Guidelines for Specialized Health Care Procedures

Third Edition

2026



Guidelines for Specialized Health Care Procedures

3rd Edition

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2026 Revision

Foreword

The Virginia Department of Health (VDH) is pleased to present a revised edition of the Guidelines for Specialized Health Care Procedures, Third Edition, (2026), a resource document for school personnel.

The Guidelines are intended to provide guidance to school administrators, school nurses, teachers and other school staff members on the care of students with special health care needs during the school day.

The Guidelines also present current, practical health information and recommendations for the development of local programs and policies related to health care services for these students.

Through these Guidelines, VDH is committed to continued collaboration with the Virginia Department of Education to assure that all schools in the Commonwealth have a safe and healthy learning environment.

_____ _____

B. Cameron Webb, MD, JD
State Health Commissioner

Date

_____ _____

Jenna Conway
Superintendent of Public Instruction

Date

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Introduction

The Guidelines for Specialized Health Care Procedures is intended to enhance the educational experience of students with health care needs by providing guidance to school nurses, teachers, and other staff regarding the health care of the students within the school setting. The Guidelines are based on current nursing and medical protocols for the care of children with special health care needs.

Parents or guardians have the primary responsibility for providing appropriate health care for their children. Whenever possible, parents and guardians are encouraged to work with their health care provider to administer medications and specialized health care procedures before or after school.

When procedures and medications need to be administered during school hours, the parents or guardians, health care provider, student (if appropriate), and school nurse should develop an individualized healthcare plan (IHP) to outline what needs to be done during the school day. Parents or guardians also need to provide the school with comprehensive health care information, medications, equipment, and supplies to help school staff care for their child. Emergency Action Plans (EAPs) should be developed as appropriate.

The Guidelines are intended to provide a broad framework for planning appropriate health care services for students. Because each student is different with a unique array of needs, these guidelines should not be the sole source or a substitute for development of an IHP that addresses the student's health care needs. The Guidelines for Specialized Health Care Procedures does not attempt to provide medical advice and should not be used as a substitute for professional medical consultation. It should be used as a tool to help school staff care for students with special health care needs. When utilizing the Guidelines, the school nurse should always practice within the scope of nursing practice in accordance with the Virginia Nurse Practice Acts.

The Guidelines are divided into eight sections reflecting systems of the body. Each section is further divided into an overview of the system, selected chronic conditions within the system, and an alphabetical listing of procedures affecting that system.

Appendix A includes sample individualized health care plans. Appendix B includes checklists that may be used to train staff on procedures.

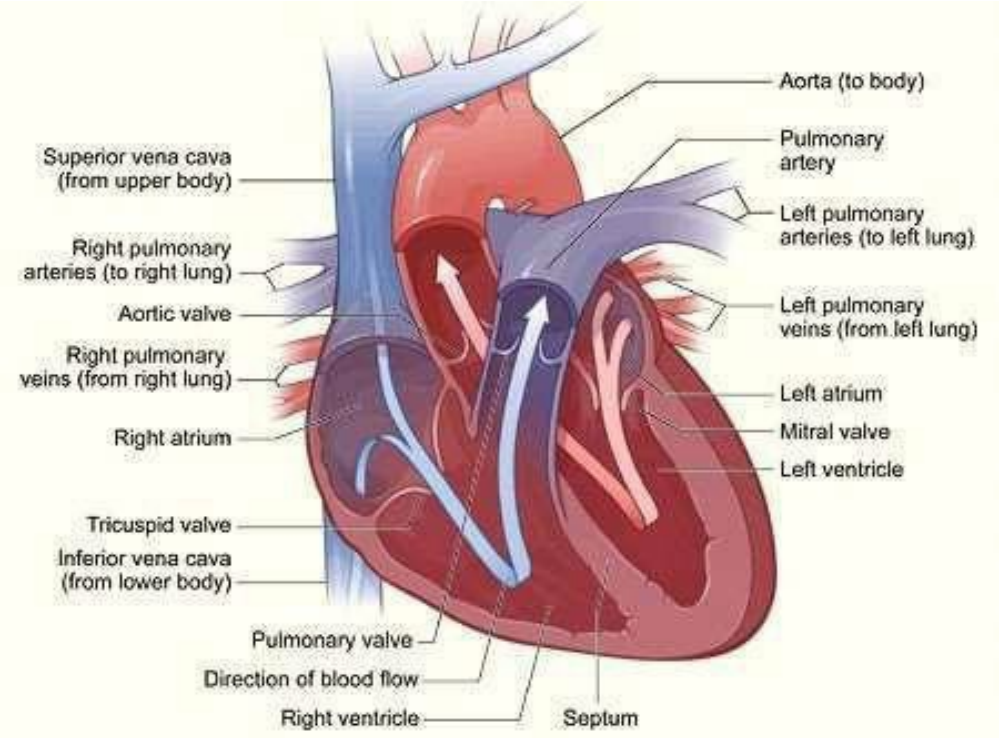
Chapter 1: Care of the Circulatory System

Overview
Central venous access devices
Management of PICC lines
Heparin/saline lock
Needleless systems and safer medical devices
One-handed needle recapping

Circulatory System

Overview

The circulatory system is composed of the heart and the blood vessels. The heart acts as a pump to transport blood via blood vessels throughout the body. The blood delivers oxygen and nutrients to all parts of the body and returns carbon dioxide and waste products to the lungs and kidneys to be eliminated. Each day the average heart beats 100,000 times and pumps about 2,000 gallons of blood.



The heart is a muscular pump with four chambers and valves that open and close to let blood flow in only one direction. The *right atrium* receives deoxygenated blood from the body. Blood flows through the tricuspid valve into the right ventricle. The *right ventricle* then contracts and pumps blood through the pulmonary valve into the pulmonary artery leading to the lungs.

In the lungs, carbon dioxide is released and oxygen is picked up by the blood. The oxygen-rich blood returns to the heart via the *pulmonary vein* into the *left atrium*. From there, it passes through the *mitral valve* into the *left ventricle*. The *left ventricle* has the strongest pump because it must pump this oxygenated blood through the aortic valve with enough force to push it through the aorta to all parts of the body.

The blood is transported to the body through a complex network of one-way vessels, which if laid end to end, would extend for 60,000 miles. The arteries carry oxygen-rich blood away from

the heart to the body. These *arteries* branch into smaller vessels called *arterioles*, which branch into the tiny *capillaries* where cells of the body can exchange their carbon dioxide and wastes for the oxygen and nutrients.

Veins take deoxygenated blood from the capillaries and return it to the heart. Veins are thinner than arteries with some having one-way valves to prevent blood from pooling in the extremities. The veins get larger in size as they return closer to the heart. The large veins inside the chest and abdomen are called *central veins*.

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Illustration Source:

National Heart, Lung, & Blood Institute. (2011). *How the heart works*. https://www.nhlbi.nih.gov/health/heart

Central Venous Access Devices

Overview

A central venous access device (CVAD) is a sterile intravenous catheter (tube) inserted into a large “central” vein (e.g., subclavian vein). It may also be called a "central line" or central venous catheter (CVC). A student may receive a CVAD if there is need for long-term intravenous access, such as the need for chemotherapy, extended antibiotic therapy, total parenteral nutrition (TPN), or frequent venipuncture (blood drawing).

There are several types of CVADs. The tunneled catheter is often called by its manufacturer’s name---Hickman, Broviac, Leonard, or Groshong. It is inserted surgically into the central vein, tunneled under the skin, and has a separate exit site, typically located in the upper chest. The portion of the catheter that is tunneled under the skin contains a Dacron cuff, which helps to hold the catheter in place while it heals and helps prevent infections by stopping bacteria from entering the tunnel and traveling up the vein. You may also find an antimicrobial cuff (trade name VitaCuff) which significantly reduces the incidence of catheter- related infection. The tunneled catheter may have one, two, or three ports (entrance lines), which will normally need to be flushed with heparin each day. Such flushing is usually done at home. (Catheters with a Groshong valve prevent backflow of blood unless negative pressure is applied. There is usually no need for heparin flushes and external clamps are not used on Groshong catheters). The tunneled catheter will also have a sterile dressing covering it to prevent it from becoming infected. This dressing should be changed according to a schedule, as specified by the health care provider, and whenever it becomes wet, soiled, or the edges are no longer intact. Routine dressing changes are done at home, but dressing changes may need to be done at school if the dressing becomes wet, soiled, or loose.

The non-tunneled catheter is similar to the tunneled catheter in appearance except that it is inserted directly into a central vein. It is usually a temporary CVAD and not seen in the school setting because it is not secured as well under the skin. Care for the non-tunneled catheter is the same as that for the tunneled except that extreme care must be taken not to dislodge it. If the student has a non-tunneled catheter, consideration should be given to homebound instruction where there would be less risk for harm to the catheter.

Another type of CVAD is the totally implanted device (TID) such as the Port-A-Cath, Mediport, PowerPort, or BardPort. They may also be called a *totally implanted venous access device* (TIVAD). This CVAD consists of a small reservoir that is totally implanted under the skin. When it is not being used, it has no tubing on the outside of the skin, does not need a dressing, and has a lower risk of becoming infected. However, when it needs to be used, the child must be stuck with a needle. Only **non-coring** Huber needles can be used to access the totally implanted CVAD to prevent damage to the port. When the TID is being used for intravenous therapy it may also need to be flushed and have its dressing changed, but flushes and dressing changes are not routinely done in schools.

A fourth type of central line is a peripherally inserted central catheter (PICC), which is inserted into a peripheral vein and threaded to a large, central vein. See the section on Management of PICC lines.

When flushing CVADs, follow manufacturer recommendations for the size of the syringe needed for the specific type of line. Generally, smaller syringes exert too much pressure and can cause a rupture in the catheter or reservoir. Therefore, 10 ml. (10 cc) syringes should be used, unless specified otherwise in the student's individualized healthcare plan (IHP). All connections should be luer-locked.

Settings and Staff

Due to the risk for infection and the need for privacy, most CVAD dressing changes are done at home. CVAD dressing may be reinforced at school, which should take place in a clean, private room such as the health room. Privacy regarding the student's medical condition and need for a CVAD should also be maintained unless the family chooses to disclose it. The student can participate in school activities, but participation in physical education activities must be determined on an individual basis by the student's health care provider.

Due to the risk of infection and/or injury, reinforcement of a central line dressing should be performed by a registered nurse using sterile technique. Administering medications through intravenous lines and central line dressing changes are not usually the responsibilities of a school nurse, but protecting the tubing and dressing from injury is. Non-medical school staff should not perform any procedures with central lines. Any school personnel who has regular contact with a student who has a CVAD must receive general training from a health care personnel covering the student's specific needs, potential problems, and implementation of the established emergency plan. Most importantly, they should be instructed what to do if the CVAD is damaged or becomes dislodged, wet, or damp.

Individualized Healthcare Plan (IHP)

Each student's Individual Healthcare Plan (IHP) must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with a central venous access device, the following items should be considered:

- The student's underlying condition and potential problems associated with the condition or treatment
- Type of CVAD—tunneled, non-tunneled, implanted, or peripherally inserted
- Specific orders from the student's healthcare provider for care at school
- The need for readily-available additional dressing supplies including a spare clamp
- Informing school staff who have regular contact with the student about the CVAD and general safety guidelines
- Reporting any fever or site changes to the school nurse, family and/or health care provider

- Determination of when, and under what conditions, the tubing or the dressing should be handled
- Never use scissors near the catheter
- Steps to be taken if a complication occurs
- Latex allergy precautions
- Standard precautions

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 367-390.

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Possible Problems with Central Venous Access Devices

Equipment that needs to be AVAILABLE at all times for Emergencies (family supplies equipment):

- Small smooth-edged clamp
- Sterile gauze
- Tape
- Gloves (sterile and clean)
- Mask, if ordered

Problems

- **Temperature elevation; redness, swelling, or drainage at the CVAD site; chills, increased fatigue, irritability or headache**
    - Notify the school nurse, family, and/or healthcare provider immediately as these are possible indications of infection. Swelling may indicate infiltration.

- **Arm, shoulder, or neck pain**
    - Infiltration or thrombosis could be developing. Also, if the implanted Dacron cuff has not fully healed, excessive sneezing, coughing, or vomiting may cause catheter migration. Notify the school nurse, family and/or healthcare provider immediately.

- **Difficulty breathing; chest pain**
    - Clamp the line and position the student on their side to help prevent an air bubble from entering the heart.

- **Do not let the student walk!**
    - **Initiate the school emergency plan. The student should be transported as soon as possible to the appropriate hospital emergency room. If the school nurse is not available, pinch the tubing with a clamp or fingers and call the emergency medical team. Notify the school nurse, family, and/or healthcare provider immediately.**
- **Blood in the tubing or bleeding from the end of the tubing**
    - Put on a pair of sterile gloves. If blood is noted in the line or coming from the end of the line, **check to see if the clamp is open or if the cap is off.** If so, close the clamp or replace the cap. Notify the school nurse and the family. If the clamp is not functioning properly, the tubing should be firmly pinched closed and the

school nurse, family, and healthcare provider notified immediately according to the student's emergency plan.

- **CVAD is pulled or falls out**
    - Inspect the exterior of the dressing. If the dressing is intact and the tape still holds the looped catheter, it is probable that no significant trauma to the student or the line has occurred. The school nurse, family, and the health care provider should be notified. If the tape or dressing has been disrupted, the dressing should be reinforced by the school nurse and the family and healthcare provider notified.
    - **If the catheter has fallen out, stay calm**. Reassure the student. The CVAD exit site should immediately be covered with sterile gauze or a clean dressing if a sterile one is not readily available. Apply firm pressure to the exit site (bleeding should be minimal).

    - **Notify the school nurse, healthcare provider and family immediately. Activate the school emergency plan.**
- **Catheter tubing breaks**
    - Clamp the catheter above the break (closest to the skin) or pinch it off by folding the catheter onto itself and wrap the broken end with sterile gauze. **Notify the school nurse, family and healthcare provider immediately. Initiate the emergency action plan.** The catheter can sometimes be repaired by the health care provider at the hospital.

Sources:

Bowden, V., & Greenberg, C. (2012). Pediatric nursing procedures (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 367-390.

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Wisconsin Improving School Health Services Project. (2015). Central venous line dressing change.

General Information for Students with Central Venous Access Devices

Date: _____

To: _____
(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has a central venous access device (CVAD), a plastic tube that has been placed into a large vein close to the heart. The tube may be used for nutritional support or medications.

The tubing, located on the chest (sometimes on the arm for peripherally inserted central catheters), may or may not be visible and is covered by a bandage to protect the site. No one should routinely touch the tubing or dressing. The CVAD should not cause any discomfort if it is secured properly.

The CVAD usually is clamped or capped during school or during transport. However, some students may have the tubing connected to an intravenous fluid solution. Usually routine CVAD care is done at home or in the school clinic.

Most students with CVADs are able to participate in school activities. The student's health care provider and family need to determine, in writing, any physical activity restrictions. Basically, the CVAD should not be bumped during activity and the tubing should not be pulled. The dressing should not get soiled or wet. If it does, the school nurse and family should be notified.

This student should have an Emergency Action Care Plan and **all staff** who have contact with this student should be familiar with how to initiate the plan.

Contact_____at
_____(phonenumber/pager) for additional information or if the student experiences any problems with the CVAD.

Source: Adapted from: Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and Youth Assisted by Medical Technology in Educational Settings: Guidelines for Care*. (2nd ed.). Baltimore: Paul H. Brookes Publishing.

PICC Line Management

Overview

A peripherally inserted central catheter (PICC) is a long intravenous (IV) line that is inserted into a peripheral vein and threaded (often with a guidewire) to a large, central vein. It is usually used for IV therapy of short to moderate length but has been used longer. It is frequently used for outpatient IV medication therapy lasting 1-6 weeks because it has fewer problems with infiltration and phlebitis than peripheral IVs, yet it costs less (does not need to be inserted in the operating room) and has fewer complications than other central venous access devices.

PICC lines are most often inserted into the antecubital fossa (the inner aspect of the elbow) and threaded through the basilic or cephalic vein to the superior vena cava (which flows into the heart). PICC lines may have a single or double lumen. For short-term therapy not requiring total parenteral nutrition, they may be trimmed before insertion and only inserted "midline," ending near the axillary vein. The site of the PICC line is covered with a sterile dressing, which should be treated like other CVAD dressings.

Precautions

PICC lines are generally treated like central venous catheters in catheter care. Dressing changes are usually done on a prescribed schedule, and heparin flushes are done at home daily. Dressing changes should be done using sterile techniques but not at school. If the dressing becomes soiled or damp, the registered school nurse should reinforce the dressing and call the parent.

It is important to remember that **most PICC lines are not sutured into place**. Extra care must be taken not to pull the catheter out of the insertion site**. PICC lines cannot be removed in the same manner as other peripherally inserted catheters or heparin locks**. In general, treat them like central lines. **If problems occur with a PICC line, the school nurse, family, and healthcare provider must be notified.**

Due to their location (usually the arm), PICC sites may not be covered by clothing. If not, a wrap or mesh may provide added protection at school if ordered by the healthcare provider. There should be no heavy lifting, push-ups, or pull-ups if the PICC line is in the arm. The healthcare provider should provide orders regarding activity level and restrictions.

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Heparin/Saline Lock--Intermittent Venous Access Device

Overview

Students who do not need continuous intravenous (IV) infusion yet still require peripheral IV access for intermittent medication or fluids may have a heparin or saline lock. An intermittent intravenous device such as this permits the student to move around more easily. These IV catheters are used for short-term courses of medication or fluids.

Heparin prevents blood from clotting in the catheter. Heparin or saline in the intermittent device is replaced regularly by injecting a prescribed amount of heparin or saline into the hub or cap. Caps must be scrubbed with alcohol using a twisting friction motion for 10-15 seconds before injecting a flush or medication. Studies indicate either heparin or saline are effective flushes if the IV catheter is larger than 24 gauge. Some studies indicate heparin is more effective in catheters as small as 24 gauge. Heparin flushes may cause more discomfort than saline for some students.

Settings and Staff

Procedures such as flushes and dressing changes should be done at home. The student's activity may need to be limited to prevent dislodging the IV catheter. Catheter insertion sites affected by the motion of a joint should be supported (e.g., using an armboard or handboard) to avoid the risk of infiltration or mechanical phlebitis from the movement of the catheter inside the vein.

Due to the risk of infection, a registered nurse should reinforce the IV catheter dressing using sterile techniques. Non-medical school staff should not perform this procedure. Any school personnel who have regular contact with a student with a heparin/saline lock or venous access device should receive training that covers potential problems and the implementation of the student emergency care plan.

Individualized Health Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with a peripheral heparin/saline lock, the following items should be considered:

- Healthcare provider's order for an intermittent venous access device
- Protection of the IV site from bumping or injury
- Activity level restrictions
- Whether catheter tubing stays clamped
- Signs of IV site infiltration or infection
- Symptoms which require notification of school nurse, family, and/or health care provider
- Safe storage and disposal of supplies
- Latex allergy precautions
- Standard precautions

Possible Problems with a Heparin/Saline Lock

- **Tender, red, swollen, or warm IV site**
    - IV catheter may be displaced or infiltrated, causing the intravenous fluid to enter the tissue, or the vein may be inflamed. Notify the school nurse and call the family immediately.
- **Wet or bloody IV dressing**
    - Male adaptor (cap) may be dislodged. The IV catheter itself may have slipped out of the vein, or the IV site may have been infiltrated. Reinforce with a dry dressing and call the family.
- **Redstreak noted above IV site**
    - The vein may be inflamed (phlebitis). Notify the school nurse, family, and/or health care provider.

Sources:

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General Information for Students with Heparin/Saline Locks

Date: _____

To: _____
(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has an intravenous (IV) catheter (tube) in a vein in his or her arm or hand. The tubing is held in place with tape. This IV tube is used to give the student medication or fluids.

When the student is not receiving medications or fluids, the IV tube is closed with a heparin or saline lock. The student may have activity restrictions.

The student should not dislodge the tubing or get it soiled or wet.

Contact_____at_____(phone number/pager) for additional information or if the student experiences any problems with the IV tubing.

Source: Adapted from: Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and Youth Assisted by Medical Technology in Educational Settings: Guidelines for Care*. (2nd ed.). Baltimore: Paul H. Brookes Publishing.

Use of Needleless Systems and Safer Medical Devices

Overview

Injuries from contaminated needles expose healthcare workers to a number of diseases, including human immunodeficiency virus (HIV), Hepatitis-B virus, and Hepatitis-C virus. According to the Centers for Disease Control and Prevention (CDC), approximately 600,000- 800,000 needlestick accidents occurred each year prior to 2000.

The Needlestick Safety and Prevention Act of 2000 was passed to reduce the risks of disease transmission and injury from needles and other sharps. In2001, the Occupational Safety and Health Administration (OSHA) revised the Bloodborne Pathogens standard to comply with the new law. As a result, **facilities are *required* to utilize safer medical devices as they become available**. These "safer medical devices" replace sharps with non-needle devices or incorporate safety features designed to reduce the likelihood of injury and have significantly decreased such injuries.

Any facility or organization that employs individuals who might reasonably experience occupational exposure to blood or other potentially infectious materials must comply with the regulation, even if the facility has never had a needlestick injury. In schools, the presence of large numbers of children and the safety of nurses and other health care workers make the use of needleless systems and safer medical devices a high priority.

A variety of products have been developed to reduce accidental needle sticks. Some safety products are "passive" and automatically engage the safety mechanism whenever they are used, while "active" products require the user to activate the safety component. There are so many new products available and being developed that it would be impossible to describe the procedure for using each one. Users are directed to follow the manufacturer's specific instructions for each device.

The International Health Care Worker Safety Center at the University of Virginia maintains a *List of Safety-Engineered Sharp Devices* and other products designed to prevent occupational exposures to bloodborne pathogens. The list includes the types of safety devices and each device's manufacturer. It also lists all the manufacturers and their contact information, including phone number, fax number, email address, and mailing address.

Types of Safer Medical Devices

Below is an outline and brief description of some of the types of safer medical devices:

- Injection Equipment
    - Needle guards—after injection:
        - user pushes safety cover/sheath forward until it locks
        - user grasps sleeve and twists flanges to loosen sleeve and pull down over retracting needle

    - Needle guards—hinged recap
        - Needle has a pre-attached sheath. After injection, the user presses the sheath against a hard surface, locking it in place over the needle.
    - Retractable needles
        - When the user fully depresses the plunger, the needle automatically retracts from the patient and is encapsulated within the syringe
        - The safety sheath covers the needle when the user pushes the button on the syringe
        - User rotates the plunger to release the needle and pull the plunger back, so the needle retracts and becomes encapsulated
    - Needleless jet injection
        - Needle-free delivery of intramuscular or subcutaneous injections using CO2 as a power source to eject medication, which then penetrates the skin
    - Pre-Filled syringes
        - Syringes prefilled with common medications and various needle safety devices
- IV Medication Delivery Systems (not usually done at school)
    - Needleless IV access—blunted cannula
        - Blunt plastic cannula with pre-slit, resealing synthetic injection sites
    - Needleless IV access—valve/access ports and connectors
        - Two-way reflux valve activated by a standard male luer lock; the valve closes automatically when the luer is removed
    - Capless valve activated by a standard male luer lock
        - Capless valve which uses positive displacement to expel fluid when the luer lock taper is removed, preventing any backflow—becoming increasingly popular because it prevents the retrograde return of blood, thus reducing clotting and contamination risks; this tubing should usually not be clamped until luer lock is removed;
    - Prefilled medication cartridge with safety needles/guards—often part of a specific IV product system line
    - Recessed/protected needles
        - Recessed needles which lock onto injection ports, usually at Y-sites
- Medication vial adapters

- IV Insertion Equipment
    - Shielded or retracting peripheral IV catheters
        - The needle retracts automatically into a needle shield when the needle is withdrawn from the catheter
        - Push-button shielding retracts the needle into the needle shield

        - Telescoping needle shield that covers stylet as it is withdrawn
        - The safety clip automatically engages and covers the needle tip as it is withdrawn
            - Shielded midline catheters
            - Guidewire introducers
- Lancets
    - Laser lancets
    - Retracting lancets
    - Strip lancets
- Sharps Disposal Containers—list of manufacturers available on the website
- Other Safer Medical Devices not often used in school settings
    - Blood collection equipment
    - Laboratory devices
    - Blood bank devices
    - Nuclear medicine devices
    - Surgical scalpels
    - Blunted suture needles
    - Alternative skin closure devices
    - Other surgical sharps protection
    - Hemodialysis and apheresis devices
    - Fluid sampling devices
    - Bone marrow collection system
    - Other miscellaneous products

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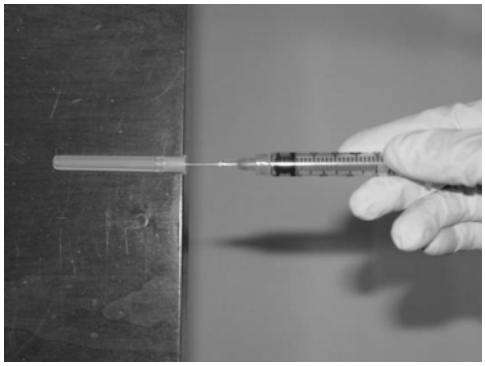
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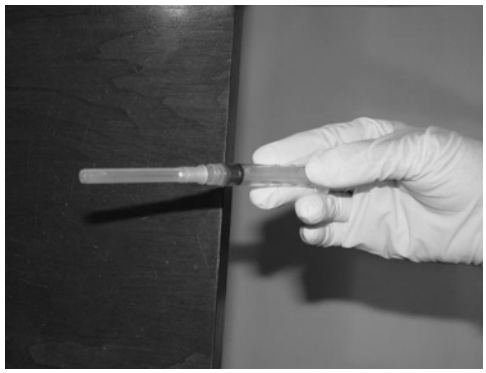
Procedure for One-Handed Needle Recapping

Due to the risk of injury, needles should rarely ever be recapped. Use this procedure only when a sharps disposal box is unavailable or when the needle is used in such a way that it has had no chance of becoming contaminated. Needlestick injuries place workers at risk for bloodborne pathogens. After a needle has been used, it should be disposed of in the nearest sharps container. It should never be placed (capped or uncapped) in the regular trash.

1. Wash your hands with soap and water and apply a pair of gloves.
2. Before using the needle, place the needle cover on a flat, solid, immovable object such as the edge of a table. The open end of the needle cap should face the worker and be within reach of the dominant hand.



3. Give the injection or use the needle and syringe to draw up the solution.
4. Place the tip of the needle inside the open end of the needle cap and gently slide the needle into the cap.
5. Once the needle is inside the cap, gently lift the syringe just off the table with the needle cap pointed upwards.
6. Carefully point the capped needle against the table and use the table's resistance to cap the needle completely.



7. Dispose of the needle and syringe in an appropriate container (sharps container) at the first opportunity.
8. Remove your gloves and wash your hands with soap and water

Sources

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Illustration Source: Vickie H. Southall.

Chapter 2: Care of the Endocrine System

Diabetes Overview DMMP and Action Plans Glucose Testing

Continuous Glucose Monitor Low Blood Glucose Glucagon

High Blood Glucose Ketone Testing Insulin

Carbohydrate Counting and Correction Factor Insulin Syringes

Insulin Pens Insulin Pumps Training Resource

Diabetes

Overview

Diabetes is a chronic disease in which the body either does not make, or does not properly use insulin, a hormone needed to convert sugar, starches, and other food into energy. People with diabetes develop increased blood glucose (sugar) levels because they lack insulin, have insufficient insulin, or are resistant to insulin's effects. High levels of glucose build up in the blood and spill into the urine; as a result, the body loses its primary source of fuel.

When insulin is no longer made, it must be obtained from another source— i.e. insulin injections or insulin pumps. When the body does not use insulin properly, oral medications may be taken instead of, or in addition to, insulin shots. Neither insulin nor other medications, however, are cures for diabetes: they only help control the disease.

Taking care of diabetes is vitally important. If not treated, diabetes can lead to serious health problems and impact learning. The disease can affect the blood vessels, eyes, kidneys, nerves, gums, and teeth. It is the leading cause of adult blindness, lower-limb amputations, and kidney failure. People with diabetes also have a higher risk of heart disease and stroke. Some of these problems can occur in teens and young adults who develop diabetes during childhood. The good news is that research shows that these problems can be significantly reduced or delayed by keeping blood glucose levels under control.

Types of Diabetes

Type 1. Type 1 diabetes mellitus (T1DM) is a complex metabolic disease. In T1DM the immune system attacks the beta cells (the pancreas's insulin-producing cells) and destroys them. Without insulin, glucose in the blood cannot be converted into a form the body can use for energy. Because the pancreas can no longer produce insulin, people with type 1 diabetes need to take insulin daily to live. T1DM can occur at any age, but it often begins in children and young adults. T1DM cannot be prevented.

Symptoms	**Risk Factors**
• Increased thirst and urination • Constant hunger • Weight loss • Blurred vision • Fatigue	• Genetics • Environment

Type 2. The first step in developing type 2 diabetes mellitus (T2DM) is usually a problem with the body's response to insulin or insulin resistance. Scientists do not entirely understand that the

body cannot use its insulin very well. This means that the body needs increasing amounts of insulin to control blood glucose. The pancreas tries to make more insulin, but insulin production may drop off after several years.

T2DM used to be found mainly in overweight adults ages 40 or older. As more children and adolescents in the United States become overweight and inactive, T2DM is occurring in younger people, including children and adolescents. To control their diabetes, children with T2DM may need to take oral medication, insulin, or both. T2DM can be decreased by avoiding obesity through a healthy diet and plenty of exercise.

Symptoms	**Risk Factors**
• Fatigue • Increased thirst and urination • Nausea • Unexplained weight loss • Blurred vision • Frequent infections • Slow healing of wounds or sores	• Being overweight (greater than 85th percentile for height/weight) • Having a family member who has T2DM • Being African American, Hispanic/Latino American, American Indian, Asian American, or Pacific Islander American • Having a mother who developed gestational diabetes while pregnant • Having high blood pressure, high cholesterol, high lipid levels • Being inactive

Understanding Diabetes and Ketoacidosis

The pancreas makes enzymes and hormones. Enzymes help digest or break down the food into glucose. Insulin is a hormone secreted by the beta cells of the pancreas. Insulin goes straight into the blood and enables glucose to enter other cells of the body. Glucose is a simple sugar that is present in the blood and is used by the body for energy. When someone has diabetes, the pancreas doesn't make enough insulin, or the body becomes resistant to its insulin. When there is not enough effective insulin, glucose cannot enter the cells. Body cells need to have glucose to provide the energy to do their jobs. When glucose cannot be used for energy, the level of glucose builds up in the bloodstream. When excess glucose builds up in the blood, the kidneys filter it out into the urine. In the process, the body uses and loses a lot of water. This causes increased thirst. Hunger is another symptom of diabetes caused by the body losing calories due to its inability to utilize the glucose from the food that is consumed. This leads to weight loss and fatigue.

When the body can't use glucose, it uses its own fat and muscle tissue for energy. Ketones are acids left in the blood when fat is used for energy. As ketone production increases, ketone blood

levels increase, causing *diabetic ketoacidosis* (DKA), a medical emergency. The body will try to get rid of ketones through the kidneys and lungs.

Symptoms of nausea, vomiting, and eventually coma can occur. The ketones will show up in the urine and may cause the breath to smell fruity.

Management of Diabetes

The goal of effective diabetes management is to control blood glucose levels by keeping them within a target range that is determined for each child. Optimal blood glucose helps to promote normal growth and development and allows for optimal learning. Effective diabetes management is needed to prevent the immediate dangers of blood glucose levels that are too high or too low. Research has shown that maintaining blood glucose levels within a target range can prevent or delay the long-term complications of diabetes, such as heart attack, stroke, blindness, kidney failure, nerve disease, and amputations of the foot or leg.

The key to optimal blood glucose control is to carefully balance food, exercise, insulin and medication. As a general rule, food makes blood glucose go up, and exercise and insulin decrease blood glucose levels. Several other factors, such as growth and puberty, mental stress, illness, or injury, can also affect blood glucose levels. With all of these factors coming into play, maintaining good blood glucose control is a constant juggling act—24 hours a day, 7 days a week.

Monitoring Blood Glucose

Students with diabetes check (or test) their blood glucose levels throughout the day using a blood glucose meter (or sometimes now using a continuous glucose monitoring sensor). The meter gives a reading of the glucose level in the blood when it is being checked.

Monitoring involves pricking the skin with a lancet at the fingertip, forearm, or other test sites to obtain a drop of blood and placing the drop on a special test strip that is inserted in a glucose meter (further information on glucose meters). If blood glucose levels are too low (hypoglycemia) or too high (hyperglycemia), students can take corrective action, such as eating, modifying their activity level, or administering insulin. Low blood glucose levels, which can be life-threatening, present the most significant immediate danger to people with diabetes.

Health care providers generally recommend that students check their blood glucose during the school day, usually before eating lunch or snacks, before physical activity, or whenever symptoms of hypoglycemia or hyperglycemia occur. In young children, symptoms may be subtle; blood glucose should be checked whenever symptoms are suspected. Many students can check their own blood glucose level; others will need supervision; and others will need to have the entire task performed by a school nurse or designated, trained, unlicensed assistive personnel (UAP). Students who can self-check can be allowed to do so whenever they need to and at any school location. Being able to do so can help achieve better glucose control, independence in

managing their diabetes, less stigma, and less time out of class. Frequency, supervision, and implementation of testing should be covered in the student's individualized health care plan.

Possible Causes of Hypoglycemia

- Too much insulin
- Too little food
- Extra physical activity
- Being ill, especially with vomiting
- Stress or emotions
- Hormonal variations

Signs of Hyperglycemia—High Blood Glucose	
Mild Symptoms	
• Increased thirst • Increased urination • Dry mouth • Fatigue • Numbness or tingling • Agitation, fidgetiness, irritability	• Increased hunger • Nausea • Blurred vision • Weakness • Lack of concentration
Moderate Symptoms	
• Decreased appetite • Nausea • Abdominal pain	• Vomiting • Sunken eyes • Weight loss
Severe Symptoms	
• Continued vomiting • Sleepiness • Coma or unconsciousness	• Very weak • Deep breathing, fruity smell • Possible ketones

Nutrition Planning

Although students with diabetes have the exact nutritional needs as other students, there are special considerations for the school setting. Structured meals and snacks contribute to optimal glucose control and prevent hypoglycemia. The timing of snacks is based on peak insulin action times (when the insulin is most effective in lowering the blood glucose) and activity. Therefore snacks must be allowed according to pre-scheduled daily snacks and

for treatment of hypoglycemia. Students with diabetes usually have an individualized meal plan based on carbohydrate counting. All meal plans are nutritionally sound and encourage the daily calorie requirements needed for optimal growth and development.

Carbohydrate counting involves calculating the number of grams of carbohydrate. This information can be obtained from nutrition information labels, to determine the amount of insulin the student needs to control blood glucose for any meal or snack. Carbohydrate counting is the preferred method for determining food choices and portion sizes (see Carbohydrate Counting section).

The exchange system is an older system that groups foods in six different lists, each with a set nutritional value. A meal plan recommends prescribed exchanges or servings from each food group for each meal and snack. The exchange lists include the following food groups:

(1) bread/starch, (2) fruit, (3) milk, (4) vegetables, (5) meat/protein foods, and (6) fats. The exchange system is not usually recommended for use in T1DM.

It is essential for school personnel working with students who have diabetes to realize that any food eaten that contains carbohydrates must be worked into the meal plan, even if it is labeled "sugar-free".

Physical Activity

Exercise and physical activity are critical components of diabetes management. Everyone can benefit from regular exercise, but it is even more important for a student with diabetes. In addition to maintaining cardiovascular fitness and controlling weight, physical activity can help to lower blood glucose levels.

Students with diabetes should participate fully in physical education classes and team sports. Students may adjust their insulin and food intake to maintain blood glucose levels within their target ranges during extra physical activity. To prevent hypoglycemia, they also may need to check their blood glucose levels more frequently while engaging in physical activity. Before exercise, general guidelines for blood glucose levels should be over 100 and under 250. When the blood glucose level is over 300, a test for ketones should be done (if recommended by the health care provider) before exercising. If ketone results are moderate or large, the student should not exercise.

The student with diabetes should eat before exercising if it has been more than two hours since the student has eaten. It is best to exercise or take physical education 30-60 minutes after a meal to allow time for food to be absorbed. A person with diabetes always needs to have a fast-acting sugar and a complex carbohydrate readily available to treat low blood sugar, and plenty of water. Physical education instructors and sports coaches should be able to recognize and assist with the treatment of hypoglycemia.

Exercise increases blood flow in general, especially to the muscles being used the most. Insulin is absorbed faster when there is increased blood flow to the exercising muscles. For example, if the insulin is injected into the arm before a run or swim, it may be absorbed quickly and cause low blood sugar. Muscles use stored energy while exercising, and after exercise, the muscles

need to replace this stored sugar. They do this by taking glucose out of the blood, which may continue for up to 12 hours after exercising.

Students using insulin pumps may disconnect from the pump for sports activities. If they keep the pump on, they may set a temporary, reduced insulin rate while they are playing. The student's individualized health care plan should include specific instructions for physical activity.

Implications for Education

Students with diabetes should have adequate time to take medication, check blood glucose, and eat. School personnel can help eliminate barriers to these activities. Students also may need additional access to food or drink and the restroom. Students with hyperglycemia or hypoglycemia often do not concentrate well, and blood glucose may need to be checked before and during academic testing. If a severe high or low blood glucose episode occurs, a student may need to be excused with an opportunity for a retake.

Planning for Disasters and Emergencies

In the event of natural disasters or other emergencies, students may need to stay at school. The family, therefore, must provide an emergency supply kit containing a 72 hour supply of the following items as appropriate:

- Blood glucose meter, testing strips, lancets, and batteries for the meter
- Insulin, syringes, & supplies
- Insulin pump and supplies
- Other medications
- Glucagon emergency kit
- Antiseptic wipes
- Urine ketones strips/Blood ketone meter and strips
- Fast-acting source of glucose
- Carbohydrate-containing snacks
- Hypoglycemia food supplies (for three episodes): quick-acting sugar and carbohydrate/protein snacks
- Continuous glucose monitoring supplies/equipment

Settings and Staff

As with all medical conditions, every effort should be made to protect the student's privacy. Students need to be able to check their blood glucose levels and respond to levels that are too high to too low as quickly as possible. Accordingly, if the healthcare provider recommends, students shall be permitted to check their blood glucose level and respond to the results at any school location or activity (Code of Virginia §22.1- 274.01:1). Taking immediate action is

essential so that the symptoms don't worsen and students don't miss time in the classroom. Blood glucose monitoring does not present a danger to other students or staff members when there is a plan for the proper disposal of lancets and other materials that come into contact with blood. The family and the school should agree on the plan, which should be consistent with Standard Precautions and local waste-disposal laws. The plan should specify the level of supervision needed for testing and treatment.

All school staff members responsible for students with diabetes should receive training that provides a basic understanding of the disease and the students' needs, how to identify medical emergencies, and whom to contact in case of an emergency.

A few school staff members should receive training from a qualified health care professional (R.N.) in student-specific routine and emergency diabetes care tasks. At least one staff member should always be available for younger, less experienced students and any student with diabetes in case of an emergency. All students with diabetes will need help with emergency medical care. The Code of Virginia § 22.1-274 ensures that in school buildings with ten or more instructional & administrative employees, at least two employees are trained in administering insulin and glucagon at a school if one or more students are diagnosed with diabetes. The Department of Education has published a manual to train school employees to administer glucagon and insulin.

Individualized Healthcare Plan (IHP)

Every student with diabetes needs a detailed IHP tailored to the individual's needs. It should cover procedures for diabetic management and possible problems and emergencies that may arise.

The National Diabetes Education Program recommends developing a plan with at least three components:

1. The Diabetes Medical Management Plan (DMMP), which contains the healthcare provider's prescribed diabetes health care regimen.
2. An individualized healthcare plan developed by the school nurse.
3. A Quick Reference Emergency Action Plan describing how to recognize hypoglycemia and hyperglycemia and what to do as soon as signs of these conditions are observed.

Some students may also need an education plan (individualized education plan [IEP] or a 504 plan) explaining what accommodations, education aids, and services are required. A sample DMMP and Quick

A Reference Emergency Plan follows this section. It may be copied and used to develop a plan for each student. A sample IHP can be found in Appendix A. For a student with diabetes, the following items should receive particular attention:

Diabetes Medical Management Plan

- Date of diagnosis
- Current health status
- Emergency contact information
- Student's willingness and ability to perform self-management tasks at school
- Lists of diabetes equipment and supplies with a schedule for quality control checks of equipment
- Plan for storage of diabetic supplies and access in an emergency
- Specific healthcare provider orders
    - Blood glucose monitoring
    - Insulin, glucagon, and other medications to be given at school
    - Meal and snack plan
    - Carbohydrate counting
    - Correction factors
    - Exercise requirements
    - Additional monitoring, such as testing for ketones
    - Continuous glucose monitoring (CGM)
- Exercise requirements
- Typical signs, symptoms, and prescribed treatment for hypoglycemia
- Typical signs, symptoms, and prescribed treatment for hyperglycemia
- Latex or other allergy precautions

Individualized Healthcare Plan (IHP)

- Where and when blood glucose monitoring and treatment will take place
- Location of student's diabetes management supplies
- Identification of designated, trained, unlicensed assistive personnel who can conduct blood glucose checking, insulin and glucagon administration, and treatment of hypoglycemia and hyperglycemia
- Emergency contact information for family and healthcare provider
- Free access to the restroom and water fountain
- Nutritional needs, including provisions for meals and snacks and obtaining nutritional (especially carbohydrate) information from dietary staff
- Specific healthcare provider orders
    - Blood glucose monitoring
    - Insulin, glucagon, and other medications to be given at school
    - Meal and snack plan
    - Carbohydrate counting
    - Correction factors
    - Exercise requirements
    - Additional monitoring, such as testing for ketones

- Exercise requirements
- Typical signs, symptoms, and prescribed treatment for hypoglycemia
- Desired goals and outcomes for health and education
- Full participation in all school-sponsored activities and field trips, with coverage by designated, trained unlicensed personnel
- Alternative times for academic exams if the student is experiencing hypoglycemia or hyperglycemia
- Flexible policies regarding absences for doctors' appointments and diabetes-related illness
- Disaster planning and storage of 72 hour supply of medication, food supplies, and water
- Maintenance of confidentiality and the student's right to privacy
- Other accommodations as identified
- Standard precautions

Emergency Care Plans for Hypoglycemia and Hyperglycemia

- Symptoms of hypoglycemia and hyperglycemia
- Actions to take when hypoglycemia or hyperglycemia occur
- Emergency contact information and phone numbers
- Basic information on the underlying health condition(s)

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Diabetes Action Plans

1. **Virginia Diabetes Medical Management Plan (DMMP)**

Visit the Virginia Diabetes Council website for the most current school DMMP template: virginiadiabetes.org

2. **Individual Health Care Plan (IHP)**

Sample templates of the following documents are available in section three of the NDEP guide, Helping the Student with Diabetes Succeed

3. **Emergency Care Plan (ECP)**

Sample templates of the following documents are available in section three of the

NDEP guide, Helping the Student with Diabetes Succeed: A Guide for School Personnel, by the U.S. Department of Health and Human Resources, National Diabetes Education Program (NDEP):

Diabetes Medical Management Plan (DMMP, Fillable PDF)

Individual Health Care Plan (IHP)

Emergency Care Plans (ECP) for Hypoglycemia and Hyperglycemia

4. **Virginia Department of Education Resources**

Diabetes Management in Schools: Manual for Unlicensed Personnel (Word)

Procedure for Blood Glucose Testing

Multiple companies are offering glucose monitoring devices, each operating differently. Therefore, families must provide manufacturer instructions for the specific glucose monitoring device to the school. Below are general guidelines for blood glucose testing. However, individuals involved with glucose monitoring should be familiar with the manufacturer's instructions of the device they are using to ensure the device's correct operation for accurate readings, proper cleaning, battery replacement, and storage. At school, blood glucose is most often tested before meals, whenever a student feels blood glucose may be low (or high), and sometimes before physical activity.

1. Review directions and become familiar with the use of the blood glucose monitor prior to use.
2. Wash your hands with soap and water.
3. Assemble the equipment required for the test included below.
    a. Alcohol prep pad
    b. Finger lancing device
    c. Blood glucose testing meter (common devices: Accuchek, Bayer Contour, One Touch Ultra, Therasense Freestyle, Fora, True Metrix, etc.)
    d. Blood testing strips for specific electronic meter
    e. Tissue or cotton balls or spot bandage
    f. Gloves
    g. Student log



4. Wash your hands again after assembling the equipment, as well as the area to be tested, with soap and water. If the caregiver is performing the procedure, put on a pair of gloves. Washing the student's hands and the test site is sufficient for preparing the site; however, alcohol may be used for further prepping. The site selected must be dry before pricking.
    a. *Alcohol may cause toughening of the skin or a burning sensation. If moisture (water or alcohol) remains on the skin, it may alter test results.*
5. Place the glucose testing strip into the electronic meter according to the manufacturer's instructions.
6. Prepare the lancing device according to the manufacturer's instructions.

*If school personnel are performing the procedure, then a disposable lancing device **must** be used. Some meters allow testing on forearms. The lancet device used for forearm testing is not disposable; therefore, the child may only use the forearm if independently able to use the lancing device. Also, blood glucose readings from alternate sites such as the forearm tend to lag about 15 minutes behind readings obtained from a fingerstick.*

Therefore, fingersticks should be used to assess blood sugars whenever hypoglycemia is suspected.

1. Select a site. If using a finger, use the top sides of the fingertips. Hang the arm below heart level for 30 seconds to increase the blood flow. *The tips of the fingertips may be more sensitive.*
2. Puncture the site with the lancing device. Gently squeeze the finger downward to obtain a large enough drop of blood to cover the test pad on the test strip.



Avoid squeezing the site excessively because excess squeezing can contaminate the sample with tissue fluid and cause hemolysis of the sample and trauma to the site.

3. Place blood on the testing strip and follow the manufacturer's instructions. Apply pressure to the lanced area with tissue or cotton ball until bleeding stops.
4. Dispose of the test strip and tissue or cotton ball in a lined wastebasket. Dispose of the lancing device in a sharps container.
5. Remove and dispose of your gloves. Wash your hands with soap and water.
6. Record results in the student log. Refer to the student's DMMP or IHP for actions. Refer to the "Quick Reference Emergency Plans" on the preceding two pages for sample actions.

Sources:

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Illustration Source:

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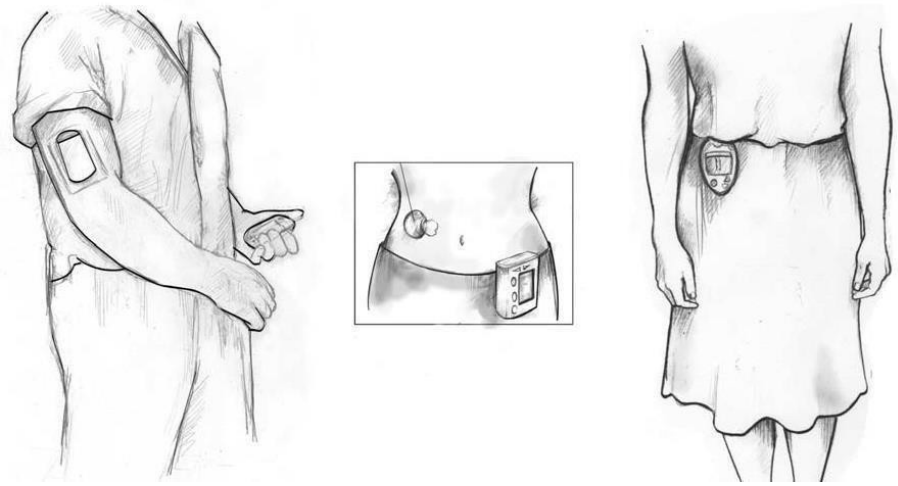
Continuous Glucose Monitoring

Overview

Continuous glucose monitors (CGM) monitor and record blood glucose levels throughout the day. It uses a tiny sensor inserted under the skin to check glucose levels in the interstitial tissues. The sensor can stay in place for several days to a week before needing to be replaced. A transmitter in the sensor sends information about the glucose levels wirelessly to a monitor. The monitor may be part of an insulin pump or it may be a separate device that looks similar to a pager or cell phone and can be carried in a purse, backpack, or pocket. The CGM alerts when glucose levels are trending too high or too low. Some models can send information directly to specific insulin pumps where insulin adjustments can be made.

CGM sensors typically take readings at 5-minute intervals. Special software downloads the glucose readings to a computer and analyzes patterns and trends. CGM systems may enable better glucose control through constant monitoring that allows corrections before glucose levels get too high or low. CGM systems monitor interstitial glucose levels. If the CGM alarms, the student should use conventional blood glucose monitoring to check blood glucose levels to determine what specific adjustments should be made. Advances in continuous glucose monitoring continue with the hope that in the future, they will provide reliable feedback and a mechanism to deliver insulin in a manner more like normal pancreatic function.

Examples of CGM systems:



Sources:

Continuous glucose monitors 2020. Diabetes Forecast
http://main.diabetes.org/dforg/pdfs/2020/2020-cg-continuous-glucose-monitors.pdf

Procedure for Mild or Moderate Low Blood Glucose

1. Recognize signs of low blood glucose. Ask the student to describe how they feel. Refer to the student's individualized health care plan, if possible.

Mild Symptoms	
• Hunger	• Sweating
• Shakiness	• Drowsiness
• Weakness	• Personality change
• Paleness	• Inability to concentrate
• Anxiety	• Dizziness
• Irritability	• Headache

Moderate Symptoms	
• Headache	• Blurred vision
• Behavior change	• Slurred speech
• Poor coordination	• Confusion

If a student cannot swallow, is combative, uncooperative, unconscious, or having a seizure, proceed <u>immediately</u> to the Procedure for Severe Low Glucose.

Factors Which Can Lead to Low Blood Glucose:

- Too much insulin
- Too little food
- Extra physical activity

To Prevent Hypoglycemia:

- Keep a fast-acting carbohydrate source with the student ***<u>ALWAYS</u>***.
- Treat low blood glucose at the ***onset*** of symptoms.
- Test blood glucose, take insulin, eat, and exercise at the prescribed times.
- Have an up-to-date management plan from the student's healthcare provider.
- Ensure that food eaten matches insulin dosing. Watch picky eaters. Provide information to families about school meals, snacks, and classroom activities involving food.
- Monitor blood glucose variations on “gym days” because an extra snack may be required ½ hour before physical education or during prolonged vigorous exercise.
- Never leave a student unattended when low blood glucose is suspected.

2. Test blood for glucose. (See Procedure for Blood Glucose Testing.) If no blood glucose meter is available, treat immediately. When in doubt, always treat. If symptoms exist, provide immediate adult supervision during testing.

If the blood glucose level is below the level indicated per the healthcare provider (usually 70-80 mg/dL): Have the student eat or drink one of the following fast-acting carbohydrates (or whatever is specified in the student's IHP):

- 4 oz. (1/2 cup) fruit juice
- 2-4 glucose tablets (chewed thoroughly before swallowing)
- 6 ounces of regular (not diet) soda (about half a can)
- 1 tube of glucose gel or cake decorating frosting
- 4-6 small hard candies
- 1-2 tablespoons of honey

Treat "on the spot." **The student should never be left alone or sent anywhere alone when experiencing hypoglycemia.** Students should be permitted to carry a source of glucose with them at all times.

If blood glucose is above 80 and the student is not feeling well, repeat the test to verify results.

3. Observe for 10-15 minutes, then recheck their blood glucose.
4. If the blood glucose is over 80 and the student is feeling better:
    a. Provide extra carbohydrate and protein snacks if over 1 hour until lunch or snack time, if ordered in student's IHP.
    b. Resume classroom activities if fully recovered.
5. Repeat giving food if symptoms persist, or the blood glucose level is less than the level indicated per the health care provider (usually 70-80mg/dL).
6. If there is no improvement, call the school nurse and family.
7. If a pupil cannot participate in care, proceed immediately to the Emergency Procedure for Severe Blood Glucose.

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Emergency Procedure for Severe Low Blood Glucose

Hypoglycemia/Insulin Reaction

1. Verify signs of severe low blood glucose:
    a. Unable to swallow
    b. Unconscious
    c. Combative
    d. Uncooperative
    e. Having seizures

Signs are so severe that the student cannot participate in care.

Factors Which Can Lead to Low Blood Glucose:

- Too much insulin
- Too little food
- Extra physical activity

To prevent hypoglycemia:

- Keep a fast-acting carbohydrate source with the student ***ALWAYS***.
- Treat low blood glucose at the **onset** of symptoms.
- Eat, take insulin, test blood glucose, and exercise at the prescribed times.
- Have an up-to-date management plan from the student's healthcare provider.
- Ensure that food eaten matches insulin dosing. Watch picky eaters. Provide information to families about school meals (monthly menus with carbohydrate counting), snacks and classroom activities involving food.
- Monitor blood glucose variations on "gym days" because an extra snack may be required ½ hour before physical education or during prolonged vigorous exercise.

2. **Have someone call emergency medical services (911 in most areas), school nurse, and family. The student should not be left unattended.**

    If a seizure occurs (due to hypoglycemia), follow the procedure for Managing a Seizure.

3. Place the student on side or in an upright position if restless/uncooperative.
    Maintain head position to one side to prevent aspiration
4. Do not attempt to give food or put anything in the student's mouth.
    The student may aspirate or choke.
5. Give the glucagon injection or Baqsimi (nasal spray), if ordered in a student's IHP. See Procedure for Giving Glucagon on the next page.

6. If the student becomes alert after receiving glucagon, stay with the student until emergency services arrive. The student may be given sips of fruit juice or regular soda once awake and able to drink.
7. Document in the student log.

Sources:

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Glucagon

Definition

Glucagon is a hormone that occurs naturally in the body. It is produced in the pancreas and raises blood glucose levels by causing the release of glycogen (a form of stored carbohydrate) from the liver that increases blood glucose levels.

Purpose

Glucagon injections and nasal spray are prescription medications used to treat severe hypoglycemia. If specified in the student's individualized health plan (IHP), glucagon should be used when the student is unconscious, having seizures, or cannot eat or drink safely. Severe hypoglycemia can cause brain damage or death.

Although it may cause nausea and vomiting when the student regains consciousness, glucagon is a life-saving treatment that cannot harm a student.

Storage

The glucagon kit should be stored at room temperature in a place designated by the student's IHP. The student may keep it. The expiration date should be checked, and it should not be administered if it has expired, discolored, or does not dissolve well. It should not be mixed until it needs to be given. Combine the glucagon for injection immediately before use by following the instructions included with the glucagon kit. (Expired glucagon kits can be used for training sessions.)

Sources:

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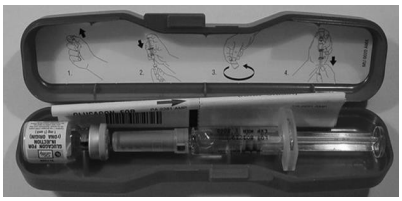
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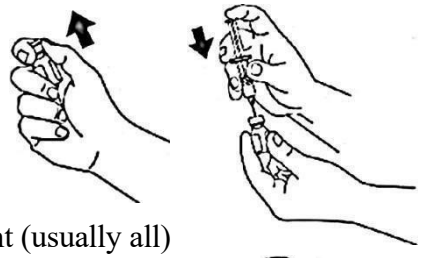
Procedure for Giving Glucagon for Severe Hypoglycemia

1. Verify signs of severe low blood glucose:
    a. Unable to swallow
    b. Unconscious
    c. Combative
    d. Uncooperative
    e. Having seizures

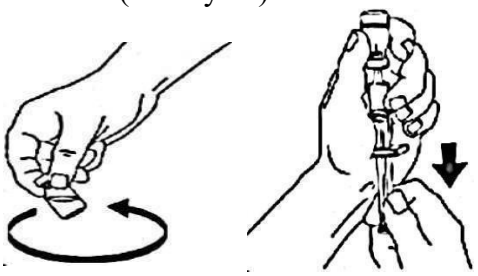
    Signs are so severe that the student cannot participate in care.
2. ***Have someone call emergency medical services, school nurse, and family. The student should not be left unattended.***
3. *If a seizure occurs, follow the procedure for Managing a Seizure.*
4. Place the pupil on their side or in an upright position if restless/uncooperative. *Maintain head position to one side to prevent aspiration*
5. Obtain a glucagon kit or nasal spray. Wash your hands with soap and water (if possible) and put on a pair of gloves.
6. Determine glucagon dose and route for administering the medication per the health care provider's orders. Follow the manufacturer instructions for administration. Glucagon kit administration requires:



7. Flip the cap off the glass vial (bottle) containing dry powder. Remove the needle cover from the syringe.
8. Take the fluid-filled syringe in the glucagon emergency kit and inject the fluid into the glucagon powder vial. Gently swirl, shake or roll to mix per manufacturer's instructions until all powder is dissolved and the solution is clear. Inspect medication for color, clarity, and presence of lumps. The solution should be clear and colorless before use.

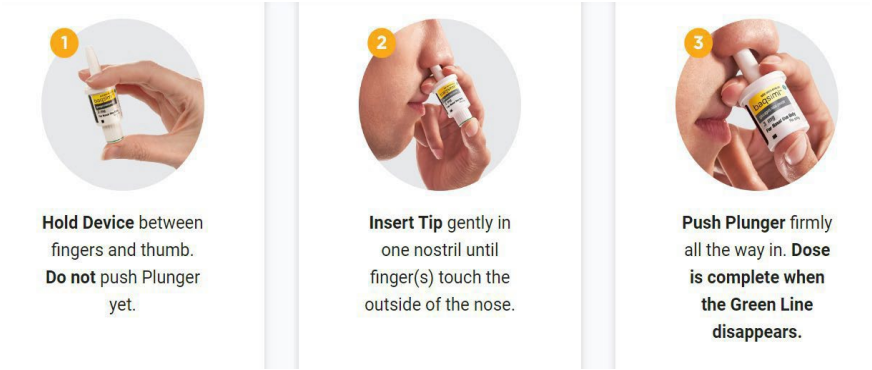


9. Hold the vial upside down and withdraw the prescribed amount (usually all) of glucagon back into the syringe. The prescribed amount should be specified in the student's individualized health plan. Withdraw the needle from the vial.



    Generally, if the student weighs >45 pounds, the full vial (1 cc) of glucagon may be injected. If the child weighs <45 pounds, inject ½ of the solution.

10. When possible, the injection site should be exposed and cleaned. However, the glucagon can be administered through clothing, if necessary. Suggested sites include the outer thigh, upper outer buttock, or arm.
11. Inject the needle straight into the muscle of the site and inject glucagon.
12. Withdraw the needle and press the site with a cotton ball or wipe. Massage the injection site for 10 seconds; apply a bandage if needed.
    a. Do not recap the syringe. Put the used syringe in a sharps container.
    b. Administration of Baqsimi nasal spray:



13. Stay with the student. It may take 15-20 minutes for the student to regain consciousness. Turn the student on their side because the glucagon may cause vomiting.
14. Recheck the student's blood sugar. Follow the student's specific instructions in IHP or DMMP for response to results. Some students may have a second injection of glucagon ordered if the glucose remains low.
15. The student may be given sips of fruit juice or regular soda once awake and able to drink. This may be followed by a snack containing proteins and carbohydrates such as a peanut butter sandwich or cheese crackers to keep blood sugar levels elevated to normal levels and prevent a recurrence.
16. Don't be surprised if the student does not remember being unconscious, incoherent, or has a headache. Blood sugar may also rise over 200, and nausea or vomiting may occur.
17. When emergency services arrive, turn the care of the student over to the emergency crew. Notify the school nurse and family.
18. Document in the student log.

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Procedure for High Blood Glucose

Hyperglycemia

1. Observe/Recognize signs of high blood glucose, although the student may frequently be asymptomatic:

Mild Symptoms	
• Increased thirst • Frequent urination • Dry mouth • Fatigue • Numbness or tingling	• Agitation, fidgetiness, irritability • Inability to concentrate • Hunger • Blurred vision • Urine ketones (negative-small)
Moderate Symptoms	
• Decreased appetite • Nausea • Abdominal pain/stomach cramps • Vomiting	• Sunken eyes • Weight loss • Dry mouth • Urine ketones (moderate-large)
Severe Symptoms	
• Continued vomiting • Sleepiness • Confusion • Coma or unconsciousness	• Very weak • Deep breathing, fruity smell • Ketones (moderate-large)

Factors Which Can Lead to High Blood Glucose (hyperglycemia):

- Too little insulin
- Expired insulin
- Too much food (for insulin taken)
- Decreased physical activity
- Any combination of the above
- Illness, injury
- Stress or emotions
- Hormonal fluctuations
- Menstrual periods
- Overtreating hypoglycemia

To prevent hyperglycemia:

- Test blood glucose, take insulin, eat, and exercise at the prescribed times.
- Have an up-to-date management plan from the student's healthcare provider.
- Ensure that food eaten matches insulin dosing. Monitor food intake- report binge eating.
- Provide information to families about school meals (monthly menus with carbohydrate counting), and snacks and classroom activities involving food. Consult with the family when snack, meal, or exercise times must be changed and before extra snacks.
- Take appropriate action if a missed dose is suspected or an insulin pump malfunctions.
- Avoid “over treating” low blood sugar reactions.

- Respect the students; realize their limits.

2. Test blood glucose. (See Procedure for Blood Glucose Testing)
3. **Initiate care per healthcare provider's orders for high blood glucose.** This may include insulin administration, checking for ketones, and possibly activity restriction (exercising when ketones are present may elevate blood glucose levels further). Insulin administration during hyperglycemia may be referred to as a "sliding scale insulin" or "correction factor" order. Refer to the student's individualized health care plan.
4. Check urine and/or blood ketones as prescribed by the healthcare provider in the DMMP. (Reference the procedure for Testing Urine Ketones and/or Blood Ketones in the chapter.)
5. Encourage the student to drink water, generally 16-24 ounces over 2 hours or 8 ounces per hour. Allow free use of the bathroom.

   If a student resumes classroom activities, they may need to use a water bottle in class to ensure adequate fluid intake.

6. If the student is feeling okay, they may resume classroom activities. If the student does not feel well (nausea, lethargy, headache), the family should be called.
7. Recheck the student's blood glucose according to their individualized plan.
8. If the student develops severe stomach pains, vomiting, and/or rapid breathing, call emergency medical services, the school nurse, and family immediately.
9. Document the care given in the student log.

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Procedure for Testing Urine Ketones

When the body can't use glucose, it uses its fat and muscle tissue for energy. Ketones are acids left in the blood when fat is used for energy. As ketone production increases, ketone blood levels increase, causing diabetic ketoacidosis, called "DKA," and may occur with hyperglycemia. Symptoms of hyperglycemia include nausea, vomiting, possible ketones, and coma.

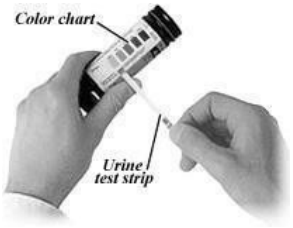
The body will try to get rid of ketones through the kidneys and lungs. The ketones will show up in the urine and may also cause the breath to smell fruity. Other symptoms include nausea, vomiting, abdominal pain, thirst, frequent urination, and drowsiness. If testing for urine ketones shows medium or large ketones to be present, extra insulin may be needed if specified in the student's individualized health plan (IHP).

If ketones are not detected early, particularly during illness, they will build up in the body, and DKA may result. DKA is the number one reason for hospitalizing children with diabetes. Early detection of ketones and treatment helps to prevent hospitalizations for DKA.



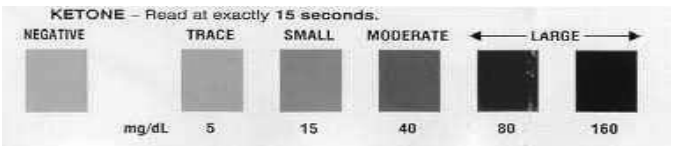
1. Wash your hands with soap and water. Review directions for urine ketone testing if not familiar with them.
2. Assemble the equipment required for the test included below.
    a. Bottle of ketone strips--check the expiration date
    b. Urine cup
    c. Gloves
3. Put on a pair of gloves prior to handling the test strip.
4. Saturate the test strip with urine by one of the following methods:
    a. The student urinates in a cup, and then the test strip is dipped into the urine.
    b. Have the student hold the test strip in urine flow.

    If assisting the student, wear disposable gloves during this procedure.



5. Dip the ketone test strip in the cup containing urine.
6. Wait the **exact** amount of time for the test strip to develop, per directions on the test strip bottle (usually 15 seconds).
7. Compare the color of the strip to the chart on the bottle. Results will be read as negative, small, moderate, or large. Refer to the student's individualized health plan for actions.

    Generally, if results are moderate or large, the student should not engage in physical activity, and the family should be called to take the student home for observation and/or medical care.



8. If the urine ketone results are trace or small, increase their fluid intake.
9. Record the results in the student log. Notify the school nurse and family.

Procedure for Testing Blood Ketones







1. Review the directions for blood ketone testing if not familiar with them.
2. Wash your hands with soap and water.
3. Assemble the equipment for the test included below.
    a. Finger lancing device
    b. Ketone testing meter
    c. Ketone testing strip in a foil packet for specific ketone testing meter
    d. Tissue or cotton ball
    e. Gloves
    f. Student log
4. Wash your hands and the area to be tested with soap and hands after preparing the equipment required for the test. Pat dry. If the caregiver is performing the procedure, put on a pair of gloves. Washing the student's hands and the test site is sufficient for prepping the site.
5. Remove the ketone test strip from its foil packet and insert the three black lines at the end of the test strip into the ketone testing meter strip port. Refer to the manufacturer's instructions as needed.
6. Push the test strip in until it stops.
7. Prepare the lancing device according to the manufacturer's instructions.
8. Puncture the top side of the fingertip with the lancing device. Gently squeeze the finger downward to obtain a large enough drop of blood to cover the purple area on the top of the test strip until the monitor begins to test.
9. Apply pressure to the lanced area with tissue or cotton ball until bleeding stops.
10. The blood ß-ketone result will show on the meter display window with the word KETONE.
11. Dispose of the test strip and tissue or cotton ball in a lined wastebasket. Dispose of the lancing device in a sharps container.
12. Remove and dispose of your gloves. Wash your hands with soap and water.
13. Record results in the student log. Refer to the student's DMMP for actions.

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Insulin

Definition

Insulin is a hormone constructed of proteins, usually produced by the pancreas. It is needed to help glucose enter the body's cells and be used for energy. Students with Type 1 Diabetes (and some with Type 2 Diabetes) need daily insulin injections. Several days without insulin can cause a life-threatening condition of ketoacidosis, coma, and eventually death. Insulin dosage is tailored to each student based on blood glucose monitoring. The goal of insulin therapy is to maintain near-normal blood glucose levels while avoiding hypoglycemia. Insulin is administered by two or more subcutaneous injections each day or continuously by a portable insulin pump.

Storage

Insulin can be affected by extremes in temperature, which can denature the protein and decrease or eliminate its effect. It is recommended that unopened insulin be stored in a refrigerator where it maintains potency until the expiration date on its label.

Opened insulin or insulin stored in pens or cartridges can be left unrefrigerated at temperatures 59-86ºF. It should be kept away from direct sunlight and heat and not be left in the glove box of a car. Once opened, the date should be written on the vial and is usually viable for 30 days, although one brand of insulin now says it maintains potency for 60 days at room temperature. Follow manufacturer's instructions for storage and use by dates, which should be noted in the student's individualized healthcare plan (IHP).

Dosage and Administration

Insulin doses are measured in "units." There are 1000 units of insulin in a 10 milliliter vial and 300 units in an insulin pen. One unit of insulin can alter a blood glucose level; therefore, ***it is imperative that the ordered dosage be EXACT!***

The number of insulin units to be given is ordered by the child's licensed healthcare provider– a physician or nurse practitioner. The insulin dose will be adjusted based on blood glucose levels, carbohydrates consumed, and physical activity.

Insulin injections are given with a small needle subcutaneously (area between the skin and the muscle). The only syringes used to inject insulin should be insulin syringes (orange tip). Tuberculin syringes and other 1 or 3- milliliter syringes should never be used because they are not calibrated for insulin. Sites should be rotated to avoid scar tissue or fatty cell growth under the skin.

Insulin Delivery Systems

Insulin delivery methods include syringes, insulin pens, and insulin pumps. In addition, syringes can be attached to several types of spring-loaded aids, which make injection easier. See procedure sections for insulin syringes, insulin pens, and insulin pumps for additional information.

Other insulin delivery systems such as inhaled insulin and pancreas transplants are being studied and may be used in the future.

Types of Insulin

Insulin can be classified as rapid-acting, short-acting, intermediate-acting, or long-acting. The different types vary in the onset of action (length of time the insulin takes to start working), peak action (when the insulin has its strongest effect), and duration of action (the length of time the insulin usually lasts). Rapid-acting and short-acting insulin can be used for meal coverage or carbohydrate coverage and correction doses (doses given to decrease elevated blood glucose). If an extra dose of rapid or short-acting insulin is given, the blood glucose should be checked approximately 30 minutes to 2 hours later or as specified in the student's IHP. Some insulin orders may call for mixing a short-acting insulin with a longer-acting insulin, but these combinations are usually not given during school hours.

Some insulin formulations are already mixed with combined intermediate and short or rapid-acting insulins. Long-acting insulins, glarine, detemir, and degludec should not be mixed with any other insulin in one syringe.

See chart below for insulin action times:

Insulin Action Times

Type of Insulin	Names	Onset of Action (how long before it starts to work)	Peak Action (when the insulin has the strongest effect)	Duration of Action (how long the insulin usually lasts)
Rapid-Acting	Lispro (Humalog) Aspart (Novolog) Glulisine (Apidra)	5-15 minutes 5-15 minutes 5-15 minutes	30-90 minutes 1-2 hours 30-90 minutes	2-4 hours 2-4 hours 2-4 hours
Short-Acting	Regular (Humulin R, Novolin R)	30-60 minutes	2-3 hours	5-8 hours
Intermediate-Acting	NPH (Humulin N, Novolin N)	2-4 hours	6-10 hours	10-18 hours
Long-Acting (basal)	Glargine (Lantus, basaglar) Detemir (Levemir)	2-4 hours 3-8 hours	peakless peakless	24 hours 6-24 hours
	Degludec (Tresiba)	30-90 minutes	peakless	24 hours

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Personnel need to know PowerPoint and training modules.

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Carbohydrate Counting and Correction Factors:

Procedure for Determining Insulin Dosages

Overview

Carbohydrate (carb) counting is one standard method of maintaining healthy blood glucose levels for students who have diabetes. Carbohydrates are the starches and sugars found in grains, pasta, dried beans, starchy vegetables, fruits, dairy products, and sweets. A student with diabetes who ingests carbohydrates needs insulin to utilize the glucose in the carbohydrate. By calculating the number of carbohydrates to be eaten, the student or caregiver can determine how much insulin is needed to cover the carbohydrates in that meal.

Food labels list the number of carbohydrates in a serving of the food. Care needs to be taken in noting the serving size and accounting for this in determining the number of carbohydrates to be consumed. In school cafeterias, the dietary or food service manager has access to the nutritional content of foods and can provide a listing for students with diabetes and the adults trained to assist them with carb counting. The family should calculate the carbohydrate count if food is brought from home. Several books contain information on carbohydrate counting and there are many "apps" (Carb Manager, Keto Diet, Life Sum) for cell phones and tablets.

One method of meal planning using carb counting is to follow a consistent carb intake meal plan and ingest the same amount of carbohydrates each day, take intermediate-acting insulin in the morning and possibly take a preset amount of rapid-acting insulin at lunch. These students do not adjust their mealtime insulin doses, but this method requires that they consume the same, predetermined amount of carbohydrates every day.

A method allowing more flexibility is to adjust the amount of insulin given to the number of carbs to be consumed, which is the method more commonly used today. This method is often combined with adding a "correction factor" for the blood glucose level to determine a total insulin dose at each mealtime to maintain blood glucose in the target range.

The *insulin-to-carbohydrate ratio* is the amount of insulin prescribed in a student's DMMP for a specific amount of carbohydrates. The healthcare provider will commonly express the amount as a ratio. One unit of insulin for every 15 grams of carbohydrates will be a 1:15 ratio; one unit of insulin for every 30 grams of carbohydrates will be a 1:30 ratio.

The *correction factor* is the amount of insulin given for blood glucose level above a student's target glucose level (somewhat similar to diabetic management of the past called "sliding scale insulin"). The actual blood glucose is subtracted from the target blood glucose and divided by the correction factor will dictate how much insulin is needed to decrease the exact level to the target level. For example, if the correction factor is 1 unit of insulin for every 50 mg/dL over 150, and the student's blood glucose is 250, then 2 units of insulin is the correction dose. It is important to note that an additional correction dose should not be given within 3 hours after being given

insulin for a meal/snack, after treatment for hypoglycemia (low blood glucose), or after a previous correction dose.

Many students with diabetes use both the insulin-to-carbohydrate ratio and a correction factor to determine the amount of insulin they need before each meal. The two amounts are combined for one dose of insulin before meals.

Sample Calculation for Computing Insulin Dose using both Insulin-to-Carb Ratio and Blood Glucose Correction Factor

Note: This is only an example--values from a student's DMMP must be used instead of the sample values.

1. Insulin to carb ratio--Student's DMMP states insulin-to-carb ratio is 1:15
    a. Determine how much insulin is needed for carbs--on this day, the student's meal contains 45 grams of carbohydrate
    b. Divide the total number of grams of carbs in the meal by the insulin-to-carb ratio

    *Calculation: 45 grams of carbs ÷ 15 grams/unit = 3 units of insulin

2. Blood glucose correction factor--Student's DMMP states correction factor is 1 unit of rapid-acting insulin for each 50 mg/dL that the blood glucose level is over the target of 150 mg/dL.
    a. Determine the premeal glucose and the target glucose--on this day, the student's premeal glucose is 250; target glucose is 150
    b. Subtract target glucose from actual glucose--on this day 250-150=100
    c. Divide the difference by the correction factor

    *Calculation: 250 mg/dL (premeal glucose) - 150 mg/dL (target glucose) = 100 mg/dL

    100/dL ÷ 50 mg/dL/unit = 2 units
3. Total dose
    a. Add the number of units from the insulin-to-carb ratio and correction factor

    *Calculation: 3 units + 2 units = 5 units

On this day, when the student's blood glucose is 250, and the student's meal contains 45 grams of carbohydrates, the student will receive 5 units of insulin.

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Procedure for Insulin Administration by Syringe

Injection of Regular or Humalog/Novolog/Apidra Insulin (and no mixing with other insulins)

Obtain the blood glucose reading before administering insulin per the health care provider's orders.

1. Wash your hands with soap and water.
2. Assemble the equipment required for the test included below:
    a. Vial of insulin
    b. A syringe with a needle (use only an insulin syringe)
    c. Alcohol prep pad
    d. Cotton balls or spot bandage (optional)
    e. Gloves (if done by anyone other than the student)
    f. Sharps container



3. Determine the insulin dose by the health care provider's orders.
4. If the insulin is cold, warm it in the palm of the hand to room temperature.

    Injecting cold insulin can cause pain and may affect absorption.

5. Put on a pair of gloves prior to handling the bottle of insulin.
6. If this is a new insulin bottle, remove the flat, colored cap. Do not remove the rubber stopper or the metal band under the cap. Check the expiration date of the vial of insulin. Write the date opened on the vial.
7. Clean the rubber top of the insulin vial with alcohol and let dry for a few seconds.
8. Remove the cap from the syringe. Fill the syringe with air equal to the number of units of insulin needed. Inject air into the Regular or Humalog/Novolog/Apidra insulin bottle with the syringe remaining in the bottle, invert and pull the plunger back beyond the number of units desired. Keeping the syringe upright and the needle below the liquid in the vial, clear any air by pulling the plunger back and tapping the syringe to raise air bubbles to the top. Push the plunger to the desired number of units, ensure no air bubbles remain, and withdraw the syringe.

    Air is always injected into the vial to prevent creating a vacuum inside the vial as insulin is removed. ***Air bubbles left in the syringe can alter the desired dose.***

9. Slip the needle back into the cap without touching the cap or needle. (See Procedure for One-Handed Needle Recapping if the syringe must be recapped.)

10. Review the insulin order. If possible, it is always good to have a second person check the insulin dose after drawing it up
11. Select the site to be used, prep with alcohol, and let dry. First, wash with soap and water and dry, if the area is dirty. Ask the student if they have a preferred site and listen to the student's guidance.

    Any subcutaneous tissue can be used for injection sites. The best absorption is in the lower abdomen, followed by the upper, outer arms, tops of the thighs, and lastly, the upper areas of the buttocks. Exercise and heat (like the warmth from a heating pad or whirlpool) will hasten the absorption of an injected area.



12. Pinch up raw skin and tissue with one hand. With the other hand, hold the syringe, with the eye of the needle pointing upward, like a pencil. Dart the needle into the “soft pocket” (the area that lies directly in front or back of the pinched-up skin) at a 90-degree angle.
13. Inject the insulin in one to five seconds. (Do not aspirate or pull back the plunger.) Release the pinched-up skin and remove the needle while applying gentle pressure at the injection site for 10-15 seconds. This will help to prevent leakage from the site.

    Take care to avoid injecting into the muscle, as it will hasten absorption. Do not massage the area as it irritates the tissue and hastens absorption.

14. Dispose of the syringe with needle intact into a sharps container being careful to point it away from the student while disposing of it.

    Recapping a contaminated needle can result in a needlestick injury.

15. Document in the student log the dose and type of insulin given, time given, the site used, and any reactions or problems. If there are any problems or concerns, contact the school nurse and/or family.

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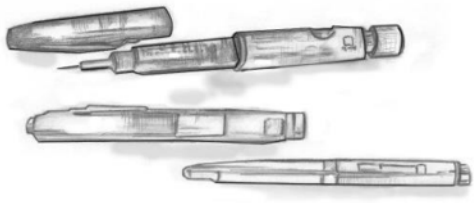
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Procedure for Insulin Pen Delivery System

An insulin pen is an insulin delivery system that has the visual appearance of a writing pen; it consists of a cartridge holder (insulin must be purchased in prescribed cartridges), a piston rod (this is a screw mechanism that adjusts the desired dose), a dose indicator window (visual numbers indicate dose), a push button (this delivers the insulin), and a pen encasement.

The purpose of an insulin pen is to provide insulin injections with a convenient and accurate device. Insulin pens assist in preventing dose errors that may occur with reading the lines on a syringe and drawing from a vial. Insulin pens are easier to use and easier to carry around than a syringe and vial. Some pens can be purchased with the insulin cartridge already in place (these are considered "disposable pens"), while other pens require "loading" of a specific insulin cartridge. The cartridge in an insulin pen is generally good for 30 days once the first dose has been used; however, check the manufacturer's instructions to verify. Insulin pens do not allow manual mixing of insulins, although some pens come with a premixed blend of shorter-acting and intermediate-acting insulin.

1. Obtain the blood glucose reading before insulin administration per the health care provider's orders.
2. Determine the insulin dose with the healthcare provider's orders.
3. Wash your hands with soap and water and put on a pair of gloves prior to assembling the equipment required for the insulin pen delivery.
4. Assemble the equipment required for the insulin pen delivery included below.
    a. Insulin pen device
    b. Pen needle
    c. Alcohol prep pad
    d. Cotton balls or spot bandage (optional)
    e. Gloves (if done by anyone other than the student)
    f. Sharps container



5. Check the insulin type/brand. This must match the health care provider's orders exactly.
6. Check the "opened date" on the pen and the level of insulin remaining in the insulin cartridge.

    Cartridges are made for multiple doses. Ensure that enough insulin remains in the cartridge for accurate dosing.

7. Attach a new needle to the pen. Remove the outer plastic cap and plastic needle cover from the needle. Place the outer cap on a flat surface with the open end facing up.

    This will assist in needle disposal after insulin is given.

8. Dial-in two units of insulin to perform an "air shot" to "prime the pump." Insulin should appear at the needle tip. If it does not, repeat the procedure.

Changes in temperatures can cause air intake. This procedure ensures that any accumulated air will be released, ensuring accurate insulin dosage.

9. Dial in the prescribed dose. Double-check the dose and get a second person to verify, if possible.
10. Ask the student if they have a preferred site for injection and listen to the student's guidance.
11. Cleanse the skin with alcohol and allow it to dry before injecting.
12. Pinch up the skin at the selected area and dart the needle into the soft pocket at a 90-degree angle.

    The soft pocket lies directly in front of or behind the pinched-up skin. Do not pinch skin if using a nano pen needle.

13. Press the button at the end of the pen to inject the insulin.
14. Count slowly to ten seconds and then remove the needle.

    Some pen manufacturers require a longer count.

15. Grasping the pen, place the needle into the plastic needle cap that was left upright on a flat surface. Unscrew the needle tip and carefully discard it into a sharps container.

    Do not lift the cap with fingers to cover the needle tip. Leave the cap on the counter and use the pen to place the needle into the cap to avoid the possibility of fingerstick injury (see Procedure for One-Handed Needle Recapping). The needle must be changed after each injection, as leaving the pen needle attached leaves an OPEN passageway into the insulin, and contamination may occur.

16. Document in the student log the dose and type of insulin given, time given, the site used, and any reactions or problems. If there are any problems or concerns, contact the school nurse and/or family.
17. If an accidental needle stick occurs with a contaminated needle, wash the area thoroughly with soap and warm water, allowing bleeding to cleanse the wound. Notify your supervisor immediately per the school division’s Bloodborne Exposure Control Plan.

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Wisconsin Improving School Health Services Project. (2015). Insulin administration by syringe.

Insulin Pump Therapy

Overview

Insulin Pump Therapy, or Continuous Subcutaneous Insulin Infusion (CSII), is an insulin delivery method that uses a small mechanical pump to deliver doses of rapid or

short-acting insulin. The pump is about the size and weight of a small cell phone. It holds a reservoir of insulin inside the pump and is programmed to deliver the insulin through a thin plastic tube called an infusion set. The infusion set is inserted via a needle covered by a cannula (catheter) just below the skin. Once inserted, the needle is removed, and the cannula stays in place for two to three days. Inserting an infusion set is very similar to giving an insulin shot, except it only needs to be done every two or three days. When it is time to change the infusion set, a new infusion set is inserted into a different site. A disconnect mechanism that allows students to remove the pump (while leaving the cannula in place) if needed for bathing or sports.

An alternate insulin pump mechanism has two components: a waterproof "pod" type pump attached to the body and a separate handheld computer that programs insulin delivery from the pod. This tubeless system allows the student to leave the pump on while bathing, swimming, or playing sports. The student or family performs **routine site changes for any insulin pump therapy at home.**

The use of insulin pumps increased, especially for students with type 1 diabetes. Insulin dosing is more precise (1/100th of a unit) and allows continuous insulin delivery/absorption to mimic normal blood insulin/glucose levels more naturally with additional bolus doses to match food intake and activity. The system allows more flexibility for mealtimes and has been shown to improve growth in children, decrease the incidence of hypoglycemia, and decrease the incidence of long-term diabetes complications.

The disadvantages of the system include increased expense, technical malfunctions, skin infections, and more calculations on the part of the student or caregiver. The system requires a student and family to commit to counting dietary carbohydrates, monitoring blood glucose, judging the impact of exercise on insulin requirements, and making the appropriate adjustments to insulin infusion rates. Many families are already doing that and find the pump can facilitate management. The other disadvantage is that the system does not use long- acting insulin, so blood glucose levels can rise quickly if the pump malfunctions.

Improved systems are continually becoming available, some of which can automatically adjust insulin infusions to match blood glucose levels without requiring calculations.

Type of Insulin

Insulin Pump Therapy uses rapid-acting insulin such as Humalog, Novolog, or Apridra (and less commonly, short-acting insulins). It combines a continuous basal insulin infusion for 24 hours and a bolus dose for meal or snack times and times of high blood glucose.

Basal Rate	The amount of insulin required when no food is eaten; a pre-programmed feature measured in units per hour (U/H) and delivered in tiny doses every few minutes; can be altered based on the pumper's daily needs; can be temporarily changed for alteration in schedule activity, illness or food.
Bolus	The amount is given when the pump is programmed to provide a dose of insulin for meals, snacks, and /or to correct elevated blood glucose.

Pump Operation and Maintenance

The specific pump manufacturer instructions must be followed. Manuals, booklets, and videos are available free of charge by calling the manufacturer's number listed on the back of the pump or consulting its website. Representatives of manufacturers are often willing to visit a school and help with training for a pump in use there.

If the supply of insulin is interrupted due to mechanical pump failure, dislodgement of the infusion set, accidental severing of the tubing, or obstructed tubing. In that case, the blood glucose level can rise quickly because there is no long-acting insulin in the system. A backup supply of syringes, rapid-acting insulin, or insulin pens should be kept at school if one of these incidents occurs to prevent or limit the subsequent hyperglycemia and possible ketoacidosis (which can occur in as little as 3 hours).

Pumps are designed to be durable enough to withstand the abuse associated with everyday living. Safety is a primary concern, so they have alarms to warn of low battery and obstruction to the tubing. The pump can be disconnected using a quick release set. This is usually done before water activities or contact sports. Most are splashproof, and some are even waterproof.

Waterproof pumps allow the student to bathe or swim without having to disconnect.

A card with the student's name, pump model and serial number, and the pump manufacturer's helpline phone number should be readily available in the health office for any problems that might occur. A wallet-sized programming card and an alarm card or manufacturer's instructions should also be available in the health office for reference.

Contact information for companies that make or sell insulin pumps in the United States:

Company	Phone	Website
Animas (One Touch)	877-937-7867	www.animascorp.com
Medtronic MiniMed (Paradigm, 530 with Enlite)	800-633-8766	www.minimed.com
OmniPod (Insulet)	800-591-3455	www.myomnipod.com
Roche (Accu-chek)	800-428-5076	www.rochediabetescaremea.com
Tandem (t:slim)	877-801-6901	www.tandemdiabetes.com



Image Source: Children with Diabetes. (2014). Insulin pump therapy.

Insulin Pump Skills

School nurses and designated, trained, unlicensed assistive personnel should be trained in operating the individual student's insulin delivery system.

Assessment of the following skills can be used in determining a student's ability to manage Insulin Pump Therapy independently:

- Appropriately counts carbohydrates
- Calculates appropriate correction dose based on healthcare provider orders
- Calculates total dose based on healthcare provider's orders for carbohydrate consumption and correction dose
- Programs appropriate bolus
- Adjusts temporary rate for exercise

- Disconnects and reconnects tubing
- Inserts new infusion set
- Fills reservoir and primes tubing
- Troubleshoots alarms appropriately
- Appropriately identifies high and low blood glucose levels
- Cares for skin site
- Recognizes pump malfunctions (dead batteries, no delivery, high-pressure alarm)
- Replace batteries, as needed
- Uses standard precautions including proper disposal of sharps and contaminated wastes

Insulin Pump Supplies

The following extra supplies should be provided by the family and kept in a designated place at school.

- Infusion set
- Reservoir
- Insulin
- Skin prep items
- Alcohol wipes
- Syringe or pen injector (in case of an infusion set or insulin pump malfunction)
- Pump batteries
- Inserter (if used)
- Manufacturers manual, alarm card, contact phone numbers

Sources:

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Wisconsin Improving School Health Services Project. (2015). Insulin administration by syringe.

Procedure for Hyperglycemia with Pump Therapy

1. Follow the instructions in the student's DMMP and IHP for hyperglycemia to include checking and treating blood glucose, urine, and/or blood ketones as the health care provider prescribed. Reference the "Procedure for High Blood Glucose" (previous section) as appropriate.
2. Check the site for leakage, cannula dislodgement, redness, and/or tenderness.

   Redness and/or tenderness at the site may indicate obstruction. The blood glucose can rise quickly since the delivery of short-acting insulin has been interrupted, and there is no long-acting insulin in the body.

3. For an infusion site malfunction, insert a new infusion set and/or replace reservoir or pod, or administer insulin by a syringe or pen. (Refer to student's DMMP and IHP.)
4. Suspend or remove the pump for a suspected insulin pump malfunction and administer insulin by syringe or pen. (Refer to student's DMMP and IHP.)

Procedure for Hypoglycemia with Pump Therapy

1. Follow "Procedure for Low Blood Glucose" (previous section) and instructions in student's IHP or DMMP for low blood glucose while receiving insulin pump therapy. Follow pump-specific directions if pump therapy must be suspended.

   Even students who usually function independently may require assistance during hypoglycemia due to mental status changes. *School personnel working with students with diabetes need to be able to recognize signs of low blood glucose and when to obtain assistance. The pump can be programmed to "suspend" function during exercise so hypoglycemia can be avoided or extra carbohydrates can be consumed for every 30 minutes of exercise.*

2. If problems continue, notify the school nurse.

   The school nurse will notify the family and/or health care provider according to the student's IHP or DMMP.

Contact information for companies that make or sell insulin pumps in the United States:

Company	Phone	Website
Animas	877-937-7867	www.animascorp.com
Medtronic MiniMed	800-633-8766	www.minimed.com
OmniPod (Insulet)	800-591-3455	www.myomnipod.com
Roche	800-428-5076	www.rochediabetescaremea.com
Tandem	877-801-6901	www.tandemdiabetes.com

Training for School Employees

The National Diabetes Education Program (2016) has recommended the following levels of training for school staff to provide effective diabetes management. Training for unlicensed staff should be completed by a diabetes-trained healthcare professional such as the school nurse or a certified diabetes educator.

Level 1. All school personnel should receive training that provides a basic understanding of diabetes, recognizing and responding to the signs and symptoms of low blood glucose (hypoglycemia) and high blood glucose (hyperglycemia), and whom to contact immediately in case of emergency.

Level 2. Classroom teachers and all school personnel who have responsibility for students with diabetes throughout the school day should receive Level 1 training plus additional training to carry out their individual roles and responsibilities and to know what to do in case of a diabetic emergency in the absence of a school nurse.

Level 3. One or more school staff members should receive in-depth training about diabetes and routine and emergency care for each student with diabetes from a registered nurse, licensed physician, or certified diabetes educators such as the school nurse or a certified diabetes nurse educator. This training will help ensure that a school staff member is always available to help younger or less-experienced students or those with additional physical or mental impairments perform diabetes care tasks (e.g., administering insulin or checking their blood glucose) in the absence of a school nurse.

The Code of Virginia §22.1-274 ensures that in a school building with ten or more instructional & administrative employees, at least two employees are trained in administering insulin and glucagon at a school if one or more students are diagnosed with diabetes. The Virginia Department of Education has published a comprehensive training guide, Manual for Training Public School employees in the Administration of Insulin and Glucagon, that is used in training staff about diabetes.

Sources:

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Code of Virginia. (1999). § 22.1-274. School health services. https://law.lis.virginia.gov/vacode/title22.1/chapter14/section22.1-274/

Actions for the School Nurse

School nurses are the key school staff members to coordinate care for students with diabetes at school and school related events. Evidence-based practice in diabetes care and diabetes technology constantly evolves as new evidence and therapies/devices are developed. The school nurse (SN) leads the team at school and, according to the National Diabetes Education Program, should take the following actions:

- Understand the School Nurse's role in ensuring compliance with federal and state laws that may apply to students with diabetes.
- Understand state laws regarding delegation of nursing tasks.
- Obtain and review the student's current DMMP.
- Using the medical orders in the DMMP and information obtained from a thorough nursing assessment, develop an IHP that promotes independence and self-care consistent with the student's abilities.
- Prepare the student's Emergency Care Plans for hypoglycemia and hyperglycemia based on the orders in the DMMP.
- Facilitate the initial school health team meeting to discuss implementing the student's DMMP and IHP.
- Serve as the school health expert on the school teams that create and implement the student's 504 plan, the IEP, or other educational plans.
- Plan and implement diabetes management training for the trained diabetes personnel and all staff responsible for the student with diabetes.
- Obtain the materials and medical supplies necessary for performing diabetes care tasks from the family.
- Perform routine and emergency diabetes care tasks.
- Maintain accurate documentation of all diabetes care provided at school.
- Provide ongoing education and training as the school year progresses for staff.
- Assess competence and provide ongoing supervision of trained diabetes personnel.
- Conduct ongoing, periodic assessments of the student with diabetes and update the IHP.
- Help ensure that the student has a supportive learning environment and is treated the same as students without diabetes.
- Distribute the NDEP primer to all school personnel responsible for students with diabetes.
- Provide education and act as a resource on managing diabetes at school to the student, family, and school staff.
- Act as an advocate for students to help them meet their diabetes healthcare needs.
- Assist the classroom teachers with developing plans for substitute teachers. Assist the physical education teacher with managing the student's physical activity at school.

- Collaborate with coworkers and outside agencies to obtain nutrition information for families.
- Communicate with the student's family--and with their permission--communicate with the student's diabetes healthcare team about progress and concerns.
- Treat the student with diabetes the same as other students, except to respond to their medical needs.
- Respect the student's confidentiality and right to privacy.

Sources:

Adapted from *Helping the Student with Diabetes Succeed: A Guide for School Personnel.* National Diabetes Education Program, U.S. Department of Health and Human Resources. (2016). NIH Publication No. 10-5217.

Resources for Teachers, Child Care Providers, Parents, and Health Professionals

American Diabetes Association. (2015, revised). *Diabetes Care Tasks at School: What Key Personnel Need to Know*. PowerPoint and training modules. https://diabetes.org/advocacy/safe-at-school-state-laws/diabetes-care-tasks-school

American Diabetes Association. *Written Care Plans*. The website has links to samples of Diabetes Medical Management Plans (DMMP), 504 Plans, and Individual Education Plans for students with diabetes. Plans in both English and Spanish are available and provide additional recommendations to consider. https://diabetes.org/advocacy/safe-at-school-state-laws/diabetes-medical-management-plan

American Diabetes Association. *State Laws, Regulations, and Policies for School Diabetes Care for Virginia.* You can also use this website to look up information about other states. https://diabetes.org/advocacy/state-advocacy

Children with Diabetes. A non-profit website dedicated to providing online support for families with children with diabetes. Includes resources for pump clothing (pump packs, pump pouches) and other accessories. https://childrenwithdiabetes.com/

Children with Diabetes. *Diabetes at School*. Resources for students, classmates of students with diabetes, teachers of students with diabetes, and other school-related resources. https://childrenwithdiabetes.com/school/

Everyday Magic. (2015). Disney and Lilly Diabetes developed resources to help children and families manage diabetes, especially newly-diagnosed diabetics. It includes videos, books, digital books, and other digital resources. http://www.t1everydaymagic.com/

Sandra Hollenberg. *My Own Book About Pumping*. Book for children with easy-to-understand information about insulin pumps (good introduction for adults too!). http://www.bcchildrens.ca/endocrinology-diabetes-site/documents/gsenglish.pdf

JDRF (Juvenile Diabetes Research Foundation). T1D in School website has a School Advisory Toolkit for Families and various other resources. Available online https://www.jdrf.org/wp-content/docs/JDRF_School_Advisory_Toolkit.pdf

National Association of Chronic Disease Directors. *Diabetes School Health Resources*. An extensive listing of resources for students with diabetes.

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Virginia Diabetes Council. *Diabetes in Schools*. Periodic review/revision. Includes DMMP forms, other forms, links to websites, and Virginia Diabetes Medical Management Plan and Protocol Supplement. https://virginiadiabetes.org/diabetes-in-schools/

Virginia Department of Education. (2015). *Manual for Training Public School Employees in the Administration of Insulin and Glucagon*. Not only has information about insulin and glucagon, but it also has extensive information about all topics relating to students with diabetes, including regulations, care plans, therapeutic management, and self-care. https://townhall.virginia.gov/L/GetFile.cfm?File=C:%5CTownHall%5Cdocroot%5CGuidanceDocs%5C201%5CGDoc_DOE_3832_v4.pdf

Supplemental Resources:

- Diabetes Management in Schools: Manual for Unlicensed Personnel (Word)
- Diabetes Medical Management Plan (2020)
- Virginia Diabetes Council Resources

Chapter 3: Care of the Gastrointestinal System

Overview Gastrostomy Tube

Gastrostomy Tube Feeding

Skin-Level Gastrostomy (G-Button) G-Button Feeding

Nasogastric Tube Jejunostomy Tube Jejunostomy Tube Feeding Colostomy

Ileostomy Ileoanal Reservoir

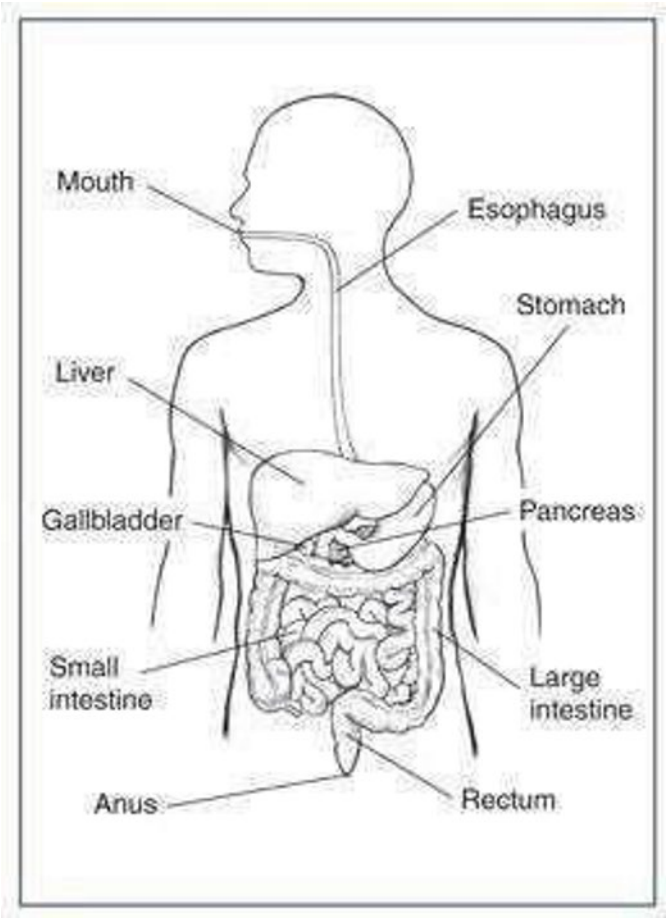
Gastrointestinal System

Overview

The gastrointestinal, or digestive, system consists of a series of hollow organs joined in a long, twisting tube from the mouth to the anus. Inside this tube is a lining called the mucosa. In the mouth, stomach, and small intestine, the mucosa contain tiny glands that produce juices to help digest food. Two solid organs, the liver and the pancreas, produce digestive juices that reach the intestine through small tubes. Digestion is the process by which food and drink are broken down into their smallest parts so that the body can use them to build and nourish cells and to provide energy. Digestion begins in the mouth, where the food is chewed into smaller pieces and then swallowed.

Movement of Food Through the System

The large, hollow organs of the digestive system contain muscles that enable their walls to move. The movement of organ walls propels food and liquid and also mixes the contents within each organ. This movement of the esophagus, stomach, and intestine is called *peristalsis*. The action of peristalsis looks like an ocean wave moving through the muscle.



The first major muscle movement occurs when food or liquid is swallowed. Although we are able to start swallowing by choice, once the swallow begins, it becomes involuntary and proceeds under the control of the nerves.

The *esophagus* is the organ into which the swallowed food is pushed. It connects the throat above with the stomach below. At the junction of the esophagus and stomach, there is a ring-like valve closing the passage between the two organs. However, as the food approaches the closed ring, the surrounding muscles relax and allow the food to pass.

The food then enters the *stomach*, a curved, pouch-like organ, which has three mechanical tasks. First, the stomach must store the swallowed food and liquid. This requires the muscle of the upper part of the stomach to relax and accept large volumes of swallowed material.

The second job is to mix up the food, liquid, and digestive juices produced by the stomach. The lower part of the stomach mixes these materials by its muscle action. The third task of the stomach is to empty its contents slowly into the small intestine.

As the food is digested in the *small intestine* and dissolved by the juices from the pancreas, liver, and intestine, the contents of the intestines are mixed and pushed forward to allow further digestion. The sections of the small intestine are the duodenum, jejunum, and ileum. Finally, all of the digested nutrients are absorbed through the intestinal walls. The waste products of this process include undigested parts of the food, known as fiber, and older cells that have been shed from the mucosa. These materials are propelled into the *large intestine*, also called the colon, where they remain, usually for a day or two, until the feces are expelled by a bowel movement through the *rectum*.

Production of Digestive Juices

The glands that act first in digestion are in the mouth--the salivary glands. Saliva produced by these glands contains an enzyme that begins to digest the starch from food into smaller molecules.

The next set of digestive glands is in the *stomach lining*. They produce stomach acid and an enzyme that digests protein. One of the unsolved puzzles of the digestive system is why the acid juice of the stomach does not dissolve the tissue of the stomach itself. In most people, the stomach mucosa is able to resist the juice, although food and other tissues of the body cannot.

After the stomach empties the food and juice mixture into the small intestine, the juices of two other digestive organs mix with the food to continue the process of digestion. One of these organs is the *pancreas*. It produces a juice that contains a wide array of enzymes to break down the carbohydrate, fat, and protein in food. Other enzymes that are active in the process come from glands in the wall of the intestine.

The liver produces yet another digestive juice--bile. Between meals, the bile is stored in the *gallbladder*. At mealtime, it is squeezed out of the gallbladder into the bile ducts to reach the intestine and mix with the fat in food. The bile acids dissolve the fat into the watery contents of the intestine, much like detergents that dissolve grease from a frying pan. After the fat is dissolved, it is digested by enzymes from the pancreas and the lining of the intestine.

Absorption and Transport of Nutrients

Digested molecules of food, as well as water and minerals from the diet, are absorbed from the upper small intestine. Most absorbed materials cross the mucosa into the blood and are carried off in the bloodstream to other parts of the body for storage or further chemical change. As already noted, this part of the process varies with different types of nutrients. Bacteria in the GI tract, also known as gut flora, help with digestion.

Carbohydrates. The digestible carbohydrates are broken into simpler molecules by enzymes in the saliva, in juice produced by the pancreas, and in the lining of the small intestine. Starch is digested in two steps: First an enzyme in the saliva and pancreatic juice breaks the starch into molecules called maltose. Maltose splits into glucose molecules that can be absorbed into the blood. Glucose is carried through the bloodstream to the liver, where it is stored or used to provide energy for the work of the body.

Protein. Foods such as meat, eggs, and beans consist of giant molecules of protein that must be digested by enzymes before they can be used to build and repair body tissues. An enzyme in the juice of the stomach starts the digestion of swallowed protein. Further digestion of the protein is completed in the small intestine. Here, several enzymes from the pancreatic juice and the lining of the intestine carry out the breakdown of huge protein molecules into smaller molecules called amino acids. These small molecules can be absorbed from the small intestine into the blood and then be carried to all parts of the body to build the walls and other parts of cells.

Fats. Fat molecules are a rich source of energy for the body. The first step in digestion of a fat, such as butter, is to dissolve it into the watery content of the intestinal cavity. The bile acids produced by the liver act as natural detergents to dissolve fat in water and allow the enzymes to break the large fat molecules into smaller molecules, some of which are fatty acids and cholesterol. The bile acids combine with the fatty acids and cholesterol and help these molecules to move into the cells of the mucosa. In these cells, the small molecules are formed back into large molecules, most of which pass into vessels (called lymphatics) near the intestine. These small vessels carry the reformed fat to the veins of the chest, and the blood carries the fat to storage depots in different parts of the body.

Vitamins. Another vital part of our food that is absorbed from the small intestine is a class of chemicals called vitamins. The two different types of vitamins are classified by the fluid in which they can be dissolved: water-soluble vitamins (all the B vitamins and vitamin C) and fat-soluble vitamins (vitamins A, D, and K).

Passage of Wastes

The remaining undigested parts of food and older cells from the lining of the GI tract lining form the waste products of the digestive process. Peristaltic waves propel the wastes through the large intestine where water is absorbed and wastes become solid during a bowel movement.

Source:

Cleveland Clinic. (n.d.). *Digestive System*. https://my.clevelandclinic.org/health/body/7041-digestive-system

Cleveland Clinic. (n.d.). *Peristalsis*. https://my.clevelandclinic.org/health/body/22892-peristalsis

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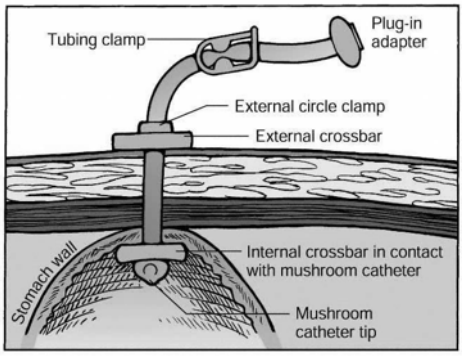
Illustration Source:

National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2013). *Your Digestive System and How It Works*. NIH Publication No.

Gastrostomy Tube

Overview

A *gastrostomy* is a surgically created opening into the stomach. A gastrostomy tube, commonly referred to as a G-tube, is a silicone or polyurethane catheter held in place by an external crossbar on the skin and by an internal stabilizer, balloon, or a retention dome (mushroom) inside the stomach. The tube can be placed initially by surgery or percutaneously (PEG).



The G-tube is used to administer fluids, food, and medication to the student. The G-tube feeding may be done by continuous or bolus feeds. Continuous feeds are given over a number of hours via slow drip and controlled by a feeding pump. Bolus feeds are specified amounts of feeds delivered over a short period of time (usually 15-30 minutes). The tube remains in the stomach at all times, but can be clamped between feedings to prevent leakage of stomach contents.

Some children do not tolerate the tube clamped. There should be directions in the child's feeding order specifying when to clamp the tube.

Gastrostomy tubes can be used to drain or vent stomach contents, but indications for long term use in students are usually due to:

- Need for supplemental calories due to increased needs from a disease process, such as cystic fibrosis or malabsorption disorders.
- Inability to consume adequate calories by mouth, which may be due to anatomical, behavioral, or psychosocial factors, such as esophageal atresia (incomplete development of the food pipe), failure to thrive, or cerebral palsy.
- Risk for choking and aspiration due to impaired swallowing or severe reflux.

Settings and Staff

Students can receive feedings anywhere. Many of the pumps are small and designed to be easily worn or carried in a backpack at all times. Bolus feeds should be done in a clean area because they are more open to the environment. Student's desire for privacy and possible need for stationery activities during a feed should be considered in determining where feeds will take place. Many students with G-tubes will receive their feeds during the night or at home, eliminating the need for any feeds during the school day.

Students who require venting or drainage of their G-tubes may need to have this done in a clean, private area such as the health office. Venting can also be achieved with the use of a Farrell bag with or without meals. G-tubes are usually covered by the student's clothing and do not interfere

with normal school activities. Participation in physical education activities may require modification and are determined on an individual basis.

A G-tube feeding may be administered by the school nurse, family member, teacher, or other staff person who has received training in appropriate techniques and problem management. The student should be encouraged to assist with the G-tube feeding as much as possible.

Excessive pulling on the G-tube should be avoided because it can cause pain and irritation to the gastric mucosa and or dislodgement.

School personnel who have regular contact with a student who has a G-tube should receive training covering the student's specific needs, potential problems, and implementation of the established emergency plan.

Individualized Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with a gastrostomy tube, the following items should be considered:

- Underlying condition and possible problems associated with the condition or treatment
- Size and type of feeding device
- Length of G-tube outside of the body (important to know in determining whether G- tube has migrated either further into the stomach or out of the stomach)
- Healthcare provider's orders for care and use of the G-tube
- Whether the student receives bolus or continuous feeds
- Amount, type, and frequency of formula to be received
- Storage of formula
- How long the formula may be used after the container has been opened
- When the tube should be flushed, such as before and after administration of feeds or medications
- Amount (volume) and type of flush liquid
- Type of portable pump and its specific instructions
- Positioning during and after feeding
- Activity level during and after feeding
- Whether the student should receive oral stimulation during feeding
- Measurement of gastric residuals, if needed
- Medication administration schedule, if needed
- Amount of food or drink a student can take by mouth
- Determining the need for venting of the G-tube
- Determining the need for clamping
- Patency of gastrostomy tract and time frame for reinsertion should the G-tube fall out

- Date tube was originally placed
- How to clean the site, if needed
- Actions to take if a student has vomiting, abdominal distension, or pain
- Manufacturer's specific instructions for any supplies or equipment
- Feeding guidelines during student transport
- Latex allergy precautions
- Standard precautions

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 249-260, 275- 283.

Children's Hospital of Philadelphia. (n.d.). *Gastrostomy Tubes (G-Tube)*. https://www.chop.edu/treatments/gastrostomy-tubes

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Illustration Source:

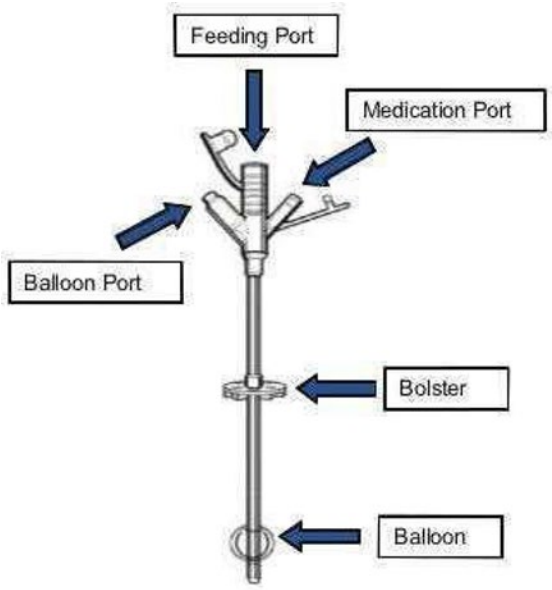
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Procedure for Gastrostomy Tube Feeding—Bolus Method

1. Wash your hands with soap and water.
2. Gather and assemble the equipment required for the gastrostomy tube feeding listed below

   Note: Equipment and feeding supplies are provided by the family.

   a. Liquid formula or feeding solution, at room temperature
   b. 60 ml catheter-tipped syringe or other feeding container for feeding
   c. Clamp or plug for end of tube
   d. Water (to flush tubing before and after feeding)
   e. Rubber bands and safety clips (to secure G-tube to clothing)
   f. Gloves



   Identify size and type of the G-tube. Shake the container well to mix the formula and note the expiration date. It is recommended that students receive a ready-to-feed commercial formula. Potential problems with a homemade blenderized recipe include inaccurate mixing, which may alter the nutrients and calorie content; separation of solids and liquids in the solution, which may clog the tube; and increased risk of contamination due to improper handling, preparation, or storage. Usually, the opened formula must be used within 24 hours. Check the student IHP for storage instructions.

   ***Tube feedings should be administered at room temperature**. Some students get cramps if the feeding solution is too cold. If a blenderized formula is brought to school, it should be refrigerated until mealtime and warmed to room temperature. This may be achieved by holding the container with the formula under warm water for several minutes. A microwave should **not** be used for this procedure due to its uneven heat distribution.*

3. Shake the formula (to mix) and measure the prescribed amount of formula to be infused.
4. Explain procedure using language the student can understand. Encourage the student to do as much of the procedure as is capable, to achieve maximum self-care skills.
5. Position the student upright or as specified in the student's individualized health plan (**IHP**).

   Students usually sit (or may lie on their right side with their head elevated) during feeding. Tubing may be clipped to their shirt. Make sure the clamp is not pressing on the skin.

6. Inspect the skin at the gastrostomy site for redness, tenderness, swelling or irritation, or presence of drainage or gastric leakage.

   Report abnormal findings to the school nurse and family.

7. Wash your hands after assembling the equipment and put on a pair of gloves.
8. Remove the plug (cap) from the G-tube and insert a catheter-tipped syringe into the end of the feeding tube.

   The G-tube is still clamped. Do not pull on gastrostomy tubing as this can cause pain and injury to the site or dislodgement.

9. Check residuals prior to feeding, if ordered. Checking residuals is typically not needed if the gastrostomy is well established (over 6 weeks old). Unclamp the tubing and gently draw back on the plunger to remove any liquid or medication that may be left in the stomach (i.e., residuals). Return the residuals to the stomach.

   Most students do not need to have residuals checked. If they do, note the amount that was withdrawn from the feeding tube and return the contents of the syringe to the stomach because stomach contents contain electrolytes and digestive enzymes. Removing them can result in electrolyte imbalance. Adjust the feeding volume according to the health care provider's orders if a residual is present. If the residual is greater than recommended, hold the feeding, wait 30-45 minutes, and check again.

10. Clamp the gastrostomy tubing, disconnect the syringe, and remove the plunger from the syringe.
11. Reinsert the catheter tip of the syringe into the tubing.

    The syringe should be held 6 inches above the level of the stomach or at the prescribed height.

12. Unclamp the tube, and allow bubbles to escape.
13. G-tubes should be flushed with 15-30 ml tepid tap water before feedings or medications. Follow the guidelines in the student's IHP.
14. Administer medication, if prescribed, either before or after a feeding, as specified in the student's IHP. Use liquid medication, if possible. Flushing with water between each medication and not mixing the medications can help to prevent clogging of the tube. If the liquid is thick, it might need to be diluted with a little water to prevent clogging as per MD order.
15. Slowly pour feeding/fluid into the syringe and allow it to flow in by gravity.

    If a container other than a syringe is used for the feeding, unclamp the tubing and allow it to flow in by gravity, using the same procedure. The flow of feeding may need to be initiated by placing the plunger into the barrel of the syringe and depressing slightly to get it started (and then remove the plunger).

Be alert to any unusual changes in the student's tolerance of the feeding. Nausea/vomiting, cramping, or diarrhea may indicate that the feeding is being given too quickly or the formula is too cold.

16. Continue to pour the feeding into the syringe as the contents empty into the stomach. Keep the syringe partially filled to prevent air from entering the stomach.

    Depending on the age and capabilities of the student, have him/her assist with the feeding by holding the syringe or pouring fluid into it. Provide oral stimulation, if ordered.

17. Raise or lower the syringe or container to adjust flow to the prescribed rate.

    The higher the syringe is held, the faster the feeding will flow into the stomach.

18. When feeding is completed, pour the prescribed amount of water, usually 15-30 ml, into the syringe and flush tubing. *This will clear the tubing of feeding and medication.*
19. Open the G-tube to air, if ordered.

    Venting allows the drainage of fluid or the release of gas bubbles in the stomach. This may help if the student has a problem with gas.

20. Clamp the tubing, remove the barrel of the syringe, and reinsert the plug into the end of the tubing.

    Clamp the tubing prior to removing the syringe or stomach contents may leak out of the tube.

21. Secure the tubing and tuck it inside clothing, but not inside a diaper or underpants.
22. Refer to the student's IHP for guidelines regarding positioning and activity after feeding. *Most students should remain upright for 30 minutes after feeding.*
23. Wash the syringe and other reusable equipment in soapy water. Rinse thoroughly, dry, and store appropriately.

    The Open formula is good for 24-48 hours. Check the label or the student's IHP to determine how long it may safely be used. Opened formula should be stored in the refrigerator in clean plastic containers (not the original can), labeled with the date it was opened. Discard any open formula after 48 hours.

24. Remove your gloves. Wash your hands with soap and water.
25. Document feeding, any medication, residual amount, feeding tolerance, and any concern about the gastrostomy site in the student's log. Notify the school nurse and family of any changes or concerns.

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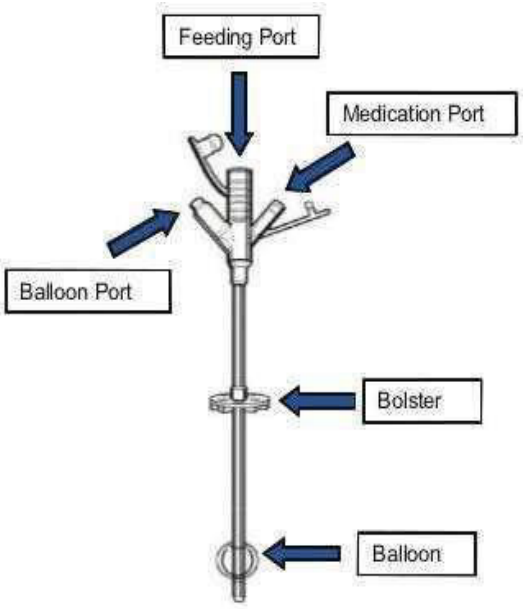
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Procedure for Gastrostomy Tube Feeding— Continuous Feeding by Pump or Slow Drip Method

1. Wash your hands with soap and water.
2. Gather and assemble the equipment required for the gastrostomy tube feeding listed below.

Note: Equipment and feeding supplies are provided by the family.

a. Liquid formula or feeding solution, at room temperature
b. 60 ml catheter-tipped syringe or other feeding container for feeding
c. Feeding bag and tubing
d. Feeding pump and stand or carry-pack, if needed
e. Clamp or plug for end of tube
f. Water (to flush tubing before and after feeding)
g. Rubber bands and safety clips (to secure G-tube to clothing)
h. Gloves



Identify size and type of G-tube. Shake the container well to mix the formula and note the expiration date. It is recommended that students receive a ready-to-feed commercial formula. Potential problems with a homemade blenderized recipe include inaccurate mixing, which may alter the nutrients and calorie content; separation of solids and liquids in the solution, which may clog the tube; and increased risk of contamination due to improper handling, preparation, or storage. Usually the opened formula must be used within 24 hours. Check student IHP for storage instructions.

***Tube feedings should be administered at room temperature**. Some students get cramps if the feeding solution is too cold. If a blenderized formula is brought to school, it should be refrigerated until mealtime and warmed to room temperature. This may be achieved by holding the container with the formula under warm water for several minutes. A microwave should **not** be used for this procedure due to its uneven heat distribution..*

3. Shake the formula (to mix) and measure the prescribed amount of formula to be infused.
4. Explain the procedure using language the student can understand. Encourage the student to do as much of the procedure as is capable, to achieve maximum self-care skills.
5. Position the student upright or as specified in the student's IHP.

Students usually sit (or may lie on their right side with their head elevated) during feeding. Tubing may be pinned to the shirt. Make sure the clamp is not pressing on the skin.

6. Inspect the skin at the gastrostomy site for redness, tenderness, swelling or irritation, or presence of drainage or gastric leakage. Observe for abdominal distension and report it if noted.

   Report abnormal findings to the school nurse and family.

7. Wash your hands with soap and water. and put on a pair of gloves.
8. Remove plug (cap) from the G-tube and insert a catheter-tipped syringe into the end of the feeding tube.

   The G-tube is still clamped. Do not pull on the gastrostomy tubing as this can cause pain and injury to the site or dislodgement.

9. Check residual prior to feeding, if ordered. Checking residual is typically NOT needed if the gastrostomy is well established. If needed, unclamp the tubing and gently draw back on the plunger to remove any liquid or medication that may be left in the stomach (i.e., residuals). Return residuals to the stomach. Clamp the gastrostomy tubing and disconnect the catheter tip syringe.

   Many students do not need to have residuals checked. Note the amount that was withdrawn from the feeding tube and return the contents of the syringe to the stomach because stomach contents contain electrolytes and digestive enzymes. Removing them can result in electrolyte imbalance. Adjust the feeding volume <u>according to the health care provider's orders</u> if a residual is present. If the residual is greater than recommended, hold feeding, wait 30-45 minutes, and check again.

10. Pour feeding/fluids into the feeding bag. Run through the tubing and fill the drip chamber according to tubing directions. Run the formula through the rest of the tubing to the tip and clamp.
11. Hang the bag on a pole above the pump or at a height to achieve the prescribed flow. If a pump is used, insert the tubing in the pump mechanism and set the proper flow rate. Some students may have pumps which are designed to hold the feeding and be worn around the waist or over the shoulder. Follow the manufacturer's instructions for use and the student's IHP for activity level.
12. G-tubes should be flushed with 15-30 ml tepid tap water before feedings or medication. Follow the guidelines in the student's IHP.
13. Administer medication, if prescribed, either before or after a feeding, as specified in the student's IHP. Use liquid medication, if possible. Flushing with water between each medication and not mixing the medications can help to prevent clogging of the tube. If the liquid is thick, it might need to be diluted with a little water to prevent clogging.

14. Insert the tip of the feeding bag tubing into the G-tube. Connection may be taped or luer-locked to prevent disconnection. Unclamp the G-tube.

    Be careful not to apply unnecessary pull on the gastrostomy.

15. Open the roller clamp of the feeding bag tubing and adjust until drips flow at the prescribed rate. If the pump is used, open the clamp completely, set the rate on the pump, and monitor for the correct rate.

    Be alert to any unusual changes in the student's tolerance of the feeding. Nausea/vomiting, cramping, or diarrhea may indicate that the feeding is being given too quickly or the formula is too cold.

16. For continuous feeding with the pump, add feeding as needed to prevent the bag from becoming empty. No more than 4 hours worth of feeding should be hung at any time to prevent contamination.
17. If a single feeding is completed (bag empties), clamp the feeding bag tubing, and clamp the G- tube.
18. Disconnect the feeding bag and tubing from the G-tube.
19. Unclamp the G-tube and use a syringe to flush with water (usually 15-30 ml), unless ordered otherwise.

    This will clear the tubing of feeding and medication.

20. Open the G-tube to air, if ordered.

    Venting allows drainage of fluid or release of gas bubbles in the stomach. This may help if the student has a problem with gas.

21. Clamp and plug the G-tube.
22. Secure tubing and tuck inside the clothes, but not inside the diaper or underpants.
23. Refer to the student's IHP regarding positioning and activity after feeding. Students are usually kept in an upright position for at least 30 minutes after feeding if there are no conflicting orders.

    The feeding tube can be disconnected while the student is being transported to and from school.

24. Wash the syringe and other reusable equipment in soapy water. Rinse thoroughly, dry, and store appropriately.

    Open formula is good for 24-48 hours. Check label or student's IHP to determine how long it may safely be used. Open formula should be stored in the refrigerator in clean plastic containers (not the original can), labeled with the date it was opened. Discard any open formula after 48 hours.

25. Remove your gloves. Wash your hands with soap and water.
26. Document the feeding, any medication, residual amount, feeding tolerance, and any concern about the gastrostomy site in the student's log and notify the school nurse and family of any changes or concerns.

Sources:

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Illustration Source:

Rady's Children's Hospital. (2012). *Guide to gastrostomy tubes*. San Diego. Used with permission.

Possible Problems That May Occur with Gastrostomy Feeds

- **Breathing difficulties, choking, coughing, and/or color changes**
  - **Stop feeding immediately**. There may be aspiration of feeding into the lungs. Call the school nurse if not present. Notify family and activate the school emergency plan. The most significant risk with tube feedings is aspiration of the feeding into the lungs. Be sure the student is positioned with their head elevated at least 30 degrees.
  - Keys to preventing aspiration:
    - Proper positioning--the head should be above the heart during feeding and for 30 minutes after
    - Monitoring for coughing, gagging, vomiting, and difficulty breathing during feeding
    - Ensuring the tube is in place.
- **Nausea and/or cramping**
  - Make sure the feeding is at room temperature.
  - Check the feeding rate. The rate may need to be slowed. Check the length of the G-tube to see if it has migrated either inward or outward.
  - If the problem continues, notify the school nurse, family, and/or health care provider.
- **Vomiting**
  - If all the above have been checked, stop feeding, and call the school nurse or family. Remove residual and vent, if ordered. The nurse can check for bloating and reduced bowel sounds.
- **Blocked gastrostomy tubing**
  - Make sure all clamps on the tubing are open.
  - This may be due to inadequate flushing, slow flow rate, or very thick fluid. Check the position of the tube. Flush with 20-30 ml of warm water. Carbonated beverages and juice have **not** proven effective in unclogging the tubing. Some students may have a prescribed declogging agent specified in their IHP that can be used. Squeeze or roll the gastrostomy tubing with fingers moving slowly down toward the student's stomach. Do not use stylet (guidewire) to try and unclog as this may damage the G-tube. If blockage remains, contact the school nurse or family.
- **Leakage**
  - Check the position of the tube. Make sure the length of tubing outside the skin remains the same (catheter has not migrated). Gently pull on the G-tube to make sure it is against the inside of the stomach wall. Check volume in the balloon (if present). Adjust the external stabilizer for the appropriate fit. Check to make sure the plug on the medication port is on securely and not leaking.
- **Redness/irritation/bleeding at site**
  - Check the G-tube site for leakage. Clean the stoma site if leakage of food/fluid/medication/stomach contents come in contact with skin. Keep the site dry. Make sure the tubing is not being pulled. Loosen the external stabilizer if it is too tight. Do not use a baby bottle nipple as a stabilizer for this traps moisture and puts too much pressure on the area. Avoid allowing the tube to dangle—secure it

to clothing. A skin barrier or other protective skin preparations may be used, if ordered. Refer to the student's IHP for cleaning or dressing instructions. In general, soap and water are the only cleansing agents needed. If a dressing is needed, use only pre-cut gauze because threads from hand-cut gauze can adhere to the stoma. Solutions such as hydrogen peroxide can interfere with skin healing, cause hypergranulation, and should be avoided, unless specifically ordered.
    - Look for other signs of infection. Notify the school nurse and family of gastrostomy site concerns.
- G-tube comes out
    - Follow guidelines in the student's IHP. The G-tube may need to be reinserted immediately if a student's tract closes quickly (usually if the gastrostomy is less than 1-2 months old). Cover the site with a dry dressing or large bandage. Notify the family and activate the student's emergency

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General Information for Students with Gastrostomy Tubes

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has a gastrostomy tube (G-tube) inserted into his or her stomach. The G-tube is used to administer food, medication, and fluids directly into the stomach and may be used during the school day.

The student may receive feedings or medication through the G-tube as needed during the school day in the classroom, the lunchroom, or the health office. The tube is held in place at all times and is clamped or capped between feedings or medication administration. The tube is covered by clothing and should not cause any discomfort for the student.

The student should be able to fully participate in physical education classes unless he or she has another condition that would interfere with full participation.

Special arrangements may need to be made for feedings and medication administration during field trips.

Contact _____ at _____(phone number) for additional information or if the student experiences any problems with the G-tube.

Source: Adapted from: Porter, S., Haynie, M., Bierle, T., Caldwell, T.H., & Palfrey, J.S. (Eds.). (1997). *Children and youth assisted by medical technology in educational settings: Guidelines for care* (2nd ed.). Baltimore: Paul H. Brookes Publishing.

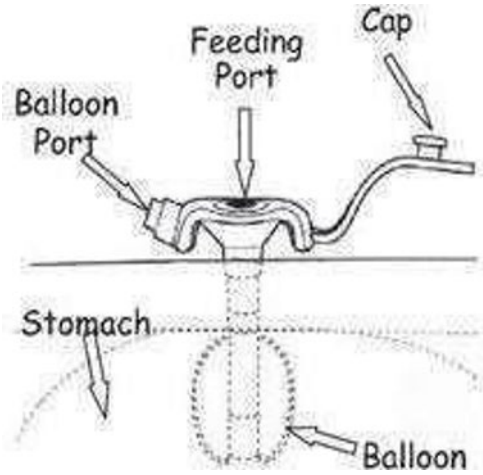
Skin-Level or Low Profile Gastrostomy Devices

(Gastrostomy Feeding Button)

Overview

A gastrostomy is a surgically created opening into the stomach through the surface of the abdomen.

Once the gastrostomy site has well healed, a smaller device may be used instead of the lengthy tube. The skin- level or low profile gastrostomy device may also be called a G-button, MIC-KEY button, Mini-One,



Nutriport, or Bard button, depending on the manufacturer. The silicone or polyurethane device consists of an internal stabilizer in the stomach (fluid-filled balloon or

mushroom-shaped dome) and an external stabilizer (crossbar, triangle, or wings) on the surface of the skin. The internal stabilizer has an antireflux valve so that stomach contents do not spill out when the device is unplugged. The device

remains in place at all times and is covered by a safety plug when not in use. The safety plug is sometimes compared, in appearance, to the opening on a beach ball. Feedings are administered by attaching a small extension tube to the device. When the feeding is over, the tube is removed and the safety plug is closed. Families often prefer a skin level device because there is no bulky tube to manage under clothing when the child is not receiving a feeding.

Skin-level gastrostomies can be used to drain or vent stomach contents, but indications for long term use in students are usually due to:

- Need for supplemental calories due to increased needs from a disease process, such as cystic fibrosis or malabsorption disorders.
- Inability to consume adequate calories by mouth, which may be due to anatomical, behavioral, or psychosocial factors, such as esophageal atresia (incomplete development of the food pipe), failure to thrive or cerebral palsy.
- Risk for choking and aspiration due to impaired swallowing or severe reflux.

Skin-level gastrostomy devices are typically inserted at the time of surgery when the gastrostomy stoma is created. They are typically changed every 3 months to prevent balloon failure.

Settings and Staff

Students can receive feedings anywhere. Many of the pumps are small and designed to be easily worn or carried at all times. Bolus feeds should be done in a clean area because they are more

open to the environment. The student's desire for privacy and possible need for stationery activities during a feed should be considered in determining where feeds will take place. Many students with G-buttons will receive their feeds during the night, eliminating the need for any feeds during the school day.

G-buttons are covered by the student's clothing and do not interfere with normal school activities. Participation in physical education activities may require modification and are determined on an individual basis.

Feedings using skin-level gastrostomy devices can be administered by the school nurse, family member, teacher, or other staff person who has received training in appropriate techniques and problem management. The student should be encouraged to assist with the feeding as much as possible.

School personnel who have regular contact with a student who has a skin-level gastrostomy device should receive training covering the student's specific needs, potential problems, and implementation of the established emergency plan.

Individualized Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with a skin-level gastrostomy device, the following items should be considered:

- Underlying condition and possible problems associated with the condition or treatment
- Size and type of the feeding device
- Whether the device has an internal balloon or a retention bolster to hold it in place
- Length of the G-button outside of the body (important to know in determining whether the G-button has migrated either further into the stomach or out of the stomach)
- Healthcare provider's order for G-button and care
- Whether the student receives bolus or continuous feeds
- Amount, type, and frequency of formula to be received
- Storage of formula
- How long the formula may be used after the container has been opened
- When the tube should be flushed, such as before and after administration of feeds or medications
- Amount (volume) and type of flush liquid
- Type of Portable Pump
- Positioning during and after feeding
- Activity level during and after feeding
- Whether the student should receive oral stimulation during feeding
- Measurement of gastric residuals, if needed
- Medication administration schedule, if needed
- Amount of food or drink a student can take by mouth
- Determining the need for venting of the gastrostomy device
- Determining the need for clamping the gastrostomy device

- Patency of gastrostomy tract and time frame for reinsertion should the device fall out
- Date tube was originally placed
- How to clean the site, if needed
- Actions to take if student has vomiting, abdominal distension, or pain
- Manufacturer's specific instructions for any supplies or equipment
- Feeding guidelines during student transport
- Latex allergy precautions
- Standard precautions

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Illustration Source:

Rady's Children's Hospital. (2012). *Guide to gastrostomy tubes*. San Diego. Used with permission.

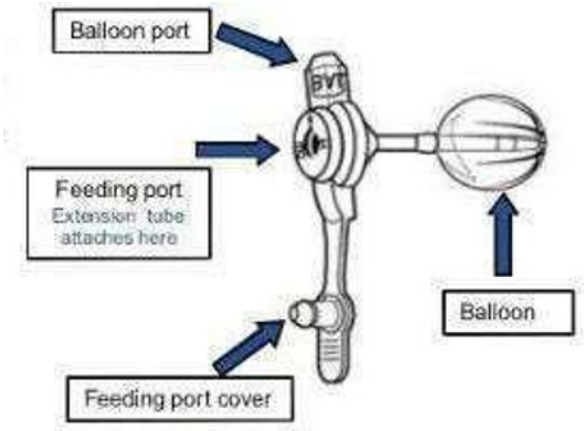
Procedure for Skin-Level Gastrostomy Device (G-Button) Feeding—Bolus Method

1. Wash your hands with soap and water.
2. Gather and assemble the equipment required for the feeding listed below.

   Note: Equipment and feeding supplies are provided by the family.

   a. Liquid formula or feeding solution, at room temperature
   b. 60 ml catheter-tipped syringe or other feeding container for feeding
   c. Adaptor with tubing and clamp (varies with type of device)
   d. Water (to flush tubing before and after feeding)
   e. Rubber bands and safety pins (to secure G-tube to clothing)
   f. Gloves

Identify size and type of the gastrostomy device. Shake the container well to mix the formula and note the expiration date. It is recommended that students receive a ready-to-feed commercial formula. Potential problems with a homemade blenderized recipe include inaccurate mixing, which may alter the nutrients and calorie content; separation of solids and liquids in the solution, which may clog the tube; and increased risk of contamination due to improper handling, preparation, or storage. Generally, opened formula must be used within 24-48 hours. Check the student IHP for storage instructions.



Tube feedings should be administered at room temperature. *Some students get cramps if the feeding solution is too cold. If a blenderized formula is brought to school, it should be refrigerated until mealtime and warmed to room temperature. This may be achieved by holding the container with the formula under warm water for several minutes. A microwave should* ***not*** *be used for this procedure due to its uneven heat distribution.*

3. Measure the prescribed amount of formula to be infused.
4. Explain the procedure using language the student can understand. Encourage the student to do as much of the procedure as is capable, to achieve maximum self-care skills.
5. Position the student upright as specified in the student plan.

   Students usually sit (or may lie on their right side with their head elevated) during feeding.

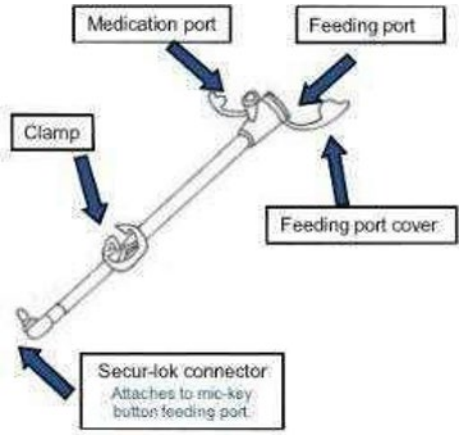
6. Inspect the skin at the gastrostomy site for redness, tenderness, swelling or irritation, or presence of drainage or gastric leakage.

Report abnormal findings to the school nurse and family.

7. Wash your hands with soap and water and put on a pair of gloves.
8. Rotate (turn 90 degrees) the external stabilizer/bolster according to the student's IHP, **if ordered**.

   This may help prevent adhesions.

9. Open the safety plug on the gastrostomy device.
10. Insert the adaptor and tubing into the gastrostomy device according to the manufacturer's instructions (some adaptors lock by lining up two black guide lines). Stabilize the button to avoid pushing it into the student's belly. Hold firmly by the feeding port (not the flange).
11. Flush with 10-30 ml tepid tap water before feedings or medications to verify the placement and functionality. Follow guidelines in the student's IHP.
12. Administer medication, if prescribed, either before or after a feeding, as specified in the student's IHP. Use liquid medication, if possible. Flushing with water between each medication and not mixing the medications can help to prevent clogging of the tube. If the liquid is thick, it might need to be diluted with a little water to prevent clogging.
13. Remove the plunger from the syringe and attach the adaptor tubing to the feeding syringe.



14. Slowly pour feeding/fluid into the syringe and allow it to flow in by gravity.

    If a container other than a syringe is used for the feeding, unclamp the tubing and allow it to flow in by gravity, using the same procedure. The flow of feeding may need to be initiated by placing the plunger into the barrel of the syringe and depressing slightly to get it started (and then remove the plunger).

    Be alert to any unusual changes in the student's tolerance of the feeding.

    Nausea/vomiting, cramping, or diarrhea may indicate that the feeding is being given too quickly or the formula is too cold.

15. Continue to pour the feeding into the syringe as the contents empty into the stomach. Keep the syringe partially filled to prevent air from entering the stomach.

    Depending on the age and capabilities of the student, have him/her assist with the feeding by holding the syringe or pouring fluid into it. Provide oral stimulation, if ordered.

16. Raise or lower the syringe or container to adjust flow to the prescribed rate.

The higher the syringe is held, the faster the feeding will flow into the stomach.

17. When feeding is completed, pour the prescribed amount of water into the syringe and flush the tubing. *This will clear the tubing of feeding and medication.*
18. Clamp the adapter tubing, remove from the gastrostomy device, and close the safety plug into the gastrostomy device.
19. Refer to the student's IHP regarding positioning and activity after feeding. Usually the student should remain upright for at least thirty minutes.
20. Wash the syringe and other reusable equipment in soapy water. Rinse thoroughly, dry, and store appropriately.

    Open formula is good for 24-48 hours. Check the label or the student's IHP to determine how long it may safely be used. Open formula should be stored in the refrigerator in clean plastic containers (not the original can), labeled with the date it was opened. Discard any open formula after 48 hours.

21. Remove your gloves. Wash your hands with soap and water.
22. Document feeding, any medication, feeding tolerance, and any concern about the gastrostomy site in the student’s log and notify the family of any changes or concerns.

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Wisconsin Improving School Health Services Project. (2015). *Gastrostomy button bolus feeding*.

Illustration Source:

Rady's Children's Hospital. (2012). *Guide to gastrostomy tubes*. San Diego. Used with permission.

Procedure for Skin-Level Gastrostomy Device (G-Button) Feeding—Slow Drip or Continuous Feeding by Pump

1. Wash your hands with soap and water.
2. Gather and assemble the equipment required for the feeding listed below.

   Note: Equipment and feeding supplies are provided by the family.

   a. Liquid formula or feeding solution, at room temperature
   b. 60 ml catheter-tipped syringe or other feeding container for feeding
   c. Feeding bag and tubing
   d. Feeding pump and stand or carry-pack, if needed
   e. Adaptor with tubing and clamp (varies with size and type of device)
   f. Water (to flush tubing before and after feeding)
   g. Rubber bands and safety pins (to secure G-tube to clothing)
   h. Gloves

   Identify the size and type of the gastrostomy device. Shake the container well to mix the formula and note the expiration date. It is recommended that students receive a ready-to-feed commercial formula. Potential problems with a homemade blenderized recipe include inaccurate mixing, which may alter the nutrients and calorie content; separation of solids and liquids in the solution, which may clog the tube; and increased risk of contamination due to improper handling, preparation, or storage. Usually, the opened formula must be used within 24 hours. Check the student's IHP for storage instructions.

   Tube feedings should be administered at room temperature. *Some students get cramps if the feeding solution is too cold. If a blenderized formula is brought to school, it should be refrigerated until mealtime and warmed to room temperature. This may be achieved by holding the container with the formula under warm water for several minutes. A microwave should* ***not*** *be used for this procedure due to its uneven heat distribution.*

3. Measure the prescribed amount of formula to be infused.
4. Explain the procedure using language the student can understand. Encourage the student to do as much of the procedure as is capable, to achieve maximum self-care skills.
5. Position the student upright as specified in the student plan.

   Students usually sit (or may lie on their right side with their head elevated) during feeding).

6. Inspect the skin at the gastrostomy site for redness, tenderness, swelling or irritation, or the presence of drainage or gastric leakage.

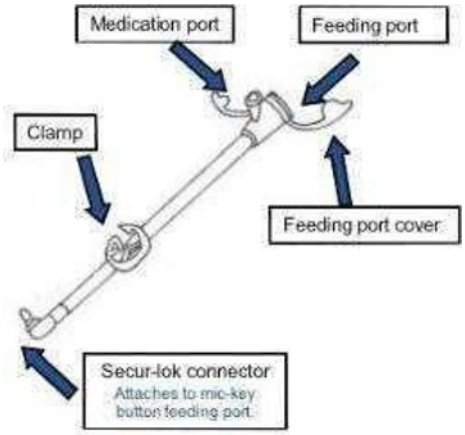
   Report abnormal findings to the school nurse and family.

7. Wash your hands and put on a pair of gloves.

8. Rotate (turn 90 degrees) the external stabilizer/bolster according to the student's IHP, **if ordered**.

   This may help prevent adhesions.

9. Open the safety plug on the gastrostomy device.
10. Insert the adapter and tubing into the gastrostomy device according to the manufacturer instructions (some adaptors lock into place).
11. Flush with 10-30 ml tepid tap water before feedings or medications. Follow student-specific guidelines.
12. Administer medication, if prescribed, either before or after a feeding, as specified in the student guidelines. Use liquid medication, if possible. Flushing with water between each medication and not mixing the medications can help to prevent clogging of the tube.
13. Insert the adaptor and tubing into the gastrostomy device according to the manufacturer instructions (some adaptors lock into place).
14. Attach the adaptor tubing to the feeding bag tubing.
15. Open the clamp of the feeding bag tubing and adjust until drips flow at the prescribed rate. If the pump is used, open the clamp completely, set the rate on the pump, and monitor for the correct rate.



   Be alert to any unusual changes in the student's tolerance of the feeding.

   Nausea/vomiting, cramping, or diarrhea may indicate that the feeding is being given too quickly or the formula is too cold.

16. For continuous feeding with the pump, add feeding as needed to prevent the bag from becoming empty. No more than 4 hours worth of feeding should be hung at any time to prevent contamination.
17. If a single feeding is completed (bag empties), clamp the feeding bag tubing, and disconnect the feeding bag from the adaptor tubing.
18. Use a syringe to flush the gastrostomy device with water (usually 15-30 ml), unless ordered otherwise.

    This will clear the device of feeding and medication.

19. Remove the adaptor tubing and close the safety plug.
20. Refer to the student's IHP regarding positioning and activity after feeding. Usually the student should remain upright for at least thirty minutes.

    The feeding tube can be disconnected while the student is being transported to and from school.

21. Wash the syringe and other reusable equipment in soapy water. Rinse thoroughly, dry, and store appropriately.

    Open formula is good for 24-48 hours. Check the label or the student's IHP to determine how long it may safely be used. Open formula should be stored in the refrigerator in clean plastic containers (not the original can), labeled with the date it was opened. Discard any open formula after 48 hours.

22. Remove your gloves. Wash your hands with soap and water.
23. Document feeding, any medication, residual amount, feeding tolerance, and any concern about the gastrostomy site in the student’s log. Notify the family of any changes or concerns.

Sources:

Applied Medical Technology. (2013). *Patient education guide: guidance and support to help you manage your gastrostomy tube Balloon Mini One buttons* https://www.appliedmedical.net/wp-content/uploads/2022/05/MiniONE_EDU_English_C-3974-M.pdf

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Illustration source:

Rady's Children's Hospital. (2012). *Guide to gastrostomy tubes*. San Diego. http://www.slideshare.net/missnicoletait/guide-to-gastrostomy-tubes Used with permission.

Possible Problems with Skin-Level Gastrostomy Devices (G-button)

- **Breathing difficulties, choking, coughing, and/or color changes**
  - **Stop feeding immediately.** There may be aspiration of feeding into the lungs. Call the school nurse if not present. Notify the family and activate the school emergency plan. The most significant risk with tube feedings is aspiration of feeding into the lungs. Be sure the student is positioned with the head elevated at least 30 degrees.
  - Keys to preventing aspiration:
    - Proper positioning--the head above the heart during feeding and 30 minutes after
    - Monitoring for coughing, gagging, vomiting, and difficulty breathing during feeding
    - Ensuring the tube is in place.
- **Nausea and/or cramping**
  - Make sure the feeding is at room temperature.
  - Check feeding rate. The rate may need to be slowed. Check the length of the G-tube to see if it has migrated either inward or outward.
  - If the problem continues, notify the school nurse, family, and/or health care provider.
- **Vomiting**
  - If all the above have been checked, stop the feeding, then call the school nurse or family. Remove the residual and vent, if ordered. The nurse can check for bloating and reduced bowel sounds.
- **Blocked gastrostomy tubing**
  - Make sure all clamps on the tubing are open.
  - Blockage may be due to inadequate flushing, slow flow rate, or very thick fluid. Check tube positioning. Flush with 20-30 ml warm water. Carbonated beverages and juice have **not** proven effective in unclogging the tubing. Some students may have a prescribed declogging agent specified in their IHP that can be tried. Squeeze or roll the gastrostomy tubing with the fingers moving slowly down toward the student's stomach. Do not use stylet (guidewire) to try and unclog as this may damage the G-tube. If blockage remains, contact the school nurse or family.
- **Leakage**
  - Check the position of the tube. Make sure the length of tubing outside the skin remains the same (catheter has not migrated). Gently pull on the G-tube to make sure it is against the inside of the stomach wall. Check the volume in the balloon (if present). Adjust external stabilizer for the appropriate fit.
- **Redness/irritation/bleeding at site**

    - Check the G-tube site for leakage. Clean the stoma site if leakage of food/fluid/medication/stomach contents come in contact with the skin. Keep the site dry. Make sure the tubing is not being pulled. Loosen the external stabilizer if it is too tight. Do not use a baby bottle nipple as a stabilizer as this traps moisture and puts too much pressure on the area. Avoid allowing the tube to dangle—secure to clothing. A skin barrier or other protective skin preparations may be used, if ordered. Refer to the student's IHP for cleaning or dressing instructions. In general, soap and water are the only cleansing agents needed. If a dressing is needed, use only pre-cut gauze because threads from hand-cut gauze can adhere to the stoma. Solutions such as hydrogen peroxide can interfere with skin healing, cause hypergranulation, and should be avoided, unless specifically ordered.
    - Look for other signs of infection. Notify the school nurse and the family of gastrostomy site concerns.
- **G-tube comes out**
    - Follow guidelines in the student IHP. The G-tube may need to be reinserted immediately if a student’s tract closes quickly (often if the gastrostomy is less than 1-2 months old). Cover the site with a dry dressing or a large bandage. Notify the family. Activate the student's emergency action plan.

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Wisconsin Improving School Health Services Project. (2015). *Gastrostomy button continuous feeding/slow drip*.

General Information for Students with Skin-Level Gastrostomy Feeding Devices (G-Button)

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has a gastrostomy feeding device, often called a G-button, inserted into his or her stomach. The G-button is used to administer food, medication, and fluids directly into the stomach and may be used during the school day.

The G-button is held in place and is capped between feedings or medication administration. The device is covered by clothing and should not cause any discomfort for the student.

The student should be able to fully participate in physical education classes unless he or she has another condition that would interfere with full participation.

Special arrangements may need to be made for feedings and medication administration during field trips.

Contact _____ at _____(phone number) for additional information or if the student experiences any problems with the G-tube.

Source: Adapted from: Porter, S., Haynie, M., Bierle, T, Caldwell, Palfrey, JS. Williams, M.. (1997) *Children and Youth Assisted by Medical Technology in Educational Settings: Guidelines for Care*. 2nd ed.. Baltimore, MD. Brookes Publishing Company.

Nasogastric Tube

A nasogastric tube (NG-tube) is a rubber or plastic tube that passes through a nostril, down the throat and esophagus, and into the stomach. It can be used to give liquids, medication, and feedings when needed. NG-tubes are usually used for relatively short periods of time during hospitalizations. If access to the stomach is needed for longer periods, a gastrostomy is usually performed. Due to the concerns about aspiration and reflux, NG tubes are rarely encountered in the school setting now. If a student presents to school with a NG tube or a NJ (nasojejunal) tube, the student will require very detailed, individualized instructions for all aspects of its care. Work with the health care provider and family to develop detailed instructions for the student's IHP and emergency action plan.

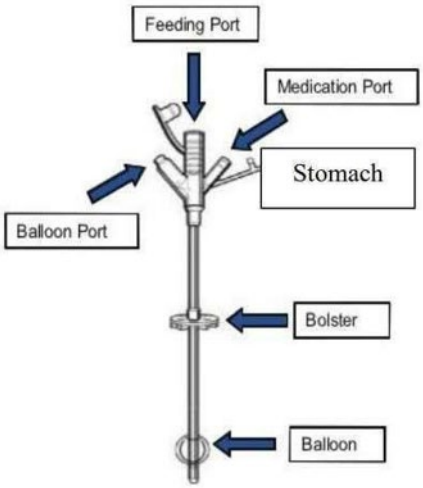
Jejunostomy Tube

Overview

A jejunostomy is a surgically created opening into the part of the small intestine that lies between the duodenum and the ileum. The jejunostomy tube (J-tube) is a silicone catheter that may be placed directly through the skin of the abdomen into the jejunum and can usually be found on the right side of the abdomen.

Some students may have a G-tube and a J-tube in the same stoma. There may be two separate tubes or one tube with several different ports. Other students may have two stomas with a gastrostomy device in one and a jejunostomy device in the other. When there are two stomas, the gastrostomy device may just be used for venting.

The gastrojejunal tube (G-J tube) is a single tube with three limbs, including a gastric port, a jejunal port, and a balloon inflation limb to hold the tube in place. It is inserted through a gastrostomy site and threaded through the pylorus into the jejunum. The tube remains in the small intestine at all times and must not move in or out. There may be a tube on the outside of the skin or a skin-level feeding device (G-J button).



Certain medications may not be administered into the jejunum and must be administered through the gastric port of the G-J tube.

Used to bypass the mouth and stomach and to administer food and fluids directly into the jejunum, the jejunostomy poses less risk for aspiration and gastroesophageal reflux. It may be used when the student has a depressed gag reflex, an obstruction in the esophagus or stomach, or an intestinal pseudo-obstruction. It may also be used when the stomach cannot be used, such as after stomach surgery or when there is a problem with stomach emptying. Residuals are usually not checked with J-tubes. Feedings are given continuously over several hours. Bolus feedings are not given via the jejunostomy since this may cause dumping syndrome and malabsorption of nutrients.

Jejunal feedings are administered slowly as a continuous drip over a number of hours. The jejunum does not tolerate larger bolus feeds. J-tubes and G-J tubes should **not** be rotated to avoid potential kinking or dislodgement. They should be flushed with water, 15-30 ml., every 6 hours to prevent clogging.

Settings and Staff

Students can receive feedings anywhere. Many of the pumps are small and designed to be easily worn or carried at all times. Student's desire for privacy and possible need for stationery activities during a feed should be considered in determining where feeds will take place. A few students with J-tubes may not need to receive feeds during the school day.

Students who require venting or drainage of their gastrostomy tubes should have this done in a clean, private area such as the health office. Some children may have the gastrostomy tube vented continuously into a small drainage bag. J-Tubes and G-Tubes are usually covered by the student's clothing and do not interfere with normal school activities. Participation in physical education activities may require modification and are determined on an individual basis.

A jejunostomy feeding may be administered by the school nurse (RN or LPN) and by trained unlicensed assistive personnel who are supervised by an RN. The student should be encouraged to assist with the J-tube feeding as much as possible.

School personnel who have regular contact with a student who has a J-tube should receive training covering the student's specific needs, potential problems, and implementation of the established emergency plan.

Individualized Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with a jejunostomy, the following items should be considered:

- Underlying condition and possible problems associated with the condition or treatment
- Size and type of feeding device
- Length of J-tube or G-J-tube outside of the body (important to know in determining whether the tube has migrated)
- Healthcare provider's order for G-J tube and its care
- Amount, type, and frequency of formula to be received
- Storage of formula
- How long the formula may be used after the container has been opened
- When the tube should be flushed, such as before and after administration of feeds or medications
- Amount (volume) and type of flush liquid
- Whether the G-tube needs venting during jejunostomy feeds
- Type of portable pump and its specific instructions
- Positioning during and after feeding
- Activity level during and after feeding
- Whether medications are administered through J-tube or G-tube
- Amount of food or drink a student can take by mouth

- Patency of jejunostomy tract and time frame for reinsertion should the J-tube fall out
- Actions to take if the student has vomiting, abdominal distension, or pain
- Manufacturer's specific instructions for any supplies or equipment
- Feeding guidelines during student transport
- Latex allergy precautions
- Standard precautions

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 249-260, 275-283.

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Illustration Source:

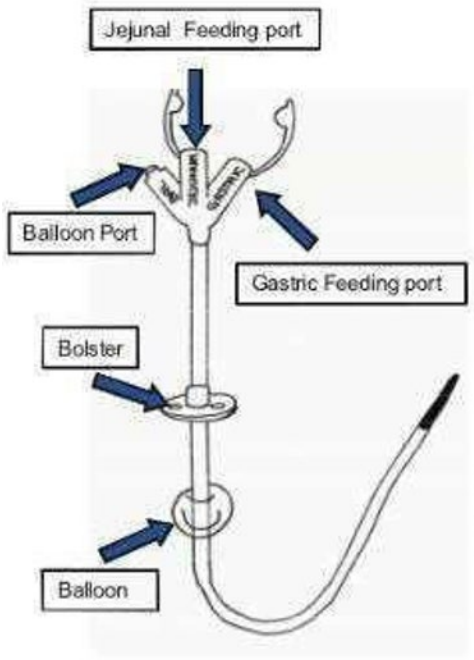
Rady's Children's Hospital. (2012). *Guide to gastrostomy tubes*. San Diego. Used with permission.

Procedure for Jejunostomy Tube Feeding – Continuous Feeding by Pump

1. Wash your hands with soap and water.
2. Gather and assemble the equipment required for the feeding listed below.

Note: Equipment and feeding supplies are provided by the family.

a. Liquid formula or feeding solution, at room temperature
b. 10 ml syringe
c. Feeding bag and tubing
d. Feeding pump and stand or carry-pack, if needed
e. Clamp or plug for the end of the tube
f. Water (to flush tubing before and after feeding)
g. Rubber bands and safety pins (to secure J-tube to clothing)
h. Gloves



Identify the size and type of the J-tube. Shake the container well to mix the formula and note the expiration date. It is recommended that students receive a ready-to-feed commercial formula. Potential problems with a homemade blenderized recipe include inaccurate mixing, which may alter the nutrients and calorie content; separation of solids and liquids in the solution, which may clog the tube; and increased risk of contamination due to improper handling, preparation, or storage. Usually, the opened formula must be used within 24-48 hours. Check the student's IHP for storage instructions.

***Tube feedings should be administered at room temperature**. Some students get cramps if the feeding solution is too cold. If a blenderized formula is brought to school, it should be refrigerated until mealtime and warmed to room temperature. This may be achieved by holding the container with the formula under warm water for several minutes. A microwave should **not** be used for this procedure due to its uneven heat distribution.*

3. Shake the formula (to mix) and measure the prescribed amount of formula to be infused.
4. Explain the procedure using language the student can understand. Encourage the student to do as much of the procedure as is capable, so as to achieve maximum self-care skills.
5. Position the student upright as specified in the student plan.

Students usually sit (or may lie on their right side with their head elevated) during feeding. Tubing may be pinned to the shirt. Make sure the clamp is not pressing on the skin.

6. Wash your hands and put on a pair of gloves.
7. Inspect the skin at the gastrostomy/jejunostomy site(s) for redness, tenderness, swelling or irritation, or the presence of drainage or gastric leakage. Observe whether the tubing length is marked at the entrance.

   Report abnormal findings to the school nurse and family.

8. Pour feeding/fluids into the feeding bag. Run through the tubing and fill the drip chamber according to the tubing directions. Run through the rest of the tubing to the tip. Clamp.
9. Hang the bag on the pole above the pump or at the appropriate height to achieve the prescribed flow. If a pump is used, insert the tubing into the pump mechanism and set the proper flow rate. Some students may have pumps which are designed to hold the feeding bag and be worn around the waist or over the shoulder. Follow the manufacturer instructions for use and the student's IHP for activity level during feed.
10. J-tubes should be flushed with 5-10 ml tepid water before the administration of feeds or medications. Open the safety plug and insert the tubing into the J-tube. Follow the guidelines in the student's IHP.
11. Administer medication, if prescribed, either before or after a feeding, as specified in the student's IHP. Always flush before administering medications. Use liquid medication, if possible. Flushing with water between each medication and not mixing the medications can help to prevent clogging of the tube. If the liquid is thick, it might need to be diluted with a little water to prevent clogging. Certain medications may not be administered into the jejunum and must be administered through the gastric port of a G-J tube.
12. Insert the tip of the feeding bag tubing into the J-tube. The connection may be taped or luer-locked to prevent disconnection. Unclamp the J-tube

    Be careful not to apply unnecessary pull on the jejunostomy.

13. Vent the G-tube, if ordered, during feeding. A syringe or drainage bag may be used for venting.
14. Open the roller clamp of the feeding bag tubing and adjust until drips flow at the prescribed rate. However, the feeding pump will usually be ordered. If the feeding pump is used, open the clamp completely, set the rate on the pump, and monitor for the correct rate.

    Be alert to any unusual changes in the student's tolerance of the feeding. Nausea/vomiting, cramping, or diarrhea may indicate that the feeding is being given too quickly or the formula is too cold.

15. For continuous feeding with the pump, add feeding as needed to prevent the bag from becoming empty. No more than 4 hours worth of feeding should be hung at any time to prevent contamination. Flush jejunostomy 4 times a day with 15-30 ml. water to prevent clogging.
16. If a feeding is completed (bag empties) during school time, clamp the feeding bag tubing, and clamp the J-tube.
17. Disconnect the feeding bag and tubing from the J-tube.
18. Unclamp the J-tube and use a syringe to flush with water, usually 5-10 ml as prescribed in the student's IHP.

    This will clear the tubing of feeding and medication and help to prevent obstruction.

19. Clamp and plug the J-tube.
20. Secure the tubing and tuck inside the clothes, but not inside the diaper or underpants.
21. Refer to the student's IHP regarding positioning and activity after feeding. Students are usually kept in an upright position for at least 30 minutes after feeding if there are no conflicting orders.

    The feeding tube can be disconnected while the student is being transported to and from school.

22. Wash the syringe and other reusable equipment in soapy water. Rinse thoroughly, dry, and store appropriately.

    Open formula is good for 24-48 hours. Check the label or student guidelines to determine how long it may safely be used. Open formula should be stored in clean plastic containers, labeled correctly (not the original can) in the refrigerator. Discard any open formula after 48 hours.

23. Remove your gloves. Wash your hands with soap and water.
24. Document feeding, any medication, residual amount, feeding tolerance, and any concern about the jejunostomy/gastrostomy site in the student's log. Notify the school nurse and family of any changes or concerns.

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Wisconsin Improving School Health Services Project. (2015). *Jejunostomy tube continuous feeding*.

Illustration Source:

Rady's Children's Hospital. (2012). *Guide to gastrostomy tubes*. San Diego.

Used with permission.

Possible Problems that May Occur with Jejunostomies

- **Breathing difficulties, choking, coughing, and/or color changes**
    - Some students may experience increased respiratory secretions while receiving feedings and may need suctioning. Stop the feeding and follow student-specific instructions for suctioning. Position the student with the head elevated at least 30 degrees. If the problem continues after suctioning, notify the school nurse and family.
- **Sweating, increased heart rate, pale skin color, irritability, diarrhea**
    - This may be a sign of dumping syndrome, which can occur when the volume or type of formula is increased. The feeding will usually need to be stopped until symptoms subside. Notify the school nurse and family and follow the student's IHP.
- **Nausea and/or cramping**
    - Make sure the feed is at room temperature. Check the feeding rate. The rate may need to be decreased. If the problem continues, notify the school nurse and family.
- **Vomiting**
    - The Jejunostomy tube may be dislodged from the jejunum. Stop the feeding. Notify the school nurse, health care provider, and family.
    - You may need to vent the G-tube if it was clamped during jejunal feeding.
- **Jejunal feeding contents in G-tube drainage**
    - The J-tube may be dislodged from the jejunum. Stop the feeding. Notify the school nurse, family, and/or health care provider.
- **Blocked jejunostomy tubing**
    - Make sure all tubing clamps are open.
    - Blockage may be due to inadequate flushing, slow flow rate, or very thick fluid. Check tube positioning. Flush with 5 ml warm water. Carbonated beverages and juice have not proven effective in unclogging the tubing. Squeeze or roll the jejunostomy tubing with the fingers moving slowly down toward the student's stomach. Do <u>not</u> use the stylet (guidewire) to try and unclog as it may damage the tube. If blockage remains, contact the school nurse or family.
- **Leakage**
    - **Drainage from jejunostomy is very caustic**. Make sure the tubing is not being pulled. Check the position of the tube. Make sure the length of the tubing outside the skin remains the same (catheter has not migrated). Check the plug on the G-J tube to make sure the gastric port is securely attached.
- **Redness/irritation/bleeding at the site**
    - Check the site for leakage. Drainage from the jejunostomy is very caustic. Clean the stoma site if leakage of food/fluid/medication/stomach or intestinal contents come in contact with the skin. Keep the site dry. Make sure the tubing is not being pulled.
    - Loosen the external stabilizer if it is too tight. Avoid allowing the tube to dangle—secure to clothing. A skin barrier or other protective skin preparations may be used, if ordered. Refer to the student's IHP for cleaning or dressing

instructions. In general, soap and water are the only cleansing agents needed. If a dressing is needed, use only pre-cut gauze because threads from hand-cut gauze can adhere to the stoma. Solutions such as hydrogen peroxide can interfere with skin healing and should be avoided, unless specifically ordered. Monitor for other signs of infection. Notify the school nurse and family of any concerns.

- **J-tube falls out**
    - Follow guidelines in the student's IHP. Cover the site with a dry dressing or a large bandage. A tube may need to be reinserted immediately to keep the site open if a student's tract closes quickly, but must be inserted by the student's health care provider. Notify the school nurse, family and health care provider. A backup gastrostomy tube should be placed in the stoma tract until the J-tube can be replaced.

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General Information for Students with Jejunostomy Tubes

Date: _____

To: _____
(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has a jejunostomy tube (J-tube) inserted into the small intestine. The J-tube is used to administer food, medication, and fluids directly into the small intestine and may be used during the school day.

The tube is held in place at all times and is clamped or capped between feedings or medication administration. The tube is covered by clothing and should not cause any discomfort for the student. The student's privacy should be assured during feedings and medication administration.

The student should be able to fully participate in physical education classes unless he or she has another condition that would interfere with full participation.
Special arrangements may need to be made for feedings and medication administration during field trips.

Contact_____at _____(phone number) for additional information or if the student experiences any problems with the J-tube.

Source: Adapted from: Porter, S., Haynie, M., Bierle, T., Caldwell, T.H., & Palfrey, J.S. (Eds.). (1997). *Children and youth assisted by medical technology in educational settings: Guidelines for care* (2nd ed.). Baltimore: Paul H. Brookes Publishing.

General Information Sheet Students with Jejunostomy Tubes

Dear (teacher, instructional assistant, bus driver):

_____[Student's name] has a condition that requires a jejunostomy tube (J-tube). This is a simple and safe way of giving food, medication, and fluids directly into the intestine because the student is unable to take these by mouth.

The jejunostomy is a surgical opening into the jejunum (part of the small intestine). A flexible tube (i.e., the J-tube) is put into the surgical opening. It is held in place on the outside at all times. The tube is clamped or capped between feedings to prevent leakage. The J-tube usually does not cause the student discomfort and is covered by clothing.

The student may receive feedings or medication through the J-tube as needed during the school day in the classroom, the lunchroom, or the health office. Unless he or she has a condition that otherwise would interfere with participation in physical education or other activities, there is no reason why he or she cannot participate fully. Special consideration may be needed, however, for field trips or other activities during which the student may not be able to receive a regularly scheduled feeding.

The following staff members have been trained to deal with any problems that may arise with this student:

_____

_____

_____

_____

For more information about J-tubes or the student's needs, consult the school nurse or family.

Source: Porter, S., Haynie, M., Bierle, T., Caldwell, T. H., & Palfrey, J. S. (Eds.). (1997). *Children and Youth Assisted by Medical Technology in Educational Settings: Guidelines for Care*. (2nd ed.). Baltimore: Paul H. Brookes Publishing

Nasojejunal Tube

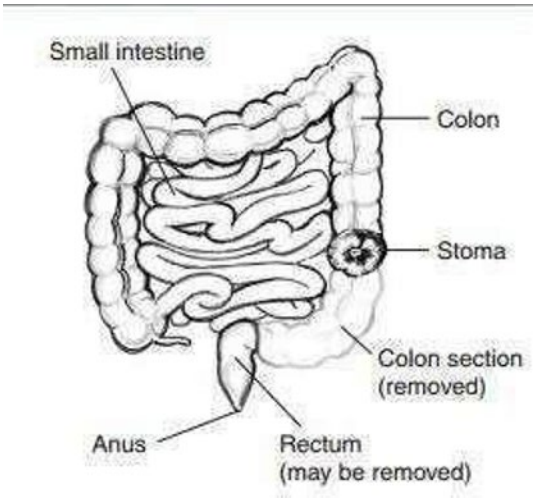
A nasojejunal tube (NJ-tube) is a tiny rubber or plastic tube that passes through a nostril, down the throat and esophagus, stomach, and into the jejunum of the small intestine. It can be used to give liquids, medication, and feedings when needed. NJ-tubes are usually used only during hospitalizations. If access to the jejunum is needed for longer periods, a gastric- jejunostomy is usually performed. Due to concerns about aspiration and reflux, NJ tubes are rarely encountered in the school setting. If a student presents to school with an NJ (nasojejunal) tube, the student will require very detailed, individualized instructions for all aspects of its care. Work with the health care provider and family to develop detailed instructions for the student's IHP and emergency action plan.

Colostomy

Overview

A colostomy is a surgically-created opening in the large intestine (colon) used to eliminate fecal material. A piece of the colon is brought through the abdominal wall out to the skin surface of the abdomen and folded back onto itself to form a stoma. The stoma is red or dark pink in color and moist, much like the mucosal lining of the mouth. A colostomy can be permanent or temporary.

Colostomies are named for the portion of the colon used to form the stoma. The character of the stool that is drained also depends on the location of the colostomy. An ostomy in the sigmoid or descending colon (most common) will be found on the left side of the abdomen and will pass stool that is soft and semi-formed because it will have passed through most of the colon where the water is absorbed. However, an ostomy in the transverse colon or ascending colon will pass stool that is semi-liquid.



Some students may have two stomas. One stoma connects to the proximal end of the intestine and functions as the colostomy where stool will come out. The other end, the mucus fistula, is connected to the remaining part of the intestine which passes only the mucus that is produced by the portion of the colon no longer connected to the rest of the digestive tract.

Students receive ostomies for a variety of reasons. Some have birth defects such as an imperforate anus, spina bifida, or Hirschsprung's Disease that require an alternate method of bowel elimination. Others may receive a colostomy due to ulcerative colitis, Crohn's disease, polyposis, injury, or nerve damage.



A pouch is worn over the colostomy to collect stool. Pouch systems can be reusable or disposable, drainable or close-bottomed, and one-piece or two-piece. Pouches typically last 1-7 days. They protect the stoma, as well as the skin around the stoma (peristomal). Stomas are rich in blood supply and may bleed slightly if irritated or rubbed. Because the stoma itself does not have nerve endings, irritation of the stoma does not usually cause discomfort. However, the skin surrounding the stoma does have nerve endings and may be sensitive to manipulation of the stoma or to contact with any discharge from the stoma.

Therefore, good skin care and a properly fitting pouch are essential to preventing irritation and breakdown at the stoma site. If the opening of the pouch is too large, it can expose the skin to fecal matter and moisture. If it is too tight or constrictive, it can cut or injure the stoma. A skin barrier is also usually applied around the stoma to protect it.

Settings and Staff

The pouch should be emptied whenever it is one-third to one-half full or if a leak occurs. The student's privacy must be ensured whether the student cares for the ostomy by him/herself or receives assistance. Pouch changes are routinely performed at home, but may need to be done at school if a leak occurs or the pouch fills. A student with an ostomy should be able to participate in all school activities, including physical education.

Emptying and cleaning the pouch can be done by the student, the school nurse, or any adult trained in appropriate techniques and problem management of ostomies.

Application of the pouch is best done by a registered or licensed practical school nurse if the student requires assistance. School staff who have regular contact with a student with a colostomy should receive general training covering the student's specific needs, potential problems, and implementation of the established emergency plan.

Individualized Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with a colostomy, the following items should be considered:

- Underlying condition and possible problems associated with the condition or treatment
- Type of ostomy and pouch
- Any doctor's orders for special care or procedures
- Student's ability to provide self-care
- Access to a change of clothing at school
- Access to a private bathroom
- Stoma care—cleansing supplies and frequency; barrier supplies
- Stoma appearance and changes that require reporting
- Usual stool consistency, frequency, and amount
- Latex allergy precautions
- Standard precautions

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Procedure for Emptying a Colostomy

1. Wash your hands with soap and water.
2. Assemble the equipment required for emptying a colostomy listed below.

   Note: The family provides the equipment and supplies. *The student should have a complete set of ostomy supplies at school with a spare pouch and a clip/pouch closure.*

   a. Tissue, wet washcloth, paper towel, or wet wipe
   b. Toilet or container to dispose of wastes
   c. Gloves, if the pouch is to be emptied by someone other than the student
   d. Clean pouch with clip closure
   e. Extra pouch supplies
3. Explain the procedure using language the student can understand. Encourage the student to do as much of the procedure as is capable,to achieve maximum self- care skills.
4. Wash your hands and put on a pair of gloves. Wash the student's hands if they are assisting.
5. Empty when 1/3-1/2 full of stool or gas. If emptying into a toilet, place a piece of toilet paper in the toilet to prevent splashing.
6. Tilt the bottom of the pouch upward and remove the clamp.
7. Fold the bottom of the pouch up to form a cuff before emptying.

   Cuffing helps keep the bottom of the pouch clean during emptying.

8. Slowly unfold the end of the pouch and empty the contents of the pouch into the toilet or container. Sliding your hands down the outside of the pouch can help to push out the stool.
9. Wipe the bottom of the pouch with a tissue, wet washcloth, paper towel, or wet wipe and unfold the cuff. Pouch deodorant can be applied, if specified in the student's IHP. Do not use oils or soap because they can weaken the pouch seal. Rinsing with water can also weaken the skin barrier seal and should be avoided.
10. Re-apply the clamp closure.
11. Flatus can be released through the gas release valve, if the pouch has one. If there is no valve, the flatus can be expelled by tilting the bottom of the pouch upward, releasing the clamp, and expelling the flatus. Re-apply the clamp.
12. Flush the wastes in the toilet.
13. Remove your gloves and wash your hands with soap and water. Wash the student's hands with soap and water also if they assist.
14. Report any change in the student’s usual pattern to the school nurse and family.
15. Document your actions and observations.

Sources:

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Procedure for Changing a Colostomy Pouch

1. Wash your hands with soap and water.
2. Assemble the equipment required for changing the colostomy pouch listed below.

   Note: The family provides the equipment and supplies. *Students should have a complete set of ostomy supplies at school with a spare pouch and a clip/pouch closure. Routine pouch changes should be performed at home.*

   a. Water
   b. Skin cleanser
   c. Soft cloth or gauze or tissues
   d. Clean pouch with a clip closure
   e. Protective paste or powder, if used
   f. Skin barrier
   g. Measuring guide, if needed
   h. Belt, if used
   i. Gloves, if pouch is to be changed by someone other than the student
   j. Tape, if needed
   k. Scissors, if needed
3. Explain the procedure using language the student can understand. Encourage the student to do as much of the procedure as is capable, so as to achieve maximum self- care skills.
4. Wash your hands with soap and water and put on a pair of gloves.
5. Empty contents of the old pouch into the toilet, bedpan, or other designated container (see previous procedure).
6. Starting at the outer top edge, use the dominant hand to carefully pull away the used pouch and skin barrier while pressing the skin downward from the bag with the non-dominant hand. Remove more by pushing the skin down than by pulling the bag off the skin.
7. **Save the clamp for reuse** (unless specified otherwise). Dispose of the used pouch in the appropriate receptacle.
8. Wash the peristomal area with water and a clean cloth or gauze or whatever is specified in the student's IHP. **Do not scrub**. (*Scrubbing can damage the stoma and cause bleeding.)*Use minimal pressure to prevent a prolapse of the stoma. Cover the stoma with gauze or tissue to prevent leakage. Make sure the skin around the stoma is clean and allow it to dry.
9. Examine the stoma for integrity (note whether it has come further out or moved further in) and any signs of necrosis. Assess the skin for redness, irritation, rash, bleeding, or breakdown.

   If there is any change in the stoma, notify the school nurse and/or family immediately. If there is skin irritation, follow guidelines in the student's IHP. Medications, ointments, or

adhesives are generally not used on the damaged skin because they make it more difficult for the pouch to stick. Skin irritation should be reported to the school nurse and/or family.

10. If a skin barrier is used that requires fitting, measure the stoma using a measuring guide or per the student's IHP. Cut the wafer-barrier and pouch to fit the stoma. Some wafer-barriers are single items, but many are attached to the pouch. Remove the paper from the wafer. Save the paper to use as a guide for cutting openings for future pouch changes (if the stoma size is stable).
11. If specified in the IHP, apply a ring of protective paste to the opening on the wafer barrier or apply around the stoma. Remove the used gauze/tissue from the stoma and discard in the appropriate receptacle.
12. If a one-piece wafer/pouch is used, remove the paper from the outer adhesive area of the pouch and apply the wafer/pouch over the stoma. If a two-piece setup is used, place the wafer barrier on the skin around the stoma, remove the backing from the pouch, and apply the pouch to the wafer and the skin. Some two piece systems require the pouches to be snapped together.
13. Firmly press the pouch and the skin barrier so there are no wrinkles and no leaks. Hold in place for 30-60 seconds.

    Body warmth will soften the rigid wafer and improve its adhesion to the skin

14. Use a clamp to seal the pouch. Make sure the bowed end of the clamp is next to the body.

    The bowedend conforms to the body providing a better fit and keeps the clamp from sticking out through clothing.

15. If a belt is used to fasten the pouch, attach it to the pouch.
16. Remove your gloves and wash your hands with soap and water.
17. Document in the student log that the procedure was done and the condition of the stoma and skin. Report to the school nurse and family any change in stoma, skin, or tolerance of the procedure.

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Possible Problems When Caring for a Student with a Colostomy

- **Odor**
  - Odor should not be detected when the student keeps the pouch closed. If there is an odor, check for a leak around the stoma or for a leak in the pouch itself. Do not make any pinholes in the pouch to release gas because doing so destroys the odor proof seal. Commercial deodorants are available if the family wants them.
- **Leakage**
  - Empty the pouch and do not allow it to get over 1/3 full before emptying. Check to see if there are any wrinkles or leaks and if the pouch is the proper size for the stoma. Reapply the pouch. Use a skin barrier paste, if ordered, to help form a seal.
- **Bleeding from stoma**
  - Stomas are rich in blood supply and may bleed slightly if irritated or rubbed. Be careful not to rub during cleaning or nick with a fingernail. Check to see if the opening of the pouch may be cutting or rubbing the stoma. If the bleeding does not stop quickly, apply gentle pressure and notify the school nurse and family. If a large area of the stoma appears to be bleeding, notify the family, school nurse, or health care provider.
- **Dark, dusky colored, or black stoma**
  - **Activate the emergency plan and notify the school nurse, family and/or health care provider immediately.** Integrity of the stoma may be compromised.
- **Irritation or skin breakdown around the stoma; discharge from the area; itching or burning under the pouch**
  - Make sure the pouch and skin barrier are sized correctly. If it is leaking or incorrectly sized, replace it with the proper sized pouch and barrier. Follow student-specific guidelines for skin care. Apply a protective paste between the barrier and the skin, if ordered. Check to see if the student is using any new ostomy products which could be causing an allergic reaction. Notify the school nurse, family, or health care provider.
- **Red rash; rash may extend beyond peristomal area**
  - The student may have a yeast infection. Clean and dry the skin carefully and notify the school nurse and the family. Keep the skin dry.
- **The stoma appears to have increased in size; part of the intestine is showing through the stoma, or the stoma sinks below the skin surface**
  - If the amount of intestinal tissue showing is more than usual, the stoma may be prolapsing (intestine being pushed out through the opening). The tissue may appear swollen, and the student may be experiencing cramping and vomiting. If the stoma sinks below skin level, it may be retracting. **Contact the school nurse, family, and/or health care provider immediately.**
- **Change in stool pattern**

- Assess recent diet history for changes. Assess for other signs of infection or illness such as fever or pain. If the student experiences a significant change in the number or consistency of stools, contact the family.

- **Pain and tenderness in the stoma or abdominal area, no output from the stoma for 4-5 hours, cramping, nausea and/or vomiting; watery green or ribbon-like output The intestine or stoma may be developing an obstruction. Notify the school nurse and family immediately.**
- **Student has body image concerns**

  Encourage the student to voice concerns. Discuss with the family as appropriate. Refer to the United Ostomy Association of America (http://www.uoaa.org/ or

  1-800-826-0826) or nearest enterostomal therapy nurse (wound ostomy certified nurse) for assistance. (Wound Ostomy and Continence Nurses 1-888-224-9626). Videos and brochures are available from UOAA and other organizations such as the Crohn's and Colitis Foundation of America.

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General Information for Students with Colostomies

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has a colostomy or opening into the large intestine to allow the body to eliminate stool. The opening, or stoma, is covered by a pouch that collects waste.

The student, if able, empties the pouch and cleans the stoma. This procedure occurs in the bathroom and the student should be allowed to go to the bathroom on an as-needed basis.

The student's privacy should be assured during this procedure, which may necessitate use of a private bathroom.

The student should be able to fully participate in physical education classes unless he or she has another condition that would interfere with full participation. It is very difficult to injure a stoma. The pouch should not come off during normal circumstances.

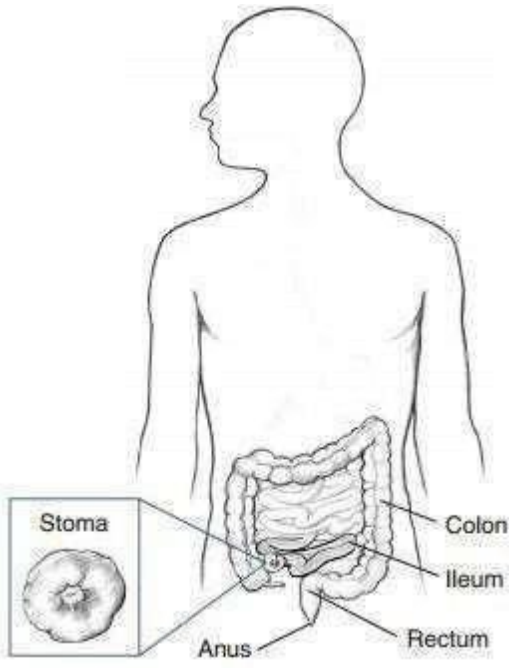
Contact_____at _____(phone number) for additional information or if the student experiences any problems with the colostomy.

Source: Adapted from: Porter, S., Haynie, M., Bierle, T., Caldwell, T.H., & Palfrey, J.S. (Eds.). (1997). *Children and youth assisted by medical technology in educational settings: Guidelines for care* (2nd ed.). Baltimore: Paul H. Brookes Publishing.

Ileostomy

Overview

An *ileostomy* is a surgically-created opening in the section of the small intestine called the *ileum* that is used to eliminate fecal material. A piece of the ileum is brought through the abdominal wall out to the skin surface of the abdomen and folded back onto itself to form a *stoma*. The stoma is red or dark pink in color and moist, much like the mucosal lining of the mouth. It is about the size of a quarter and is usually located in the lower right part of the abdomen near the beltline.



The discharge from an ileostomy is much looser and more liquefied than the fecal material from a colostomy because food is not completely digested until it passes through the colon where most water absorption takes place.

The discharge also contains digestive enzymes, which are very irritating and caustic to the skin. Ileostomies drain fairly constantly; with more after meals and less during the night. Some foods may pass through fairly intact without being digested very much.

A pouch is worn over the ileostomy to collect waste. Because the output from an ileostomy is so caustic, it is very important to have a proper fitting pouch and good skin care. Pouches for ileostomies sometimes protrude or use convex inserts to help the stoma protrude more to decrease the possibility of stool getting under the pouch. Pouch systems can be reusable or disposable, drainable or close-bottomed, and one-piece or two-piece. Pouches typically last 1-7 days. They protect the stoma, as well as the skin around the stoma (peristomal). Stomas are rich in blood supply and may bleed slightly if irritated or rubbed. Because the stoma itself does not have nerve endings, irritation of the stoma does not usually cause discomfort. However, the skin surrounding the stoma does have nerve endings and may be sensitive to manipulation of the stoma or to contact with any discharge from the stoma. Therefore, good skin care and a properly fitting pouch are essential to preventing irritation and breakdown at the stoma site. If the opening of the pouch is too large, it can expose the skin to fecal matter and moisture. If it is too tight or constrictive, it can cut or injure the stoma. A skin barrier is also usually applied around the stoma to protect it. The best time to change an ileostomy pouch is when the bowel is least active, usually 2-4 hours after meals.

Reasons to call the family and health care provider:

- no output from the ileostomy for 4-6 hours accompanied by cramping and nausea
- persistent nausea and vomiting
- cramps which last more than 2-3 hours
- watery discharge which last more than 5-6 hours
- deep cut in the stoma
- significant change in stoma size or color
- severe skin irritation or ulcers
- excessive bleeding from the stoma
- continuous bleeding where the stoma and skin join
- unusually strong odor--may indicate infection

Settings and Staff

The ileostomy pouch should be emptied whenever it is one-third to one-half full or if a leak occurs. The student's privacy must be ensured whether the student cares for the ostomy by him/herself or receives assistance. Pouch changes are routinely performed at home, but may need to be done at school if a leak occurs. A student should be able to participate in all school activities, including physical education.

Emptying and cleaning the pouch can be done by the student, the school nurse, or any adult trained in appropriate techniques and problem management of ostomies.

Application of the pouch is best done by a registered or licensed practical nurse if the student requires assistance, but can be done by a specially trained adult. School staff who have regular contact with a student with an ileostomy should receive general training covering the student's specific needs, potential problems, and implementation of the established emergency plan.

Individualized Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with a ileostomy, the following items should be considered:

- Underlying condition and possible problems associated with the condition or treatment
- Type of pouch and supplies
- Any doctor's orders for special care or procedures
- How often the pouch should be emptied

- The student's ability to provide self-care
- Access to a change of clothing at school
- Access to a private bathroom
- Stoma care—cleansing supplies and frequency; barrier supplies
- Stoma appearance and changes that require reporting
- Usual stool consistency, frequency, and amount
- Diet modification, if needed
- Latex allergy precautions
- Standard precautions

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Illustration Source:

National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2014). *Image Library*. NO1740. https://www.niddk.nih.gov/news/media-library

Procedure for Emptying an Ileostomy

1. Wash your hands with soap and water.
2. Assemble the equipment required for emptying the ileostomy listed below.

   Note: The family provides the equipment and the supplies. *Students should have a complete set of ostomy supplies at school with a spare pouch and clip/pouch closure.*

   a. Tissue, wet washcloth, paper towel, or wet wipe

   b. Toilet or container to dispose of wastes

   c. Gloves, if the pouch is to be emptied by someone other than the student

   d. Clean the pouch with a clip closure

   e. Extra pouch supplies

3. Explain the procedure using language the student can understand. Encourage the student to do as much of the procedure as is capable, so as to achieve maximum self- care skills.
4. Wash your hands again after assembling the equipment and put on a pair of gloves.
5. Empty when 1/3-1/2 full of stool or gas. If emptying into a toilet, place a piece of toilet paper in the toilet to prevent splashing.
6. Tilt the bottom of the pouch upward and remove the clamp.
7. Fold the bottom of the pouch up to form a cuff before emptying.

   Cuffing helps keep the bottom of the pouch clean during emptying.

8. Slowly unfold the end of the pouch and empty the contents of the pouch into the toilet or container.
9. Wipe the bottom of the pouch with a tissue, wet washcloth, paper towel, or wet wipe and unfold the cuff. Pouch deodorant can be applied, if specified in the student's IHP. Do not use oils or soap because they can weaken the pouch seal. Rinsing with water can also weaken the skin barrier seal and should be avoided.
10. Re-apply the clamp closure.
11. Flatus can be released through the gas release valve, if the pouch has one. If there is no valve, flatus can be expelled by tilting the bottom of the pouch upward, releasing the clamp, and expelling the flatus. Re-apply the clamp.
12. Flush wastes in the toilet.

13. Remove your gloves and wash your hands with soap and water. Wash the student's hands if they assist.
14. Report any change in the student’s usual pattern to the school nurse and family.
15. Document the actions and observations.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 519-525.

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Procedure for Changing an Ileostomy Pouch

1. Wash your hands with soap and water.
2. Assemble the equipment required for changing the ileostomy pouch listed below:

   Note: The family provides the equipment and the supplies. *Students should have a complete set of ostomy supplies at school with a spare pouch and clip/pouch closure. Routine pouch changes should be performed at home.*

   a. Water
   b. Skin cleanser
   c. Soft cloth or gauze or tissues
   d. Clean pouch with a clip closure
   e. Protective paste or powder, if used
   f. Skin barrier
   g. Measuring guide, if needed
   h. Belt, if used
   i. Gloves, if the pouch is to be changed by someone other than the student
   j. Tape, if needed
   k. Scissors, if needed
3. Explain the procedure using language the student can understand. Encourage the student to do as much of the procedure as is capable, so as to achieve maximum self- care skills.
4. Wash your hands and put on a pair of gloves.
5. Empty contents of the old pouch into the toilet, bedpan, or other designated container. Placing a piece of toilet paper in the toilet before emptying can help to prevent splashing.
6. Starting at the outer top edge, press the skin downward from the bag with the non-dominant hand while carefully removing the used pouch with the dominant hand.
7. **Save the clamp for reuse** (unless specified otherwise). Dispose of the used pouch in the appropriate receptacle.
8. Wash the peristomal area with water and a clean cloth or gauze or whatever is specified in the student's IHP. Do not use baby wipes on the skin because they can leave a film on the skin and prevent a good seal. **Do not scrub**. Use minimal pressure to prevent a

prolapse of the stoma. Cover the stoma with gauze or tissue to prevent leakage. Make sure the skin around the stoma is clean and allow it to dry.

Scrubbing can damage the stoma and cause bleeding.

9. Examine the stoma for integrity (whether it has come further out or moved further in) and any signs of necrosis. Assess the skin for redness, irritation, rash, bleeding, or breakdown.

   If there is any change in the stoma, notify the school nurse and/or family immediately*. If there is skin irritation, follow guidelines in the student's IHP. Medications, ointments, or adhesives are generally not used on the damaged skin because they make it more difficult for the pouch to stick. Skin irritation should be reported to the school nurse and/or family.*

10. If a skin barrier is used that requires fitting, measure the stoma using a measuring guide or per the student's IHP. Cut the wafer-barrier to fit the stoma. Be careful not to puncture the pouch. Some wafer-barriers are single items, but many are attached to the pouch. Remove the paper from the wafer. Save the paper to use as a guide for cutting openings for future pouch changes (if the stoma size is stable).

11. If specified, apply a ring of protective paste to the opening on the wafer barrier or apply around the stoma. Remove the used gauze/tissue from the stoma and discard in the appropriate receptacle.

12. If a one-piece wafer/pouch is used, remove the paper from the outer adhesive area of the pouch and apply the wafer/pouch over the stoma. If a two-piece setup is used, place the wafer barrier on the skin around the stoma, remove the backing from the pouch, and apply the pouch to the wafer and the skin. Some two piece systems require pouches to be snapped together.

13. Firmly press the pouch and skin barrier so there are no wrinkles and no leaks. Hold in place for 30-60 seconds.

    Body warmth will soften rigid wafers and improve adhesion to the skin.

14. Use the clamp to seal the pouch. Make sure the bowed end of the clamp is next to the body.

    The bowed end conforms to the body providing a better fit and keeps the clamp from sticking out through clothing.

15. If a belt is used to fasten the pouch, attach to the pouch.

16. Remove your gloves and wash your hands with soap and water.

17. Document in the student log that the procedure was done and the condition of the stoma and skin. Report to the school nurse and family any change in stoma, skin, or tolerance of the procedure.

Sources:

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Possible Problems When Caring for a Student with An Ileostomy Pouch

- **Odor**
    - Odor should not be detected when the student keeps the pouch closed. If there is an odor, check for a leak around the stoma or for a leak in the pouch itself. Do not make any pinholes in the pouch to release gas because doing so destroys the odor proof seal. Commercial deodorants are available if the family wants them.
- **Leakage**
    - Empty the pouch and do not allow it to get over 1/3 full before emptying. Check to see if there are any wrinkles or leaks and if the pouch is the proper size for the stoma. Reapply the pouch. Use a skin barrier paste, if ordered, to help form a seal.
- **Bleeding from stoma**
    - Stomas are rich in blood supply and may bleed slightly if irritated or rubbed. Be careful not to rub during cleaning or nick with a fingernail. Check to see if the opening of the pouch may be cutting or rubbing the stoma. If the bleeding does not stop quickly, apply gentle pressure and notify the family. If a large area of the stoma appears to be bleeding, notify the family, school nurse, or health care provider.
- **Dark, dusky colored, or black stoma**
    - **Activate the emergency plan and notify the family and/or health care provider immediately.** Integrity of the stoma may be compromised.
- **Irritation or skin breakdown around the stoma; discharge from area; itching or burning under the pouch**
    - Make sure the pouch and skin barrier are sized correctly. If leaking or incorrectly sized, replace it with the proper sized pouch and barrier. Follow student-specific guidelines for skin care. Apply protective paste between the barrier and the skin, if ordered. Check to see if the student is using any new ostomy products which could be causing an allergic reaction. Notify the school nurse, family, or health care provider.
- **Red rash; rash may extend beyond peristomal area**
    - The student may have a yeast infection. Clean and dry the skin carefully and notify the school nurse and the family. Keep the skin dry.
- **Stoma appears to increase in size; part of the intestine is showing through the stoma, or the stoma sinks below the skin surface**

- If the amount of intestinal tissue showing is more than usual, the stoma may be prolapsing (intestine being pushed out through the opening). The tissue may appear swollen, and the student may experience cramping and vomiting. If the stoma sinks below skin level, it may be retracting. **Contact the school nurse, family, and/or health care provider immediately.**

- **Change in stool pattern**
  - Assess recent diet history for changes. Assess for other signs of infection or illness such as fever or pain. If the student experiences a significant change in the number or consistency of stools, contact the family.

- **Pain and tenderness in the stoma or abdominal area, no output from the stoma for 4-5 hours, cramping, nausea and/or vomiting; watery green or ribbon-like output**. The intestine or stoma may be developing an obstruction. **Notify the school nurse and family immediately.**

- **Student has body image concerns**
  - Encourage the student to voice concerns. Discuss with the family as appropriate. Refer to the United Ostomy Association of America (https://www.ostomy.org/ or 1-800-826-0826) or nearest enterostomal therapy nurse (wound ostomy certified nurse) for assistance. (Wound Ostomy and Continence Nurses 1-888-224-9626).
  - Videos and brochures are available from UOAA and other organizations such as the Crohn's and Colitis Foundation of America.

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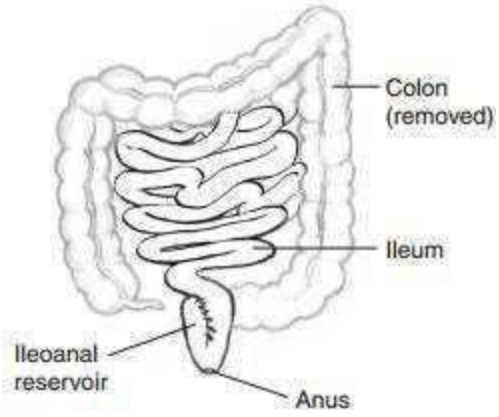
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Ileoanal Reservoir and Continent Ileostomy

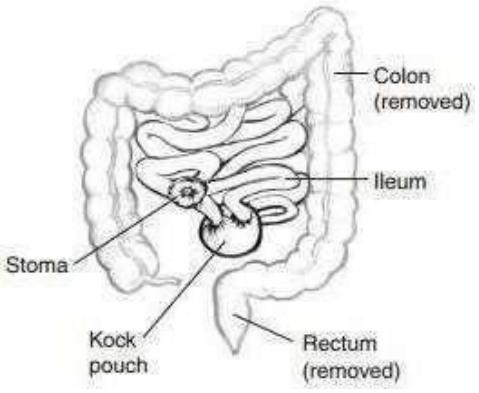
Ileoanal Reservoir

An *ileoanal reservoir* is a surgically-created internal pouch made from the end of the ileum. This surgery is an alternative to an ileostomy and does not require wearing an external pouch. After removing the colon, the surgeon creates an internal pouch and connects this to the anus. Also known as a J-pouch (for its shape), the ileoanal reservoir collects the stool until it is ready to exit the body through the anus during a bowel movement. The sphincter muscle around the anus must be intact to keep the pouch from leaking. It is most often used for students who have ulcerative colitis or familial adenomatous polyposis and need to have their colons removed.



Continent Ileostomy

A *continent ileostomy* also allows the student not to have to wear an external pouch. After removal of the colon, an internal pouch, sometimes called a Kock pouch is created from the end of the ileum and is brought to the surface of the abdomen. The surgeon makes a valve inside the pouch so the intestinal contents do not flow out. The pouch can be drained by inserting a thin catheter or drain through the stoma 4-6 times a day. The stoma is covered by a patch or dressing between drainings. Due to the delicate nature of this surgery, it is no longer performed very often but may be used when a person does not have an intact, functioning anus.



Sources:

National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2014). *Ostomy surgery of the bowel.* NIH Publication No. 14-4641.

United Ostomy Associations of America. (2011). *Ileoanal reservoir guide*. https://www.ostomy.org/

General Information for Students with Ileostomies

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has an ileostomy, or opening into the small intestine to allow the body to eliminate stool. The opening, or stoma, is covered by a pouch that collects stool.

The student usually empties the pouch and cleans the stoma. This procedure occurs in the bathroom and the student should be allowed to go to the bathroom on an as needed basis.

The student's privacy should be assured during this procedure, which may necessitate use of a private bathroom.

The student should be able to fully participate in physical education classes unless he or she has another condition that would interfere with full participation. It is very difficult to injure a stoma. The pouch should not come off during normal circumstances.

Contact_____ _____at_____(phone number) for additional information or if the student experiences any problems with the ileostomy.

Source: Adapted from: Porter, S., Haynie, M., Bierle, T., Caldwell, T.H., & Palfrey, J.S. (Eds.). (1997). *Children and youth assisted by medical technology in educational settings: Guidelines for care* (2nd ed.). Baltimore: Paul H. Brookes Publishing.

Supplemental Resource:

OSTOMY 101

Provided by United Ostomy Associations of America

UOAA United Ostomy Associations of America, Inc.

WHAT IS AN OSTOMY?



AN OSTOMY causes a change in the way urine or stool exits the body as a result of a surgical procedure. Bodily waste is rerouted from its usual path because of malfunctioning parts of the urinary or digestive system. They can be temporary or permanent.

A STOMA is the opening created by ostomy surgery. It is located on the abdomen and is dark pink in color. For most ostomies, a pouch is worn over the stoma to collect stool or urine. For some people it is possible to have a continent diversion, which is a procedure that avoids having to wear a pouch, as an alternative to a conventional ostomy.



OSTOMIES ARE PROSTHETICS



Persons living with an ostomy in the U.S.

WHAT ARE THE DIFFERENT TYPES?



A **colostomy** diverts stool from the colon.



An **ileostomy** diverts stool from the small intestines.



A **urostomy** diverts urine when the bladder has been removed or bypassed.

DID YOU KNOW...?

You'd likely never know if you met a person with an ostomy.



Babies, kids and adults have ostomies.

Approximately **100,000** ostomy surgeries are performed annually in the United States.



People with ostomies live full & meaningful lives that include swimming, working, playing sports & having relationships.

OSTOMIES **SAVE LIVES.**

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WHY DOES A PERSON **NEED OR CHOOSE** AN OSTOMY?

COMMON REASONS FOR A COLOSTOMY:

- Diverticulitis causing rupture
- Inflammatory Bowel Disease
- Birth Defects
- Cancers
- Bowel obstruction
- Injury

COMMON REASONS FOR AN ILEOSTOMY:

- Inflammatory Bowel Disease
- Familial adenomatous
- Birth Defects
- polyposis
- Cancers

COMMON REASONS FOR A UROSTOMY:

- Cancer *(particularly of the bladder)*
- Birth defects
- Bladder diseases or injuries

OSTOMY.ORG

Advocates for a Positive Change

Available Online: https://www.ostomy.org

Chapter 4: Care of the Musculoskeletal System and Mobility Care

Overview

Physical Mobility Assistance

Positioning a Student

Assisting with a Cane

Assisting with Crutches

Assisting with a Walker

Assisting with a Wheelchair

Assisting with a Prosthesis

Assisting with an Orthosis

Cast Care

Principles of Good Body Mechanics

Musculoskeletal System and Mobility Care

Overview

Movement of the body is dependent on the proper functioning of the musculoskeletal and nervous systems. If any body part is altered or injured, the result can be a loss or change in the body's ability to move. Mobility impacts how a student can access the educational environment, and therefore, assessment and support of mobility is an important issue for school nurses and all educational personnel remove the phrase "who work with children".

Body positioning is an important consideration in maintaining optimal functioning. Not only does it impact mobility and access to education, it can reduce muscle tension, which can affect pain and the ability to concentrate on academics. Collaboration between the school nurse, health care provider, teachers, physical therapists, and occupational therapists can help determine the most appropriate positioning and assistive devices for students with special musculoskeletal needs.

Muscle movement and functioning may be altered by a number of causes. Injuries to an extremity can cause permanent or temporary loss of function. Damage to a portion of a student's brain may result in an interruption in the transmission of impulses to the muscles and loss of the muscles' ability to function. In addition, muscles may lose their ability to contract because of disease or deterioration due to a decrease in the number of nerves acting upon them. They may also lose function due to lack of use.

Routine daily activities help keep muscles loose and pliable by maintaining range of motion in the joints and related muscles. If movement is less frequent and limited, the muscles become less pliable and shortened. The shortened muscles can pull the joint into an abnormal position, creating a contracture. Contractures cause greater effort for movement, increased wear on the joints, and further decreased range of motion. Loss of normal muscle movement can make bones porous and soft.

Adaptive equipment (desk, chairs, feeding equipment) and frequent movement can be used in assisting the student to maintain optimal function in the school environment. Activities in the classroom, cafeteria, and physical education program may need to be modified to meet the student's needs. All adaptive equipment and assistive devices, owned by the school division, should be checked for proper condition and function on a frequent basis per school division policy to ensure the safety of the student. Frequent use can cause wear and tear over time and lead to accidents or injuries. Devices that belong to the student and brought to school should be properly labeled. If maintenance or operational issues are identified, the parent or guardian should be notified before further use.

Sources:

Cleveland Clinic. (n.d.). *Musculoskeletal System.* https://my.clevelandclinic.org

Cleveland Clinic. (n.d.). *Nervous System.* https://my.clevelandclinic.org/health/articles/21202-nervous-system

Selekman, J. (2013). *School nursing: A comprehensive text*. (2nd ed.). Philadelphia: F.A. Davis, 1044-1045.

Physical Mobility Assistance

Overview

The purpose of the following procedures is to help the student who requires physical mobility assistance to maintain good range of motion, good muscle length, and as much independence as possible in normal daily activities. Mobility is important to students' growth and development. Inactivity can lead to a decrease in the functional capabilities of body systems and ability of students to access their educational plan. The major consequences of impaired mobility are loss of muscle strength and endurance, bone demineralization, loss of joint mobility and contractures, increased workload on the heart, pooling of blood in the extremities, shallow respirations, decreased basal metabolic rate, decreased gastrointestinal motility, and nerve degeneration. Decreased mobility can also have a profound effect on children's development of independence, creativity, and sense of mastery. It is important to encourage students to be as active as their conditions allow.

Settings and Staff

Students who need physical mobility assistance participate in regular school activities with modifications that should be determined by the family, health care provider, physical therapist, occupational therapist, school nurse, and school staff. Staff who have contact with the student should be familiar with how to assist the student with movement and positioning.

Support of the student who requires assistive devices for ambulation can be administered by the school nurse, physical therapist, occupational therapist, family, instructional aide, or other staff person who has general training in the assistive device of the student.

General training should cover the student's specific health care needs, use of assistive devices, potential problems, appropriate lifting procedures and how to get help should problems occur.

Individualized Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student who requires assistance with mobility, the following items should be considered:

- Student's underlying condition and possible problems associated with the condition
- Student's baseline status (including skin condition, level of mobility)
- Health Care Provider's orders for mobility devices and mobility support
- Type of physical mobility assistance student requires
- Reason student requires the physical mobility assistance
- Care and use of any assistive device
- When assistive device is to be used
- Transportation needs and plans

- Standard Precautions

Sources:

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children.* (10th ed.). St. Louis: Elsevier Mosby, 1547-1556.

Selekman, J. (2013). *School nursing: A comprehensive text*. (2nd ed.). Philadelphia: F.A. Davis, 1044-1045.

Smith, S., Duell, D. & Martin, B. (2012). *Clinical nursing skills: Basic to advanced skills* (8th ed.). Boston: Pearson, 335-337.

Procedure for Positioning a Student

1. Review the health care provider's orders and the student's individualized health care plan.
2. Explain the procedure to the student at his/her level of understanding. Encourage the student to participate as much as possible.
3. Wash your hands with soap and water.
4. Assemble equipment for positioning of the student. Know how the equipment works before using it with the student. Equipment varies with students and position. Talk with the family to determine which equipment is used at home.
5. Have assistance available as needed to ensure the safety of the student and staff. The degree of assistance depends on the student's size, how much the student can assist with the procedure, and the size and physical ability of the staff person.
6. **Follow the principles of good body mechanics when lifting or moving the student.** Good body mechanics can help prevent back injury.
7. Change the student's position as needed or as specified. Change position frequently, unless contraindicated, to prevent dependent edema and to stimulate circulation. **Positioning should be individualized for each student.**
8. The following guidelines are for positioning a student who does not have musculoskeletal abnormalities such as a dislocated hip. The guidelines may not be appropriate for all students. These guidelines should only be used after consulting the student's health care provider, physical therapist, school nurse, or other persons who are knowledgeable about the student's condition.

Position	Action
Supine Position (on back)	
Head is in alignment with the spine, both laterally, and front to back.	*Place the pillow under the head, so that it reaches under the shoulders.*
Position the trunk so that hip flexion is minimized.	*Place a small pillow under the small of the back, if comfortable.*
Slightly flex the arms at the elbow.	*Position the arms comfortably at the student's side with the hands open. Use a handroll if necessary.*

Position	Action
Extend the legs in a neutral position with the toes pointed to the ceiling.	*Support the feet with a vertical support, so that the student can brace his/her feet to keep them upright.*
Suspend the heels in the space between the cot and footboard.	*Place a small pillow under the ankles to prevent pressure on the heels.*
Place hip rolls under the greater trochanter (hip) in the area of the hip joint and upper thigh.	*Place small pillows or rolled towels by the hips and upper thigh to prevent the legs from turning outward.*
Lateral Position (on side)	
Align the head with the spine.	*Place a pillow under the head.*
Align the body so that it is not twisted.	*Place a pillow lengthwise at the back, anchor the pillow by pushing a pillowcase edge under the student's back. Fold the outer side of the pillow under and tuck it against the student for added support.*
Support a slight hip abduction by positioning the hip slightly forward.	*Flex the hip and knee of the upper leg, bringing the upper leg forward so that it doesn't rest on the lower leg. Position the pillow lengthwise under the upper leg supporting the entire leg including the foot and ankle.*
Flex the arm at the elbow and shoulder joint.	*Position the lower arm in a comfortable position. Place the upper arm and hand on a pillow with the elbow and shoulder flexed. Use a hand roll if necessary.*
Prone (on stomach)	
Turn the head laterally and align with the body.	*Turn the head to the side and place on a small flat pillow if necessary.*
Abduct the arms (slightly away from body) and externally rotate at the shoulder joint. Flex the elbows.	*Place the arms at the student's side, using handrolls if necessary. Place small foam pads or pillows as needed under the shoulders.*

Position	Action
Place a small flat support under pelvis at level of the umbilicus and extending to the upper third of the thigh.	*Place a flat pillow under the abdomen to align the spine and help with breathing (unless the individual is obese or the abdomen protrudes).*
Place the lower extremities in a neutral position.	*Extend the legs in a comfortable position.*
Suspend the toes over the edge of the cot.	*Either position the student so that the toes extend over the end of the cot or place a pillow under the ankles so the toes do not touch or rub against the cot.*

9. Inspect the skin surfaces regularly for signs of irritation, redness, or evidence of pressure.
10. Make sure the student is safe and comfortable.
11. Wash your hands with soap and water.
12. Clean and store the equipment as needed.
13. Document the change of position in the student's log. Report any changes from the student's usual pattern to the school nurse and family.

Sources:

Smith, S., Duell, D. & Martin, B. (2012). *Clinical nursing skills: Basic to advanced skills (8th ed.)*. Boston: Pearson, 348-353.

Wisconsin Improving School Health Services Project. (2015). *Transfer procedures*

Procedure for Assisting Student with a Cane

Note: Equipment and supplies are provided by families.

1. Review the health care provider's orders and the student's individualized health care plan.
2. Verify if the student will be using 1 or 2 canes and the type of cane used:
    a. Straight-legged or standard cane
    b. Tripod or three-pronged cane
    c. Quad cane
3. Explain the procedure to the student at his/her level of understanding. Encourage the student to participate as much as possible.
4. Check the fit of the cane for the student's height. With the student standing with his/her elbow flexed at a 20 or 30-degree angle, place the cane tip 6 inches to the side of the little toe. The handle should be approximately level with the greater trochanter (hip).
5. Make sure that the cane has the student's name on it.
6. Teach and/or reinforce the student's gait:
    a. Hold the cane on the stronger (unaffected) side. This offers the most support.
    b. Keep the cane close to the body to avoid leaning on it.
    c. Advance the cane 4 inches in front of the body and move the weaker leg even with the cane.
    d. Shift weight to the affected leg and cane and move the unaffected leg ahead of the cane.

During teaching, accompany the student by walking on the unaffected side.

If the student is unable to hold the cane with the hand opposite the weak leg, he/she can hold the cane on the same side as the weak leg and advance both the cane and the weak leg together.

7. Teach stair climbing:
    a. Upstairs: Advance the unaffected leg up to the next step; followed by the cane; followed by the weaker leg.
    b. Downstairs: Place the cane and weaker leg on the next lower step, and then step down with the unaffected leg.

8. Arrange for the student to use the elevator. Use of the elevator decreases the possibility of injury to the student or others on the stairs. If an elevator is not available, the student may need all of his/her classes on the ground floor.
9. Arrange transportation as needed for fire drills and emergency evacuations. Elevators are not available during fire drills. Prearrange an evacuation plan for the student **prior** to fire drills or emergencies.
10. Safety tips:
    a. Make sure rubber cane tips are in good repair. Tips should be wide, provide good suction, and be replaced promptly if worn. Check that screws and nuts are tight.
    b. Designate a place in the classroom for the cane. The Cane should be kept next to the student in the classroom if possible but placed so that it is not a safety hazard for others.
    c. Encourage the student to keep his/her hands free to handle the cane. The student should be encouraged to carry possessions in a light backpack or have another person carry the possessions.
    d. If necessary, arrange for the student to leave each class 5 minutes early. Leaving early allows the student to be out of the hall during regular changing of classes.
11. Document teaching and the student's ability to walk with a cane.

Sources:

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children. (10th ed.)*. St. Louis: Elsevier Mosby, 1565-1566.

Selekman, J. (2013). *School nursing: A comprehensive text. (2nd ed.)*. Philadelphia: F.A. Davis, 1044-1045.

Smith, S., Duell, D. & Martin, B. (2012). *Clinical nursing skills: Basic to advanced skills (8th ed.)*. Boston: Pearson, 388-390.

Wilkinson, J.M., Treas, L.S., Barnett, K.L., & Smith, M.H. (2016). *Fundamentals of nursing: Vol. 2: Thinking, doing, and caring.* Philadelphia: F.A.Davis, 639-640.

Procedure for Assisting a Student with Crutches

Note: Equipment and supplies are provided by families.

Crutches are one type of mobility device used when students cannot bear weight while walking, can only bear partial weight, or need support for balance while wearing braces. There are several different types of crutches and making the appropriate selection depends on the student's needs. Forearm crutches and trough crutches are most frequently used by students with varying degrees of paralysis who use them long term with braces for support in walking. A newer type of crutch is the leg support crutch or knee walker/knee scooter crutch. This "crutch" works best for injuries to the ankle or lower leg and looks much like a scooter with a seat for the affected leg. The most common type of crutch is the axillary swing-through crutch and the instructions below are primarily for this type of crutch.

1. Review the health care provider's orders and the student's individualized health care plan.
2. Explain the procedure to the student at his/her level of understanding. Emphasize safety. Encourage the student to participate as much as possible.
3. Encourage the student to wear non-skid, hard-soled, low-heeled shoes.
4. Check the crutches for the appropriate length while the student is standing erect. Place the crutch tip 6 inches in front of the student and 4-6 inches to the side (tripod position). The arm-piece of the axillary crutch should be 2-3 finger widths f below the axilla.
5. Check the handpiece. The handpiece should allow a 20-30 degree flexion of the elbow when the arm piece is 2-3 finger-widths below the axilla.
6. Use axillary arm pads. Teach the student to place body weight on the palms, never on the axilla.
7. Check to make sure the crutches have intact rubber tips on the bottom for stability.
8. Make sure that the crutches have the student's name on them.
9. Verify that the student is using the gait prescribed by the health care provider.
10. Crutch Gaits:
    a. <u>2-Point Gait</u>
        i. Advance the right crutch and left foot together; then the left crutch and right foot together.
        ii. 2-Point Gait requires at least partial weight bearing on each foot, and requires more balance than 4-Point Gait.
    b. <u>3-Point Gait</u>

i. Balance body weight on the crutches. Advance both crutches and the weaker extremity at the same time; then advance the stronger extremity.

ii. This gait requires strength and balance because the arms must support all the body's weight. It also requires bearing all of the weight on one foot. Useful when a student cannot bear weight on one foot or when the student has only one leg.

c. 4-Point Gait

i. Advance right crutch; then left foot; then left crutch; then right foot.

ii. This gait is used by a student can move each leg separately and can bear some weight on each foot.

d. Swing-To & Swing-Through Gait

i. Swing-to gait: advance both crutches forward; swing body to a position even with the crutches.

ii. Swing-through gait: advance both crutches forward; swing body past crutches; bring crutches in front of body.

iii. These gaits are usually used when a student's lower extremities are paralyzed or a student uses braces.

11. Teach the student how to stand:

a. Hold both crutches together in the hand on the affected side

b. Push down on a stable support base with the free hand; put weight on the stronger leg; lift the body

c. Stand with a back straight; bear weight on the unaffected leg and the crutches

d. Place both crutches on same level as feet

e. Advance unaffected leg while bearing down on crutches

f. Pull the affected leg and crutches while bearing weight on the unaffected leg

12. Teach student how to sit:

a. Make sure the chair is stationary or braced against a wall. Stand in front of the chair, facing forward.

b. Place the unaffected leg against the chair.

c. Hold the crutches together in the hand on the affected side.

i. Keep the student's back straight and gently ease down supporting weight on the crutches and unaffected leg

ii. When almost seated, gently hold on to the arm of the chair and complete the movement

13. Teach walking upstairs:

i. Place the crutches on same level as the student's feet

ii. Shift weight to the crutches and advance unaffected leg to the next step

iii. Shift weight to the unaffected leg and lift the affected leg and crutches up to the step

14. Teach walking downstairs:

i. Place both crutches on the same level as feet

ii. Shift weight to the unaffected leg

iii. Lower crutches to the next step

iv. Shift body weight to the crutches and transfer the unaffected leg to step with the crutches

15. Arrange for the student to use the elevator. Use of the elevator decreases the possibility of injury to the student or others on the stairs. If an elevator is not available, the student may need all of his/her classes on the ground floor.

16. Arrange transportation as needed for fire drills and emergency evacuations. Prearrange evacuation plans and make sure both the student and staff are aware of them. Elevators are not available during fire drills.

17. Safety tips:

a. Make sure the rubber tips are in good repair. Tips should be wide, provide good suction, and be replaced promptly if worn.

b. Make sure the screws and nuts are tight.

c. Designate a place in the classroom for the crutches. (The crutches should be kept next to the student in the classroom if possible but placed so that they are not a safety hazard for others).

d. Encourage the student to keep their hands free to handle the crutches. The student should carry possessions in a lightweight backpack or have another person help carry the student's possessions.

e. It is usually beneficial to arrange for the student to leave each class 5 minutes early to be out of the hall during regular changing of classes.

f. Use the elevator instead of stair walking whenever possible to decrease risk of accidents.

18. Document teaching and the student's ability to walk with the crutches.

Sources:

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children. (10th ed.)*. St. Louis: Elsevier Mosby, 1565-1566.

Selekman, J. (2013). *School nursing: A comprehensive text*. (2nd ed.). Philadelphia: F.A. Davis, 1044-1045.

Smith, S., Duell, D. & Martin, B. (2012). *Clinical nursing skills: Basic to advanced skills* (8th ed.). Boston: Pearson, 391-397.

Wilkinson, J.M., Treas, L.S., Barnett, K.L., & Smith, M.H. (2016). *Fundamentals of nursing: Vol. 2: Thinking, doing, and caring.* Philadelphia: F.A.Davis, 639-640.

Procedure for Assisting a Student with a Walker

Note: Equipment and supplies are provided by families.

1. Review the health care provider's orders and the student's individualized health care plan.
2. Explain the procedure to the student at his/her level of understanding. Encourage the student to participate as much as possible.
3. Check the fit of the walker for the student's height. With the student standing erect and in line with the rear legs of the walker, the student's elbows should be flexed at a 20-30 degree angle when his/her hands are on the grips. A newer type of walker is a "knee walker" which can be used in place of crutches for a lower leg or ankle injury. It looks much like a scooter with a seat for the affected leg.
4. Make sure the walker has the student's name on it.
5. Teach and/or reinforce the gait:
    a. Use the arms to move the walker forward 6-8 inches without flexing the trunk forward. (If the walker does not have wheels, it should be picked up instead of sliding it).
    b. Move the weaker leg first while bearing weight on the walker.
    c. Move the stronger leg forward to be even with the first.
    d. The student's body should not come into contact with the crossbar.
6. Do not allow the student to use the walker on the stairs or inclines.
7. Arrange for the student to use the elevator.
8. Arrange transportation as needed for fire drills and emergency evacuations. Prearrange evacuation plans and make sure both the student and staff are aware of them.
9. Safety tips:
    a. Make sure the rubber tips are in good repair. Tips should be wide, provide good suction, and be replaced promptly if worn.
    b. Make sure the screws and nuts are tight.
    c. Designate a place in the classroom for the walker. Walkers should be kept next to the student in the classroom if possible but placed so it is not a safety hazard for others
    d. Encourage the student to keep their hands free to handle the walker. The student should carry possessions in a lightweight backpack or have another person help carry

the student's possessions. Do not hang book bags or other items from the walker because it may make the walker too heavy to move safely.

e. If necessary, arrange for the student to leave each class 5 minutes early to be out of the hall during regular changing of classes.

10. Document teaching and the student's ability to walk with a walker.

Sources:

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children. (10th ed.)*. St. Louis: Elsevier Mosby, 1565-1566.

Selekman, J. (2013). *School nursing: A comprehensive text*. (2nd ed.). Philadelphia: F.A. Davis, 1044-1045.

Smith, S., Duell, D. & Martin, B. (2012). *Clinical nursing skills: Basic to advanced skills* (8th ed.). Boston: Pearson, 391-397.

Wilkinson, J.M., Treas, L.S., Barnett, K.L., & Smith, M.H. (2016). *Fundamentals of nursing: Vol. 2: Thinking, doing, and caring.* Philadelphia: F.A.Davis, 639-640.

Procedure for Assisting a Student with a Wheelchair

Note: Equipment and supplies are provided by families.

1. Assess the need for assistance with a wheelchair at school. Review the health care provider's orders and student's individualized health care plan.
2. Explain the procedure to the student at his/her level of understanding. Encourage the student to participate as much as possible.
3. Obtain a consultation with a physical therapist, if needed. The physical therapist can assist and facilitate implementation of the health care provider's orders for a wheelchair and can make recommendations regarding accessibility. Communicate with the family throughout the process and obtain consent.
4. Verify that everywhere the student needs to go in the school is fully wheelchair accessible. Provide the student with precautions regarding the most accessible routes.
5. Teach and assist the student to monitor for skin irritations and pressure areas. Students with compromised sensation may have pressure relief cushions or adaptations. Monitor for rubbing and skin irritation as the student grows.
6. Teach and assist the student to move from a surface the height of the wheelchair seat to the wheelchair:
    a. Position the wheelchair towards the student's strongest side at a 45-degree angle to the transfer seat. Lock the wheels.
    b. Move the student to the edge of the transfer seat. Allow the student to assist as much as possible.
    c. Standing in front of the student, place your arms under the student's axilla or around the student's back.
    d. Rock the student and, on a count of three, pivot the student into the wheelchair.
    e. Position the student in the wheelchair to minimize pressure areas.
    f. Remain in front of the student to assess stability. Allow the student to sit for 2 minutes. Observe for dizziness relating to orthostatic hypotension. Do not leave the student until he/she is stable. A safety belt (gait belt) can be used with larger students. Smaller students may be moved more easily by putting one arm under the student's knees and the other supporting the neck/back while lifting from the transfer seat to the wheelchair. Maintain good body mechanics when doing any lifting.

7. Teach and assist the student to move to a standing position as appropriate:
    a. Lock wheelchair wheels.
    b. Make sure the student can bear weight. Allow the student to help as much as possible.
    c. Instruct the student to move to the edge of the cot or chair with hands on the chair arms or cot edge.
    d. Place one knee between the student's knees, if the student has a weak knee, brace it with your knee.
    e. Instruct the student to put the stronger foot slightly under him.
    f. Bend the knees, lean slightly forward, and place the arms around the student's waist. Grasp a strong belt around the student's waist. Stand close to the cot with feet shoulder-width apart for a broad base of support.
    g. Instruct the student to push down with his/her arms, lean forward, and stand up on the count of three.
    h. Hold the student closely.
    i. On count of three, rock weight to the back foot bringing the student forward to a standing position.

       Use a cue that both you and the student can understand.
    j. Instruct the student to lock his/her knees.
    k. Allow time for the student to balance him/herself, then pivot the student slowly until he/she is seated in the chair.
8. Teach and assist the student to move from a standing to a sitting position:
    a. Lock wheelchair wheels.
    b. Allow the student to assist as much as possible.
    c. Remind the student to feel the back of the chair with his/her legs.
    d. Instruct the student to reach back for the chair's arms.
    e. Hold the student at the waist by grasping a strong belt.
    f. Shift weight to the forward leg and guide the student as he/she bends their knees and sits in the chair.
    g. Make sure the student is safe and secure.

Use a seatbelt or harness as needed.

9. Recharge batteries on motorized chairs or scooters each day according to the manufacturer's battery directions.
10. Arrange for the student to use the elevator.

    Use of the elevator decreases the possibility of injury to the student or others. If an elevator is not available, the student may need all of his/her classes on the ground floor.

11. Arrange transportation as needed for fire drills and emergency evacuations. Prearrange evacuation plans and make sure both the student and staff are aware of them.

    Elevators are not available during fire drills.

12. Assess transportation of the student and wheelchair between home and school.

    Whenever possible, the student should be transferred from a wheelchair to an appropriate federally- approved child/occupant restraint system when being transported. If transportation in a wheelchair is necessary, the student should be transported facing forward and only in vehicles that can be adapted to secure a wheelchair. Ones using a lap and shoulder belt that can be secured to the vehicle and a 4-point strap tie down system are preferable. Vehicle drivers, teachers, aides, nurses, and monitors should be able to demonstrate the ability to correctly use whatever restraint system is used and know what to do in an emergency.

13. Wheelchair safety tips:

    a. Check the rear wheels for movement when the brakes are locked.

       Brakes need to be repaired when they are ineffective or out of alignment. (Note: Routine maintenance should be performed at home.)

    b. Make sure the seatbelt is fastened.

    c. Feet should be on footrests.

    d. Arms and legs should be inside the chair when passing through a doorway.

    e. Always lock brakes when the wheelchair is stopped, even if it is empty.

    f. Push at a walking speed. Hold on to the wheelchair when pushing it.

       Extra caution should be taken on gravel or uneven surfaces because the front wheels could become stuck and the wheelchair might tip over.

    g. Back the wheelchair down ramps and curbs.

       Both wheels should go over the curb together so the chair does not tip.

h. Push the wheelchair forward going up ramps and curbs.

Tip chair back so that the front wheels clear the curb. After clearing, put the front wheels down on the surface and lift the back wheels over the curb.

i. Never tilt the chair far back, turn sharply, or stop rapidly.

14. If necessary, arrange for the student to leave each class 5 minutes early.

Leaving early allows the student to be out of the hall during regular changing of classes.

15. Document teaching and review student safety points.

Sources:

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children. (10th ed.)*. St. Louis: Elsevier Mosby, 1566-1567.

Porter, S., Branowicki, P., & Palfrey, J. (2014). *Supporting students with special health care needs: Guidelines and procedures for schools (3rd ed.)*. Baltimore: Paul H. Brookes Publishing, 147-148.

Selekman, J. (2013). *School nursing: A comprehensive text*. (2nd ed.). Philadelphia: F.A. Davis, 1044-1045.

Wisconsin Improving School Health Services Project. (2015). *Transfer procedures*.

Assisting a Student with a Prosthesis

Note: Equipment and supplies are provided by families.

1. Assess the need for assistance for the prosthesis—an artificial extension that is a replacement for a body part, such as an artificial limb or an artificial eye. *Review the health care provider's orders and student's individualized health care plan.*
2. Explain the procedure to the student at his/her level of understanding. Encourage the student to participate as much as possible.
3. Obtain a consultation with a physical or occupational therapist if you are unfamiliar with using a prosthesis.

   The physical or occupational therapist can assist and facilitate implementation of the health care provider's orders for a prosthesis.
4. Check the gait and proper fit and function of the prosthesis.
   a. Check the health care provider's orders.
   b. Observe the student in prosthesis. Assure proper alignment of the prosthesis and that stockinet or stump socks are put on under the prosthesis to absorb perspiration, prevent skin friction, and provide support. Prosthesis may be removed before showers and swimming.
   c. Assess the condition and cleanliness of the prosthesis and any protective clothing.
   d. Encourage the student/family to keep prostheses clean.
   e. Newer prostheses may be myoelectric devices and require monitoring of its proper function.
5. If necessary, remove the prosthesis and observe the skin condition under the prosthesis daily. *Observe for areas of redness or skin breakdown. Report any areas of concern to the school nurse, family and/or health care provider.*
6. If possible, make sure that the prosthesis has the student's name on it.
7. Verify the ability of the student to function with a prosthesis on.

   Note if the student is able to move and function as he/she should. Report any concerns to the school nurse, family and/or health care provider.
8. If necessary, determine the student's ability to remove and put on a prosthesis.
9. *Watch the student put on and remove the prosthesis.*
10. If necessary, arrange for the student to use the elevator.

Use of the elevator decreases the possibility of injury to the student or others on the stairs. If an elevator is not available, the student may need all of his/her classes on the ground floor.

11. Arrange transportation as needed for fire drills and emergency evacuations.
12. **Prearrange** evacuation plans and make sure both the student and staff are aware of them.

    Elevators are not available during fire drills.

13. Document care and findings in the student log. Notify the school nurse, family and/or health care provider of any problems, changes, or concerns.

Possible Problems for a Student with a Prosthesis

- **Inflamed joint**
    - Signs of an inflamed joint are pain, warmth, swelling, or redness at the joint. Notify the school nurse, family and/or the health care provider of any signs of inflammation.
- **Reddened area on the skin under the prosthesis**
    - It may be the beginning stage of a pressure sore. Remove the prosthesis if allowed. If the reddened area does not disappear after 20 minutes, notify the school nurse, family and/or health care provider.
- **Too small or ill-fitting equipment**
    - Notify the school nurse, family and/or the health care provider.
- **Joint contracture**
    - Characterized by stiffness or tightness in the joint with resistance to movement. Notify the school nurse, family and/or the healthcare provider of any decreased movement of the joint.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures (3rd ed.)*. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 604-605.

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children. (10th ed.)*. St. Louis: Elsevier Mosby, 1563-1566.

Assisting a Student with an Orthosis

Note: Equipment and supplies are provided by families.

1. Assess the need for assistance for the orthosis or orthotic—an orthopedic device that is used to support a body part. It may be called a splint or a brace. Other examples include shoe lifts and cranial molding helmets. Specific orthoses describe the area of the body they treat and are often abbreviated. For example, the ankle-foot orthoses are referred to as AFOs, knee-ankle-foot orthoses as KAFOs, and thoracolumbosacral orthosis as TLSOs.

   Review the health care provider's orders and the student's individualized health care plan.

2. Explain the procedure to the student at his/her level of understanding. Encourage the student to participate as much as possible.

3. Obtain a consultation with a physical or occupational therapist if unfamiliar with using the orthosis.

   The physical or occupational therapist can assist and facilitate implementation of the health care provider's orders for the orthosis.

4. Check the gait and proper fit and function of the orthosis.

   a. Check the health care provider's orders.

   b. Check the full length of the orthosis.

   c. Observe the student in orthosis. Mechanical joints should match body joints.

   d. Observe orthosis for: worn areas, loose or missing buckles, straps or screws, cracks in the plastic, dents in the metal, condition of related areas (such as shoes).

   e. Encourage the student/family to keep orthosis clean.

   f. A layer of thin clothing (such as a cotton undershirt or socks) can be worn under most orthoses to protect the skin. Keep clothing free from wrinkles.

5. If allowed, remove orthosis and observe the skin condition under orthosis daily.

   Observe for areas of redness or skin breakdown. Report any areas of concern to family and/or the health care provider.

6. If the child has decreased sensation, check circulation and skin condition frequently. If the child complains of a burning sensation under the orthosis, remove the orthosis (unless contraindicated) and observe the skin for reddened areas.

7. Make sure that the orthosis has the student's name on it.

8. Verify the ability of the student to function with orthosis on.

   Note if the student is able to move and function as he/she should. Report any concerns to the school nurse, family and/or health care provider.

9. Determine the student's ability to put on and remove orthosis.

10. *Watch the student put on and remove orthosis.*

11. If necessary, arrange for the student to use the elevator.

    Use of the elevator decreases the possibility of injury to the student or others on the stairs. If an elevator is not available, the student may need all of his/her classes on the ground floor.

12. Arrange transportation as needed for fire drills and emergency evacuations. Prearrange evacuation plans and make sure both the student and staff are aware of them.

    Elevators are not available during fire drills.

13. Document care and findings on student log.

    Notify the school nurse, family and/or the health care provider of any problems, changes, or concerns.

Possible Problems for a Student with an Orthosis

- **Inflamed joint**
    - Signs of an inflamed joint are pain, warmth, swelling, or redness at the joint. Notify the school nurse, family and/or the health care provider of any signs of inflammation.
- **Reddened area on the skin under orthosis**
    - May be the beginning stage of pressure sore. Remove orthosis if allowed. If the reddened area does not disappear after 20 minutes, notify the school nurse, family and/or health care provider.
- **Too small or ill-fitting equipment**
    - Notify the school nurse, family and/or the health care provider.
- **Joint contracture**

- Characterized by stiffness or tightness in the joint with resistance to movement. Notify the school nurse, family and/or the health care provider of any decrease in the movement of the joint.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 604-605.s

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children. (10th ed.)*. St. Louis: Elsevier Mosby, 1563-1566.

Procedure for Cast Care

Note: Equipment and supplies are provided by families.

1. Assess why the student received a cast. Casts are typically applied to injured limbs to immobilize them and allow bones, ligaments, tendons, or muscles to heal.

   Review the health care provider's orders and student's individualized healthcare plan.

2. Determine the type of cast and **whether the student is allowed to bear weight** on it.

3. Casting Materials

   a. Synthetic-to include fiberglass or mixture of polypropylene, nylon and polyester. These are the most common casting materials used with children as they are lightweight and durable. Available in colors and prints. Material may or may not be waterproof. Prolonged wear or demanding activities may lead to cracks or splits in the cast causing skin irritation or damage.

   b. Plaster of Paris—usually reserved for situations that require close conformity or small irregularly shaped areas such as the hand. It is relatively heavy and must be kept dry.

4. Explain the procedure to the student at his/her level of understanding. Encourage the student to participate as much as possible.

5. Check cast fit. Observe the affected body part that is visible. Check for:

   a. Color, swelling, and warmth of extremity

      Extremity should be the same color as a comparable extremity and warm, with no swelling (may have some swelling initially).

   b. Capillary refill of toes or fingers

      Capillary refill can be checked by pressing on the nailbeds of the toes or fingers. After releasing the nail bed, the color should return rapidly to the nailbed in 3 seconds or less.

   c. Sensation and movement of toes or fingers

      The student's ability to move and feel the extremity can be evaluated by viewing his/her response to touch and asking him to wiggle toes/fingers. Report any changes to the school nurse, family and/or health care providers.

6. Observe the condition of the cast. Observe cast for cracks, dents, or soft spots. Edges should not be soft or crumbly. **Remind the student not to put <u>anything</u> inside the cast,**

especially pencils and other items found at school. Encourage the student/family to keep the cast clean.

7. Observe for any complaints or problems noted by the student, especially the five "Ps": pain, pallor, paresthesia, paralysis, or pulselessness.

   Notify family and/or the health care provider of any pain, color change, pressure, numbness, or decreased sensation in the affected body part. Observe for skin rashes or reddened areas around the cast. Notify the family and/or the health care provider of any concerns.

8. Protect the cast from soiling. Some synthetic casts can be wiped with mild soap and water. If a student has a cast which borders the perineal area, do **not** cut a diaper to fit the area because the raw areas of the diaper give off debris that can get under the cast and irritate the skin.

   Cover cast with plastic wrap as needed at mealtimes and with elimination. If the plastic wrap is soiled or wet, remove plastic wrap, clean skin, and reapply wrap.

9. Do **not** use oily substances (skin lotions) or powder in or around the edges of the cast. Oil softens the skin and can lead to skin breakdown, as well as softening of the cast. Powder will cake under the cast and cause a skin breakdown. (Some references recommend rubbing the skin with isopropyl alcohol (70%) four times a day to toughen the skin. However, no scientific data could be found to support this practice). **Do not** use alcohol on red or irritated skin.

10. If the student is immobile, change position as needed to prevent breakdown. Avoid allowing the affected limb to hang down for more than 30 minutes.

11. Petaling the cast edges with adhesive tape or moleskin may decrease skin irritation and protect the edges of the cast. Do not put padding in the cast.

    Padding such as cotton or tissues may fall down in cast and decrease circulation.

12. Caution the student not to scratch under the cast. Itching can sometimes be relieved by an ice pack or by tapping on the cast.

    Scratching can cause a break in the skin and lead to an infection.

13. If the student has a spica cast, do not use the bar to lift the student. Reclining wheelchairs can be used to accommodate the child in a spica cast.

    Placing pressure on the bar may damage the cast.

14. If needed, arrange for the student to use the elevator.

Use of the elevator decreases the possibility of injury to the student or others on the stairs. If an elevator is not available, the student may need all of his/her classes on the ground floor.

15. Assess transportation needs of the student between home and school. *Some casts may make it difficult to secure the student in an appropriate restraint system. Special vests, such as the E-Z-On Vest, and car safety seats have been designed for transport and some health care facilities may have these available for loan. Vehicle drivers, teachers, aides, nurses, and monitors should be able to demonstrate the ability to correctly use whatever restraint system is employed and know what to do in an emergency.*

16. If needed, arrange transportation as needed for fire drills and emergency evacuations. Prearrange evacuation plans and make sure both the student and staff are aware of them.

    Elevators are not available during fire drills.

17. Document care and findings on student log.

    Notify the school nurse, family and/or the health care provider of any problems, changes, or concerns.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures (3rd ed.)*. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 166-175.

Gockley, A., Hennikus, W., Lavin S.T., Rzucidlo, S, and Rieghard, C. (2015).

Transportation of children in spica casts in the USA. *Journal of Pediatric Orthopedics*, 277-280. http://www.ncbi.nlm.nih.gov/pubmed/26018926.

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children. (10th ed.)*. St. Louis: Elsevier Mosby, 1556-1559.

Smith, S., Duell, D. & Martin, B. (2012). *Clinical nursing skills: Basic to advanced skills (8th ed.)*. Boston: Pearson, 1017-1022.

Problems that May Occur with Casts

Presence of pain greater than expected, decreased or absent movement, pain with stretching toes or fingers, decreased sensation in the affected extremity.

These are indicators of pressure build-up under the cast. Pressure decreases circulation to the affected extremity. Decrease in circulation can result in damage to muscle tissue and nerves. If pressure causes a decrease in circulation as described, raise the casted extremity above the rest of the student's body and contact the school nurse, family, and health care provider immediately so that pressure can be relieved.

- **Damaged cast**
    - Immobilize the extremity and notify the school nurse, family, and health care provider of the extent of the damage.
- **Plaster of Paris cast becomes wet or soiled**
    - Allow to air-dry. If the wet area is large or the cast is soiled, contact the school nurse or family.
- **Cast too tight**
    - Signs include: pale to white color of the fingers or toes, the fingers or toes cool or cold to touch, swelling of affected body part, numbness or tingling, decrease or absence of sensation or movement. May indicate the beginning of reduced circulation to extremity due to pressure under the cast. Elevate the extremity and notify the school nurse, family and/or health care provider immediately.
- **Pain or gestures of pain**
    - May be due to pressure areas resulting from improper molding of the cast, food, or foreign particles under cast, which can cause irritation and skin breakdown. Report any complaints or gestures of pain to the school nurse, family and/or health care provider.
- **Drainage on cast or odor from cast**
    - May be due to an open sore, sloughing of the skin under the cast, or infection. Report any drainage or odor to the school nurse, family and/or health care provider for assessment.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures (3rd ed.)*. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 166-175.

Gockley, A., Hennikus, W., Lavin S.T., Rzucidlo, S, and Rieghard, C. (2015).

Transportation of children in spica casts in the USA. *Journal of Pediatric Orthopedics*, 277-280. http://www.ncbi.nlm.nih.gov/pubmed/26018926.

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children. (10th ed.)*. St. Louis: Elsevier Mosby, 1556-1559.

Smith, S., Duell, D. & Martin, B. (2012). *Clinical nursing skills: Basic to advanced skills (8th ed.)*. Boston: Pearson, 1017-1022.

General Information for Students Who Require Assistance with Physical Mobility

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student uses one or more of the following devices to help with movement (please check):

- ❑ Cane
- ❑ Crutches
- ❑ Walker
- ❑ Prosthesis (a replacement for a missing limb)
- ❑ Brace or splint
- ❑ Cast
- ❑ Wheelchair
- ❑ Other _____

Students using one of these devices may need more time to move from one area to another.

They also may need the following physical assistance or special devices to avoid falls or to otherwise keep the student safe:

_____

_____

_____

Contact_____at _____(phone number) for additional information or if the student experiences any problems when using these devices.

Chapter 5: Care of the Neurological System

Concussion Assessment & Management

Seizure Management

Rectal Diazepam Administration

Vagal Nerve Stimulation

Ventricular Shunt

Concussion Management

Overview

A concussion is a type of brain injury that results from a blow or jolt to the head or body that causes a sudden jarring of the head. The brain bounces back and forth inside the bony skull. A concussion can occur with, or without, a loss of consciousness. Research shows that the inability to remember what happened just prior to the injury and just after the injury may be a more reliable indicator of a concussion than loss of consciousness. Concussions can be more serious on young, developing brains. At school, concussions are most common in physical education classes and while playing sports. But, they can occur in a classroom or hall if a student hits his/her head on a desk, floor, or another student. To prevent further injury, it is important to recognize when a student may have sustained a concussion and respond appropriately. The best treatment for a concussion is physical and cognitive rest. Research has shown that metabolic changes take place in the brain as a result of a concussion. These changes make the brain susceptible to serious injury shortly after a concussion. If a student receives a second blow to the head, the brain's regulatory mechanisms can fail, causing massive cerebral edema, brain herniation, and sudden death. While this is rare, the devastating consequences of Second Impact Syndrome make it imperative that concussions are managed correctly.

Signs and Symptoms

Students who exhibit one or more of the signs and symptoms listed below after receiving a blow to the head should be referred to an appropriate health care provider experienced in evaluating concussions. The Virginia Board of Education defines an appropriate provider as a physician, nurse practitioner, physician assistant, neuropsychologist, or licensed athletic trainer. Concussions do not show up on an MRI or CAT scan, but these tests may be done to rule out other serious brain injuries.

Signs of Concussion

- Appears dazed or stunned
- Is confused about what has happened
- Answers questions slowly or inaccurately
- Slurs words
- Repeats questions
- Can't remember what happened prior to the injury
- Can't remember what happened after the injury

- Exhibits difficulties with balance or coordination
- Loses consciousness (even briefly)
- Shows behavior or personality changes

Symptoms Reported by the Student

Physical

- Headache or pressure in the head
- Nausea or vomiting
- Fatigue or feeling tired
- Blurry or double vision
- Sensitivity to light or noise
- Numbness or tingling
- Dizziness or balance problems
- Just does not “feel right”

Emotional

- Irritable
- Sad
- More emotional than usual
- Nervous

Thinking/Remembering

- Difficulty thinking clearly
- Difficulty concentrating
- Feeling slowed down
- Feeling sluggish or groggy Sleep
- Drowsy
- Sleeps more than usual
- Sleeps less than usual
- Has trouble falling asleep

Role of School Nurse

The primary role of the school nurse is to recognize when an injury may have caused a concussion and refer the student to the appropriate resources to prevent further injury. When the student returns to school after a concussion, the nurse can assess for ongoing symptoms and help to develop a plan that will support recovery. It is important that the school and the nurse have plans and procedures in place ahead of time to deal with concussions. The CDC has developed a

concussion action plan, which can be found under Resources at the end of this section. The nurse can also educate parents, staff, coaches, and students about concussions and how to manage them. The nurse can review school facilities and policies to help prevent concussions, especially repeat concussions, and help create a safe school environment. Most recently, the CDC is trying to reshape the culture around concussions and encourage student athletes to recognize the seriousness of concussions and to take time to heal before resuming activity (Concussion at Play: Opportunities to Reshape the Culture Around Concussion, 2015). School nurses can be an important influence in protecting students and promoting a safer culture around concussions.

Virginia Regulations

In 2010, the General Assembly passed the Student Athlete Protection Act with amendments added in 2014, 2016, and 2019 (see Code of Virginia §22.1-271.5 and §22.1-271.6) directing the Board of Education to develop, biennially update, and distribute to school divisions guidelines on policies for concussions in student-athletes. School divisions are required to develop policies and procedures regarding the identification and handling of suspected concussions in students. Below are the main points of the law:

- The Board of Education is required to develop, biennially update, and distribute to each local school division guidelines on policies to inform and educate coaches, parents or guardians, and student-athletes of the nature and risk of concussions, criteria for removal from and return to play, risks of not reporting the injury and continuing to play, and the effects of concussions on student-athletes' academic performance.
- Each school division must develop policies and procedures for suspected concussions in student-athletes, including both physical activity and academic guidelines.
- Each student athlete and the student athlete's parent/guardian must review information on concussion signs and symptoms on an annual basis and sign that they have read and understand the information.
- If any student athlete is suspected to have sustained a concussion in a practice or game, the athlete shall be removed from the activity and not return to play that day.
- The student must be free of any concussion symptoms to resume play in the future and receive written clearance from a licensed healthcare provider.
- A licensed Healthcare Provider (MD, NP, PA, licensed athletic trainer) will use a standardized concussion sideline assessment tool such as Sport Concussion Assessment Tool-3 (SCAT3), Sudden Assessment for Concussions (SAC), or Balance Error Scoring System (BESS) to test cognitive ability and postural stability.
- A concussion policy team will review and refine local concussion management policies annually. Each school division will develop policies to ensure staff and volunteers are

trained in recognition of concussions and concussion management and may encourage other organizations using their athletic facilities to train their staff and volunteers in concussion management.

These regulations are often referred to as "**Return to Play**" guidelines. Although each Student's care is individualized, in general, most guidelines recommend that student athletes resume a graduated, modified return to play schedule as recommended by the Zurich Consensus Statement and the American Academy of Pediatrics. This means that after a documented concussion, the student would not resume full play in a game for seven days after the injury and providing there are no remaining symptoms of concussion. This may include modifications for other physical activities in which the student participates, such as physical education classes and recess. If increasing activity results in symptoms, the activity is reduced until symptoms resolve. In encouraging student athletes to allow adequate healing time, the CDC has adopted the motto "Better to miss one game than the whole season"

Research has shown that post-concussion symptoms are resolved in 7-10 days for 90% of students. Individualized return to play plans must be developed for the remaining 10%.

Return to Learning

As research determined the need for physical rest after a concussion, the need for cognitive rest also became apparent. Since one of the brain's primary functions is completing cognitive, it was recognized that cognitive rest is also important to healing after a concussion. However, since most students look normal after a concussion, educators and parents may fail to recognize the need for academic adjustments. If a student sprains an ankle, adults typically would not force the student to walk with full weight bearing immediately after injury and would allow time for healing. Similarly, allowing cognitive rest may help to minimize symptoms and facilitate a quicker recovery from a concussion. The more severe the concussion, the more time may be needed for rest and healing. Much more research needs to be done on this subject to determine evidence-based guidelines for mental rest after a concussion. In general, it has been recommended that if a student cannot concentrate without headache or other symptoms for 30 minutes, rest at home might be best. Rest also means no video games, texting, computer work, loud music, or heavy reading. Lighter activities such as watching television or interacting with family might be recommended until symptoms subside.

The CDC recommends that when students return to school after a concussion, school professionals should watch for:

- Problems concentrating or paying attention
- Longer time needed to complete assignments
- Difficulty remembering or learning new material

- Difficulty organizing tasks or moving from one task to the next
- Irritability
- Inappropriate or impulsive behavior
- Decreased ability to cope with stress
- Being more emotional than usual
- Fatigue or drowsiness
- Difficulty handling the lights and sounds in a school environment
- Physical symptoms such as headache, nausea, dizziness.

If a student is still experiencing symptoms after a concussion, the following adjustments to their academic program can be considered:

- Absence, initially after concussion
- Return to school but with a shortened day
- Reduction in workload at school; prioritizing assignments
- Allowance of more time to complete assignments
- Allowing the student to take cognitive breaks in between classes in a quiet place
- Modification or exclusion from physical education classes and recess--but not substituting a mental activity for them
- Providing class notes from a teacher or fellow student
- Limited screen time
- Treatment with authorized medications
- Allowing the student to eat lunch in a quiet location.

During the student's recovery, it is essential for communication and collaboration between the educational staff, school nurse, family, and student. Schools might want to consider a case manager for the student until symptoms disappear. If the student's symptoms persist beyond 4 weeks and affect his ability to fully participate in his education, a team may need to develop accommodations or a 504 plan. It has been noted that students with special needs, attention deficits, and learning disorders may have greater difficulty recovering from a concussion. Moreover, students who have had more than one concussion may take longer to recover.

Revised Virginia Regulations (2015)

In 2015, the Virginia Board of Education added guidelines (Code of Virginia §22.1-271.6) for a Return to Learn Protocol with the following recommendations:

1. A student recovering from a brain injury shall gradually increase cognitive activities progressing through *some or all* of the following phases. Some students may need total rest with a gradual return to school, while others will be able to continue doing academic work with minimal instructional modifications. The decision to progress from one phase to another should reflect the absence of any relevant signs or

symptoms, and should be based on the recommendation of the student's appropriate licensed health care provider in collaboration with school staff, including teachers, school counselors, school administrators, psychologists, nurses, clinic aides, or others as determined by local school division concussion policy.

a. Home: Rest

- Phase 1: Cognitive and physical rest may include
    - minimal cognitive activities – limit reading, computer use, texting, television, and/or video games;
    - no homework;
    - no driving; and
- Phase 2: Light cognitive mental activity may include
    - up to 30 minutes of sustained cognitive exertion;
    - no prolonged concentration;
    - no driving; and
    - limited physical activity.

The student will progress to part-time school attendance when able to tolerate a minimum of 30 minutes of sustained cognitive exertion without exacerbation of symptoms or reemergence of previously resolved symptoms.

b. School: Part-time

- Phase 3: Maximum instructional modifications including, but not limited to
    - shortened days with built-in breaks;
    - modified environment (e.g., limiting time in hallway, identifying quiet and/or dark spaces);
    - established learning priorities;
    - exclusion from standardized and classroom testing;
    - extra time, extra assistance, and/or modified assignments;
    - rest and recovery once out of school; and
    - elimination or reduction of homework.

The student will progress to the moderate instructional modification phase when able to tolerate a part-time return with moderate instructional modifications without exacerbation of symptoms or re-emergence of previously resolved symptoms.

- Phase 4: Moderate instructional modifications including, but not limited to
    - established priorities for learning;

- limited homework;
- alternative grading strategies;
- built-in breaks;
- modified and/or limited classroom testing, exclusion from standardized testing; and
- reduction of extra time, assistance, and/or modification of assignments as needed.

The student will progress to the minimal instructional modification phase when they are able to tolerate full-time school attendance without exacerbation of existing symptoms or reemergence of previously resolved symptoms.

c. School: Full-time
   - Phase 5: Minimal instructional modification - instructional strategies may include, but are not limited to
     - built-in breaks;
     - limited formative and summative testing, exclusion from standardized testing;
     - reduction of extra time, assistance, *and* modification of assignments; and
     - continuation of instructional modification and supports in academically challenging subjects that require cognitive overexertion and stress.

Students will progress to unmodified school participation when they are able to handle sustained cognitive exertion without exacerbation of symptoms or re-emergence of previously resolved symptoms.

- Phase 6: Attends all classes; maintains full academic load/homework; requires no instructional modifications.

Progression through the above phases shall be governed by the presence or resolution of symptoms resulting from a concussion experienced by the student including, but are not b. to

- difficulty with attention, concentration, organization, long-term and short-term memory, reasoning, planning, and problem solving;
- fatigue, drowsiness, difficulties handling a stimulating school environment (e.g., sensitivity to light and sound);
- inappropriate or impulsive behavior during class, greater irritability, less able to cope with stress, more emotional than usual; and
- physical symptoms (e.g., headache, nausea, dizziness).

2. Progression through gradually increasing cognitive demands should adhere to the following guidelines:

    a. increase the amount of time in school;
    b. increase the nature and amount of work, the length of time spent on the work, or the type or difficulty of work (change only one of these variables at a time);
    c. if symptoms do not worsen, demands may continue to be gradually increased;
    d. if symptoms do worsen, the activity should be discontinued for at least 20 minutes and the student allowed to rest
    e. if the symptoms are relieved with rest, the student may reattempt the activity at or below the level that produced symptoms; and
    f. if the symptoms are not relieved with rest, the student should discontinue the current activity for the day and reattempt when symptoms have lessened or resolved (such as the next day).

3. If symptoms persist or fail to improve over time, additional in-school support may be required with consideration for further evaluation. If the student is three to four weeks post injury without significant evidence of improvement, a 504 plan should be considered.

4. A student-athlete shall progress to a stage where he or she no longer requires instructional modifications or other support before being cleared to return to full athletic participation (return-to-play).

The American Academy of Pediatrics (AAP) Return to Learn Following a Concussion Guidelines (October 2013), and the American Medical Society for Sports Medicine (AMSSM) Position Statement (2019), are available online to assist health care providers, student-athletes, their families, and school divisions, as needed.

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Procedure to Follow After a Possible Concussion

1. Observe for concussion danger signs and contact Emergency Medical Services if any of the following are observed:

    a. loss of consciousness
    b. headache that gets worse and does not go away
    c. cannot remember what happened just prior to injury or what happened afterwards
    d. weakness, numbness, or decreased coordination
    e. repeated vomiting or nausea
    f. one pupil larger than the other
    g. slurred speech
    h. seizures
    i. cannot recognize people or places
    j. very drowsy or cannot be awakened
    k. becomes increasingly confused, restless, or agitated
    l. has unusual behavior or just doesn't "act right"

These may be signs of a concussion or of a more serious brain injury and need to be evaluated immediately.

2. Observe the student for signs and symptoms of a concussion for at least 30 minutes.

Some symptoms might take time to develop.

3. Complete the **Concussion Signs and Symptoms Checklist** (on next page) and monitor the student during the observation period.

The form includes an easy-to-use checklist to evaluate when the student arrives at the clinic, 15 minutes later, 30 minutes later, and ongoing assessment if symptoms persist.

4. After 30 minutes, if there are no further symptoms, return the student to class but advise no participation in sports or other active activities for the rest of the day.

5. Notify the student's family that the student had an injury to the head. Send an information sheet home with the student for parents describing how to monitor for further symptoms.

Alerts family to monitor for signs of head injury and gives them information on which signs to observe and report.

6. If the student sees a Healthcare Provider, monitor for problems on return to school.

CONCUSSION SIGNS AND SYMPTOMS

Checklist

CDC HEADS UP
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Student's Name: _____ Student's Grade: _____ Date/Time of Injury: _____

Where and How Injury Occurred: *(Be sure to include cause and force of the hit or blow to the head.)* _____

_____

Description of Injury: *(Be sure to include information about any loss of consciousness and for how long, memory loss, or seizures following the injury, or previous concussions, if any. See the section on Danger Signs on the back of this form.)* _____

_____

_____

DIRECTIONS:

Use this checklist to monitor students who come to your office with a head injury. Students should be monitored for a minimum of 30 minutes. Check for signs or symptoms when the student first arrives at your office, 15 minutes later, and at the end of 30 minutes.

Students who experience one or more of the signs or symptoms of concussion after a bump, blow, or jolt to the head should be referred to a healthcare professional with experience in evaluating for concussion. For those instances when a parent is coming to take the student to a healthcare professional, observe the student for any new or worsening symptoms right before the student leaves. Send a copy of this checklist with the student for the healthcare professional to review.

OBSERVED SIGNS	0 MINUTES	15 MINUTES	30 MINUTES	MINUTES JUST PRIOR TO LEAVING
Appears dazed or stunned				
Is confused about events				
Repeats questions				
Answers questions slowly				
Can't recall events *prior* to the hit, bump, or fall				
Can't recall events *after* the hit, bump, or fall				
Loses consciousness (even briefly)				
Shows behavior or personality changes				
Forgets class schedule or assignments				
PHYSICAL SYMPTOMS				
Headache or "pressure" in head				
Nausea or vomiting				
Balance problems or dizziness				
Fatigue or feeling tired				
Blurry or double vision				
Sensitivity to light				
Sensitivity to noise				
Numbness or tingling				
Does not "feel right"				
COGNITIVE SYMPTOMS				
Difficulty thinking clearly				
Difficulty concentrating				
Difficulty remembering				
Feeling more slowed down than usual				
Feeling sluggish, hazy, foggy, or groggy				
EMOTIONAL SYMPTOMS				
Irritable				
Sad				
More emotional than usual				
Nervous				

CONCUSSION
SIGNS AND SYMPTOMS

Checklist

Danger signs:

Be alert for symptoms that worsen over time. The student should be seen in an emergency department right away if she or he has one or more of these danger signs:

- ☐ One pupil (the black part in the middle of the eye) larger than the other
- ☐ Drowsiness or cannot be awakened
- ☐ A headache that gets worse and does not go away
- ☐ Weakness, numbness, or decreased coordination
- ☐ Repeated vomiting or nausea
- ☐ Slurred speech
- ☐ Convulsions or seizures
- ☐ Difficulty recognizing people or places
- ☐ Increasing confusion, restlessness, or agitation
- ☐ Unusual behavior
- ☐ Loss of consciousness (even a brief loss of consciousness should be taken seriously)

Additional information about this checklist:

This checklist is also useful if a student appears to have sustained a head injury outside of school or on a previous school day. In such cases, be sure to ask the student about possible sleep symptoms. Drowsiness, sleeping more or less than usual, or difficulty falling asleep may indicate a concussion.

To maintain confidentiality and ensure privacy, this checklist is intended for use only by appropriate school professionals, healthcare professionals, and the student's parent(s) or guardians.

Resolution of injury:

☐ Student returned to class ☐ Student sent home ☐ Student referred to healthcare professional with experience in evaluating for concussion

SIGNATURE OF SCHOOL PROFESSIONAL COMPLETING THIS FORM: _____

TITLE: _____

COMMENTS:

To download this checklist in Spanish, please visit cdc.gov/HEADSUP. Para obtener una copia electrónica de esta lista de síntomas en español, por favor visite cdc.gov/HEADSUP.

To learn more,
cdc.gov/HEADSUP

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Acute Concussion Evaluation (ACE)

Care Plan

Gerard Gioia, PhD[1] & Micky Collins, PhD[2]
[1]Children's National Medical Center
[2]University of Pittsburgh Medical Center

Patient Name:_____
DOB:_____ Age:_____
Date:_____ ID/MR#_____
Date of Injury:_____

You have been diagnosed with a concussion (also known as a mild traumatic brain injury). This personal plan is based on your symptoms and is designed to help speed your recovery. Your careful attention to it can also prevent further injury.

You should not participate in any high risk activities (e.g., sports, physical education (PE), riding a bike, etc.) if you still have any of the symptoms below. It is important to limit activities that require a lot of thinking or concentration (homework, job-related activities), as this can also make your symptoms worse. If you no longer have any symptoms and believe that your concentration and thinking are back to normal, you can slowly and carefully return to your daily activities. Children and teenagers will need help from their parents, teachers, coaches, or athletic trainers to help monitor their recovery and return to activities.

Today the following symptoms are present (circle or check). ____**No reported symptoms**

Physical		Thinking	Emotional	Sleep
Headaches	Sensitivity to light	Feeling mentally foggy	Irritability	Drowsiness
Nausea	Sensitivity to noise	Problems concentrating	Sadness	Sleeping more than usual
Fatigue	Numbness/Tingling	Problems remembering	Feeling more emotional	Sleeping less than usual
Visual problems	Vomiting	Feeling more slowed down	Nervousness	Trouble falling asleep
Balance Problems	Dizziness			

RED FLAGS: Call your doctor or go to your emergency department if you suddenly experience any of the following

Headaches that worsen	Look very drowsy, can't be awakened	Can't recognize people or places	Unusual behavior change
Seizures	Repeated vomiting	Increasing confusion	Increasing irritability
Neck pain	Slurred speech	Weakness or numbness in arms or legs	Loss of consciousness

— SCHOOL VERSION —

Returning to Daily Activities

1. Get lots of rest. Be sure to get enough sleep at night- no late nights. Keep the same bedtime weekdays and weekends.
2. Take daytime naps or rest breaks when you feel tired or fatigued.
3. **Limit physical activity as well as activities that require a lot of thinking or concentration. These activities can make symptoms worse.**
   - Physical activity includes PE, sports practices, weight-training, running, exercising, heavy lifting, etc.
   - Thinking and concentration activities (e.g., homework, classwork load, job-related activity).
4. Drink lots of fluids and eat carbohydrates or protein to main appropriate blood sugar levels.
5. **As symptoms decrease, you may begin to gradually return to your daily activities. If symptoms worsen or return, lessen your activities, then try again to increase your activities gradually.**
6. During recovery, it is normal to feel frustrated and sad when you do not feel right and you can't be as active as usual.
7. Repeated evaluation of your symptoms is recommended to help guide recovery.

Returning to School

1. If you (or your child) are still having symptoms of concussion you may need extra help to perform school-related activities. As your (or your child's) symptoms decrease during recovery, the extra help or supports can be removed gradually.
2. Inform the teacher(s), school nurse, school psychologist or counselor, and administrator(s) about your (or your child's) injury and symptoms. School personnel should be instructed to watch for:
   - Increased problems paying attention or concentrating
   - Increased problems remembering or learning new information
   - Longer time needed to complete tasks or assignments
   - Greater irritability, less able to cope with stress
   - Symptoms worsen (e.g., headache, tiredness) when doing schoolwork

-Continued on back page-

This form is part of the "Heads Up: Brain Injury in Your Practice" tool kit developed by the Centers for Disease Control and Prevention (CDC).

Returning to School (Continued)

Until you (or your child) have fully recovered, the following supports are recommended: *(check all that apply)*

__No return to school. Return on (date)_____

__Return to school with following supports. Review on (date)_____

__Shortened day. Recommend ___ hours per day until (date)_____

__Shortened classes (i.e., rest breaks during classes). Maximum class length: _____ minutes.

__Allow extra time to complete coursework/assignments and tests.

__Lessen homework load by _____%. Maximum length of nightly homework: _____ minutes.

__No significant classroom or standardized testing at this time.

__Check for the return of symptoms (use symptom table on front page of this form) when doing activities that require a lot of attention or concentration.

__Take rest breaks during the day as needed.

__Request meeting of 504 or School Management Team to discuss this plan and needed supports.

Returning to Sports

1. **You should NEVER return to play if you still have ANY symptoms** – (Be sure that you do not have any symptoms at rest and while doing any physical activity and/or activities that require a lot of thinking or concentration.)
2. Be sure that the PE teacher, coach, and/or athletic trainer are aware of your injury and symptoms.
3. It is normal to feel frustrated, sad and even angry because you cannot return to sports right away. With any injury, a full recovery will reduce the chances of getting hurt again. It is better to miss one or two games than the whole season.

The following are recommended at the present time:

___ Do not return to PE class at this time

___ Return to PE class

___ Do not return to sports practices/games at this time

___ **Gradual** return to sports practices under the supervision of an appropriate health care provider.

- Return to play should occur in gradual steps beginning with aerobic exercise only to increase your heart rate (e.g., stationary cycle); moving to increasing your heart rate with movement (e.g., running); then adding controlled contact if appropriate; and finally return to sports competition.
- Pay careful attention to your symptoms and your thinking and concentration skills at each stage of activity. Move to the next level of activity only if you do not experience any symptoms at the each level. If your symptoms return, stop these activities and let your health care professional know. Once you have not experienced symptoms for a minimum of 24 hours and you receive permission from your health care professional, you should start again at the previous step of the return to play plan.

Gradual Return to Play Plan

1. No physical activity
2. Low levels of physical activity (i.e.,). This includes walking, light jogging, light stationary biking, light weightlifting (lower weight, higher reps, no bench, no squat).
3. Moderate levels of physical activity with body/head movement. This includes moderate jogging, brief running, moderate-intensity stationary biking, moderate-intensity weightlifting (reduced time and/or reduced weight from your typical routine).
4. Heavy non-contact physical activity. This includes sprinting/running, high-intensity stationary biking, regular weightlifting routine, non-contact sport-specific drills (in 3 planes of movement).
5. Full contact in controlled practice.
6. Full contact in game play.

*Neuropsychological testing can provide valuable information to assist physicians with treatment planning, such as return to play decisions.

This referral plan is based on today's evaluation:

___ Return to this office. Date/Time_____

___ Refer to: Neurosurgery____ Neurology____ Sports Medicine____ Physiatrist____ Psychiatrist____ Other____

___ Refer for neuropsychological testing

___ Other_____

ACE Care Plan Completed by:_____ **MD RN NP PhD ATC**

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Available online: cdc.gov/headsup

Seizure Management

VA Code § 22.1-274.6 (2021)

Overview

A seizure is an event in which there is a temporary change in behavior resulting from a sudden, abnormal burst of electrical activity in the brain. If the electrical disturbance is limited to only one area of the brain, then the result is a partial seizure. The location of the initial electrical malfunction and the extent of its spread determine the clinical manifestations of the seizure. For example, the student may experience confusion, loss of awareness, aimless movements, jerking movements or uncontrolled body movements. Sometimes the student may just exhibit purposeless, repetitive actions such as hand wringing or lip smacking. There may or may not be a loss of consciousness and awareness. If the electrical disturbance affects the entire brain, the result is a generalized seizure.

Epilepsyis defined as a chronic condition that is characterized by 2 or more recurrent seizures. Many students with epilepsy have more than one seizure type. Nearly 3 million people in the US have epilepsy, and approximately 1 in 26 people will develop epilepsy at some point in their lifetime. Between 0.5 and 1% of students are affected. It may become less frequent and resolve as a child ages.

Some seizures may result from an acute medical illness (e.g., during a hypoglycemic episode for a diabetic) or an acute injury (e.g., head injury) and cease once the illness is treated.

Some children may have one seizure without the cause ever being known.

Classification of Seizures

Seizures may be generalized motor or non-motor and affect the entire body, or focal aware and focal impaired awareness where one area of the brain is affected resulting in more localized symptoms. The following table summarizes the classification of seizures which was updated in 2016 by the International League Against Epilepsy:

Generalized Motor Seizures	Clinical Manifestations
Tonic-clonic seizures (*formerly known as* grand mal seizures; affects the entire brain at the onset)	The eyes roll upward, the student loses consciousness, falls to the ground, and becomes rigid as muscles tighten (tonic phase). This is followed by jerking movements of the entire body (clonic phase) as muscles undergo rhythmic tightening and relaxation. During this phase, the student may become incontinent of stool and urine as his/her muscles contract and relax. Breathing may be shallow or even stop briefly (rare), but renews as jerking movements end.

Generalized Motor Seizures	Clinical Manifestations
Onset: any age	Generalized seizures usually last 1-2 minutes. After the tonic-clonic phase, movement slows and is followed by drowsiness or deep sleep that can last several hours (postictal state).
Atonic seizures (*also known as drop attacks)* Onset: age 2-5	Manifested as a sudden, momentary loss of motor tone. The student may or may not lose consciousness. A mild atonic seizure may cause a sudden, brief head drop. During a more severe atonic seizure, the student may suddenly fall to the ground, lose consciousness briefly, and then get up as if nothing happened. If a student has frequent atonic seizures, a helmet may be worn to prevent injury to the head or face. These seizures tend to be resistant to drug therapy.
Myoclonic seizures	Characterized by sudden, brief contractures of a muscle or group of muscles without loss of consciousness and no postictal state.

Generalized Non-Motor Seizures	Clinical Manifestations
Absence seizures (*formerly called* petit mal seizures, "lapses," or "staring spells") Onset: age 4-12	These seizures are characterized by a brief loss of consciousness with minimal or no alteration in muscle tone and sometimes go unrecognized. There is no warning and the seizures can be mistaken for daydreaming or inattentiveness. Students may: ● Simply stare blankly for 5-10 seconds or blink ● Drop objects because of loss of muscle tone ● Have minor movements such as lip-smacking ● Experience twitching or slight hand movements The student will be unable to recall what happened during these brief periods of "blankness." If untreated, seizures may occur many times a day.

Generalized Motor Seizures	Clinical Manifestations
	Seizures can be precipitated by fatigue, stress, hypoglycemia, or hyperventilation.

Focal Seizures	Clinical Manifestations
Focal aware seizures (*formerly called* "partial" or "simple partial" seizures) affects just one part of the brain Onset: any age	Manifestations are dependent on the area affected and tend to be localized. The student may be aware of the seizure, remember the experience, but may be limited in how he or she can interact while it is happening. For example, a student's eyes or eyes and head turn to one side and the arm on that side may be extended with the fingers clenched. The student may appear to be looking toward the closed fist. A focal aware seizure may also manifest as a tingling in the hand or face, as a visual distortion, or a sudden strange feeling. It is important for an eyewitness to give a clear description of the seizure, especially which body parts are initially involved, to aid in diagnosis and treatment. Also, noting the circumstances that precipitated the episode can help in treatment. Students may also experience a postictal stage after a partial seizure. Focal aware seizures may spread and become generalized. Consciousness is *never* impaired.
Focal Impaired Awareness Seizures (*formerly known as "complex partial" or "psychomotor" seizures*, begin in one area of the brain and spread to other areas) Onset: age 3 and up	The most common type of seizures. These seizures first begin with an *aura* or warning that the seizure is about to occur. The aura may be described as a strange feeling in the pit of the stomach that rises up to the throat, or a sensation that is accompanied by odd or unpleasant odors or tastes, auditory or visual hallucinations, or feelings of elation or strangeness. A student may cry or run for help. If a student experiencing a focal impaired awareness seizure is touched or restrained, he/she may become combative. During this time, the student is often unaware of his/her environment and unable to respond appropriately to the environment. After the aura, the student may suddenly become limp or stiff, appear dazed, and confused. The most obvious behaviors may be lip smacking, repeating words, chewing, picking at clothing, drooling, and swallowing.

	Focal impaired awareness seizures may spread and become generalized. Consciousness is *always* impaired.

In addition, a number of epilepsy syndromes have been identified. They include: Benign Rolandic Epilepsy, Lennox-Gastaut Syndrome, Landau-Kleffner Syndrome, Rasmussen's Syndrome, Juvenile Myoclonic Epilepsy, Frontal Lobe Epilepsy, Temporal Lobe Epilepsy, and Progressive Myoclonic Epilepsy.

Potential Settings

Many students with a history of seizures attend regular classrooms and participate in regular school activities, with modifications that are determined by the parents, health care provider, school nurse, and school staff. As with all medical conditions, every effort is made to protect the student's privacy, especially during the occurrence of a seizure. School personnel having contact with the student need to be familiar with the student's medications and potential side effects, be able to recognize signs of seizure-related behavior, know what to do when signs are observed, and know how to implement the established school emergency plan.

Medications Currently Used to Treat Seizures

(This list includes only some of the most common medications available to treat seizures.) Additional medications to treat seizures may become available for use in the U.S. *as approved by the FDA* and as prescribed by the health care provider**.**

Generic Name	Trade Name	Seizure Type	Adverse Reactions
Carbamazepine	*Tegretol*	Secondary tonic/clonic Focal Impaired awareness Focal aware	Allergic reactions, dizziness, ataxia, poor muscle coordination, nausea, behavioral changes, blurred or double vision, aplastic anemia, hepatitis
Clonazepam	*Klonopin*	Absence Myoclonic Tonic/clonic	Sedation, hyperactivity, aggressiveness, slurred speech, double vision, ataxia, behavior changes, increased salivation
Diazepam (nasal form) This is the same medication used in a rectal form called Diastat	Valtoco® **nasal** form of benzodiazepines	Seizure clusters	Sleepiness and nasal discomfort Less frequent side effects include headache, slurred speech, throat irritation, runny nose, abnormal taste, increased lacrimation, or nose bleeding.
Ethosuximide	*Zarontin*	Absence	GI upset, loss of appetite, headache, lethargy, behavior changes, dizziness, dystonia, myelosuppression, drug-induced lupus
Felbamate—used only with caution and informed consent due to serious adverse reactions	*Felbatol*	Focal and generalized (reserved for severe epilepsy)	**Aplastic anemia, hepatic failure,** anorexia, weight loss, nausea, insomnia, headache, fatigue
Gabapentin	*Neurontin*	Focal	Somnolence, dizziness, ataxia, fatigue, weight gain

Lacosamide	*Vimpat*	Focal	Dizziness, headache, nausea, double vision
Lamotrigine	*Lamictal*	Focal Tonic-clonic Absence Myoclonic	Somnolence, dizziness, rash, nausea, blurred vision, tremor
Levetiracetam	*Keppra*	Focal Myoclonic	Drowsiness, dizziness, behavioral problems
Midazolam (nasal form)	Nayzilam® Nasal form of benzodiazepines	Seizure clusters	Sleepiness and nasal discomfort Less frequent side effects include headache, throat irritation, runny nose,
Phenobarbital	*Luminal*	Tonic-clonic Focal Febrile	Sedation, hyperactivity, changes in sleep pattern, inattention, irritability, cognitive impairment
Phenytoin	*Dilantin*	Tonic-clonic Focal impaired awareness Focal aware	Gingival hyperplasia, hirsutism, nystagmus, blurred or double vision, ataxia, rashes, folate deficiency, drug-induced lupus, myelosuppression
Pregabalin	*Lyrica*	Focal	Blurred vision, dizziness, dry mouth, weight gain, sleepiness, swelling of hands and feet, trouble concentrating
Primidione	*Mysoline*	Tonic-clonic Focal impaired awareness Focal aware	Sedation, hyperactivity, ataxia, behavior changes, rare hematological and hypersensitivity reactions

Rufinamide	*Banzel*	Lennox-Gastaut Syndrome (also known as myoclonic-astatic epilepsy)	Allergic reactions, dizziness, drowsiness, headache, nausea, fatigue, vomiting, appetite changes, sore throat, blurred vision, tremor, blood in urine, behavior and mood changes, insomnia, suicidal thoughts
Tiagabine	*Gabitril*	Focal	Dizziness, somnolence, headache, depression
Topiramate	*Topamax*	Focal Tonic-clonic Atonic Myoclonic Absence	Somnolence, anorexia, fatigue, difficulty with concentration, nervousness
Valium	*Diastat (rectal)*	See next section for more information	Dizziness, headache, insomnia. sleepiness, blurred vision, vomiting, nausea diarrhea, tremors, appetite loss
Valproate Valproic acid	*Depakote* *Depakene* *Depacon (injection)*	Myoclonic Absence Tonic-clonic Mixed seizures types	Hair loss, tremor, elevated liver enzymes and liver failure, irregular menses, increased appetite, upset stomach, nausea and vomiting, pancreatitis thrombocytopenia

Other new drugs being used include Celontin (Methsuximide), Clobazam (Onfi), Mebaral (Mephobarbital), Peganone (Ethotoin), Sabril (Vigabatrin), and Tridione (Trinethaione). Many antiepileptic drugs are now available as once a day or twice a day dosing formulations.

Diet Therapy

In specific cases, students with seizures may be prescribed a ketogenic diet for treatment and control of seizures. Usually this diet is prescribed for students with poorly controlled seizures who cannot tolerate the side effects of antiepileptic medications.

The ketogenic diet is designed to create a state of *ketosis* which has been found to metabolically improve seizure control in certain cases. It is most often used for myoclonic seizures, but has been used for tonic-clonic and complex partial seizures. The diet is high in fats (80-90%) and low in carbohydrates and proteins. Consumption of this diet forces the body to use fats as the primary energy source instead of glucose and causes ketosis. It is a carefully calculated diet and requires daily monitoring to maintain ketosis. A student on a ketogenic diet is followed by a registered dietitian and has a prescribed meal plan to follow daily. Coordination between the student's neurologist, dietitian, family, and school is recommended for the development of a successful individualized healthcare plan (IHP). Even a small amount of sugar can disrupt the diet so the food consumed by students on it must be monitored closely. The diet is low in vitamins and minerals so vitamin supplements are usually recommended.

Monitoring

The purpose of seizure monitoring is to protect the student from injury during a seizure, to carefully observe the seizure in order to provide information for the management of the seizure disorder, and to distinguish between behaviors related to a seizure and those behaviors not related to it.

Monitoring provides the health care provider with the information needed to better manage the student's medication. An increase in the number of seizures may indicate that the student needs a change in medication, or that he/she is not receiving the prescribed medication.

Approximately 30% of all people with epilepsy seizures are never controlled and are referred to as drug resistant epilepsy. In addition, antiepileptic medication can be toxic. Therefore, any side effects from the medication should be documented and reported to the family and/or health care provider. Careful monitoring of the student can improve the management of seizures.

Service Animals

See section in Special Care Issues chapter and *Code of Virginia §51.5-44*.

Signs of an Emergency

Most seizures are self-limiting and are not medical emergencies. A series of consecutive seizures in which the student does not regain consciousness is called status epilepticus, and is a medical emergency. Immediate medical care is required. Many students will have rescue medication ordered for seizure emergencies. Seizures which last longer than 5 minutes require emergency medical services. Seizures lasting longer than 30 minutes can cause brain damage. Status epilepticus can lead to respiratory failure, brain damage, and death.

Therefore, it is critical that the student receive immediate medical attention.

Managing a Seizure

Managing a seizure in school consists of protecting the student, observing the student, and getting medical assistance when needed. The procedures on the following pages are guidelines for managing a student having a seizure and what to do after the student has a seizure. Included in the guidelines is the First Aid Flow Chart for Seizures algorithm.

Individualized Healthcare Plan

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with seizures, the following items should be considered:

- Student's underlying condition and possible problems associated with the condition or treatment.
- Type of seizures the student experiences and typical course of seizure
- Student's baseline or normal behaviors.
- Healthcare provider's orders for medications and care
- Whether the student experiences auras, or can anticipate when seizures may occur
- Behaviors that indicate a seizure may be about to occur
- Actions to take if the student has a seizure
- Medications the student is taking and signs of adverse reactions or toxicity
- Who is to be notified when the student has a seizure
- Determining the need for seizure precautions, and what these precautions will be
- Guidelines for service animal, if prescribed
- Latex allergy precautions
- Standard precautions

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Note:

Additional resources can be found at the:

Epilepsy Foundation website: www.epilepsy.com

http://www.epilepsyfoundation.org/livingwithepilepsy/educators/socialissues/schoolnurseprogram/

Procedure for Managing a Seizure

If a student has a seizure:

1. Remain calm.
   No one can stop a seizure once it starts. If the first person remains calm, it will help others stay calm too. Talk calmly and reassuringly during and after the seizure, which will help as the student recovers from the seizure.

2. Time the seizure. Document all of the student's activity during a seizure: time the seizure began, time the seizure ended, area of body where the seizure began, any movement of the seizure from one area of the body to another, and type of movements of the head, face, and/or arms.

3. Check for medical alert I.D. and follow the student's individualized healthcare plan (IHP) or seizure action plan. If applicable, provide seizure rescue treatment, if prescribed (medications, such as rectal diazepam, or treatments, such as a vagal nerve stimulator, which can be used as needed to stop clusters of seizures, seizures that last longer than usual, or seizures that occur at predictable times).

4. Have an adult stay with the student during the seizure to monitor his/her progress.

5. Put on a pair of gloves, if available.

6. If the student is standing or sitting, gently lower them to the ground to avoid a fall. Clear the area of anything that could hurt the student. **Do not attempt to restrain the student** or use force. If the student is wandering or confused, help steer him or her clear of unsafe situations.
   Restraining will not stop a seizure and can lead to injuries and make the student more confused and agitated, causing more injury. Do not remove the student from a wheelchair unless necessary.

7. Turn the student on their side unless injury exists. If possible, put something flat and soft (like a folded blanket or jacket) under their head to prevent the student banging their head against the floor.
   This positioning prevents the tongue from blocking the airway and helps the student not to choke on secretions.

8. **Do not place anything in the student's mouth**.
   Padded tongue blades and airways are not accepted practice because they may induce vomiting, cause potential damage to teeth, and may be aspirated. A person ***cannot*** *"swallow their tongue."*

9. Loosen tight clothing, especially around the student's neck. Remove any eyeglasses.

10. Do not give the student any oral medications or anything to drink during a seizure.

11. Provide emotional support. Keep additional, unneeded onlookers away.
    It can be embarrassing and confusing for a person to wake up to a crowd of people.

12. Call (911) Emergency Medical Services if:
    a. Student stops breathing.
    b. Seizure lasts more than 5 minutes.
    c. This is the student's first seizure.
    d. Repeated seizures without regaining consciousness.
    e. Student cannot be awakened and are unresponsive to pain after seizure ends.
    f. Pupils are not equal in size after seizure.
    g. There is evidence of student injury.
    h. Student has diabetes or is pregnant.
    i. Seizure occurs in water.
    j. Parents request emergency evaluation

Prepare the school environment to be as safe as possible for the student who has a history of seizures.

Be aware of the potential for head injuries with uncontrolled seizures. The student may require a lightweight helmet for head protection, especially for seizures that produce sudden changes in muscle tone (atonic, myoclonic, akinetic). Prepare for potential problems associated with seizures. For example, if the student has copious secretions with a seizure, a bulb syringe or suction machine will need to be available.

Pathways and environments should be free of unnecessary objects. For example, unused toys, wheelchairs, storage boxes, etc. should be removed from the environment.

Supervision during use of hazardous machinery or equipment (such as that found in a shop class) should be available.

After a Student Has a Seizure:

1. After the seizure is over, clear secretions from the student's mouth with a bulb syringe or suction catheter. Keep the student positioned on his/her side.
   Do not try to clear the student's mouth until the seizure has ended.

2. Monitor the student's breathing.
   Check the position of the head and tongue. Reposition if the head is hyperextended. If the student is not breathing, call 911 and activate the school emergency plan and begin CPR.

3. Talk with the student to determine their level of awareness.
   Note if the student is alert, confused, drowsy, etc. and document findings.

If the student remains unconscious after seizure is over, maintain an open airway and assess breathing. If necessary, begin rescue breathing or CPR.

4. Determine and document whether or not the student is able to move arms and legs, or if there is change in their ability to move.

5. Check for injuries and provide care, if needed. If the student remains unconscious after seizure is over, maintain an open airway and continue to assess breathing. If necessary, start Rescue Breathing or CPR.

6. Check for loss of control of urine and stool, and for any injuries. Provide privacy.
   Loss of control is very embarrassing to the student. Clean the student to make him/her more comfortable.

7. **Remain with the student until he or she has regained full awareness** of his or her surroundings. Make the student comfortable; allow him/her to sleep as needed. Do not give food or liquids until fully alert and the swallowing reflex has returned.

   After the seizure, the student may sleep for 30 minutes up to a number of hours (postictal period). Refer to the First Aid Flow Chart for Seizures to determine the disposition of the student post seizure.

8. Document the length of seizure, what happened during and after the seizure. Report if there is a change in the frequency or type of seizure activity.
   Notify the school nurse, family and/or health care provider as designated in the IHP.

Resources for Learning to Manage Seizures:

As per the Code of Virginia 22.1-274.6, each local school division shall require all employees whose duties include regular contact with students to complete, on a biennial basis, a training program. The National Association for School Nurses, in partnership with the Epilepsy Foundation, has a continuing education program and resources available online for school nurses, *Resources for Schools from the Epilepsy Foundation.*

The Epilepsy Foundation also has developed *Schools and Seizure Preparedness*, *Seizure Training for School Nurses*, and *Seizure Training for School Personnel* which is appropriate for teachers, bus drivers, instructional assistants, and other education staff.

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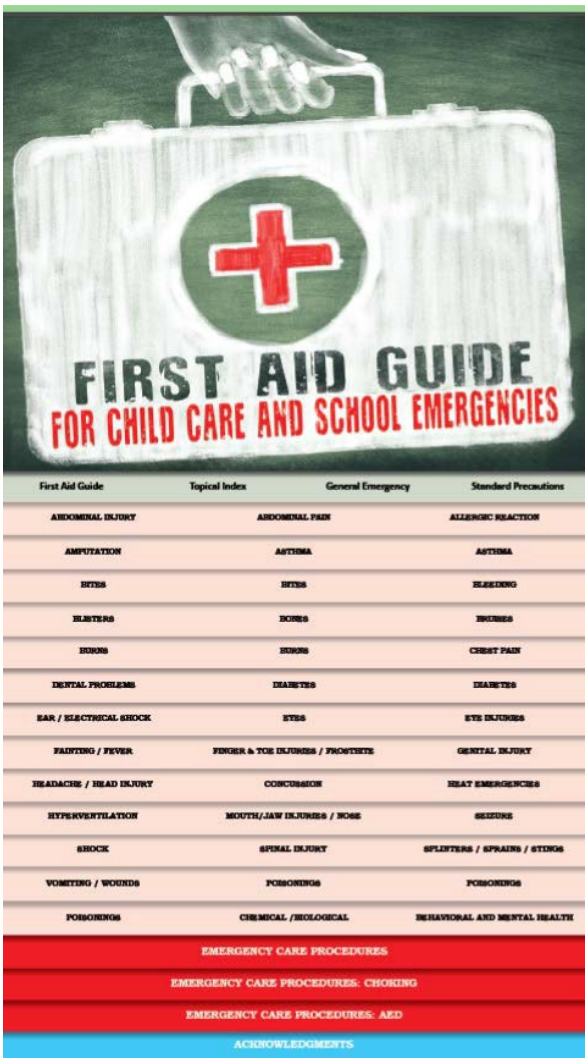
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First Aid Guide for Seizure Management



SEIZURE

NOTE: Remain calm. A seizure cannot be stopped once it starts.

SIGNS AND SYMPTOMS

- Aura- may experience unusual sensation or feeling immediately preceding seizure, such as:
  - Visual hallucination
  - Bright lights
  - Strange sound
  - Strange smell
  - Strange behavior
  - Daydreaming
- Shaking, muscle jerking, and/or falls to the ground
- Confused or unaware of surroundings, dazed
- Unable to respond to directions or questions for a brief period of time
- Loss of consciousness followed by stiffening of entire body for a few seconds followed by a period of jerking.

TREATMENT

1. Call **911** (unless individual has a seizure disorder, then follow written **emergency action plan**).
2. Wear gloves. Use Standard Precautions (see **Standard Precautions**).
3. If individual is standing or sitting, gently lower to ground to avoid a fall.
4. **Do not** place anything in individual's mouth. Place on side to prevent choking on secretions and blockage of airway by the tongue.
5. Loosen restrictive clothing. Ensure privacy.
6. If possible, place a cushion or blanket under individual's head.
7. **Do not** hold or restrain individual.
8. Clear area around the individual to prevent injury from sharp objects.
9. **Do not** give food, drink, or medications during a seizure.
10. Remain with individual during the seizure to monitor progress.
11. Observe all of the individual's activity during the seizure, including:
    - Time the seizure began.
    - Area of the body where seizure began.
    - Any movement of the seizure from one area of the body to the other.
    - Type of movements of the head, face, and arms that occur during the seizure.
12. When the seizure is over:
    - If necessary, clear secretions from mouth. Turn individual onto side to allow for drainage of secretions.
    - Monitor breathing.
    - Determine level of awareness.
    - Determine individual's ability to move arms and legs.
    - Provide privacy.
    - Check for loss of control of urine and stool.
    - Check for injuries. See appropriate procedures for treatment.
    - If individual remains unconscious after seizure is over, maintain open airway and continue to assess breathing. If necessary, certified personnel start CPR (see **CPR**).
    - Keep individual comfortable.
    - Allow individual to sleep as needed. (May last from 30 minutes to several hours.)
    - Record the length of the seizure and activity during and after the seizure.
    - If **911** not called, call parent / guardian and recommend contact with healthcare provider.

ADDITIONAL RESOURCES

CENTERS FOR DISEASE CONTROL AND PREVENTION: EPILEPSY
HTTP://WWW.CDC.GOV/EPILEPSY

EPILEPSY FOUNDATION: SEIZURE FIRST AID
HTTP://WWW.EPILEPSY.COM/GET-HELP/SEIZURE-FIRST-AID

Available online: https://www.vdh.virginia.gov/school-age-health-and-forms/school-health-guidelines-and-resources/

Epilepsy Foundation – Seizure Observation Record

EPILEPSY FOUNDATION
Eastern Pennsylvania

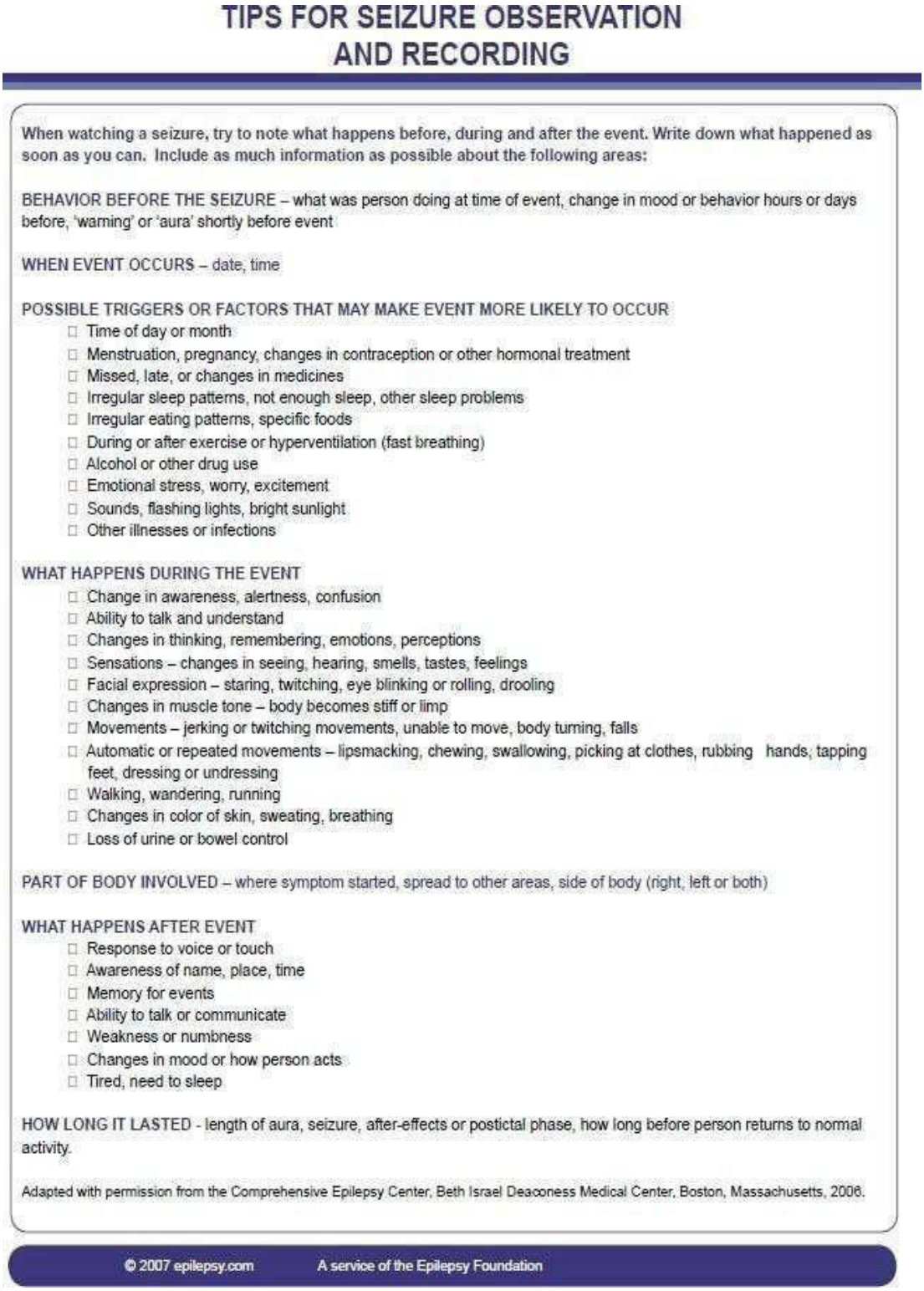
Seizure Observation Record

Name:				
Date & Time				
Seizure Length				
Pre-Seizure Observation (Briefly list behaviors, triggering events, activities)				
Conscious (yes/no/altered)				
Injuries (briefly describe)				
Muscle Tone/Body Movements	Rigid/clenching			
	Limp			
	Fell down			
	Rocking			
	Wandering around			
	Whole body jerking			
Extremity Movements	(R) arm jerking			
	(L) arm jerking			
	(R) leg jerking			
	(L) leg jerking			
	Random Movement			
Color	Bluish			
	Pale			
	Flushed			
Eyes	Pupils dilated			
	Turned (R or L)			
	Rolled up			
	Staring or blinking (clarify)			
	Closed			
Mouth	Salivating			
	Chewing			
	Lip smacking			
Verbal Sounds (gagging, talking, throat clearing, etc.)				
Breathing (normal, labored, stopped, noisy, etc.)				
Incontinent (urine or feces)				
Post-Seizure Observation	Confused			
	Sleepy/tired			
	Headache			
	Speech slurring			
	Other			
Length to Orientation				
Parents Notified? (time of call)				
EMS Called? (call time & arrival time)				

Please put additional notes on back as necessary.

Available Online: https://www.efepa.org/wp-content/uploads/2014/04/Observation-Record-6-11_Updated-2015.pdf

Tips for Seizure Observation and Recording Document



TIPS FOR SEIZURE OBSERVATION AND RECORDING

When watching a seizure, try to note what happens before, during and after the event. Write down what happened as soon as you can. Include as much information as possible about the following areas:

BEHAVIOR BEFORE THE SEIZURE – what was person doing at time of event, change in mood or behavior hours or days before, 'warning' or 'aura' shortly before event

WHEN EVENT OCCURS – date, time

POSSIBLE TRIGGERS OR FACTORS THAT MAY MAKE EVENT MORE LIKELY TO OCCUR

- ☐ Time of day or month
- ☐ Menstruation, pregnancy, changes in contraception or other hormonal treatment
- ☐ Missed, late, or changes in medicines
- ☐ Irregular sleep patterns, not enough sleep, other sleep problems
- ☐ Irregular eating patterns, specific foods
- ☐ During or after exercise or hyperventilation (fast breathing)
- ☐ Alcohol or other drug use
- ☐ Emotional stress, worry, excitement
- ☐ Sounds, flashing lights, bright sunlight
- ☐ Other illnesses or infections

WHAT HAPPENS DURING THE EVENT

- ☐ Change in awareness, alertness, confusion
- ☐ Ability to talk and understand
- ☐ Changes in thinking, remembering, emotions, perceptions
- ☐ Sensations – changes in seeing, hearing, smells, tastes, feelings
- ☐ Facial expression – staring, twitching, eye blinking or rolling, drooling
- ☐ Changes in muscle tone – body becomes stiff or limp
- ☐ Movements – jerking or twitching movements, unable to move, body turning, falls
- ☐ Automatic or repeated movements – lipsmacking, chewing, swallowing, picking at clothes, rubbing hands, tapping feet, dressing or undressing
- ☐ Walking, wandering, running
- ☐ Changes in color of skin, sweating, breathing
- ☐ Loss of urine or bowel control

PART OF BODY INVOLVED – where symptom started, spread to other areas, side of body (right, left or both)

WHAT HAPPENS AFTER EVENT

- ☐ Response to voice or touch
- ☐ Awareness of name, place, time
- ☐ Memory for events
- ☐ Ability to talk or communicate
- ☐ Weakness or numbness
- ☐ Changes in mood or how person acts
- ☐ Tired, need to sleep

HOW LONG IT LASTED - length of aura, seizure, after-effects or postictal phase, how long before person returns to normal activity.

Adapted with permission from the Comprehensive Epilepsy Center, Beth Israel Deaconess Medical Center, Boston, Massachusetts, 2006.

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Available Online:

https://www.epilepsy.com/sites/core/files/atoms/files/72TSO_TipsSeizureObserRec_05-2019.pdf

SEIZURE ACTION PLAN (SAP)

EPILEPSY FOUNDATION | END EPILEPSY

Name: _____ Birth Date: _____

Address: _____ Phone: _____

Emergency Contact/Relationship _____ Phone: _____

Seizure Information

Seizure Type	How Long It Lasts	How Often	What Happens

How to respond to a seizure (check all that apply) ☑

- ☐ First aid – **Stay. Safe. Side.**
- ☐ Give rescue therapy according to SAP
- ☐ Notify emergency contact
- ☐ Notify emergency contact at _____
- ☐ Call 911 for transport to _____
- ☐ Other _____

First aid for any seizure

- ☐ **STAY** calm, keep calm, **begin timing seizure**
- ☐ Keep me **SAFE** – remove harmful objects, don't restrain, protect head
- ☐ **SIDE** – turn on side if not awake, keep airway clear, don't put objects in mouth
- ☐ **STAY** until recovered from seizure
- ☐ Swipe magnet for VNS
- ☐ Write down what happens _____
- ☐ Other _____

When to call 911

- ☐ Seizure with loss of consciousness longer than 5 minutes, not responding to rescue med if available
- ☐ Repeated seizures longer than 10 minutes, no recovery between them, not responding to rescue med if available
- ☐ Difficulty breathing after seizure
- ☐ Serious injury occurs or suspected, seizure in water

When to call your provider first

- ☐ Change in seizure type, number or pattern
- ☐ Person does not return to usual behavior (i.e., confused for a long period)
- ☐ First time seizure that stops on its' own
- ☐ Other medical problems or pregnancy need to be checked

When **rescue therapy** may be needed:

WHEN AND WHAT TO DO

If seizure (cluster, # or length) _____

Name of Med/Rx _____ How much to give (dose) _____

How to give _____

If seizure (cluster, # or length) _____

Name of Med/Rx _____ How much to give (dose) _____

How to give _____

If seizure (cluster, # or length) _____

Name of Med/Rx _____ How much to give (dose) _____

How to give _____

Seizure Action Plan *continued*

Care after seizure

What type of help is needed? (describe) _____

When is person able to resume usual activity? _____

Special instructions

First Responders: _____

_____

Emergency Department: _____

_____

Daily seizure medicine

Medicine Name	Total Daily Amount	Amount of Tab/Liquid	How Taken (time of each dose and how much)

Other information

Triggers: _____

Important Medical History _____

Allergies _____

Epilepsy Surgery (type, date, side effects) _____

Device: ☐ VNS ☐ RNS ☐ DBS Date Implanted _____

Diet Therapy ☐ Ketogenic ☐ Low Glycemic ☐ Modified Atkins ☐ Other (describe) _____

Special Instructions: _____

_____

Health care contacts

Epilepsy Provider: _____ Phone: _____

Primary Care: _____ Phone: _____

Preferred Hospital: _____ Phone: _____

Pharmacy: _____ Phone: _____

My signature _____ Date _____

Provider signature _____ Date _____

Epilepsy.com

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EPILEPSY FOUNDATION | END EPILEPSY

Available Online: **epilepsy.com**



Available online: www.epilepsy.com/recognition/first-aid-resources

General Information for Students Who May Have a Seizure

Date:_____

To:_____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student:_____

This student has had seizures in the past. He or she may be taking medications to prevent a seizure from occurring again. A *seizure* is an event in which there is a temporary change in behavior resulting from a sudden, abnormal burst of electrical activity in the brain.

Most students who experience seizures are able to participate in regular school activities. Some students may be able to anticipate when they are getting ready to have a seizure. If a seizure is noted, or if the student tells you that a seizure is about to occur, remain calm and contact the school nurse, family, or designated contact person. Some students may have a service dog which can warn them of an impending seizure.

Seizures usually last less than 5 minutes. Call for help, but do not leave the student. Do **NOT** try to put anything in the student's mouth during a seizure. If the student is standing or sitting, gently lower the student to the ground to avoid a fall. Place the student on his/her side or stomach. Monitor the student's ability to breathe and remove hard objects that might accidentally be hit.

This student should have an Emergency Action Care Plan and **all staff** who have contact with this student should be familiar with how to initiate the plan. Any unusual behaviors or seizure activity should be reported to the school nurse and family.

Additional training for staff can be found in the Seizure Training for School Personnel guide at www.epilepsy.com website and specific information and video for bus drivers can be found on YouTube at https://www.youtube.com/watch?v=_I6UKZOelXk.

Please contact_____at_____(phone number) for additional information or if the student experiences any problems with seizures.

Rectal Diazepam for Seizures

E*pilepsy* is a chronic condition that is characterized by recurrent seizures. A *seizure* is an event in which there is a temporary change in behavior resulting from a sudden, abnormal burst of electrical activity in the brain. Many students with epilepsy have more than one seizure type and may have other symptoms as well. Some students continue to experience seizures despite medical treatment. Acute prolonged or repetitive seizures are detrimental to a student's health.

Studies show that rectal diazepam can be a safe and effective treatment for acute repetitive or prolonged seizures. Diazepam rectal gel is used in emergency situations to stop cluster seizures (episodes of increased seizure activity) in people who are taking other medications to treat epilepsy (seizures). Although intravenous diazepam can produce serious respiratory depression, published studies of rectal diazepam have found no instances of serious respiratory depression. The most common side effect of rectal diazepam is sleepiness. Other side effects that have been reported include dizziness, headache, poor coordination, pain, nervousness, slowed speech, diarrhea, and rash. The greatest incidence of side effects is when more than one dose is given.

Rectal diazepam is available as a rectal gel. The most commonly prescribed form is Diastat®, a rectal gel that comes pre-packaged as a quick delivery set in a syringe with a flexible, molded tip. Diastat Acudial 10 mg or 20 mg syringes are dialed and locked to the prescribed dose. A

2.5 mg Diastat syringe is also available. It can be stored for three years at room temperature.

Settings and Staff

The need to give rectal diazepam can occur anywhere. Measures should be taken to protect the privacy of the student as much as possible. Students who may require rectal diazepam on the bus should have an adult aide available on the bus. Guidelines regarding where and how diazepam can be administered should be covered in the student's individualized healthcare plan (IHP).

Rectal diazepam can be administered by a registered nurse, licensed practical nurse, or other adult with **specialized** training in appropriate techniques and problem management. Guidelines regarding who can administer rectal diazepam should be included in the student's health care plan. It has been approved by the U.S. Food and Drug Administration for use by family members or other non-medical caregivers. Virginia law states that school personnel specially trained in administration of rectal diazepam may administer it (specific training for unlicensed assistive personnel in Virginia public schools available from Virginia Department of Education listed in reference list). These persons should also have training in cardiopulmonary resuscitation. Any school personnel who has regular contact with a student who requires rectal diazepam should receive **general** training covering the student's specific needs, potential problems and implementation of the established school emergency plan.

Individualized Healthcare Plan

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student who requires rectal diazepam for seizures, the following items should be considered:

- Details of events which would necessitate the administration of rectal diazepam
- Need to call 911 and activate the emergency plan when rectal diazepam is given

- Healthcare Provider's order for rectal diazepam
- Student’s underlying condition and possible problems associated with the condition or treatment.
- Type of seizures student experiences and typical course of seizure
- Actions to take when the student has a seizure
- Side effects to monitor
- What to do if respiratory depression is noted
- Student’s baseline or normal behaviors.
- Whether the student experiences auras, or can anticipate when seizures may occur
- Behaviors that indicate a seizure may be about to occur
- Other medications the student is taking and signs of adverse reactions or toxicity
- Who is to be notified when the student has a seizure
- Latex allergy precautions
- Standard precautions

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Procedure for Administering Rectal Diazepam

Note: Equipment, medication and supplies provided by parents.

1. Review the procedure prior to having to implement it.
2. Verify the medication order--including dosage, and circumstances under which rectal diazepam should be administered..
3. Put on a pair of gloves.
4. Obtain assistance from another adult, if possible. **Ensure student privacy during administration.**
5. **Call 911 and activate the emergency plan.**
   ***911 must be called and the emergency plan activated whenever rectal diazepam is given by school personnel**.*
6. Remove the protective cover from the medication syringe and lubricate the rectal tip with lubricating jelly (comes with syringe).
7. Turn the student on his or her side (left side preferable) facing you. Bend the upper leg forward and separate the buttocks to expose the rectum. Place a soft item under their head, if possible.
8. If using Diastat© Acudial syringe, make sure that the dose display window indicates prescribed dose and that green "ready ban" is visible.
9. Separate the buttocks and gently insert the syringe tip into the rectum. The rim should be snug against the rectal opening. Slowly count to three while gently pushing in the plunger. Count to three again before removing the syringe. Hold the buttocks together while counting to three one more time to prevent leakage.
   Rim should be snug against the rectal opening.
10. Keep the student on their side facing you and note the time the medication was given.
11. Keep the student on his or her side and observe for side effects. Monitor respiratory status throughout the seizures and afterwards.
    Respiratory depression can be a consequence of a seizure and/or of seizure medications.
12. Remove your gloves and wash your hands with soap and water when appropriate.
13. Document the administration of diazepam, student's response, and implementation of the school emergency plan. Dispose of rectal syringe according to package insert

instructions. Make sure someone remains with the student to observe for side effects and seizure activity.

Note: Medication Administration, School Nurses Guide: A Training Manual for Unlicensed Public School Employees includes instruction on administering rectal medication and is available from the Virginia Department of Education (2022) online: https://www.vdh.virginia.gov/content/uploads/sites/58/2021/01/DOEMedication-administrations-manual.pdf

Sources:

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Seizure Action Plan with Diastat from Epilepsy Foundation of Virginia (2014).

Seizure Treatment Plan with Diastat

Student Name: _____

Treatment Order Date: _____

Age: _____ Weight: _____

Treatment:

- DIASTAT® ACUDIAL™ (diazepam rectal gel) _____ mg rectally prn for:

  Seizure > _____ minutes OR for _____ or more seizures in _____hours

- **OTHER**: _____

  _____

- **Call 911 if**:
  - Seizure does not stop within _____minutes of giving DIASTAT ACUDICAL.
  - Child does not start waking up within _____ minutes after seizure is over (no DIASTAT ACUDIAL given).
  - Child does not start waking up within _____ minutes after seizure is over (after DIASTAT ACUDIAL given).

Following a seizure:

_____ Child will return to class.

_____ Child should rest in the nurse's office.

_____ Parents/caregiver should be notified immediately.

_____ Parents/caregiver should receive a note/copy of the seizure report sent home with child.

Physician/Nurse Practitioner (Printed): _____

Signature: _____ Date: _____

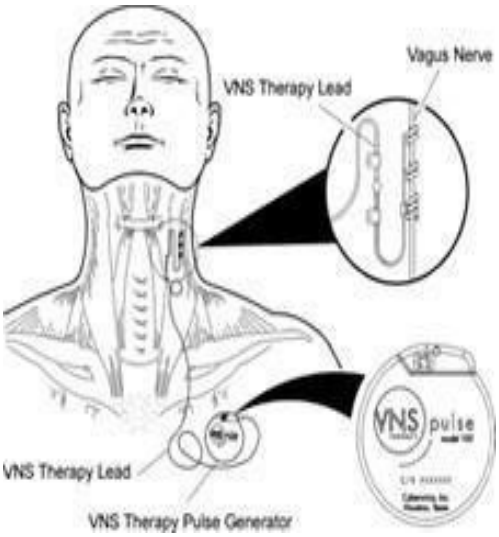
Address: _____

Phone: _____

Available online: https://www.epilepsy.com/local/virginia

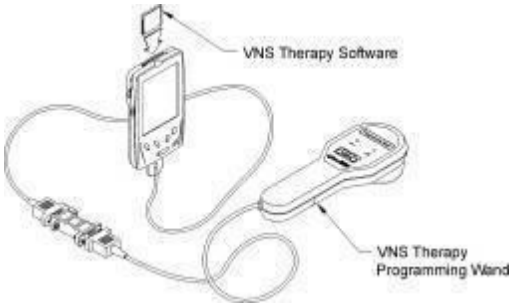
Vagal Nerve Stimulation for Seizures

Epilepsy is a chronic condition that is characterized by recurrent seizures. A *seizure* is an event in which there is a temporary change in behavior resulting from a sudden, abnormal burst of electrical activity in the brain. Many students with epilepsy have more than one seizure type and may have other symptoms as well. Some students continue to experience seizures despite medical treatment. Acute prolonged or repetitive seizures are detrimental to a student's health.



Vagal nerve stimulation (VNS) has been found to reduce the frequency and intensity of some seizures. It involves the insertion of a device similar to a pacemaker under the skin on the left side of the chest. This vagal nerve stimulator sends intermittent electrical signals to the brain by stimulating the left vagus nerve in the neck. The vagus nerve is one of the cranial nerves (X) that controls the muscles responsible for swallowing, coughing and voice sounds. It is not fully understood how VNS works, but the theory is that the stimulation alters nerve pathways that lead to a seizure. Benefits of VNS are not always immediately apparent. Seizure activity may improve immediately, or it may improve over a two-year time period.

The vagal nerve stimulator works in two ways. It is automatically programmed to deliver stimulation; typically the stimulator activates "on" for 30 seconds once every 5 minutes, but has many other settings set by the healthcare provider. It can also be activated to give extra stimulations manually between pre-programmed stimulations by placing a magnet over the stimulator and then removing the magnet. A newer VNS device, AspireSR has been designed to detect possible seizure activity and can automatically deliver additional stimulation when it detects a rapid heart rate rise, an indication of an impending seizure in 82% of patients with epilepsy.



VNS is FDA approved for children and adults 12 years of age and older, but is used in many young children.

The VNS system consists of a pulse *generator* which is battery- operated and looks much like a pacemaker implanted under the skin of the chest.

Programming of the generator is accomplished with a wand attached to a computer. A strong magnet can also be used to activate the VNS on demand if the student senses that a seizure is about to occur or has just started. In addition, the magnet can temporarily suspend activity of the VNS if activation of the VNS affects normal eating, speaking, or singing. Portable magnets can be carried or worn by students. The most common side effects of VNS are hoarseness and tingling or pain in the throat or neck. Cough, headache, and ear pain have also been reported. Side effects tend to diminish over time. Equipment that could interfere with the stimulator should be avoided. This includes strong magnets, MRI scanners, hair clippers, computers, and loudspeaker magnets. Areas which display pacemaker warning signs should also be avoided. The additional handheld magnets supplied for manual stimulation of the system can damage credit cards, and cell phones.

Settings and Staff

The VNS system delivers stimulation on a regular, ongoing basis. The need for additional VNS to prevent a seizure can occur anywhere. Measures should be taken to protect the privacy of the student.

VNS can be administered by the student or by an adult with training in appropriate VNS techniques and problem management. Any school personnel who has regular contact with a student who requires VNS should receive general training covering the student's specific needs, potential problems and implementation of the established emergency plan. This training should include what to do when a seizure occurs and how and when to activate VNS.

Individualized Healthcare Plan

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student who might require vagal nerve stimulation, the following items should be considered:

- Student's underlying condition and possible problems associated with the condition or treatment.
- Type of seizures student experiences and typical course of the seizure
- Whether the student experiences auras, or can anticipate when seizures are about to occur
- Behaviors that indicate a seizure may be about to occur
- Actions to take when the student has a seizure
- When and how to use VNS magnets
- When to check Pulse Generator battery
- Side effects to monitor
- Student's baseline or normal behaviors.
- Other medications the student is taking and signs of adverse reactions or toxicity

- Standard precaution

Sources:

American Association of Neurological Surgeons. (n.d.). *Vagus nerve stimulation*. AANS.

Cleveland Clinic. (n.d.). *Vagus nerve stimulation*. Available online at: https://my.clevelandclinic.org/health/treatments/17598-vagus-nerve-stimulation-vns#:~:text=A%20note%20from%20Cleveland%20Clinic,then%20travels%20to%20your%20brain.

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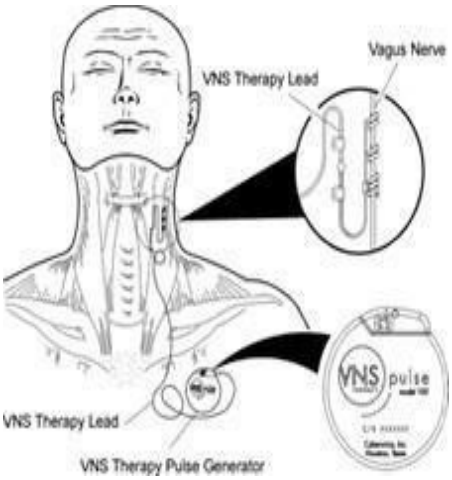
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Procedure for Activating Vagal Nerve Stimulation

Note: Equipment and supplies provided by parents/guardians.

1. Review the literature that comes with the vagal nerve stimulator.
2. Student or trained caregiver should keep the magnet with the student at all times. The watch-style magnet attaches to the wrist with a wristband. The pager-style magnet comes with a belt clip so that the magnet and clip can be removed as a unit from the belt without coming apart. Always keep magnets at least 10 inches away from tablet computers, credit cards, televisions, computers, microwave ovens, watches, or other magnets.
3. If the student senses a seizure is about to occur, place the magnet over the Pulse Generator site for one second and then move it away. This will cause the VNS system to deliver extra stimulation. This can be done by the student or by any adult trained in using VNS.

   To use the pager-style magnet, remove the belt clip and magnet from the belt and place the label against the Pulse Generator. To use the watch-style magnet, position the wrist so that the label can be placed over the generator.
4. To temporarily stop stimulation (turn "off" the Pulse Generator) when the student needs to sing or speak in public, while eating, or if the stimulation is ever painful, put the magnet over the Pulse Generator and leave it there. The Pulse Generator will <u>not</u> stimulate while the magnet is in place over top of it, but it will start when the magnet is removed. The magnet should not be used for more than four hours in a row because it can decrease the Pulse Generator battery.
5. Check the pulse generator battery on a regular basis. Pass the magnet over the Pulse Generator for one second to see if it causes a stimulation and is working.
6. If stimulation ever hurts, hold the magnet in place to stop stimulation and contact the school nurse, family, and health care provider immediately.
7. If the student complains of sore throat, hoarseness, or any other problems with the VNS, document in the student log and notify the school nurse and family.

Sources:

Cyberonics. (2013). An Introduction to VNS Therapy for people with epilepsy and their families.

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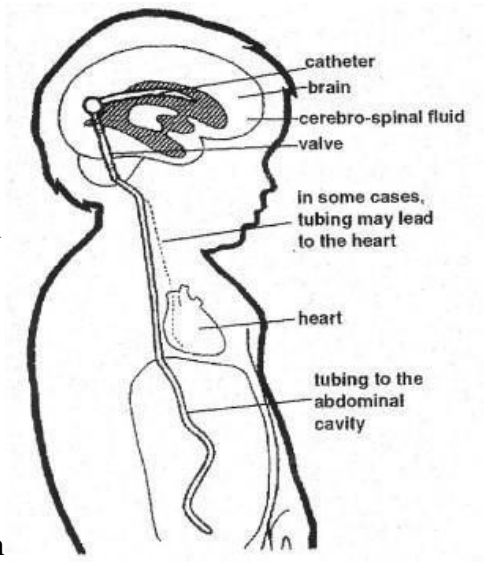
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Ventricular Shunt

Overview



A ventricular shunt is a method of treatment for hydrocephalus. Hydrocephalus is when excess cerebrospinal fluid is in the ventricles of the brain. A ventricular shunt is surgically placed to drain the excess fluid from the ventricles in the brain into another part of the body. The most common type is the ventriculoperitoneal shunt (VP-shunt), which drains fluid from the ventricles of the brain to the peritoneal (abdominal) cavity. A ventriculoatrial shunt (VA-shunt) drains the excess fluid to the right chamber of the heart, the right atrium.

Students who have a shunt need routine monitoring to ensure the proper functioning of the shunt. Shunts can become infected, obstructed, disconnected, or kinked. If the shunt malfunctions, cerebrospinal fluid does not drain properly and the student with hydrocephalus can develop increased intracranial pressure and possible brain damage. Shunt malfunctions can be detected by a change in behavior, headache, irritability, vomiting, and/or difficulties with coordination. Shunt monitoring involves watching for behaviors that may indicate the shunt is not functioning. The family is the best source of information with regards to what signs the student is most likely to exhibit when the shunt is not functioning properly. Any such signs should be reported to the school nurse, family and/or health care provider immediately.

Settings and Staff

Students with a shunt can attend a regular classroom. Many students with a shunt are able to participate in regular school activities, with modifications determined by the family, health care provider, school nurse, and school staff. Activities that may result in damage to the shunt, such as contact sports, may be restricted.

Monitoring of a ventricular shunt may be performed by the school nurse, family, teacher aide, or other staff person who has training in monitoring the shunt of the student. General training should cover the student's specific health care needs, signs of increased intracranial pressure, potential problems, and how to implement the established emergency plan.

Individualized Healthcare Plan

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with a ventricular shunt, the following items should be considered:

Student's underlying condition and possible problems associated with the condition or treatment

- Student's baseline or normal behaviors
- Behaviors that indicate that there may be a malfunction of the shunt. The family can

usually describe which behaviors are specifically indicative of shunt malfunction in their child

- Symptoms and behaviors which should be reported to the school nurse and family
- Medications the student is taking and signs of adverse reactions or toxicity
- Health Care Providers orders regarding shunt and monitoring
- Determination of the need for seizure precautions
- Latex allergy precautions
- Standard precautions

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Illustration sources:

National Hydrocephalus foundation. (2014). *Treatment of hydrocephalus*. Used with permission.

Procedure for Monitoring a Ventricular Shunt

1. Document observations of the student's:
    a. Behavior
    b. Level of activity
    c. Response to, and awareness of, the environment
    d. Coordination

    Using knowledge of the student's usual behavior can help staff discriminate between usual and unusual behavior.

2. Obtain baseline measurements of the student's vital signs, especially blood pressure and pulse rate.
3. Document any signs of shunt malfunction or signs of infection in the school health record or the student's log. Alert the school nurse and family of any changes or concerns.
   See below for signs of shunt malfunction or infection.

Possible Problems with Ventricular Shunts

1. **Signs Of Increased Intracranial Pressure**
    a. Headache
    b. Nausea
    c. Vomiting
    d. Double vision or blurred vision
    e. Irritability or restlessness
    f. Personality change
    g. Lethargy or drowsiness
    h. Inability to follow simple commands
    i. Decreased orientation to time and place
    j. Seizures

    When a shunt malfunctions, the fluid in the ventricles builds up, resulting in increased intracranial pressure (increased pressure in the brain). School personnel who are uncertain

of their observations should consult with the school nurse and/or family to determine if the health care provider should be notified.

It is **important** that the school staff learn what is normal behavior for the individual student and what behaviors indicate the presence of increased intracranial pressure. Seizures must be monitored by the school staff and treated appropriately. (See the section on Seizures in this manual).

2. Persistent Increased Pressure

If the pressure continues to increase in the ventricles, the student's pupils (the dark area in the center of the eye) may become smaller and react very slowly to light. If the pressure continues to increase, the student may complain of increased headache and the student's pupils may enlarge and become fixed when exposed to light. The pulse may decrease, breathing may become irregular, and eventually, death may occur.

The physician may determine that the valve of the shunt must be pumped to reduce intracranial pressure. **The risks involved with the pumping of the shunt are great**. If too much cerebrospinal fluid is removed, there is a resulting decrease in the amount of pressure in the brain. The ventricles may collapse inward, resulting in additional brain damage.

This procedure should never be done in a school setting by non-physician school staff.

3. Signs of shunt infection

a. Nausea
b. Vomiting
c. Headache
d. Lethargy
e. Fever
f. Feeding problems

Any signs of shunt infection should be reported to the school nurse, family and/or healthcare provider. A shunt infection requires administration of antibiotics. The shunt may need to be replaced if the infection is not treated successfully.

Sources:

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children* (10th ed.). St. Louis: Elsevier Mosby, 1483-1490.

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Selekman, J. (2013). *School nursing: A comprehensive text* (2nd ed.). Philadelphia: F.A. Davis, 748-750.

General Information for Students with Ventricular Shunts

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has a ventricular shunt used to drain excess fluid from the brain. The shunt is under the skin and is not visible except for a slight bulge.

Most students with ventricular shunts are able to participate in regular school activities, but may need to avoid contact sports. Blows to the head should be avoided. If a blow to the head occurs, the school nurse and family should be notified and the student should be observed closely for any changes in behavior.

Any other changes in behavior should be reported to the school nurse and family.

Contact_____at_____(phone number) for additional information or if the student experiences any problems with the ventricular shunt.

Source: Adapted from: Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and youth assisted by medical technology in educational settings: Guidelines for care* (2nd ed.). Baltimore: Paul H. Brookes Publishing.

Chapter 6: Care of the Respiratory System

Asthma

Peak Expiratory Flow Rate Monitoring

Inhalers and Spacers

Nebulizer Treatments

Oxygen Use

Nasal Cannula Oxygen Mask

Pulse Oximetry

Tracheostomy

Tracheal Suctioning

Tracheostomy Tube Changes

Tracheostomy Oxygen Administration

Manual Resuscitator

Nose and Mouth Suctioning

Chest Physiotherapy Postural Drainage and Percussion

Mechanical Ventilators

COVID-19

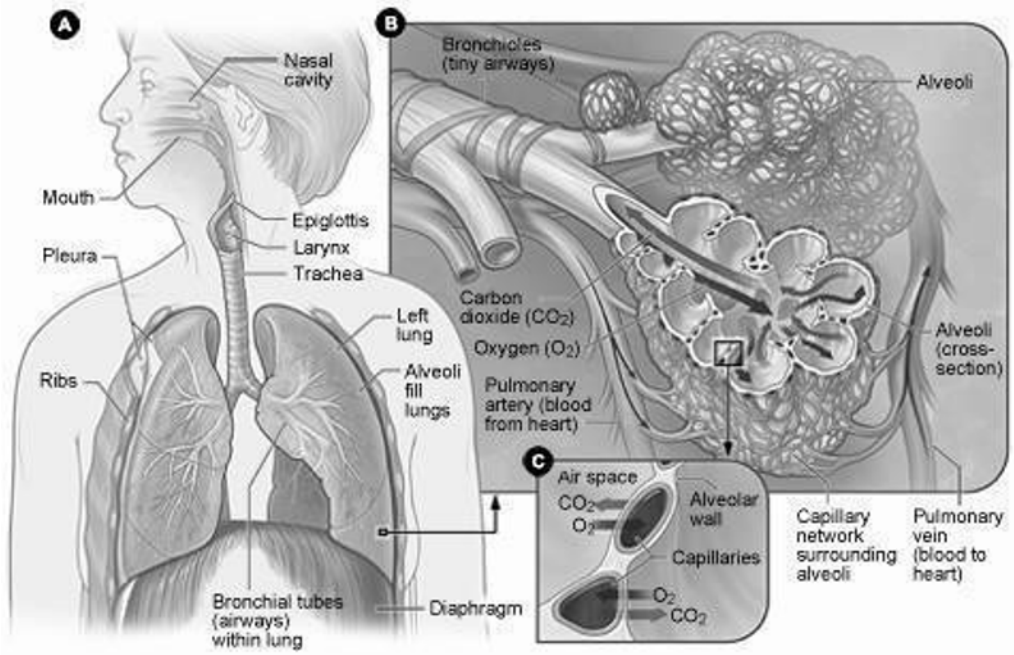
Respiratory System

Overview

The respiratory system brings air into the body. In the lungs, oxygen from the air is exchanged for carbon dioxide. The oxygen in the air travels from the alveoli of the lungs through the bloodstream (with the help of hemoglobin) to cells in all parts of the body. The cells use oxygen as fuel and give off carbon dioxide as a waste gas. This waste is carried by the blood back to the lungs to be eliminated. The average adult takes 15-20 breaths per minute--over 20,000 breaths per day.

The structures of the *upper airway* filter, warm, and humidify the air taken in. Air enters the body through the *nose* and *mouth*. *Sinuses*, hollow bones of the head, help to warm and humidify the air, while hairs in the nose filter it. The air passes through the *pharynx* at the back of the throat and the *larynx*, which contains the vocal cords.

The air then enters the *lower airway* at the *trachea* (sometimes called the "windpipe"). A flap of tissue called the *epiglottis* covers the windpipe during swallowing so that food and drink do not enter the lungs. The trachea divides into two main *bronchi*. The bronchi further divide into *bronchioles,* which divide many times until the *alveoli* are reached. It is in the alveoli, which are covered in tiny capillary blood vessels, that the oxygen in the air is exchanged for carbon dioxide from the body. The respiratory tract is lined with *mucus* and tiny hairs called *cilia* which trap and then push out dust particles. Most of the airways are surrounded by smooth muscle, which can tighten and narrow.



The *diaphragm* is a dome-shaped muscle that separates the chest cavity from the abdominal cavity. When the diaphragm and *intercostal muscles* of the ribs contract, they pull downwards, allowing air to enter on inspiration. Nervous centers in the brain and spinal cord control the initiation of breathing by the diaphragm.

Disorders Involving the Respiratory System

A variety of diseases and conditions can affect the respiratory system and lead to ineffective gas exchange. They can be categorized by the structures they affect:

- Disorders affecting the upper airway
    - Abnormalities of the nasal or oral cavity such as cleft palate
    - Abnormalities of the facial muscles or bones
    - Neuromuscular diseases such as muscular dystrophy and other progressive neurological diseases
    - Conditions which affect swallowing and the protection of the airways from food
- Disorders affecting the lower airway
    - Conditions causing bronchospasm, such as asthma
    - Infectious diseases such as bronchitis which cause a buildup of mucus of fluid that narrows the airways and limits airflow
    - Diseases such as cystic fibrosis which cause excessive mucus that can clog the airways
    - Abnormalities of the trachea and bronchi which can cause narrowing (stenosis), obstruction (swelling or tumors) or abnormally limp airways (tracheomalacia)
    - Chronic obstructive pulmonary disease (COPD) which is usually caused by smoking or air pollutants which damage the airways and alveoli
- Disorders of the alveoli
    - Bronchopulmonary dysplasia (chronic lung disease)
    - Pneumonia
- Disorders affecting the respiratory muscles
    - Spinal cord injuries
    - Progressive degenerative neuromuscular diseases such as muscular dystrophy
- Disorders affecting the central nervous system's stimulus to breathe
    - Brain damage from birth, trauma, drowning
    - Progressive neurological conditions
    - High spinal cord injuries

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Illustration Source:

National Heart, Lung, and & Blood Institute (2012). *The respiratory system*. https://www.nhlbi.nih.gov/health-topics/how-lungs-work

Asthma

Overview

Asthma causes swelling of the airways. This results in narrowing of the airways that carry air from the nose and mouth to the lungs. Allergens or irritating things entering the lungs trigger asthma symptoms. Symptoms include trouble breathing, wheezing, coughing and tightness in the chest. Asthma can be deadly.

- There is no cure for asthma, but it can be managed with proper prevention of asthma attacks and treatment.
- More Americans than ever before have asthma. It is one of this country's most common and costly chronic conditions.
- Approximately 25 million Americans have asthma. This equals to about 1 in 13 Americans, including 8 percent of adults and 7 percent of children.
- About 20 million U.S. adults age 18 and over have asthma.
- It is the leading chronic disease in children
- Currently, there are about 5.1 million children under the age of 18 with asthma.
- Asthma is more common in boys than girls.
- In 2019, 44.3 percent of children age 18 and younger who had asthma reported having one or more asthma attacks in the past year.
    - About 47.2 percent of children under the age of 5 with asthma had an episode.
    - https://www.aafa.org/asthma-facts/

Asthma is one of the leading causes of school absences and the third leading cause of hospitalization for children. The Centers for Disease Control and Prevention (CDC) estimates that asthma results in 10.5 million lost school days each year. The impact of illness and death is disproportionately higher among low-income populations, minorities, and inner-city children.

The CDC created the National Asthma Control Program to support the goals and objectives of Healthy People 2030 for asthma. The goals of the program are to reduce the number of deaths, hospitalizations, emergency department visits, school or work days missed, and limitations on activity due to asthma.

Definition

Asthma is a chronic lung disease that causes airway inflammation. Inflamed airways are particularly sensitive and tend to overreact to certain "triggers." Triggers can include numerous physical, chemical, and pharmacologic agents, such as allergens, viral infections, cold air, and exercise. When the airways react to a trigger, three physiologic processes happen:

1. Bronchospasm, contraction or squeezing of the involuntary muscle surrounding the airway
2. Inflammation and edema (swelling) of the mucous membranes of the airways
3. Excessive, thick secretions from mucous glands.

Bronchospasm, edema, and increased mucus narrow the airway and result in less air getting into and out of the lungs thereby causing wheezing, coughing, chest tightness, and/or difficulty breathing. The CDC describes it as "trying to breathe through a straw stuffed with cotton." Wheezing is a high-pitched whistling or squeaky sound that can be made when air moves through narrowed airways. These symptoms can be mild or moderate and affect activity levels, or they can be severe and life threatening. Therefore, people caring for a student with asthma need knowledge and skill to assess and support the student.

Common Asthma Triggers

Asthma triggers and symptoms vary from one person to another. Several categories of triggers have been identified:

- ***Allergens*** such as pollen, mold, animal dander, dust mites, and cockroaches.
- ***Irritants*** such as cigarette smoke, chalk dust, perfume, pesticides, strong odors, cold air, and weather changes.
- ***Medical conditions*** such as viral respiratory infections and gastric reflux.
- ***Physical exercise***, especially during cold weather. Exercise-induced asthma (EIA) is precipitated by vigorous physical activity and can occur in most children with asthma.

Environmental Control in Schools

Although triggers to asthma cannot be eliminated, it is important to identify ways to decrease exposure to as many triggers as possible. All schools should be smoke free to avoid secondhand exposure to cigarette smoke. Efforts to minimize environmental irritants in the school setting include decreasing exposure to harsh cleaning supplies, reducing exposure to chalk dust, chemical irritants in science and art classes, and exhaust fumes from idling buses, decreasing or eliminating animals in school, using Integrated Pest Management techniques to reduce the need for insecticides, central air conditioning to keep pollen and dust outside, and decreasing mold by controlling moisture problems.

Recommendations of Expert Panel Report-3 Asthma Guidelines

The National Asthma Education and Prevention Program (National Heart, Lung, and Blood Institute of the National Institutes of Health) has established guidelines for diagnosis and management of asthma since 1991. Its (third) Expert Panel Report 3 was presented in 2007 with a more recent 2016 update. The six key messages from the EPR-3 Asthma Guidelines are:

1. Inhaled corticosteroids are the most effective anti-inflammatory medication for long term management of persistent asthma.
2. Use written action plans to guide patient self-management.
3. Asthma severity should be assessed at the initial visit to determine initial treatment.

4. Assess and monitor asthma control at all follow-up visits and adjust treatment as necessary.
5. Schedule periodic follow up visits (at least every 6 months).
6. Act to control environmental exposures that worsen asthma.
    a. In addition, four other key messages have been identified by asthma care groups:

All patients should also receive:

1. Asthma education by a qualified health professional
2. Referral to an asthma specialist, when appropriate
3. Education regarding the danger of overuse of short-acting beta-agonists
4. Information regarding risk factors for death from asthma.

Managing Asthma in Schools

The National Asthma Education and Prevention Program School Asthma Subcommittee has developed guidelines for schools to use in developing a plan to assist their students with asthma. Copies of *Managing Asthma: A Guide for Schools* can be downloaded or mailed without charge (see Resources in this section). The action items identified for school asthma management are:

1. Establish an asthma management team.
    a. designate one person to coordinate and oversee asthma management activities
    b. involve staff from across the school to ensure coordination
2. Identify students who have asthma.
    a. identify and track students who have asthma and the services they need
    b. ensure that students with asthma have a written asthma action plan on file
3. Provide care, support, and resources.
    a. provide students who have asthma with access to appropriate support services, resources, and assistance from trained personnel (including case management)
    b. assess students' asthma control (e.g., peak flow meter, medication use)
    c. encourage interaction with the student's health care provider
    d. document and evaluate services provided to students who have asthma
4. Ensure quick and easy access to prescribed medications.
    a. ensure medication access during all school and school-sponsored activities
    b. support students who have asthma who carry and administer their own medications (*Code of Virginia* §22.1-274.2)
5. Maintain a school-wide plan for emergencies.
    a. develop clear emergency procedures for responding to asthma attacks
    b. ensure availability of appropriate asthma medications and devices in case of emergency
    c. facilitate re-entry to school following an asthma attack
6. Provide a healthy school environment.
    a. establish an indoor air quality program
    b. regularly assess environmental risks
    c. reduce allergens, irritants, and other asthma triggers
7. Enable full participation.
    a. encourage and support full participation of students who have asthma
    b. modify activities when necessary
    c. watch for reluctance or inability to participate in activities

8. Educate students, staff, and families.
    a. provide asthma education to students who have asthma and their families to help improve their asthma self-management skills
    b. conduct in-services for all staff about managing asthma and allergies
    c. provide asthma education for the entire student body
9. Promote partnerships.
    a. facilitate open and cooperative exchange of information among school staff, parents, and guardians, students, and health care providers
    b. coordinate school asthma activities as much as possible with other school programs and with community service organizations that can provide additional resources
    c. Studies have found that school nurses can play a significant role in helping students manage their asthma. The following page outlines specific roles and responsibilities the National Asthma Education and Prevention Program recommended for school nurses in a school's Asthma Management Plan:



Asthma Management Program in the School

ROLES AND RESPONSIBILITIES FOR
SCHOOL NURSES

Participate on a team to develop, implement, and monitor the asthma management program

- Provide leadership and technical expertise to school asthma management team.

Identify and track students who have asthma

- Facilitate the development, communication, and use of asthma action plans with students, parents and guardians, staff, and health care providers.
- File asthma action plans in a secure location with easy access in an emergency, and share copies with relevant staff in accordance with privacy laws.

Provide care, support services, and resources for students who have asthma

- Oversee, deliver, and document care: Administer medication, monitor asthma control, develop individualized health service plans, coordinate care, and maintain records.
- Delegate care to staff only in accordance with your State Nurse Practice Act and other prevailing laws, rules, and regulations.

Ensure quick and easy access to prescribed medications

- Provide safe storage and easy access to prescribed medication when needed.
- For students who carry their own asthma inhalers, ask parents or guardians if they would like to provide a second inhaler to store at school.
- Provide feedback to parents and health care providers about a student's readiness to carry and self-administer medication.
- Periodically review students' technique to ensure proper use of inhalers.
- Train designated back-up staff to provide quick and easy access to students' medications when you are unavailable.

Maintain a school-wide plan for asthma emergencies

- Help establish a school-wide plan for asthma emergencies.
- Train staff to follow the plan, including whom to contact and how when a student has an asthma attack.
- Track and report asthma attacks, calls to 9-1-1, and related emergency events.
- Assess the response after each event, and recommend changes to the emergency plan and protocols as needed.

Provide a healthy school environment and reduce asthma triggers

- Train teachers, coaches, and other staff to help students avoid or reduce exposure to their asthma triggers in line with students' asthma action plans.
- Help the school's indoor air quality team prioritize key health and safety issues to tackle.
- Refer student to his or her health care provider to identify or test for asthma triggers if student's asthma is not controlled.
- Use the student's asthma action plan to guide individual recommendations.

Enable full participation by students who have asthma

- Advise teachers, instructors, and coaches on modifying activities to match students' current asthma status or based on students' asthma action plans.
- Teach staff how to use metered-dose inhalers to assist students, as appropriate, to pre-medicate before exercise.

Educate students, staff, and parents and guardians about asthma

- Obtain continuing education in asthma and consider becoming a certified asthma educator.
- Provide asthma education to students who have asthma and their families to help them improve asthma self-management skills.

Promote partnerships among school staff, students, parents and guardians, health care providers, and the community

- Communicate policies, procedures, and other information related to asthma management to staff, parents and guardians, students, and health care providers and listen to their concerns and feedback.
- Coordinate with community organizations that can provide additional resources and support to school staff, students, and families.

Available Online: https://www.nhlbi.nih.gov/files/docs/resources/lung/NACI_ManagingAsthma-508%20FINAL.pdf

Monitoring and Use of Peak Flow Meters

The use of a peak flow meter is an important part of asthma care that allows earlier detection of asthma flare ups in order to prevent more serious attacks. The peak expiratory flow meter (PEFM) is a portable, hand-held device used to measure the ability to move air out of the lungs. The PEFM is commonly used over a two-week period to determine the student's normal peak expiratory flow rate, the volume of air that can be forcibly expelled from the airways. This rate can then be used for comparison when the child has signs of breathing difficulty. Students with asthma (especially moderate or severe asthma) or other respiratory conditions can use peak flow readings to help recognize early changes that may be signs of worsening respiratory status or to determine the severity of an asthmatic episode. Altered peak flow readings can sometimes detect airway changes before symptoms appear. (Readings are effort-dependent, meaning that a poor effort will yield poor results). Readings can be used to guide use of additional medication and to help determine when to seek emergency care.

Peak flow rate monitoring can be performed by the student, school nurse, family, teacher, aide, or other staff person who has had general training in its use. General training should cover the student's specific health care needs, how to obtain a peak flow reading, and to use the student's established action plan based on peak flow results. See Procedure for Peak Flow Rate Monitoring and students' individualized plans for further guidelines.

Administering Medication

There are two basic types of medications used to control asthma symptoms. One type of medication is used for quick relief when a student has asthma symptoms and usually involves bronchodilators to relax the muscles and open the airways. The other type of medication is used to prevent asthma symptoms by decreasing inflammation. It is important to understand the differences between the two types. Each treats different problems associated with asthma and should never be used interchangeably.

Emergency, Quick Relief, or Rescue Medications work very quickly and are used to open the airways in asthma attacks. They are usually bronchodilators and work by relaxing the muscles surrounding the airways so that the airways open and allow the child to breathe easier. They may be used before exercise to keep the airways open. Quick relief medications often are delivered through metered dose inhalers (MDI) and usually work for about four hours. Students should always have ready access to their emergency inhaler. See Procedure for Use of Metered Dose Inhalers. Examples of common bronchodilators that are emergency medications include:

- Albuterol (Proventil, Ventolin, ProAir)
- Levalbuterol (Xopenex)

Prevention Medications include anti-inflammatory and other long-acting medications to prevent asthma symptoms. They work slowly (over 12-24 hours) and keep airways open by decreasing the inflammation or swelling in the airways and the amount of mucus produced. These medications are given on a regular basis (often for weeks or months at a time) and are usually administered outside of school hours. They generally **will not** stop an acute asthma attack. Students may use a

combination of more than one long-acting medication to control asthma symptoms. Examples of common prevention medications include:

Metered Dose or Diskus Inhalers:

- Corticosteroids
    - Beclomethasone (QVAR, Vanceril)
    - Budesonide (Pulmicort)
    - Ciclesonide (Alvesco)
    - Flunisolide (Aerospan)
    - Fluticasone (Flovent)
    - Mometasone (Asmanex)
- Nonsteroidal
    - Cromolyn sodium (Intal)
- Combined Medication (inhaled corticosteroid + long-acting beta-agonist)
    - Fluticasone/Salmeterol (Advair)
    - Budesonide/Formoterol (Symbicort)
    - Mometasone/Formoterol (Dulera)

Oral Medications

- Corticosteroids
    - Methylprednisolone (Medrol)
    - Prednisolone (Pediapred, Prelone)
    - Prednisone (Orasone, Sterapred)
- Leukotriene modifiers
    - Montelukast (Singulair)
    - Zafirlukast (Accolate)
    - Zileuton (Zyflo)
- Theophylline (rarely used)
    - Slo-bid, Theo-Dur, Elixophyllin, Theochron
- Immunomodulators
    - Omalizumab (Xolair subcutaneous injection, 1-2 times/month)
    - Mepolizumab (Nucala subcutaneous injection monthly)

Treating Asthma Attacks

The most common symptoms of asthma are coughing, wheezing, chest tightness, and shortness of breath. Symptoms may occur after physical exercise or at any time after exposure to an allergen, irritant, or weather change. Other symptoms include having less energy than usual, tightening of neck muscles with breathing, sucking in of the chest with each breath (retractions), and grayish, cyanotic tint to nail beds and lips. Children may have difficulty talking or become anxious when they have an asthma attack. Very young children may complain of stomach aches, headaches, or scratchy throats when their asthma is worsening.

During an asthma attack, it is important to stay calm, have the student sit in a comfortable position, and follow the instructions on the student's Emergency Asthma Action Plan. Get a peak flow

reading, if a peak flow meter (PFM) is available, and administer medication if that is part of the Emergency Asthma Action Plan. Re-assess the student and if no improvement or symptoms worsen, follow the Action Plan, including notifying and getting help from the people identified in the plan. **Do not leave the student unattended.**

Physical Education and Sports Adjustments

Some students have exercise-induced asthma (EIA), which occurs after vigorous exercise or activity. In addition, *any* student with asthma can experience EIA. The goal of managing EIA is to allow students to participate in any activity without asthma symptoms. These students may need inhaled medication prior to exercise. Therefore, medication should be **available and convenient**. Teachers and coaches need to be aware that the student may need medication before participating in vigorous exercise and may need to stop the activity if asthma symptoms occur. Activity may need to be limited for a student who has recently had an asthma attack.

Warm-up and cool-down periods may be needed. The student with asthma may not be able to exercise on a recently mowed field or during very cold weather. Guidelines for physical activity and need for medication should be covered in the student's individualized healthcare plan (IHP). Additional plans may need to be developed for activities occurring after school hours.

Asthma Education and Training

In general, students should be taught to be responsible for managing their own asthma. An asthma education program in the school helps students learn how to control their asthma symptoms and prevent acute attacks. Family and school staff also need to learn about asthma and its management.

To provide comprehensive management of asthma in students, there must be collaboration between the student, the family, the health care provider, and the school.

Communication and planning is essential to successful collaboration. See Resources at the end of this section.

Individualized Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. It is extremely important for the student with asthma to have **written** plans in place outlining how to manage the student's asthma on a daily basis and detailing what to do in an emergency.

An IHP for the student with asthma should consist of **two** components. The first, the Asthma Care Plan is a detailed outline of how to manage the student's asthma, including daily management, monitoring, medications, physical activity guidelines, as well as emergency management and emergency contacts. The second, the Asthma Action Plan (or Emergency Asthma Action Plan) includes only the information that is essential to know if the child needs immediate care for an asthma attack.

It should be noted that Section 22.1-274.2 of the *Code of Virginia* requires local school boards to develop and implement policies to permit a student with asthma to possess and self- administer inhaled asthma medications during the school day, on school property, or at school- sponsored activities. Written permission from both the student's parent and health care provider, as well as an individualized health care plan, are required.

A sample Virginia Asthma Action Plan follows this section and can be used in developing individual action plans.

In developing an IHP for a student with asthma, the following items should receive particular attention:

- Student's baseline status, including, color, respiratory rate, pulse, and blood pressure and assessment of changes in this status
- Healthcare provider's orders for management of asthma
- Asthma triggers, especially those that might be encountered at school
- Medications, both preventive and emergency medications, including which ones will be kept at school and whether students may carry/use medication outside the school clinic (with healthcare provider's orders)
- Student's self-care skills and knowledge of early signs of respiratory distress
- Emergency contact information
- Need for peak flow monitoring. If used, include the student's best peak flow reading, the frequency/timing of measurements, and reasons for obtaining additional measurements
- Symptoms usually exhibited by the student at the onset of asthma flare-ups
- Symptoms exhibited by the student which require prompt or emergency action
- Protocol for handling increased symptoms or emergency situations
- Determination of peak flow rate values that should be reported to the family
- Emergency contact information for the family and health care provider
- Activity modifications, if any
- Identity of school personnel who need to know the student's Action Plan and identification of personnel who can assist in an emergency
- Schedule and instructions for cleaning of any tubing and equipment needed
- Plan or system for determining when an MDI needs to be replaced
- Maintenance of confidentiality and the student's right to privacy
- Standard precautions

Resources:

Asthma and Allergy Foundation of America: *Asthma Facts.* https://www.aafa.org/asthma-facts/

Managing Asthma: A Guide for Schools 2014 Edition, National Institutes of Health (NIH) Publication #14-2650. https://www.nhlbi.nih.gov/files/docs/resources/lung/NACI_ManagingAsthma-508%20FINAL.pdf

So You Have Asthma: A Guide for Patients and their Families, NIH publication #13-5248.

Managing Asthma Triggers, National Association of School Nurses (NASN). Online free training for continuing education hours. https://studylib.net/doc/5520159/managing-asthma-triggers---national-association-of-school…

Know How to Use Your Asthma Inhaler, CDC videos that demonstrate correct use of inhalers and spacers.

Asthma Action Plan Assessment: A Tool for School Nurse Assessment, NIH. Available on page 51 of *Managing Asthma.*

Teaming Up for Asthma Control, School Nurse Online-Module, Children's Hospital, University of Missouri Health Care. Online educational video with resources for both the school nurse and the student with asthma.

Asthma: A Presentation of Asthma Management and Prevention, Centers for Disease Control and Prevention. Slide presentation (75 slides **with** speaker notes) that can be used to discuss asthma, risk factors, management, and public health response.

Is the Asthma Action Plan Working? A Tool for School Nurse Assessment, National Asthma Education Prevention Program and NASN.

Just for kids. American Academy of Allergy Asthma & Immunology. https://www.aaaai.org/Conditions-Treatments/Just-For-Kids

Open Airways for Schools, American Lung Association. Award-winning program to help elementary school children learn to better manage their asthma. http://www.lung.org/lung-disease/asthma/creating-asthma-friendly-environments/ asthma-in-schools/open-airways-for-schools/index.html

Back to School with Asthma Toolkit, American Lung Association. Includes sample letters, forms, guidelines for students with asthma.

http://www.lung.org/lung-disease/asthma/creating-asthma-friendly-environments/ asthma-in-schools/back-to-school-with-asthma/back-to-school-with-asthma-toolki t.html

School Nurse Evidence-Based Clinical Guidelines: Asthma, National Association of School Nurses. These evidence-based guidelines are sold as an eBook and provide current information for caring for students with asthma.

Asthma Home Environment Checklist. Environmental Protection Agency (EPA).

Checklist to use at home to assess for allergens.

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National Asthma Education and Prevention Program. (2014). *How asthma friendly is your school?* National Heart Lung and Blood Institute. https://www.nhlbi.nih.gov/sites/default/files/publications/55-830.pdf

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https://www.nhlbi.nih.gov/resources/asthma-action-plan-2020

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National Asthma Education and Prevention Program

National Asthma Education and Prevention Program
NAEPP School Asthma Education Subcommittee

Is the Asthma Action Plan Working?
A Tool for School Nurse Assessment

Assessment for: _____ **Completed by:** _____ **Date:** _____
(Student) (Nurse or Parent)

This tool assists the school nurse in assessing if students are achieving good control of their asthma. Its use is particularly indicated for students receiving intensive case management services at school.

With good asthma management, students should:

- Be free from asthma symptoms or have only minor symptoms:
  - no coughing or wheezing
  - no difficulty breathing or chest-tightness
  - no wakening at night due to asthma symptoms
- Be able to go to school every day, unhampered by asthma.
- Be able to participate fully in regular school and daycare activities, including play, sports, and exercise.
- Have no bothersome side effects from medications.
- Have no emergency room or hospital visits.
- Have no missed class time for asthma-related interventions or missed class time is minimized.

Signs that a student's asthma is not well controlled:

Indicate by checking the appropriate box whether any of the signs or symptoms listed below have been observed or reported by parents or children within the past 2-4 weeks (6 months for history). If any boxes are marked, this suggests difficulty with following the treatment plan or need for a change in treatment or intervention (e.g., different or additional medications, better identification or avoidance of triggers).

- ☐ Asthma symptoms more than two days a week or multiple times in one day that require quick-relief medicine (short-acting beta2-agonists, e.g., albuterol).
- ☐ Symptoms get worse even with quick-relief meds.
- ☐ Waking up at night because of coughing or wheezing.
- ☐ Frequent or irregular heartbeat, headache, upset stomach, irritability, feeling shaky or dizzy.
- ☐ Missing school or classroom time because of asthma symptoms.
- ☐ Having to stop and rest at PE, recess, or during activities at home because of symptoms.
- ☐ Exacerbations requiring oral systemic corticosteroids more than once a year.
- ☐ Symptoms require unscheduled visit to doctor, emergency room, or hospitalization.
- ☐ 911 call required.

If you checked any of the above, use the following questions to more specifically ascertain areas where intervention may be needed.

Probes	Responsible Person/Site	Yes	No	N/A
Medications				
• Are appropriate forms completed and on file for permitting medication administration at school?	By school staff	☐	☐	☐
	Self-carry	☐	☐	☐
• Has a daily long-term-control medication(s)* been prescribed?		☐	☐	☐
• Is long-term-control medication available to use as ordered?	Home	☐	☐	☐
	School	☐	☐	☐
• Is the student taking the long-term-control medication(s) as ordered?	Home	☐	☐	☐
	School	☐	☐	☐
• Has a quick-relief (short-acting B2-agonist) medication been prescribed?		☐	☐	☐
• Is quick-relief medication easily accessible?	Home	☐	☐	
	Personal inhaler(s) at school health office	☐	☐	
	Self-carry	☐	☐	
• Is the student using quick-relief medication(s) as ordered… ◦ Before exercise?	Home	☐	☐	☐
	School	☐	☐	☐
◦ Immediately when symptoms occur?	Home	☐	☐	☐
	School	☐	☐	☐

Probes (continued)	Responsible Person/Site	Yes	No	N/A
Medical Administration				
• Does the student use correct technique when taking medication?	Home	☐	☐	☐
	School	☐	☐	☐
• Does the person administering the medication use correct technique?	Home	☐	☐	☐
	School	☐	☐	☐
Monitoring				
• Can the student identify his/her early warning signs and symptoms that indicate the onset of an asthma episode and need for quick-relief medicine?		☐	☐	☐
• Can the student identify his/her asthma signs and symptoms that indicate the need for help or medical attention?		☐	☐	☐
• Can the student correctly use a peak flow meter or asthma diary for tracking symptoms?		☐	☐	☐
• Are the student's asthma signs and symptoms monitored using a Peak Flow, verbal report, or diary? ◦ Daily?	Home	☐	☐	☐
	School	☐	☐	☐
◦ For response to quick-relief medication?	Home	☐	☐	☐
	School	☐	☐	☐
◦ During physical activity?	Home	☐	☐	☐
	School	☐	☐	☐
Trigger Awareness				
• Have triggers been identified?		☐	☐	
• Can student name his/her triggers?		☐	☐	☐
• Can parents/caregivers list their child's asthma triggers?		☐	☐	
• Are teachers, including physical educators, aware of this student's asthma triggers?		☐	☐	
Trigger Avoidance				
• Are triggers removed or adequately managed?	Home	☐	☐	☐
	School	☐	☐	☐

School nurses provide appropriate asthma education and health behavior intervention to students, parents, and school personnel when signs and symptoms of uncontrolled asthma and other areas of concern are identified. If there is an indication for a change in asthma medications or treatment regimen, refer the student and family to their primary care provider or asthma care specialist or help families to find such services as soon as possible.

*Long-term-control medications (controllers) include inhaled corticosteroids (ICS), leukotriene receptor antagonists (LTRA), or combination medicine (long-acting B2-agonists and ICS), cromolyn, or theophylline.

February 2009

Available Online: https://www.swcpeh.org/_documents/pdf/fc_asthma_tools-actioncardform.pdf

Peak Expiratory Flow Rate Monitoring

Overview

A peak flow meter (PFM) is a portable, hand-held device used to measure Peak Expiratory Flow Rate (PEFR), or the ability to move air out of the lungs. To determine a student's baseline air flow, the PFM is used frequently over a two-week period to determine the student's PEFR. This rate can then be used for comparison when the child has signs of breathing difficulty.

Students with asthma (especially moderate or severe asthma) or other respiratory conditions can use peak flow readings to help recognize early changes that may be signs of worsening respiratory status or determine the severity of an asthmatic episode. Altered peak flow readings can sometimes detect airway changes before symptoms appear.

Readings can be used to guide use of additional medication and when to seek emergency care. Peak flow measurement is dependent on both the effort and technique utilized so it should not be the only measure used in assessing a student's respiratory status. It should be noted that flow rates are generally slightly lower in the mornings than the afternoons.

Settings and Staff

There are no restrictions as to where peak expiratory flow rate monitoring can be done. The setting should be clean and appropriate to the student's need/desire for privacy. Students with peak flow meters can attend a regular classroom and participate in regular school activities.

Peak flow rate monitoring can be performed by the student, school nurse, family, teacher, aide, or other staff person who has had general training in using peak flow meters. General training should cover the student's specific health care needs, how to obtain a peak flow reading, and how to implement the established action plan.

Individualized Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for the student who needs peak flow rate monitoring, the following items should be considered:

- Need for student to measure peak flow rates
- Healthcare provider orders for peak expiratory flow rate monitoring
- Student's underlying condition and possible problems associated with the condition or treatment
- Frequency/timing of measurements and reasons for obtaining additional measurements
- Determination of peak flow rate values that should be reported to the family and/or health care provider
- Development of an action plan using peak flow values to guide interventions
- Student's baseline status, including color, respiratory rate, pulse, and blood pressure and assessment of changes in this status

- Student's self-care skills and knowledge of early signs of respiratory distress
- Standard precautions

Procedure for Peak Flow Rate Monitoring

1. Determine the need for peak flow rate monitoring. The student may ask for a measurement.

   Review orders for obtaining baseline ratings and assessment ratings. Assess the student's status: respiratory rate, depth, effort, pulse, restlessness, color, retractions, cough, wheezing, and lung sounds.



2. Wash your hands with soap and water.
3. Assemble the equipment required for the monitoring listed below.
   a. Peak flow meter
   b. Chart or log of student's peak flow readings
4. Explain the procedure using explanations the student can understand. Encourage the student to do as much of the procedure as is capable, to achieve maximum self-care skills.
5. Before each use, make sure the sliding marker or indicator arrow is at the bottom of the numbered scale on the meter (zero or lowest number).

   Connect the mouthpiece to the peak flow meter, if not already attached.

6. Advise the student to **stand** up straight and remove any gum or food from the mouth.
7. Instruct the student to take a deep breath, filling the lungs completely.
8. Have the student place the mouthpiece of the meter in the mouth and close the lips tightly around the mouthpiece.

   Be sure the tongue is kept away from the opening of the mouthpiece.

9. In one breath, have the student blow out as hard and as quickly as possible—a "fast hard blast"—until he/she has blown as much air as possible out of the lungs.

   The force of the air coming out of the lungs causes the marker to move along the numbered scale. When exhaling, students should make a "hah" sound, not a "tah" sound. A "hah" sound is just exhaled air, while a "tah" sound is made with the tongue and does not give an accurate measurement.

10. Note the number achieved by the marker on the numbered scale.
11. Repeat steps 5-10 two more times.

The student should obtain similar numbers for all three tries. Inconsistent numbers may indicate incorrect technique. If the student coughs or uses incorrect technique, do not use that number.

12. Record the highest number achieved in the student's chart or log. Readings should be obtained over several weeks when the student is not having respiratory problems to determine the student's "personal best" or usual peak flow rate. Many health care providers advise measuring peak flow rates close to the same time each morning. Peak flow rates may be lower in the mornings than late afternoons.
13. After these readings have been obtained, the student's peak flow rate can be measured on a regular basis or on an "as needed" basis according to guidelines in the student's IHP. Compare any peak flow rates with the student's personal best or normal peak flow rate. Follow the healthcare provider's guidelines for any recommended actions.

Generally, three zones (correlated to traffic light colors of green, yellow, and red for easy interpretation) are used to interpret peak flow rates. Be aware of the following general guidelines, but follow the health care provider's specific guidelines for each student:

Zone	**Peak Flow Rate**	**Action**
Green	80 – 100% 	Continue the regular management plan. No additional action needed.
Yellow	50 – 80%	Airways are narrowing and may require additional treatment. Symptoms can get better or worse depending on actions taken. Refer to the individualized health care plan or action plan for instructions and medication use.
Red	< 50% 	**Medical Alert**—severe narrowing may be occurring. **Implement the asthma action plan** predetermined by the healthcare provider. Notify the school nurse, family and/or health care provider if the peak flow rate does not return to the yellow or green zone.

14. Document the peak flow reading and any action taken.

    Report to the school nurse and family any changes from the student's usual pattern.

15. Care for the peak flow meter according to instructions. Meters can be cleaned in mild detergent and hot water. Rinse and dry thoroughly before storage.

    Dirt collected in the meter can make measurements inaccurate. Germs or mucus can also collect in the meter.

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Illustration source:

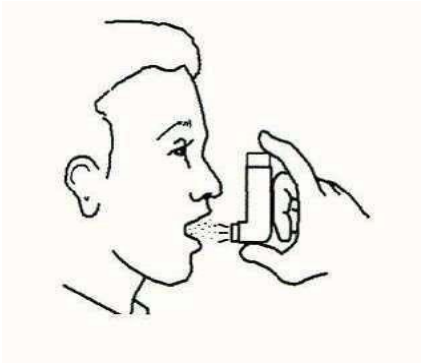
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Procedure for Using a Metered Dose Inhaler (MDI)

A metered dose inhaler (MDI) is a device used to deliver asthma medication directly to the lungs. It consists of a canister of pressurized medication that fits into a plastic sleeve connected to a mouthpiece. The MDI propels aerosolized medication into the airway. In comparison, medications taken in pill form must travel through the body to reach the lungs and generally require much higher doses than the inhaled forms. With an inhaler, the dose is delivered to the lungs where it is immediately absorbed, which also decreases the chance of medication side effects to the rest of the body. A prescription from the student's health care provider is required for inhalers to be used at school.

However, the medication sprayed from the MDI may not reach the lungs if correct technique is not used. Research has shown that many students (and adults) do not know how to correctly use their inhaler. It is important to assess technique and not just assume those with asthma know the correct way, no matter how long they have been using an inhaler.

It can be difficult to determine how much medication remains in an MDI. ***Putting the canister in water to see if it is empty does <u>not</u> work*** and can harm the inhaler. Most MDI's now have counters. The number of doses in a canister is written on the MDI. If the MDI is used on a regular basis, the date it will run empty can be calculated by dividing the number of doses by the number of puffs used per day. For example, if the MDI has 200 doses and is ordered 2 puffs twice a day (4 puffs total per day), then it should last 50 days. However, if an MDI is used as an emergency or rescue inhaler, then a running count of how many doses have been used can be kept. Because it can be difficult to keep this count, having two inhalers available so a refill is available when one runs out ensures that the medication will always be available.



Section 22.1-274.2 of the *Code of Virginia* requires local school boards to develop and implement policies to permit a student with asthma to possess and self-administer inhaled asthma medications during the school day, on school property, or at school-sponsored activities. Written permission from both the student's parent/guardian and health care provider, as well as an individualized health care plan, are required. Asthma rescue medication should always be easily accessible in an emergency.

Using a Metered Dose Inhaler

1. Wash your hands with soap and water.
2. Explain the procedure at the student's level of understanding.

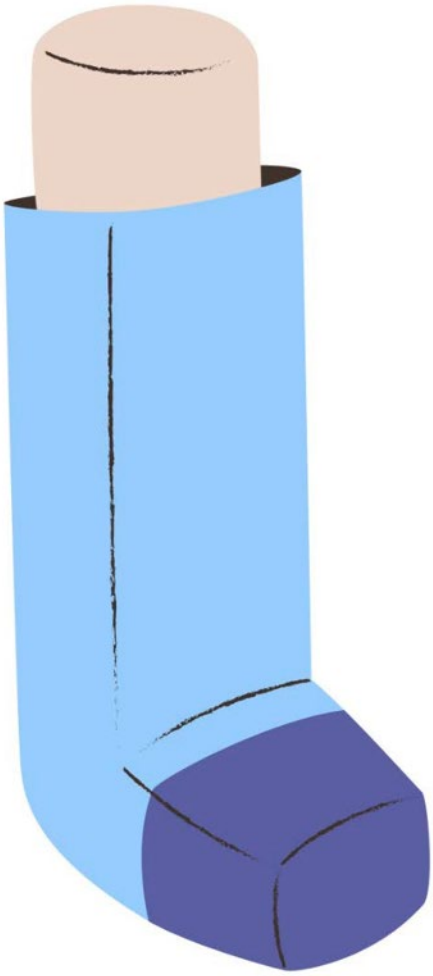
   By teaching correct technique for using an MDI, the caregiver helps the student achieve maximum self-care skills and ensures that the correct amount of medication is obtained.

3. Have the student stand, and using the thumb and one or two fingers, hold the inhaler upright, with the mouthpiece end down and pointing towards his/her face.
4. Remove the cap and shake the inhaler 10-15 times.

   This mixes the medication with the propellants. Check the medication to see how much shaking is needed. A few brands (Alvesco, QVAR) do not require shaking.
5. Tilt the head back slightly and breathe all the way out.
6. Position the inhaler in one of three ways:
   a. Hold the inhaler 1-2 inches away from the open mouth--OR--
   b. Place the inhaler in the mouth and form a seal with the lips--OR--
   c. Use a spacer to hold the inhaler. See Procedure for Using Spacers. This method is preferred as it delivers twice as much medicine to the lungs.
7. Press down on the inhaler to release the medication while starting to breathe in slowly for 3-5 seconds.
8. Hold breath for 10 seconds to allow the medicine to reach deeply into the lungs. Then breathe out slowly.
9. Repeat puff as directed by the student-specific order. For emergency, quick-relief, or rescue medicine (beta 2-agonists), wait 1 minute between puffs.

   Waiting one minute allows the airway to dilate from the first dose of medicine and may allow more of the second puff to penetrate better. There is no need to wait between puffs for other medications (corticosteroids and non-steroidals).
10. When done, wipe off the mouthpiece and replace the cap.
11. Rinse out the student's mouth with water, if possible.
12. Document the medication given in the student log (and the student's response, if specified in the plan).

Inhalers should be stored in a cool, dry place. Never store in the glove compartment of a car because the inhaler begins to lose effectiveness at high temperatures. It is best to store the inhaler in a plastic bag while carrying it in a pocket or purse. The MDI may need to be primed if it is new or hasn't been used for a long time to ensure the correct amount of medication is in each puff. Follow specific MDI instructions for how many sprays/puffs into the air are needed to prime the inhaler.



A metered dose inhaler (MDI) is a device used to deliver asthma medication directly to the lungs. It consists of a canister of pressurized medication that fits into a plastic sleeve connected to a mouthpiece. The MDI propels aerosolized medication into the airway. The medication sprayed from the MDI may not reach the lungs if correct technique is not used. It is important to assess technique and not just assume those with asthma know the correct way, no matter how long they have been using an inhaler.

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Undesignated Stock Albuterol Inhalers

In 2021 the General Assembly passed HB 2019 (McQuinn), which amended and reenacted §§ 8.01-225, 22.1-274.2, and 54.1-3408 of the *Code of Virginia*, relating to public elementary and secondary schools' possession and administration of undesignated stock albuterol inhalers and valved holding chambers. The provisions of the first enactment clause shall become effective on January 1, 2022.

The emergency response and procedures for a student experiencing an asthmatic crisis or respiratory distress in the school setting are part of the school division's School Crisis, Emergency Management and Medical Emergency Response Plan. Information regarding the procedure to possess and administer undesignated stock albuterol in the school setting can be accessed on the Virginia Department of Education's **School Health Guidance and Resources webpage** and include:

- **Guidelines for Use of Undesignated Stock Albuterol in Schools** (Word)
- **Guidelines for Managing Asthma in Virginia Schools** (Word)
- **Virginia Pediatric Asthma Action Plan** (PDF)

School divisions will develop policies, procedures, and protocols for the use of emergency undesignated stock albuterol in elementary and secondary schools. Schools should determine the number of staff that need to be trained, frequency of training, training options, and evaluation or competency measures. Training of school personnel, employees of a local governing body, or an employee of a local health department in the administration of albuterol should be conducted on an annual basis by a registered nurse and schools may use the **Undesignated Stock Albuterol Training Modules** developed by the Virginia Department of Education (VDOE) or develop their own training.

The VDOE recommends all personnel trained to administer medication be Cardiopulmonary Resuscitation (CPR) Certified. Policies and procedures for the emergency treatment of respiratory distress using undesignated stock albuterol is not intended to replace the individual's Asthma Action Plan. Instead, it should be used when an Asthma Action Plan and/or prescribed short-acting bronchodilator Metered Dose Inhaler (MDI) with valved holding chamber (albuterol inhaler) are not available or easily accessible.

The administration of undesignated stock albuterol may be used in the following situations:

- If the student has a current Asthma Action Plan but does not have their prescribed medication available.
    - In this case, use the medical care plan provided by the healthcare provider for the student and the school's supply of undesignated stock albuterol inhaler with a valved holding chamber.

- If there is no Asthma Action Plan and the student is having difficulty breathing.
    - In this case, use the school's standing order and the school's supply of undesignated stock albuterol inhaler with a valved holding chamber.

Symptoms of Respiratory Distress

Respiratory distress can be the sudden appearance of signs and symptoms of difficulty breathing and may be categorized into "Mild to Moderate" or "Moderate to Severe." Evaluation of the person's level of distress is based on the signs and symptoms present and occurring upon presentation. Trained school personnel should begin the plan of care based on the symptoms the student is experiencing.

Mild to Moderate Respiratory Distress

Mild to Moderate symptoms of respiratory distress may include one or more of the following:

- Struggling to breathe
- Whistling in the chest
- Persistent coughing, chest pain, wheezing, chest tightness
- Noisy breathing
- Shallow breathing
- Decreased breath sounds
- Breathing hard or fast and/or shortness of breath

Medical Response to Mild to Moderate Respiratory Distress Symptoms

Determine if the student is experiencing respiratory distress based on the signs and symptoms present. Act quickly as it is safer to give albuterol than to delay treatment. **Refer to the VDH algorithm for** Mild to Moderate Respiratory Distress **to determine next steps in the intervention process as indicated below:**

- Never leave a student alone.
- Have the student sit in a chair, or on the ground, and restrict physical activity.
- Summon for help, notify parent and school administration, and follow your school division protocol.
- If available, a Registered Nurse/Licensed Practical Nurse should obtain and continue to monitor vital signs (pulse, respiratory rate, blood pressure, pulse oximetry) every five minutes or as needed.
- Administer albuterol per standing order from the local health director.
    - Administer **four puffs** of albuterol with a valved (spacer) holding chamber between 15 -30 seconds between puffs, or one unit or ampule dose of albuterol via nebulizer per standing order.

    - If symptoms improve and the student has no tightness in chest, shortness of breath, and can walk and talk easily, continue to monitor.
- Keep the student in the health office until breathing returns to normal and the parent or guardian has been contacted.
- Refer the student to a healthcare provider for follow up care.
- **If there is no improvement in symptoms in ten to fifteen minutes.**
    - Repeat **four puffs** of albuterol with a valved holding chamber, 15 - 30 seconds between puffs or an additional one unit or ampule of albuterol via nebulizer.
    - **Call 911 and follow the actions for** Moderate to Severe Respiratory Distress.

Moderate to Severe Respiratory Distress

Moderate to Severe symptoms of respiratory distress may include one or more of the following:

- Struggling to breathe and or shortness of breath and or hunched over (tripod breathing)
- Coughing, wheezing, tightness in the chest
- Difficulty speaking (one word or short sentences)
- Blueness around the lips or fingernails (may look gray or "dusky")
- Chest retractions (chest/neck are pulling in)
- Use of accessory muscles (stomach muscles are moving up and down)
- Fast pulse (tachycardia)
- Agitation
- Nasal flaring

Medical Response to Moderate to Severe Respiratory Distress Symptoms

The student may present with or progress to symptoms of severe respiratory distress. Based on symptoms, determine that respiratory distress appears to be occurring. Act quickly as it is safer to give albuterol than to delay treatment**. Refer to the VDH algorithm for** Moderate to Severe Respiratory Distress **to determine next steps in the intervention process listed below:**

- **Call 911 immediately.**
- Never leave a student alone.
- Have the student sit in a chair, or on the ground, and restrict physical activity. Encourage slow breaths.
- Summon for help, notify parent and school administration, and follow your school division protocol.
- If available, a registered nurse/licensed practical nurse should obtain and continue to monitor vital signs (pulse, respiratory rate, blood pressure, pulse oximetry) every five minutes or as needed.
- Administer albuterol per standing order from the local health director.

    - Administer **eight puffs** of albuterol MDI with a valved holding chamber, each 15-30 seconds apart between puffs, or one unit or ampule dose of albuterol via nebulizer per standing order.
    - If there is no improvement in symptoms: May give albuterol continuously until Emergency medical Services (EMS) arrives.
    - If a student becomes unresponsive, check for pulse and initiate CPR with rescue breathing.
    - Monitor the student continuously. Registered nurse/licensed practical nurse should obtain and document vital signs (pulse, respiratory rate, blood pressure, pulse oximetry); repeat every five minutes or as needed.
    - Continue to monitor the student until EMS arrives.
- Schools may have policies and procedures currently in place to administer oxygen to students, and this may continue with a standing order.

Procedures for Proper Cleaning of Devices
General cleaning principles apply to all inhalers in order to keep them in good working order. If not cleaned properly, equipment such as an inhaler, mask, or mouthpiece can harbor bacteria or viruses and lead to increased risk of transmission for users. Clean devices after use following the manufacturer's recommendation for cleaning.

Clean all equipment after use following the manufacturer recommendations.

If the albuterol metered dose inhaler will be used for multiple students, thoroughly clean with an approved cleaner following the manufacturer recommendations. Allow the inhaler to completely dry before reusing or restocking the inhaler. Clean valved holding chamber according to manufacturer's recommendation and/or VDOE training modules, if utilized.
Items not shared between multiple students include:

- valved holding chamber; and
- mask and tubing used for nebulizer treatments.

Post Event Procedures
School health staff should document respiratory distress, intervention, and follow up care with the student and parent following administration of undesignated stock albuterol. Data will be collected on the number of doses administered of undesignated stock albuterol in school settings and submitted to the VDOE, via the Single Sign-on for Web Systems (SSWS) School Health Services Survey, at the end of each school year.

The VDH recommends that any student who requires the use of undesignated stock albuterol for respiratory distress should be referred to their healthcare provider for follow up medical care and not remain in school. Local school policy may require an updated Asthma Action Plan,

prescription medication for use during the school day, or a medical clearance letter to return to school or activities.

- Schools should assist families with any additional support services needed to effectively manage the student in the school setting.
- Reorder a supply of stock albuterol using the **VDH online ordering system**. available on the VDOE School Health Guidance and Resources.
- Document use of undesignated stock albuterol for reporting purposes:

Reporting Form

Local school divisions may develop a reporting form to be completed and returned to the supervisor of school health services after the administration of any undesignated stock albuterol. An example of an Undesignated Stock Albuterol Reporting form can be found on the next three pages.

Sample Report

This template may be used by the school division to develop a reporting form for the use of undesignated stock albuterol.

Undesignated Stock Albuterol Reporting Form

Demographics and Health History

School District: _____ **School Name:** _____

Type of Person: ☐ Student **Gender:** ☐ M ☐ F ☐ Non-binary

Race: ☐ American Indian/Alaskan Native ☐ African American ☐ Native Hawaiian/Pacific Islander ☐ Asian ☐ White ☐ Other: _____

Diagnosis/History of Asthma: ◯ Yes ◯ No ◯ Unknown

History of severe respiratory distress: ◯ Yes ◯ No ◯ Unknown

Was an asthma action plan available at school? ◯ Yes ◯ No ◯ Unknown

School Plans and Medical Orders

Individual Health Care Plan (IHP) in place? ◯ Yes ◯ No ◯ Unknown

Written school district policy on the administration of undesignated stock albuterol in place? ◯ Yes ◯ No ◯ Unknown

Does the student have a student specific order for albuterol? ◯ Yes ◯ No ◯ Unknown

Does the student have permission to self-carry their inhaler? ◯ Yes ◯ No
If student self-carries, was medication available? ◯ Yes ◯ No

Has asthma medication been supplied to the clinic? ◯ Yes ◯ No
If no, does the family need assistance identifying resources? ◯ Yes ◯ No

Incident Reporting

Date/Time of Occurrence: _____/_____/_____ _____:_____ ◯ am/pm

Vital Signs: BP ____/____ Temp _____ Pulse _____ Respiration_____

If known, specify trigger that precipitated this episode: ☐ Exercise ☐ Illness/Cold ☐ Pollen/Dust ☐ Strong Odors/Smoke ☐ Acid Reflux ☐ Animals/Pests ☐ Mold ☐ Stress/Emotions ☐ Other: _____

Did reaction begin prior to school? ◯ Yes ◯ No ◯ Unknown

Is this the first time the student required use of the undesignated stock albuterol inhaler?
◯ Yes ◯ No
If no, has the student required use of the undesignated stock inhaler in the last 30 days?
◯ Yes ◯ No

Sample Report

Location where symptoms developed:

☐ Classroom ☐ Cafeteria ☐ Health Office/Clinic ☐ Playground ☐ Bus ☐ Other

If other, specify: _____

Symptoms: (Check all that apply.)

- ☐ Abdominal discomfort
- ☐ Blue lips and fingernails
- ☐ Breathing hard and fast
- ☐ Chest discomfort
- ☐ Cold/Illness
- ☐ Cyanosis
- ☐ Diaphoresis
- ☐ Difficulty breathing
- ☐ Difficulty swallowing
- ☐ Difficulty talking, eating, walking
- ☐ Dizziness
- ☐ Faint/weak pulse
- ☐ Headache
- ☐ Hoarse voice
- ☐ Hypotension
- ☐ Irritability
- ☐ Loss of consciousness
- ☐ Stridor
- ☐ Swollen throat/tongue
- ☐ Tachycardia
- ☐ Tightness (chest, throat)
- ☐ Tired or lethargic
- ☐ Vomiting
- ☐ Wheezing

Location the undesignated stock albuterol was administered: ☐ Clinic ☐ Other/Specify:_____

Location of undesignated stock albuterol storage: ☐ Clinic ☐ Other/Specify:_____

Undesignated stock albuterol administered by: ☐ School Nurse ☐ Other/Specify:_____

TIME ELAPSED

- **between onset of symptoms and communication of symptoms:** _____minutes
- **between communication of symptoms and administration of inhaler:** _____minutes

Disposition

Local Health District: _____

Standing Order Prescriber: _____

Notify prescribing MD? ○ Yes ○ No ○ Unknown **Notify LHD?** ○ Yes ○ No ○ Unknown

When was the parent/guardian notified of undesignated stock albuterol administration (time)? _____:____ ○ ○ am/pm

Parent/guardian: ☐ Will come to school ☐ Currently at school ☐ Will meet student at hospital
☐ Other:_____

Was EMS notified? ○ Yes ○ No **Time:** _____:_____am/pm **Transferred to ER:** ○ Yes ○ No

If yes, transferred via ☐ Ambulance ☐ Parent/guardian ☐ Other
Discharged after _____hours

Hospitalized? ○ No ○ Yes ☐ If yes, discharged after _____day(s) **Name of hospital:**_____

Adverse Event
☐ Notify immediately Local Health Director/Physician notified of hospitalization, intubation or death.

Sample Report

Student Outcome

☐ Called 911

☐ No EMS/911 transport. Refer to student health record for additional information. Parent instructed to follow up with a healthcare provider.

☐ EMS/911 transported The student was sent home from ER with parent/guardian or emergency contact. Instructed parent/guardian emergency contact to follow up with a healthcare provider and provide an updated/new Asthma Action Plan.

☐ 911 Was Not Called

☐ Returned student to class after following the student's Asthma Action Plan or standing order. Notified parent/guardian emergency contact and instructed to follow up with a healthcare provider. If needed, School Nurse requested an updated Asthma Action Plan.

☐ Student sent home with parent/guardian or emergency contact and instructed to follow up with a healthcare provider. The student has an Asthma Action Plan on file at the school. If needed, the School Nurse requested an updated Asthma Action Plan.

☐ Student sent home with parent/guardian or emergency contact. No Asthma Action Plan is on file. Instructed parent/guardian or emergency contact to follow up with a healthcare provider and provide an Asthma Action Plan.

School Follow-Up

Did a debriefing meeting occur? ◯ Yes ◯ No ◯ Unknown

Recommendations for changes? ☐ Protocol/Policy ☐ Training ☐ Education

☐ Information sharing ☐ Other: _____

Optional Student Information

Name: _____ **Grade:** _____

Date of Birth: _____/_____/_____ **Age:** _____

Contact Information

Please provide contact information of the individual who completed this form.

Name: _____

Role: _____

Email address: _____

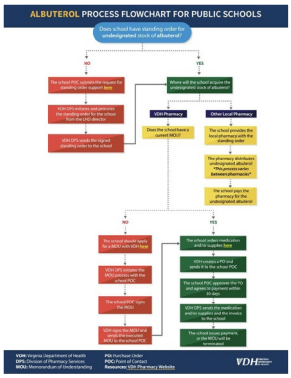
Phone Number: (_____) - _____ - _____

Date: _____/_____/_____

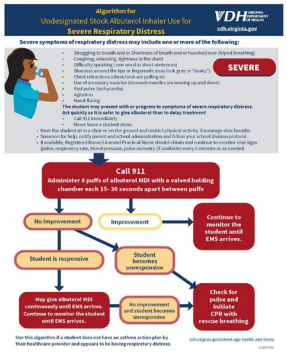
The School Nurse will need to **complete all pages of this form** within three (3) calendar days after the administration of any undesignated stock albuterol. The local health department director/physician may request additional follow up information after any administration of undesignated stock albuterol for treatment of respiratory distress.

Revised and used with permission of the Massachusetts Department of Health, School Health Unit.

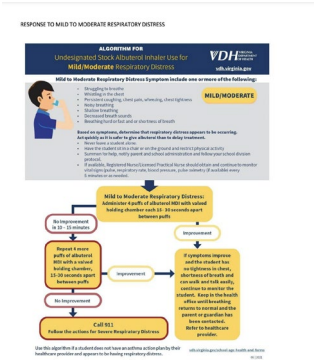
Flowcharts, Action Plans, and Algorithms
Albuterol Inhaler



[Albuterol Flowchart for Procurement of Medication]



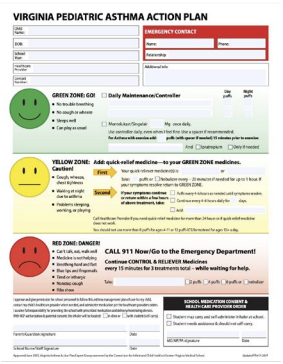
[Severe Respiratory Distress Flowchart]



[Mild Respiratory Distress Flowchart]



[Know Your Asthma Triggers]



[Virginia Asthma Action Plan]

Albuterol Procurement

Public schools who desire to obtain Albuterol must have a signed standing order.

[Standing Order for Undesignated Stock of Albuterol]

Unless a public school has a contracted physician to sign the order locally, requests for a standing order should be submitted to VDH via the RedCap online ordering form.

A flowchart for the ordering process is available on the VDH Pharmacy webpage.

Procedure for Using Spacers with Metered Dose Inhalers

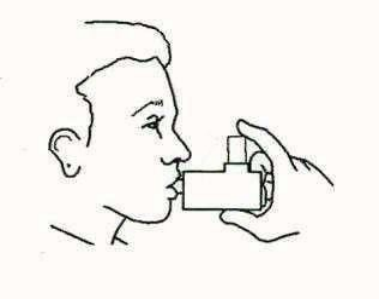
Many people (especially young children) find it difficult to coordinate the spraying of a metered dose inhaler (MDI) and the inhalation of the medication. Sometimes the puffs are miss-timed and only make it part of the way into the airways, and some of the medication is deposited in the mouth or on the back of the throat instead of the lungs.

A spacer is a hollow tube that attaches to a MDI. It slows down or "holds" a dose of medication until a student is able to take it in. The medication is sprayed into the spacer instead of the mouth. As the student inhales, the medication passes quickly through the mouth and throat, reducing the amount of medication released into the air and preventing it from being sprayed directly in the mouth or throat. It helps a student get the most from their inhaled asthma medicine. The spacer usually has a one-way valve that prevents the student from exhaling into the spacer. Some studies have shown that the larger volume spacers delivered more medication than the small volume spacers.

Some spacers have masks which cover the nose and mouth for younger children enabling more medicine to be inhaled. Spacers without masks should not be used until the child is 7-8 years of age.

Using a Spacer with a Metered Dose Inhaler

1. Wash your hands with soap and water.
2. Explain the procedure at the student's level of understanding.
   By teaching correct technique for using a spacer with an MDI, the caregiver helps the student achieve maximum self-care skills and ensures that the correct amount of medication is obtained.



3. Remove the plastic cap from the MDI and the spacer.
4. Shake the MDI and insert into the back of the spacer.
5. Have the student breathe out deeply.
6. Put the mouthpiece of the spacer into the mouth between the teeth and close the lips around it.
7. Press down on the MDI to spray one puff from the MDI into the spacer.
8. Take a long, slow breath through the mouth and hold your breath for 5-10 seconds.
   If a whistling sound is heard, the student is breathing in too quickly.
9. Take the spacer out of the mouth and breathe normally.

10. If a second puff is ordered, wait at least one minute between puffs.
11. Rinse the student's mouth with water and have him/her spit it out.
12. Document the medication given in the student log.
13. At least once a week, wash the spacer in warm water and thoroughly dry.

"With appropriate care, including medical management and strategies to reduce environmental asthma triggers, students with asthma can control their symptoms so that the condition does not interfere with their educational activities." Guidelines for Managing Asthma In Virginia Schools, 2020 Virginia Department of Education

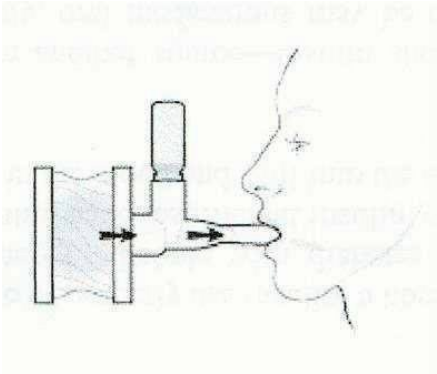




For additional resources, visit VDOE School Health website.

Using an InspirEase® Spacer with a Metered Dose Inhaler

1. Wash your hands with soap and water.
2. Explain the procedure at the student's level of understanding.
   By teaching correct technique for using a spacer with an MDI, the caregiver helps the student achieve maximum self-care skills and ensures that the correct amount of medication is obtained.
3. Remove the aerosol can from the MDI plastic holder and shake it.
4. The Inspirease spacer consists of a mouthpiece and a reservoir bag. Place the mouthpiece into the opening of the reservoir bag, making sure to line up the locking tabs. Twist to lock.
5. Carefully untwist or extend the reservoir bag until it is completely open.
6. Insert the stem of the canister securely into the adaptor port of the mouthpiece.
7. Have the student breathe out deeply.
8. Place the mouthpiece between the teeth and seal the lips tightly around it.



9. Press down on the MDI to spray one puff from the MDI into the InspirEase.
10. Take a long, slow breath through the mouth and hold your breath for 5-10 seconds.
    If a whistling sound is heard, the student is breathing in too quickly.
11. Have the student breathe out into the bag slowly, keeping the lips around the mouthpiece.
12. Have the student breathe in again slowly and hold their breath for 5-10 seconds.
13. If a second puff is ordered, wait at least one minute between puffs.
14. Document the medication given in the student log.
15. Wash and dry the mouthpiece with warm water and try thoroughly once per day. The reservoir bag should not be washed, but needs to be replaced every 2-4 weeks, or sooner if it gets a hole or tear.

Sources:

Barry, P. & O'Callaghan, C. (1996). Inhalation drug delivery from seven different spacer devices. Thorax 51(8): 835-840. https://thorax.bmj.com/content/thoraxjnl/51/8/835.full.pdf

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 545-548.

Center for Disease Control and Prevention. (2014). *Know how to use your asthma inhaler.* Videos using students to teach correct inhaler use. https://www.cdc.gov/asthma/pdfs/Inhaler_Spacer_FactSheet.pdf

Colorado Asthma Coalition. (2012). Using a spacer with your inhaler.

Corjulo, M. (2011). Mastering the metered-dose inhaler: an essential step toward improving asthma control in school. *NASN School Nurse, 26, 285.*

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Minnesota Healthy Learners Asthma Initiative. (n.d.). How to use a metered dose inhaler with InspirEase spacer.

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National Asthma Education and Prevention Program. (2014). Tipsheets. https://www.nhlbi.nih.gov/science/national-asthma-education-and-prevention-program-coordinating-committee-naeppcc

Porter, S., Branowicki, P., & Palfrey, J. (2014). *Supporting students with special health care needs: Guidelines and procedures for schools* (3rd ed.). Baltimore: Paul H. Brookes Publishing, 351.

Selekman, J. (2013). *School nursing: A comprehensive text* (2nd ed.). Philadelphia: F.A. Davis, 831-834.

WebMD. (2013). How to use a metered dose inhaler with an InspirEase spacer. http://www.webmd.com/asthma/metered-dose-inhaler-spacer

Wisconsin Improving School Health Services Project. (2015). *Inhaler with spacer*

Procedure for Using Dry-Powder Inhalers

Dry-powder inhalers (DPIs) dispense medication in a very fine, powdered form. The medication particles are so small that they can easily reach the tiniest airways. Because every DPI works a little differently, the instructions must be read before using. Some DPIs have dose counters, which can make it easier to tell when the inhaler is almost empty. Cold temperatures don't reduce the effectiveness of DPIs as they might with some MDIs. General instructions for most DPIs:

1. Wash your hands with soap and water.
2. Follow the manufacturer's instructions to prime the DPI and load a prescribed dose of the dry-powder medicine.
   There is no need to shake the DPI. Shaking can result in losing some powder.



3. Have the student stand up.
4. Have the student breathe out slowly for 3-5 seconds.
5. Place the mouthpiece of the inhaler in the student's mouth and close their lips around it to form a tight seal. Have the student inhale deeply and forcefully.
   The DPI is breath-activated, so the student can control the rate at which the medication is inhaled. It needs to be inhaled with sufficient force to assure accurate delivery of medication to the lungs. Most DPIs require closing the mouth tightly around the mouthpiece of the inhaler.
6. Have the student hold breath for 10 seconds and then exhale slowly.
7. If specified in the student IHP, repeat the procedure for the correct number of doses. One inhalation from a DPI often provides the same dosage as two puffs of a comparable medication from a MDI.
8. Wipe the mouthpiece at least weekly with a dry cloth. Do NOT use water to clean the dry powder inhaler.
9. Document the medication given in the student log as well as the student response.

Diskhaler® and **Diskus**® are two other common types of dry-powder inhalers. However, they are used for preventive medications, which are not likely to be administered at school, so

more specific instructions for these devices will not be covered here. Instructions can usually be found with the devices and are also Available Online:

https://www.webmd.com/drugs/2/drug-20538/advair-diskus-inhalation/detailss-and-videos/videos/how-to-use-a-diskus-inhaler

https://asthma.ca/get-help/treatment/how-to-use/

Sources:

Allergy & Asthma Network. (2022, February 3). *Dry-powder inhaler*. https://allergyasthmanetwork.org/what-is-asthma/how-is-asthma-treated/how-to-u se-a-dry-powder-inhaler/

American Lung Association. (n.d.). *How to use a dry powder inhaler*. https://www.lung.org/lung-health-diseases/lung-disease-lookup/asthma/treatment/devices/ellipta

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Center for Disease Control and Prevention. (2014). *Know how to use your asthma inhaler*. https://www.cdc.gov/asthma/pdfs/Inhaler_Spacer_FactSheet.pdf

Corjulo, M. (2011). Mastering the metered-dose inhaler: an essential step toward improving asthma control in school. *NASN School Nurse, 26, 285.*

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children* (10th ed.). St. Louis: Elsevier Mosby, 1222-1225.

National Heart Lung and Blood Institute. (2014). *How to use a dry powder inhaler*. *Managing Asthma: A Guide for Schools*, NIH publication #14-2650, p. 58.https://www.nhlbi.nih.gov/sites/default/files/publications/How-to-Use-a-Dry-Powder-Inhaler_21-HL-8164.pdf

National Asthma Education and Prevention Program. (2014). *Tipsheets*. https://www.nhlbi.nih.gov/science/national-asthma-education-and-prevention-program-coordinating-committee-naeppcc

Selekman, J. (2013). *School nursing: A comprehensive text* (2nd ed.). Philadelphia: F.A. Davis, 831-834.

Nebulizer Treatments

Overview

Nebulizers use compressed air to break up medications into super fine particles and deliver them as a mist to be inhaled directly into the lungs. The compressed air is forced through a cup with liquid medication, forming a mist. The mist is directed into a mask or mouthpiece, which the student wears while receiving the treatments. Studies have found that inhaling smaller doses of medication directly into the lungs is more efficient and causes fewer side effects than taking the same medication in pill or liquid form. Nebulizers are often used with children because the procedure is easier to coordinate and use than metered dose inhalers.

All nebulizers have the same basic features—an air compressor, connecting tubing, air inlet, air outlet, medication cup, and either a face mask or a T-adaptor (which fits in the mouth). The mask directs air to the nose and mouth and is easier for younger children to use. The T adaptor directs air to the mouthpiece while allowing exhaled air to escape

The compressor on the nebulizer makes a great deal of noise so nebulizer treatments are best done in a private, clean area such as the health office. Students who require nebulizer treatments can attend a regular classroom and participate in regular school activities. Physical education activities may need modification if the student is receiving the nebulized medication because of bronchoconstriction.



A nebulizer treatment can be administered by the school nurse, family, teacher, or other adult with proven competency-based training in appropriate techniques and problem management. Many students can perform nebulizer treatments by themselves. Those who cannot should be encouraged to assist with the treatment as much as possible. Any school personnel who has regular contact with a student who requires a nebulizer treatment should receive training covering the student's specific needs, potential problems, and implementation of the established emergency plan.

Individualized Healthcare Plan (IHP)

Each student’s IHP must be tailored to the individual’s needs. A sample plan is included in Appendix A. When preparing an IHP for a student who requires tracheal suctioning, the following items should be considered:

- Underlying condition and possible problems associated with the condition or treatment
- Healthcare provider's order for suctioning
- Size and type of tracheostomy tube
- Student’s baseline color, respiratory rate, pulse, blood pressure, secretions

- Student specific signs of respiratory distress
- Need for filtering or humidity (e.g., artificial nose)
- Type of suction catheter (one-time use versus sleeved or inline)
- Suctioning guidelines—frequency, size of catheter, special instructions
- Length of the tracheostomy tube measured to determine the depth of suctioning
- Appropriate pressure settings if the suction machine has a vacuum setting
- Need for breaths with a manual resuscitation bag
- Equipment and supplies needed
- Back up equipment and personnel
- Portable equipment and responsibility for transporting equipment
- Student's self-care ability and ability to request assistance
- Emergency action plan, including all phone numbers
- Identification of individuals capable of assisting the student or caregivers
- Staffing needs to provide safe care for the student and plan for absences Avoidance of small particles in the air, such as chalk dust, aerosols, glitter, small toys, and sand
- Latex allergy precautions
- Standard precautions



Example of equipment needed for nebulizer treatments.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 545-548.

Center for Disease Control and Prevention. (2014). *Know how to use your asthma inhaler.* https://www.cdc.gov/asthma/pdfs/Inhaler_Spacer_FactSheet.pdf

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 53-55. https://portal.ct.gov/-/media/SDE/Publications/clinical_guidelines/clinical_guidelines.pdf

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National Asthma Education and Prevention Program. (2014). Tipsheets. Nationwide Children's Hospital. (n.d.). *Nebulizers*. https://www.nationwidechildrens.org/family-resources-education/health-wellness-and-safety-resources/resources-for-parents-and-kids/how-to-use-an-epipen/epinephrine-myths-and-facts/how-to-use-a-nebulizer

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Selekman, J. (2013). *School nursing: A comprehensive text* (2nd ed.). Philadelphia: F.A. Davis, 831-834.

Wisconsin Improving School Health Services Project. (2015). *Nebulizer*.

Illustration Source:

National Asthma Education and Prevention Program. (2014).

Procedure for Nebulizer Aerosol Treatment

1. Determine the need for treatment based on the health care provider's order. The student may ask for treatment.
   Assess student's respiratory status: rate, depth, effort, wheezing, cough, retractions, breath sounds, and color.
2. Wash your hands with soap and water.
3. Assemble the equipment required for the treatment listed below.
   a. Compressor
   b. Connecting tubing
   c. Nebulizer medication chamber
   d. Mask, or mouthpiece with T adaptor
   e. Medication
   f. Diluting solution
   g. Syringe, if needed for measuring
   h. Filter disc/exhalation filter, if needed
4. Place the unit on a firm, flat surface.
   Most compressors are electrically powered; some may be battery powered.

5. Attach one end of the connecting tubing to the compressor's air outlet.
6. Unscrew the top from the nebulizer cup. Most nebulizer cups unscrew from the top.
7. Most nebulized medication comes premixed and packaged in a unit-dose dosette so the entire contents should be squirted into the bottom half of the nebulizer cup and then the top screwed back on.

   If the medication requires mixing, place the prescribed amount of medicine and diluting solution into the nebulizer cup and screw the cup back together.

8. Attach the other end of the connecting tubing to the bottom of the medication cup.
9. Keeping the cup vertical, attach a face mask or T tube with a mouthpiece to the top of the cup.
10. Have the student sit in a comfortable position.
11. Turn on the power switch.
    A fine mist should be visible.

12. Have the student place mouthpiece in mouth and seal lips around mouthpiece, or place the mask over the nose and mouth (or tracheostomy, if applicable).
13. Instruct the student to breathe normally in and out of the mouthpiece or mask.
14. Every 1-2 minutes have the student take a deep breath, hold breath briefly, then exhale slowly and resume normal breathing. Most treatments last 10-15 minutes.
    Taking some deep breaths ensures that the medicine gets to the lower airways, not just the mouth.

15. Keep the nebulizer cup upright. The cup may require gentle tapping to make sure all the dose is utilized.
16. When all the medication has been aerosolized, turn off power.
17. Remove the mouthpiece or mask.

18. Assess student's respiratory status. **If the student is still having difficulty breathing after nebulizer treatment or is wheezing, follow the student-specific action plan**.
19. Wash the mouthpiece or mask and nebulizer cup. Allow to thoroughly dry on a paper towel before storing. Do not wash the tubing with water. Refer to the cleaning instructions for the other parts.
20. Wash your hands with soap and water.
21. Document the treatment. Report to the school nurse and family any changes in the student's usual pattern of tolerating the procedure.

Cleaning and care of equipment: After each use, rinse the medication cup, mouthpiece, and mask under warm running water for 30 seconds. Shake off any excess water. Allow the equipment to dry. When the parts are dry, store them in a clean plastic bag. Do not wash the tubing. Replace the tubing if it becomes cloudy, discolored, or wet inside. Once or twice a week: Clean nebulizer parts more thoroughly according to manufacturer's instructions. If there are no instructions, the parts can be soaked in a solution of 1 cup white vinegar and 2 cups warm water for 30 minutes. Rinse thoroughly after soaking. Some parts may be boiled or cleaned in a dishwasher.

Thorough cleaning can be done at home. Cleaning the equipment prevents clogging and malfunction and reduces infection. Compressors can be used for multiple students. Other parts are student-specific.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 545-548.

Center for Disease Control and Prevention. (2014). *Know how to use your asthma inhaler.* https://www.cdc.gov/asthma/pdfs/Inhaler_Spacer_FactSheet.pdf

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Wisconsin Improving School Health Services Project. (2015). *Nebulizer*.

Possible Problems That May Occur During Nebulizer Treatments

1. **Chest tightness, coughing, wheezing, shortness of breath, retractions (pulling in of rib cage): Follow the Emergency Asthma Action Plan**. Give the nebulizer treatment, if ordered. Nebulized bronchodilators can act quickly to help with breathing. Notify the school nurse and family.

2. **Breathing gets increasingly difficult. Cough or wheeze worsens:** Stay calm. Reassure student. Document the student's vital signs.

   Follow the Emergency Asthma Action Plan and notify the school nurse and family.

3. **Struggling to breathe or hunching over after the treatment is finished: Follow the Emergency Asthma Action Plan. Call 911, if necessary.** Notify the school nurse, family, and health care provider.

4. **Dizziness, lightheadedness:** The student may be breathing too rapidly. Encourage the student to take slower breaths. If this persists, stop treatment and continue when the student is feeling better.

5. **Becomes shaky or jittery during bronchodilator treatment:** Medication may be causing increased heart rate. Follow the student guidelines for care.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 545-548.

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Wisconsin Improving School Health Services Project. (2015). *Nebulizer*.

Information for Students Who Need Nebulizer Treatments

Date: _____

To: _____
(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student requires nebulizer treatments to deliver medications in a mist form directly into his or her lungs.

The student will have the necessary equipment at school to administer the medication through the nebulizer and this information will be included in the student's health care plan.

The procedure will be conducted by a trained staff member. The student may be able to request a nebulizer treatment and assist with the procedure.

The student may be able to participate in many school activities. Modifications should be approved by the family, health care provider, and school.

Contact_____at _____(phone number) for additional information or if the student experiences any problems with the nebulizer.

Source: Adapted from: Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and youth assisted by medical technology in educational settings: Guidelines for care* (2nd ed.). Baltimore: Paul H. Brookes Publishing

Oxygen Use

Overview

Oxygen is needed for all body functions. A student may need supplemental oxygen therapy when hypoxia or hypoxemia results from a respiratory condition, a cardiac condition, or increased metabolic demands.

Early signs of hypoxia:	
Restlessness	Confusion or change in behavior
Visual disturbances	Tachycardia
Anxious look	Headache
Tachypnea	Dyspnea

Chronic hypoxia:	
Polycythemia	Elevated pCO2
Clubbing of fingers and toes	Chronic pO2 <55
Peripheral edema	Right-sided heart failure

Advanced hypoxia:	
Hypotension	Cyanosis
Bradycardia	Metabolic acidosis

Oxygen Sources

Note: Oxygen is considered a medication and requires a health care provider's orders.

Oxygen Gas

A common source of pure oxygen is oxygen gas stored under pressure in a metal tank. This is especially common for students who need oxygen on a standby basis or who use a ventilator. Tanks come in a variety of sizes and portability. The amount of oxygen remaining in a tank is indicated on the pressure gauge of the tank. Regulators or flowmeters are attached to the tank to control the amount of oxygen the student receives. Oxygen delivery tubing is attached to the “Christmas tree” adapter on the regulator or flowmeter. Oxygen cylinders should be secured in an upright position. Because the oxygen is stored under high pressure, the tank can be a safety hazard. Its cumbersome design and need for frequent refills are also disadvantages.

Oxygen Liquid

The liquid oxygen system includes a large liquid thermal reservoir that stores the pure oxygen as a liquid at -300º Fahrenheit. These tanks also come in a variety of sizes and portability. A portable unit that can be worn over the shoulder can supply oxygen for several hours.

Equipment for both gas and liquid oxygen include:

- Regulator with pressure gauge and flowmeter
- Tank stand or carrier
- Humidification source
- Oxygen tubing
- Mask or cannula
- Wrench for gas tank valve

Oxygen Concentrator

This electronically powered machine extracts oxygen molecules from room air and concentrates it for delivery to the student. It can be used for low oxygen flow less than 4 liter/minute. Its advantage is that it does not require a tank or need refills. However, it does require an electrical outlet so it is not as portable. Units can have a back-up battery that functions during a power outlet or when temporarily portable. The units have air filters that require cleaning.

- Equipment for the oxygen concentrator:
- Humidification source
- Oxygen tubing
- Mask or cannula
- Emergency oxygen tank for power failure

Safety Precautions for Oxygen Use

- **Do not smoke or allow open flames near oxygen.** Post “No Smoking” or “Oxygen in Use” signs at the door. Oxygen supports combustion and a small spark can cause a fire.
- Do not allow oil, grease, or any other highly flammable material to come into contact with any part of the oxygen setup. Do not lubricate any fittings with oil and do not handle equipment with greasy hands or rags.
- Store oxygen away from heaters, radiators, and other heat sources, including the hot sun
- Avoid use of friction-type toys or battery-operated devices due to chance of sparks.
- Avoid use of friction-type toys or battery-operated devices due to chance of sparks.
- Make sure all electrical devices in the area use grounded three-prong plugs.

- Avoid use of friction-type toys or battery-operated devices due to chance of sparks.
- Make sure all electrical devices in the area use grounded three-prong plugs.
- Keep fire extinguishers near the classroom and available in other areas of school.
- Never put anything over an oxygen tank.
- Keep a spare oxygen source, extra tubing, and other tank equipment readily available.
- When using a gas tank, make sure that it is secured upright in its stand (including during transport) and cannot be knocked over (it can become a missile).
- Check the alarm system—pinch tubing to obstruct flow and see if the alarm sounds when the oxygen stops.
- Make sure that oxygen tubing does not become kinked (except for brief testing), obstructed, punctured, or disconnected.
- Use the flowmeter setting prescribed by the student's health care provider.
- Liquid oxygen can evaporate while in a portable unit--check the level often.
- To check if an oxygen tank is empty, look at the red area on the dial. If it reads less than 500 pounds per square inch (PSI), the tank is empty and needs replacing.
- Keep the name of the home oxygen company and its telephone contact posted on/near the oxygen equipment and in the student's health care plan. Contact the company if any equipment does not appear to function correctly.
- Notify the local fire department and emergency medical services that oxygen is in use at the school.

Settings and Staff

Whenever a student is receiving oxygen therapy:

- **There should be no smoking, open flame, or heat source close to the oxygen because these may increase the risk of fire.**
- **Check equipment and oxygen supply at least daily, or as specified by the student's care plan.**

NOTE: The Virginia Department of Education has taken the position that students who need to be accompanied by a supply of oxygen can be transported by the school bus under the following conditions:

- An aide, attendant, nurse, etc. who has received specific training for administration of oxygen and general training on the student's special needs, shall accompany and sit next to the student;
- Only the driver, aide, and the student should be on the vehicle when oxygen is present;
- The tank or cylinder shall be removed from the bus when the student departs;
- **If a portable oxygen system (backpack) comparable to a "C" or "D" type that holds 200-400 liters is used, then the student can be transported on the same bus as other students;**

- The oxygen equipment (backpack tank) shall be mounted and securely fastened to the bus body in an upright position so that valves are protected from possible breakage and to prevent exposure to intense heat. Mounting should be as near as practical to the student's seating position. If a wheelchair is used, the oxygen may be secured to the properly secured wheelchair. If oxygen is necessary during transportation, instead of removing the cylinder from its mounting, a small amount of regular oxygen extension tubing from the cylinder, which should be adjacent to the student's seating position, then a face mask shall be considered.

  (Memo from Barbara Goodman, Principal Specialist, Pupil Transportation, Virginia Department of Education to Frank C. Dixon, Director of Transportation, Fairfax County Schools, April 21, 1994.)

NOTE: The Virginia Department of Education has taken the position that students who need to be accompanied by a supply of oxygen can be **transported by the school bus** under the following conditions:

- It is strongly recommended that an aide, attendant, nurse, etc. who has received specific training for administration of oxygen and general training on the student's special needs, accompany and sit next to the student;
- Oxygen should only be carried when medically necessary and specified in a student's IEP or IHP. Emergency plans should be developed in advance of need.
- Oxygen cylinders should be checked for cracks, leaks, or other defects
- Carry the cylinder carefully using both hands--the cylinder is susceptible to valve damage if dropped or carried by the valve or regulator
- Each cylinder should be secured upright to prevent movement, stored away from sources of potential sparks or heat, and in a location that allows all passengers free egress from emergency exits. It should not be secured in a location where a wheel chair occupant could strike against it in a crash situation.
- It is recommended that a decal indicating compressed oxygen is on board the bus should be placed in a visible place on the exterior of the bus.

  (Virginia Department of Education, *Transporting children with special needs: Transporting of oxygen on school buses,* 2012).

The school nurse or other adult with proven competency-based training in appropriate techniques and problem management may administer oxygen through a nasal cannula or mask. Use of a tracheostomy collar may require a registered nurse or respiratory therapist with training, depending on the care needs of the student with a tracheostomy and as specified in the student's individualized health care plan. Any school personnel who have regular contact with a student who requires oxygen should receive general training covering the student's specific needs, potential problems and implementation of the established emergency plan.

Individualized Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student requiring supplemental oxygen use, the following items should be considered:

- Student's underlying condition and possible problems associated with the condition or treatment
- Health care provider's order for oxygen including how and when it is to be administered
- Student's baseline respiratory status, including color, breath sounds, respiratory rate, pulse, and blood pressure
- Need and frequency for pulse oximetry readings
- Signs and symptoms shown by the student when not receiving adequate oxygen (e.g., cyanosis, agitation, distress)
- Student's ability to request assistance or extra oxygen when needed
- Percentage and/or liter flow of oxygen prescribed (for both routine use and for emergencies)
- Adaptation of classroom for oxygen equipment and supplies, including storage and transport
- Access to oxygen supply in other areas of the school (i.e., portable or stationary)
- Posting of oxygen safety precautions including "oxygen in use" warnings and other oxygen safety precautions
- Need for transportation of oxygen to and from school
- Spare oxygen supply and safe storage when not in use
- Latex allergy precautions
- Standard precautions

Sources:

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U. S. Department of Transportation Pipeline and Hazardous Materials Safety Administration. (2012). *DOT guidance for the safe transportation of medical oxygen for personal use on buses and trains* https://www.easterntrav.com/wp-content/uploads/2020/01/oxygen-on-bus.pdf

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Procedure for Using a Nasal Cannula

A nasal cannula uses small plastic prongs which fit in the student's nostrils and attach to oxygen delivery tubing. It is easy, comfortable, and usually tolerated well because it allows eating and talking. It cannot be used to deliver oxygen concentrations greater than 40% or when there is an obstruction to the nasal passages, such as from swelling, a deviated septum or polyps.

1. Review the oxygen safety precautions (see previous section).
2. Wash your hands with soap and water.
3. Assemble the equipment required for the nasal cannula listed below.
    a. Oxygen source and backup

        Make sure that the tank has enough oxygen.

    b. Cannula and tubing
    c. Humidity source, if needed and ordered
    d. Adaptor for connecting tubing
    e. Extra connecting tubing, if needed for mobility
4. Explain the procedure using explanations the student can understand. Encourage the student to do as much of the procedure as is capable, so as to achieve maximum self-care skills.
5. Securely attach the cannula tubing to the oxygen source.

    Usually a "Christmas tree" adaptor is used to attach the tubing to the oxygen source. Attach a humidifier, if ordered. Humidification of low flow oxygen is often not needed and may contribute to bacterial growth. Make sure that all connections are secure to prevent leaks.

6. Turn on the oxygen source. A highly visible information card stating the oxygen liter flow should be attached to the regulator.
7. Set the flowmeter to the flow rate prescribed by the healthcare provider. **Do not change this setting without first contacting the healthcare provider.**

    Oxygen liter flow can be ordered as a set liter flow rate (e.g., 2 liters per minute) or as a range (e.g., 2-4 liters per minute) based on the student's needs.

8. Check the cannula prongs to make sure that oxygen is coming out.

    Hold them up to your hand and feel for flow coming out. If no flow is felt, check the oxygen supply (make sure the tank still has oxygen), connections for leaks, flow rate, and tubing for obstruction.

9. Gently place cannula prongs into each of the student's nostrils. **Make sure both prongs are in the nostrils**. Loop the tubing over each ear then under the chin. Tubing can be secured by sliding the adjuster up under the chin. Check with the student to make sure it

is comfortable. Do not apply too tightly because this can occlude the nostrils and put excess pressure on facial structures. Assess skin integrity frequently for signs of skin breakdown.

If the student is not comfortable, the cannula tubing can be secured behind the head rather than under the chin. If using an elastic strap to secure the cannula, position it over the ears and around the back of the head.

10. If ordered, provide nares care with ONLY water-soluble products.

    Do not use petroleum products such as petroleum jelly because they are combustible and difficult to clear from the mucosa.

11. Wash your hands with soap and water.
12. Document the procedure on the student's log sheet. Notify the school nurse and family if there are any changes in the student's usual pattern.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 526-533.

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Wisconsin Improving School Health Services Project. (2015). *Administering oxygen*.

Procedure for Using an Oxygen Mask

1. In an oxygen mask, oxygen flows in through the tubing at the bottom of the mask and out through large holes on the sides. It is useful when nasal passages are blocked and can be used to deliver higher concentrations of oxygen than the nasal cannula.
2. Review the oxygen safety precautions (see previous section).
3. Wash your hands with soap and water.
4. Assemble the equipment required for using the oxygen mask listed below.
    a. Oxygen source and backup

        Make sure that the tank has enough oxygen.

    b. Mask and tubing
    c. Humidity source, if needed and ordered
    d. Adaptor for the connecting tubing
    e. Extra connecting tubing, if needed for mobility
5. Explain the procedure using explanations the student can understand. Encourage the student to do as much of the procedure as he/she is capable, so as to achieve maximum self-care skills.
6. Securely attach the cannula tubing to the oxygen source.

    Usually a "Christmas tree" adaptor is used to attach the tubing to the oxygen source. Attach a humidifier, if ordered. Make sure that all connections are secure to prevent leaks.

7. Turn on the oxygen source. A highly visible information card stating the oxygen liter flow should be attached to the regulator.
8. Set the flowmeter to the flow rate prescribed by the health care provider. **Do not change this setting without first contacting the health care provider.**

    Oxygen liter flow can be ordered as a set liter flow rate (e.g., 2 liters per minute) or as a range (e.g., 2-4 liters per minute) based on the student's needs.

9. Check the oxygen mask for flow.

    Hold the mask up to your hand and feel for the flow coming out. If no flow is felt, check oxygen supply (make sure the tank still has oxygen), connections for leaks, flow rate, and the tubing for obstruction.

10. Place the mask over the student's nose, mouth, and chin. Mold the flexible metal edge to the bridge of the nose. Adjust the elastic band around the student's head to hold the mask firmly but comfortably and without excess pressure on the face.

    Make sure that the student is comfortable with the mask and that the mask does not touch the eyes. Assess the skin's integrity frequently for signs of skin breakdown.

11. Wash your hands with soap and water.

12. Document the procedure and problems on the student's log sheet. Notify the school nurse and family if there are any changes in the student's usual pattern.

Possible Problems for Students Requiring Supplemental Oxygen

- **Redness, dryness, or bleeding of the nares, face or tracheostomy area**
    - Check to make sure the devices are not attached too tightly and that they have sufficient humidity, if ordered. **Never use powders or petroleum products on the student's face**. Petroleum products are combustible and difficult to clear from the mucosa. Powders can be aerosolized and irritate the airways. Notify the school nurse and family who can discuss the problem with the health care provider.
- **Rapid breathing or shortness of breath, agitation, confusion, dizziness, or headache**
- **Retractions or pulling in of the muscles at the neck or chest Rapid or pounding pulse**
- **Blue color or pallor of the lips or nails**

Stay calm and reassure the student. Check the student for:

- Check nasal cannula, mask, or tracheostomy collar for correct placement.
- Make sure the student's mouth, nose, or tracheostomy tube is not obstructed by food or mucus and that the student is positioned so that the airway is not blocked.
- Check the tracheostomy tube placement.
- Make sure the collar is not out of position or obstructing the tracheostomy tube.
- With students of African or Mediterranean descent, be careful when assessing for cyanosis, especially around the mouth, because this area may be dark blue normally. Carefully evaluate on an individual basis.

Check the equipment. Check the oxygen flow--if flow is weak or inadequate:

- Make sure the regulator, flowmeter, and valve are on the correct settings.
- Make sure the tank still has gas and is working properly. If not, replace it with a backup.
- Check all connections.
- Check that the tubing is not kinked or blocked.
- Make sure tubing is not obstructed by water condensing in the tubing.
- Empty the water from the tube frequently when using the humidified mist.

Increased oxygen flow may be needed. Notify the school nurse, family and/or health care provider.

- **Continues to show signs of respiratory distress, becomes unconscious, or has a respiratory arrest. Initiate the school emergency plan and notify the school nurse and family. Begin cardiopulmonary resuscitation if needed.**

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 526-533.

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Wisconsin Improving School Health Services Project. (2015). *Administering oxygen*.

General Information for Students with Supplemental Oxygen

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student needs to use additional oxygen during the school day.

The oxygen usually is administered through a mask or tubing inserted into the student's nose or into a tracheostomy collar. The oxygen is kept in a small tank and should always remain with the student. Students may use oxygen continuously or intermittently, depending on their care plan.

This student may be able to participate in many school activities. Modifications should be approved by the family, health care provider, and school.

Open flames and smoking should be prohibited in rooms in which a student is using oxygen.

Contact_____at_____(phone number) for additional information or if the student experiences any problems with the use of oxygen.

Source: Adapted from: Porter, S., Haynie, M., Bierle, T., Caldwell, T. H., & Palfrey, J. S. (Eds.). (1997). *Children and youth assisted by medical technology in educational settings: guidelines for care* (2nd ed.). Baltimore: Paul H. Brookes Publishing

Pulse Oximetry

Overview

Pulse oximetry measures the percentage of hemoglobin saturated with oxygen. Students with ventilation/perfusion abnormalities such as asthma or congestive heart failure may benefit from pulse oximetry and the measurement of oxygen saturation (SaO2). The pulse oximeter consists of a probe with a light-emitting diode (LED) and a light-sensitive photodetector, connected by cable to an oximeter. The oximeter measures the absorption (amplitude) of two wavelengths of light passing through body parts with a high perfusion of arterial blood. The procedure is noninvasive, painless, and reliable.

It is important to remember that pulse oximetry measures oxygen saturation (SaO2), not the actual amount of oxygen in the blood. The partial pressure of oxygen (PaO2) can be correlated with the SaO2 by means of the oxyhemoglobin dissociation curve. A SaO2 reading of 90% correlates with a PaO2 reading of approximately 60 mmHg. In most students, normal oxygen saturation is expected to be equal to or greater than 95%, with 90% as the lowest acceptable value. However, many health care providers prefer a SaO2 of 93% as the lowest acceptable value (correlates to PaO2 of 70 mmHg). Anemia, pH, and body temperature changes can impact oxygen saturation values. Some students with chronic anemia, heart conditions, or other conditions may normally run lower oxygen saturations. For a student with asthma, a decrease in oxygenation is a very late sign of distress, so relying on pulse oximetry could be falsely reassuring during an asthma attack. It is important to use pulse oximetry as just one component of a complete respiratory assessment. **Acceptable values for students requiring pulse oximetry should be specified in their individualized health care plans.**

Settings and Staff

There are no restrictions as to where pulse oximetry can be done. The setting should be clean and appropriate to the student's need/desire for privacy. Students with oximeters can attend a regular classroom and participate in regular school activities, with modifications as needed and as determined by the family, health care provider, school nurse, and school staff.

Pulse oximetry can be performed by the school nurse, family, teacher aide, or other staff person who has had general training in pulse oximetry. General training should cover the student's specific health care needs, how to select a sensor site and apply the probe/sensor, reporting values to the proper person, potential problems, how to obtain assistance should problems occur, and how to implement the established emergency plan. The most complex aspect of pulse oximetry is interpreting the results. Guidelines should be specified in the student's individualized health care plan. If there are questions or concerns about a value, the school nurse, family, and/or health care provider should be contacted for assistance.

Individualized Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student who requires pulse oximetry, the following items should be considered:

- Need for the student to receive pulse oximetry
- Whether oximetry is to be continuous or intermittent
- Frequency of measurements if intermittent and alarm limits if continuous
- Student's underlying condition and possible problems associated with the condition or treatment
- Determination of oxygen saturation values that should be immediately reported to the school nurse, family and/or health care provider
- Determination of oxygen saturation values that require specific interventions, such as oxygen or medication administration
- Student's baseline status, including color, respiratory rate, pulse, and blood pressure and assessment of changes in this status
- Student's self-care skills and knowledge of early signs of respiratory distress
- Latex allergy precautions—if child is latex sensitive, clip-on probes (not adhesive probes) should be used
- Standard precautions

Sources:

American Lung Association. (n.d.). *Pulse oximetry*. https://www.lung.org/lung-health-diseases/lung-procedures-and-tests/ pulse-oximetry

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Procedure for Measuring Pulse Oximetry

1. Determine the need for oximetry. The student may ask for a measurement.

   Assess the student's status: respiratory rate, depth, effort, pulse, restlessness, color, retractions, cough, wheezing, and lung sounds.

2. Wash your hands with soap and water.
3. Explain the procedure using explanations the student can understand. Encourage the student to do as much of the procedure as is capable, so as to achieve maximum self- care skills.
4. Position the student as recommended.

   Usually performed while the student is sitting to decrease the motion artifact that can interfere with measurement. Should not be performed in direct sunlight or under bright lights because these lights can interfere with the performance of the saturation sensor. Sensors can be covered to protect from bright lighting.



5. Instruct the student to breathe normally, if necessary.

   Normal breathing prevents large fluctuations in minute ventilation and possible changes in oxygen saturation.

6. Select an appropriate site to apply sensor/probe bases on peripheral circulation. Site must have adequate capillary refill and be free of moisture. It must not be edematous, hypothermic, or have nail polish. Fingers, toes, and earlobes are the most commonly used sites.

   Nail polish and moisture can affect light transmission and falsely alter saturation. Hypothermia can cause vasoconstriction, altering saturation.

7. Attach a pulse oximeter sensor/probe to the selected site. The light-emitting diode (LED) and photodetector must face each other with a tissue pad in between. The light source (LED) is usually positioned on top of the nail. The clip-on probe attaches like a clothespin to a fingertip. Adhesive sensor must be applied so that the light source is on one side of the finger and the detector is directly opposite facing it.
8. Attach the sensor cable to the oximeter and turn the machine on. Observe waveform display and listen for audible beep or watch for reading.

   Light or waveform fluctuates with each pulsation and reflects pulse strength. Poor light waveform may indicate the signal is too weak to give accurate oxygen saturation readings.

9. Correlate the oximeter pulse rate with the client's apical or radial pulse.

Oximeter pulse rate, student's radial pulse, and apical pulse rate should be similar. If differences exist, inaccurate oxygen saturation readings may be obtained. Reevaluate the site and the placement of sensor/probe.

10. Read the saturation level on the digital display when the readout reaches a constant value (after at least 10 seconds) and the pulse display is strong.
11. If continuous oxygen saturation monitoring is ordered, verify the alarm limits and alarm volume. Limits should be set as ordered in the student-specific plan. Assess the sensor/probe site every 2-4 hours and rotate site every 4-8 hours to prevent burns from the sensors.
12. If intermittent monitoring is ordered, remove the probe and turn off the oximeter's power after reading. If an adhesive sensor is used, place it on the plastic backing for future use. Store the probe and oximeter in an appropriate location.
13. Wash your hands with soap and water. If the oximeter probe is used for more than one student, it should be cleaned between uses according to the manufacturer recommendations.
14. Record oxygen saturation readings in the student log. Note any change in the respiratory status at this time.
15. Compare readings with the student baseline and acceptable values. Report to the school nurse and family any changes from the student's usual pattern.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 606-611.

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Selekman, J. (2013). *School nursing: A comprehensive text* (2nd ed.). Philadelphia: F.A. Davis, 540-541, 1045-1047.

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Wisconsin Improving School Health Services Project. (2015). *Pulse oximetry monitoring*.

Possible Problems with Pulse Oximetry

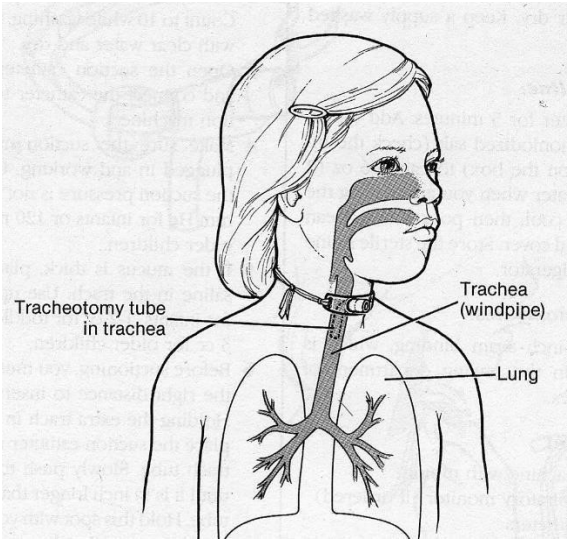
- **No reading on oximeter**
    - Check to see if sensors are properly aligned or the clip is securely on the finger. Make sure the wires are intact and securely fastened.
    - Check that the oximeter has charged batteries or is plugged in and the electrical outlet is functioning.
- **Low oxygen saturation readings but the student has no sign of respiratory distress**
    - Check:
        - Correlation between pulse rate and oximeter pulse reading. If they differ, re-position the probe.
        - Capillary refill. Loosen any tight-fitting clothes. If the student's circulation has decreased, choose a different site for the probe.
        - Light source on probe.
        - If a limb is being moved during reading, it may need to switch to another site.
        - Adhesion of sensor/probe to skin site (unless using clip type).
        - Assess for hypothermia. If the extremity is cold, move the probe or warm extremity.
        - Lighting in the room. Bright direct lighting or bright sunlight can affect the readings.
        - Probe/sensor site for sweating, nail polish.
- **Low oxygen saturation readings and the student has signs of respiratory distress**
    - Follow guidelines in the student's individualized health plan. Administer oxygen or suction the student, if prescribed. If distress persists, notify the school nurse, family and/or health care provider. Be prepared to implement the school emergency plan.
- **Irritation of probe/sensor site**
    - Move probe/sensor. Assess site every 2-8 hours as needed or specified. Notify the school nurse and family of irritation.

Tracheostomy

Overview

A tracheostomy is a surgically-created opening (stoma) in the neck and trachea (windpipe). It provides a way for air to go into and out of the lungs. A curved plastic tube is inserted into the stoma to keep it open for breathing. In children without tracheostomies, air is filtered, moistened, and heated as it passes through the nose or mouth. Children with tracheostomies bypass the upper airway and need extra care to moisten and protect their lower airway. Most students with tracheostomies are able to speak, eat, and drink, but require careful monitoring.

There are a variety of conditions that may necessitate a tracheostomy. Some children are born with a trachea whose walls collapse easily occluding the airway (tracheomalacia). Others have neuromuscular conditions, laryngeal spasm, vocal cord paralysis, or congenital anomalies which compromise the airway. Children who require long-term respiratory support (e.g., ventilators) because of such disorders as spinal cord injuries or bronchopulmonary dysplasia frequently receive tracheostomies. Other reasons for a tracheostomy include subglottic stenosis, Treacher Collins or Pierre Robin Syndrome, severe neck or mouth injuries, facial or airway burns, and anaphylaxis (severe allergic reaction).



Equipment Needed for Tracheostomy Care

The student with a tracheostomy should always have access to the equipment listed below. The equipment should be checked daily and may be carried in a backpack. It is supplied by the family and must be carried with the student **at all times.**

- Spare tracheostomy tube (same size as current one) and obturator
- One size smaller tracheostomy tube
- Gauze pads
- Tracheostomy ties or Velcro ties
- Suction machine
- Suction catheters
- Sterile or clean gloves, per guidelines in the student's individualized healthcare plan (IHP)
- Sterile or clean cotton-tip swabs, if required
- Pipe cleaners, if needed for cleaning of an inner cannula
- Water-based lubricant

- Manual resuscitator with adaptor (Ambu bag)
- saline or ½ strength hydrogen peroxide (diluted with saline or distilled water)
- Scissors, blunt nosed
- Heat Moisture Exchanger (HME), more commonly known as an artificial nose, for protecting the tracheostomy from dry or cold air and dust or other particles, if specified. *The artificial nose must be changed if it appears to be saturated with moisture or secretions.* ***Do not rinse****. Discard and replace if saturated.*
- Device to deliver humidity, if prescribed
- Device to deliver oxygen, if prescribed
- Hand-powered suction device (back-up suction)
- Syringe to inflate or deflate tracheostomy cuff, if needed
- Hand sanitizer
- List of emergency phone numbers
- Note with the child's brief medical history

Settings and Staff

Students with tracheostomies can usually attend general classes with their peers. Participation in other school activities must be decided on an individual basis by the health care provider, family and school professionals. Some children with tracheostomies require a trained caregiver to accompany them at all times. Staff who work with children who have tracheostomies should receive special training in how to recognize breathing difficulty and specialized CPR. They should also know how to activate the student's emergency plan.

Students with tracheostomies should avoid areas where there might be a lot of dust. This includes chalk dust and playground dust. Normally the nose and mouth filters, warms, and moistens the air before it reaches the lungs. Students with tracheostomies do not have this filtering system and take air directly into the trachea (windpipe) and then the lungs. Most students who have a tracheostomy will wear a heat moisture exchanger (may be called an artificial "nose") to protect from this.

Routine tracheostomy care, including such procedures as stoma care and tube changes, should be performed at home. If additional routine care is necessary, it should be done in a clean, private area such as the health office. In an emergency, the care can be done wherever the patient is at that moment. For this reason, a suction machine and a complete set of supplies and equipment for tracheostomy care should accompany the student at all times (see above). This can be transported in a backpack or "go bag."

Tracheal care for students who require care in school, such as suctioning, cleaning, use of a tracheostomy collar, or other daily care, should be provided by a registered school nurse, licensed respiratory therapist, licensed practical nurse or other specifically trained unlicensed assistive personnel under the supervision of a registered nurse. These caregivers should have

proven, competency-based training in appropriate techniques and problem management. **All staff in contact with students who have tracheostomies should have specialized cardiopulmonary resuscitation training. They should be able to recognize signs of breathing difficulty and should know how to activate the student's emergency plan.**

Any school personnel who have regular contact with a student who has a tracheostomy must receive general training covering the student's specific needs, potential problems, and implementation of the established school emergency plan. Staff should **not** use powders, aerosols (i.e., room deodorizers), small particles, such as sand, glitter, lint, chalk dust, and animal hair, small pieces of food and water, or glue or chemicals with strong fumes near a student with a tracheostomy. Students who may have accidental contact with any of these potential hazards should have some kind of protective covering for the tracheostomy.

Individualized Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with a tracheostomy, the following items should be considered:

- Underlying condition and possible problems associated with the condition or treatment
- Health care provider's order for tracheostomy and its care
- Size and type of tracheostomy tube
- Student's baseline color, respiratory rate, pulse, blood pressure, secretions
- Student specific signs of respiratory distress
- Need for filtering or humidity (e.g., artificial nose)
- Suctioning guidelines—frequency, size of the catheter, special instructions
- Equipment and supplies needed, including instructions for use
- Back up equipment and personnel
- Portable equipment and responsibility for transporting equipment
- Student's self care ability and ability to request assistance
- Emergency action plan, including all phone numbers
- Identification of individuals capable of assisting student or caregivers
- Staffing needs to provide safe care for the student and plan for absences
- Avoidance of small particles in the air, such as chalk dust, aerosols, glitter, small toys, and sand
- Need for additional fluids
- Speech and communication needs
- Disaster care planning
- Means of communicating between school personnel when immediate help is needed (e.g., walkie-talkies, intercoms, telephones, cellular phones)
- Latex allergy precautions

- Standard precautions

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Potential Problems for Students with Tracheostomies

- **Signs of Respiratory distress:**
    - Difficulty breathing
    - Pale blue color around lips, eyes, nails
    - Increased respiratory rate
    - Retractions
    - Increased heart rate
    - Anxious, frightened look
    - Wheezing, grunting, noisy breathing
    - Restlessness, agitation

Tracheostomy tube may be blocked with mucus or foreign matter. Suction the tracheostomy. Change the tracheostomy tube if needed. Check the placement of the tracheostomy tube and air movement from the tracheostomy. Reassure the student. **If symptoms do not clear with suction or tube change, activate the school emergency plan. Do not leave the student alone.**

- **Tracheostomy tube becomes dislodged**
    - *Stay calm and do not leave the student alone*. Reposition the tracheostomy tube, if possible. If unable to reposition or the tube has come totally out, insert a new (spare) tracheostomy tube using an obturator immediately. If a regular size tube cannot be inserted, use one size smaller. If a spare trach is not available, replace it with the one that came out. Reposition the child and tilt head back if there is difficulty inserting. Check the air movement. Give breaths with a resuscitation bag, if indicated.
    - Administer oxygen if prescribed in the emergency plan. **Initiate the school emergency plan and begin cardiopulmonary resuscitation, if necessary**. Notify the school nurse, family and health care provider.
- **Suction catheter cannot be inserted into tracheostomy tube**
    - ***Do not leave the student alone*.** Reposition the head/neck and try again. Change the inner cannula (if present) or replace the tracheostomy tube. Give breaths with a resuscitation bag, if needed. Check for air movement. Give oxygen, if prescribed in the emergency plan. Initiate the school emergency plan and begin cardiopulmonary resuscitation (CPR), if necessary. Notify the school nurse, family and health care provider.
- **Aspiration of foreign material (e.g., food, sand) into the tracheostomy**
    - ***Do not leave the student alone. Suction first. Do not give breaths with a resuscitation bag because forcing air could push the aspirate further into lungs*.** Give breaths with a resuscitation bag **after** initial suctioning. Check for air movement. If the tube remains blocked, replace it with a new trach tube. If the mucus is very thick **and** saline has been prescribed, saline may be added. However, saline is no longer routinely recommended and may cause more harm

than good. If the student experiences a bronchospasm causing wheezing, medications may be required, if prescribed. **If respiratory distress continues, initiate the school emergency plan. Begin CPR, if needed**. Notify the school nurse, family and health care provider.

- **Distress during suctioning**
    - Limit suctioning to 5-10 seconds or less. Suction more frequently for shorter periods. Make sure the catheter is no more than ½ the diameter of the tracheostomy. Activate the school emergency plan if distress persists. Notify the school nurse and family.
- **Dressing becomes wet**
    - Replace the dressing with a similar dressing. Use a pre-slit gauze if possible. If pre-slit gauze is not available, use 4"x4" gauze unfolded to 8"x4." Fold lengthwise, then fold gauze corners up in a "U" shape and slide under the tracheostomy ties around the outer opening of the tracheostomy tube. (Fibers from freshly-cut gauze can enter site so do not use cut gauze).
- **Excessive secretions requiring frequent suctioning**
    - May require more frequent suctioning or more humidity. Suction as needed. Encourage fluid intake to thin mucus. Yellow or green mucus may indicate infection and should be reported immediately.
- **Fever or chills; yellow or green secretions; foul odor, congested lung sounds; listlessness, increased mucus**
    - Possible signs of infection. Document and notify the school nurse and family.
- **Redness or skin breakdown at the stoma**
    - Clean the site as specified in the student's individualized healthcare plan and make sure dressing stays dry. (Studies have shown that most sites should be cleaned with just water or soap and water). Check that the ties are not too tight (should allow one finger to be inserted comfortably between the tie and neck). Document the appearance of the site in the student log and notify the school nurse and family of any changes.
- **Bleeding or pain at stoma site**
    - Notify the school nurse and family. May be due to infection, trauma, or excessive coughing
- **Pink or red streaked secretions from tracheostomy**
    - May occur as a result of suctioning. Check suction pressure (should always be less than 100 mmHg for children and 120 mmHg for adolescents). Limit suctioning to 5 seconds at a time. Notify the family. If actual bleeding is observed, notify the school nurse and family immediately and activate the school emergency plan.

General Information for Students with Tracheostomies

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has a tracheostomy, or opening in the neck to allow the student to breathe through an opening in the windpipe. A tube may be inserted into the opening and secured to the neck with Velcro or ties. Some tracheostomy openings may not be covered.

This student:

- ❑ Is able to eat and drink normally by mouth
- ❑ Is not able to eat and drink normally by mouth
- ❑ Is able to speak normally
- ❑ Is unable to speak normally
- ❑ Does tracheostomy care at home
- ❑ Has a caregiver with him or her to do tracheostomy care at school

This student may be able to participate in many school activities. Modifications should be approved by the family, health care provider, and school.

The student may need to avoid certain activities (such as swimming) and should avoid exposure to other students with respiratory infections (such as colds). Specific recommendations will be included in the student's Individualized Health Care Plan.

School staff in frequent contact with this student are encouraged to complete cardiopulmonary resuscitation (CPR) training and specialized training for people with tracheostomies.

Contact_____at_____(phone number) for additional information or if the student experiences any problems with the tracheostomy.

Source: Adapted from: Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and youth assisted by medical technology in educational settings: Guidelines for care* (2nd ed.). Baltimore: Paul H. Brookes Publishing

Tracheal Suctioning

Overview

A tracheostomy tube bypasses the upper airway's filtering, humidifying, and warming mechanisms. In response to this, the body produces more mucus. The tracheostomy tube usually needs suctioning to remove mucus from the tube and the trachea to allow for more effective breathing. Suctioning involves passing a vacuum-type tube into the tracheostomy to remove excess mucus and debris. Many students need suctioning every 4-6 hours. New tracheostomies may need more frequent suctioning. Some children may be able to request suctioning when it is needed; others must rely on caregivers to assess the need.

Indications that suctioning might be needed include:

- Fast breathing, increased difficulty breathing
- Increased coughing
- Noisy, rattling breath sounds
- Bubbles of mucus visible in the tracheostomy
- Whistling noise from tracheostomy
- Irritability, anxious look
- Poor color
- Decreased air movement into and out of the tracheostomy
- Congestion prior to eating or drinking
- After nebulizer treatments or chest percussion and drainage

Settings and Staff

Routine suctioning can be done in a classroom if a clean, non-busy area is available, but in most cases is done in a clean, private area to protect the student's privacy and to protect the classroom from disruptions involving the noisy suctioning procedure. Emergency suctioning should be done as soon as possible wherever the student might be. If an electric suction machine is used, a grounded electrical outlet must be available. Portable suctioning equipment should accompany the student at all times.

Tracheal suctioning should be provided by a registered school nurse, licensed respiratory therapist, or licensed practical nurse or other specifically trained unlicensed assistive personnel under the supervision of a registered school nurse. These caregivers should have proven, competency-based training in appropriate techniques and problem management. **All staff in contact with students who have tracheostomies should have specialized cardiopulmonary resuscitation training. They should be able to recognize signs of breathing difficulty and should know how to activate the student's emergency plan.** Any school personnel who have regular contact with a student with a tracheostomy must receive general training covering the

student's specific needs, potential problems, and implementation of the established emergency plan.

Individualized Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student who requires tracheal suctioning, the following items should be considered:

- Underlying condition and possible problems associated with the condition or treatment
- Healthcare provider's order for suctioning
- Size and type of tracheostomy tube
- Student's baseline color, respiratory rate, pulse, blood pressure, secretions
- Student specific signs of respiratory distress
- Need for filtering or humidity (e.g., artificial nose)
- Type of suction catheter (one-time use versus sleeved or inline)
- Suctioning guidelines—frequency, size of catheter, special instructions
- Length of the tracheostomy tube measured to determine the depth of suctioning
- Appropriate pressure settings if the suction machine has a vacuum setting
- Need for breaths with a manual resuscitation bag
- Equipment and supplies needed
- Back up equipment and personnel
- Portable equipment and responsibility for transporting equipment
- Student's self-care ability and ability to request assistance
- Emergency action plan, including all phone numbers
- Identification of individuals capable of assisting the student or caregivers
- Staffing needs to provide safe care for the student and plan for absences Avoidance of small particles in the air, such as chalk dust, aerosols, glitter, small toys, and sand
- Latex allergy precautions
- Standard precautions

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Procedure for Tracheal Suctioning Using One-Time Use Catheter

Equipment for suctioning must be available for use at ALL times.

Note: Family supplies equipment and supplies.

1. Wash your hands with soap and water.
2. Gather the equipment and materials required for the tracheal suction listed below.
    a. Suction machine and manual backup
    Students should also have a portable suction machine or manual device that can travel with them throughout school and during transport to and from home. A manual means of suctioning should also be available as a back up at all times in case of power failure, equipment malfunction, or lack of electrical outlet.
    b. Correctly-sized suction catheter
    Suction catheters should be no greater than ½ the diameter of the tracheostomy tube. To determine how deep the suction catheter should be inserted, determine the length of the tube from the package, family or health care provider. Pre-marked suction catheters are recommended.
    c. Sterile saline or sterile water to clear catheter
    d. Container for saline or water
    e. Disposable gloves, latex and powder free; sterile or clean according to student IHP
    f. Self-inflating manual resuscitation (Ambu) bag with adaptor for tracheostomy
    g. Plastic bag for disposal of materials
    h. Saline dosettes, ONLY if prescribed—no longer routinely used
3. Determine depth to be suctioned **prior** to suctioning. This should be in the student's IHP and/or noted on suction catheters.
    Suctioning should normally be shallow, only to the end of the tracheostomy tube, to avoid damage to the respiratory tissues.
4. Position the student as specified in their IHP. Although not required, it is advisable to have another person available for assistance if needed.

    Most students are suctioned while seated upright at school.

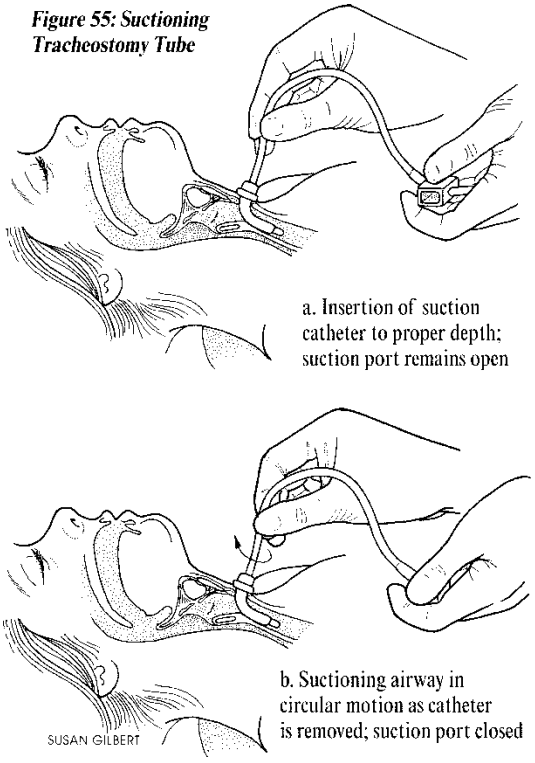
5. Explain the procedure using explanations the student can understand. Encourage the student to do as much of the procedure as is capable, so as to achieve maximum self-care skills.
6. Encourage the student to cough up any secretions. If nebulizer treatment, postural drainage, or percussion is ordered for the student, it may be beneficial to do these prior to suctioning.

Coughing may eliminate the need for suctioning.

7. Turn on the suction machine. A suction of 80-100 mmHg is usually recommended for children and 80-120 mmHg for adolescents. Put your finger at the end of the connecting tube to confirm suction.
8. Wash your hands with soap and water.
9. Open the suction catheter or kit.
   Peel paper back without touching the inside of the package to maintain sterility.
10. Pour a small amount of sterile saline or sterile water into the container.
    This will be used to moisten the catheter and to clear out secretions in the catheter.
11. Put on a pair of gloves. A mask, goggles, or face shield may be required with some students to fully protect the caregiver from coughed-up mucus.
12. Holding the connecting end of the suction catheter in the dominant hand, secure it to the suction machine tubing (held in non-dominant hand). Leave the other end of the catheter in its covering.

    The dominant hand should remain "sterile/clean." It should not touch anything but the sterile catheter. The non-dominant hand should be used to turn on switches or touch other objects.

Figure 55: Suctioning Tracheostomy Tube



13. Do **NOT** manually ventilate with the resuscitation bag and/or hyperoxygenate prior to suctioning **unless** it is specifically prescribed.

    There is controversy over whether this intervention is helpful and usually is no longer done. Delivering a manual breath when secretions are in the tracheostomy tube can serve to force this mucus deeper into the airway.
    Stable children without a ventilator typically do not require extra oxygenation prior to suctioning.

14. Holding the suction catheter 2-3 inches from the tip with the dominant hand, insert the tip of the catheter in sterile saline or sterile water.

This tests that suction is functioning. This also helps to lubricate the tip of the catheter and clear out any secretions in the connecting tubing. Do not use a lubricant other than water because the lubricant can dry and cause airway occlusion.

15. With the thumb off of the vent hole, gently but quickly insert the catheter into the tracheostomy. ***Do not suction while the catheter is being inserted*** because it can damage the tracheal mucosa, as well as increase hypoxia. Do not insert the catheter beyond the distal end of the tracheostomy tube.
    Guide catheter with sterile, dominant hand. If the catheter is inserted too deeply, this can cause irritation/injury to the trachea, as well as bronchospasm. Determine the length of the tracheostomy tube from the package, family, or health care provider ***prior*** *to suctioning.*

    Coughing indicates that the suction catheter possibly has passed the end of the tracheostomy tube.

16. Cover the vent hole intermittently with your thumb while withdrawing the catheter. Rotate the catheter gently between thumb and index finger while suctioning and withdrawing.

    This helps to reach all secretions in the tracheostomy tube and prevent injury to the tracheal mucosal lining. Uncovering intermittently and rotating the catheter helps prevent damage to the mucosal lining.

    Each insertion and withdrawal of the catheter must take no longer than 5-10 seconds.

    Extended suctioning can block the airway and cause a serious drop in the student's oxygen level.

17. Allow the student to rest and breathe or give breaths with a resuscitator bag between suctioning passes. The timing of each suctioning pass and the length of the rest period depend on the student's tolerance of the procedure and absence of complications. Suction saline again through the catheter to rinse secretions from the catheter and tubing.
    This helps the student get new oxygen/air into the lungs.
18. **Do not routinely use saline to loosen secretions**. *Only if prescribed*, insert several drops of saline into the tracheostomy with the non-dominant hand. Manually ventilate with a resuscitation bag to disperse saline, *only if ordered.*
    Saline may push secretions back down the airway. It was once used to loosen or thin thick or dry secretions. Research indicates it may increase airway contamination, decrease

*oxygen saturations, and do a poor job of thinning secretions. It is **not** recommended unless it is specifically ordered.*

19. If moist, gurgling noises or whistling sounds are still heard, or if mucus is seen at the tracheostomy opening, repeat the suctioning procedure (steps 16-19). Usually there should be no more than three suctioning passes. Assess the student's color and respiratory status throughout the procedure. If a student was receiving oxygen by a mask before suctioning, reapplication of the mask between passes might be needed.

    If appropriate, ask the student if he or she needs repeat suction.

20. The nose and back of the mouth may be suctioned if needed after completion of tracheal suctioning.

    *After the nose and mouth are suctioned, the catheter **cannot** be reused to suction the tracheostomy.*

21. Rinse the catheter and the connecting tubing with normal saline until clear. Use continuous suction.

    Removes catheter sections in the tubing. Secretions left in tubing decrease suctioning efficiency and provide an environment for growth of microorganisms.

22. Disconnect the catheter from the suction tubing. Wrap the catheter around the gloved hand. Pull the glove off inside out so that the catheter remains rolled in the glove. Place the first glove in the remaining gloved hand. Pull off the other glove over the first glove to seal in the contaminated tubing.

    For each suctioning session, a new catheter should be used. Sleeved catheters (see next procedure) may be reused as long as they are <u>not</u> used to suction the nose and mouth.

    Consult the family and health care provider for student-specific use.

23. Discard the used suction catheter in the appropriate receptacle. Turn off the suction. Wash your hands with soap and water.
24. Note color, consistency (e.g., thin, thick), and quantity of the secretions.
25. Compare the student’s respiratory assessments before and after suctioning. Document the procedure on the student’s log sheet and notify the school nurse and family of any changes from the student's usual pattern.

26. Be sure the suction equipment and supplies are restocked, checked daily, and ready for immediate use.

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Illustration Source

The Center for Pediatric Emergency Medicine (CPEM). Teaching resource for instructors in prehospital pediatrics. Illustrations by Susan Gilbert.

Tracheal Suctioning Using a Sleeved or Inline Suction Catheter

Overview

Sleeved or inline suction catheters may be used for tracheal suctioning. A sleeved catheter consists of a sterile suction catheter inside a clear plastic sheath or "sleeve." The catheter can be threaded into the trachea and retracted back into the sleeve after suctioning. The catheter never comes in contact with the environment, only the inside of the sleeve and the inside of the trachea. Therefore, the catheter can be used for multiple suctionings. Usually the sleeved catheter is used for a 24 hour period and then discarded; however, some sleeved catheters have been designed to be used for 72 hours before being discarded.

Research studies have demonstrated that people using sleeved catheters generally have less risk of developing a lung infection than those using conventional disposable catheters. The cost of each sleeved catheter is many times the cost of a single-use catheter. However, most studies have found that when the number of catheters, sterile gloves, and nurse's time are factored into the costs, sleeved catheters are less expensive, or comparable, in cost. Other studies have found that suctioning is done more frequently on patients with sleeved catheters because the setup and procedure are easier. Additionally, sleeved catheters designed for ventilators can be attached to the ventilator tubing to form a *closed tracheal suctioning system*, allowing suctioning to take place without opening the system. This closed system has been found to decrease the risk of infection, as well as minimize oxygen desaturation during suctioning because the tubing system does not need to be opened to accomplish suctioning.

Note: Family provides equipment and supplies.

Procedure



Follow steps 1-10 for tracheal suctioning.

1. Put on a pair of gloves.
2. Attach the control valve of the sleeved catheter to the connecting suction tubing (if not already connected).
3. Turn on the machine to the appropriate vacuum setting for the student, usually 80-100 mmHg for children and 80-120 mmHg for adolescents.
4. Suction a small amount of sterile water or saline.

   This lubricates the tube, ensures that the tubing is clear of secretions, and tests the functioning of the suction system.

5. If the student is ventilator dependent, attach a T-piece to the ventilator breathing circuit and connect the T-piece to the student's tracheostomy.
6. Using the thumb and index finger of the dominant hand, advance the catheter through the tracheostomy tube and into the tracheobronchial tree. It may be necessary to gently retract the catheter sleeve as the catheter is advanced.
7. ***Do not suction while the catheter is being inserted*** because it can damage the tracheal mucosa, as well as increase hypoxia. Do not insert the catheter beyond the distal end of the tracheostomy tube.
8. Cover the vent hole intermittently with your thumb while withdrawing the catheter. Rotate the catheter gently between your thumb and index finger while suctioning and withdrawing.

   This helps to reach all secretions in the tracheostomy tube and prevent injury to the tracheal mucosal lining. Uncovering intermittently and rotating the catheter helps prevent damage to the mucosal lining.

   Each insertion and withdrawal of the catheter must take no longer than 5-10 seconds.

   Extended suctioning can block the airway and cause a serious drop in the student's oxygen level.

9. Allow the student to rest and breathe or give breaths with a resuscitator bag between suctioning passes. The timing of each suctioning pass and the length of the rest period depend on the student's tolerance of the procedure and absence of complications. *This helps the student get new oxygen/air into their lungs.* Suction the saline again through the catheter to rinse secretions from the catheter and tubing.
10. **Do not routinely use saline to loosen the secretions**. Only if prescribed, insert several drops of saline into the tracheostomy with your non-dominant hand. Manually ventilate with a resuscitation bag to disperse the saline, if ordered.

    Saline may push secretions back down the airway. It was once used to loosen or thin thick or dry secretions. Research indicates it may increase airway contamination, decrease oxygen saturations, and do a poor job of thinning secretion contaminations, decrease the oxygen saturation, and may not help clear secretions.

11. If moist, gurgling noises or whistling sounds are heard or if the mucus is seen at the tracheostomy opening, repeat the suctioning procedure (steps 7-9). Assess the student's color and respiratory status throughout the procedure.

    If appropriate, ask the student if he or she needs repeat suctioning.

12. Rinse the catheter and the connecting tubing with normal saline *until clear*.

    This step is particularly important with sleeved catheters because they are reused and any secretions left in the catheter can provide an environment for growth of microorganisms.

13. Sleeved catheters can be reused for up to 24-72 hours. Follow manufacturer-specific and guidelines in student's IHP. They cannot be reused in the trachea if they are used to suction the mouth and nose.
14. Remove your gloves. Wash your hands with soap and water.
15. Note color, consistency (e.g., thin, thick), and quantity of the secretions. Compare the student's respiratory assessments before and after suctioning. Document the procedure on the student's log sheet and notify the school nurse and family of any changes from the student's usual pattern.
16. Be sure the suction equipment and supplies are restocked, checked daily, and ready for immediate use.

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Possible Problems When Suctioning

- Signs of Respiratory distress:
    - Difficulty breathing
    - Pale blue color around lips, eyes, nails
    - Increased respiratory rate
    - Retractions
    - Increased heart rate
    - Anxious ,frightened look
    - Wheezing, grunting, noisy breathing
    - Restlessness, agitation

    The tracheostomy tube may be blocked with mucus or foreign matter. Suction the tracheostomy. Change the tracheostomy tube, if needed. Check the placement of the tracheostomy tube and air movement from the tracheostomy. Reassure the student**. If symptoms do not clear with suction or tube change, activate the school emergency plan. Do not leave the student alone.**

- **Tracheostomy tube becomes dislodged**
    - ***Stay calm and do not leave the student alone***. Reposition the tracheostomy tube, if possible. If unable to reposition or the tube has come totally out, insert a new (spare) tracheostomy tube using an obturator **immediately.** If a regular size tube cannot be inserted, use one size smaller. If a spare trach is not available, replace it with the one that came out. Reposition the child and tilt their head back if there is difficulty inserting. Check air movement. Give breaths with a resuscitation bag, if indicated. Administer oxygen if prescribed in the emergency plan. I**nitiate the school emergency plan** and begin cardiopulmonary resuscitation, if necessary. Notify the school nurse, family and health care provider.
- **Suction catheter cannot be inserted into tracheostomy tube**
    - ***Do not leave the student alone***. Reposition the head/neck and try again. Change the inner cannula (if present) or replace the tracheostomy tube. Give breaths with a resuscitation bag, if needed. Check for air movement. Give oxygen, if prescribed in the emergency plan. **Initiate the school emergency plan** and begin cardiopulmonary resuscitation (CPR), if necessary. Notify the school nurse, family and health care provider.
- **Bleeding during suctioning**
    - If there are pink or blood-streaked secretions, check the suction pressure (should always be less than 120 mmHg). Limit suctioning to 5 seconds at a time. Notify the school nurse and family. If a large amount of blood is suctioned or the student develops respiratory distress while being suctioned, a**ctivate the school emergency plan** and notify the school nurse and family. Reassure the student.

- **Bronchospasm during suctioning**
    - This may be due to excessive suctioning. Reassure the student and help the student to calm down. If unable to withdraw the catheter, disconnect from the connecting tubing and hold oxygen near the end of the suction catheter. If the bronchospasm relaxes, remove the catheter. If the bronchospasm remains, the student may require medication (e.g., bronchodilator). Notify the school nurse, family and health care provider. **Be prepared to initiate the school emergency plan.**

Information for Students Who Need Tracheal Suctioning

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has a tracheostomy, or opening in the neck to allow the student to breathe through an opening in the windpipe. A tube may be inserted into the opening and secured to the neck with Velcro or ties. Other tracheostomy openings may not be covered.

Occasionally, the tracheostomy tube may need to be cleared of mucous and other secretions through tracheal suctioning. The student may be able to assist with the procedure.

If a student needs suctioning, the equipment must be available to the student at all times. In addition, a trained staff member will help the student suction the tracheostomy.

This student may be able to participate in many school activities. Modifications should be approved by the family, health care provider, and school.

School staff in frequent contact with this student are encouraged to complete cardiopulmonary resuscitation (CPR) training and specialized training for people with tracheostomies.

Contact _____at_____(phone number) for additional information or if the student experiences any problems with the tracheal suctioning.

Source: Adapted from: Porter, S., Haynie, M., Bierle, T., Caldwell, T. H., & Palfrey, J. S. (Eds.). (1997). *Children and youth assisted by medical technology in educational settings: guidelines for care* (2nd ed.). Baltimore: Paul H. Brookes Publishing

Tracheostomy Tube Changes

Overview

Tracheostomy tubes are typically changed every 2-4 weeks to prevent mucus or bacteria buildup. However, a tube may need to be changed if it becomes blocked or accidentally dislodged. **At school, tracheostomy tube changes should only be done in an emergency situation.** Two people should be present during the procedure unless this is not practical in an emergency.

Settings and Staff

Routine tracheostomy tube changes should be performed at home, ideally on an empty stomach when the airway is relatively free of mucus. If a tracheostomy becomes blocked or accidentally comes out, the tube must be changed or reinserted immediately--wherever the student is, even if conditions are not ideal.

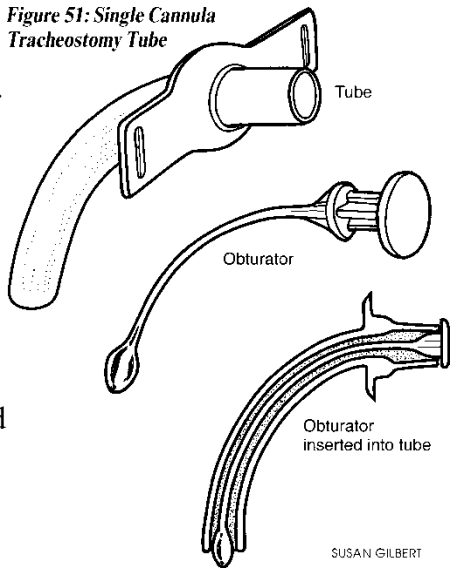


Figure 51: Single Cannula Tracheostomy Tube

Tracheostomy tube changes should be provided by a registered school nurse, licensed respiratory therapist, or licensed practical nurse under the supervision of a registered school nurse. These caregivers should have proven, competency-based training in appropriate techniques and problem management.

All staff in contact with students who have tracheostomies should have specialized cardiopulmonary resuscitation training. They should be able to recognize signs of breathing difficulty and should know how to activate the student's emergency plan.

Any school personnel who have regular contact with a student with a tracheostomy must receive general training covering the student's specific needs, potential problems, and implementation of the established school emergency plan. The tracheostomy checklist in the appendices can be used as a baseline for competency based training in performing the procedure and problem management.

Individualized Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student who needs a tracheostomy tube change, the following items should be considered (most should already be in the IHP for the student's tracheostomy):

- Underlying condition and possible problems associated with the condition or treatment
- Health care provider's order for tracheostomy care and tube change
- Size and type of the tracheostomy tube

- Use of an obturator
- Type of ties, gauze, and/or skin care
- Portable equipment and supplies and responsibility for transporting them with the student
- Student's baseline color, respiratory rate, pulse, blood pressure, secretions
- Student specific signs of respiratory distress
- Student's self care ability and ability to request assistance
- Emergency action plan, including all phone numbers
- Identification of individuals capable of assisting
- Student's need for support during reinsertion
- Student's ability to breathe without a tracheostomy tube
- Any known difficulties that might be encountered during reinsertion
- Staffing needs to provide safe care for the student and plan for absences
- Latex allergy precautions
- Standard precautions

Tracheal Suctioning Helpful Resources

- How to Do an Emergency Trach Change
- How to Do a Routine Trach Change
- How to Suction a Trach
- How to Care for Your Child's Skin and Do a Trach Tie Change

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Illustration Source: The Center for Pediatric Emergency Medicine (CPEM). Teaching resource for instructors in prehospital pediatrics. Illustrations by Susan Gi

Procedure for Changing a Tracheostomy Tube

Note: Family provides equipment and supplies.

1. Wash your hands with soap and water.
2. Gather the equipment and materials required for the procedure listed below.
    - **a.** Exact size and type of tracheostomy tube ordered for the student

      Always have a spare clean tracheostomy tube available and ready for use.

    - **b.** Tracheostomy tube one size smaller than currently being used.

      Used if difficulty encountered with insertion of the regular-sized tube

    - **c.** Velcro ties, twill tape, or other ties to hold tracheostomy tube in place
    - **d.** Obturator, if needed (used as a guide for insertion)
    - **e.** Blunt scissors
    - **f.** Syringe to inflate and deflate cuff, if the tube has a cuff
    - **g.** Sterile water-soluble lubricant or sterile saline

      Never *use Vaseline or oil-based lubricants.*

    - **h.** Resuscitation bag and mask
    - **i.** Blanket roll, if needed, to position student's neck
    - **j.** Stethoscope
    - **k.** Oxygen, if ordered
    - **l.** Suctioning device and supplies
    - **m.** Gloves
    - **n.** Another person to assist, if possible
3. Explain the procedure using explanations the student can understand. Encourage the student to do as much of the procedure as is capable, to achieve maximum self-care skills.
4. Position the student as recommended/ordered.

   Best positioning is usually to have the student lie on their back with a blanket roll under the shoulders.

5. Wash your hands with soap and water.
6. Have spare Velcro ties or pre-cut tracheostomy ties ready.
7. Open the tracheostomy tube package. Keep the tube clean. **Do not touch the curved** part of the tube that is inserted into the trachea.
8. Put on a pair of sterile gloves. Protective facial gear may be needed if the student has excessive secretions and coughs during insertion.
9. Insert the obturator into the clean tracheostomy tube.
10. Attach the Velcro holder or tracheostomy ties to one side of the new tube.

11. If ordered, lubricate the end of the tracheostomy tube with water-based lubricant or sterile saline sparingly.

Lubrication may decrease the trauma to tracheal tissue, but sometimes is not used due to possibility of aspiration.

12. Administer supplemental oxygen, if ordered.

13. Have the assistant hold the old tube in place while cutting/removing the ties. If the tube is being changed by one person, do not remove the ties until a clean tracheostomy tube is in hand. **Always hold the tube when ties are not secure because a cough can dislodge the tube**.

14. When the new tube is ready (in hand), have the assistant remove the old tube.

15. Gently and quickly insert the new tube in a smooth curving motion directing the tip of the tube toward the back of the neck in a downward and inward arc. **Hold in place until secured because changing the tracheostomy tube will usually cause the child to cough**.

Back and downward motion follows the natural curve of the trachea. ***Do not force the tube*** *as this could damage the trachea. Reposition neck and try again.*

16. If an obturator is used, stabilize the flanges of the tracheostomy tube and **immediately remove the obturator after the tube is inserted**. Insert the inner cannula, if it is used, at this time. Continue to hold in place until it is secured with ties.

Hold the tracheostomy tube in place at all times. A person is unable to breathe when the obturator is in place in the tracheostomy tube.

17. Listen and feel for air movement through the tracheostomy tube. Observe the student for signs of respiratory distress. Assistant may listen with a stethoscope for breath sounds.

18. Secure the tube in place with ties or Velcro holder. If using ties, the tracheostomy ties should be tied in a double or triple knot. They should never be tied in a bow because they can accidentally become untied. The ties should be loose enough that one finger can be slipped in between the ties and the neck. Note: some students may have a metal chain trach holder instead.

19. Listen with a stethoscope to assess breath sounds. Watch the chest rise with breath. Give 2-4 breaths with a resuscitation bag or provide oxygenation as ordered, if indicated based on the student's respiratory status. Suction, if needed.

A small amount of bleeding may occur around the tube or be in secretions after tracheostomy change. If unusual or persistent bleeding is present, notify the school nurse, family and health care provider.

20. Most tracheostomy tubes used at schools will not require cuff inflation or an inner cannula, but follow the student's IHP for guidance on this.

21. Do skin care, if needed (see guidelines in student's IHP), and reapply gauze around and under the tracheostomy tube and ties.

Use pre-slit gauze or commercially-prepared tracheostomy dressings. Do not cut regular gauze to fit because tiny fibers from cut gauze can enter the tracheostomy.

22. Discard the used equipment according to standard precautions guidelines.
23. Remove your gloves and wash your hands with soap and water.
24. Document the procedure and problems or concerns on the student's log sheet. Notify the school nurse and family of the tracheostomy change.
25. Replenish the supplies.

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Possible Problems with Tracheostomy Tube Changes

- **If the tracheostomy tube comes out and the student is not showing signs of distress.** Call for assistance**.** Do not leave the student alone. Follow the procedure for the tracheostomy tube change.
- **If the tracheostomy tube comes out and the student shows signs of respiratory distress**
    - As soon as possible, attempt to insert a tracheostomy tube as outlined in the procedure.
- **If the tracheostomy tube comes out and new tube has been inserted and the student is still having difficulty**
    - Listen for breath sounds and assess airway. The tube may need to be repositioned or reinserted. Administer oxygen via the tracheostomy. Suction the tracheostomy. Consider using bronchodilators, if ordered**. If distress persists, initiate the emergency school plan**. Begin cardiopulmonary resuscitation (CPR), if necessary. Use a manual resuscitation bag, if indicated.
- **Tracheostomy tube cannot be reinserted Never leave the student alone. Call for assistance.**
    - This may be due to a bronchospasm or poor positioning:
    - Reassure and reposition the student. Retry.
    - Try using an obturator if it has not been used.
    - Try to insert a one size smaller tracheostomy tube.
    - Encourage the student to take a deep breath—be prepared to insert a tube if the stoma opens**.**
    - Administer the flow of oxygen directly to the tracheostomy stoma.
    - Give rescue breathing through the natural airway and tape over the tracheal stoma.
- **If a tracheostomy tube cannot be inserted and the student has increasing respiratory distress and/or respiratory arrest, initiate the school emergency plan. Begin CPR with mouth-to-mouth or mouth-to- mask breathing, using standard precautions. Tracheostomy stoma may be covered with the thumb if an air leak is present. Never leave the student alone. Call for assistance.**
- **Aspiration of foreign material into the tracheostomy**
    - **Always suction first. If the manual resuscitator bag is used prior to suctioning, it can force the foreign material further into the lungs.**
    - Check for air movement. If the tracheostomy tube remains blocked by matter, change the tracheostomy tube. Give breaths with a resuscitation bag after initial suctioning. Check for air movement and give breaths with a resuscitation bag if

indicated. Administer oxygen if prescribed in the emergency plan. If a bronchospasm occurs, give medication, if prescribed.

- Respiratory distress or arrest can occur with any aspiration. Be prepared to initiate the school emergency plan. Begin CPR after suctioning, if needed. Notify the school nurse, family and health care provider. Wearing a Heat Moisture Exchanger (HME), also known as an artificial nose or tracheostomy filter, can help prevent aspiration of foreign materials into the trachea.

Procedure for Using Oxygen with a Tracheostomy Collar

A tracheostomy collar is used to deliver oxygen or humidified air to a tracheostomy. It is often used with a humidifying device to prevent development of dry, thick secretions which can plug the tracheostomy.

Note: Family provides equipment, supplies, and oxygen.

1. Review the oxygen safety precautions (see previous section).
2. Wash your hands with soap and water.
3. Assemble the equipment required for the procedure listed below.
    - Tracheostomy collar
    - Humidifier
    - Heating device, if indicated
    - Oxygen tubing
    - Wide bore tubing
    - Nipple adaptor
    - Oxygen source, if needed
    - Gloves
4. Set up the humidification device according to the guidelines in the student's IHP.
5. Explain the procedure using explanations the student can understand. Encourage the student to do as much of the procedure as he/she is capable, so as to achieve maximum self-care skills.
6. Put on a pair of gloves.
7. Securely attach the tubing to an air or oxygen source. Some students may only require humidified room air and not need oxygen.

    Usually a "Christmas tree" adaptor is used to attach the tubing to the oxygen source or compressed air. Attach a humidifier, if ordered. Make sure that all connections are secure to prevent leaks.
8. If oxygen is prescribed, turn on the oxygen source. A highly visible information card stating the oxygen liter flow should be attached to the regulator.
9. Set the flowmeter to the flow rate specified by the health care provider. **Do not change this setting without first contacting the health care provider.**

Oxygen liter flow can be ordered as a set liter flow rate (e.g., 2 liters per minute) or as a range (e.g., 2-4 liters per minute) based on the student's needs.

10. Connect to the heater and/or humidifier, if ordered. Place one end of the wide bore tubing on the collar and the other on the humidifier or heater.

    Some students may use a cool mist.

11. With prolonged humidification, moisture condensates and collects in the tubing. When this happens, the flow of air/oxygen may be blocked. Therefore, the water in the tubing requires periodic emptying.

12. With compressed air/oxygen on, look for mist coming out of the end of tubing (hold up to light for easier viewing).

    If this is not present, check that all connections are secure and compressed air/oxygen is flowing. Briefly turn on higher flow to see if mist is present, and then return to ordered flow.

13. Place the collar on the student's neck over the tracheostomy tube in the midline.

    Adjust the tracheostomy collar so that it is snug but not uncomfortable for the student.

14. Remove your gloves and wash your hands.

15. Document the procedure on the student's log sheet. Notify the school nurse and family if there are any changes in the student's usual pattern.

Sources:

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Cincinnati Children's Hospital. (2011). *Best evidence statement (BESt): Basic pediatric tracheostomy care*. In conjunction with the Agency for Healthcare Research and Quality. Cincinnati, OH.

Cincinnati Children's Hospital. (2021). *Tracheotomy Care Handbook*. https://www.cincinnatichildrens.org/health/t/tracheotomy-handbook

Essential Evidence Plus. (2013). *Tracheostomy care*. Duodecim Medical Publications Ltd.

Mitchell, R., et al. (2012). Clinical consensus statement: Tracheostomy care. *Otolaryngology Head Neck Surgery* 148 (1): 6-20. https://doi.org/10.1177/0194599812460376

Porter, S., Branowicki, P., & Palfrey, J. (2014). *Supporting students with special health care needs: Guidelines and procedures for schools* (3rd ed.). Baltimore: Paul H. Brookes Publishing, 343-345.

Wisconsin Improving School Health Services Project. (2015). Manual resuscitation with Tracheostomy.

Manual Resuscitation Bag

Overview

A manual resuscitation bag (e.g., Ambu bag) is a hollow, football-shaped, self-inflating bag used to give breaths of air and oxygen to a student who is unable to take adequate breaths on his or her own. The bag can be used with a mask that covers the student's mouth and nose, or it can be attached to a tracheostomy tube. When squeezed, the air is pushed out of the bag and into the student. When the bag is released, air flows out of the lungs through the exhalation (non-rebreathing) valve.

Students with tracheostomies and students who use ventilators should have manual resuscitation bags with them at all times. Resuscitation bags can be used when the student is having difficulty breathing or if the student stops breathing on his or her own. They may also be used to give extra breaths or oxygen during tracheostomy or ventilator care. They frequently are used to give extra oxygen after suctioning. They may also be used to give breaths if a ventilator fails or loses power.

Settings and Staff

Routine care using resuscitation bags should be done in a clean, private area such as the health office.

In emergency situations, manual resuscitation bags should be used wherever the student might be.

Emergency care should be addressed in the student's individualized health care plan and appropriate training should be provided to personnel.

Any school personnel who have regular contact with a student who may require the use of a manual resuscitator during an emergency should receive training covering the student's special needs, potential problems, and implementation of the established emergency plan.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 526-531.

Cincinnati Children's Hospital. (2011). *Best evidence statement (BESt): Basic pediatric tracheostomy care*. In conjunction with Agency for Healthcare Research and Quality. Cincinnati, OH.

Cincinnati Children's Hospital. (2021). *Tracheotomy Care Handbook*. https://www.cincinnatichildrens.org/health/t/tracheotomy-handbook

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Wisconsin Improving School Health Services Project. (2015). Manual resuscitation with Tracheostomy.

Procedure for Using a Manual Resuscitation Bag with a Tracheostomy

Note: Family provides equipment, supplies, and oxygen.

1. Wash your hands with soap and water.
2. Assemble the equipment required for the procedure listed below.
    a. Manual resuscitation bag (e.g., Ambu bag)
    b. Adaptor for tracheostomy tube
    c. Oxygen source with appropriate tubing, if needed
    d. Tracheostomy or ventilator supplies, as appropriate
3. Explain the procedure using explanations the student can understand. Encourage the student to do as much of the procedure they are capable of doing, to achieve maximum self-care skills.
4. Keep a manual resuscitation bag near the student for quick access. Make sure the tracheostomy connector is in place. If oxygen is to be used, connect the oxygen tubing to the oxygen port of the bag and make sure oxygen is flowing at the prescribed flow rate.
5. Attach the tracheostomy connector part of the bag snugly to the tracheostomy tube. Steady the tracheostomy tube with your non-dominant hand while securing the connector to prevent accidental dislodgement.
6. Squeeze the bag to deliver breaths. Squeeze hard enough to make the student's chest rise. Two hands may be needed to squeeze for larger students. Try to coordinate with the student's own breathing efforts. As the student starts to breathe in, squeeze the bag. **If resistance is felt, or the student looks distressed, make sure the tube is patent and the breaths are being coordinated with the student's own breaths.**

    If the student is unable to breathe on his or her own, squeeze the manual resuscitator at a regular rate to deliver the number of breaths per minute specified in the student's IHP. If no rate is specified, give 16-20 breaths for younger students and 12-16 for older students and adolescents.
7. Assess the student's respiratory status, including skin color, for effectiveness of bagging.
8. When "bagging" is no longer needed, carefully remove the resuscitation bag from the tracheostomy tube. Hold the tracheostomy tube steady with your non-dominant hand to prevent pulling or accidentally dislodging it. If the student requires a tracheostomy

collar with oxygen, be sure to reconnect this when the resuscitation bag is no longer needed.

9. Wash your hands with soap and water.
10. Document this procedure on the student's log sheet. Notify the school nurse and family if there are any changes in the student's usual pattern.

Sources:

Cincinnati Children's Hospital. (2011). *Best evidence statement (BESt): Basic pediatric tracheostomy care*. In conjunction with Agency for Healthcare Research and Quality. Cincinnati, OH.

Cincinnati Children's Hospital. (2021). *Tracheotomy Care Handbook*. https://www.cincinnatichildrens.org/health/t/tracheotomy-handbook

Essential Evidence Plus. (2013). *Tracheostomy care*. Duodecim Medical Publications Ltd.

Mitchell, R., et al. (2012). Clinical consensus statement: Tracheostomy care. *Otolaryngology Head Neck Surgery* 148 (1): 6-20. https://doi.org/10.1177/0194599812460376

Porter, S., Branowicki, P., & Palfrey, J. (2014). *Supporting students with special health care needs: Guidelines and procedures for schools* (3rd ed.). Baltimore: Paul H. Brookes Publishing, 343-345.

Wisconsin Improving School Health Services Project. (2015). Manual resuscitation with Tracheostomy.

Nose and Mouth Suctioning

Overview

The nose and/or mouth can be suctioned when the student needs assistance in removing secretions from the airway. Some students may be able to request suctioning and assist with the procedure. Other students will need the caregiver to recognize when suctioning is needed. Suctioning may be needed when the student's breathing becomes noisy or excess secretions are seen in the mouth or at the back of the throat. Gurgling, bubbling, or rattling breath sounds may be heard. The student may show signs of respiratory distress, such as increased respirations, difficulty breathing, excessive coughing, choking, anxiousness, irritability, or color changes.

Settings and Staff

Emergency suctioning should be done wherever the student is located. For this reason, students likely to need suctioning should have portable suctioning equipment with them during transport and when traveling through school. Routine suctioning should be done in a clean, private area with accessibility to an electrical outlet. It can be done in a corner of a classroom, but tends to be noisy and disruptive to class so it is usually done in a school health office.

Suctioning of the nose and mouth can be performed by an unlicensed assistive personnel with proven competency-based training in appropriate techniques and problem management.

Pharyngeal suctioning should be done by a school nurse (RN or LPN), respiratory therapist, or trained unlicensed assistive personnel under the supervision of a registered school nurse.

School personnel who have regular contact with a student who requires nose and mouth suctioning should receive training that covers the student's special needs, potential problems, and how to implement the established emergency plan.

Individualized Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student who needs suctioning of the nose and mouth, the following items should be considered:

- Student's underlying condition and the possible complications arising from the condition or treatment
- Student's baseline respiratory status, including respiratory rate and usual amount of secretions
- Student-specific signs of respiratory distress (e.g., noisy breathing, agitation)
- Healthcare provider's order for suctioning
- Ability of the student to request assistance or suctioning

- Frequency of suctioning and routine indications for suctioning
- Indications for additional suctioning
- Position of the student during suctioning
- Depth of suctioning
- Type of suction catheters (size and whether they can be reused)
- Cleaning of Yankauer or tonsil tip suction, if prescribed
- Suction machine and pressure settings
- Latex allergy precautions
- Standard precautions

Sources:

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 101-103. https://portal.ct.gov/-/media/SDE/Publications/clinical_guidelines/clinical_guidelines.pdf

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children* (10th ed.). St. Louis: Elsevier Mosby, 1152-1153.

Porter, S., Branowicki, P., & Palfrey, J. (2014). *Supporting students with special health care needs: Guidelines and procedures for schools* (3rd ed.). Baltimore: Paul H. Brookes Publishing, 346-350.

Selekman, J. (2013). *School nursing: A comprehensive text* (2nd ed.). Philadelphia: F.A. Davis, 1048-1053.

Procedure for Nose and Mouth Suctioning Using Suction Machine

Note: Family provides the equipment and supplies.

1. Wash your hands with soap and water.
2. Gather the equipment and materials required for the procedure listed below.
    - Suction machine and tubing

      Equipment for suctioning must be assembled and ready for quick use at all times. It should be checked daily by specified personnel.
    - Suction catheter of the appropriate size, or Yankauer or tonsil tip suction catheter (oral suction catheters)
    - Bulb syringe or other manual backup suction
    - Disposable gloves
    - Plastic bag for disposal of materials
    - Water or saline to clean and lubricate catheter, with container
3. Position the student as recommended/ordered. Most students are suctioned in the semi-Fowler's (head elevated, semi-recumbent) position or in a sitting position.

   Position may vary and should be recommended in the student IHP.
4. Explain the procedure using explanations the student can understand. Encourage the student to do as much of the procedure as is capable, so as to achieve maximum self-care skills.
5. Switch on the suction machine and check for suction by placing your finger at the end of the connecting tubing. Set the suction as specified, usually between 60-120 mmHg pressure.
6. Encourage the student to cough and expel secretions.

   Coughing may eliminate the need for suctioning or bring secretions up for easier suctioning.
7. Open the suction catheter or kit, being careful not to touch the inside of the package.

   This keeps the catheter clean and reduces risk of infection.
8. Put on a pair of gloves.

9. Holding the connecting end of the suction catheter in the dominant hand, secure it to the suction machine tubing (held in the non-dominant hand). Leave the other end of the catheter in its covering.

   The dominant hand should remain clean/sterile. It should not touch anything but the catheter. The non-dominant hand should be used to turn on switches and touch other objects.

10. Remove the covering from the end of the suction catheter with the non-dominant hand while holding the catheter in the dominant hand.

11. Hold the suction catheter 2-3 inches from its tip with your dominant hand and insert the tip in water.

12. Cover the vent hole with the thumb of your non-dominant hand to suction a small amount of saline through the catheter.

    This tests that suction is functioning. This also helps to lubricate the tip of the catheter and clear out any secretions in the connecting tubing. Do not use a lubricant other than water because the lubricant can dry and cause airway occlusion.

13. With your thumb off the vent hole, insert the catheter gently into the nose to the prescribed depth specified in the student guidelines. Always suction the nose first because there are more bacteria in the mouth.

    Many students may only need to have the anterior part of the nose suctioned. Be gentle because the nose bleeds easily. If the nose secretions are too thick, a few drops of saline can be put in each nostril.

14. Cover the vent hole with your non-dominant thumb while suctioning and withdrawing the catheter. Gently rotate the catheter between thumb and index finger while suctioning and withdrawing.

    Rotating the suction catheter prevents it from attaching to the mucosa and damaging the mucous membrane. If the catheter sticks, remove the thumb from the vent hole to release suction.

15. If the student is still congested, repeat nasal suction. Between passes, suction water to rinse secretions out of the catheter.

16. With your thumb off the vent hole, insert the catheter gently into the mouth.

17. Cover the vent hole with your non-dominant thumb. Gently rotate the catheter between your thumb and index finger while suctioning and withdrawing to minimize damage to the oral mucosa.

18. If oral suctioning only is being done with a Yankauer or tonsil tip suction catheter, insert Yankauer into the student's mouth along the gum line and move around their mouth until the secretions are cleared. Yankauer is a plastic, rod shaped catheter with holes at the end. It provides continuous suction and is not controlled with a finger adaptor.

    Parts of the mouth to be suctioned include the back of the throat, the cheeks, and under the tongue. Be careful when suctioning the back of the throat as this may cause the student to gag and vomit.

19. If gurgling noises persist, repeat the mouth suctioning procedure with the same catheter. Between passes, water can be suctioned to rinse secretions out of the catheter. Monitor the student's respiratory status throughout the procedure.

    If appropriate, ask the student if he or she needs repeat suctioning. If suctioning of the nose is needed after suctioning of the mouth, a clean catheter should be used.

20. Rinse the catheter and the connecting tubing with water until clear, using continuous suction.

    Secretions left in tubing decrease suctioning efficiency and provide an environment for growth of microorganisms.

21. Disconnect the catheter from the suction tubing. Wrap the catheter around your gloved hand. Pull the glove off inside out so that the catheter remains rolled in the glove. Place the first glove in the remaining gloved hand. Pull off the other glove over the first glove to seal in the contaminated tubing. If the Yankauer (or tonsil tip) suction catheter is used for oral suctioning, it may be stored in a clean container for future use. Follow the guidelines in the student's IHP.

22. Discard the disposable used suction catheter with gloves in the appropriate receptacle. Turn off the suction. Wash your hands with soap and water.

23. Note color, consistency (e.g., thin, thick), and quantity of secretions. Document procedures on the student's log sheet and notify the school nurse and family of any changes or problems.

24. Be sure the suction equipment and supplies are restocked and checked daily and are ready for immediate use.

Sources:

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 101-103. https://portal.ct.gov/-/media/SDE/Publications/clinical_guidelines/clinical_guidelines.pdf

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Selekman, J. (2013). *School nursing: A comprehensive text* (2nd ed.). Philadelphia: F.A. Davis, 1048-1053.

Procedure for Nose and Mouth Suctioning with a Bulb Syringe

Note: Family provides the equipment and supplies.

1. Wash your hands with soap and water.
2. Gather and assemble equipment required for the procedure listed below.
    - Bulb syringe (nasal aspirator)
    - Saline
    - Tissues
    - Disposable gloves
3. Explain the procedure using explanations the student can understand. Encourage the student to do as much of the procedure as is capable, so as to achieve maximum self-care skills.
4. Position the student as recommended in the student's individualized health plan.
5. Put on a pair of gloves.
6. Hold the bulb syringe in the palm of your hand with the long tip between index and middle finger. Squeeze the bulb syringe flat with your thumb. Place the tip gently into the nose or mouth, where secretions are visible or audible, and let the bulb fill up.

    When suctioning the mouth, suction under the tongue, inside the cheeks, and in the back of the throat. Be careful in suctioning the back of the throat because this may cause the student to gag and vomit.
7. Remove the bulb syringe from the nose or mouth. Hold the syringe over a tissue or basin and squeeze the bulb to push out the secretions; then let it refill with air.
8. Repeat steps 6 and 7 as needed until the nose and mouth are clear.
9. If the nose secretions are too thick, a few drops of saline can be put in the edge of each nostril before suctioning with the bulb syringe.
10. Clean the bulb syringe in hot soapy water, rinse with fresh water, let dry, and store.
11. Dispose of the tissues in the appropriate receptacle.
12. Remove your gloves.
13. Wash your hands with soap and water.
14. Note color, consistency, and amount of secretions on the student’s log sheet and then notify the school nurse and family of any changes or problems.

Sources:

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 101-103. https://portal.ct.gov/-/media/SDE/Publications/clinical_guidelines/clinical_guidelines.pdf

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Selekman, J. (2013). *School nursing: A comprehensive text* (2nd ed.). Philadelphia: F.A. Davis, 1048-1053.

Possible Problems with Nose and Mouth Suctioning

- **Nosebleed during suctioning**
    - Stop suctioning. Gently squeeze the bridge of the nose and hold for 5 minutes.
    - After bleeding has stopped, refrain from using that side of the nose for suctioning until cleared by the family or health care provider.

- **Gagging or vomiting during suctioning.**
    - Gagging is probably caused by the catheter going down too far. Withdraw a little and try to finish suctioning. If vomiting occurs, remove the catheter and position the student to keep the airway open. Calm the student and make sure that he or she is breathing without problems. If the student still needs suctioning, proceed carefully and try suctioning less deeply.

Sources:

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 101-103. https://portal.ct.gov/-/media/SDE/Publications/clinical_guidelines/clinical_guidelines.pdf

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children* (10th ed.). St. Louis: Elsevier Mosby, 1152-1153.

Porter, S., Branowicki, P., & Palfrey, J. (2014). *Supporting students with special health care needs: Guidelines and procedures for schools* (3rd ed.). Baltimore: Paul H. Brookes Publishing, 346-350.

Selekman, J. (2013). *School nursing: A comprehensive text* (2nd ed.). Philadelphia: F.A. Davis, 1048-1053.

General Information for Students Who Need Nose and Mouth Suctioning with a Bulb Syringe

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student requires occasional suctioning with a bulb syringe to clear secretions and mucous from the airway to help the student breathe better.

The procedure will be conducted by a trained staff member. The student may be able to request suctioning and assist with the procedure.

Staff working with the student should know what signs the student displays when suctioning is needed.

If a student needs suctioning, the suctioning equipment must be with the student at all times.

The student may be able to participate in many school activities. Modifications should be approved by the family, health care provider, and school.

Contact_____at_____(phone number) for additional information or if the student experiences any problems with the suctioning procedure.

Source: Adapted from: Porter, S., Haynie, M., Bierle, T., Caldwell, T. H., & Palfrey, J. S. (Eds.). (1997). *Children and youth assisted by medical technology in educational settings: guidelines for care* (2nd ed.). Baltimore: Paul H. Brookes Publishing.

Chest Physiotherapy Postural Drainage and Percussion

Overview

Chest physiotherapy (CPT) can be an important part of treatment of acute and chronic respiratory conditions, such as bronchitis, cystic fibrosis, pneumonia, and asthma. CPT is performed to improve pulmonary hygiene and to maintain normal airway function by promoting the drainage and coughing up of secretions from the lungs.

In the traditional manual method, the student is placed in various positions to allow gravity to be used to promote drainage of secretions from the lungs and percussion of the chest wall is done to help loosen secretions for removal. However, most students who need CPT on a regular basis (e.g., students with cystic fibrosis) have it done using a mechanical vest that provides high-frequency chest wall oscillation. Using a vest saves caregiver time and promotes greater independence for students in providing their own therapy.

Settings and Staff

Manual CPT should be performed in a setting that allows for proper positioning and privacy of the student. Small students can be placed in the lap of a staff person. Older and larger students can be placed on a slant board, a padded wedge board, or a bed or couch with pillows to position the student. CPT should generally not be performed for at least one hour after feeding or meds. CPT using a mechanical vest can be performed wherever the privacy concerns of the student are respected. Some students may prefer remaining in the classroom.

CPT may be administered by the school nurse, family, teacher aide, or other staff person who has had general training in CPT of the student. General training should cover the student's specific health care needs, potential problems, how to obtain assistance should problems occur, and how to implement the established emergency plan.

Individual Healthcare Plan

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student who needs CPT, the following items should be considered:

- Student's underlying condition and possible problems associated with the condition or treatment
- Health care provider orders for chest physiotherapy

- Student's baseline status, including color, respiratory rate, pulse, and blood pressure
- Positions to be used during CPT
- Use of airway clearance assistive devices such as vests or mechanical vibrators
- Timing of CPT in relation to feeding schedule
- Frequency of CPT
- Student's tolerance of CPT
- Contraindications to CPT, such as the presence of fractured ribs or bleeding disorder
- Signs and symptoms shown by the student when not receiving adequate oxygen (e.g., cyanosis, agitation, distress)
- Possible need for pulse oximeter readings during CPT
- Possible need for suctioning
- Standard precautions

Procedure for Manual Chest Physiotherapy (CPT)

1. Wash your hands with soap and water.
2. Assemble the equipment required for the procedure listed below.
    - Pillows
    - Tissues
    - Suction equipment, if needed
    - Wastebasket with plastic liner
    - Vest airway clearance system, if prescribed

    Choose a time for the procedure when at least one hour has passed since the student has eaten.

3. Check the health care provider orders for CPT and frequency prescribed.
4. Perform a baseline respiratory assessment.

The student may be placed on a pulse oximeter during CPT because desaturation may occur during CPT.

5. Explain the procedure using explanations the student can understand. Emphasize that the staff person is not "hitting" the student.

Smooth muscles of the tracheobronchial tree may constrict because of fear, tension, or discomfort. Therefore, a relaxed, cooperative student will receive more effective CPT.

6. Use the following sequence for percussing and/or vibrating (if prescribed) each lobe of the lung:
    - Place the student in one of the 10 positions.

To percuss all the lobes of the lungs, the student should be placed in 10 different positions. The different positions use the principle of gravity to promote drainage of the tracheobronchial tree. The student is positioned so that the mucus collected in each bronchus is able to drain downward toward the trachea where it can be coughed out or suctioned out. Placing the student in a head down position facilitates drainage of the lung bases. Placing the student in a sitting position facilitates drainage in the apical segment of the upper lobe. In the unstable student, these positions may be modified (i.e., the head down position would be inappropriate for a student with increased intracranial pressure or abdominal distention).

    - Percuss over selected area for 1-2 minutes or amount of time specified in student's IHP.

Percussion facilitates drainage by jarring the secretions. A cupped hand or soft mask creates an air pocket that softens the blow of the percussion and transfers the energy from the percussion into the lung. When using the hands to percuss, hold the hands cupped with fingers and thumb together. The cupped hand striking the chest wall should create a hollow sound, not a slapping sound. Keep the wrists loose and elbows partially flexed. Strike the chest rapidly with alternating hands. Percussion is performed over a single layer of clothing, not over buttons, snaps, or zippers.

    - If ordered, use vibration over specified areas.

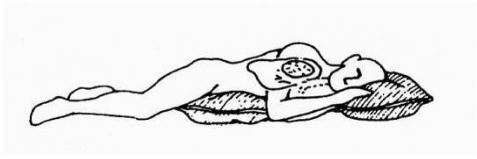
Vibration is done with a firm, shaking pressure applied to the chest wall during exhalation. Vibration may shake mucus loose or increase the velocity and turbulence of exhaled air, facilitating mucus removal.

    - Instruct the student to cough into tissue following percussion of each location. Discard the used tissues into lined wastebaskets.

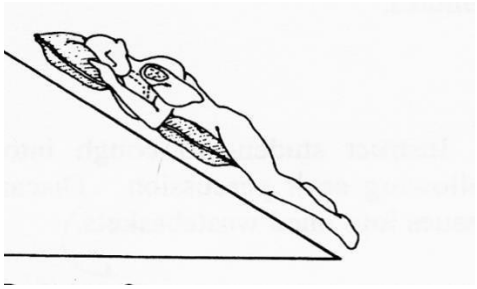
Coughing is most effective if the student is sitting up so that diaphragmatic excursion is maximal. Ideally, the student should take several deep breaths and then follow the last breath with a deep cough. Initial coughing attempts may not produce sputum. As further positioning and percussion are provided, coughing will become more productive. Students with ineffective or suppressed coughs can be suctioned. (Use of vibration may break bones

when students have abnormal bone conditions or are receiving medication such as steroids.)

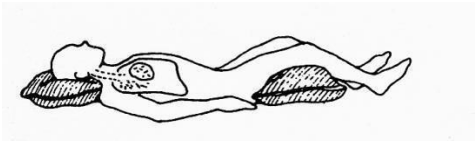
7. For percussing students over 40 pounds, the following positions may be used:
    - Position 1—student on their stomach with the right side of the torso and the right arm elevated on a pillow—*used for percussing the posterior segment of the right, upper lobe, over right scapular area. Depending on the student's weight, additional pillows may be needed to obtain the desired elevation in all positions.*



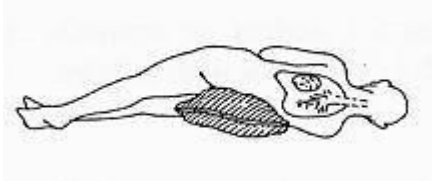
    - Position 2—student on their stomach with the left side of the torso and the left arm elevated on a pillow—*for the posterior segment of the left upper lobe, over the left scapular area. The left bronchus is more vertical, thus requiring a nearly 45 degree elevation.*



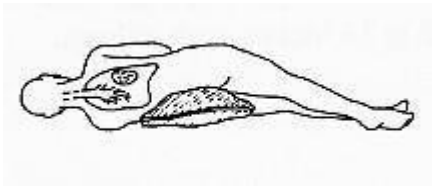
    - Position 3—student flat on their back with pillows placed under the head and knees—*anterior segments of the right and left upper lobes, between the clavicle and nipple area.*



    - Position 4—student on their back. Turn the hips a ¼ turn to the right. Elevate the hips 10-12 inches with pillows. Use additional pillows as needed to hold the hips to the right—*for percussing the lingular process of the left lung, from the left armpit to the nipple area.*



- Position 5—student on their back. Turn the hips a ¼ turn to the left. Elevate the hips 10-12 inches with pillows. Use additional pillows as needed to hold the hips to the left—*for percussing the right middle lobe, from the right armpit to the nipple area.*



- Position 6—student flat on their stomach with pillows under the stomach and lower legs/feet—*for apical segments of the right and left lower lobes, over the lower scapular area.*



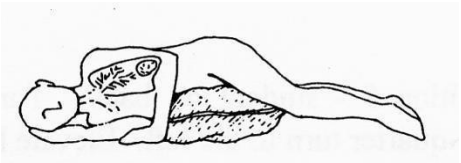
- Position 7—student on their back with the hips elevated 16-18 inches with pillows—*for the anterior basal segment of the right and left lower lobes, over the lower chest area below the nipples.*



- Position 8—student on their stomach with the hips elevated 16-18 inches with pillows—*for basal segments of the right and left lower lobes, over the lower chest areas (avoid the kidneys).*



- Position 9—student on their right side with the hips elevated 16-18 inches with pillows —*for the lateral basal segment of the left lower lobe, over the left side from beneath the armpit to the end of the rib cage.*



- Position 10—student on their left side with the hips elevated 16-18 inches with pillows—*for the lateral basal segment of the right lower lobe, over the right side from beneath the armpit to the end of the ribcage.*



8. The techniques for percussing students under 40 pounds (18 kg) and other students in a sitting position are as follows:
    - Person who is performing the percussing sits in a chair with legs outstretched at a 45 degree angle and with the bottom of your feet braced against a solid, upright object. A pillow is placed in front of your knees. The student is placed face down on your lap with the student's chin resting on the pillow.

This position is correct for percussing posterior basal segments of lower lobes, over area from lower scapulae to end of ribcage. Note: Young children and infants usually have no upper lobe involvement requiring percussion. Percuss with light pressure.

- Seated as before, hold the student face up on your lap with the student's head resting on the pillow.

This position is correct for percussing anterior segments of lower lobes, over the area from below the nipple to the end of the rib cage.

9. At the end of the procedure, have the wastebaskets contents disposed of, utilizing standard precautions.
10. Document CPT on the student's health record or treatment log.

Procedure for Chest Physiotherapy (CPT) Using a Vest

CPT performed in school is usually now done by a vest using high frequency chest oscillation. The student puts on a vest which rapidly fills and deflates, gently compressing and releasing the chest wall 10-25 times per second. The process, High Frequency Chest Wall Oscillation, helps thin or thick mucus and creates mini-coughs that dislodge mucus from the bronchial walls and makes it easier to move out of the airways. A typical treatment takes 15-20 minutes, does not require special positioning, and is not as labor intensive as manual CPT. It promotes independent functioning as students learn to perform the procedure on themselves.

1. Wash your hands with soap and water.
2. Assemble the equipment required for the procedure listed below.
    - Vest airway clearance system
    - Tissues
    - Wastebasket with plastic liner
    - Suction equipment, if needed

    Choose a time for the procedure when at least one hour has passed since the student has eaten.

3. Perform a baseline respiratory assessment.

    The student may be placed on a pulse oximeter during CPT because desaturation may occur during CPT.

4. Check the health care provider's order for CPT using a vest and note pressure and frequencies prescribed.
5. Connect the air hoses as directed for the brand of vest being used.
6. Have the student put on the vest.
7. Begin the treatment by pressing the on button.

    Some vests require pressing the button twice--once to inflate and a second time to start the oscillations.

8. Some brands turn off automatically when the prescribed time of treatment has passed.
9. Have the student remove the vest and cough up any mucus.
10. Document CPT on the student’s health record or treatment log.

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Use of Mechanical Ventilators

This section provides a general overview of basic ventilator terminology, appropriate personnel, and possible problems and emergency management. It is NOT intended to be used as a comprehensive guide to understand, maintain, or troubleshoot ventilators. Other manuals and training are available for this. Also, each student on mechanical ventilation should have a detailed individualized healthcare plan describing specific guidelines for that student's ventilator and care.

Overview

Mechanical ventilators deliver air to the lungs when the student is not able to do so. They may use either positive or negative pressure to ventilate the student. *Positive pressure ventilators* exert a positive pressure on the airway to **push** air into the lungs. *Negative pressure ventilators* act by creating negative pressure, which **pulls** air into the lungs.

Ventilators help to sustain life when a student cannot breathe adequately on his or her own.

Most ventilators are positive pressure ventilators that deliver air through a mask, cannula, endotracheal tube, or tracheostomy tube. In the school setting, the student almost always has a tracheostomy and may need a ventilator due to lung damage, neurological damage (e.g., spinal cord injuries), or muscle weakness (e.g., muscular dystrophy). The ventilator is small enough to be portable and usually mounts on the back of a wheelchair. Negative pressure ventilators, such as the iron lung, shell (cuirass) ventilator, and the body wrap (raincoat) ventilator are much larger and used primarily for neuromuscular disorders. They are rarely encountered in the school setting.

The ventilator can provide total respiratory support for a person who cannot breathe unassisted or can assist the student who is able to breathe, but whose respiratory ability is not adequate.

The student may breathe partially on his or her own just requiring extra breaths by the ventilator or needing positive end expiratory pressure (PEEP) to keep the alveoli open. Humidification is also needed for the student who has a tracheostomy requiring ventilation.

Families with ventilator-dependent children need much support. They usually have nursing and other support services coming into the home. They may experience burnout or stress regarding the student's multiple needs. The student on mechanical ventilation is dependent on others for many things. Anxiety related to this dependence on others and to communication difficulties may present many challenges and needs.

Settings

Most students who require ventilators will need them at all times, including transport to and from school. Maintaining a power source will be critical wherever the student may be. Any potential site should have a back-up power source and grounded electrical outlets available.

Any student at school with a ventilator must also have a "go bag" or other supply kit containing a manual resuscitation bag, a spare tracheostomy tube, and suction equipment and supplies.

See "go-bag" checklist in the Appendix.

Staff Preparation

Care of the student assisted by a ventilator should be performed by a qualified registered school nurse or respiratory therapist, or licensed practical nurse or other specifically trained unlicensed assistive personnel under the supervision of a registered school nurse.

Providing educational services to a student assisted by mechanical ventilation is a complex and challenging commitment. There are various health care delivery service models, and some utilize nonmedical personnel to provide ventilator care.

All caregivers should:

- Be aware of state nurse practice acts that may specify current care delivery and delegation issues
- Be trained in student-specific ventilator procedures due to the technical and unique nature of care
- Be immediately available to the student who is dependent on mechanical ventilation in all school environments, including the classroom and transportation vehicle
- Understand the amount of assistance each student requires from the ventilator
- Know specialized cardiopulmonary resuscitation for students with tracheostomies

All school personnel who have regular contact with a student requiring mechanical ventilation must receive training covering the student’s specific needs, potential problems, and implementation of the established emergency plan.

The basic skills checklists for troubleshooting the ventilator machine and ventilator alarms in Appendix B can be used as a foundation for ventilator training. However, their use alone does

not constitute comprehensive competency-based training. Additional training in student- specific techniques, equipment, and health care needs is essential and should be documented.

Individual Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student who requires the use of a ventilator, the following items should be considered:

- Underlying condition and the possible problems arising from the condition or treatment
- Healthcare provider's orders for ventilation and settings
- Degree of ventilator dependency
- Ventilator settings and the frequency that settings should be checked
- Student's ability to request assistance
- Baseline respiratory status
- Signs and symptoms of respiratory distress (e.g., cyanosis, agitation)
- Appropriate response to ventilator alarms
- Personnel needed to provide qualified care
- Plan for caregiver absences
- Back-up power supply available at all times (e.g., battery, generator)
- Written emergency plan
- Emergency card with ventilator settings posted near ventilator at all times
- Phone list with numbers of family, healthcare providers, home care agency, and medical equipment supplier
- Routine suctioning schedule and guidelines/indications for additional suctioning
- Tracheostomy tube size and type
- Plan for tracheostomy care and supplies (see section on tracheostomies)
- Need for humidification and/or oxygen
- Use of pulse oximetry
- Measures to prevent respiratory infection
- Notification of EMS, power company, phone company, and fire department of ventilator dependent student and /or oxygen use at school
- Plan for transport to and from school
- Latex allergy precautions
- Standard precautions

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Mechanical Ventilation Helpful Resources



Issue Paper

SAFE INITIATION AND MANAGEMENT OF MECHANICAL VENTILATION

A White Paper from the American Association for Respiratory Care (AARC) and University HealthSystem Consortium's (UHC) Respiratory Care Network

This paper provides guidance for best practices for safe initiation and management of mechanical ventilation. It helps define the competency, training, and interdisciplinary approach necessary for patient safety and improved outcomes.

Background and Purpose

Approximately nine percent of all safety intelligence data demonstrate that changes to mechanical ventilator settings were performed by health care providers that had no competency training regarding the specific functions of the ventilator in use.[1] Mechanical ventilators are very complex and require training and competency to ensure positive patient outcomes and to avoid patient harm. Inappropriate setting changes, failure to change alarms when ventilator settings are changed, changing settings without appropriate orders, and failure to communicate changes to the interdisciplinary team are under reported.

This issues paper is intended to provide additional guidance to acute and long term health care facilities, home care/durable medical equipment organizations (DME), and other providers to ensure that all personnel trained to setup, install, and make setting adjustments have formal training in the basics of mechanical ventilation as well as competency specific to ventilator(s) in use. An interdisciplinary approach with good communication between all members of the healthcare team will result in safe delivery of mechanical ventilation and improve outcomes.

Training and Competencies Purpose

Initiating and maintaining both invasive and non-invasive mechanical ventilation is a complex process. The licensed clinician must differentiate among various manufacturers, ventilator models, available modes, and breath types to determine which is appropriate for each individual patient. In addition, the terminology surrounding mechanical ventilation modes and features is not universal. This lack of standardized vocabulary leads to ambiguity and confusion regarding mechanical ventilation application.[2] Once mechanical ventilation is initiated, the clinician must also be able to adjust the ventilatory support for the patient based on physiologic response as measured by invasive and non-invasive monitoring. Therefore, it is imperative that each clinician who initiates and manages mechanical ventilation demonstrate competency before participating in this type of patient care.

Competency

Competency is the ability of a practitioner to integrate the professional attributes required to perform in a given role, situation, or practice setting. These professional attributes include knowledge, skill, judgment, attitudes, values, and beliefs. Many acute care and long term care facilities as well as home care/DME providers require annual competency testing for staff to document knowledge and skills regarding a multitude of procedures, including invasive and non-

It is imperative that each clinician who initiates and manages mechanical ventilation demonstrate competency before participating in this type of patient care.

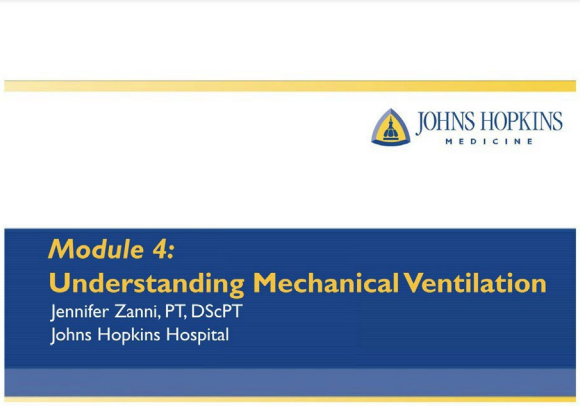
invasive mechanical ventilation. The American Association for Respiratory Care (AARC) position statement for "Pre-Hospital Ventilator Management Competency" advocates regular competency evaluations of pre-hospital providers of mechanical ventilation.[3] The North Carolina Board for Respiratory Care position statement "Making Adjustments to Functioning Ventilators" also advocates completion and documentation of competency or skills review for anyone making ventilator adjustments.[4] Any clinician initiating and caring for home ventilators in a post-hospital setting should also maintain regular competency evaluations.

Though there is wide support for regularly timed competency demonstrations by clinicians who initiate and manage mechanical ventilation, a standardized

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[Safe Initiation and Management of Mechanical Ventilation]

[American Association of for Respiratory Care]



JOHNS HOPKINS MEDICINE

Module 4:
Understanding Mechanical Ventilation
Jennifer Zanni, PT, DScPT
Johns Hopkins Hospital

[Understanding Mechanical Ventilation]

[Johns Hopkins Medicine]

Ventilator Safety Checks

Standard ventilator features should be checked each day when the student arrives at school and more often as specified by the student's IHP. Setting up a routine is highly recommended.

Note: Family provides equipment and supplies.

1. Before focusing on the machines and devices, focus first on the student--assess breathing and general health.
2. Are the ventilator settings the same as ordered by the healthcare provider? Check each setting. Make sure a card with ventilator settings is posted near the ventilator at all times. Keep the ventilator out of direct sunlight.
3. Check the power source:

Power source must be available and **must be connected for the machine to function.** Outlets must be accessible and grounded**.** No other devices should be plugged into the outlet (to help to avoid a short from occurring).

- Internal battery

Internal battery is generally a 12-volt DC battery intended for emergency use only.

- External battery

External battery is connected to the ventilator via a cable and will operate for approximately 10 hours if fully charged. Make sure the external battery is not touching the ventilator because the battery might heat up and be damaged.

- Back-up battery

The back-up battery may be kept at home.

- Emergency power supply

4. Check the ventilator circuit. Drain tubing of excess water. Check for kinks in the tubing. Inspect for wear and cracks. Check connections for tightness. Make sure the tubing is routed to prevent water from draining into the student's airway or back into the humidifier or ventilator.

Tubing and equipment required:

- Pressure tubing

The ventilator circuit consists of the tubing that is attached to the ventilator and the student's tracheostomy tube and other components such as the humidifier and the exhalation and PEEP valves. The tubing carries the air from the ventilator to the student.

- Valves:
    - Exhalation valve

Caution always should be taken not to block or obstruct the exhalation valve with the student's clothing or equipment.

    - PEEP valve
- Other adaptors needed for a particular student including a spare of each one

Routine cleaning of ventilator circuits should be done at home daily or as needed.

5. Check the oxygen source (if prescribed for the student):
    - Adequate supply of oxygen, functioning gauge, and spare tank

Ensure adequate supply of oxygen is available for the day. Identify flow in liters per minute (LPM) and percentage of oxygen.

    - Connection to ventilator and spare tubing
6. Check humidification source:

Any student whose nose and mouth are bypassed by a tracheostomy tube needs a source of humidification. The humidifier must have an adequate amount of water and be set at a safe temperature. Make sure the student's head is higher than the humidifier. Many students use a heat-moisture exchanger (HME) for humidification. Check the "artificial nose" (HME) to make sure it is not wet or dirty (can set off the high-pressure alarm).

    - Heat-moisture exchanger
    - Passive condenser
7. Check alarms:

Alarms should never be turned off. *All ventilator alarm settings should be written on the emergency card posted on a visible side of the ventilator.*

    - High and low pressure
    - Volume
    - Power source
8. Other equipment that should be checked daily:

Each student with a ventilator should have a "go bag" containing all of these supplies.

- Manual resuscitation bag and adaptor or mask
- Spare tracheostomy tube and supplies
- Suctioning equipment

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Ventilator Parameters

Ventilator parameters are prescribed for each student requiring ventilator assistance. They should be checked upon arrival at school and several times during the day as specified in the student's IHP, or more frequently if the student's status changes. A clearly-visible card, stating the student's ventilator settings, should be mounted on the ventilator.

- **Tidal Volume (VT)**
  - The amount of air (cc's) in each breath. Determined by the student's size.
- **Respiratory rate**
  - Number of breaths per minute delivered by the ventilator; also called frequency.
- **Oxygen**
  - Delivered in liters/minute. Order usually specifies desired O2 saturation level.
- **Peak inspiratory pressure (PIP)**
  - Amount of pressure required to inflate the lungs to the prescribed tidal volume.
- **Positive end expiratory pressure (PEEP)**
  - Amount of pressure needed to keep the lungs from collapsing after exhalation.
- **Inspiratory time ("I" Time)**
  - The amount of time in the vent cycle used to deliver a breath. The I:E ratio describes the amount of inspiratory versus expiratory time taken with each breath and can be adjusted to fit the individual student's needs.
- **Sigh volume**
  - Large, ventilator-delivered breath that is usually 1 1/2 times as large as the tidal volume

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Ventilator Modes

- **Assist control (AC)**
    - With each spontaneous breath the student takes, a preset tidal volume is triggered and delivered. If the student does not take spontaneous breaths, the ventilator automatically delivers a breath at a preset rate and tidal volume.

- **Synchronized intermittent mandatory ventilation (SIMV)**
    - A mandatory number of mechanical breaths are synchronized with the student's spontaneous breaths at a preset frequency and volume. Allows the student to breathe in between the ventilator breaths at his or her own tidal volume. The ventilator senses the student's spontaneous breath and synchronizes the timed ventilator breath with the student's inspiratory effort, reducing competition between machine breaths and spontaneous breaths.
- **Pressure support ventilation (PSV)**
    - When the child takes a spontaneous breath, the ventilator delivers a preset sustained peak pressure throughout the inspiratory phase, thus resulting in increased tidal volume. the higher the pressure support, the larger the tidal volume.
- **Intermittent mandatory ventilation (IMV)**
    - Delivers a preset number of mechanical breaths at a preset tidal volume but allows the student to breathe in between the ventilator breaths at their own tidal volume.
- **Continuous positive airway pressure (CPAP)**
    - A constant elevated level of airway pressure is maintained during inspiration and expiration with each spontaneous breath the child takes. Essentially PEEP without a ventilator- delivered breaths of any type. It is student triggered and must be terminated.
- **Control mode; Controlled mandatory ventilation (CMV)**
    - A mechanical breath is automatically given at a preset rate and tidal volume. Used for apneic or chemically paralyzed students.
- **Pressure regulated volume control (PRVC)**
    - A preset peak inspiratory pressure and preset tidal volume are maintained during each spontaneous breath. May be used as a supplement, such as with a student who has muscular dystrophy.

Ventilator Alarms

Ventilator alarms must remain on at all times.

- **High-pressure alarm**
  - Reflects excessive inspiratory pressure. It may indicate increased resistance or obstruction. Commonly caused by:
    - coughing--can briefly cause "back pressure" in the tubing
    - airway obstruction--can be caused by a mucous plug
    - bent or kinked tubing
    - excessive water in the tubing
    - a new piston seal that is tight
    - changes in student's breathing--e.g., breathing hard and fast
- **Low-pressure alarm**
  - Indicates a too-low inspiratory pressure. Warns of a leak in the system; may signal that adequate volume is not being delivered. Commonly caused by:
    - the ventilator tubing becoming disconnected
    - a loose connection in the tubing circuit
    - any leaks in the exhalation valve
    - the humidification jar not tightly closed
    - the exhalation and pressure tubing being accidentally switched
    - any cracks, tears, or holes somewhere in the tubing
- **Power source alarm**
  - Indicates a change in power. **Alarms should never be turned off.** May provide warning when the battery source is getting low.
- **Temperature alarm**
  - The majority of home care ventilators **do not** have temperature alarms built into the humidifier unit. The temperature of inspired gas can be checked with an in-line thermometer. Check the water level and assess connections.

Possible Problems When Using a Ventilator that Requires Immediate Attention

- **Respiratory distress**
  - **increased shortness of breath**
  - **agitation**
  - **blueness or pallor of lips or nail beds**
  - **retractions (pulling in of chest muscles)**
  - **rapid or pounding pulse**
  - **confusion**

Immediately check and reassure the student. Call for assistance. **Never leave the student alone.**

Check:

- if the student needs suctioning
- for an occlusion of the tracheostomy tube by a plug or secretions
- whether the student may be coughing or doing something else to raise pressure transiently for a dislodged tube or other airway problems
- the connections to the ventilator
- the exhalation valve to see if it is obstructed
- the power source for ventilator
- the adequacy of oxygen supply

The student may be disconnected from the ventilator and ventilated by a manual resuscitation bag if needed while being checked.

- **Dislodged tracheostomy**
  - Change the tracheostomy tube. (See tracheostomy section).
- **Blocked tracheostomy**
  - Suction the tracheostomy. If still blocked, replace the trach.
- **Increased secretions**
  - Suction the tracheostomy more frequently.
- **Wheezing**
  - Check student's IHP. Administer bronchodilators or give nebulizer treatment, if ordered. Notify the school nurse and family if there is continued wheezing. Consider a tracheostomy tube change if not resolved with the nebulizer and suction. May be partially occluded by retained secretions.
- **Respiratory distress persists or the student becomes unconscious**

Activate the school emergency plan immediately. Continue using the manual resuscitator.

- **Distress is relieved by disconnecting from the ventilator and using manual resuscitation** While using the manual resuscitator to ventilate the student, check, or have an assistant check, ventilator. Check for:
  - water condensation
  - connections
  - leaks
  - valves, tubing, circuit for obstruction
  - power supply

If unable to locate and correct the problem, continue using the manual resuscitator and call the home care company, school nurse, family, and others as specified in the student's IHP. **Activate the school emergency plan**.

- **Interrupted power supply (outage, equipment malfunction)**
    - Ventilate the student with a manual resuscitator until the back-up power supply is in operation.
- **High pressure alarm goes off. This is usually an intermittent alarm accompanied by a flashing red light**

Always check the student first.

- The student may have mucus plugging the tracheostomy tube and need suctioning.
- Check the position of the tracheostomy tube and correct as needed. A new tube may be needed.
- If the student is coughing, sneezing, talking, or laughing, pressure may temporarily be raised enough to activate the alarm.
- Assess for bronchospasm and follow student's IHP.
- If the student is anxious and "fighting" the ventilator, the high pressure alarm may be activated. Attempt to calm the student.

Remove the student from the ventilator and give breaths with a manual resuscitation bag and then check the ventilator.

- Check the tubing for kinks.
- Check for condensation (water) in the tubing.
- Check the exhalation valve to make sure it is not being obstructed.
- Check the ventilator settings for accidental change.

Test system after the cause of the problem is found and fixed. Place the student back on the ventilator.

- **Low pressure alarm or apnea alarm goes off. This is a continuous audible alarm and is usually accompanied by a flashing red light on the ventilator front panel. Always check the student first.**
    - Circuit tubing may be disconnected from the ventilator. Reconnect.
    - Check for loose connections, leaks or cracks in the system. Tighten, if needed.
    - Check the tracheostomy tube for correct placement.
    - If the student has a cuffed tube, check for a leak in the cuff.
    - Replace exhalation valve if it is wet or punctured.
    - Check for an accidental change in the ventilator settings.

Remove the student from the ventilator and give breaths with a manual resuscitation bag and check the ventilator.

Test the system after the cause of the problem is found and fixed. Place the student back on the ventilator.

- **Power alarm sounds. This is a continuous alarm, usually accompanied by a flashing light as well.**
    - The alarm may sound whenever the power source is interrupted (e.g., battery change). **Check to see that the power source is functioning.** Make sure the ventilator is plugged in the outlet and the power supply available if using AC power. If all three power sources fail, remove the student from the ventilator. **Give breaths with a manual resuscitation bag and activate the school emergency plan.**

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Checking the Ventilator

The California Thoracic Society has developed an "A-B-C-D" acronym to help in remembering what to check first in an emergency with a ventilator.

A is for Airway

1. Check if the tracheostomy tube is in place. Ventilator alarms might not go off even if a tracheostomy tube has fallen partly—or all the way—out.
2. Suction the trach and make sure that air is moving through it.
3. When in doubt, change the tracheostomy tube.
4. If none of these steps help, then start CPR.

B is for Breathing Machine (i.e., mechanical ventilator)

1. If the trach isn't plugged and it is in the right place, then check the ventilator.
2. Are the settings right?
3. Which alarm is going off?
4. Is the ventilator working at all? Make sure the electrical cord is plugged in all the way to the back of the ventilator and into the wall outlet.
5. Check to make sure that the ventilator tubing is free of excess moisture.
6. Check the battery.
7. **When in doubt—and if your child looks blue or lethargic—use the manual resuscitation bag (Ambu-bag™) to resuscitate by hand, and then switch to the back-up ventilator. Use oxygen with the Ambu-bag™.**

C is for Child

1. Once you are sure that there is no problem with either the airway or the breathing machine, look at the child from head to toe. Is he coming down with an illness? Is the child irritable or less alert? Does the child interact with caregivers? Notice if a fever, an increase or change in secretions, sweating, or fast heartbeat are present.

D is for Discussion with your doctor

1. If the child is in extreme distress, call 9-1-1.
2. 2. If the child seems okay, but showing some respiratory symptoms such as coming down with a cold, notify the parent. Recommend that the parent call the doctor to let him/her know the child is behaving differently than normal. The health care team is relying on daily caregivers to provide information about changes in assessment.

California Thoracic Society. (2010). Home Care of Children on Ventilators: A Parent's Guide. p. 39-40.

Information for Students Who Use Mechanical Ventilators

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student requires a ventilator, or breathing machine, to push air into the lungs. The ventilator usually is attached through a tracheostomy tube (see tracheostomy care).

The ventilator is powered by a battery or other power source and must be with the student at all times, including during transportation.

Ventilator care will be conducted by a trained caregiver who will be with the student at all times.

The student's health care plan will address care needs during the day, feeding issues, and avoiding exposure to respiratory infections including colds.

Contact_____at_____(phone number) for additional information or if the student experiences any problems with the ventilator. School staff in frequent contact with this student are encouraged to complete cardiopulmonary resuscitation (CPR) training and specialized training for people with tracheostomies.

Source: Adapted from: Porter, S., Haynie, M., Bierle, T., Caldwell, T. H., & Palfrey, J. S. (Eds.). (1997). Children and youth assisted by medical technology in educational settings: guidelines for care (2nd ed.). Baltimore: Paul H. Brookes Publishing.

COVID-19

(Coronavirus 2019 infection caused by SARS-CoV-2 virus)

The latest guidance on K-12 schools and child care programs is available on the VDH K-12 Education and Child Care website.

Chapter 7: Special Care Issues

Attention Deficit/Hyperactivity Disorder

Food Allergies

Managing Food Allergies in Schools

Latex Allergies

Service Animals in Schools

Trauma-Informed Care

Measuring Body Temperature

Attention Deficit Hyperactivity Disorder (ADHD)

Overview

Attention deficit hyperactivity disorder (ADHD), first described in the medical literature in 1902, is the most common behavioral disorder diagnosed in childhood.

The core symptoms of ADHD include **developmentally inappropriate** levels of attention, concentration, activity, distractibility, and/or impulsivity. Symptoms of ADHD are first apparent in preschool or early elementary school and cause problems in more than one setting, such as both school and home.

Children with ADHD may experience academic difficulties, rejection by peers, and higher injury rates. Adolescents and adults with untreated ADHD are at greater risk for substance abuse, as well as injuries and dysfunctional social relationships. Parents of children with ADHD often experience frustration, marital discord, and additional financial expenses. Long term adverse consequences from ADHD include negative effects on academic performance, vocational success, and social functioning.

Children with ADHD present challenges and often need more services from the health care, judicial, education, and social service systems. According to the American Academy of Pediatrics, in 2019 ADHD affects 9.4% of children aged 2-17. Boys are more than twice as likely as girls to be diagnosed.



Word cloud created from content found on the American Psychiatric Association website. Available Online: [Psychiatry.org - What is ADHD?]

Current Diagnostic Criteria

According to the Diagnostic and Statistical Manual, 5th Edition (DSM-5), there are three presentations of ADHD:

- Primarily Hyperactive/Impulsive—exhibit 6 or more symptoms of hyperactivity/impulsivity
- Primarily Inattentive–exhibit 6 or more symptoms of inattention.
- Combined—exhibits 6 or more symptoms of both hyperactivity/impulsivity and inattention; most children with ADHD exhibit this presentation.

To be diagnosed with ADHD, the child must not only meet these behavioral criteria, he/she must demonstrate functional impairment, display symptoms in two or more settings, and have had evidence of onset of symptoms before the age of twelve. For many years, diagnostic criteria for ADHD focused on children. DSM-5 recognizes that ADHD often persists into adulthood and includes guidelines for diagnosing and treating adults. People 17 and older must have at least five symptoms of inattention or hyperactivity/impulsivity. It is important to realize that students with ADHD may have other coexisting conditions, such as learning disabilities, oppositional defiant disorder, and/or anxiety disorders, although many students have ADHD alone. Not all students with inattention, hyperactivity, and impulsivity have ADHD. A comprehensive evaluation must take place for diagnosis. Generally, this evaluation will include interviews with both the parents and the student, as well as observations of the student in school. Rating scales

from both the parents and educators are often used in this process. In addition, psychoeducational testing can be useful in the evaluation to rule out specific medical syndromes, neurologic disorders, pervasive developmental disorders, and sensory deficits. Psychological evaluation can help evaluate for conduct disorders, oppositional defiant disorders, anxiety, depression, adjustment reaction, obsessive-compulsive disorder, family dysfunction, or poor environmental fit.

The underlying cause of ADHD is not understood. Research indicates that the disorder may have a genetic link and may be related to a biochemical imbalance or structural anomaly in the brain. Children born preterm have a 2-3 times greater risk of developing ADHD. However, the exact cause of ADHD in any specific student cannot usually be determined.

The *DSM-5* diagnostic criteria for ADHD are based upon the following five observable characteristics:

A. Either 1 or 2
    1. Six or more of the following symptoms of **inattention** presentation have persisted for at least 6 months to a degree that is maladaptive and inconsistent with the developmental level:
        a. Often fails to give close attention to details or makes careless mistakes in his/her schoolwork, work, or other activities.
        b. Often has difficulty sustaining attention in tasks or play activities.
        c. Often does not listen when spoken to directly.
        d. Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions).
        e. Often has difficulty organizing tasks and activities.
        f. Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework).
        g. Often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, or books).
        h. Is easily distracted by extraneous stimuli.
        i. Is often forgetful in daily activities.
    2. Six or more of the following symptoms of **hyperactivity/impulsivity** presentation have persisted for at least six months to a degree that is maladaptive and inconsistent with the developmental level:

Hyperactivity

- Often fidgets with his/her hands or feet or squirms in their seat.

- Often leaves their seat in the classroom or in other situations in which remaining seated is expected.
- Often runs about or climbs excessively in situations in which it is inappropriate (in adolescents and adults, may be limited to subjective feelings of restlessness).
- Often has difficulty playing or engaging in activities quietly.
- Is often "on the go" or often acts as if "driven by a motor."
- Often talks excessively.

Impulsivity

- Often blurts out answers before questions have been completed.
- Often has difficulty awaiting a turn.
- Often interrupts or intrudes on others (e.g., butts into conversations or games).

3. Some hyperactive impulsive or inattentive symptoms that caused impairment were present before 12 years of age.
4. Some impairment from the symptoms is present in two or more settings (e.g., at school or at work or at home).
5. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.
6. The symptoms do not occur exclusively during the course of schizophrenia, or other psychotic disorder, and are not better accounted for by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, or a personality disorder). DSM-5 does allow a person to be diagnosed with ADHD and Autism Spectrum Disorder.

The Vanderbilt ADHD Rating Scales are recommended as part of the evaluation and diagnosis of ADHD in children and adolescents. The following behavioral rating scales can be used in addition to the initial evaluation: Conners' Rating Scales (the revised Conners' Parent Rating Scale [CPRS-R], the revised Conners' Teacher Rating Scale [CTRS-R], and the Conners'/Wells Self-Report of Symptoms rating scale [CASS]), Achenbach Scales: Child Behavioral Checklist (CBCL), Teacher Report Form (TRF), Youth Self Report (YSR), ADHD Rating Scale – IV (ADHD RS-IV) (DSM-IV-based), and the Swan, Nolan, and Pelham Questionnaire (SNAP) (DSM-IV-based).

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Management of ADHD

Clinical Practice Guidelines

The American Academy of Pediatrics (AAP) partnered with the Agency for Healthcare Research and Quality (AHRQ) and other agencies in developing the evidence base for clinical practice guidelines for the treatment of ADHD. They recommend use of stimulant medication and/or behavioral therapy to reach target goals. They emphasize that primary care clinicians should collaborate with both parents/guardians and school-based professionals to monitor the progress and effectiveness of interventions.

Action Statement 1: The primary care clinician should initiate an evaluation for ADHD for any child 4 through 18 years of age who presents with academic or behavioral problems and symptoms of inattention, hyperactivity, or impulsivity **(quality of evidence B/strong recommendation)**.

Action Statement 2: To make a diagnosis of ADHD, the primary care clinician should determine that *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition Text Revision* (DSM-5) criteria have been met (including documentation of impairment in more than 1 major setting), and information should be obtained primarily from reports from parents or guardians, teachers, and other school and mental health clinicians involved in the child's care. The primary care clinician should also rule out any alternative cause **(quality of evidence B/strong recommendation).**

Action Statement 3: In the evaluation of a child for ADHD, the primary care clinician should include assessment for other conditions that might coexist with ADHD, including emotional or behavioral (e.g., anxiety, depressive, oppositional defiant, and conduct disorders), developmental (e.g., learning and language disorders or other neurodevelopmental disorders), and physical (e.g., tics, sleep apnea) conditions **(quality of evidence B/strong recommendation)**.

Action Statement 4: The primary care clinician should recognize ADHD as a chronic condition and, therefore, consider children and adolescents with ADHD as children and youth with special health care needs. Management of children and youth with special health care needs should follow the principles of the chronic care model and the medical home **(quality of evidence B/strong recommendation)**.

Action Statement 5: Recommendations for treatment of children and youth with ADHD vary depending on the patient's age.

Action Statement 5a: For preschool-aged children (4-5 years of age), the primary care clinician should prescribe evidence-based parent and/or teacher-administered behavior therapy as the first line of treatment **(quality of evidence A/strong recommendation)** and may prescribe methylphenidate if the behavior interventions do not provide significant improvement and there is moderate-to-severe continuing disturbance in the child's function. In areas in which evidence-based behavioral treatments are not available, the clinician needs to weigh the risks of starting medication at an early age against the harm of delaying diagnosis and treatment **(quality of evidence B/recommendation)**.

Action Statement 5b: For elementary school-aged children (6-11 years of age), the primary care clinician should prescribe U.S. Food and Drug Administration (FDA) approved medications for ADHD **(quality of evidence A/strong recommendation)** and/or evidence based parent- and/or teacher administered behavior therapy as treatment for ADHD, preferably both **(quality of evidence B/strong recommendation)**. The evidence is particularly strong for stimulant medications and sufficient but less strong for atomoxetine, extended-release guanfacine, and extended-release clonidine (in that order) **(quality of evidence A/strong recommendation)**. The school environment, program, or placement is a part of any treatment plan.

Action Statement 6: Primary care clinicians should titrate doses of medication for ADHD to achieve maximum benefit with minimum adverse effects **(quality of evidence B/strong recommendation)**.

Pharmacotherapies

Psychopharmacologic agents represent one part of a thorough treatment plan for children aged 6 and older after the diagnosis of ADHD has been confirmed. Prior to starting the use of stimulants, baseline assessments of blood pressure, pulse, height, weight, and physical examination should be done.

First-line treatment recommended by the AAP and AHRQ, as specified in Recommendation 5B above, involve the use of one of the stimulant medications: methylphenidate, dextroamphetamine, or amphetamine salts. No significant differences in efficacy have been found among the stimulants available and combination therapies are not routinely recommended. Several long-acting forms of ADHD medications are approved for use and have gained popularity because their once-daily dosing can be done at home and does not require administration during the day at school.

Because they are controlled substances, stimulants should have locked storage and receive careful documentation upon receiving and dispensing them.

There have been some reports of crushing and intranasal abuse of stimulants by students and/or family members. Concerta, a long-acting form of methylphenidate, cannot be crushed and abused because it contains a high molecular polymer that is mixed with the methylphenidate. If a crushed tablet is mixed with water, the tablet forms a gel that makes methylphenidate separation from the polymer nearly impossible.

The stimulant medication pemoline (Cylert) was once widely used, but is no longer recommended due to its risk of hepatotoxicity.

School personnel in Virginia are prohibited from recommending the use of psychotropic medications for any student. They may recommend that a student be evaluated by an appropriate medical practitioner. (Reference *Code of Virginia* § 22.1-274.3)

The table below summarizes the medications used for ADHD:

Common Medications

Type of medication	Brand name	Generic Name	Duration
Short-acting amphetamine stimulants	Adderall	Mixed amphetamine salts	4 to 6 hours
	Dexedrine	Dextroamphetamine	4 to 6 hours
	Dextrostat	Dextroamphetamine	4 to 6 hours
Short-acting methylphenidate stimulants	Focalin	Dexmethylphenidate	4 to 6 hours
	Methylin	Methylphenidate (tablet, liquid, and chewable tablets)	3 to 5 hours
	Ritalin	Methylphenidate	3 to 5 hours
Intermediate-acting methylphenidate stimulants	Metadate CD	Extended-release methylphenidate	6 to 8 hours
	Ritalin LA	Extended-release Methylphenidate	6 to 8 hours
Long-acting amphetamine stimulants	Adderall-XR	Extended-release amphetamine	10 to 12 hours
	Dexedrine Spansule	Extended-release amphetamine	6+ hours
	Vyvanse	Lisdexamfetamine	10 to 12 hours
Long-acting methylphenidate stimulants	Concerta	Extended-release methylphenidate	10 to 12 hours
	Daytrana	Extended-release methylphenidate (skin patch)	11 to 12 hours
	Focalin XR	Extended-release dexmethylphenidate	8 to 12 hours
	Quillivant XR	Extended-release methylphenidate (liquid)	10 to 12 hours
Long-acting non-stimulants	Intuniv	Guanfacine	24 hours
	Kapvay	Clonidine	12 hours
	Strattera	Atomoxetine	24 hours

Products are mentioned for informational purposes only and do not imply an endorsement by the American Academy of Pediatrics. Your doctor or pharmacist can provide you with important safety information for the products listed.

Available Online: Common ADHD Medications & Treatments for Children - HealthyChildren.org

Sources:

Agency for Healthcare Research and Quality. (December 1999). *Treatment of Attention Deficit Hyperactivity Disorder*. Summary, Evidence Report/Technology Assessment: Number 11. AHRQ Publication No. 99-E017. https://www.ncbi.nlm.nih.gov/books/NBK11948/

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School Based Interventions

The teacher and other school personnel's attitude toward ADHD is important for educational success. Understanding the disorder encourages use of appropriate interventions and strategies. Open communication between school professionals and parents is critical for the success of the child with ADHD. Classroom interventions may involve making environmental, instructional, behavioral, and social modifications. Each child with ADHD can benefit from a plan individualized to his or her needs. Possible modifications can include:

Environmental:

- Seat in quiet area
- Seat near good role model
- Increase distance between desks
- Allow the student to stand while working
- Provide notebook with dividers
- Reward neatness of desk/area; do not punish sloppiness
- Use tape recorder instead of writing notes, assignments, or homework
- Allow frequent breaks to walk or stretch
- Structure a similar routine for each day
- Seat near the teacher
- Colorize/organize subjects with folders and/or notebooks

Instructional:

- Allow extra time to complete tasks
- Shorten assignments
- Break long assignments into smaller parts; give assignments one at a time
- Reduce amount of homework; require fewer correct responses; pair written and oral instructions
- Provide peer assistance in note taking
- Remind students to recheck work
- Review instructions and directions frequently
- Avoid oral reading in front of class if difficult area for the student
- Accept oral responses
- Accept use of word processor or computer
- Limit quantity of written work
- Accept use of calculator
- Provide immediate feedback

- Model math and writing processes
- Read to the student frequently
- Highlight relevant information
- Use timer to set limit for task completion
- Limit the amount of work on one page
- Vary test responses
- Provide hands on approach to learning
- Provide information in small steps
- Break tasks down into small steps
- Review information frequently and provide repetition
- Summarize key points provide student a copy of lecture notes
- Use outlining, webbing, and visual diagrams
- Practice dictation
- Illustrate vocabulary
- Verbalize steps in the process; talk slower when giving directions
- Provide wait time for response to question
- Use graph paper for math assignments
- Adjust type, difficulty and sequence of material required

Behavioral:

- Encourage self-monitoring
- Provide visual charts
- Post simply and clearly written rules
- Provide cues and prompts as reminders
- Ignore minor inappropriate behavior
- Increase immediacy of rewards and consequences
- Provide visual of hierarchy of consequences
- Supervise closely during unstructured periods
- Avoid lecturing and criticism
- Model appropriate behaviors
- Use behavior contract for one behavior at a time with appropriate reward
- Call on only when hand is raised
- Speak softly in non-threatening manner
- Provide leadership role opportunities
- Reinforce compliant behavior immediately and consistently
- Provide purposeful learning assignments

- Include high interest activities
- Practice verbally rehearsing the appropriate behavior
- Provide opportunity for practicing the appropriate behavior
- Use home-based consequences
- Stick to set limits
- Directly verbalize expectations
- Be flexible
- Learn to increase structure
- Establish one goal at a time
- Give the student two choices to decide upon
- Avoid creating competitive situations and activities

Social:

- Increase contact by touch or name
- Structure interactions
- Promote acceptable social behavior
- Assign special responsibilities to boost self esteem
- Send positive notes home
- Train appropriate anger control
- Provide encouragement
- Teach social skills directly
- Foster acceptance of differences among peers

Student and Parent/Guardian Issues

The student with ADHD has to cope with frequent health care provider visits and medication adjustments. He or she must also learn to handle related frustration, social, and behavioral concerns. Having difficulty controlling behavior according to classroom expectations, along with discipline referrals and academic difficulties, greatly influence the development of the student's self-esteem. Each student must be evaluated on an individual basis and his/her strengths must be emphasized.

Students with ADHD may also have great difficulty complying with parental instructions. The parents/guardians, in return, may become frustrated trying to manage their student's behavior effectively. Homework often becomes an issue of concern due to failure to complete the assignment within a reasonable amount of time and with reasonable effort. Supervision can become an issue due to the student's impulsivity and poor judgment.

Other demands may be placed upon the parents/guardians and siblings of students with ADHD, which may result in high levels of family stress. Support groups, behavioral consultation, and counseling can help families adapt.

National Institutes of Health Consensus Statement on ADHD

The National Institutes of Health (NIH) held a consensus development conference of experts in the field to examine what was known about ADHD. Consensus statements often do not represent the latest findings in a particular field because such findings need to be further studied and replicated before becoming widely accepted as standards. The value of consensus statements is that they reflect an "educated consensus" of what is known about a particular subject and are developed by scientists and citizens chosen for their expertise and impartiality. Results of a development conference on ADHD were published in 2000 and addressed six key questions with the following statements (this is the most recent consensus statement).

What is the scientific evidence to support ADHD as a disorder?

Although no independent valid test exists for ADHD, diagnosis "can be made reliably using well-tested diagnostic interview methods. Evidence supporting the validity of ADHD includes the long-term developmental course of ADHD over time, cross-national studies revealing similar risk factors, familial aggregation of ADHD, and heritability" (NIH, 2000). The consensus statement notes that there appears to be a central nervous system basis for ADHD, but further research is needed to definitely determine this. Problems of diagnosis include differentiation from other behavioral disorders and determining "the appropriate boundary between the normal population and those with ADHD." It also notes the need for research to determine diagnostic criteria for young children, adolescents, and adults.

What is the impact of ADHD on individuals, families, and society?

ADHD represents a costly, major public health issue. Children with ADHD experience rejection by peers, academic difficulties, and higher injury rates. Adolescents, and later, some adults with untreated ADHD are at greater risk for substance abuse, injuries, and dysfunctional social relationships. Parents of children with ADHD experience frustration, marital discord, and additional financial expense. In society, persons with ADHD need more services from the health care system, the judicial system, schools, and social services. Families face difficult treatment decisions made worse by "the media war between those who overstate the benefits of treatment and those who overstate the dangers of treatment" (NIH, 2000).

What are the effective treatments for ADHD?

Short-term trials of both stimulants and psychosocial treatments have established their efficacy in alleviating symptoms of inattention, hyperactivity, impulsivity, and aggressiveness. Psychosocial therapies include behavioral strategies such as reward/consequence management, parent/guardian training, and teacher training.

Cognitive-behavioral treatment is not effective. Studies comparing stimulants with psychosocial treatment consistently report greater efficacy with stimulants. Alternative treatments such as diet management, vitamins, herbs, biofeedback, and perceptual stimulation demonstrate inconsistent results and have not been proven effective.

What are the risks of the use of stimulant medication and other treatments?

There appears to be no conclusive evidence that stimulant use is harmful. However, studies of long-term effects are not available. Adverse drug reactions are usually dose related. There may be short-term effects on growth rate, but ultimate height is not affected. Data is limited and conflicting as to whether stimulant use increases the risk of substance abuse—more research is needed in this area. The increased use of stimulants may result in a risk of oversupply and illicit use for society.

What are the existing diagnostic and treatment practices, and what are the barriers to appropriate identification, evaluation, and intervention?

There are wide variations in practice among communities and physicians, suggesting no consensus. Children may sometimes be underdiagnosed and sometimes be overdiagnosed. Closer follow-up and collaboration between clinician, family, and school personnel is needed. Barriers to care include negative media portrayal of ADHD, the lack of specialists to care for children with ADHD, inadequate collaboration between the educational system and the practitioner and insurance coverage that limits reimbursement for mental health treatments.

What are the directions for future research?

A list of ten areas needing research is delineated. Moreover, the need for research into the etiology of ADHD is emphasized because as long as the cause is not known, there are no universal strategies for prevention.

The teacher and other school personnel's attitude toward ADHD is important for educational success. Understanding the disorder encourages use of appropriate interventions and strategies. Open communication between school professionals and parents is critical for the success of the child with ADHD. Classroom interventions may involve making environmental, instructional,

behavioral, and social modifications. Each child with ADHD can benefit from a plan individualized to his or her needs.



For additional resources, visit the VDOE Some Specific Conditions: Attention-Deficit/ Hyperactivity Disorder webpage:

https://www.doe.virginia.gov/programs-services/special-education/specific-disabilities/other-health-impairment/some-specific-conditions

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Managing Food Allergies in Schools

Overview

Food allergies can be life threatening. They refer to reactions involving immunologic reactions (usually IgE) to particular foods. They may be immediate or delayed, mild or severe. When severe, food allergies can cause systemic (throughout the body) hypersensitivity reactions in cardiovascular, respiratory, gastrointestinal, and cutaneous tissues. The problem is growing. According to the American Academy of Pediatrics, 8% of children in the U.S. have a food allergy.

Reactions may occur from actual *ingestion* of a food or from *contact* with the food. This contact may occur anywhere at school—in the cafeteria, in the classroom, on the bus, or on the playground. Students with severe allergies may experience an allergic reaction just from sniffing the offending food, from touching another student who has handled the offending food, or from utensils that have touched the offending food and later touch another food that the student ingests.

Allergic reactions to food are increasing and are among the most common medical emergencies that occur at school. American Academy of Pediatrics reports almost 18% of students with food allergies are reported to have had an allergic reaction at school.

Avoidance of the offending food(s) is the only way to prevent a reaction. The principles of successful management of food allergies are prevention and preparedness--avoiding the allergen and preparing for treatment of acute allergic reactions.

The list of foods that can cause allergic reactions is unlimited. However, several foods typically cause many severe allergic reactions in school-age children and include:

- Peanuts
- Tree nuts (e.g., pecans, walnuts)
- Fish (e.g., cod, whitefish)
- Shellfish (shrimp, lobster, crab, scallops, or oysters).

Ingredients containing these foods (such as peanut oil or peanut flour) may also be hidden in other prepared foods. These foods can cause severe anaphylactic reactions, and sensitivity continues throughout life.

Other foods that are commonly associated with allergic reactions include:

- Milk

- Eggs
- Soybeans
- Wheat

Reactions to these foods, however, tend to be less severe and may lessen as the child gets older. Many children are said to “outgrow” these allergies.

Food allergy and food intolerance are often confused. For comparison, food intolerances refer to reactions that are non-immunologic, such as lactose intolerance involving a deficiency of an enzyme necessary for the digestion of milk. Food sensitivities involve digestive reactions and other symptoms that occur after eating particular food additives such as food coloring, monosodium glutamate, or sulfites (used in dried fruits). Celiac disease is a gluten-sensitive enteropathy. Although it has symptoms which make it look like an allergy, it is not an IgE-mediated immune response. It may be an autoimmune response that results in the body attacking normal tissue in the GI tract in response to eating products that contain gluten (such as wheat, barley, or oats).

Settings and Staff

Management of food allergies should occur throughout the entire school day and in all settings. Allergic reactions to food do not just occur in the cafeteria. Materials used in class projects or snacks in the classroom can trigger a reaction. Contact with other students who have had contact with allergy-causing food(s) can also cause an allergic reaction. Students interacting on a bus can accidentally expose an allergic student to an allergen.

Some schools may designate areas or tables in the cafeteria where certain foods are not allowed to decrease exposure. However, according to the National Association of School Nurses (NASN) Position Statement, “completely banning nuts or other foods is not recommended as it is 1) not possible to control what other people bring onto the school grounds, and 2) does not provide the allergic student with an environment where he/she can safely learn to navigate a world containing nuts. “A ban can create a false sense of security.”

All school personnel who have contact with the student with food allergies should know how to decrease the risk of allergic reactions and how to activate the Food Allergy Action Plan or established school emergency plan for the student.

The Centers for Disease Control & Prevention has compiled an extensive list of recommendations for schools in the management of food allergies. *Voluntary Guidelines for Managing Food Allergies In Schools and Early Care and Education Programs* is available to all schools by calling 1-800-CDC-INFO or going online to www.cdc.gov/healthyyouth.

Individualized Healthcare Plan (IHP)

Each student's individualized healthcare plan (IHP) must be tailored to the individual's needs. Any student with prescribed epinephrine should have an IHP that discusses continuous monitoring, emergency plans, and evaluation. A sample Food Allergy Action Plan (Food Allergy & Anaphylaxis Emergency Care Plan) is included.

Managing a Food Allergy

- Some points to remember in the management of food allergies include:
- Teach the student with a food allergy how to manage the allergy (as developmentally appropriate), including how to avoid unsafe foods and foods with unknown ingredients, how to read food labels, symptoms of allergic reactions, and how to get help when needed
- Obtain the healthcare provider' orders for care
- Collaborate with the family to develop strategies to manage the allergy
- Develop a **written** Allergy Action Plan
- Have appropriate medications available in the event of an emergency (and not locked away)
- Develop plans for field trips, school bus rides, substitute teacher days, and after-school programs which allow the student to participate while accommodating his/her needs
- Develop plans for carrying and storing epinephrine for students who have permission to self-carry
- Make sure that all personnel who interact with the student on a regular basis know how to recognize symptoms of an allergic reaction and know what to do if one occurs
- Institute a "no sharing" food policy between students
- Avoid foods whose ingredients are unknown. Recognize other names for allergenic foods on food labels (e.g., casein hydrolysate for milk).
- Consider designating a table where a particular allergic food could not be eaten if a student has a severe allergy (e.g., peanut-free table). However, it is not possible or advisable to make a school "nut free" or "allergy free." It can be "nut aware" or "allergy aware".
- Consider informing parents/guardians of other students if a severe allergy exists with parental permission
- Teach classmates (especially adolescents) how to respond to an allergic reaction
- Expand "no bullying" policies to cover students who are bullied due to food allergies and restrictions

- Teach food service workers to avoid cross-contamination in preparing or cleaning up foods
- Inform students and staff that hand sanitizers do **not** remove food proteins—use soap and water to do so
- Plan for yearly training on food allergy and epinephrine use
- Communicate with all parents/guardians about allergy awareness policies. When parents/guardians don't understand why certain school policies exist, they may not comply and may become resentful. Teaching basics can increase acceptance and compliance.

Resources--School Food Allergy Program

Many resources exist for help in developing food allergy management programs in schools. Some of these include:

1. *Safe at School and Ready to Learn*, National School Boards Association, a comprehensive manual to guide development of policies for managing food allergies in schools..
2. *Voluntary Guidelines for Managing Food Allergies in Schools and Early Care and Education Programs*, Centers for Disease Control and Prevention (CDC), comprehensive guidelines for school food allergy management. Developed by Food Allergy Research Education, NASN, and CDC.
3. *Online Food Allergy Tool Kit*, National Association of School Nurses. Contains a variety of factsheets, guidelines, articles, checklists, sample forms, and care plans for managing food allergies at school.

https://www.nasn.org/nasn-resources/resources-by-topic/allergies-anaphylaxis

4. *Guidelines for the Diagnosis and Management of Food Allergy in the United States, Summary for Patients, Families, and Caregiver,* National Institute of Allergy and Infectious Diseases, National Institutes of Health. https://www.niaid.nih.gov/sites/default/files/faguidelinespatient.pdf
5. *Managing Food Allergies in the School Setting (2011)*. Twenty minute video developed by Food Allergy Research Education in cooperation with the CDC, NASN, and SCBA to help schools manage food allergies. https://www.youtube.com/watch?v=zvM8EaQpckw
6. *Getting Started at School.* Free online interactive course teaches educators how to prepare for food allergy and anaphylaxis.

https://www.foodallergy.org/resources/getting-started-school

7. *Be a PAL:* Protect a Life from Food Allergies. This program teaches children how to avoid allergen exposure and how to deal with a reaction. https://www.foodallergy.org/resources/be-palr
8. Resources to help children understand the seriousness of food allergies.
    - *Fabulous Me, Piper Lee and the Peanut Butter Itch* by Tolya Thompson
    - *Alexander, the Elephant Who Couldn't Eat Peanuts* Book Series by Susan Leavitt
    - Arthur Family Health Video, "Binky Goes Nuts: Understanding Peanut Allergies" https://www.pbs.org/video/arthur-binky-goes-nuts/
9. *Bullying*, Food Allergy Research Education program that addresses food allergy bullying. https://www.foodallergy.org/resources/bullying
10. *Kids Living with Food Allergies*, video by the Food Allergy Research & Education (FARE) using children with allergies to help other children understand food allergies. https://www.youtube.com/watch?v=pOcQsnMonHs
11. The Virginia General Assembly passed legislation in 2012 and 2013 that requires local education agencies to adopt and implement policies for the possession and administration of epinephrine in Virginia public schools. Resources that school divisions may use in developing these policies can be found later in this section and in the *Recognition and Treatment of Anaphylaxis in the School Setting* Guidelines (2013) in the *Virginia School Health Guidelines.*

Federal Regulations

The United States Department of Agriculture (USDA) outlines federal regulations for providing meals to students with special dietary needs in the manual, *Accommodating Children with Special Dietary Needs in School Nutrition Programs for School Food Service Staff* (2001, rev.2013, Available Online: http://www.fns.usda.gov/sites/default/files/special_dietary_needs.pdf

Schools participating in a federally-funded school nutrition program must provide substitutions to the standard meal for disabled students and may make substitutions for non-disabled students with **medically-certified dietary needs.**

The form entitled *Physician's Statement for Students with Special Dietary Needs* must be completed and submitted to the school nutrition program for each student with special dietary needs. Any changes to the statement must be made in writing. A copy of this form, as well as more details of the regulation, can be found in the Virginia Department of Education (VDOE) *Superintendent's Memos #8* dated October 11, 2002 and later in this section.

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FARE Food Allergy Research & Education — FOOD ALLERGY & ANAPHYLAXIS EMERGENCY CARE PLAN

Name: _____ D.O.B.: _____

Allergy to: _____

Weight: _____ lbs. Asthma: ☐ **Yes (higher risk for a severe reaction)** ☐ **No**

NOTE: Do not depend on antihistamines or inhalers (bronchodilators) to treat a severe reaction. USE EPINEPHRINE.

Extremely reactive to the following allergens: _____

THEREFORE:

☐ If checked, give epinephrine immediately if the allergen was LIKELY eaten, for ANY symptoms.

☐ If checked, give epinephrine immediately if the allergen was DEFINITELY eaten, even if no symptoms are apparent.

FOR **ANY** OF THE FOLLOWING:

SEVERE SYMPTOMS

LUNG — Shortness of breath, wheezing, repetitive cough

HEART — Pale or bluish skin, faintness, weak pulse, dizziness

THROAT — Tight or hoarse throat, trouble breathing or swallowing

MOUTH — Significant swelling of the tongue or lips

SKIN — Many hives over body, widespread redness

GUT — Repetitive vomiting, severe diarrhea

OTHER — Feeling something bad is about to happen, anxiety, confusion

OR A COMBINATION of symptoms from different body areas.

1. **INJECT EPINEPHRINE IMMEDIATELY.**
2. **Call 911.** Tell emergency dispatcher the person is having anaphylaxis and may need epinephrine when emergency responders arrive.

- Consider giving additional medications following epinephrine:
  - » Antihistamine
  - » Inhaler (bronchodilator) if wheezing
- Lay the person flat, raise legs and keep warm. If breathing is difficult or they are vomiting, let them sit up or lie on their side.
- If symptoms do not improve, or symptoms return, more doses of epinephrine can be given about 5 minutes or more after the last dose.
- Alert emergency contacts.
- Transport patient to ER, even if symptoms resolve. Patient should remain in ER for at least 4 hours because symptoms may return.

MILD SYMPTOMS

NOSE — Itchy or runny nose, sneezing

MOUTH — Itchy mouth

SKIN — A few hives, mild itch

GUT — Mild nausea or discomfort

FOR **MILD SYMPTOMS** FROM **MORE THAN ONE** SYSTEM AREA, GIVE EPINEPHRINE.

FOR **MILD SYMPTOMS** FROM **A SINGLE SYSTEM** AREA, FOLLOW THE DIRECTIONS BELOW:

1. Antihistamines may be given, if ordered by a healthcare provider.
2. Stay with the person; alert emergency contacts.
3. Watch closely for changes. If symptoms worsen, give epinephrine.

MEDICATIONS/DOSES

Epinephrine Brand or Generic: _____

Epinephrine Dose: ☐ 0.1 mg IM ☐ 0.15 mg IM ☐ 0.3 mg IM

Antihistamine Brand or Generic: _____

Antihistamine Dose: _____

Other (e.g., inhaler-bronchodilator if wheezing): _____

_____

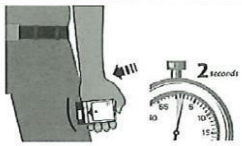
PATIENT OR PARENT/GUARDIAN AUTHORIZATION SIGNATURE DATE PHYSICIAN/HCP AUTHORIZATION SIGNATURE DATE

FORM PROVIDED COURTESY OF FOOD ALLERGY RESEARCH & EDUCATION (FARE) (FOODALLERGY.ORG) 5/2018

FARE Food Allergy Research & Education — FOOD ALLERGY & ANAPHYLAXIS EMERGENCY CARE PLAN

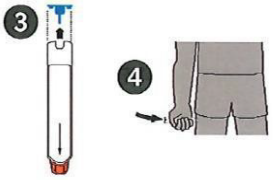
HOW TO USE AUVI-Q® (EPINEPRHINE INJECTION, USP), KALEO

1. Remove Auvi-Q from the outer case.
2. Pull off red safety guard.
3. Place black end of Auvi-Q against the middle of the outer thigh.
4. Press firmly until you hear a click and hiss sound, and hold in place for 2 seconds.
5. Call 911 and get emergency medical help right away.



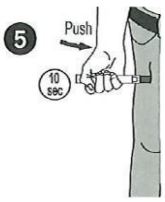
HOW TO USE EPIPEN® AND EPIPEN JR® (EPINEPHRINE) AUTO-INJECTOR AND EPINEPHRINE INJECTION (AUTHORIZED GENERIC OF EPIPEN®), USP AUTO-INJECTOR, MYLAN AUTO-INJECTOR, MYLAN

1. Remove the EpiPen® or EpiPen Jr® Auto-Injector from the clear carrier tube.
2. Grasp the auto-injector in your fist with the orange tip (needle end) pointing downward.
3. With your other hand, remove the blue safety release by pulling straight up.
4. Swing and push the auto-injector firmly into the middle of the outer thigh until it 'clicks'.
5. Hold firmly in place for 3 seconds (count slowly 1, 2, 3).
6. Remove and massage the injection area for 10 seconds.
7. Call 911 and get emergency medical help right away.



HOW TO USE IMPAX EPINEPHRINE INJECTION (AUTHORIZED GENERIC OF ADRENACLICK®), USP AUTO-INJECTOR, IMPAX LABORATORIES

1. Remove epinephrine auto-injector from its protective carrying case.
2. Pull off both blue end caps: you will now see a red tip.
3. Grasp the auto-injector in your fist with the red tip pointing downward.
4. Put the red tip against the middle of the outer thigh at a 90-degree angle, perpendicular to the thigh.
5. Press down hard and hold firmly against the thigh for approximately 10 seconds.
6. Remove and massage the area for 10 seconds.
7. Call 911 and get emergency medical help right away.



HOW TO USE TEVA'S GENERIC EPIPEN® (EPINEPHRINE INJECTION, USP) AUTO-INJECTOR, TEVA PHARMACEUTICAL INDUSTRIES

1. Quickly twist the yellow or green cap off of the auto-injector in the direction of the "twist arrow" to remove it.
2. Grasp the auto-injector in your fist with the orange tip (needle end) pointing downward.
3. With your other hand, pull off the blue safety release.
4. Place the orange tip against the middle of the outer thigh (upper leg) at a right angle (perpendicular) to the thigh.
5. Swing and push the auto-injector firmly into the middle of the outer thigh until it 'clicks'.
6. Hold firmly in place for 3 seconds (count slowly 1, 2, 3).
7. Remove and massage the injection area for 10 seconds.
8. Call 911 and get emergency medical help right away.



ADMINISTRATION AND SAFETY INFORMATION FOR ALL AUTO-INJECTORS:

1. Do not put your thumb, fingers or hand over the tip of the auto-injector or inject into any body part other than mid-outer thigh. In case of accidental injection, go immediately to the nearest emergency room.
2. If administering to a young child, hold their leg firmly in place before and during injection to prevent injuries.
3. Epinephrine can be injected through clothing if needed.
4. Call 911 immediately after injection.

OTHER DIRECTIONS/INFORMATION (may self-carry epinephrine, may self-administer epinephrine, etc.):

Treat the person before calling emergency contacts. The first signs of a reaction can be mild, but symptoms can worsen quickly.

EMERGENCY CONTACTS — CALL 911

RESCUE SQUAD: _____

DOCTOR: _____ PHONE: _____

PARENT/GUARDIAN: _____ PHONE: _____

OTHER EMERGENCY CONTACTS

NAME/RELATIONSHIP: _____ PHONE: _____

NAME/RELATIONSHIP: _____ PHONE: _____

NAME/RELATIONSHIP: _____ PHONE: _____

FORM PROVIDED COURTESY OF FOOD ALLERGY RESEARCH & EDUCATION (FARE) (FOODALLERGY.ORG) 1/2019

Available Online: https://www.foodallergy.org/

Physician's Statement for Students with Special Dietary Needs*

Student's Name		Age	
Name of School	Grade Level	Classroom	
Does the child have a disability? If Yes, describe the major life activities affected by the disability.		Yes	No
Does the child have special nutritional or feeding needs? If **Yes**, complete **Part B** of this form and have it signed by a licensed physician.		Yes	No
If the child is not disabled, does the child have special nutritional or feeding needs? If **Yes**, complete **Part B** of this form and have it signed by a recognized medical authority.		Yes	No

PART B

List any dietary restrictions or special diet.

List any allergies or food intolerances to avoid.

List foods to be substituted.

List foods that need the following change in texture. If all foods need to be prepared in this manner, indicate "All."

Cut up or chopped into bite size pieces:

Finely ground:

Pureed:

List any special equipment or utensils that are needed.

Indicate any other comments about the child's eating or feeding patterns.

Physician or Medical Authority's Signature	Date:

***This statement must be updated annually.**

SCHOOL GUIDELINES FOR MANAGING STUDENTS WITH FOOD ALLERGIES

Food allergies can be life threatening. The risk of accidental exposure to foods can be reduced in the school setting if schools work with students, parents, and physicians to minimize risks and provide a safe educational environment for food-allergic students.

Family's Responsibility

- Notify the school of the child's allergies.
- Work with the school team to develop a plan that accommodates the child's needs throughout the school including in the classroom, in the cafeteria, in after-care programs, during school-sponsored activities, and on the school bus, as well as a Food Allergy Action Plan.
- Provide written medical documentation, instructions, and medications as directed by a physician, using the Food Allergy Action Plan as a guide. Include a photo of the child on written form.
- Provide properly labeled medications and replace medications after use or upon expiration.
- Educate the child in the self-management of their food allergy including:
  - safe and unsafe foods
  - strategies for avoiding exposure to unsafe foods
  - symptoms of allergic reactions
  - how and when to tell an adult they may be having an allergy-related problem
  - how to read food labels (age appropriate)
- Review policies/procedures with the school staff, the child's physician, and the child (if age appropriate) after a reaction has occurred.
- Provide emergency contact information.

School's Responsibility

- Be knowledgeable about and follow applicable federal laws including ADA, IDEA, Section 504, and FERPA and any state laws or district policies that apply.
- Review the health records submitted by parents and physicians.
- Include food-allergic students in school activities. Students should not be excluded from school activities solely based on their food allergy.
- Identify a core team of, but not limited to, school nurse, teacher, principal, school food service and nutrition manager/director, and counselor (if available) to work with parents and the student (age appropriate) to establish a prevention plan. Changes to the prevention plan to promote food allergy management should be made with core team participation.

- Assure that all staff who interact with the student on a regular basis understands food allergy, can recognize symptoms, knows what to do in an emergency, and works with other school staff to eliminate the use of food allergens in the allergic student's meals, educational tools, arts and crafts projects, or incentives.
- Practice the Food Allergy Action Plans before an allergic reaction occurs to assure the efficiency/effectiveness of the plans.
- Coordinate with the school nurse to be sure medications are appropriately stored, and be sure that an emergency kit is available that contains a physician's standing order for epinephrine. In states were regulations permit, medications are kept in a easily accessible secure location central to designated school personnel, not in locked cupboards or drawers. Students should be allowed to carry their own epinephrine, if age appropriate after approval from the students physician/clinic, parent and school nurse, and allowed by state or local regulations.
- Designate school personnel who are properly trained to administer medications in accordance with the State Nursing and Good Samaritan Laws governing the administration of emergency medications.
- Be prepared to handle a reaction and ensure that there is a staff member available who is properly trained to administer medications during the school day regardless of time or location.
- Review policies/prevention plan with the core team members, parents/guardians, student (age appropriate), and physician after a reaction has occurred.
- Work with the district transportation administrator to assure that school bus driver training includes symptom awareness and what to do if a reaction occurs.
- Recommend that all buses have communication devices in case of an emergency.
- Enforce a "no eating" policy on school buses with exceptions made only to accommodate special needs under federal or similar laws, or school district policy. Discuss appropriate management of food allergy with family.
- Discuss field trips with the family of the food-allergic child to decide appropriate strategies for managing the food allergy.
- Follow federal/state/district laws and regulations regarding sharing medical information about the student.
- Take threats or harassment against an allergic child seriously.

Student's Responsibility

- Should not trade food with others.
- Should not eat anything with unknown ingredients or known to contain any allergen.
- Should be proactive in the care and management of their food allergies and reactions based on their developmental level.
- Should notify an adult immediately if they eat something they believe may contain the food to which they are allergic.

More detailed suggestions for implementing these objectives and creating a specific plan for each individual student in order to address his or her particular needs are available in The Food Allergy & Anaphylaxis Network's (FAAN) *School Food Allergy Program*. The *School Food Allergy Program* has been endorsed and/or supported by the Anaphylaxis Committee of the American Academy of Allergy Asthma and Immunology, the National Association of School Nurses, and the Executive Committee of the Section on Allergy and Immunology of the American Academy of Pediatrics. FAAN can be reached at: 800/929-4040.

The following organizations participated in the development of this document:

American School Food Service Association
National Association of Elementary School Principals
National Association of School Nurses
National School Boards Association
The Food Allergy & Anaphylaxis Network

Teacher's Checklist for Managing Food Allergies

- ✓ Work with parents, the school nurse, and other appropriate school personnel to determine if any classroom modifications are needed to make sure that students with food allergies can participate fully in class activities.
- ✓ Avoid the use of identified allergens in class projects, parties, holidays and celebrations, arts, crafts, science experiments, cooking, snacks, or rewards. Modify class materials as needed.
- ✓ Use non-food incentives for prizes, gifts, and awards.
- ✓ Consider designated allergy-friendly seating arrangements in the cafeteria.
- ✓ Include information about children with special needs, including those with known food allergies, in instructions to substitute teachers.
- ✓ Encourage children to wash hands before and after handling or consuming food.
- ✓ Determine if the intended location for a field trip is safe for students with food allergies. If it is not safe, the trip might have to be changed or cancelled if accommodations cannot be made. Students cannot be excluded from field trips because of food allergies.
- ✓ Avoid ordering food from restaurants because food allergens may be present, but unrecognized.
- ✓ Have rapid access to epinephrine auto-injectors. If you suspect a severe food allergy reaction or anaphylaxis, take immediate action, consistent with your school's food allergy management emergency response protocol.
- ✓ Be a role model by respecting the needs of students with food allergies and reinforcing the school's rules against discrimination and bullying.



Available Online: [Educators - Safe Classrooms for Kids with Allergies | FARE (foodallergy.org)]

Student Name: _____ Grade: _____

Teacher/Staff Contact Person: _____ Date of IHP: _____ Review Date: _____

Secondary Health Concerns: _____

Sample Individualized Healthcare Plan – Food Allergy Management

Goal: Student will have an integrated appropriate allergy management regimen during the school day with a focus on prevention. School personnel will be prepared and trained to respond in an emergency medical situation.

INTERVENTIONS	IMPLEMENTED DATE & INITIAL	EVALUATION or OUTCOME INDICATORS (Circle & Date)
Food Allergy Management at School ▪ Food Allergen – Signs and Symptoms o Assist student to recognize symptoms of an allergic reaction and encourage him/her to access appropriate care and medications when needed. Show respect for self-management and self-determination. ▪ Maintain individual school health record to note allergy information from healthcare provider and exposure at school o Document original diagnosis o Document each episode of allergic reaction o Document any medications given ▪ Provide instruction to student and staff on prevention measures and emergency response o Provide appropriate guidance in creating a safe classroom and school environment to minimize the risk of exposure to food allergens. • Alert classroom teacher to request alternative snacks from parent o Provide faculty with presentation related to food allergy management. o Work with Food Service personnel • Determine if food allergic food is served		**Student Health Needs and Responses** Parent participation in health needs – Provides for child's physical needs Provides needed medical information, medical orders and medication to school Never demonstrated 1 2 3 4 5 Consistently demonstrated Student self-care - Student recognizes symptoms and self-manages food allergy well Never demonstrated 1 2 3 4 5 Consistently demonstrated The following records are up to date, accurate and legible: • Cumulative Health Record, Student Visit Record • Allergy Action Plan (Emergency Care Plan) • Medication Record Never 1 2 3 4 5 Consistently Prevention measures that allow student to fully access educational program • Faculty and staff has been trained to reduce accidental exposures to allergens • Faculty and staff is willing and has been trained to respond to an anaphylactic emergency • Faculty and staff has alternative foods in classroom for curricular and celebration use

Individualized Healthcare Plan written by: _____ Page 1 of 3

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in cafeteria • Avoid cross-contamination with allergen • Establish safe environment for all students o Develop emergency protocols (and initiate care as needed) that include: accessing emergency care at school, as well as EMS as needed, medication protocols (including orders from healthcare provider) • Check medications for dosage and expiration dates • Counsel student if self-carrying medication o Develop student specific Emergency Care Plan that outlines emergency care to school staff, including teachers, support staff, food service staff, custodial staff, transportation staff ▪ Instruct staff in epinephrine administration as appropriate. o Follow student's Emergency Care Plan at onset of symptoms o Address specific issues that may be present for field trips and other educational activities that occur at an off campus location including box lunches, food options. o Have plan in place in the event that the nurse is not available ▪ Implement organizational changes to facilitate shared decision making for self-management of chronic illnesses.		Faculty has been instructed in food allergy management Never 1 2 3 4 5 Consistently Food Service Personnel make appropriate accommodations for student with food allergy • Substitutions are available as needed • Accommodations are made to prevent cross-contamination during food preparation • Student is protected from exposure in cafeteria while not being socially isolated Never demonstrated 1 2 3 4 5 Consistently demonstrated Policies and procedures are in place in school to address the following concerns: • Emergency medication availability, storage and administration • Student may self-carry if student is responsible and policy is in place • Accommodations necessary on field trips or during extra-curricular activities • Plan in place in the event that the nurse is not available Not in place 1 2 3 4 5 Consistently employed

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▪ Plan and prepare for building evacuations and other emergency responses to provide care to students with allergies. o Have medication available in all settings o Have medical orders available o Have parent contact information available at all times.		

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Managing Anaphylaxis

Overview

Anaphylaxis is a severe, sudden, **systemic**, potentially fatal allergic reaction that occurs when the immune system responds to a substance in the environment and can involve the skin, respiratory tract, gastrointestinal tract, and cardiovascular system. Symptoms typically occur within minutes to two hours after contact with the allergy-causing substance. Anaphylaxis can rapidly progress to airway constriction, skin and intestinal irritation, and altered heart rhythms. Without prompt treatment in severe cases, it can lead to complete airway obstruction, shock, and death.

Common food triggers include:

- Peanuts
- Tree nuts (walnuts, cashews)
- Shellfish
- Fish
- Milk
- Eggs
- Soy
- Wheat

Other common triggers include:

- Insect bites/stings
- Medications
- Latex/rubber

Individuals who have been allergic to foods and have asthma are believed to be at a higher risk for developing an anaphylactic reaction. Adolescents who have asthma, along with peanut and tree nut allergy, and do not have quick access to an EpiPen® during a reaction are at highest risk for a fatal reaction.

Symptoms of an Anaphylactic Reaction

An anaphylactic reaction can include:

- Hives

- Itching
- Flushing or redness of the skin
- Sudden difficulty breathing
- Wheezing
- Swelling of the lips, tongue or throat
- Throat tightness, difficulty swallowing
- Drop in blood pressure
- Tingling sensation or metallic taste in mouth
- Vomiting, diarrhea
- Feeling of apprehension, agitation

Young children may not be able to accurately articulate these symptoms and may say things like, “my tongue itches,” "my tongue has hair on it," “there’s something stuck in my throat,” “there are bugs in my ears,” “I can’t swallow,” "my throat feels thick," or “I can’t breathe.”

Symptoms may occur within a few minutes but may worsen over hours. Symptoms also may resolve, but reoccur two to three hours later (without re-exposure to the allergen).

Treatment

Epinephrine is used to treat an anaphylactic reaction by reversing the symptoms. This medication is available via prescription in an auto-injecting pen; examples include an EpiPen® or EpiPen® Jr., Epinephrine Auto-Injector, or as Adrenaclick®. Another mode of delivery is the Auvi-Q®, a compact auto-injector of epinephrine which has an audio component to assist in administering the injection. Generic auto-injectors may become available in the future, but the FDA has not designated any of them as therapeutically equivalent yet.

Epinephrine should be administered as soon as the individual feels the symptoms of anaphylaxis. Students who have been prescribed epinephrine should carry it with them (if appropriate) or have **immediate access** to the medication at all times. It should be stored **away from light at room temperature (59-86º F)** and **not** in a refrigerator or the glove compartment of a car.

The **dose of epinephrine administered should be 0.15 mg intramuscularly in the outer thigh for students weighing 33- 66 pounds and 0.3 mg for students weighing more than 66 pounds**. (According to the CDC growth charts, 66 pounds is in the 50th percentile for 9-year-olds). Note: **The American Academy of Pediatrics has recommended modifying the dosage to 0.15mg for students under 55 pounds and 0.3mg for those over 55 pounds so some prescriptions may indicate this, and the guideline may be changed in the future. Every auto- injector brand is available in both 0.15mg and 0.3mg doses and has training devices available to demonstrate and practice their use.

Epinephrine administration should result in an immediate call to Emergency Medical Services or 911. A second injection may be needed in 5-15 minutes if symptoms do not subside. The student should not be left alone and may experience a bi-phasic reaction where symptoms reappear 2 or 3 hours later without another exposure to the allergen. There is no absolute contraindication to the administration of epinephrine. Experts agree that when in doubt about an anaphylactic reaction, the best option is to administer epinephrine.

Antihistamines and asthma medications should never be prescribed **instead of** epinephrine because they cannot reverse the symptoms of anaphylaxis.

3 R's for Treating Anaphylaxis

- **R**ecognize symptoms early
- **R**eact quickly
- **R**eview what happened and plan to prevent it from recurring (avoid the trigger)

Keep in mind that families will often be very anxious when bringing their child to school if he/she has a history of anaphylaxis. Open communication and collaboration between family and school can help lessen fears for everyone.

Virginia Regulations

In 2012, Virginia enacted legislation to require local school boards to adopt and implement policies for the possession and administration of epinephrine in Virginia public schools by the beginning of the 2012-13 school year; and in 2013 amended the Code to protect from liability those who administer it (§54.1-3408 and §8.01-225). The regulation below is from the *Code of Virginia*:

*§*22.1-274.2 C. By the beginning of the 2013-2014 school year, local school boards shall adopt and implement policies for the possession and administration of epinephrine in every school, to be administered by any school nurse, employee of the school board, employee of a local governing body, or employee of a local health department who is authorized by a prescriber and trained in the administration of epinephrine to any student believed to be having an anaphylactic reaction.

The Virginia Department of Health in collaboration with the Department of Education published an extensive set of guidelines relating to recognizing and treating anaphylaxis in schools.

Every school division has been recommended to adopt policies for:

- possession and administration of epinephrine
- standing orders for non-specific student epinephrine and to have a t least two doses of each dose of epinephrine available (unless every student is over 66 pounds)
- identification of staff trained in the administration of epinephrine
- training school employees in recognizing and responding t o anaphylaxis
- procedures for documenting administration and reporting
- procedures for purchasing, storing, and maintaining supplies (checking expirations)
- guidelines for parents of students with known needs for epinephrine to have orders, an IHP, and their own supply of epinephrine available the entire school year

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Responding to Anaphylaxis

1. Based on symptoms, determine that an anaphylactic reaction appears to be occurring. Act quickly. It is safer to give epinephrine than to delay treatment. **Anaphylaxis is a life-threatening reaction**.
2. If you are alone and are able to provide epinephrine, call out or yell for help as you immediately go to get the epinephrine. Do not take extra time seeking others until you have provided the epinephrine.
3. If you are alone and do not know how to provide epinephrine, call out or yell for help. If someone is available to help you, have them get the personnel trained to provide epinephrine and the epinephrine while you dial 911 and follow the dispatcher's instructions. Advise 911 operator that anaphylaxis is suspected and epinephrine is available. **Your goal is to get someone (EMS or trained personnel) to provide epinephrine and care as soon as possible**.
4. Select the appropriate epinephrine auto-injector to administer, based on weight.

Dosage: 0.15 mg Epinephrine auto-injector IM, if less than 66 pounds

0.30 mg Epinephrine auto-injector IM, if 66 pounds or greater

Frequency: If the symptoms persist or return, a second dose should be administered 5- 15 minutes after the first dose.

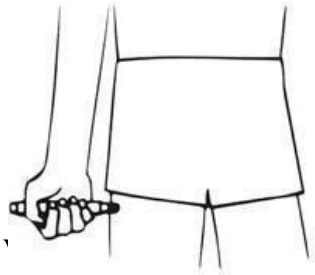
5. Inject the epinephrine via auto-injector: Pull off the safety release cap. Swing and jab it firmly into the upper, outer thigh, (through clothing if necessary). Hold it in place for *5 or 10 seconds to deliver the medication and then remove it. *Note: Check the manufacturer instructions for time of delivery of the medication. Massage the area for 10 more seconds. Note the time.
6. Call or have a bystander call 911 immediately or activate the Emergency Medical System (EMS). Advise the 911 operator that anaphylaxis is suspected and epinephrine was given.
7. Keep the individual either lying down or seated. If they lose consciousness, check if they are breathing and have a pulse. If not, begin CPR (cardiopulmonary resuscitation), call out for help and continue CPR until the individual regains a pulse and is breathing or until EMS arrives and takes over.
8. Call the School Nurse/Front Office school personnel and advise of the situation.
9. Repeat the dose after 5 to 15 minutes if symptoms persist.
10. Stay with the individual until EMS arrives, continuing to follow the directions in No. 5 above if a repeat dose is needed.
11. Provide EMS with used Epinephrine auto injector labeled with name, date, and time administered to transport to the ER with the student.

12. Ensure the parents/guardians have been notified and advised to promptly let the student's primary care physician know about the episode of suspected anaphylaxis.
13. Complete the required documentation of the incident. (See Attachment: Sample Report of Anaphylactic Reaction.)
14. Order a replacement epinephrine auto injector(s).

Procedure for Using an Epinephrine Auto-Injector

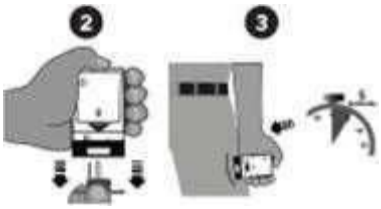
EpiPen® or EpiPen Jr.®

1. Remove the EpiPen Auto-Injector from the plastic carrying case.
2. Pull off the blue safety release cap.
3. Swing and firmly push (jab) orange tip against the mid-outer thigh.
4. Hold for approximately 10 seconds
5. Remove it and massage the area for 10 seconds.
6. Save the EpiPen unit to label and send with the student when EMS arri



Auvi-Q ™

1. Remove the outer case of Auvi-Q. This will automatically activate the voice instructions.
2. Pull off the red safety guard.
3. Place black end against the mid-outer thigh.
4. Press firmly and hold for 5 seconds.
5. Remove it from the thigh.
6. Save the Auvi-Q unit to label and send with the student when EMS arrives.



Adrenaclick®



1. Remove the outer case.
2. Remove gray caps labeled “1” and “2”
3. Place the red rounded tip against the mid-outer thigh (can go through clothes).
4. Press down hard until the needle penetrates.
5. Hold for 10 seconds. Remove from the thigh.
6. Save the Adrenaclick unit to label and send with the student when EMS arrives.

Resources for Learning How to Use Epinephrine Auto-Injectors

Auvi-Q®: www.auvi-q.com

- Training Video https://www.auvi-q.com/hcp/resources
- Trainers available. https://www.auvi-q.com/about-auvi-q
- Mobile app https://www.auvi-q.com/resources



EpiPen®, EpiPen Jr.®:

https://www.epipen.com/-/media/files/epipen/howtouseepipenautoinjector.pdf

- Training Video https://www.youtube.com/watch?v=EYyOqBXJeiw
- Trainers available Call 1-800-395-3376 or visit:

https://www.schoolhealth.com/epipen-trainer



Adrenaclick®: http://adrenaclick.com/index.php

- Training Video: https://www.youtube.com/watch?v=mzreoXrzvaw
- Trainers available, call 1-855-EPINEPH



Sample Protocol for Treatment of Symptoms of Anaphylaxis -

Epinephrine Autoinjector Administration by School Health Professionals and Trained Personnel
For School Age Children – Kindergarten - Grade 12

ARE SIGNS AND SYMPTOMS OF POSSIBLE ANAPHYLAXIS PRESENT AND WAS THERE AN EXPOSURE TO A POSSIBLE TRIGGER (food, insect sting, latex, medication or other trigger)**?**

Contact the school nurse immediately.

If YES, proceed with this protocol.

If NO, see Signs, Symptoms & Triggers section on the next page.

If the student has an **Emergency Care Plan**, follow the plan immediately.

Are any of these signs and symptoms present and severe?	**Or is there a COMBINATION of symptoms from different body areas?**
LUNG: Short of breath, wheeze, repetitive cough HEART: Pale, blue, faint, weak pulse, dizzy, confused THROAT: Tight, hoarse, trouble breathing/swallowing MOUTH: Obstructive swelling (tongue and/or lips) SKIN: Hives over body	SKIN: Hives, itchy rashes, swelling (eyes, lips) GUT: Vomiting, cramping pain, diarrhea HEENT: Runny nose, sneezing, swollen eyes, phlegm throat OTHER: Confusion, agitation, feeling of impending doom **If YES, quickly follow the protocol below:** If No, see Signs, Symptoms & Triggers section on next page.

DO NOT DELAY TREATING ANAPHYLAXIS.

When in doubt, give epinephrine. Contact the School Nurse immediately.

Treating anaphylaxis in the first few minutes can save a life. Not all anaphylaxis has skin symptoms.

Follow the building emergency response plan/protocol and:

IMMEDIATELY ADMINISTER EPINEPHRINE AUTOINJECTOR PER STANDING ORDER:

- 0.15 mg – body weight less than 55 pounds (see reverse page if weight unknown)
- 0.3 mg – body weight 55 pounds or more
- Inject into middle outer side of upper leg, note time and site of injection
- *Stay with student and monitor closely*

Designate a person to call Emergency Medical System (911) and request ambulance with epinephrine.



Stay with and observe student until EMS (ambulance arrives).

- Maintain airway, monitor circulation, start CPR as necessary
- Do not have the student rise to an upright position
- Consider lying on the back with legs elevated, but alternative positioning is needed for vomiting (side lying, head to side) or difficulty breathing (sitting).
- Observe for changes until EMS arrives

IF NO IMPROVEMENT OR IF SYMPTOMS WORSEN IN ABOUT 5 OR MORE MINUTES, ADMINISTER A SECOND EPINEPHRINE DOSE *according to local policy*

- Provide EMS with identifying information, observed signs and symptoms, time epinephrine administered, used epinephrine autoinjector to take with to the hospital
- **Transport to the Emergency Department via EMS even if a symptom seems to get better.**

Physician Signature:_____Date: _____

See next page for additional information.

Protocol Notes - For an emergency, follow the directions on the next page.

Epinephrine Autoinjector Administration by School Health Professionals and Trained Personnel

DO NOT DELAY TREATING ANAPHYLAXIS.

Treating anaphylaxis in the first few minutes can save a life.

School nurse administration is preferable. Training non-licensed staff to recognize and treat first time anaphylaxis requires extensive and well thought out training.[1] Nursing assessment cannot be delegated.

Signs, Symptoms & Triggers:

- SEVERE SYMPTOMS WITH NO KNOWN TRIGGER: Seeing rashes such as hives AND additional serious symptoms warrant epinephrine administration.
    - If no trigger is found and the symptoms are severe, then consider asthma, fainting, heart condition, seizure, viral illness and contact the school nurse. If there is no school nurse available, contact the school designee for assistance and CALL 911 as needed per district guidelines.
    - When unsure or unclear, do not let concerns over whether severe difficulty breathing is caused by anaphylaxis or asthma keep you from using epinephrine. Severe asthma can be treated with epinephrine.
- MILD SYMPTOMS: Whether or not there was exposure to a known trigger, refer to the school nurse to monitor closely and assess. Do not delay the administration of epinephrine if symptoms progress.
    - Do not leave the student. Mild symptoms can quickly become severe.
    - **If the symptoms become severe, administer epinephrine per protocol on reverse.**

Determining the proper dose of stock epinephrine (recommended):

Currently several methods may be used to decide at what weight or age to give an adult strength dose autoinjector.

- Weight based, although most accurate, may not be practical in emergency situations and an alternative method should be determined by local policy. Do not delay giving epinephrine to obtain weight.
- See your state's regulations and train accordingly.

Weight	Length	Grade	Age	Epinephrine Autoinjector
Less than 55 lb. (25kg)[2]	Less than 125 cm. (measure top of head to heel) Consider using tape or a string of this length and storing with stock epinephrine.	Pre-k or Kindergarten	3-6	0.15 mg **Junior** *May give adult dose if pediatric dose unavailable.*
Greater or equal to 55 lbs. (25kg)[2]	Greater than or equal to 125 cm. (measure top of head to heel)	1st grade and up	7 –adult	0.30 mg **Adult**

Transporting to the hospital:

- Students should always be transported to the hospital following administration of epinephrine.
- They are at risk for a secondary or biphasic reaction which may require immediate treatment (as many as 1/3 of children will experience a secondary reaction).[3]

After an emergency event:

- Make sure the parents/guardians are notified to follow up with a private physician. Follow up with the family - evaluate the plan.
- In the case of the student with known history, discuss how exposure occurred and if new allergen avoidance measures are needed. For students with no previous history of anaphylaxis, consider developing an IHP in collaboration with the PCP for possible future occurrences.
- Complete documentation per district policy.
- Make sure a replacement epinephrine auto injector is obtained.
- Review the response and emergency communication, update as needed to improve outcomes.

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[2]Sicherer, S. & Simons, E. (2007). Self-injectable epinephrine for first-aid management of anaphylaxis. *Pediatrics, 119* (3), 638 – 646. NIAID food allergy guidelines 6.3.1.

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[3]Schoessler, S. & White, M. (2013). Recognition and treatment of anaphylaxis in the school setting: The essential role of the school nurse. *Journal of School Nursing, 29,* 407 – 415. https://doi.org/10.1177/1059840513506014

Sample Report

This template may be used by the school division to develop a reporting form for the use of epinephrine.

Report of Epinephrine Administration

Demographics and Health History

School District: _____ **School Name:** _____

Type of Person: ☐ Student ☐ Staff ☐ Visitor **Gender:** ☐ M ☐ F ☐ Non-binary

Race: ☐ American Indian/Alaskan Native ☐ African American ☐ Native Hawaiian/Pacific Islander ☐ Asian ☐ White ☐ Other: _____

History of severe or life-threatening allergy:
☐ Yes, known by student/family ☐ Yes, known by school ☐ Unknown

If known, specify type of allergy: _____

If yes, was allergy action plan available at school? ☐ Yes ☐ No ☐ Unknown

History of anaphylaxis: ☐ Yes, known by student/family ☐ Yes, known by school ☐ Unknown

Previous epinephrine use: ☐ Yes, by student/family ☐ Yes, at school ☐ No ☐ Unknown

Diagnosis/History of Asthma: ☐ Yes, known by student/family ☐ Yes, known by school ☐ No ☐ Unknown

School Plans and Medical Orders

Individual Health Care Plan (IHP) in place?	☐ Yes	☐ No	☐ Unknown
Written school district policy on management of life-threatening allergies in place?	☐ Yes	☐ No	☐ Unknown
Does the student have a student specific order for epinephrine?	☐ Yes	☐ No	☐ Unknown
	☐ Unknown		

Expiration Date of epinephrine: ____/____/____

Epinephrine Administration Incident Reporting

Date/Time of Occurrence: _____/_____/_____ _____:_____ ○ am ○ pm

Vital Signs: BP ____/____ Temp _____ Pulse _____ Respiration_____

If known, specify trigger that precipitated this allergic episode: ☐ Insect sting ☐ Medication ☐ Food ☐ Exercise ☐ Latex ☐ Unknown ☐ Other: _____

If food was a trigger, please specify which food: _____ ☐ Ingested ☐ Touched ☐ Inhaled

Did reaction begin prior to school? ○ Yes ○ No ○ Unknown

Sample Report

Location where symptoms developed:

☐ Classroom ☐ Cafeteria ☐ Health Office/Clinic ☐ Playground ☐ Bus ☐ Other
If other, specify: _____

How did exposure occur? _____

_____

Symptoms: (Check all that apply.)

Respiratory	GI	Skin	Cardiac/Vascular	Other
☐ Cough	☐ Abdominal discomfort	☐ Angioedema	☐ Chest discomfort	☐ Diaphoresis
☐ Difficulty breathing	☐ Diarrhea	☐ Flushing	☐ Cyanosis	☐ Irritability
☐ Hoarse voice	☐ Difficulty swallowing	☐ General pruritus	☐ Dizziness	☐ Loss of consciousness
☐ Nasal congestion/rhinorrhea	☐ Oral pruritus	☐ General rash	☐ Faint/weak pulse	☐ Metallic taste
☐ Swollen throat/tongue	☐ Nausea	☐ Hives	☐ Headache	☐ Red eyes
☐ Shortness of breath	☐ Vomiting	☐ Lip swelling	☐ Hypotension	☐ Sneezing
☐ Stridor		☐ Localized rash	☐ Tachycardia	☐ Uterine cramping
☐ Tightness (chest, throat)		☐ Pale		
☐ Wheezing				

Location epinephrine was administered: ☐ Health Office/Clinic ☐ Other Specify:_____

Location of epinephrine storage: ☐ Health Office/Clinic ☐ Other Specify:_____

Epinephrine administered by: ☐ School Nurse ☐ Teacher ☐ Self ☐ Other/Specify:_____

If epinephrine was administered by other, was the person formally trained?
☐ Yes If known, date of training: ____/____/____ ☐ No ☐ Unknown

If epinephrine was self-administered by a student at school or a school-sponsored function, was the student formally trained? ☐ Yes If known, date of training: ____/____/____ ☐ No

TIME ELAPSED

- **between onset of symptoms and communication of symptoms:** _____minutes
- **between communication of symptoms and administration of epinephrine:** _____minutes

Was a second dose of epinephrine required? ◯ Yes ◯ No ◯ Unknown
If yes, was that dose administered at the school prior to arrival of EMS? ◯ Yes ◯ No ◯ Unknown

Approximate time between the first and second dose: _____ minutes
Biphasic reaction? ◯ Yes ◯ No ◯ Unknown

Disposition

EMS notified at (time): _____:_____ ◯ am/pm **Transferred to ER:** ◯ Yes ◯ No
If yes, transferred via ☐ Ambulance ☐ Parent/guardian ☐ Other **Discharged after _____hours**

Hospitalized? ☐ No ☐ Yes ☐ If yes, discharged after _____day(s) **Name of hospital:**_____

Student/Staff/Visitor outcome: _____
_____

Sample Report

If first occurrence of allergic reaction:

- Was the individual prescribed an epinephrine autoinjector in the ER? ○Yes ○No ○ Unknown
- If yes, who provided the epinephrine autoinjector training? ○Yes ○No ○ Unknown
- Did the ER refer the individual to PCP and/or allergist for follow-up? ○Yes ○No ○ Unknown

Parental Notification

When was the parent/guardian notified of epinephrine administration (time)? _____:_____○ ○am/pm
Parent/guardian: ☐Will come to school ☐Will meet student at hospital ☐Currently at school
☐Other:_____

School Follow-Up

Did a debriefing meeting occur? ○ Yes ○ No ○ Unknown

Notify prescribing MD? ○ Yes ○ No ○ Unknown **Notify LHD?** ○ Yes ○ No ○ Unknown

Recommendations for changes?

☐Protocol/Policy ☐Training ☐Education ☐Information sharing
☐Other: _____

Optional **Student Information**

Name: _____

Date of Birth: _____/_____/_____ **Grade: _____** **Age: _____**

Contact Information

Please provide contact information of the individual who completed this form.

Name: _____

Role: _____

Email address: _____

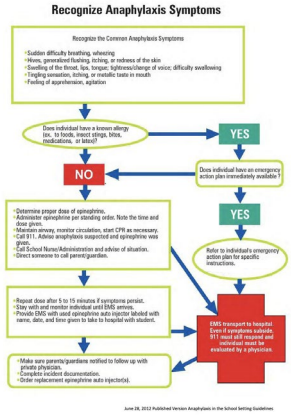
Phone Number: (_____) - _____ - _____

Date: _____/_____/_____

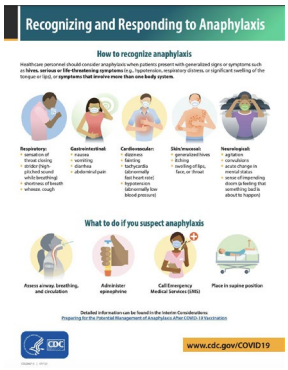
The School Nurse will need to complete all pages of this form within three (3) calendar days after the administration of any undesignated stock epinephrine.

Revised and used with permission of the Massachusetts Department of Health, School Health Unit.

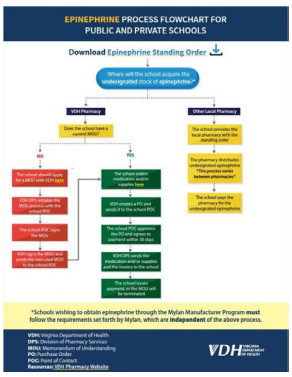
Flowcharts, Action Plans, and Algorithms
Epinephrine



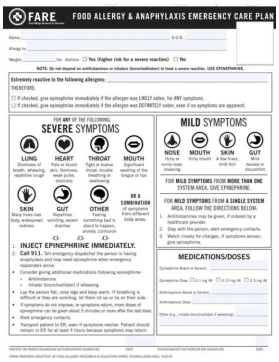
[Recognizing Anaphylaxis Symptoms]



[Recognizing and Responding to Anaphylaxis]



[Epinephrine Flowchart for Procurement of Medication]



[Food Allergy & Anaphylaxis Emergency Care Plan]

Procurement Options Available for K-12 Schools

1

EpiPen 4 Schools Program

- EpiPen4Schools

2

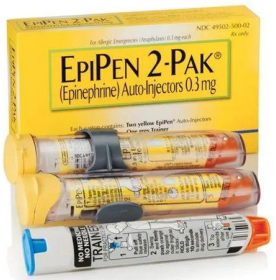
Virginia Department of Health Pharmacy

- VDH Epinephrine and Supplies Application
- Epinephrine Order Request

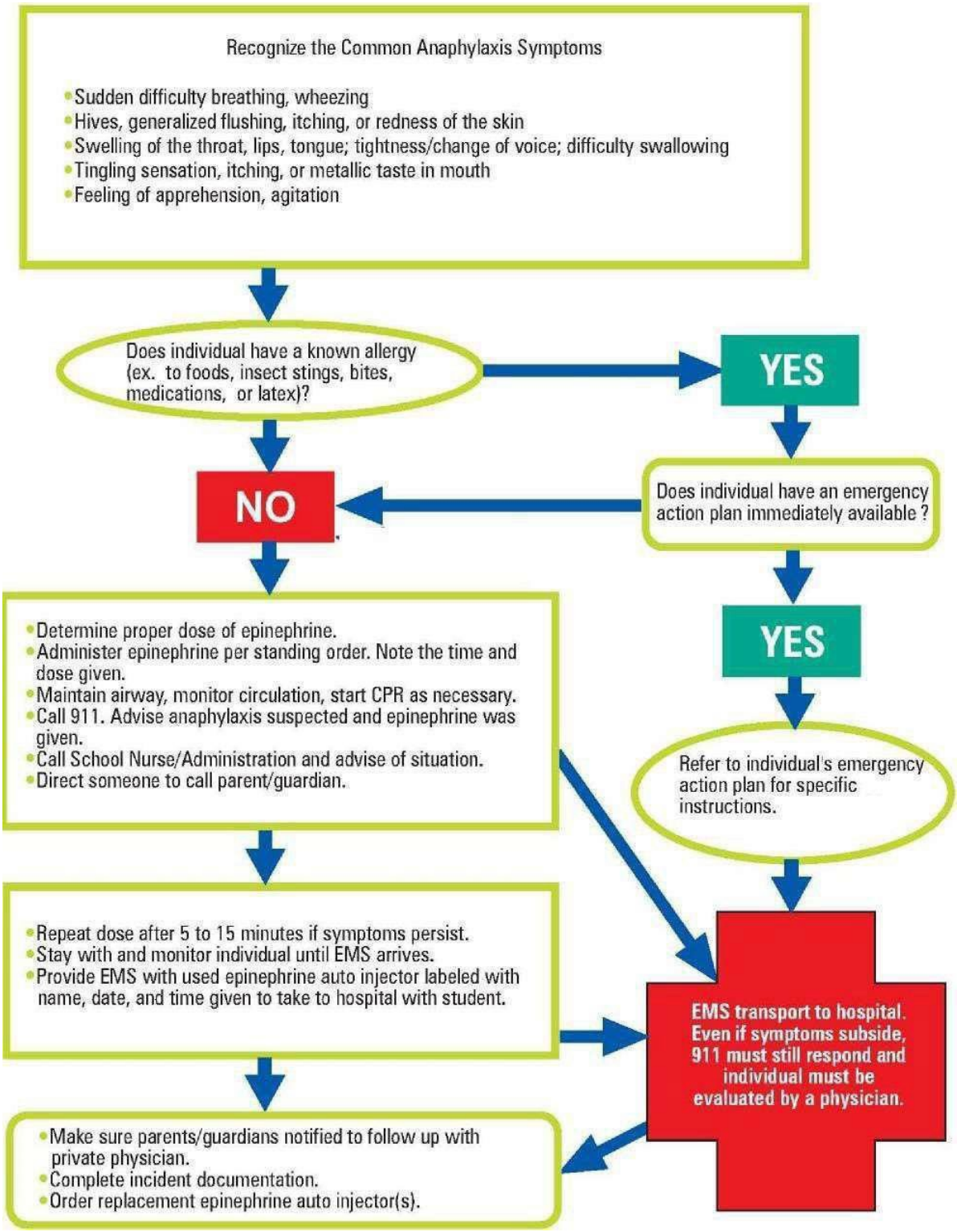
3

Local Pharmacy

- Find Your Local Pharmacy Tool



Recognize Anaphylaxis Symptoms



Available online:
https://ris.dls.virginia.gov/uploads/8VAC20/DIBR/f5aa4004941~2.pdf#page=11

American Academy of Allergy Asthma & Immunology
www.aaaai.org

Anaphylaxis Emergency Action Plan

Patient Name: _____ **Age:** _____

Allergies: _____

Asthma ☐ **Yes** ***(high risk for severe reaction)*** ☐ **No**

Additional health problems besides anaphylaxis: _____

_____

Concurrent medications: _____

_____

Symptoms of Anaphylaxis

MOUTH	**itching, swelling of lips and/or tongue**
THROAT*	**itching, tightness/closure, hoarseness**
SKIN	**itching, hives, redness, swelling**
GUT	**vomiting, diarrhea, cramps**
LUNG*	**shortness of breath, cough, wheeze**
HEART*	**weak pulse, dizziness, passing out**

Only a few symptoms may be present. Severity of symptoms can change quickly.
****Some symptoms can be life-threatening. ACT FAST!***

Emergency Action Steps - DO NOT HESITATE TO GIVE EPINEPHRINE!

1. Inject epinephrine in thigh using (check one):

☐ **Adrenaclick (0.15 mg)** ☐ **Adrenaclick (0.3 mg)**

☐ **Auvi-Q (0.15 mg)** ☐ **Auvi-Q (0.3 mg)**

☐ **EpiPen Jr (0.15 mg)** ☐ **EpiPen (0.3 mg)**

Epinephrine Injection, USP Auto-injector- authorized generic

☐ **(0.15 mg)** ☐ **(0.3 mg)**

☐ **Other (0.15 mg)** ☐ **Other (0.3 mg)**

Specify others: _____

IMPORTANT: ASTHMA INHALERS AND/OR ANTIHISTAMINES CAN'T BE DEPENDED ON IN ANAPHYLAXIS.

2. Call 911 or rescue squad (before calling contact)

3. Emergency contact #1: home_____ **work**_____ **cell**_____

Emergency contact #2: home_____ **work**_____ **cell**_____

Emergency contact #3: home_____ **work**_____ **cell**_____

Comments: _____

_____

_____
Doctor's Signature/Date/Phone Number

_____
Parent's Signature (for individuals under age 18 yrs)/Date

This information is for general purposes and is not intended to replace the advice of a qualified health professional. For more information, visit www.aaaai.org. © 2017 American Academy of Allergy, Asthma & Immunology 4/2017

Available Online: https://www.aaaai.org/Aaaai/media/MediaLibrary/PDF%20Documents/Libraries/Anaphylaxis-Emergency-Action-Plan.pdf

Sample Anaphylaxis Policy (from Virginia Department of Education)

(Severe Allergic Reaction)

It is the policy of____Public Schools to provide at least two (2) doses of auto-injectable epinephrine (hereinafter called 'unassigned or stock epinephrine') in each school, to be administered by a school nurse or employee of the school board who is authorized and trained in the administration of epinephrine to any student believed to be having an anaphylactic reaction on school premises, during the academic day. The *Code of Virginia* (§8.01-225) provides civil protection for employees of a school board who are appropriately trained to administer epinephrine.

Policy Limitations

Parents of students with known life threatening allergies and/or anaphylaxis should provide the school with written instructions from the students' health care provider for handling anaphylaxis and all necessary medications for implementing the student specific order on an annual basis. This anaphylaxis policy is not intended to replace student specific orders or parent provided individual medications. This policy **does not** extend to activities off school grounds (including transportation to and from school, field trips, etc.) or outside of the academic day (sporting events, extra-curricular activities, etc.).

Overview

Anaphylaxis is a severe systemic allergic reaction from exposure to allergens that is rapid in onset and can cause death. Common allergens include animal dander, fish, latex, milk, shellfish, tree nuts, eggs, insect venom, medications, peanuts, soy, and wheat. A severe allergic reaction usually occurs quickly; death has been reported to occur within minutes. An anaphylactic reaction can occur up to one to two hours after exposure to the allergen.

Symptoms of Anaphylaxis

- Shortness of breath or tightness of chest; difficulty in or absence of breathing
- Sneezing, wheezing or coughing
- Difficulty swallowing
- Swelling of lips, eyes, face, tongue, throat or elsewhere
- Low blood pressure, dizziness and/or fainting
- Heart beat complaints: rapid or decreased
- Blueness around lips, inside lips, eyelids
- Sweating and anxiety

- Itching, with or without hives; raised red rash in any area of the body
- Skin flushing or color becomes pale
- Hoarseness
- Loss of bowel or bladder control
- Nausea, abdominal pain, vomiting and diarrhea
- Burning sensation, especially face or chest
- Loss of consciousness

Although anaphylactic reactions typically result in multiple symptoms, reactions may vary. A single symptom may indicate anaphylaxis. **Epinephrine should be administered promptly at the first sign of anaphylaxis. It is safer to administer epinephrine than to delay treatment for anaphylaxis.**

Training

Building level administration shall be responsible for identifying at least two employees, in addition to the school nurse (RN or LPN), to be trained in the administration of epinephrine by auto-injector. Only trained personnel should administer epinephrine to a student believed to be having an anaphylactic reaction. Training shall be conducted in accordance with the most current edition of the Virginia Department of Education's *Manual for Training Public School Employees in the Administration of Medication.*

Training shall be conducted annually or more often as needed.

Standing Orders

Standing orders are written to cover multiple people as opposed to individual-specific orders, which are written for one person.____Public Schools shall designate an authorized medical provider (MD, DO, PA, or NP with prescriptive authority) to prescribe non-student specific epinephrine for the school division, to be administered to any student believed to be having an anaphylactic reaction on school grounds, during the academic day.

Standing orders must be renewed annually and with any change in the prescriber.

Responding to Anaphylaxis

If student-specific orders are on file they should be followed for students with known life threatening allergies and/or anaphylaxis.

For suspected anaphylaxis without specific orders:

1. Based on symptoms, determine that an anaphylactic reaction is occurring.
2. Act quickly. It is safer to give epinephrine than to delay treatment. **This is a life and death decision**.
3. Determine the proper dose and administer epinephrine. Note the time.
4. Direct someone to call 911 and request medical assistance. Advise the 911 operator that anaphylaxis is suspected and that epinephrine has been given.
5. Stay with the person until emergency medical services (EMS) arrives.



6. Monitor their airway and breathing.
7. Reassure and calm person as needed.
8. Call School Nurse/Front Office school personnel and advise of the situation.
9. Direct someone to call the parent/guardian.
10. If symptoms continue and EMS is not on the scene, administer a second dose of epinephrine 5 to 15 minutes after the initial injection. Note the time.
11. Administer CPR if needed.
12. EMS to transport the individual to the emergency room. Document the individual's name, date, and time the epinephrine was administered on the used epinephrine auto-injector and give it to EMS to accompany the individual to the emergency room.
13. Even if symptoms subside, 911 must still respond and the individual must be evaluated by a physician. A delayed or secondary reaction may occur.
14. Document the incident and complete the incident report.
15. Replace the epinephrine stock medication as appropriate.

Courtesy of FAAN, 2012

Post Event Actions

- Once the epinephrine is administered, the local Emergency Medical Services (911) shall be activated and the student transported to the emergency room for follow-up care. In some reactions, the symptoms go away, only to return one to three hours later. This is called a “biphasic reaction.” Often these second-phase symptoms occur in the respiratory tract and may be more severe than the first-phase symptoms. Therefore, follow up care with a health care provider is necessary. The student will not be allowed to remain at school or return to school on the day epinephrine is administered.
- Document the event.
- Complete an incident report.
- Replace the epinephrine stock medication immediately.

Storage, Access and Maintenance

Epinephrine should be stored in a safe, unlocked and accessible location, in a dark place at room temperature (between 59-86 degrees F). Epinephrine should **not** be maintained in a locked cabinet or behind locked doors. Staff should be made aware of the storage location in each school. It should be protected from exposure to heat, cold or freezing temperatures.

Exposure to sunlight will hasten deterioration of epinephrine more rapidly than exposure to room temperatures. The expiration date of epinephrine solutions should be periodically checked; the drug should be replaced if it is approaching the expiration date. The contents should periodically be inspected through the clear window of the auto-injector. The solution should be clear; if it is discolored or contains solid particles, replace the unit.

Each school should maintain documentation that stock epinephrine has been checked on a monthly basis to ensure proper storage, expiration date, and medication stability.

The school division shall maintain a sufficient number of extra doses of epinephrine for replacement of used or expired school stock on the day it is used or discarded. Expired auto-injectors or those with discolored solution or solid particles should not be used.

Discard them in a sharps container.

Managing Latex Allergies

Latex is a natural rubber which is used to manufacture many medical supplies such as gloves, catheters and other tubing, as well as common household items. Common items which may contain latex:

Medical items:	Non-medical items:
● Ace wraps ● Band-Aids ● Catheters ● Elastic bandages ● Gloves ● Intravenous set up ports ● Medication vials ● Pads on crutches ● Tape ● Tourniquets ● Wheelchair cushions	● Art supplies ● Balloons ● Elastic in clothing ● Erasers ● Pacifiers ● Rubber balls ● Rubber bands ● Rubber mats, carpet backs ● Toys (Koosh ball)

Latex allergies are frequently identified in individuals who have repeated and prolonged exposure to rubber. Therefore, individuals who have multiple surgeries or procedures involving contact with latex (e.g., students with spina bifida), health professionals, and others who use latex products on a frequent basis are at risk for developing a hypersensitivity to latex. Approximately 2/3 students with spina bifida or multiple surgeries and 8-17% of health care workers have developed latex allergies. Non-latex gloves should be used in school settings.

Research indicates that there is a link between latex allergies and certain food allergies. It found that latex has similar antigenic characteristics to a variety of fruits. Individuals with latex allergies have experienced a range of allergic reactions including rashes, asthma, and anaphylaxis with the ingestion of certain foods. Offending foods commonly include bananas, chestnuts, walnuts, avocados, kiwi, and papaya. Food that has been handled by latex gloves may also cause a reaction in a latex-sensitive student.

Latex reactions include watery eyes, wheezing, rash, hives, swelling, and in severe cases, life threatening anaphylactic shock. Allergic responses can occur when latex-containing items:

- Touch the skin

- Touch mucous membranes, including the mouth, urethra, rectum, or genitals
- Enter the bloodstream
- Are inhaled (often carried by the powder from latex gloves or balloons)
- Come into contact with internal organs during surgery Recommendations for individuals with latex allergies:
- Use non-latex products which are usually made of vinyl, silicone, or plastic (these alternative products are recommended not only for those with a history of latex allergy, but also for individuals who are at risk for developing this allergy, such as health care workers and persons with spina bifida or urologic problems)
- Do not eat the offending foods
- Do not eat items that are made with these foods
- Avoid these foods even if they have been eaten without problems in the past (repeated exposures may cause increased sensitivity to the foods)

It is important to remember that packages labeled "hypoallergenic" are not necessarily latex free.

Students with known sensitivity to latex should have a plan with specific guidelines for that student. School personnel who use latex products should be aware of the possibility of allergic reactions. Communication with students and families about this allergy and documentation of the allergy are recommended. Allergic individuals should discuss with their primary health care provider the possible use of Medic alert tags, injectable epinephrine kits, and prophylactic medication.

The next two pages contain lists of items in the community and hospital that often contain latex, along with a list of latex-safe alternatives. The list is compiled by the Spina Bifida Association of America and updated most recently in 2015.

Sources:

American Academy of Allergy Asthma & Immunology. (2015). *Latex allergy*. Available online at: https://www.aaaai.org/

American College of Allergy, Asthma & Immunology. (2014). *Latex allergy*. http://acaai.org/allergies/types/skin-allergies/latex-allergy

American Latex Allergy Association. (2011). *School safety guidelines for latex-allergic students* (2nd ed.). Singer, WI: American Latex Allergy Association.

Asthma and Allergy Foundation of America. (2015). *Latex allergy*. https://aafa.org/allergies/types-of-allergies/latex-allergy/

Spina Bifida Association. (2015). Latex in the home and community.

https://www.spinabifidaassociation.org/wp-content/uploads/latex-in-the-home-and-community-eng.pdf

SPINA BIFIDA ASSOCIATION

LATEX in the Hospital Environment

Updated Fall 2015

This list provides a guide to some of the most common objects containing latex and offers some alternatives. It is not meant to be a comprehensive listing. ***It is required by law that manufacturers must label any medical items that contain natural rubber latex.*** *ALWAYS CHECK THE PRODUCTS PACKAGING. If in doubt regarding the safety of an item, call the manufacturer.*

Frequently contains LATEX	LATEX-Safe Alternatives
Anesthesia: circuits, bags, oxygen masks	Neoprene (Anesthesia Associates, Ohmeda adult), some Vital Signs
Bandaids	Active Strip (3M), CURAD Neon, Readi-Bandages, NHP, Coverlet, some Airstrip, Advanced Healing
Blood pressure cuff and tubing (J&J)	Cleen Cuff (Vital Signs), nylon, some Trimline
Bulb syringe	Some Davol, Medline, RÜSCH, Premium, Baxter
Casts: Delta-Lite Podiatry, Orthoflex (J&J)	Scotchcast soft, Delta-Lites, recent Conformable Caraglas Ultra (J&J), liners (Gore)
Catheters: condom	Clear Advantage, ProSys NL, selected Coloplast, Rochester, PolyTech (Hollister)
Catheters: indwelling & systems, UDS	Some Am BioMed, Argyle, Bard, Cook, Dale, Kendall, Lifetech, Mentor/ Coloplast, Rochester, RÜSCH, Vitaid, Adapters & plug (Addto)
Catheters: cardiac, vascular, pulmonary	Some World Medical, Am BioMed
Catheters: straight, coude, foley	Selected RobNel (Sherwood), Coloplast, Bard, RUSCH, Hollister, AstraTech, or Rochester catheters Be sure to check labeling on the box. Individual catheter packages are not always labeled.
Catheters: feeding	Accumark feeding catheter (Sims Portex)
Dressings: Dyna-flex, butterfly closures (J&J), Tensoplast (formerly Elastoplast), Action Wrap, Lyofoam (Acme), Spandage (Medi-tech), Telfa	Duoderm, Reston foam (3M), Opsite, Venigard, Comfeel, Sorbaview, Telfa (some) Xeroform, PinCare, Bioclusive, Montgomery strap (J&J), Webril, Metalline, Selopor, Opraflex, Centurion brief, some Airstrips, Rainbow Net (Surgilast), VAC, Warm-up
NOTE: latex in package only: Steri-strip wound closure system, Tegasorb, Active Strips (3M), Nu-Derm (J&J), CURAD	
Ear Plugs	Grainger (5F767)
Elastic wrap: ACE, Esmarch, Zimmer Dyna-flex, Dyna-flex, Elastikon (J&J), Coban (3M)	E-Cotton, CEB elastic (coNco), Champ (Carolon), Adban Adhesive, X-Mark (Avcor), Co-Flex (Tetra), PowerFlex (Andover), Comprilan (Jobst), Esmark (DeRoyal, NHP), 3M™ Coban™ LF Latex Free Self-Adherent Wrap, "CoFlex-AFD" and "Co-Flex NL" by Andover Healthcare
Electrode bulbs, pads, grounding	Some Baxter, Dantec EMG, Conmed, ValleyLab, Vermont Med, Staodyn, Neotrode
Endotracheal tubes, airways	Selected Berman, Mallinckrodt, Polamedco, Portex, RÜSCH, Sheridan, Shiley
Enemas	BabyLax, Enemeez, Bowel Management Tube (MIC), Pharmaseal set, all Fleet Ready-to-Use, cone irrigation set (Convatec), silicone retention cuff tip (Lafayette), Coloplast Cone Tip enema set
G-tubes, buttons	Silicone (Bard, Flexiflo, MIC, RÜSCH, Stomate)
Gloves: sterile, clean, surgical, orthodontic	Allergard (J&J), dermaprene (Ansell), N-DEX (Best), Safeskin Nitrile, Neolon, SensiCare, Tru-touch (Maxxim), Nitrex, Tactyl 1,2 (SmartPractice), Duraprene, (Allegiance Healthcare), Elastyren (Hermal, Center Labs), Boston Medical, Masel, Neotech, Biogel Skin Sense (Regent Medical)
Incentive deep breathing exerciser	Voldyne 5000 (Sherwood David & Geck), Triflo II
IV access: injection ports, Y-sites, bags, pumps, buretrol ports, PRN adapters, needleless systems	Polymer injection caps, burettes and Safsite (Braun), Abbot Systems, Walrus, Gemini (IMED), selected Baxter (InterLink), Statlock, Ready Med, ConMed, Clave, Alaris, Hudson, selected Sims, IV boards (Avcor), Terumo Pumps: Mach II, ADS 100, Clic-Open (vial top remover–Sepha Pharm)

SPINA BIFIDA ASSOCIATION

LATEX in the Hospital Environment

(continued)

Frequently contains LATEX	LATEX-Safe Alternatives
OR/Infection Control masks, hats, shoe covers	Some by Kimberly Clark, TECNOL, OR and sterile packs (CML, DeRoyal) twill ties
Ostomy supplies	Check with individual companies regarding latex content of products
Medication/Immunization vial stoppers	Some AmRegent, Astra, Bedford Labs, Fujisawa, Gensia, Glaxo, Lilly, Roche. Check the CDC website for up to date information at /www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/B/latex-table.pdf
Miscellaneous items	Soft-Grip fabric clamp covers (Scanlan), Precision Dynamics ID bracelets
Penrose drains	Jackson-Pratt, Zimmer Hemovac
Pulse oximeters, thermometer probes	Nonin oximeters, selected Nellcor sensors, Diatec probe covers
Reflex hammers	Cover with plastic bag, Pedipals
Respirators	Advantage (MSA), HEPA-Tech (Uvex), PFR 95 (Tecnol), 3M 1860
Resuscitators, manual	Certain Ambu, Armstrong, Laerdal, Puriton Bennett, Vital Blue, Respironics, RÜSCH
Skin Adhesives	Mastisol (Ferndale)
Spacer (for metered dose inhalers)	ACE spacer (Center Labs), OptiHaler (HealthScan)
Stethoscope tubing	PVC (some Littman) cover with ScopeCoat or latex-free stockinette (Albahealth)
Suction tubing	PVC (Davol, Laerdal, Mallinckrodt, Superior, Yankauer) Medline, Ballard
Syringes, disposable	Terumo Medical, Abbott PCA Abbojject, Norm-Ject (Air-Tite), EpiPen, selected BD syringes, AdvantaJet (Activa)
Tapes: pink, Waterproof (3M), Zonas, Moleskin cloth	Dermicel (J&J), Durapore, Microfoam, Micropore, Transpore (3M) Cath-Strip Molepad, Hytape Pink, STATtape
Waterproof (J&J), adhesive felt (Acme)	(Genetic Labs), Ice Tape (P.O.Pak), All-Felt (Universal Foot Care), Hypafix
Tonopen disposable covers (glaucoma tester)	None
Tourniquets	Children's Medical, Grafco, VelcroPedic, X-Tourn straps (Avcor), Free-Band (Kent)
Theraband (also strip, tube), other OT supplies	REP Bands and Cords (OPTP), Exercise putty (Rolyan), new Thera-Band Exercisers
Tubing, sheeting	Plastic tubing–Tygon LR-40 (Norton), elastic thread, sheets (JPS Elastomerics)
Vascular/Compression stockings	Compriform Custom (Jobst), Latex Free TEDs, some varieties of Sigvaris

Available Online: **https://www.spinabifidaassociation.org**

SPINA BIFIDA ASSOCIATION

LATEX in the Home & Community

Updated Fall 2015

This list provides a guide to some of the most common objects containing latex and offers some alternatives. It is not meant to be a comprehensive listing. ***Manufacturers are not required to label home and community products which contain natural rubber.*** *ALWAYS CHECK THE PRODUCTS PACKAGING. If in doubt regarding the safety of an item, call the manufacturer.*

Frequently contains LATEX	LATEX-Safe Alternatives
School/Office/Art supplies: paints, glue, erasers, fabric paints, grips for writing utensils, duct tape	Elmers (School Glue, Glue-All, GluColors, Carpenters Wood Glue, Sno-Drift paste) FaberCastel erasers, Crayola (except stamps, erasers), Liquitex paints, DickBlick tempera, acrylic paints and soap erasers, Play-Doh, Pro-Craft, Clic Eraser, Pentel erasers, pens, and pencils, 3M Post-it Notes, Staedtler Mars Plastic Eraser, masking tape, STATtape, Dixon/ Ticonderoga Company (Erasers, Wooden Pencils and Art Supplies)
Balloons	Mylar balloons, Mister Balloon, plastic ballons
Balls: Koosh balls, tennis balls, bowling balls, ball pits	PVC (Hedstrom Sports Ball), Nerf Foam Balls, Gertie Balls, Googlie Imperial Toys, AMF Bowling balls
Carpet backing, gym floor, gym mats	Broadloom carpets contain no NRL. For other products, provide barrier cloth or mat.
Chewing gum	Bubblicious, Trident (Warner-Lambert), Wrigley gums (check new products), Bazooka gum, Bubble Yum, Ice Breakers gum
Clothes: liquid appliques on tee-shirts, elastic on socks, underwear, sneakers, sandals	Cloth-covered elastic, neoprene (Decent Exposures, NOLATEX Industries), Buster Brown elastic-free socks (Vermont Country Store)
Condoms, contraceptive sponges, diaphragm	Polyurethane (Avanti), female condom (Reality), Wideseal Silicone Diaphragms (Milex), Trojan Supra Condom, FemCaps
Costumes: masks, face paint, nail polish, etc.	Check all products
CPR manikins and medical training aids	Most Laerdal products
Crutches: tips, axillary pads, hand grips	Cover with cloth or tape
Dental dams, cups, bands, root canal material, orthodontic rubber bands	PURO/M27 intraoral elastics (Midwest Orthodontic), wire springs, sealant (Delton) dams (Meer Dental, Hygenic Corp), John O Butler, Earloop masks (Richmond)
Diapers, incontinence pads, rubber pants	Huggies, First Quality, Gold Seal, Tranquility, Always, Attends, Drypers Diapers (not training pants), Confidence (Paper-Pak), Pampers, Luvs, Seventh Generation Diapers
Feeding nipples	Silicone, vinyl (selected Gerber, Evenflo, MAM, Ross, Mead Johnson)
Food handled with latex gloves	Synthetic gloves for food handling
Handles on racquets, tools, bicycles	Vinyl, leather handles or cover with cloth or tape
Kitchen cleaning gloves	PVC MYPLEX (Magla), cotton liners (Allerderm)
Mattress / pressure relief	Check each one for latex content
Miscellaneous items	Some medical stickers by MediBadge, UAL, Cushie Tushie Potty Seat, Bumbo Seat, Water Pik shower head and hose
Newsprint, ads, coupons, lottery scratch tickets	None
Pacifiers	Soothies (Children's Med Ventures), selected Binky, Gerber, Infa, Kip, MAM
Paints, sealants, stains, etc.	There is NO NATURAL RUBBER in latex paint, though it may be present in some waterproof paints and sealants
Playpits, playground surfaces	Natural rubber latex may be a component of surfaces, Boundless Playgrounds
Rubber bands, bungee cords	Plasti bands
Toothbrushes / infant massager	Soft bristle brush or cloth, Gerber/NUK, all Oral B products
Toys: Stretch Armstrong, old Barbies	Jurassic Park figures (Kenner), 1993 Barbie, Disney dolls (Mattel), many toys by Fisher Price, Little Tikes, Playschool, Discovery, Trolls (Norfin), Silly-putty

SPINA BIFIDA ASSOCIATION

LATEX in the Home & Community

(continued)

Frequently contains LATEX	LATEX-Safe Alternatives
Water toys and equipment: beach thongs, masks, bathing suits, caps, scuba gear, goggles	PVC, plastic, nylon, Suits Me Swimwear
Wheelchair cushions	Jay, ROHO cushions, Sof Care bed/chair cushions (Gaymar)
Wheelchair tires	Recommend using leather gloves
Zippered plastic storage bags	Waxed paper, plain plastic bags, Ziploc bags, Glad Press N' Seal

Associated Allergies
Foods include: banana, avocado, chestnut, kiwi, pear. Plants include: Poinsettia and milk weed pods.

About These Lists
These lists are offered by the Latex Committee of the Nursing and Healthcare Professionals Council of the Spina Bifida Association as a guideline to individuals, families, and professionals. It is updated annually.

The information contained in these lists is constantly changing as manufacturers improve their products and as we learn more about latex allergy.

PLEASE NOTE: The latex content of products may vary between companies and product series. Companies that offer "alternatives" may ALSO make many LATEX products. We recommend that you check with suppliers before exposing individuals with latex allergies to the product.

REMEMBER: Always check the label—even if the product is on this list. If a product has recently replaced latex, many institutions will continue to use the old stock before they replace it with the new.

For More Information
For the most current version of this list, visit the SBA Web site at www.spinabifidaassociation.org.

Online Resources
Spina Bifida Association
www.spinabifidaassociation.org

American Latex Allergy Association/ALERT
www.latexallergyresources.org
Type I Versus Type IV Allergic Reactions: How do they Differ?
www.latexallergyresources.org/Newsletter/newsletterArticle.cfm?NewsletterID=16

Centers for Disease Control and Prevention—latex in vaccine packaging
www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/B/latex-table.pdf

Decent Exposures
(latex free undergarments)
1-800-524-4949
www.decentexposures.com

OSHA
www.osha.gov/SLTC/latexallergy

American College of Allergy, Asthma & Immunology
www.acaai.org

Center for Disease Control Latex in Vaccine Packaging
www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/B/latex-table.pdf

Available Online: **https://www.spinabifidaassociation.org/**

Service Animals in Schools

Overview

The Americans with Disabilities Act (ADA) defines a *service animal* as any dog or miniature horse individually trained to do work or perform tasks for the benefit of an individual with a disability. Service animals are working animals who have been trained to provide service directly related to a person's disability. Animals whose function is to provide comfort or emotional support do not qualify as service animals under ADA.

Examples of tasks that service animals can perform include:

- assisting people who are blind or have low vision with navigation and other tasksalerting people who are deaf or hard of hearing
- pulling a wheelchair
- retrieving or carrying items
- opening doors
- alerting and assisting a person who is having a seizure
- sensing and alerting a person with diabetes to hypoglycemia or hyperglycemia
- alerting a person to the presence of an allergen
- providing physical support and assistance with balance and stability
- calming a person with Post Traumatic Stress Disorder during an anxiety attack
- reminding a person with mental illness to take prescribed medications

A *trained service dog* can be called a guide dog, hearing dog, assistance dog, seizure alert dog, diabetic alert dog, mobility dog, psychiatric service dog, or autism service dog. A trained service dog is NOT called a skilled companion dog, therapy dog, social dog, facility dog, agility dog, police dog, helping dog, support dog, or search and rescue dog. Service animals must be healthy (with appropriate immunizations), housebroken, and trained.

Legal Guidelines

The guidelines for service animals in schools in Virginia fall under these regulations:

- *Code of Virginia*, § 51.5-44
- *Americans with Disabilities Act* (ADA), as amended implementing regulations at 28 CFR Parts 35 and 36
- *The Rehabilitation Act of 1973*, as amended
- *Individuals with Disabilities Education Act* (IDEA), implementing regulations at 34 CFR Part 300

- *Virginians with Disabilities Act*

Service animals must be allowed to accompany students and staff with disabilities in all areas of the school where the public is normally allowed to go. The animal must be under control of its handler. This usually means on a leash or harness unless the animal needs to be able to move about more freely to accomplish its work and then it needs to be under voice control of the handler. In Virginia, a service dog for students with visual impairments must be identified by a harness, for students with hearing impairments by a blaze orange leash, and for students with mobility impairments by a harness, backpack, or vest identifying it as a trained service dog. Service animals are not pets so a "no pets" policy cannot be applied to them.

School divisions are not responsible for the care (including feeding and elimination) or supervision of a service animal. Often, the student is the handler for the service animal. When this is not possible, arrangements are worked out between the family and school division.

Schools may request that a service animal be removed if it is out of control and the handler does not take effective action to control it. Under ADA, a school division may not require proof of service animal "certification" or "licensing."

Service animals have usually been accepted when they were working with a student with observable physical disabilities. As the use and number of service animals increases with students with less observable disabilities, concerns have arisen. Most commonly, they relate to other students and staff who have allergies or identified fears of dogs. Virginia recognizes that service animals must be qualified and carefully weighed against the rights of other students who are equally entitled to receive educational benefits at the school. However, ADA requirements of 2010 state that "allergies and fear of dogs are not valid reasons for denying access or refusing service to people using service animals. When a person who is allergic to dog dander and a person who uses a service animal must spend time in the same room or classroom, they both should be accommodated by assigning them, if possible, to different locations within the room or different rooms in the facility."

Types of Service Dogs

Most people are aware of service dogs which provide services to people with visual, hearing, or mobility impairments. In recent years, other dogs have been specially trained to work with other health conditions.

- Diabetic Alert Dogs (DADs)--these dogs have been shown to be able to detect changes in blood sugar and alert their owners to both hypoglycemia and hyperglycemia. Some

studies have found that they can help decrease the number of hypoglycemic episodes and improve hemoglobin A1C levels.

- Seizure Alert Dogs (SADs) or Seizure Response Dogs (SRDs)--although there is less scientific literature about these dogs, it is speculated that SADs can detect an odor or other autonomic characteristic (such as increased heart rate) and warn their owner of an impending seizure so that the person can get to a safe location, take extra anti-seizure medication, or use a Vagal Nerve Stimulator to thwart a seizure. If the individual experiences a seizure, the dog can respond to keep them safe or get assistance.
- Autism Service Dogs--to meet ADA requirements, these dogs must not be used for just emotional support. Some dogs have been used to prevent elopement (such as running into traffic) or to alert a caregiver to self-injurious behavior. This safety support could facilitate independent functioning of the child with autism. However, since ADA states that service dogs must be controlled by their handler, and students with autism do not assume responsibility for their dog, there can be differing views about the use of autism service dogs.

Individualized Healthcare Plan (IHP)

Each student's individualized healthcare plan (IHP) must be tailored to the individual's needs. Any student requiring a service animal should have an IHP that considers the following:

- Reason for the service animal
- Type of training the animal has had as well as medical/immunization records
- Need for notification of parents of other students in the class
- Plan for service animal's control and care at school including:
    - Handling
    - Hydration
    - rest place for the service animal
    - elimination
- Emergency evacuation plan
- Fire drill plan/participation
- Transportation
- Alternate plans if the service animal or its primary handler (if not the student) is not able to accompany the student to school
- Training for staff or aides who may handle the service animal
- Educational program to educate students and staff on how to interact appropriately with the service animal.

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Hill, D., King, S., & Mrachko, A. (2013). Students with autism, service dogs, and public schools: A review of state laws. Journal of Disability Policy Studies doi:10.177/1044207313477204. https://journals.sagepub.com/doi/10.1177/1044207313477204

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Virginia Department of Education. (2011). *Guidelines for school division policy and procedures regarding service animals in Virginia's public schools*.

Trauma-Informed Care

Overview

Students are frequently exposed to violence in their homes and communities. There is growing scientific evidence that this exposure can have a permanent negative effect on the chemical and physical structures of the brain. Exposure to violence can result in the experience of trauma.

Prolonged activation of the stress response systems can cause cognitive impairments such as trouble with attention, concentration, and memory. Stress on other body systems (endocrine, cardiovascular, immune-response) can increase the risk for stress-related disease in adulthood.

An Attorney General's task force has reported that 46 million children, or two out of every three children in the United States, are exposed to an act of violence, crime, abuse, or psychological trauma in any given year. Potentially traumatic events include being the victim of, or witnessing family violence, community violence (such as gang violence or shootings), natural disasters, child abuse or neglect, sexual assault, or bullying. Girls are more likely to experience sexual assault, dating violence, and child abuse while boys are more likely to witness physical harm and scenes of war, fire, and natural disasters. Events that cause great stress to the maturing brain are called *adverse childhood experiences* (ACE) and include the death of a parent, divorce, abuse or neglect, witnessing domestic violence, incarceration of a family member, and living with someone who has a mental illness or substance abuse problem. Some researchers also include chronic economic hardship, social exclusion by peers, and being treated unfairly due to race or gender orientation. Children who have received repeated "doses" of trauma or ACEs have been found to be at increased risk for disease (cardiovascular, lung, and liver), depression, substance abuse, obesity, violence, and risky sexual behaviors.

Caring adults can act as a buffer against the harmful effects of trauma and chronic stress. Every child is unique and responds differently to trauma. Younger children may cling to caregivers, cry, or regress in behavior while adolescents may engage in risky behavior, substance use, or have suicidal thoughts. Recognizing signs of exposure to violence can help in identifying which students may need support and assistance in coping with chronic stress or exposure to violence. Bowen and Mahnke (2015) published this list of behaviors to monitor:

- anxiousness and irritability
- trouble concentrating and/or sleeping
- being easily startled
- hyper vigilance or watchfulness
- withdrawal from social interactions
- dissociation (detachment, forgetfulness)

- challenging behaviors such as picking fights, disobeying, aggressive outbursts
- avoidance of places where trauma may have occurred
- physical signs of abuse or of self-injury
- feelings of powerlessness
- traumatic play (reenacting play with toys or playmates)
- trouble developing or maintaining relationships with peers
- regression in development
- substance use
- risky sexual behavior

Settings and Staff

Although most cases of exposure to violence do not occur on school grounds, students can certainly exhibit manifestations of such exposure at school. Any adult at school can assist in helping children cope with the stress they experience. Additionally, school staff are mandated reporters--obligated by law to report evidence of child abuse and neglect to child protective services (CPS). The **Virginia Tiered Systems of Support** aligns academics, behavior, and social-emotional wellness into a single decision-making framework to establish the supports needed for schools to be effective learning environments for all students.

When violence does occur on school grounds, the National Association of School Nurses notes that school nurses have knowledge and skills that can be used to address violent behaviors by their ability to coordinate emergency response until rescue teams arrive, provide nursing care for injured students, apply crisis intervention strategies to help resolve conflicts, identify and refer students who need counseling, and participate on crisis intervention teams.

Care for the Student

Even when students are exposed to violence, many show resilience and are not traumatized or permanently harmed. A student can have protective factors that reduce the effect of the stressful event on the student's life. Protective factors can be internal (temperament, conflict resolution skills) or external (strong relationships, mentors, healthy caregivers, stable living environments, safe places to play, positive school climate). See the Guidelines that follow for ways that school nurses and other educational staff can help to develop resilient students and support students who are exposed to traumatic events.

Students from low socioeconomic backgrounds are particularly vulnerable to family and community violence. Their families are also more likely to be stressed themselves and have limited resources to offer their children. Many of these students have Medicaid, which can be an important source of reimbursement for physical and behavioral health services for those who

have experienced violence and trauma. Students covered by Medicaid are entitled to a special benefit called Early and Periodic Screening, Diagnosis and Treatment (EPSDT), which covers some mental health services not otherwise covered by Medicaid. Both screenings and treatment are covered by this benefit, although it can be challenging for families to navigate the system without assistance.

Students exposed to violence can have lasting physical, mental, and emotional harm. They may develop difficulties with attachment, anxiety, and aggressive behaviors, which impair their capacity for partnering and parenting later in life. The Futures Without Violence organization has proposed 16 recommendations to help *all* students develop resilience and cope with the effects of exposure to violence and trauma. Specific recommendations for supporting students exposed to Intimate Partner Violence (IPV) follow. Finally, policy recommendations to ensure students thrive in supportive communities will be covered. Research demonstrating that caring adults can help students become more resilient provide the basis for these recommendations.

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Recommendations to Help Students Develop Resilience

Adapted from: *Everyday Magic: 16 Ways Adults Can Support Children Exposed to Violence and Trauma* (2015).

1. **Take care of yourself**. Dealing with challenging behaviors can be difficult and listening to a student's story can be stressful. It can trigger past experiences with trauma and interfere with supporting children. Taking care of oneself can help a person to become a more effective caregiver.
2. **Reach out, connect, and support**. Make connections with the students you see each day. Greet them by name and create a welcoming environment that will help them feel valued and increase their sense of belonging to a community.
3. **Be a good listener**. Practice respectful active listening to show children they are heard and valued. Establishing an emotional, non-judgmental connection can help to build trust while listening is a tool that can help them express their thoughts and make sense of their experience. However, do not force a student to discuss an experience that has been traumatic because doing so can re-traumatize. Let the student take the lead and set the tone. Using reflection and helping a student identify their emotions through words can promote healing. Always keep in mind mandatory reporting laws.
4. **Answer a child's questions honestly but age appropriately**. Use basic understanding language for elementary-age children, acknowledging that sometimes bad things happen that we can't explain. More direct language with discussion and analysis can be appropriate for adolescents. If the adolescent is angry, try to remain calm and help to discover the basis for his/her anger.
5. **Respect a child's cultural background**. A strong cultural identity can be a protective factor and should be supported. Connect students with supportive cultural resources in the community. If language barriers exist, use reassuring body language and basic conversation that show interest and care.
6. **Don't make promises you can't keep**. Students may look to adults for safety after traumatizing events. However, you cannot promise safety if that is not possible, especially for children living in communities where violence is common. You can say "I will do everything in my power to keep you safe" or "I have some good ideas about what we can do to help you feel better." You can brainstorm what students can do if feeling unsafe or overwhelmed and can discuss safe places they can go at home or ways to stay safe in their community. Praise them for being brave in sharing fear-provoking feelings. Help them to identify other adults that might be able to support them.
7. **Reduce stress and build coping skills**. Supportive adults who help create safe environments can help students decrease chronic stress and overcome adversity. They

can help students identify soothing activities (such as listening to music, talking with a friend, playing with a pet, taking a walk or writing in a journal) which have helped them feel better in the past. They can help them identify unhealthy coping strategies (such as getting angry, lashing out at others, drinking, or smoking) and help them replace those strategies with more effective ones.

8. **Connect children to what they love**. Adults can help children identify their strengths and natural talents and encourage them to flourish, giving them positive feelings to feel good about. By actively listening to students, adults can discover what activities students enjoy and encourage them to seek out those activities when they are stressed, and to develop mastery and leadership skills in those areas. Encouraging extracurricular activities can also help to decrease social isolation and increase relationships with peers and other adults. Encouraging volunteering and using student strengths to help others can assist in developing a sense of purpose and self value.
9. **Help children manage their emotions**. Students who have been traumatized may exhibit challenging behaviors. Helping students to see the connection between their emotions and their behaviors can help them understand their emotional reactions and begin to develop better coping behaviors. For example, using supportive language such as, "If that happened to me, I might feel the same way too. It is okay to be sad, but it is not okay to [insert unsafe behavior]."
10. **Support peer relationships for children exposed to trauma**. Students who have been exposed to trauma may react with impulsive, regressive, or withdrawn behaviors. Helping them identify supportive friends that make them feel happy and confident can increase their coping skills and inspire them to mimic the behaviors of their supportive friends.
11. **Be a role model**. Watching how adults handle stress and how they calmly deal with stressors can be a model for a child learning to cope with stress. Showing respect and compassion for others while being optimistic and resourceful can set a powerful example for students. Adults can help students identify signs of unhealthy relationships and unhealthy ways of dealing with stress (such as yelling, disrespectful language, name calling, hitting, or kicking).
12. **Be a mentor**. Mentoring is one proven way to help develop resiliency. Mentors who can provide consistent, caring support over time help children develop a sense of worth and become important role models for future behavior.
13. **Identify a child's "anchors."** Anchors are members of the student's support network and may be parents, teachers, coaches, grandparents, siblings, faith leaders, school staff, neighbors and friends. Discovering who provides support or who the student looks up to is part of helping to cultivate this network of supportive persons in the student's life. By working together, a more resilient environment can be created. Also, some of the student's support network may have also been traumatized (e.g. the parent

in an abusive situation) and supporting that person can better prepare them to help the traumatized student.

14. **Create calm, stable, and predictable environments**. Students exposed to trauma may be extra vigilant or in a constant state of worry and sensory overload, always on alert for possible threats. This heightened state of alertness can affect their ability to concentrate and finish their schoolwork. Providing a calm environment and structure where students can predict what is going to happen next can help lessen their sense of uneasiness. Promoting an atmosphere of no bullying or teasing also removes that potential stressor.
15. **If a child uses challenging or difficult behavior, do not resort to shaming or isolating punishments**. When students are exposed to trauma, they may act aggressively or use other challenging behaviors to control their environment (and their feelings). While misbehavior cannot be tolerated, there is a need to recognize that the behaviors may be a reaction to trauma and that the student needs to feel safe and secure. Setting up clear, firm limits and developing logical (not punitive) consequences may help the student to develop self control and lessen negative behaviors.
16. **Be proactive and search out child-supporting resources in your community.** Each community has trained mental health professionals, school social workers, faith-based organizations, and child advocacy groups that can assist in supporting students who have been affected by trauma. Help students and their families connect to these resources as appropriate. If there are not adequate resources, work together with others in the community to develop this type of care.

School Nurse Interventions to Prevent Violence

Adapted from the National Association of School Nurses Position Statement *School Violence, Role of the School Nurse in Prevention* (2013)

1. **Facilitate student connectedness to the school community.**

2. **Engage parents in school activities that promote connections with their children and foster communication, problem-solving, limit setting, and monitoring of children.**

3. **Support activities that help establish a climate that promotes respect for others.**

4. **Support policies of zero tolerance for weapons on school property.**

5. **Advocate for adult monitoring of hallways between classes, during lunch, on the playground, and at the beginning and end of the school day.**

6. **Serve as positive role models and help develop mentoring programs for at risk youth.**

7. **Educate students and their families about gun safety.**

8. **Assist in the creation of a safe school environment that promotes trust and caring.**

9. **Engage in classroom discussions that facilitate respectful communication.**

10. **Facilitate building skills in communication, problem-solving, anger management, coping, and conflict resolution throughout the school**.

Recommendations to Build Resiliency in Students and Parents Exposed to Intimate Partner Violence

Intimate Partner Violence (IPV) has also been known as domestic violence or abuse within families. It is a potent stressor for students whether that student has been a target of the abuse or has observed a family member who is a target of abuse. Caring adults can help students heal and thrive. These recommendations are adapted from *Promising Futures: 16 Trauma- informed, Evidence-based recommendations for Advocates Working with Children Exposed to Intimate Partner Violence* published by Futures Without Violence in 2013.

1. **Recognize that children of all ages, from infancy through adolescence, are vulnerable to the adverse impact of IPV exposure**. Many people think that infants and children exposed to violence cannot remember it and will not be damaged by it, but research has shown that it can affect the neurodevelopment of their brain and how they act in later childhood and beyond.
2. **Establish a respectful and trusting relationship with the child's mother**. Many mothers who are victims of IPV are ashamed and guilty about how their children have been affected. Their protective actions may be misinterpreted as poor parenting and their reluctance to seek help may be due to fear of the abuser retaliating. Letting mothers know that you understand their predicament can help to develop a trusting relationship and can encourage the mother to be more receptive to taking steps to improve the situation. Note: fathers can be the abused in a family relationship, but because mothers are much more likely to be the abused in IPV, this set of guidelines writes the recommendations with that in mind.
3. **Let mothers and children know that it is ok to talk about what has happened if the child would like to engage in this type of discussion**. In families with IPV, mothers avoid discussing the situation with their children, trying to shield their children from trauma. However, many children want to discuss it and it may be a powerful way for the children to heal. Parents may need support in learning how to talk with their children and determining their readiness.
4. **Tell children that violence is not their fault; if children say that the violence is their fault or that they should have stopped it, tell them directly that they are not responsible for violence and that it is not their job to intervene** (or coach their mothers to do so). Children often think egocentrically and blame themselves for violence in the home. Children who blame themselves for the violence have more behavior problems than those who were told it was not their fault.
5. **Foster children's self-esteem by showing and telling them that they are lovable, competent and important**. Developing self esteem and personal skills is tied to resilience in children. Help parents to know how to respond to their children's stress

and provide physical comfort to children (following their children's lead). The parents may never have received hugs or cuddling when they were young.

6. **Help children know what to expect**. Establishing a structured and predictable routine (such as regular meals and bedtime) can help children feel more secure.
7. **Model and encourage good friendship skills**. Students who have good friend networks are more resilient and have higher self esteem. Students exposed to IPV have fewer behavior problems if they feel accepted by their peers.
8. **Use emotion words to help children understand how others might feel during disagreements**.
9. **Recognize that when children are disruptive, they are generally feeling out of control and may not have the ability to use other strategies to express themselves**. Students who grow up in violent homes may be hyper vigilant and have difficulty controlling their emotions and behaviors. Approaching them calmly and respectfully while avoiding shaming and humiliating them with demands helps them learn that they can trust helping adults.
10. **Incorporate the family's culture into interventions, and support mothers and children to explore the values, norms, and cultural meanings that impact their choices and give them strength**. Culture is a central part of a student's identity and helps to shape values and norms. Work with the culture, not against it.
11. **Actively teach and model alternatives to violence**. Help students learn conflict resolution skills and healthy ways of playing. Help them to see disagreements from other perspectives so that they do not think differing viewpoints are examples of hostility.
12. **Involve mothers in conversations with their children about the children's views of the abuse.** Students may both fear and love an abusing parent and need to discuss these conflicting emotions. discussing the student’s perceptions of the acceptability of violence is important because they are more likely to be aggressive if they view violence as a norm.
13. **Discuss child development with mothers**. Mothers in homes with IPV often describe inappropriate expectations of their children and attribute negative motives to difficult developmentally appropriate behaviors.
14. **Help mothers teach their children how to label their emotions**. When mothers help their children recognize and cope with strong emotions, the children gain a sense of mastery over them and learn to manage their behavior.
15. **Address mothers' parenting stress**. When mothers learn effective parenting strategies and are empowered to communicate with their children, their children have fewer behavior problems. Remind parents that they are the most important people in their children's lives.

16. **Work with mothers to help them extend both their own and their child's social support network.** Social supports include friends, family, and community members. Increasing support networks contributes to resilience and helps to develop supportive relationships.

Policy Recommendations to Decrease the Effects of Trauma on Children

A partnership of 14 organizations with leaders in health, education, justice, and child development, developed policy goals to prevent and address childhood exposure to violence and trauma. These are the goals they established for the United States in the *Executive Summary: Safe, Healthy, and Ready to Learn: Policy Recommendations to Ensure Children Thrive in Supportive Communities Free from Violence and Trauma* (Futures Without Violence, 2015).

1. **Invest early in parents and young children.**

2. **Help schools promote positive school climates, be trauma sensitive, and raise achievement.**

3. **Train educators, health care workers, and other child-serving professionals about preventing and responding to youth violence and trauma.**

4. **Prevent violence and trauma; expand violence prevention efforts to reduce children's exposure to violence.**

5. **Improve intra-and inter-governmental coordination and alignment.**

6. **Increase the availability of trauma-informed services for children and families.**

7. **Increase public awareness and knowledge of childhood violence and trauma.**

Measuring Body Temperatures

Overview

Measuring body temperature is one assessment used in evaluating the physical status of a student. Elevated temperature can be one indication of an infectious or inflammatory process in the body. Temperature can be measured at several sites in the body via the oral, rectal, axillary, skin, temporal artery, or tympanic membrane route. Due to privacy issues, rectal temperatures should generally not be measured at school. Although glass thermometers were used for many years, they are no longer considered safe due to the hazards of mercury and should NOT be used in schools.

According to Selekman, there is no agreement as to the most effective thermometer to use in the school setting. Many school nurses are using temporal artery thermometers because the newest ones do not have to touch the student's skin to record temperatures, which saves money on probe covers/disposable supplies. Temporal artery thermometers are recommended as the thermometer of choice for students with autism (and other students who become apprehensive about contact with thermometers) because no physical contact needs to occur when using the newer temporal artery thermometers.

Axillary Temperature Measurement Using Electronic Thermometer

1. Assess need for axillary measurement. For example, young children may not be able to hold the thermometer under their tongues properly for accurate temperature measurement.
2. Wash your hands with soap and water. Put on a pair of disposable gloves (optional).

   Use of an oral probe cover minimizes the need to wear gloves because it can be removed without physical contact.

3. Explain the way temperature will be taken and the importance of maintaining a proper thermometer position until the reading is complete.

   Students can be curious about such measurements and may remove the thermometer to check the results before they are complete.

4. Remove the thermometer pack from the charging unit and grasp the top of the oral probe.
5. Slide the probe into the disposable plastic probe cover.
6. Move clothing away from the shoulder and arm. Raise the student's arm and gently place the probe into the center of the axilla, keeping the tip close to the skin and not

the clothing. Lower the student's arm over the probe and place the arm across the student's chest.
7. Leave the thermometer probe in place until an audible signal occurs and the student's temperature appears on the digital display.
8. Remove the probe from the axilla.
9. Return the probe to the storage position of the thermometer. Return the thermometer to the charger.
10. Remove your gloves, if worn, and dispose of them appropriately. Wash your hands with soap and water.
11. Record the temperature. Notify the school nurse and family if there is a change from the student's usual temperature.

Oral Temperature Measurement Using Chemical Dot Thermometer

Chemical dot thermometers are disposable, single-use thermometers with specific chemical mixtures in each dot that melt and change color to measure temperature in increments of two tenths of a degree. They are easy to read and can also be used for axillary temperatures, but must be kept away from heat. They should be stored in areas where temperatures do not exceed 86°. If unused thermometers are exposed to heat greater than 95°F, then they should be placed in a freezer for one hour and then left at room temperature for 24 hours before using.

1. Wash your hands with soap and water. Put on a clean pair of gloves (optional).
2. Explain the way temperature will be taken and the importance of maintaining a proper position until the reading is complete.
3. *Students may not be familiar with chemical dot thermometers and may remove the thermometer to check the results before they are complete.*
4. Gently place the dotted end of the thermometer under the student's tongue in the left or right posterior pocket (not in the pocket in front of the tongue).
5. *Heat from superficial blood vessels in the sublingual pocket produces the temperature reading.*
6. Have the child keep his/her mouth closed without biting the thermometer.
7. Leave the thermometer probe in place for 3 minutes (for some brands, one minute).
8. Remove the thermometer and wait 10-15 seconds for the color change to stabilize before reading. With most brands, the last blue dot indicates the correct temperature.
9. Dispose of the thermometer in the appropriate receptacle.
10. Wash your hands with soap and water.

Oral Temperature Measurement Using Electronic Thermometer

1. Assess factors which may influence an oral temperature measurement. Recent intake of cold or hot beverages, use of oxygen masks, or open-mouth breathing can affect accuracy of measurement.
2. Wash your hands with soap and water. Put on a pair of disposable gloves (optional).

   Use of an oral probe cover minimizes the need to wear gloves because it can be removed without physical contact.

3. Explain the way temperature will be taken and the importance of maintaining a proper thermometer position until the reading is complete.

   Students can be curious about such measurements and may remove the thermometer to check the results before they are complete.

4. Remove the thermometer pack from the charging unit and grasp the top of the oral probe.
5. Slide the probe into the disposable plastic probe cover.
6. Gently place the thermometer probe under the student's tongue in the left or right posterior pocket (not in the pocket in front of the tongue).

   With electronic thermometers, temperatures in the left or right sublingual pocket are higher than in the area in front of the tongue. Heat from superficial blood vessels in the sublingual pocket produces the temperature reading.

7. Have the child keep their mouth closed without biting the thermometer.

   Holding the thermometer may achieve more accurate readings for some students.

8. Leave the thermometer probe in place until an audible signal occurs and the student's temperature appears on the digital display.
9. Remove the thermometer probe from under the client's tongue. Discard the plastic probe cover into the appropriate receptacle.

Note: Small digital thermometers designed for home use may run on batteries/microprocessor chips instead of a charger and utilize disposable plastic sleeve covers. Care should be taken when removing the sleeves because it is easier to become contaminated with saliva than when using the hard plastic probe covers.

10. Return the probe to the storage position of the thermometer. Return the thermometer to the charger.
11. Remove your gloves, if worn, and dispose of them appropriately. Wash your hands with soap and water.
12. Record the temperature. Notify the school nurse and family if there is a change from the student's usual temperature.

Oral Temperature Measurement Using Glass Thermometers

DO NOT USE. See Steps to Take in the Event of a Mercury Spill at the end of this section.

Skin Temperature Measurement Using Plastic Strip Thermometers

Plastic strip thermometers are disposable thermometers that use a temperature-sensitive patch or tape to measure temperature. Their accuracy has been variable.

1. Wash your hands with soap and water.
2. Explain the way their temperature will be taken.
3. Place the strip on the forehead until a color change occurs, usually in about 15 seconds.
4. Remove the strip and dispose of the appropriate receptacle.
5. Wash your hands with soap and water.
6. Record the temperature Notify the school nurse and family if there is a change from the student's usual temperature.

Temporal Artery Temperature Measurement

One of the newest methods for measuring temperature is the temporal artery thermometer. It uses infrared technology to measure the temperature of the skin surface over the temporal artery, a major artery of the head. It is quick, noninvasive, and easy to use and recommended as a screening method of temperature measurement. (Some studies have questioned whether it is as accurate as some other measures when measuring febrile babies over time).

There are now two different temporal artery thermometers available. The newest requires no contact with the skin and is preferred for students with autism. Always follow the instructions of the particular thermometer that is being used.

Instructions for Non-Contact Temporal Artery Thermometers:

1. Explain the way temperature will be taken. *Students may not be familiar with the temporal artery thermometer and may fear it.*
2. Make sure the thermometer is in the body temperature taking mode if it is also one that can be used to measure ambient temperature or the temperature of liquids.
3. Wipe the perspiration or hair from the student's forehead.
4. Hold the thermometer 1-3 inches from the student (follow specific device instructions for distance). Press and release the "SCAN" button. The temperature will immediately display.
5. Record the temperature. Notify the school nurse and family if there is a change from the student's usual temperature.

Instructions for Temporal Artery Thermometers that touch the forehead:

1. Wash your hands with soap and water.
2. Explain the way their temperature will be taken.

   Students may not be familiar with the temporal artery thermometer and may fear it.

3. Wipe the perspiration or hair from the student's forehead.
4. Remove the protective cap. Be sure the lens is clean.
5. Gently position the probe flat on the center of the forehead, midway between the eyebrow and hairline. Press and hold the SCAN button.
6. Lightly slide the thermometer across the forehead keeping the sensor flat and in contact with the skin until you reach the hairline. Lift the probe from the forehead and touch the neck just behind the ear lobe.

   A beeping can be heard and a red LED light will blink to indicate a temperature measurement is taking place. Accuracy of the reading is increased if both the forehead and neck are scanned, especially if moisture or sweat is present on the forehead.

7. Release the SCAN button and remove the thermometer from the head.
8. Read the temperature on the display. Temperatures obtained by temporal artery thermometers may be 0.8-1.0°F (0.4°C) higher than those obtained by oral thermometers (they correlate closer to rectal temperatures).

   Thermometer will shut off automatically after 30 seconds.

9. Wait at least 30 seconds before re-scanning for a temperature.
10. Replace the protective cap on the thermometer to protect the sensor when not in use.
11. Wash your hands with soap and water.
12. Record the temperature. Notify the school nurse and family if there is a change from the student's usual temperature.

Tympanic Membrane Temperature Measurement

Tympanic membrane thermometers measure temperature by detecting the infrared heat produced by the eardrum and surrounding tissue. The tympanic membrane is used because both the eardrum and hypothalamus (temperature-regulating center) have the same blood circulation. The measurement is quick, noninvasive, and generally well tolerated, but there are conflicting views regarding its absolute accuracy. Generally, the accuracy is dependent on utilizing proper technique and absence of earwax. Many times, the thermometer is not positioned correctly in the ear canal.

1. Wash your hands with soap and water.
2. Explain the way temperature will be taken and the importance of maintaining a proper position until the reading is complete.

   Students may not be familiar with the tympanic thermometer and may fear that it could cause pain.

3. Right-handed persons should measure temperature from the student's right ear and left-handed persons should measure from the student's left ear because the less acute the angle of approach, the better the probe seal.
4. Attach a clean (disposable) probe cover.
5. Perform an ear tug to straighten the ear canal—gently pull the ear **up and back**.

   Pulling up and back straightens the ear canal in children over 3 years of age. In children under 3, pull pinna down and back.

6. While tugging the ear, insert the covered probe tip gently into the ear canal, pointing at the midpoint between the eyebrow and the sideburn on the opposite side of the face. Fit the probe snugly into the canal.

   Temperature is most accurate with maximum exposure of the tympanic membrane. Gentle pressure seals the ear canal from room temperature, which can alter readings greatly.

7. Press the activation button. Digital reading of temperature appears within 2 seconds.

   Some studies suggest taking three measurements and recording the highest reading to obtain the most accurate reading.

8. Carefully remove the thermometer from the ear canal.
9. Press the ejector button and dispose of the probe cover in the appropriate receptacle.

   Pressing the ejector button causes the digital reading to disappear.

10. Wash your hands with soap and water.
11. Record temperature. Notify the school nurse and family if there is a change from the student's usual temperature.

Steps to Take in the Event of a Mercury Spill

Glass mercury thermometers were once standard in schools and medical centers. However, concerns regarding the safety of the mercury within glass thermometers prompted most states to ban mercury thermometers in schools and for the general phase out of the manufacture and calibration of mercury thermometers. Mercury is a neurotoxin and even low levels of mercury exposure can pose harm. Mercury's most dangerous attribute is its ability to vaporize and form a hazardous gas. **Mercury thermometers should never be used in schools.** Most schools no longer have them although some have been found in science labs and back cabinets where their existence had been forgotten. Many people mistakenly believe that skin exposure to mercury is the biggest problem and try to clean up mercury spills with caution to avoid touching mercury in the cleanup.

However, mercury vaporizes easily and inhalation poses the greatest threat to people. If a mercury spill occurs:

1. Evacuate the immediate area and ventilate as well as possible.
2. Contact an environmental consultant at the health department or an environmental services department for cleanup and disposal instructions.
3. Do ***NOT*** attempt to clean up a mercury spill using rags or a vacuum. This will only disperse the mercury and encourage volatilization.
4. Do ***NOT*** use household cleaning products to clean the spill, especially products containing ammonia or chlorine because a toxic gas may be produced.
5. Do ***NOT*** use a broom. The mercury will break into smaller beads and spread further.

6. Do ***NOT*** use a vacuum because this will release mercury into the air.
7. Do ***NOT*** touch spilled mercury droplets. If skin contact occurs, immediately flush the area with water for 15 minutes.
8. Complete an occurrence report as directed by institution procedure.

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Chapter 8: Care of the Urinary System

Overview

Clean Intermittent Catheterization

Indwelling Urinary Catheter

External Urinary Catheter

Urostomy

Continent Urostomy, Vesicostomy, or Appendicovesicostomy

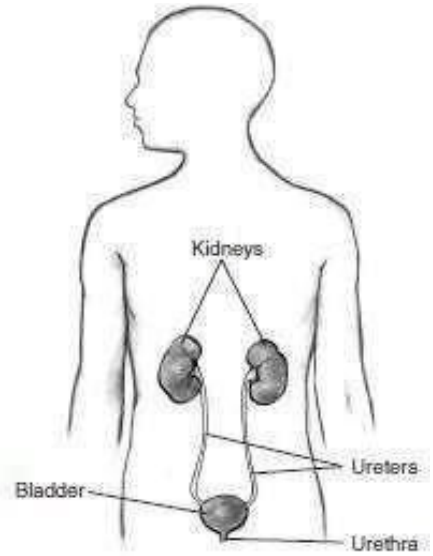
Peritoneal Dialysis

Hemodialysis

Urinary System

Overview

The *urinary system* filters waste material and water from the blood and excretes it from the body as urine.



The *kidneys* are two bean-shaped organs, each about the size of a fist, that are located on either side of the spine, just below the rib cage.

They remove a type of waste called urea from the blood and regulate the amount of water in the body. Renal arteries carry blood to the kidneys, where the waste is removed and renal veins take the cleansed blood away from the kidneys. Every day, the kidneys filter about 120- 150 quarts of blood to produce about 1-2 quarts of urine. As much as 90% of the water that the kidneys remove from the blood is returned to the bloodstream after the waste is filtered out. The kidneys are also involved in regulating blood pressure, regulating the levels of electrolytes such as potassium and phosphate, the c blood cells, and calcium absorption.

From the kidneys, urine travels down two thin tubes called *ureters* to the bladder.

The *bladder* is a hollow muscular organ, which stores urine until it is ready to be excreted from the body. Circular muscles called *sphincters* close tightly around the opening of the bladder and help keep urine from leaking.

During urination, urine passes from the bladder through the *urethra*, a tube leading from the bladder to the external opening of the body. This opening is called the *meatus* and is located at the tip of the penis in boys and between the labia, immediately above the vagina, in girls.

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Clean Intermittent Catheterization

Overview

Clean intermittent catheterization (CIC) is a clean (not sterile) procedure used to empty the bladder. It is generally performed by/for students who cannot urinate spontaneously or who cannot fully empty their bladder when they urinate. Often children with myelomeningocele (spina bifida) or spinal cord injury have *neurogenic bladders*. When urine sits in the bladder for long periods of time, infection can develop. CIC helps to prevent urinary tract infections by emptying the bladder every few hours and prevents wetting from urine overflowing from a full bladder. The catheter is inserted for just long enough to drain the urine and is then removed.

Depending upon the cognitive status of the child, he/she can be taught to perform the CIC procedure for themselves, often starting around the age of six. For most children, intermittent self-catheterization is a clean procedure and sometimes the same catheter can be used for weeks at a time between washings. Self-catheters are straight tubes without the side balloon inflation ports found on indwelling catheters. They are also more rigid than indwelling catheters to make insertion easier.

Settings and Staff

CIC can be done in a regular bathroom, health office, or any other facility **where the student's privacy is ensured**. Toilet facilities will need to be wheelchair accessible and have bars or supports for the student needing such assistance. Some students may need to lie down on a bed or cot to be catheterized.

A school nurse (RN or LPN) or health assistant with competency-based training in CIC and problem management can safely do this procedure. Students should be encouraged to learn this procedure and do it themselves, if able. However, it is important to note that some of these students may still need some supervision. School personnel who have regular contact with the student requiring CIC should receive general training that covers the student's specific needs, potential problems, and implementation of the established emergency plan.

Individualized Healthcare Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student requiring clean intermittent catheterization, the following items should be considered:

- Underlying condition and possible problems associated with the condition or treatment
- Healthcare provider's orders for catheterization and equipment to be used

- Individual baseline status, including urine color, amount, and pattern of continence
- Student’s ability to self-catheterize and how to foster independence in performing the procedure
- Depending upon the technique (clean or sterile), a pair of non-latex gloves should be worn
- Frequency of catheterizations
- Flexible timing of the catheterization to accommodate the classroom schedule, field trips, and other school events
- Position of the student during catheterization
- Whether catheters are reused or disposed after each use
- Cleaning procedure for reusable catheters
- Whether gloves are needed and whether they need to be sterile or clean
- Medications that may affect urine color, amount, and odor
- Student’s need for assistance/monitoring with catheterization, clothing and leg braces
- Access to a change of clothing at school
- Student’s need for additional fluids and types of recommended fluids
- Student's history of urinary tract infections
- Access to an additional adult’s presence when school staff perform catheterization
- Avoidance of latex gloves and latex catheters even if student does not have a latex allergy yet
- Standard precautions

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Procedure for Clean Intermittent Catheterization— Male

Note: Family provides equipment and supplies.

1. Wash your hands with soap and water.
2. Assemble the equipment required for the catheterization included below.
    - Water-soluble lubricant (e.g., K-Y Jelly, Lubrifax, Surgilube)
    - Catheter
    - Wet wipes or cotton balls (non sterile) plus mild soap and water or student-specific cleansing supplies
    - Storage receptacle for the catheter, such as a sealed plastic bag
    - Toilet or container for urine
    - Non-latex gloves, if person other than the student does the procedure
    - *If the student does the procedure unassisted, gloves may not be needed; however, the student should wash his hands with soap and water before and after performing the procedure.*
3. Have another adult present for the procedure, if possible.
4. *Having two adults present protects both the student and the caregiver.*
5. Explain the procedure using explanations the student can understand. Encourage him to do as much of the procedure as he is capable, to achieve maximum self-care skills.
6. Position the student.
7. *The student may be catheterized lying down, standing, or sitting. If able, he may stand at or sit on the toilet. If unable to sit or stand, he may lie on his back. A receptacle to catch the flow of urine from the catheter is required.*
8. Wash your hands with soap and water after assembling the required equipment and put on the non-latex gloves.
9. Lubricate the first 3 inches of the catheter with a water-soluble lubricant and place it on a clean surface.
10. Cleanse the penis by washing the glans with soapy cotton balls or cleansing supplies specified in student's IHP. Hold the penis below the glans. Foreskin may be retracted on uncircumcised males. Beginning at the urethra, use circular motions to wash away from the meatus. Do this three times using a clean cotton ball each time you wash the penis.
11. *Starting at the meatus and washing toward the base of the penis helps remove bacteria from the area.*
12. Holding the penis at a 45-90 degree angle from the abdomen, use the dominant hand to gently insert catheter into the urethral opening.
13. *If resistance is met at the bladder sphincter, use gentle but firm pressure until the sphincter relaxes. Encouraging the child to breathe deeply may help to relax the*

urinary tract. ***Do not force the catheter. If unusual resistance is felt, notify the school nurse and family****. Make sure the other end of the catheter is in a receptacle or over the toilet to catch urine.*

14. Insert the catheter until urine begins to flow. Continue to advance the catheter approximately one inch further and hold in place. When the flow stops, insert the catheter slightly more and then withdraw a little to make sure all urine is drained. Rotate the catheter so that the catheter openings have reached all areas of the bladder.
15. *It may be helpful to have the student bear down a couple of times while the catheter is in place.*
16. After the bladder is emptied, pinch the catheter and withdraw.
17. *This prevents urine still in the catheter from flowing back into the bladder during withdrawal.*
18. If the student is uncircumcised, move the foreskin back over the glans when finished.
19. *Failure to return the foreskin can lead to swelling of the penis and impairment of circulation.*
20. Wipe off any excess lubricant or urine.
21. Assist the student in dressing, if needed.
22. Measure and record the urine volume, if ordered. Dispose of the urine appropriately.
23. If using a one-time use catheter, wrap the catheter around the gloved palm, pull the glove over the catheter when degloving (to contain it) and dispose of it according to the school's infection control procedure.
24. If using a reusable catheter, wash, rinse, dry, and store the catheter in an appropriate container according to the student's IHP.
25. *Examples of storage receptacles include a sealed plastic bag, a urine specimen container, and a clean pencil case. The reusable catheter(s) should be sent home with the student to be cleaned. Dispose of the catheters when they become brittle upon repeated use.*
26. Remove your gloves and wash your hands with soap and water.
27. Document on the log sheet that the procedure was done. Report to the school nurse and family any changes such as cloudy urine, mucus, blood, foul odor, color changes, unusual wetting between catheterizations, which may be signs of an infection.

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Procedure for Clean Intermittent Catheterization— Female

Note: Family provides equipment and supplies.

1. Wash your hands with soap and water..
2. Assemble the equipment required for the catheterization included below.
    - Water-soluble lubricant (e.g., K-Y Jelly, Lubrifax, Surgilube)
    - Catheter
    - Wet wipes or cotton balls (non sterile) plus mild soap and water or student-specific cleansing supplies
    - Storage receptacle for catheter, such as a sealed plastic bag
    - Toilet or container for urine
    - Non-latex gloves, if a person other than student does procedure

    If the student does the procedure unassisted, gloves may not be needed; however, the student should wash her hands with soap and water before and after performing the procedure.

3. Have another adult present for the procedure, if possible.

    Having two adults present protects both the student and the caregiver.

4. Explain the procedure using explanations the student can understand. Encourage her to do as much of the procedure as she is capable, so as to achieve maximum self-care skills.
5. Position the student.

    The student may be catheterized lying down, standing, or sitting. If able, she may stand at or sit on the toilet. If unable to sit or stand, she may lie on her back. A receptacle to catch the flow of urine from the catheter is required.

6. Wash your hands with soap and water after assembling the required equipment and put on non-latex gloves.
7. Lubricate the first 3 inches of the catheter with a water-soluble lubricant and place it on a clean surface.
8. Separate the labia and hold it open with your non-dominant hand. Cleanse, starting at the top of the labia and going down toward the rectum. Use a clean cotton ball each time. Wash three times: once down the middle and once down each side.

*Do **not** cleanse in a circular motion because doing so may move bacteria from the rectal area towards the urethra.*

9. Locate the urinary meatus (opening). Gently insert the catheter until there is urine.

   The female urethra is short and straight. Keep the other end of the catheter over the toilet or the receptacle. If no urine is obtained, the catheter may have slipped into the vagina instead of the urethra.

10. When the urine flow stops, insert the catheter slightly more. If no more urine is obtained, withdraw it slightly and rotate the catheter so that the catheter openings have reached all areas of the bladder.

    It may be helpful to have the student bear down a couple of times while the catheter is in place to ensure that all urine has been drained completely.

11. After the bladder is completely empty, pinch the catheter and withdraw.

    This prevents urine still in the catheter from flowing back into the bladder during withdrawal.

12. Wipe off any excess lubricant or urine.
13. Assist the student in dressing, if needed.
14. Measure and record the urine volume, if ordered. Dispose of the urine.
15. If using a one-time use catheter, wrap the catheter around the gloved palm, pull the glove over the catheter when degloving (to contain it) and dispose of it according to the school's infection control procedure.
16. If using a reusable catheter, wash, rinse, dry, and store the catheter in an appropriate container according to the student's IHP.

    Examples of storage receptacles include a sealed plastic bag, a urine specimen container, and a clean pencil case. The reusable catheter(s) should be sent home with the student to be cleaned. Dispose of the catheters when they become brittle upon repeated use.

17. Remove your gloves and wash your hands with soap and water.
18. Document on the log sheet that the procedure was done. Report to the school nurse and family any changes such as cloudy urine, mucus, blood, foul odor, color changes, unusual wetting between catheterizations, which may be signs of infection.

Sources:

American Academy of Pediatrics. (2015). *Clean Intermittent Catheterizations*.

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 716-719.

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 59-61. https://portal.ct.gov/-/media/SDE/Publications/clinical_guidelines/clinical_guidelines.pdf

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National Library of Medicine Medline Plus. (2012). *Self catheterization--female*. http://www.nlm.nih.gov/medlineplus/ency/patientinstructions/000144.htm

Porter, S., Branowicki, P., & Palfrey, J. (2014). *Supporting students with special health care needs: Guidelines and procedures for schools* (3rd ed.). Baltimore: Paul H. Brookes Publishing, 280-289.

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Wisconsin Improving School Health Services Project. (2015). *Clean intermittent catheterization female*.

Possible Problems for Students Using Clean Intermittent Catheterization

- **Cloudy urine, blood in urine, foul odor, color changes, unusual wetting between catheterizations, nausea/vomiting, urgency**

    - These may be signs of a urinary tract infection. Always report to the school nurse and family any changes in the student's usual pattern or tolerance of procedure.

- **Inability to pass catheter**

    - This may be due to increased sphincter tone caused by anxiety or spasm. Encourage the child to relax by breathing slowly and deeply.
    - In boys: Reposition the penis and use gentle but firm pressure until the sphincter relaxes. Sometimes it helps to have boys flex at the hips to decrease the reflex resistance of the bladder sphincter.
    - In girls: Check the catheter placement because the catheter may be in the vagina. If the catheter is in the vagina, leave the catheter in vagina temporarily as a landmark indicating where not to insert, and insert another clean catheter.
    - If still unsuccessful, notify the school nurse, family or health care provider for further instructions.

- **No urine obtained during catheterization**

    - Check the position of the catheter. This may be due to improper placement of the catheter or the bladder may be empty. Check for wetness. Sometimes the patient is using a catheter that is too small. In this case, urine actually dribbles around the catheter when catheterizing and urine also dribbles out of the bladder intermittently.

- **Bleeding from urethra**

    - This may be due to trauma to the urethra or to a urinary tract infection. Contact the school nurse, family and health care provider.

Sources:

American Academy of Pediatrics. (2015). *Clean Intermittent Catheterizations*.

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 716-719.

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Selekman, J. (2013). *School nursing: A comprehensive text*. (2nd ed.). Philadelphia: F.A. Davis, 1042-1044.

Wisconsin Improving School Health Services Project. (2015). *Clean intermittent catheterization female*.

General Information for Students Who Use Clean Intermittent Catheterization

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student needs to use a urinary catheter to drain urine from the bladder.

Students usually use a catheter every 4-6 hours. This procedure should be done in private in the bathroom or school clinic.

This student should be able to fully participate in physical education classes or other school activities unless he or she has another condition that would interfere with full participation. The student may need time for catheterizations before field trips or other activities when access to a bathroom may be limited.

Please contact_____at_____**(**phone number/pager) for additional information or if the student experiences any problems with the catheter.

Source: Adapted from: Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and youth assisted by medical technology in educational settings: Guidelines for care*. (2nd ed.). Baltimore: Paul H. Brookes Publishing.

Indwelling Urinary Catheter

Overview

Indwelling urinary catheters used outside the hospital setting for students are usually used after surgical procedures on the urinary tract. A retention or Foley catheter is introduced through the urethra into the bladder. The retention catheter contains a smaller tube within the larger tube.

This smaller tube is connected to a balloon near the insertion tip. After the catheter is inserted, the balloon is inflated with water to hold the catheter in place in the bladder. The Foley catheter has two openings at the end, one to drain the urine, the other to inflate/deflate the balloon.

Catheters are sized by the diameter of the lumen--the larger the number, the larger the lumen (i.e., 8F, 10F, 12F). The balloons of retention catheters are sized by the volume of fluid used to inflate them and usually have a 5-milliliter capacity.

Settings and Staff

As with all health-related conditions, every effort should be made to protect the student's privacy. Procedures such as emptying the urinary collection bag can be done in regular toilet facilities in the school or the nurse's office or any other facility where the student's privacy is ensured.

Care of an indwelling catheter may be managed by the school nurse, family, teacher aide, or other staff person who has received training in care of the indwelling catheter of the student. General training should cover the student's specific health care needs, potential problems, how to obtain assistance should problems occur, and when to activate the emergency plan.

Individualized Healthcare Plan

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with an indwelling urinary catheter, the following items should be considered:

- Student's underlying condition and possible problems associated with the condition or treatment
- Health Care Provider's order for the catheter and its care
- Type of catheter and volume of retention balloon
- Medications that may affect urine color, amount, and odor
- Student's ability for self-care and fostering independence in performing the procedure
- Individual baseline status, including urine color and amount

- Student's need for additional fluids and type of recommended fluids
- Positioning of the catheter tubing and collection device/bag
- Measures to be taken if catheter is dislodged, leaking, or obstructed
- Instructions for maintaining a closed system
- Access to an additional adult's presence when the school staff perform the catheterization
- Latex allergy precautions
- Standard precautions
- Non-latex gloves should be worn at all times when providing care for the student with an indwelling catheter

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 712-715.

Centers for Disease Control. (2009). *Guideline for prevention of catheter-associated urinary tract infections 2009*. http://www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 64-65. https://portal.ct.gov/-/media/SDE/Publications/clinical_guidelines/clinical_guidelines.pdf

Smith, S., Duell, D. & Martin, B. (2012). *Clinical nursing skills: Basic to advanced skills* (8th ed.). Boston: Pearson, 783-784.

Wilkinson, J.M., Treas, L.S., Barnett, K.L., & Smith, M.H. (2016). *Fundamentals of nursing: Vol. 2: Thinking, doing, and caring.* Philadelphia: F.A.Davis, 532, 544-548.

Procedure for Monitoring an Indwelling Urinary Catheter

1. To empty the drainage bag:
    - Wash your hands with soap and water. and put on a pair of non-latex gloves.
    - Open the outlet valve or clamp on the urinary collection device and allow the contents of the bag to drain into a urinal or other collection device.
    - Do not allow the end of outlet tubing on the collection device/bag to touch the collection device or floor.

    Bacteria on the collection device could be transferred to the urinary collection system, which could result in a urinary tract or kidney infection.

    - Do not lift the collection device/bag or tubing above the level of the student's bladder.

    Urine can flow back into the bladder if the tubing or bag is raised, which could increase risk of infection.

    - Close the clamp of the valve on the urinary collection device/bag.
    - Wipe the end of the outlet tubing with alcohol or other disinfectant if specified in student's IHP and replace the end of the tubing into the slot on the collection bag.
    - Do **not** disconnect the catheter itself from drainage tubing unless ordered by a health care provider.

    Opening the drainage system can allow contaminants to enter, increasing the risk of infection. Catheter-associated urinary tract infections (CAUTI) are a great risk to students with indwelling urinary catheters.

    - Dispose of the urine from the collection device into the toilet.
    - Dispose of your gloves and wash your hands with soap and water..
2. Observe and document on the student's log the color, amount, sediment buildup, and appearance of the urine each time the collection device/bag is emptied.
3. Monitor the amount of urine in the urinary collection device/bag every 2 hours.

Urine output should be at least 1 ml per kg of body weight per hour. A student who weighs 20 kg (44 lbs) should have at least 20 ml of urine per hour. If less than this amount of urine is noted for the student, the school nurse and/or the family should be notified.

4. Encourage fluid intake to prevent sediment buildup and infection, unless contraindicated.
5. Clamp the tubing whenever the collection device/bag must be lifted higher than the student's bladder. Avoid raising it whenever possible to prevent reflux of urine into the bladder.
6. Keep the catheter and collection tubing free from kinks. Loop the tubing so that neither the tubing or the collection bag rests on the floor.
7. Any blood or discharge from the urethra or any change in the student's urine should be immediately reported to the school nurse and/or the family.

Blood, discharge, change in urine could be a sign of trauma to, or infection of, the urinary system.

8. Indwelling catheters are typically maintained only temporarily so as to avoid CAUTIs. Check with the family and student's health care provider if catheter use is maintained.

NOTE: Only qualified persons (i.e., registered or licensed practical nurse) should reinsert or remove an indwelling catheter using sterile technique and only with a physician's orders

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 712-715.

Centers for Disease Control. (2009). *Guideline for prevention of catheter-associated urinary tract infections 2009*. http://www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 64-65. https://portal.ct.gov/-/media/SDE/Publications/clinical_guidelines/clinical_guidelines.pdf

Smith, S., Duell, D. & Martin, B. (2012). *Clinical nursing skills: Basic to advanced skills* (8th ed.). Boston: Pearson, 783-784.

Wilkinson, J.M., Treas, L.S., Barnett, K.L., & Smith, M.H. (2016). *Fundamentals of nursing: Vol. 2: Thinking, doing, and caring.* Philadelphia: F.A.Davis, 532, 544-548.

General Information for Students Who Use Indwelling Urinary Catheters

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student uses an indwelling urinary catheter, or a small tube attached to a collection bag, to drain urine from the bladder. The bag should be drained by the student (or by another person) 3 to 4 times a day. This procedure should be done in private in the bathroom or school clinic. **Two adults should be present whenever the procedure is done at school.** The bag should always be kept below the level of the student's bladder, and the tubing should be kept off of the floor.

The student may need modifications to participate in physical education classes.

The student may need time to empty the bag prior to field trips or other activities when access to a bathroom may be a problem.

Contact_____at _____(phone number/pager) for additional information or if the student experiences any problems with the catheter.

Source: Adapted from Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and youth assisted by medical technology in educational settings: Guidelines for care*. (2nd ed.). Baltimore: Paul H. Brookes Publishing.

External Urinary Catheter

Overview

An external urinary catheter is used to keep dry the clothing of incontinent male students or male students with dribbling or poor control of voiding.

Settings and Staff

The removal and application of a condom-type external urinary collection device is usually **not** done during school hours. Procedures such as emptying the urinary collection bag can be done in regular toilet facilities in the school or the nurse's office or any other facility where the student's privacy is ensured. As with all health related conditions, every effort should be made to protect the student's privacy.

Removal and application of an external urinary catheter may be performed by the school nurse, family member, teacher aide, or other staff person who has general training in external urinary catheters. General training should cover the student's specific health care needs, potential problems, and how to obtain assistance should problems occur. If possible, **two adults should be present whenever the procedure is done at school.**

Individualized Healthcare Plan

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with an external urinary catheter, the following items should be considered:

- Underlying condition and problems associated with the condition or treatment
- Health care provider's order for an external catheter and its care
- Student's ability for self-care and fostering independence in performing the procedure
- Individual baseline status, including urine color and amount
- Type of adhesive used to increase catheter adherence to penis
- Medications that would affect urine color, amount, and odor
- Student's need for additional fluids and type of recommended fluids
- Positioning of the catheter tubing and collection device/bag
- Access to a change of clothing in the educational setting
- Access to an additional adult's presence if school staff have to re-apply or adjust the external catheter
- Latex allergy precautions
- Standard precautions

Sources:

Centers for Disease Control. (2009). *Guideline for prevention of catheter-associated urinary tract infections 2009*. http://www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 62-63. Available online: https://portal.ct.gov/-/media/SDE/Publications/clinical_guidelines/clinical_guidelines.pdf

Smith, S., Duell, D. & Martin, B. (2012). *Clinical nursing skills: Basic to advanced skills* (8th ed.). Boston: Pearson, 767-770.

Wilkinson, J.M., Treas, L.S., Barnett, K.L., & Smith, M.H. (2016). *Fundamentals of nursing: Vol. 2: Thinking, doing, and caring.* Philadelphia: F.A.Davis, 548-550.

Procedure for Application and Removal of External Catheter

Note: Family provides the equipment and supplies.

1. Wash your hands with soap and water.
2. Assemble the equipment required for the removal of the catheter included below.
    - Water-soluble lubricant (e.g., K-Y Jelly, Lubrifax, Surgilube)
    - Skin adhesive or tincture of benzoin and cotton tipped applicators
    - Adhesive remover
    - Condom-type urine collection device
    - One-inch wide elastic adhesive
    - Scissors
    - Paper towels
    - Chux or disposable waterproof protective pad
    - Non-latex gloves
3. Explain the procedure using explanations the student can understand. Encourage him to do as much of the procedure as he is capable, to achieve maximum self-care skills.
4. **Have another adult present for the procedure**.

    Having two adults present protects both the student and the caregiver.

5. Position the student.

    The external catheter may be applied while the student is lying down, standing, or sitting.

6. Wash your hands with soap and water after assembling the equipment.and put on non-latex gloves.
7. Position the chux or waterproof disposable towel under the penis and remove previously applied urinary collection device as follows:
    - Carefully clip the condom and tape near the junction of the penis.
    - Pull on the condom and tape it off gently.
8. Inspect the skin of penis. If it is irritated, **DO NOT** apply the collection device until the area clears.

    Disposable waterproof undergarments (diapers) can be used until the skin clears.

9. If necessary, cleanse the shaft of penis with adhesive remover as specified in student IHP.

Old adhesive must be removed so that new adhesive will adhere well.

10. If necessary, cleanse the shaft of penis and perineal area with soap and water. Dry the area thoroughly.

    Cleansing reduces skin irritation, odor, and possibility of infection. Adhesive remover, if left on the skin, will dry out and irritate the skin of the penis.

11. Make a small hole in the center of the paper towel and place over the shaft of the penis until the towel covers the area below the penis.

    The paper towel must cover pubic hair to protect it from adhesive spray.

12. Roll the condom-type collection device onto glans of penis, leaving 1-2 inch space between the end of the tubing and the end of the penis.

    Space is left to prevent irritation from the plastic insert rubbing against the glans. Space also allows for the elongation of penis during an erection.

13. Hold the condom in place on glans (condom prevents contact of spray on glans):
    - Spray a thin layer of adhesive around the entire shaft of penis and allow it to become "tacky" (may take 60 seconds).

      -OR-

    - Apply tincture of benzoin to the shaft of the penis (not on glans) with cotton-tipped applicators and allow the benzoin to dry.

      -OR-

    - Some external catheters require the placement of a special adhesive strip onto the penis before the application of the external catheter.
14. Unroll the condom-type collection device to cover the shaft of penis.
15. If ordered by a healthcare provider, spiral wrap the penile shaft with a strip of **elastic** adhesive tape. **Do not overlap the tape**.

Do not wrap tape completely around the penis*. The strip should be spiral wrapped and not overlap itself. Overlapping tape may cause constriction of blood supply to the penis.*

16. Clip and remove the ring of the condom catheter.

Ring must be completely removed to prevent pressure damage.

17. Attach a condom catheter to the leg bag or drainage bag. Be sure the condom is not twisted and the tubing is not kinked.

    Positioning of the leg bag may vary according to the student's activity and level of functioning. A twisted condom catheter obstructs the urine flow.

18. Empty the collection bag before it becomes full. *A full bag puts more tension on the catheter and may contribute to problems keeping the catheter intact.*
19. Remove your gloves. Dispose of the gloves and used supplies.
20. Wash your hands with soap and water.
21. Document in the student record the application and removal of the external catheter and the condition of the student’s skin.

    Report to the school nurse and family any change in the student's usual pattern.

Sources:

Centers for Disease Control. (2009). *Guideline for prevention of catheter-associated urinary tract infections*.

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 62-63. https://portal.ct.gov/-/media/SDE/Publications/clinical_guidelines/clinical_guidelines.pdf

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Wilkinson, J.M., Treas, L.S., Barnett, K.L., & Smith, M.H. (2016). *Fundamentals of nursing: Vol. 2: Thinking, doing, and caring.* Philadelphia: F.A.Davis, 548-550.

Possible Problems with an External Urinary Catheter

- **Bleeding from the urethra**
    - This may be due to trauma to the urethra or a urinary tract infection. Contact the school nurse, family and health care provider.
- **Cloudy urine, mucus, blood, foul odor, color changes in the urine**
    - May indicate a urinary tract infection. Always report to the school nurse and family any changes in the student's usual pattern.
- **Skin of the penis irritated**
    - Remove the external catheter and put incontinence garments (diapers) on the student until the skin clears. Check with the school nurse and family regarding the type of adherence used.
- **Leaking of urine around the condom catheter**
    - Use a smaller condom to provide a wrinkle-free application. Make sure the penis is thoroughly dry before applying the condom system. Replace or rewrap the adhesive. Contact the school nurse and family if this happens frequently.

Sources:

Centers for Disease Control. (2009). *Guideline for prevention of catheter-associated urinary tract infections 2009*. http://www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 62-63. https://portal.ct.gov/-/media/SDE/Publications/clinical_guidelines/clinical_guidelines.pdf

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Wilkinson, J.M., Treas, L.S., Barnett, K.L., & Smith, M.H. (2016). *Fundamentals of nursing: Vol. 2: Thinking, doing, and caring.* Philadelphia: F.A.Davis, 548-550.

Ostomies for Urinary Elimination

Overview

An *ostomy* for urinary elimination or diversion uses a surgically- created opening in the urinary tract to allow the elimination of urine. The ostomy can be temporary or permanent.



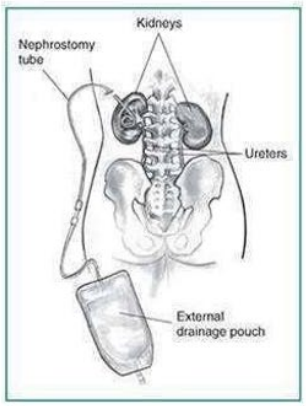
An ostomy may be needed when there is an obstruction or blockage preventing flow of urine through the urinary system. Infection, birth defects, cancer, abnormal motility, or accident or injury may precipitate the need for an ostomy.

A *stoma* is the opening of the ostomy on the skin of the abdomen. A portion of the urinary tract, or a portion of intestine used as a passageway, is brough on the surface of the abdomen and folded back onto itself, then stitched on to the skin. Stomas are usually round, but the size may vary. A healthy stoma is shiny, moist, and dark pink, similar to the inside lining of the mouth. Because stomas are rich in blood supply, they may bleed slightly if irritated or rubbed. However, irritation of the stoma does not cause discomfort because the stoma itself does not have nerve endings. The skin around the stoma does have nerve endings and may be sensitive to manipulation of the stoma or contact with the stoma discharge. Good skin care is important because discharge from the ostomy can be very irritating. A well-fitting barrier and pouch around the ostomy will help protect the skin from any leakage.

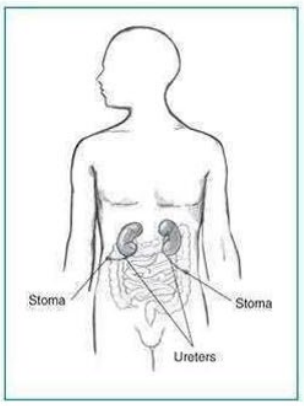
Students may wear a pouch over the stoma to collect urine or they may catheterize a continent ostomy to remove the urine. Ostomies are usually identified by the body part from which they originate; their outside openings may be located anywhere on the abdomen. Common urinary ostomies include:

- Urostomy—a general term used to describe any surgically-created opening from the surface of the abdomen to any part of the urinary tract.
- Nephrostomy—a surgically-created opening leading to the kidney
- Ureterostomy—a surgically-created opening leading to one of the ureters
- Vesicostomy—a surgically-created opening leading to the bladder
- Appendicovesicostomy—a surgically-created opening using the appendix as a passageway to the bladder
- Ileal conduit—a surgically-created opening in the urinary tract using a piece of the ileum as the passageway (conduit) and stoma; drains urine, not stool

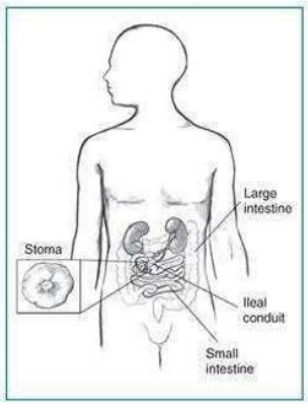
Nephrostomy



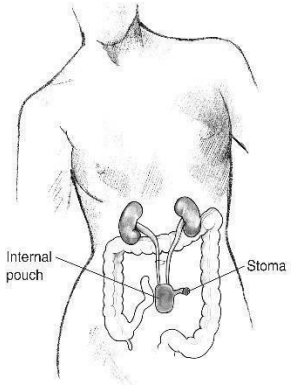
Ureterostomy



Ileal Conduit



Some urostomies constantly drain urine as it is made. The ostomy appliance should be emptied when it is 1/3 full to prevent leakage. Others are connected to an internally-constructed pouch and designed to remain continent until the stoma is accessed by a catheter.



The continent stoma can be covered with a small bandage or left open depending on the student's preference.

Settings and Staff

Stoma care and catheterization should be done in a private place, such as a bathroom or the health room. The pouch should be emptied when it is 1/3 full or if a leak occurs. Some students may want to keep an extra change of clothes at school in case of leakage. The student should be able to participate in all school activities, including physical education.

The student should be encouraged to perform stoma care and catheterization of the continent stoma, if possible. Care can be done by the school nurse (RN or LPN) with documented competency-based training in appropriate techniques and problem management. School personnel who have regular contact with a student who has an ostomy should receive general training covering the student's specific needs, potential problems, and implementation of the established emergency plan.

Individualized Healthcare Plan

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with a urostomy, the following items should be considered:

- Student's underlying condition and possible problems associated with the condition
- Student's ability for self-care and support to accomplish self-care (should have a private bathroom with a sink available)
- Healthcare provider's order for procedures and treatments
- Type of ostomy and type of pouch system
- What to do if the urostomy has an odor (may indicate infection or leak)
- Student's need for additional fluids and type of recommended fluids
- Additional supplies for use at school, including a spare pouch (if used)
- Access to a change of clothing at school
- Student's baseline status (e.g., urine volume, urine color)
- Latex allergy precautions
- Standard precautions

Sources:

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Procedure for Changing a Urostomy Pouch

Note: Family provides the equipment and supplies. **Urostomy pouches should not routinely be changed at school, but may require changing if leaking**.

1. Wash your hands with soap and water.
2. Assemble the equipment required for changing the urostomy bag included below.
    a. Soap and water or student-specific cleanser
    b. Soft cloth or gauze
    c. Skin prep
    d. Skin barrier
    e. Replacement pouch and belt
    f. Measuring guide, if needed
    g. Scissors, if specified
    h. Adhesive
    i. Non-latex gloves, if pouch is to be changed by someone other than the student (make sure that the student has washed his/her hands with soap and water prior to and proceeding procedure)
    j. Tape, if needed
    k. Container to store the used pouch
    l. Disinfectant solution for cleaning the pouch

    Students should keep a complete set of supplies at school including a spare pouch and pouch clip closure. The pouch for ureterostomies must have an antireflux valve to prevent urine from re-entering the stoma.

3. Explain the procedure using explanations the student can understand. Encourage the student to do as much of the procedure as they are capable to achieve maximum self-care skills.
4. Wash your hands with soap and water and put on a pair of gloves.
5. Empty the contents of the used pouch into the toilet or the appropriate receptacle. Dry the drainage port with toilet paper.
6. Gently remove the used pouch and skin barrier. Instead of pulling the bag off the skin, push the skin away from the bag.
7. If the new skin barrier needs fitting, use the student-specific guidelines to measure the stoma and prepare the barrier.

    Opening should be large enough to prevent pressure on the stoma, but small enough to prevent leaking on the skin.

8. Wash the stoma using water alone, soap and water, or cleanser specified in student's IHP with a clean cloth or gauze. **Do not scrub the stoma as this may cause irritation or bleeding**.

   Chemical or perfumed wipes can also irritate delicate skin.

9. Cover the stoma with gauze or cloth to wick leakage, and then clean the skin around the stoma.
10. Inspect the skin for redness, rash, bleeding, blistering, or drainage.

    If there is skin irritation, follow the guidelines in the student's IHP for care. Do not apply medication, ointment, or adhesive to damaged skin because doing so can make it more difficult for the pouch to adhere to the skin. Notify the school nurse and/or family if there is skin irritation.

11. Pat the skin dry with dry gauze or cloth.
12. Using the instructions in the student's IHP to prepare the skin, place the skin barrier on the skin around the stoma, starting at the bottom and working up around the stoma.
13. *Starting at the bottom helps ensure a good seal there, where leaks most commonly occur.*
14. Remove the used gauze and discard it in the appropriate receptacle.
15. Peel the backing from the adhesive on the pouch and apply the adhesive to the pouch.
16. Center the new pouch directly over the stoma.
17. Using fingertips, firmly press the adhesive of the pouch to the skin barrier making sure there are no wrinkles and no leaks. Start at the bottom and work up around the stoma.
18. *The pouch can be opened to allow in a small amount of air. Seal the bottom if the pouch has a bottom drain. If a belt is used to secure the pouch, attach it to the pouch.*
19. Dispose of the used pouch and supplies in the appropriate receptacle.
20. Remove your gloves and wash your hands with soap and water.
21. Document the completion of the procedure in the log, including any significant observations. Notify the school nurse and family of any change in the stoma or urine pattern.

Sources:

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Procedure for Catheterizing a Continent Urostomy, Vesicostomy or Appendicovesicostomy

Note: Family provides the equipment and supplies.

1. Wash your hands with soap and water..
2. Assemble the equipment required for the catheterization included below.
    a. Soap and water or alcohol-free wipes or other cleansing agent as specified in the student's IHP
    b. Non-latex gloves, if the catheterization is to be done by someone other than the student
    c. Catheter
    d. Water-soluble lubricant (e.g., KY jelly)
    e. Catheter storage bag
    f. Container to collect and dispose of the urine if you are unable to perform the procedure while the student sits on toilet
    g. Small adhesive bandage or stoma covering

    Students should maintain adequate supplies at school for multiple catheterizations.

3. Explain the procedure using explanations the student can understand. Encourage the student to do as much of the procedure as is capable, so as to achieve maximum self-care skills.
4. Wash your hands again after assembling the equipment and put on a pair of gloves.
5. Wash the stoma gently using cleansing supplies, if ordered. Do not scrub.

    Cleansing may remove debris and decrease the chance of infection.

6. Lubricate the catheter tip with water-soluble lubricant.
7. *Lubrication aids insertion and may prevent tissue trauma.*
8. Hold the catheter near the tip and insert into the stoma until a flow of urine is passed. Insert the catheter approximately ½-1 inch further.

    Make sure the other end of the catheter is in either a collection container to catch urine or over the toilet. If slight resistance is felt, it may help to twist the catheter or aim it downwards while the student takes a deep breath.

9. Leave the catheter in the stoma until the flow of urine stops.

In an appendicovesicostomy, the stoma may be higher than the bladder so the catheter needs to be held lower than the level of the bladder to facilitate complete emptying. The flow of urine can also be impeded by a mucus plug. If this occurs, the catheter should be removed and rinsed, lubricated, and reinserted. Occasionally the continent urostomy may need to be gently irrigated if there is presence of persistent mucus. ***A physician's order is needed for the urostomy irrigation****.*

10. Slowly withdraw the catheter.

    Sometimes there is an additional gush of urine. Pinching the catheter can prevent urine still in the catheter from flowing back into the stoma during withdrawal.

11. Cover the stoma with a bandage or stoma covering.
12. Dispose of the urine in the toilet, noting volume and appearance.
13. Wash and dry the equipment. Store in an appropriate container, such as a sealed plastic bag.
14. Remove your gloves and wash your hands with soap and water.
15. Document the procedure in the log. Report to the school nurse and family any changes--cloudy urine, mucus, blood, foul odor, color changes, or unusual wetting between catheterizations.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 519-525.

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Wilkinson, J.M., Treas, L.S., Barnett, K.L., & Smith, M.H. (2016). *Fundamentals of nursing: Vol. 1: Theory, concepts, and applications.* Philadelphia: F.A. Davis, 738-739.

Possible Problems with Urostomies

- **Urine leakage**
  - Empty the pouch when it is 1/3 full. Check to see if the pouch has a leak, if there are wrinkles in the adhesive attachment, or if the pouch size is correct for the stoma. Apply a new pouch if necessary. The continent stoma may be getting too full and need more frequent catheterizations.
- **Irritation or skin breakdown around the stoma; raw or weeping skin**
  - This may be due to improper stoma care or to an inadequate barrier on the skin. In addition, some skin preparations or products can cause a reaction. Notify the school nurse, family or health care provider.
- **Foul odor, cloudy urine**
  - If there is an odor, check for a leak around the stoma or in the pouch itself. Urinary tract infections can also cause the urine to have a strong smell. Some foods such as asparagus and B-complex foods may cause a distinctive odor.
- **Change in the flow of urine, especially a decrease**
  - This can occur if there is an inadequate intake or if the urostomy (especially a ureterostomy) has narrowed. Report any changes in urine flow to the school nurse and family.
- **Bleeding from stoma**
  - The stoma becomes irritated very easily. This can happen if it is rubbed too hard during the cleaning, an irritating cleanser is used or it is scratched with a fingernail. Usually the bleeding stops quickly, but if it does not, apply gentle pressure and notify the school nurse. If a large area of the stoma is bleeding, notify the school nurse, family or the health care provider.
- **Rash with small red spots on the stoma or skin around the stoma**
  - Clean and dry the skin carefully and notify the family. The student may have a yeast infection. Notify the school nurse and family.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 519-525.

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General Information for Students with Urostomies

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has a urostomy, or opening into the abdomen, to allow the body to eliminate urine. The opening, or stoma, is covered by a plastic pouch that collects urine.

The student usually empties the pouch and cleans the stoma without assistance. Some students may catheterize the stoma. This procedure should be done in the bathroom. The student's privacy should be assured during the procedure and the student should be allowed to go to the bathroom on an as needed basis.

The student should be able to fully participate in physical education classes unless he or she has another condition that would interfere with full participation. It is very difficult to injure a stoma. The pouch should not come off during normal circumstances.

Please contact_____at_____(phone number/pager) for additional information or if the student experiences any problems with the urostomy.

Source: Adapted from: Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and youth assisted by medical technology in educational settings: Guidelines for care*. (2nd ed.). Baltimore: Paul H. Brookes Publishing.

Peritoneal Dialysis

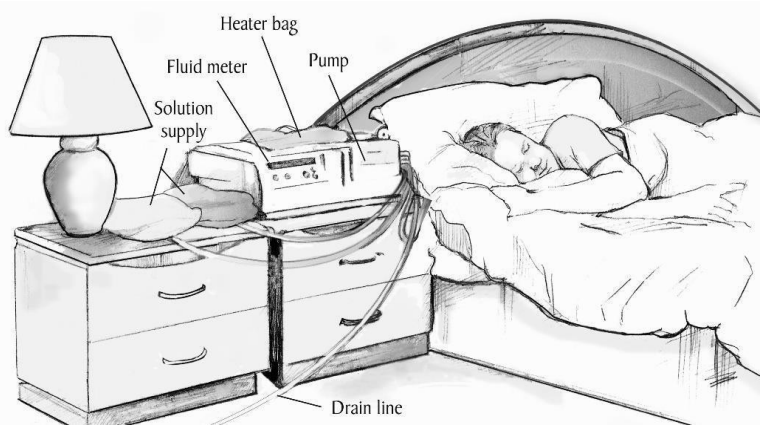
Overview

Healthy kidneys cleanse the blood by removing excess fluid, minerals, and wastes. They also make hormones that keep the bones strong and blood healthy. When kidneys fail, harmful wastes build up in the body, blood pressure may rise, the body may retain excess fluid and not make enough red blood cells. When kidney failure occurs, a student needs treatment to replace the work of the failed kidneys.

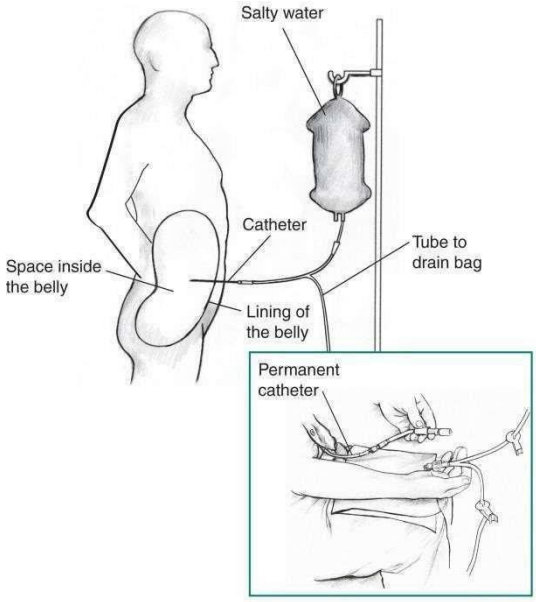
The two methods for treating renal failure are dialysis and kidney transplantation. During dialysis, a filter is used to rid the body of waste products and excess fluid. There are two types of dialysis: peritoneal dialysis and hemodialysis.

Peritoneal dialysis uses the semi-permeable lining of the abdomen, the *peritoneum*, to filter waste products via the processes of osmosis and diffusion. A soft tube called a catheter is used to fill the abdominal cavity with a cleansing solution, or *dialysate*. The peritoneum allows waste products and extra fluid to pass from the blood into the dialysis solution. The solution contains a sugar called dextrose that can pull wastes and extra fluid into the abdominal cavity. These wastes and fluid then leave the body when the dialysis solution is drained. There are two forms of peritoneal dialysis:

- Continuous Cycling Peritoneal Dialysis (CCPD) uses a machine called a *cycler* to instill and drain the dialysate 3-5 times during the night. Depending on the student's comfort, the peritoneal cavity may or may not be left full of dialysate during the 12 hours that he or she is not undergoing CCPD. This is generally the preferred method of peritoneal dialysis for students because it can be done overnight and causes less disruption to the school day.



- Continuous Ambulatory Peritoneal Dialysis (CAPD) doesn't require a machine and is carried out continuously throughout each 24- hour period. The dialysate solution is instilled by gravity through a catheter into the abdominal space and drained out, by gravity, at regular intervals. The process of draining and filling is called an *exchange* and takes about 30-40 minutes. The period the dialysate stays in the abdomen is called the *dwell* time and usually lasts 4-6 hours.



In peritoneal dialysis, a catheter (e.g., Tenckhoff) is placed surgically in the abdomen and tunneled under the skin. One or two cuffs (subcutaneous cuff and peritoneal cuff) help to keep the catheter in place and prevent bacteria from traveling along the catheter from outside into the abdominal cavity. The outside end of the catheter has either a cap or a length of tubing with a rolled-up empty dialysate bag attached, which can be tucked into the student's clothing or in a carrying pouch. The catheter should always be protected and covered by a dressing and clothing to protect it from tugging or pulling because a break in the system or skin tearing could occur.

Infection is the most common complication of peritoneal dialysis. Repeated peritoneal infections, *peritonitis*, can lead to peritoneal membrane failure and the inability to use the peritoneum for further dialysis. Therefore, every effort must be made to prevent infection. Signs of infection include fever, pain, redness, nausea, and a tender, distended abdomen. Any signs of infection require prompt attention and notification of the school nurse, family, and health care provider.

Settings and Staff

Due to the risk for infection and the need for privacy, procedures such as dialysate exchange or dressing changes should take place at home or in a clean, private room such as the health room. The student can participate in school activities, but participation in physical education activities must be determined on an individual basis by the student's health care provider.

<u>Only</u> the school nurse (RN or LPN) with competency-based training in peritoneal dialysis should perform this procedure due to the high risk for infection or injury. Peritoneal dialysis training usually takes place in a dialysis unit. Simply changing the dressing at the exit site can be performed by a registered nurse using sterile technique. The skin around the catheter site must be kept clean and dry because skin breakdown can also lead to peritonitis. School personnel who

have regular contact with a student who has a peritoneal dialysis catheter should receive general training covering the student's specific needs, potential problems, and implementation of the established emergency plan.

Individualized Healthcare Plan

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student receiving peritoneal dialysis, the following items should be considered:

- Student's underlying condition and potential problems associated with the condition or treatment
- Health care provider's orders for procedures and treatments
- Observations which need to be reported to the health care provider
- Medication requirements
- Diet restrictions, most significantly, foods with high potassium and protein content
- Requirements for blood pressure monitoring
- Susceptibility to infections, especially peritonitis
- Restrictions about touching the tubing or the dressing
- Activity restrictions
- Provision of supplies by family for emergency care
- Body image concerns
- Latex allergy precautions
- Standard precautions

Sources:

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National Institute of Diabetes and Digestive and Kidney Diseases. (April 2006).

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National Kidney Foundation. (2015). *Nutrition and peritoneal dialysis*. https://www.kidney.org/atoz/content/nutripd

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National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2014). Image Library. N01699. https://www.niddk.nih.gov/news/media-library

Possible Problems for the Student Requiring Peritoneal Dialysis

- **Abdominal pain, fever, nausea, vomiting, unusual color or cloudiness of used dialysate, redness or pain around the catheter**. **This is a potential emergency. Be prepared to activate the school emergency plan**. Have the student rest. Take vital signs. **Notify the school nurse, family or dialysis unit immediately** because peritonitis can develop within a few hours.
- **Catheter is pulled or tugged**
    - Examine the catheter tubing for any leaks or breaks. Notify the school nurse. Using a sterile technique (including wearing a mask and sterile gloves), the school nurse can remove the dressing, and check for any trauma or tears in the skin. **If any leaking or trauma has occurred, notify the family or dialysis unit immediately.** Cover the site with a sterile dressing.
- **Tubing becomes disconnected**
    - If the catheter and tubing become disconnected, cover the open end with a sterile dressing. Stop the flow of dialysate from the catheter by bending the catheter. Secure the folded, bent catheter to stop dialysate flow. **Call the school nurse, family and dialysis unit immediately.**
- **Cover on the end of the catheter comes off**
    - Cover the catheter end with sterile gauze. Make sure the roller clamp is intact and the dialysate is not leaking. If the clamp is open, close it. Notify the school nurse and family.
- **Dressing or the skin near catheter becomes dirty or wet**
    - Notify the school nurse and family so that the skin can be cleaned and sterile dressing applied.
- **Dressing at the exit site comes off**
    - Using a sterile technique (including mask and sterile gloves), place the sterile split gauze on the skin around the catheter. Cover both the catheter and gauze with a second gauze and secure with specified tape. Notify the school nurse and family.

Sources:

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children*. (10th ed.). St. Louis: Elsevier Mosby , 1036-1038.

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Possible Problems for the Student with Renal Failure

- **Chest pain, numbness in the face or limbs, and generalized weakness**
    - **Activate the school emergency plan and notify the school nurse, family and health care provider.**
    - Most students on dialysis need to control the amount of potassium in their diet because too much potassium can interfere with the heart muscle's ability to pump, causing an irregular heartbeat and possibly even cardiac arrest. These symptoms may indicate an unsafe potassium level. Potassium is a mineral found in many foods, including salt substitutes, bananas, oranges, dark leafy greens, avocados, potatoes, yogurt, beans, chocolate, and nuts.
- **Shortness of breath**
    - The student could be developing fluid in the lungs. Check the vital signs and record**.** Have the student sit and rest. **If difficult breathing continues or increases, activate the school emergency plan and notify the school nurse, family and health care provider**. Keep the student in a sitting position while waiting for the ambulance.
    - Leaning forward over a table or chair may facilitate ease of respiration.
- **Sudden onset of localized pain, usually felt while moving or walking Activate the emergency plan and notify the school nurse and family**.
    - Students with renal failure often lose calcium, causing bones to become brittle and break with even a minor injury. Document the location of pain and assess the need for immobilizing the area of pain.

Sources:

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children*. (10th ed.). St. Louis: Elsevier Mosby, 1036-1038.

National Institute of Diabetes and Digestive and Kidney Diseases. (November 2007). *Kidney Failure: Choosing a Treatment That's Right for You*. Bethesda, MD: National Institutes of Health. NIH Publication No. 08-2412. https://www.niddk.nih.gov/health-information/kidney-disease/kidney-failure/choosing-treatment

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General Information for Students with Peritoneal Dialysis Catheters

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has a catheter, or tube, into the abdomen to help remove waste products through a procedure called peritoneal dialysis.

The tube may be closed and covered or it may be attached to a bag of solution. In either case, the bag and tubing are covered by the student's clothing.

The bag and catheter should not be touched except in an emergency.

All staff who have contact with this student should be familiar with the emergency plan and how to initiate it.

The student should be able to participate in school activities.

The student needs permission from his or her health care provider to participate in physical education classes or swimming. The student should avoid bumping the catheter or pulling on the tubing.

Please contact_____at_____(phone number/pager) for additional information or if the student experiences any problems with the catheter.

Source: Adapted from: Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and youth assisted by medical technology in educational settings: Guidelines for care*. (2nd ed.). Baltimore: Paul H. Brookes Publishing.

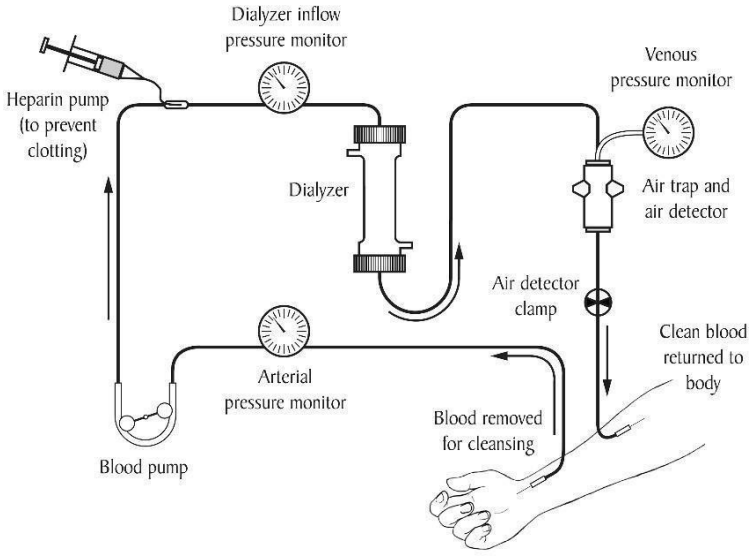
Hemodialysis

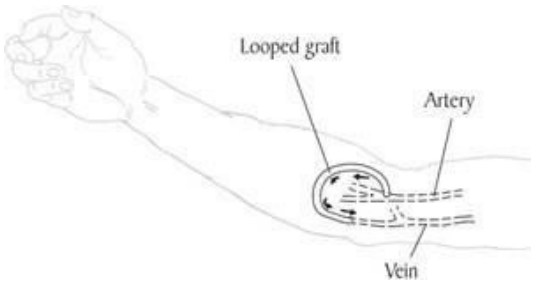
Overview

Healthy kidneys cleanse the blood by removing excess fluid, minerals, and wastes. They also make hormones that keep the bones strong and blood healthy. When kidneys fail, harmful wastes build up in the body, blood pressure may rise, the body may retain excess fluid and not make enough red blood cells. When kidney failure like this is experienced, a student needs treatment to replace the work of the failed kidneys.

The two methods for treating renal failure are dialysis and kidney transplantation. During dialysis, a filter is used to rid the body of waste products and excess fluid. There are two types of dialysis: peritoneal dialysis and hemodialysis.

Hemodialysis uses a special filter called a *dialyzer* that functions as an artificial kidney to rid blood of harmful wastes, extra salt, and extra water. During treatment, blood travels through tubes into the dialyzer, where a semi-permeable membrane filters out wastes and extra water. Then the cleansed blood flows through another set of tubes back into the body. Hemodialysis is usually done three times a week and each treatment lasts 3-5 hours.



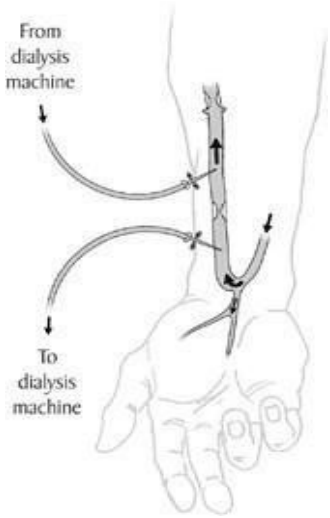


Hemodialysis requires easy access to the student's blood supply. The two main types of access are a fistula and a graft. To create an *arteriovenous fistula*, an artery is connected directly to a vein, usually in the forearm. The increased blood flow makes the vein grow larger and stronger so that it can be used for repeated needle insertions. However, it may take several weeks before it is ready to be used. A *graft* connects an artery to a vein using a synthetic tube and can be used

sooner than a fistula; however, it is more likely to experience infection and clotting so it is not normally used for long-term dialysis.

Hemodialysis is performed in the hospital, dialysis unit, or at home by specially-trained health care providers.

Care of the Arteriovenous Fistula



Because vascular access problems are the most common reason for hospitalization among students on hemodialysis, the fistula must receive special care. The fistula can be checked by lightly placing clean fingers over to feel a vibration, the *thrill*, or by placing a clean stethoscope over it and listening for a loud buzzing sound, the *bruit*. This indicates patency of the fistula. The school nurse should become familiar with the bruit. If any changes are noted in the bruit, the student's emergency school plan should be initiated. Anything that causes decreased blood flow to the fistula area should be avoided. ***Do <u>not</u> draw blood or measure blood pressure in the arm or leg on which the fistula is located.*** Lying on the fistula, carrying heavy objects, and wearing watches or bracelets should also be avoided.

Settings and Staff

Every effort should be made to protect the student's privacy. Checking the bruit of a fistula on an arm can be performed in any setting; checking the patency of a thigh fistula requires a more private setting, such as the health room.

A student with an arteriovenous fistula can normally participate in regular school activities. Participation in athletics or activities where the student is around sharp equipment can be decided on an individual basis by the health care provider.

School personnel who have regular contact with a student who has a fistula should receive general training covering the student's specific needs, potential problems, and how to implement the established emergency plan. If the student knows how to check fistula patency, he or she should notify the people identified in the emergency plan if there are any changes in the bruit. Fistula care should be done by a registered school nurse with proven competency- based training in appropriate techniques and problem management.

Individualized Healthcare Plan

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student receiving hemodialysis, the following items should be considered:

- Student's underlying condition and potential problems associated with the condition or treatment
- Plans to ensure that school staff who have regular contact with the student are aware that the student has a fistula and be familiar with the baseline appearance of the fistula and vibration of the bruit
- Emergency contact information including dialysis center
- Healthcare Provider's orders for procedures and treatments
- Location of fistula or graft and any special precautions
- Frequency of checking fistula
- Notifying the school nurse and family or health care provider immediately if student has:
    - fever
    - pain in the fistula
    - loss of bruit or bulging of the fistula
- Medication requirements
- Frequency of blood pressure measurements (should **not** be done on the limb with fistula)
- Diet restrictions, especially foods high in potassium, sodium, or phosphorus
- Fluid restrictions
- Activity restrictions
- Susceptibility to infections, especially chicken pox
- Latex allergy precautions
- Standard precautions

The following school issues should be considered when working with a student needing hemodialysis:

- Reducing the amount of written homework.
- Using tape recorders and computers if the fistula placement affects the student's ability to write.
- Dialysis scheduling.
- Using flexibility in scheduling subjects during dialysis time.
- Possibility of frequent hospitalizations.
- Providing textbooks, workbooks, and worksheets for a hospital tutor.

- Monitoring student performance, both in class and in the hospital.
- Make-up work and tests.
- Home tutoring when illness prevents the student from attending school.
- Evaluation of performance and review work after long absences.
- Making outlines and notes available to the student.
- Contracts to modify the amount of work and still achieve educational goals.
- Assessing for fatigue.
- Avoiding after-school tutorial sessions.
- Access to a school elevator in case of fatigue or bone disease.

Sources:

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children*. (10th ed.). St. Louis: Elsevier Mosby , 1036-1036.

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National Institute of Diabetes and Digestive and Kidney Diseases. (November 2007).

Kidney failure: Choosing a treatment that's right for you. Bethesda, MD: National Institutes of Health. NIH Publication No. 08-2412.

National Institute of Diabetes and Digestive and Kidney Diseases. (December 2006). *Treatment methods for kidney failure: Hemodialysis*. Bethesda, MD: National Institutes of Health. NIH Publication No. 07-4666.

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National Kidney Foundation. (2015). *Nutrition and peritoneal dialysis*. https://www.kidney.org/atoz/content/nutripd

National Library of Medicine Medline Plus. (2014). *Taking care of your vascular access for hemodialysis*. http://www.nlm.nih.gov/medlineplus/ency/patientinstructions/000591.htm

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National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2014). Image Library. N00550. https://www.niddk.nih.gov/news/media-library

National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2014). Image Library. N00590. https://www.niddk.nih.gov/news/media-library

National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2014). Image Library. N01725. https://www.niddk.nih.gov/news/media-library

Possible Problems for the Student Requiring Hemodialysis

- **Oozing or bleeding**
    - Usually due to the scab from the last needle puncture coming off. Put on sterile gloves and apply direct pressure to the oozing site using folded gauze. Apply only enough pressure to stop the oozing of blood yet still feel the bruit. Once bleeding has stopped, apply a small band aid. If bleeding continues for more than 10 minutes, notify the school nurse, family and dialysis center.
- **Injury or trauma to the fistula**
    - Arterial blood has been rerouted to the fistula so **the student could lose a <u>large</u> quantity of blood in a very short period of time if there is damage to the fistula.** A cut into the fistula will cause the blood to spurt out. **Activate the school emergency plan**. Put on a pair of sterile gloves, a face shield (if available) and apply pressure with sterile gauze directly to the bleeding site.
- **No bruit detected when the fistula is palpated or auscultated with a stethoscope**
    - Try both palpation and auscultation to assess the bruit. Palpate the distal pulses and observe the capillary refill in the extremity digits to check circulation. Have the student lie down and check their blood pressure. **If their blood pressure is low or bruit still cannot be felt, call the school nurse, dialysis unit and the family.** If clotting has occurred, success of de-clotting depends on how quickly treatment is initiated.

Sources:

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children*. (10th ed.). St. Louis: Elsevier Mosby , 1036-1036.

National Institute of Diabetes and Digestive and Kidney Diseases. (November 2007).

Kidney failure: Choosing a treatment that's right for you. Bethesda, MD: National Institutes of Health. NIH Publication No. 08-2412.

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National Library of Medicine Medline Plus. (2014). *Taking care of your vascular access for hemodialysis*. http://www.nlm.nih.gov/medlineplus/ency/patientinstructions/000591.htm

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Smith, S., Duell, D. & Martin, B. (2012). *Clinical nursing skills: Basic to advanced skills* (8th ed.). Boston: Pearson, 805-810.

General Information for Students Receiving Hemodialysis

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has a fistula, or a surgical joining of an artery and vein, located in his or her

_____. The fistula is used to help remove waste products through a procedure called hemodialysis. The fistula often is covered by the student's clothing.

No tight-fitting objects (i.e., watch, elastic band) should be worn on an arm with a fistula. The student also should not bump the area around the fistula.

Fistula care is usually done at home or in the dialysis unit. The student should be able to participate in school activities.

The student needs permission from his or her health care provider to participate in physical education activities and classes with any limitations noted:

_____

_____

_____

All staff who have contact with this student should be familiar with the school emergency plan and how to initiate it.

Please contact_____at_____(phone number/pager) for additional information or if the student experiences any problems with the fistula.

Source: Adapted from: Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and youth assisted by medical technology in educational settings: Guidelines for care*. (2nd ed.). Baltimore: Paul H. Brookes Publishing.

Reference List

A comprehensive list of references and additional resources can be found at the end of each chapter's subsection.

Appendix A

Individualized Healthcare Plans

Emergency Plan Procedure Information Sheet Daily Log Medical Order Forms

Parent Authorization Form

Components of an Individualized Healthcare Plan

Who should have an Individualized Healthcare Plan (IHP)?

Students with mild to severe health care needs and require frequent nursing services at school should have an IHP.

What is the purpose of an IHP?

The IHP helps assure consistent, safe health care for the student, protects the school nurse in legal proceedings, and provides documentation regarding the extent of services provided. Each IHP should be individualized to meet the needs of the student.

What should the IHP include?

The IHP should include the following four components:

1. Nursing assessment
2. Nursing diagnoses
3. Nursing interventions
4. Expected outcomes

Each IHP may include additional components to meet the needs of the student. The IHP should be revised when the student's physical condition or care changes. Each IHP should be consistent with minimum standards of care.

IHPs also should address:

- Physical education classes, if appropriate
- Special activities (i.e., swimming)
- Field trips
- Classroom parties
- Off-campus work opportunities
- Bus transportation
- Medical equipment, supplies, and services

Who should develop and sign the IHP?

The following individuals should help develop and then sign the IHP:

- Parents/Guardians
- Student
- Medical provider (optional)
- Registered school nurse

Parents or legal guardians **must** authorize, in writing, care provided for their minor children.

Medical providers (physicians, nurse practitioners, physician assistants) **must** provide written orders for medical treatments provided at school.

How often should the IHP be updated?

The IHP should be updated as appropriate and revised at least annually (i.e., at least once each school year) or after significant changes occur in the student's health status.

What is the Emergency Care Plan or Emergency Action Plan?

The Emergency Care Plan (ECP) is required when a chronic condition has the potential to result in a medical emergency. The ECP is a component of the IHP.

Components of an Individualized Healthcare Plan (IHP)

1. Assessment

The assessment provides the background information for the IHP and includes:

- Health history
- Current health status Self-care skills/needs Psychosocial status
- Health issues related to learning

2. Nursing Diagnosis

A nursing diagnosis summarizes the current health status of the student based on the student's response to the health condition and defines what the school nurse can contribute as an autonomous practitioner.

3. Goals

Goals are clear, concise, realistic descriptions of desired outcomes. They may be short- term or long-term but they must be measurable.

4. Nursing Interventions

A nursing intervention is any treatment performed to reach a goal or desired outcome.

5. Student Outcome

An outcome describes what the student is expected to do. It must be realistic and measurable.

6. Evaluation

The evaluation consists of periodically reviewing the student's goals and outcomes; comparing actual versus predicted outcomes; reviewing the interventions; and, if necessary, modifying the IHP. Evaluations also should

occur when the student's health status changes significantly or when the medical provider changes the student's prescribed treatment or medications.

Sources:

National Association of School Nurses. (2015). *Individualized healthcare plans: The role of the school nurse* (Position Statement). Silver Spring, MD: Author.

Schwab, N. (2005). *Legal issues in school health services: A resource for school administrators, school attorneys, school nurses*. Authors Choice Press.

Individualized Healthcare Plan (IHP)

Student: _____

Name Date of Birth

Prepared By: _____

School Nurse Date

Approved By: _____

Parent/Guardian(s) Date

_____

Parent/Guardian(s) Date

Approved By: _____

Student Date

Approved By: _____

Medical Provider (optional) Date

Next Review & Revision Due: _____

Individualized Healthcare Plan

Demographics

Student Name_____Birth Date _____

Home Address_____

Home Phone _____

Email Address _____

Parent/Guardian_____Phone _____

Parent/Guardian_____Phone _____

Caregiver _____

Language Spoken at Home _____

Emergency Contacts:

Name_____ Relationship _____ Phone _____
Name_____ Relationship _____ Phone_____

Medical Care

Primary Healthcare Provider_____Phone _____

Specialty Healthcare Provider_____Phone _____

Health History

Brief Health History

_____

_____

_____

_____

_____

_____

Special Healthcare Needs _____

_____

Current Health Status (Baseline status, e.g., skin color/integrity, vital signs, mobility)

Student Participation in Care

Health Issues Related to Learning

Activity Considerations (physical education, field trips, extracurricular activities)

Equipment, Supplies, Services _____

_____

_____

Other considerations _____

_____

Medication & Dietary Needs

Current Medications (dose, route, time)

_____

_____

_____

Special Dietary Requirements

_____

_____

_____

Allergies (include type of reaction)

_____

Individualized Healthcare Plan - Components

Procedures

Procedure _____

Frequency_____

Times _____

Position of student during procedure

_____

Ability of student to assist/perform procedure

_____

Location for procedure

_____

Equipment needed

_____

_____

_____

Procedural considerations & precautions

_____

_____

Staff qualified to assist with procedure

Daily Log

Student Name_____Class/Grade _____

Procedure _____

Parent_____Phone _____

Date/Time	Procedure Notes	Observations	Time for Prep, Procedure, and Documentation	Completed by

Emergency Care Plan (or Emergency Action Plan)

Student Name: _____ Class/Grade: _____

Parent/Guardian: _____

Phone: _____

Parent/Guardian: _____

Phone: _____

Healthcare Provider: _____

Phone: _____

If you see this	Do this

In an emergency occurs:

1. **Stay with child**
2. **Call or have someone else call the school nurse**
3. **If the school nurse is not available, the following staff members are trained to initiate the emergency care plan.**

_____

Transportation Plan for Student with Special Health Care Needs

Student Name _____ Class/Grade _____

Parent _____ Phone _____

Period From _____

To _____

Review Date _____

1. Adaptations/Accommodations Required

_____ Transportation Aide

_____ Bus lift

_____ Seat belt

_____ Special restraint

_____ Wheelchair tie down

Space for equipment: specify _____

_____

2. Positioning or Handling Requirements

_____ None

_____ Describe _____

_____

_____

_____

3. Behavior Considerations

_____ None

_____ Describe _____

_____

_____

_____

Individualized Health Care Plan - Components

Procedures

Assessment Data	Nursing Diagnosis	Goals	Nursing Interventions	Expected Outcomes

Procedure(s): _____

4. Transportation Staff Training

Training has been provided to drivers and substitute driver(s). _____ yes _____ no

Describe training provided _____

_____

_____

_____

Date training completed _____

5. Student Specific Emergency Procedures

If you see this	Do this

Medical Orders for Specialized Health Care Procedures

Student Name _____ **Birth Date** _____

Home Address _____

Name/description of specialized health care procedure _____

_____

_____

Time or indication for procedure _____

_____

Precautions, potential complications & needed actions _____

_____

_____

Person(s) authorized to perform procedure

___ School Nurse ___ Trained School Staff ___ Student

Procedure is to be continued as above until (maximum of one school year)

_____

Medical Provider Signature _____ **Date** _____

I request that the procedure/treatment be performed to my child, named above. The medical provider explained to me the procedure, its purpose and possible complications.

Parent/Guardian Signature _____ **Date** _____

Parent/Guardian _____ **Date** _____

Medical Order Form

Student Name _____ Birth Date _____

Home Address _____

Licensed Medical Provider _____ Title _____

Phone _____

Date of Order _____ Discontinuation Date _____

Medication _____

Route of administration _____

Dosage _____

Frequency _____

Time(s) of administration _____

Specific directions for administration _____

_____

Special side effects, contraindications, or possible adverse reactions

_____

_____

Consent for self-administration by student (with approval of parent/guardian & school nurse) ____ Yes ____ No

_____ _____

Signature of Medical Provider Date

I request that the medication, names above, be given to my child. The medical provider explained to me the medication. its purpose and possible complications.

Parent/Guardian Signature _____ Date _____

Parent/Guardian _____ Date _____

Appendix B

Skills checklists for procedures

Gastrointestinal system

Musculoskeletal system

Neurological system

Respiratory system

Urinary system

Sample diabetes care skills checklists are located in the Virginia Department of Education *Manual for Training Public School Employees in the Administration of Insulin and Glucagon, Appendix C: Sample Skills Checklists*

Skills Checklist: Gastrostomy Feeding Bolus Method

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy)							
5. Identifies possible problems and appropriate actions							
6. Identifies size _____ and type _____ of G-tube							
7. Identifies student-specific instructions for guidelines as to:							
• _____ time(s) of feeding							
• _____ ml (amount)							
• _____ formula (type)							
• _____ duration (minutes)							
• _____ position of student							
Identifies Supplies:							
1. Liquid formula or feeding solution, at room temperature							
2. 60 ml catheter-tipped syringe or other feeding container for feeding							
3. Clamp or plug for end of tube							
4. Water (to flush tubing before and after feeding)							
5. Rubber bands and safety pins (to secure G-tube to clothing)							
6. Gloves							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Shakes formula to mix and measures amount							
4. Positions student and explains procedure							
5. Washes hands and dons gloves							
6. Inspects skin							
7. Removes cap and inserts syringe. Aspirates (if ordered)							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
8. Measures residual (if needed) and returns to stomach							
9. If stomach contents are over _____ ml, subtract from feeding							
10. Clamps tubing and removes syringe							
11. Attaches syringe without plunger to feeding port. Unclamps tube.							
12. Flushes with 15-30 ml water (or as specified)							
13. Administers medications, if ordered, flushing before and after							
14. Pours room temperature formula into syringe							
15. Allows feeding to flow in slowly by gravity							
16. Adjusts height of syringe to achieve prescribed flow rate							
17. Observes tolerance of feeding							
18. Keeps syringe partially filled until feeding complete							
19. Flushes with prescribed amount of water, usually 15-30 ml							
20. Opens G-tube to air, if ordered							
21. Clamps tubing, removes syringe, and reinserts plug							
22. Secures tubing							
23. Washes and dries supplies as specified							
24. Washes hands							
25. Documents procedure and observations							
26. Notifies family of any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Gastrostomy Feeding Slow Drip or Continuous Method

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy) and student's activity level							
5. Identifies possible problems and appropriate actions							
6. Identifies size _____ and type _____ of G-tube							
7. Identifies student-specific instructions for guidelines as to:							
• _____ time(s) of feeding							
• _____ ml (amount)							
• _____ formula (type)							
• _____ duration (minutes)							
• _____ position of student							
Identifies Supplies:							
1. Liquid formula or feeding solution, at room temperature							
2. 60 ml catheter-tipped syringe or other feeding container for feeding							
3. Feeding bag and tubing							
4. Feeding pump and stand or carry-pack, if needed							
5. Clamp or plug for end of tube							
6. Water (to flush tubing before and after feeding)							
7. Rubber bands and safety pins (to secure G-tube to clothing)							
8. Gloves							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Shakes formula to mix and measures amount							
4. Positions student and explains procedure							
5. Washes hands and dons gloves							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
6. Inspects skin							
7. Removes cap and inserts syringe. Aspirates (if ordered)							
8. Measures residual (if needed) and returns to stomach							
9. If stomach contents are over _____ ml, subtracts from feeding							
10. Clamps tubing and removes syringe							
11. Fills feeding bag with room temperature feeding, primes tubing, and hangs bag							
12. Flushes with 15-30 ml water (or as specified)							
13. Administers medications, if ordered, flushing before and after							
14. Inserts tip of tubing into G-tube, secures, and unclamps							
15. Adjusts flow rate							
16. Observes tolerance of feeding							
17. Keeps bag partially filled until feeding complete; does not hang more than 4 hours' worth of feeding at one time							
18. If single feeding completed, disconnects, and flushes with prescribed amount of water, usually 15-30 ml							
19. Opens G-tube to air, if ordered							
20. Clamps tubing, removes syringe, and reinserts plug							
21. Secures tubing							
22. Washes and dries supplies as specified							
23. Washes hands							
24. Documents procedure and observations							
25. Notifies family of any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Skin-Level Gastrostomy Feeding Bolus Method

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy)							
5. Identifies possible problems and appropriate actions							
6. Identifies size _____ and type _____ of gastrostomy device							
7. Identifies student-specific instructions for guidelines as to:							
• _____ time(s) of feeding							
• _____ ml (amount)							
• _____ formula (type)							
• _____ duration (minutes)							
• _____ position of student							
Identifies Supplies:							
1. Liquid formula or feeding solution, at room temperature							
2. 60 ml catheter-tipped syringe or other feeding container for feeding							
3. Adaptor with tubing and clamp							
4. Water (to flush tubing before and after feeding)							
5. Gloves							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Shakes formula to mix and measures amount							
4. Positions student and explains procedure.							
5. Washes hands and dons gloves							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
6. Inspects skin and rotates bolster, if ordered.							
7. Opens safety plug							
8. Inserts adaptor and tubing							
9. Flushes with 15-30 ml water (or as specified)							
10. Administers medications, if ordered, flushing before and after							
11. Attaches syringe without plunger to feeding port							
12. Pours room temperature formula into syringe							
13. Allows feeding to flow in slowly by gravity							
14. Adjusts height of syringe to achieve prescribed flow rate							
15. Observes tolerance of feeding							
16. Keeps syringe partially filled until feeding complete							
17. Flushes with prescribed amount of water, usually 15-30 ml							
18. Clamps tubing, removes syringe, and reinserts plug							
19. Washes and dries supplies as specified							
20. Washes hands							
21. Documents procedure and observations							
22. Notifies family of any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Skin-Level Gastrostomy Feeding Slow Drip or Continuous Method

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy) and student's activity level							
5. Identifies possible problems and appropriate actions							
6. Identifies size _____ and type _____ of gastrostomy device							
7. Identifies student-specific instructions for guidelines as to:							
• _____ time(s) of feeding							
• _____ ml (amount)							
• _____ formula (type)							
• _____ duration (minutes)							
• _____ position of student							
Identifies Supplies:							
1. Liquid formula or feeding solution, at room temperature							
2. 60 ml catheter-tipped syringe or other feeding container for feeding							
3. Feeding bag and tubing							
4. Feeding pump and stand or carry-pack, if needed							
5. Clamp or plug for end of tube							
6. Water (to flush tubing before and after feeding)							
7. Rubber bands and safety pins (to secure device to clothing)							
8. Gloves							
Procedure:							
1. Washes hands							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
2. Assembles equipment							
3. Shakes formula to mix and measures amount							
4. Positions student and explains procedure.							
5. Washes hands and dons gloves							
6. Inspects skin and rotates bolster, if ordered.							
7. Opens safety plug							
8. Inserts adaptor and tubing							
9. Fills feeding bag with room temperature feeding, primes tubing, and hangs bag							
10. Flushes device with 15-30 ml water (or as specified)							
11. Administers medications, if ordered, flushing before and after							
12. Attaches adaptor tubing to feeding bag tubing, secures, and unclamps							
13. Adjusts flow rate							
14. Observes tolerance of feeding							
15. Keeps bag partially filled until feeding complete; does not hang more than 4 hours' worth of feeding							
16. If single feeding completed, disconnects, and flushes with prescribed amount of water, usually 15-30 ml. Removes adaptor tubing and closes safety plug							
17. Secures tubing if continuous feeding							
18. Washes and dries supplies as specified							
19. Washes hands							
20. Documents procedure and observations							
21. Notifies family of any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Jejunostomy Feeding Continuous Feeding by Pump

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy) and student's activity level							
5. Identifies possible problems and appropriate actions							
6. Identifies size _____ and type _____ of jejunostomy device							
7. Identifies student-specific instructions for guidelines as to:							
• _____ time(s) of feeding							
• _____ ml (amount)							
• _____ formula (type)							
• _____ duration (minutes)							
• _____ position of student							
Identifies Supplies:							
1. Liquid formula or feeding solution, at room temperature							
2. 10 ml catheter-tipped syringe or other feeding container for feeding							
3. Feeding bag and tubing							
4. Feeding pump and stand or carry-pack, if needed							
5. Clamp or plug for end of tube							
6. Water (to flush tubing before and after feeding)							
7. Rubber bands and safety pins (to secure device to clothing)							
8. Gloves							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Shakes formula to mix and measures amount							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
4. Positions student and explains procedure.							
5. Washes hands and dons gloves							
6. Inspects skin							
7. Fills feeding bag with room temperature feeding, primes tubing, and hangs bag							
8. Opens safety plug							
9. Inserts adaptor and tubing							
10. Flushes with 5-10 ml water (or as specified)							
11. Administers medications, if ordered, flushing before and after							
12. Attaches adaptor tubing to feeding bag tubing, secures, and unclamps							
13. Vents G-tube, if present and ordered							
14. Adjusts flow rate on pump							
15. Assesses tolerance of feeding							
16. Keeps bag partially filled until feeding complete; does not hang more than 4 hours' worth of feeding							
17. If single feeding completed, disconnects, and flushes with prescribed amount of water, usually 5-10 ml. Removes adaptor tubing and closes safety plug							
18. Secures tubing if continuous feeding							
19. Washes and dries supplies as specified							
20. Removes gloves and washes hands							
21. Documents procedure and observations							
22. Notifies family of any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Emptying a Colostomy

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy)							
5. Identifies possible problems and appropriate actions							
6. Identifies when _____ and how often _____colostomy should be emptied							
Identifies Supplies:							
1. Tissue, wet washcloth, paper towel, or wet wipe							
2. Toilet or container to dispose of wastes							
3. Gloves, if pouch is to be emptied by someone other than student							
4. Clean pouch with clip closure							
5. Extra pouch supplies							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Positions student and explains procedure							
4. Washes hands and dons gloves							
5. Tilts the bottom of the pouch and removes clamp							
6. Folds bottom to form cuff							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
7. Slowly unfolds end and empty contents							
8. Wipes pouch							
9. Re-applies clamp							
10. Disposes of wastes							
11. Removes gloves and washes hands							
12. Documents procedure and reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Changing a Colostomy Pouch

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy)							
5. Identifies possible problems and appropriate actions							
6. Identifies times/reasons for changes: _____							
Identifies Supplies:							
1. Water							
2. Skin cleanser							
3. Soft cloth or gauze or tissues							
4. Clean pouch with clip closure							
5. Protective paste or powder, if used							
6. Skin barrier							
7. Measuring guide, if needed							
8. Belt, if used							
9. Gloves, if pouch is to be changed by someone other than student							
10. Tape, if needed							
11. Scissors, if needed							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Positions student and explains procedure							
4. Washes hands and dons gloves							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
5. Empties contents of old pouch							
6. Carefully separates pouch and skin barrier							
7. Saves clamp for future use							
8. Gently washes peristomal area and allows to dry							
9. Assesses stoma for integrity							
10. Measures stoma and cuts barrier and pouch to fit							
11. Removes paper and saves to use as a guide if needed							
12. Applies protective paste, if ordered							
13. Applies barrier /wafer/pouch/ correctly							
14. Holds pouch/barrier in place for 30-60 seconds							
15. Seals pouch with clamp							
16. Fastens pouch to belt, if used							
17. Disposes of supplies appropriately							
18. Removes gloves and washes hands							
19. Documents procedure and reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Emptying an Ileostomy

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy)							
5. Identifies possible problems and appropriate actions							
6. Identifies when _____ and how often _____ileostomy should be emptied							
Identifies Supplies:							
1. Tissue, wet washcloth, paper towel, or wet wipe							
2. Toilet or container to dispose of wastes							
3. Gloves, if pouch is to be emptied by someone other than student							
4. Clean pouch with clip closure							
5. Extra pouch supplies							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Positions student and explains procedure							
4. Washes hands and dons gloves							
5. Tilts the bottom of the pouch and removes clamp							
6. Folds bottom to form cuff							
7. Slowly unfolds end and empty contents							
8. Wipes pouch							
9. Re-applies clamp							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
10. Disposes of wastes							
11. Removes gloves and washes hands							
12. Documents procedure and reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Changing an Ileostomy Pouch

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
1. Reviews standard precautions							
2. Identifies student's ability to participate in procedure							
3. Identifies where procedure is done (respects privacy)							
4. Identifies possible problems and appropriate actions							
5. Identifies times/reasons for changes: _____							
Identifies Supplies:							
12. Water							
1. Skin cleanser							
2. Soft cloth or gauze or tissues							
3. Clean pouch with clip closure							
4. Protective paste or powder, if used							
5. Skin barrier							
6. Measuring guide, if needed							
7. Belt, if used							
8. Gloves, if pouch is to be changed by someone other than student							
9. Tape, if needed							
10. Scissors, if needed							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Positions student and explains procedure							
4. Washes hands and dons gloves							
5. Empties contents of old pouch							
6. Carefully separates pouch and skin barrier							
7. Saves clamp for future use							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
8. Gently washes peristomal area, allows to dry, and places gauze over stoma							
9. Assesses stoma for integrity							
10. Measures stoma and cuts barrier and pouch to fit							
11. Removes paper and saves to use as a guide if needed							
12. Apply protective paste, if ordered							
13. Applies barrier/wafer/pouch correctly							
14. Holds pouch/barrier in place for 30-60 seconds							
15. Seals pouch with clamp							
16. Fastens pouch to belt, if used							
17. Disposes of supplies appropriately							
18. Removes gloves and washes hands							
19. Documents procedure and reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Positioning a Student

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Identifies student's ability to participate in procedure							
3. Identifies possible problems and appropriate actions							
Procedure:							
1. Washes hands							
2. Explains procedure							
3. Assembles equipment as needed							
4. Obtains assistance if needed							
5. Follows principles of good body mechanics							
6. Change student's position as needed							
7. Inspects skin							
8. Ensures comfort							
9. Washes hands							
10. Cleans and stores equipment as needed							
11. Documents and reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Assisting a Student with a Cane

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
4. Identifies student's ability to participate in procedure							
5. Identifies possible problems and appropriate actions							
6. Identifies type of cane(s) used:							
7. Identifies type of gait: _____							
Procedure:							
1. Washes hands							
2. Explains procedure							
3. Assembles equipment as needed							
4. Obtains assistance if needed							
5. Checks fit of cane							
6. Teaches/reinforces gait							
7. Teaches stair climbing as needed							
8. Arranges for use of elevator							
9. Arranges transportation during emergencies and drills							
10. Describes safety tips							
11. Cleans and stores equipment as needed							
12. Documents and reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Assisting a Student with Crutches

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Identifies student's ability to participate in procedure							
3. Identifies possible problems and appropriate actions							
4. Identifies type of crutches used:							
5. Identifies type of gait: _____							
Procedure:							
1. Washes hands							
2. Explains procedure							
3. Assembles equipment as needed							
4. Encourages proper shoes							
5. Checks fit of crutches							
6. Checks handpieces and arm pads							
7. Teaches/reinforces gait							
8. Teaches/reinforces sitting							
9. Teaches stair climbing as needed							
10. Arranges for use of elevator							
11. Arranges transportation during emergencies and drills							
12. Describes safety tips							
13. Cleans and stores equipment as needed							
14. Documents and reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

Skills Checklist: Assisting a Student with a Walker

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Identifies student's ability to participate in procedure							
3. Identifies possible problems and appropriate actions							
4. Identifies type of walker used: _____							
Procedure:							
1. Washes hands							
2. Explains procedure and encourages student to participate							
3. Assembles equipment as needed							
4. Checks fit of walker							
5. Teaches/reinforces gait							
6. Does not allow use on stairs							
7. Arranges for use of elevator							
8. Arranges transportation during emergencies and drills							
9. Describes safety tips							
10. Cleans and stores equipment as needed							
11. Documents and reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

Skills Checklist: Assisting a Student with a Wheelchair

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Identifies student's ability to participate in procedure							
3. Identifies possible problems and appropriate actions							
4. Identifies type of wheelchair used: _____							
Procedure:							
1. Washes hands							
2. Explains procedure and encourages student to participate							
3. Assembles equipment as needed							
4. Checks all areas of school and grounds for wheelchair accessibility							
5. Monitors for skin irritations and pressure areas							
6. Teaches and assists moving from a surface to wheelchair							
7. Teaches and assists moving from sitting to standing							
8. Teaches and assists moving from standing to sitting							
9. Locks wheelchair whenever appropriate							
10. Uses a seatbelt or harness whenever needed for safety							
11. Stays with student until stable							
12. Maintains good body mechanics							
13. Recharges batteries as needed							
14. Arranges for use of elevator							
15. Arranges transportation during emergencies and drills							
16. Describes safety tips							
17. Cleans and stores equipment as needed							
18. Documents and reports any changes							

Procedure approved by:

Parent/Guardian signature	Date

I have received and understand the training.

Trainee Signature	Date
Trainer Signature (RN)	Date
Supervising RN Signature	Date

Skills Checklist: Assisting a Student with a Prosthesis

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Identifies student's ability to participate in procedure							
3. Identifies possible problems and appropriate actions							
4. Identifies type of prosthesis used:							
Procedure:							
1. Washes hands							
2. Explains procedure and encourages student to participate							
3. Assembles equipment as needed							
4. Checks gait if applicable							
5. Checks proper fit, alignment, and function of prosthesis							
6. Inspects skin for redness or breakdown							
7. Arranges for use of elevator if needed							
8. Arranges transportation during emergencies and drills if needed							
9. Documents and reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Assisting a Student with an Orthosis

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Identifies student's ability to participate in procedure							
3. Identifies possible problems and appropriate actions							
4. Identifies type of orthosis used: _____							
Procedure:							
1. Washes hands							
2. Explains procedure and encourages student to participate							
3. Assembles equipment as needed and checks for wear and any defects							
4. Determines student's ability to put on and remove orthosis							
5. Checks gait							
6. Checks proper fit, alignment, and function of orthosis							
7. Inspects skin for redness or breakdown							
8. Checks circulation and skin if student has any complaints of burning, pain, or decreased sensation							
9. Arranges for use of elevator if needed							
10. Arranges transportation during emergencies and drills if needed							
11. Documents and reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer/Supervisor RN Signature Date

Skills Checklist: Cast Care

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Identifies student's ability to participate in procedure							
3. Identifies possible problems and appropriate actions							
4. Identifies type of casting material used: _____							
5. Identifies whether weight bearing or not _____							
Procedure:							
1. Washes hands							
2. Explains procedure and encourages student to participate							
3. Checks cast for wear and any defects							
4. Cautions student not to put anything inside cast or scratch under cast							
5. Checks cast fit by checking color, swelling, capillary refill, sensation and movement							
6. Observes for the five "Ps"							
7. Protects cast from soiling							
8. Inspects skin for redness or breakdown							
9. Changes position and keeps affected limb elevated as needed; does not use bar on spica cast to lift student							
10. Arranges for use of elevator if needed							
11. Arranges transportation during emergencies and drills if needed							
12. Documents and reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer/Supervisor RN Signature Date

Skills Checklist: Body Mechanics

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Principles:							
1. Obtains help when needed to lift heavy loads							
2. Uses proper posture							
3. When possible, pushes, pulls, rolls, or lowers objects instead of lifting							
4. Stands close to objects to be moved							
5. Provides broad base of support							
6. Keeps back straight, knees and hips flexed, weight distributed on both feet, and shoulders in line with pelvis							
7. Flexes knees instead of stooping							
8. Avoids twisting of torso							
9. Uses verbal counts to coordinate movements with others							
10. Squats and stands to lift rather than bending over and lifting							
11. Carries objects close to body							
12. Carries using muscles that pull shoulder blades together							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer/Supervisor RN Signature Date

_____ _____

Skills Checklist: Administering Rectal Diazepam

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies possible problems and appropriate actions							
4. Reviews cardiopulmonary resuscitation training							
5. Verifies medication dose Diazepam_____ mg							
Identifies Supplies:							
1. Gloves							
2. Medication syringe with rectal diazepam							
3. Lubricating jelly (comes with syringe)							
Procedure:							
1. Washes hands if possible							
2. Assembles equipment and obtains assistance if possible							
3. Dons gloves							
4. Removes protective syringe cover and lubricates tip							
5. Turns student on left side							
6. Gently inserts syringe tip in rectum							
7. Slowly pushes in medication							
8. Removes syringe and holds buttocks together							
9. Notes time medication given							
10. Calls 911 and activates emergency plan							
11. Constantly monitors for side effects, especially respiratory							
12. Removes gloves and washes hands							
13. Documents diazepam administration, student response, and implementation of emergency plan							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Activating Vagal Nerve Stimulation for Seizures

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews literature on VNS							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy)							
5. Identifies possible problems and appropriate actions							
6. Identifies situations where VNS may need to be stopped							
7. Checks Pulse Generator battery _____ (when)							
Identifies Supplies:							
1. VNS magnet							
Procedure:							
1. Keeps magnet with student at all times							
2. If student senses a seizure, places magnet over Pulse Generator (PG) for one second							
a. Pager-style : removes belt clip and magnet from belt and places label side against PG							
b. Watch-style: positions wrist so label can be placed over PG							
3. Moves magnet away after one second							
4. Stops stimulation when needed by holding magnet over Pulse Generator, but does not use magnet for more than four hours							
5. Checks Pulse Generator battery on a regular basis by causing a stimulation							
6. If stimulation causes pain, holds magnet in place to stop pain and contacts health care provider immediately							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
7. Documents and reports any complaints of sore throat, hoarseness, or other problems							
8. Reports any changes to nurse & family							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Monitoring a Ventricular Shunt

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies possible problems and appropriate actions							
5. Identifies student-specific signs of shunt malfunction (specify) _____ _____ _____ ___							
6. Reviews other possible signs of shunt malfunction							
Identifies Supplies:							
1. Blood pressure cuff and stethoscope							
Procedure:							
1. Documents baseline behavior, level of activity, coordination, and response to environment							
2. Obtains baseline vital signs							
3. Observes for signs of shunt malfunction							
4. Notifies school nurse and family of any changes or concerns							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer/Supervisor RN Signature Date

Skills Checklist: Peak Flow Rate Monitoring

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy)							
5. Identifies possible problems and appropriate actions							
6. Identifies when and how often to measure peak flow rate (PFR)_____ _____							
7. Identifies values for student:							
• _____ Green							
• _____ Yellow							
• _____ Red							
Identifies Supplies:							
1. Peak flow meter							
2. Chart or log of peak flow readings							
Procedure:							
1. Washes hands							
2. Assembles equipment as needed							
3. Explains procedure							
4. Makes sure sliding marker starts at zero							
5. Advises student to stand and to clear mouth							
6. Instructs student to take deep breath, place mouthpiece in mouth and blow out as hard as possible							
7. Notes number achieved and repeats two more times							
8. Records highest number							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
9. Measures PFR on a regular basis and as needed							
10. Correctly compares measurements and takes appropriate actions							
11. Washes and dries meter as specified							
12. Documents PFR reading and any actions taken							
13. Reports significant changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Using a Metered Dose Inhaler

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy)							
5. Identifies possible problems and appropriate actions							
6. Identifies: type of MDI _____ medication_____ type of spacer if used _____							
7. Identifies when and how often to use metered dose inhaler (MDI)_____ _____							
Identifies Supplies:							
1. Metered dose inhaler							
2. Medication log							
Procedure:							
1. Washes hands							
2. Assembles equipment as needed							
3. Explains procedure							
4. Has student stand and hold MDI correctly							
5. Removes cap and shakes MDI							
6. Tilts head and breathes out							
7. Positions MDI 1-2 inches from mouth or uses spacer							
8. Follows correct procedure for any spacer used							
9. Presses to release medication while breathing in slowly							
10. Holds breath for 10 seconds							
11. Repeats puff as ordered							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
12. Waits one minute between puffs of rescue medications							
13. Wipes off mouthpiece and replaces cap							
14. Washes hands							
15. Documents medication and student response							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Nebulizer Treatments

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy)							
5. Identifies possible problems and appropriate actions							
6. Identifies medication, amount, and frequency_____							
Identifies Supplies:							
1. Compressor							
2. Connecting tubing							
3. Nebulizer medication chamber							
4. Mask, or mouthpiece with T adaptor							
5. Medication							
6. Diluting solution							
7. Syringe, if needed for measuring							
8. Filter disc/exhalation filter, if needed							
Procedure:							
1. Determines need for treatment							
2. Washes hands							
3. Assembles equipment as needed							
4. Positions student and explains procedure							
5. Attaches connecting tubing to compressor							
6. Unscrews nebulizer cup							
7. Measures medication accurately and places correct amount and diluting solution (if needed) into nebulizer cup							
8. Screws cup back together							
9. Attaches connecting tubing to medication cup							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
10. Keeps cup vertical and attaches face mask or T tube to cup							
11. Turns on power switch							
12. Has student seal lips around mouthpiece or places mask over mouth and nose							
13. Instructs student to breathe normally and take a deep breath every 1-2 minutes							
14. Allows medication to completely aerosolize before ending treatment							
15. Removes mouthpiece or mask							
16. Assesses student's respiratory status and takes appropriate actions							
17. Washes, dries and stores equipment appropriately							
18. Washes hands							
19. Documents treatment							
20. Reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Oxygen Cylinder

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy)							
5. Identifies possible problems and appropriate actions							
6. Identifies oxygen safety precautions							
Identifies supplies:							
1. Oxygen cylinder with key							
2. Oxygen regulator							
3. Flowmeter							
4. Delivery device with oxygen tubing							
5. Humidifier, if needed							
6. Tank Stand							
Procedure:							
1. Positions student and explains procedure							
2. Washes hands							
3. Prepares tank and regulator							
4. Turns on tank							
5. Checks pressure in tank							
6. Estimates amount of time tank will last							
7. Connects delivery device and humidifier (if needed) to cylinder							
8. Adjusts flow to ordered liters per minute; checks delivery device to make sure oxygen is coming out							
9. Provides oxygen to student using delivery device prescribed							
10. Monitors PSI, flow, and time while tank is being used							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
11. Monitors student's respiratory status while oxygen being used							
12. Turns off tank before turning off flowmeter when oxygen no longer needed or tank is changed							
13. Stores tank safely							
14. Washes hands							
15. Documents procedure and observations							
16. Notifies family of any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Liquid Oxygen System

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy)							
5. Identifies possible problems and appropriate actions							
6. Identifies oxygen safety precautions							
Identifies Supplies:							
1. Liquid oxygen system							
2. Delivery device with oxygen tubing							
3. Humidifier, if needed							
Procedure:							
1. Positions student and explains procedure							
2. Washes hands							
3. Assembles supplies and prepares unit							
4. Checks level of fluid							
5. Connects delivery device and humidifier to liquid system							
6. Adjusts flow to prescribed rate; checks delivery device to make sure oxygen is coming out							
7. Provides oxygen to student using delivery device prescribed							
8. Monitors flow							
9. Monitors student's respiratory status while oxygen being used							
10. Turns off cylinder before turning off flowmeter when oxygen no longer needed or cylinder is changed							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
11. Washes hands							
12. Monitors level of liquid daily and stores cylinder safely							
13. Documents procedure and observations							
14. Notifies family of any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Oxygen Concentrator

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy)							
5. Identifies possible problems and appropriate actions							
6. Identifies oxygen safety precautions							
Identifies Supplies:							
1. Oxygen concentrator							
2. Delivery device with oxygen tubing							
3. Flowmeter							
4. Humidifier, if needed							
Procedure:							
1. Positions student and explains procedure							
2. Washes hands							
3. Assembles supplies and checks filter							
4. Turns on concentrator							
5. Connects delivery device to concentrator with oxygen tubing							
6. Adjusts flow to prescribed rate; checks delivery device to make sure oxygen is coming out							
7. Provides oxygen to student using delivery device prescribed							
8. Monitors flow							
9. Monitors student's respiratory status while oxygen being used							
10. Turns off tank before turning off flowmeter when oxygen no longer needed or tank is changed							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
11. Washes hands							
12. Documents procedure and observations							
13. Notifies family of any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Go Bag Supplies

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Identifies Supplies and Their Use:							
1. Resuscitator bag							
2. Extra tracheostomy tube with ties (and obturator if needed)							
3. Extra tracheostomy tube one size smaller							
4. 3 ml Syringe							
5. Suction catheters							
6. Gloves							
7. Bulb syringe							
8. Portable suction machine							
9. Blunt scissors							
10. Tissues							
11. Hydrogen peroxide							
12. Cotton-tipped applicators							
13. Pipe cleaners, if needed							
14. Pre-cut tracheal gauze/sponges							
15. Saline or water-soluble lubricant							
16. Saline vials or dosettes							
17. Passive condenser							
18. List of emergency phone numbers							
19. List of go bag supplies							
20. Emergency plan							
21. Any other items specified in IHP _____							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Nasal Cannula

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done							
5. Identifies oxygen flow rate_____							
6. Identifies possible problems and appropriate actions							
7. Identifies oxygen safety precautions							
Identifies Supplies:							
1. Oxygen source and backup							
2. Cannula and tubing							
3. Humidity source, if needed							
4. Adaptor for connecting tubing							
5. Extra connecting tubing, if needed for mobility							
Procedure:							
1. Reviews oxygen safety precautions							
2. Washes hands							
3. Gathers equipment							
4. Positions student and explains procedure							
5. Attaches cannula tubing to oxygen							
6. Turns on oxygen							
7. Correctly sets flowmeter							
8. Checks prongs for flow							
9. Gently places prongs in nostrils							
10. Loops tubing and ensures comfort							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
11. Uses only water-soluble nasal care products, if needed							
12. Washes hands							
13. Documents procedure and observations							
14. Notifies family of any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Oxygen Mask

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done							
5. Identifies oxygen flow rate_____							
6. Identifies possible problems and appropriate actions							
7. Identifies oxygen safety precautions							
Identifies Supplies:							
1. Oxygen source and backup							
2. Mask and tubing							
3. Humidity source, if needed							
4. Adaptor for connecting tubing							
5. Extra connecting tubing, if needed for mobility							
Procedure:							
1. Reviews oxygen safety precautions							
2. Washes hands							
3. Assembles equipment							
4. Positions student and explains procedure							
5. Attaches tubing to mask and oxygen							
6. Turns on oxygen							
7. Correctly sets flowmeter							
8. Checks mask for flow							
9. Correctly places mask over student's nose, mouth, and chin							
10. Adjusts elastic band and ensures comfort							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
11. Washes hands							
12. Documents procedure and observations							
13. Notifies family of any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Pulse Oximetry

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done							
5. Identifies acceptable pulse oximetry values for student _____							
6. Identifies possible problems and appropriate actions							
Identifies Supplies:							
1. Oximeter							
2. Oximeter probe or sensor							
Procedure:							
1. Determines need for oximetry							
2. Washes hands							
3. Assembles equipment							
4. Positions student and explains procedure							
5. Selects appropriate site for sensor							
6. Attaches sensor correctly; makes sure light source and photodetector are directly opposite							
7. Attaches sensor cable to oximeter (if needed)							
8. Turns on machine							
9. Correlates oximeter pulse rate with radial pulse							
10. Reads saturation level							
11. Verifies alarms and sets limits _____							
12. Removes sensor if intermittent monitoring and correctly stores supplies							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
13. Washes hands							
14. Documents readings and observations of respiratory status							
15. Notifies family of any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Tracheal Suctioning

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done							
5. Identifies possible problems and appropriate actions							
Identifies Supplies:							
1. Suction machine and manual backup							
2. Correctly-sized suction catheter							
3. Sterile saline or water							
4. Container for saline or water							
5. Gloves							
6. Resuscitator bag with tracheostomy adaptor							
7. Saline, if prescribed							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Positions student and explains procedure							
4. Encourages student to cough up secretions							
5. Turns on suction machine and checks for function							
6. Washes hands							
7. Opens suction catheter or kit							
8. Pours saline/water into container							
9. Dons gloves and other protective gear as needed							
10. Connects suction catheter to suction machine tubing							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
11. Checks function by suctioning up water							
12. Determines depth of suctioning needed							
13. Inserts catheter into tracheostomy tube without suction							
14. Applies suction; twirls catheter between fingers as it is pulled out							
15. Uses no more than 5-10 seconds for each suctioning pass							
16. Maintains sterile technique while suctioning							
17. Allows rest and gives breaths with resuscitator bag between passes							
18. Does <u>not</u> routinely instill saline unless specifically ordered							
19. Repeats suctioning as needed for removal of secretions							
20. Suctions nose and mouth if indicated							
21. Rinses catheter and tubing until clear							
22. Disconnects catheter from tubing and disposes of catheter and gloves properly							
23. Turns off suction							
24. Washes hands							
25. Documents color, consistency, and quantity of secretions as well as respiratory status							
26. Reports any changes							
27. Makes sure equipment and supplies are restocked and ready for next use							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer/Supervisor RN Signature Date

Skills Checklist: Tracheal Suctioning Using a Sleeved Catheter

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done							
5. Identifies possible problems and appropriate actions							
Identifies Supplies:							
1. Suction machine and manual backup							
2. Correctly-sized sleeved suction catheter							
3. Sterile saline or water							
4. Container for saline or water							
5. Gloves							
6. Resuscitator bag with tracheostomy adaptor							
7. Saline, if prescribed							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Positions student and explains procedure							
4. Encourages student to cough up secretions							
5. Turns on suction machine and checks for function							
6. Washes hands							
7. Opens suction catheter or kit							
8. Pours saline/water into container							
9. Dons gloves and other protective gear as needed							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
10. Attaches control valve of sleeved catheter to connecting suction tubing							
11. Checks function by suctioning up water							
12. If ventilator dependent, attaches T-piece to ventilator circuit and connects to tracheostomy							
13. Determines depth of suctioning needed							
14. Advances catheter into tracheostomy tube without suction							
15. Applies suction; twirls catheter between fingers as it is pulled out							
16. Uses no more than 5-10 seconds for each suctioning pass							
17. Allows rest and gives breaths with resuscitator bag between passes							
18. Does not routinely instill saline							
19. Repeats suctioning as needed for removal of secretions							
20. Rinses catheter and tubing until clear							
21. Stores catheter for re-use as specified in IHP							
22. Does not reuse catheter if it is used to suction mouth or nose							
23. Turns off suction							
24. Removes gloves and washes hands							
25. Documents color, consistency, and quantity of secretions as well as respiratory status							
26. Reports any changes							
27. Makes sure equipment and supplies are restocked and ready for use							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer/Supervisor RN Signature Date

Skills Checklist: Tracheostomy Tube Changes

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done							
5. Identifies type and size of trach tube _____							
6. Identifies possible problems and appropriate actions							
Identifies Supplies:							
1. Exact size and type of tracheostomy tube ordered for student							
2. Tracheostomy tube one size smaller than currently being used.							
3. Velcro ties, twill tape, or other ties							
4. Obturator, if needed (used as a guide for insertion)							
5. Blunt scissors							
6. Syringe to inflate and deflate cuff, if tube has a cuff							
7. Sterile water-soluble lubricant or sterile saline							
8. Resuscitation bag							
9. Blanket roll, if needed, to position student's neck							
10. Stethoscope							
11. Oxygen, if ordered							
12. Suctioning device and supplies							
13. Gloves							
14. Another person to assist, if possible							
Procedure:							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
1. Changes only when necessary at school, not on a routine basis							
2. Washes hands							
3. Assembles equipment							
4. Positions student and explains procedure							
5. Washes hands							
6. Keeps spare ties ready							
7. Opens tracheostomy tube package maintaining sterile technique							
8. Dons gloves and other protective gear as needed							
9. Inserts obturator into tracheostomy tube							
10. Attaches ties to one side of new tube							
11. Lubricates tube sparingly if ordered							
12. Administers supplemental oxygen if ordered							
13. Cuts ties; holds tube securely in place when ties are not secure							
14. With new tube ready, removes old tube							
15. Inserts new tube, secures, and removes obturator immediately							
16. Inserts inner cannula if needed							
17. Listens and feels for air movement and assesses respiratory status							
18. If tube has cuff, inflates cuff							
19. Secures tube with ties							
20. Does skin care if needed and applies gauze							
21. Discards used supplies properly							
22. Removes gloves and washes hands							
23. Documents color, consistency, and quantity of secretions as well as respiratory status							
24. Notifies family of any changes							

Procedure approved by:

_____

Parent/Guardian signature Date

_____

Trainer/Supervisor RN Signature Date

I have received and understand the training.

_____

Trainee Signature Date

Skills Checklist: Using Oxygen with a Tracheostomy Collar

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done							
5. Identifies possible problems and appropriate actions							
6. Identifies oxygen flow rate _____							
7. Reviews oxygen safety precautions							
Identifies Supplies:							
1. Tracheostomy collar							
2. Humidifier							
3. Heating device, if indicated							
4. Oxygen tubing							
5. Wide bore tubing							
6. Nipple adaptor							
7. Oxygen source							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Positions student and explains procedure							
4. Sets up humidification device							
5. Attaches tubing to air/oxygen							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
6. Turns on oxygen							
7. Sets flow rate correctly							
8. Connects to heater and/or humidifier							
9. Confirms mist coming out of tubing							
10. Empties tubing when water condensation builds up							
11. Places collar over tracheostomy correctly							
12. Washes hands							
13. Documents procedure and respiratory status							
14. Reports any changes or concerns							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Using a Manual Resuscitator with a Tracheostomy

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done							
5. Identifies possible problems and appropriate actions							
6. Reviews oxygen safety precautions							
Identifies Supplies:							
1. Manual resuscitator bag (e.g. Ambu)							
2. Adaptor for tracheostomy tube							
3. Oxygen source with appropriate tubing, if needed							
4. Tracheostomy or ventilator supplies, as appropriate							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Positions student and explains procedure							
4. Keeps bag near student with attachments ready for student use							
5. Attaches bag to tracheostomy tube							
6. Squeezes bag appropriately to deliver breaths							
7. Coordinates with students breaths and delivers correct rate							
8. Assesses effectiveness of bagging							
9. Disconnects when bagging no longer needed							
10. Washes hands							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
11. Documents procedure and respiratory status							
12. Notifies family of any changes or concerns							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Nose and Mouth Suctioning Using Suction Machine

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done							
5. Identifies possible problems and appropriate actions							
Identifies Supplies:							
1. Suction machine and tubing							
2. Suction catheter of the appropriate size, or Yankauer or tonsil tip suction catheter							
3. Bulb syringe or other manual backup suction							
4. Disposable gloves							
5. Plastic bag for disposal of materials							
6. Water or saline to clean and lubricate catheter, with container							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Positions student and explains procedure							
4. Switches on suction machine and checks suction							
5. Encourages student to cough up secretions							
6. Opens suction catheter without touching inside of package							
7. Dons gloves							
8. Connects catheter to suction tubing							
9. Checks suction by drawing up water							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
10. Inserts catheter into nose							
11. Covers vent hole and suctions while withdrawing catheter							
12. Repeats suctioning of nose as needed							
13. Suctions mouth after nose							
14. If using Yankauer, suctions in mouth along gum line and other parts of mouth as needed							
15. Rinses catheter and tubing with water							
16. Disconnects catheter from tubing and disposes of catheter appropriately							
17. Removes gloves and washes hands							
18. Documents procedure and respiratory status							
19. Reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Nose and Mouth Suctioning with a Bulb Syringe

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done							
5. Identifies possible problems and appropriate actions							
Identifies Supplies:							
1. Bulb syringe							
2. Saline							
3. Tissues							
4. Disposable gloves							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Positions student and explains procedure							
4. Dons gloves							
5. Holds bulb syringe in palm with tip between index and middle finger							
6. Squeezes bulb syringe flat with thumb							
7. Places tip gently in nose or mouth and lets bulb fill up							
8. Removes from nose or mouth and squirts secretions into tissue or basin							
9. Repeats suctioning of nose and mouth as needed							
10. Suctions mouth after nose if both are suctioned							
11. Loosens secretions with saline if needed							
12. Cleans bulb syringe in hot soapy water; rinses, dries, and stores							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
13. Disposes of tissues appropriately							
14. Removes gloves and washes hands							
15. Documents procedure and character of secretions							
16. Reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Chest Physiotherapy (CPT)

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done							
5. Identifies possible problems and appropriate actions							
6. Identifies positions to be used for CPT _____ _____ _____ _____ _____							
Identifies Supplies:							
1. Pillows							
2. Suction equipment, if needed							
3. Tissues							
4. Wastebasket with plastic liner							
5. Vest airway clearance system, if prescribed							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Explains procedure							
4. Places vest airway clearance system on student if prescribed							
5. Positions student as specified							
6. Percusses over selected area for specified time _____							
7. Uses vibration over area if specified							
8. Instructs student to cough into tissue following percussion							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
9. Performs CPT over each area specified							
10. Disposes of tissues appropriately							
11. Washes hands							
12. Documents CPT and reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Ventilator Machine/Circuit and Settings

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Identifies Components and Use:							
1. Power source							
• Accessible, grounded outlets							
• Internal battery							
• External battery							
• Back-up battery							
• Emergency power supply							
2. Circuit							
• Pressure tubing							
• Exhalation valve							
• PEEP valve							
• Other adaptors as needed							
3. Oxygen source							
• Adequate supply, spare tank, gauge							
• Connection to ventilator and spare tubing							
• Flow rate and oxygen percentage							
4. Humidification source							
• Passive condenser							
• Heat moisture exchanger							
5. Patient pressure manometer							
6. Alarms							
• High and low pressure							
• Volume							
• Power source							
• Temperature (if present)							
7. Manual resuscitator bag and adaptor							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
8. Spare tracheostomy tube and supplies (go-bag supplies)							
9. Suctioning equipment							
Ventilator Parameters:							
1. Tidal volume							
2. Respiratory rate							
3. Oxygen							
4. Peak inspiratory pressure							
5. Positive end expiratory pressure							
6. Inspiratory time							
7. Sigh volume							
Ventilator Modes							
1. Assist control (AC)							
2. Intermittent mandatory ventilation (IMV)							
3. Synchronized intermittent mandatory ventilation (SIMV)							
4. Pressure support ventilation (PSV)							
5. Continuous positive airway pressure (CPAP)							
6. Controlled mandatory ventilation (CMV)							
7. Pressure regulated volume control (PRVC)							

*****Use of this checklist alone does <u>not</u> constitute comprehensive competency-based training in ventilator oversight. Additional training is essential and should be documented.*****

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer/Supervisor RN Signature Date

Skills Checklist: Ventilator Troubleshooting Alarms

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Procedure if Alarm Sounds							
1. Identifies which alarm is sounding							
2. Always checks student first when alarm sounds							
3. Removes student from ventilator and gives breaths with resuscitator bag if problem not immediately correctly within a few seconds							
4. Identifies high pressure alarm sound:							
• Student may have mucus and need suctioning. Suctions as needed							
• Checks position of tracheostomy tube. Corrects or replaces as needed							
• Checks for student coughing, sneezing, talking, or laughing which can trigger alarm							
• Assesses for bronchospasm							
• Observes for student anxiety and "fighting" of ventilator. Calms as needed							
• Checks tubing for kinks							
• Checks for condensation in tubing							
• Checks exhalation valve for obstruction							
• Checks for accidental change of ventilator settings							
5. Identifies low pressure alarm sound:							
• Checks for tubing disconnection. Reconnects if needed							
• Checks for loose connections, leaks, or cracks in system. Tightens, if needed							
• Checks tracheostomy tube for correct placement and corrects or replaces							
• Checks for leak in cuff, if present							
• Checks exhalation valve for moisture or puncture							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
• Checks for accidental change of ventilator settings							
6. Identifies power alarm sound:							
• Makes sure ventilator plugged into outlet if using AC power							
• Checks AC power, internal battery, external battery							
• If all power sources fail, removes from ventilator, gives breaths with resuscitator bag and activates emergency plan							
7. Places student back on ventilator when problem is solved							
8. Resets alarms if needed							
9. Activates emergency plan if needed. Gives breaths with manual resuscitator bag as long as necessary							

*****Use of this checklist alone does <u>not</u> constitute comprehensive competency-based training in ventilator alarm troubleshooting. Additional training is essential and should be documented.*****

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Clean Intermittent Catheterization--Male

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies possible problems and appropriate actions							
5. Identifies where procedure is done _____ (respects privacy)							
6. Identifies times for clean intermittent catheterizations (CIC) _____							
7. Identifies student position for CIC _____							
Identifies Supplies:							
1. Water-soluble lubricant							
2. Catheter (e.g., plastic, polyvinylchloride, metal)							
3. Wet wipes or cotton balls plus mild soap and water or student-specific cleansing supplies							
4. Storage receptacle for catheter, such as a sealed plastic bag							
5. Toilet or container for urine							
6. Gloves, if person other than student does procedure							
Procedure:							
1. Washes hands							
2. Assembles equipment and obtains assistance if possible							
3. Explains procedure and positions student							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
4. Washes hands and dons gloves Chooses non-latex gloves							
5. Lubricates first 3 inches of catheter with water-soluble lubricant							
6. Cleanses penis as specified _____							
7. Uses each swab/cotton ball only once in cleaning							
8. Wipes/swabs a minimum of three times							
9. Foreskin may be retracted for cleaning if needed							
10. Holding penis at a 45-90 degree angle, gently inserts catheter							
11. Does not force catheter if unusual resistance is felt							
12. Advances catheter until urine begins to flow							
13. When flow stops, advances catheter a little further, then rotates and withdraws slightly to completely drain bladder							
14. Pinches catheter and withdraws							
15. Pulls foreskin back over glans, if not circumcised							
16. Wipes off excess lubricant and assists student in dressing							
17. Measures and records urine volume, if ordered							
18. Disposes of urine appropriately							
19. Washes, rinses, dries, and stores catheter appropriately							
20. Removes gloves and washes hands							
21. Documents procedure and characteristics of urine							
22. Reports any changes							

Procedure approved by:

_____

Parent/Guardian signature Date

I have received and understand the training.

_____

Trainee Signature Date

_____

Trainer/Supervisor RN Signature Date

Skills Checklist: Clean Intermittent Catheterization--Female

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies possible problems and appropriate actions							
5. Identifies where procedure is done _____ (respects privacy)							
6. Identifies times for clean intermittent catheterizations (CIC) _____							
7. Identifies student position for CIC _____							
Identifies Supplies:							
1. Water-soluble lubricant							
2. Catheter (e.g., plastic, polyvinylchloride, metal)							
3. Wet wipes or cotton balls plus mild soap and water or student-specific cleansing supplies							
4. Storage receptacle for catheter, such as a sealed plastic bag							
5. Toilet or container for urine							
6. Gloves, if person other than student does procedure							
Procedure:							
1. Washes hands							
2. Assembles equipment and obtains assistance if possible							
3. Explains procedure and positions student							
4. Washes hands and dons gloves Chooses non-latex gloves							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
5. Lubricates first 3 inches of catheter with water-soluble lubricant							
6. Separates the labia and cleanses starting at top of labia and going down toward rectum							
7. Uses each swab/cotton ball only once in cleaning							
8. Wipes/swabs three times							
9. Does not use a circular motion in cleaning							
10. Locates the urinary meatus							
11. Gently inserts until urine begins to flow							
12. Does not force catheter if unusual resistance is felt							
13. When flow stops, advances catheter a little further, then rotates and withdraws slightly to completely drain bladder							
14. Pinches catheter and withdraws							
15. Wipes off excess lubricant and assists student in dressing							
16. Measures and records urine volume, if ordered							
17. Disposes of urine appropriately							
18. Washes, rinses, dries, and stores catheter appropriately							
19. Removes gloves and washes hands							
20. Documents procedure and characteristics of urine							
21. Reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer/Supervisor RN Signature Date

Skills Checklist: Monitoring an Indwelling Urinary Catheter

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies possible problems and appropriate actions							
5. Identifies where procedure is done _____ (respects privacy)							
Identifies Supplies:							
1. Gloves							
Procedure:							
1. Monitors urine output for adequacy							
2. Encourages fluid intake							
3. Avoids lifting collection device or tubing above bladder							
When Emptying Drainage Bag:							
4. Washes hands and dons gloves							
5. Opens outlet valve and drains urine into appropriate container							
6. Does not allow end of tubing to touch anything which could contaminate it							
7. Does not lift tubing or bag above bladder level							
8. Closes clamp/valve							
9. Measures and records urine volume							
10. Does <u>not</u> disconnect catheter from drainage tubing							
11. Disposes of urine and gloves appropriately							
12. Washes hands after any contact with drainage bag, tubing, or catheter							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
13. Documents procedure and characteristics of urine							
14. Reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Care of External Urinary Catheter

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies possible problems and appropriate actions							
5. Identifies where procedure is done _____ (respects privacy)							
Identifies Supplies:							
1. Water-soluble lubricant							
2. Skin adhesive or tincture of benzoin and cotton tipped applicators							
3. Adhesive remover							
4. Condom-type urine collection device							
5. One-inch wide elastic adhesive							
6. Scissors							
7. Paper towels							
8. Gloves							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Explains procedure and positions student							
4. Arranges for another adult to be present, if possible							
5. Wash hands and dons gloves							
6. Gently removes existing external catheter							
7. Inspects skin of penis							
8. Does not apply collection device if skin irritated							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
9. Cleanses shaft of penis as needed and dries thoroughly							
10. Makes small hole in center of paper towel and places if over shaft of penis to decrease contact between adhesive and hair							
11. Rolls external catheter onto glans, leaving 1/2 - 2 inch space between ends of tubing and penis							
12. Applies adhesive to shaft of penis; does not apply adhesive on glans							
13. Unrolls condom-type collection device to cover shaft of penis							
14. If ordered, spiral wraps strip of elastic tape							
15. Does not overlap tape or wrap tape completely around penis							
16. Clips and removes ring of condom, if present							
17. Attaches condom to leg bag or drainage bag							
18. Empties collection bag before it becomes full							
19. Disposes of urine and gloves appropriately							
20. Washes hands after any contact with drainage bag, tubing, or catheter							
21. Documents procedure and characteristics of urine							
22. Reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Changing an Urostomy Pouch

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies where procedure is done (respects privacy)							
5. Identifies possible problems and appropriate actions							
6. Identifies times/reasons for changes: _____							
Identifies Supplies:							
1. Water							
2. Skin cleanser							
3. Soft cloth or gauze or tissues							
4. Replacement pouch and belt							
5. Skin prep							
6. Skin barrier							
7. Measuring guide, if needed							
8. Container to store pouch							
9. Adhesive							
10. Gloves, if pouch is to be changed by someone other than student							
11. Tape, if needed							
12. Scissors, if needed							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Positions student and explains procedure							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
4. Washes hands and dons gloves							
5. Empties contents of old pouch							
6. Carefully removes pouch and skin barrier							
7. Gently washes peristomal area, allows to dry, and places gauze over stoma							
8. Assesses stoma/skin for integrity							
9. Measures stoma and cuts barrier and pouch to fit							
10. Removes paper and saves to use as a guide							
11. Pats skin dry							
12. Applies barrier correctly							
13. Removes used gauze/cloth and discards							
14. Centers new pouch over stoma/barrier							
15. Makes sure there are no wrinkles Holds pouch/barrier in place for 30-60 seconds							
16. Makes sure pouch is sealed							
17. Fastens pouch to belt, if used							
18. Disposes of supplies appropriately							
19. Removes gloves and washes hands							
20. Documents procedure and reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Skills Checklist: Catheterizing a Continent Urostomy, Vesicostomy, Appendicovesicostomy, or Umbilical (Mitrofanoff) Stoma

Student's Name: _____ Teacher: _____

Person Trained: _____ Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHP for student-specific instructions							
2. Reviews standard precautions							
3. Identifies student's ability to participate in procedure							
4. Identifies possible problems and appropriate actions							
5. Identifies where procedure is done _____ (respects privacy)							
6. Identifies type and anatomy of ostomy and stoma _____ _____ _____							
7. Identifies times for clean intermittent catheterizations (CIC) _____							
8. Identifies student position for CIC _____							
Identifies Supplies:							
1. Soap and water or alcohol-free towelette							
2. Gloves, if pouch is to be changed by someone other than student							
3. Catheter							
4. Water-soluble lubricant							
5. Catheter storage bag							
6. Container to collect and dispose of urine if unable to perform procedure while student sits on toilet							
7. Small adhesive bandage or stoma covering							
Procedure:							
1. Washes hands							

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
2. Assembles equipment							
3. Explains procedure and positions student							
4. Wash hands and dons gloves							
5. Washes stoma with _____ (cleansing supplies)							
6. Lubricates catheter tip with water-soluble lubricant							
7. Holding catheter near the tip, gently inserts into stoma until urine flows							
8. Leaves catheter in stoma until urine flow stops							
9. Slowly withdraws catheter							
10. Covers stoma with covering or as specified							
11. Observes, measures, and disposes of urine properly							
12. Washes, dries and stores equipment per student specific guidelines							
13. Removes gloves and washes hands							
14. Documents procedure and characteristics of urine							
15. Reports any changes							

Procedure approved by:

_____ _____

Parent/Guardian signature Date

I have received and understand the training.

_____ _____

Trainee Signature Date

_____ _____

Trainer Signature (RN) Date

_____ _____

Supervising RN Signature Date

Appendix C

Supplemental resources for School Nurses are available on the *Virginia Department of Health* School Health website under the Resources section.

Available online: https://www.vdh.virginia.gov/school-age-health-and-forms/school-nurses/

School Nurse Checklist

Hearing and Vision Screening Resource

School Health Activity Chart