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Guidelines for Specialized Health Care Procedures

(Revision 2004)

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for the
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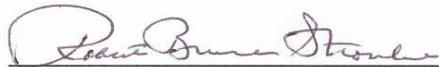
Foreword

The Virginia Department of Health (VDH) and the Virginia Department of Education (DOE) are pleased to present a revised edition of *Guidelines for Specialized Health Care Procedures*, a resource document for school personnel. The Guidelines were developed and published by VDH in collaboration with DOE.

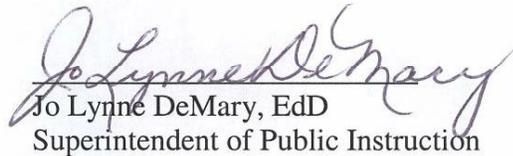
The Guidelines are intended to provide guidance to school administrators, school nurses, teachers, and other staff members on the care of students with special health care needs during the school day.

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

Through these Guidelines, VDH and DOE are committed to assuring that all schools in the Commonwealth have a safe and healthy learning environment.



Robert B. Stroube, MD, MPH
State Health Commissioner



Jo Lynne DeMary, EdD
Superintendent of Public Instruction

07/26/2004
Date

Sept. 10, 2004
Date

nowledgements

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Special thanks are extended to Vickie Southall, RN, MSN, the primary author of the revised Guidelines, a review panel of school nurses and medical providers, and Gwen Smith, RN, MSN, with the Virginia Department of Education. The editor was Carol Pollock, RN, MSN, FNP, with the Virginia Department of Health's Division of Child and Adolescent Health.

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Appendix A—Individualized Health Care Plans and Forms
Appendix B—Skills Checklists for Procedures

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Introduction

The *Guidelines for Specialized Health Care Procedures* is intended to enhance the educational process of students with special health care needs by providing guidance to school nurses, teachers, and other staff regarding the medical 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 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 health care plan (IHCP) to outline what needs to be done during the school day. Parents or guardians also need to provide the school with comprehensive medical information, medications, medical equipment, and medical supplies to help school staff care for their child.

The Guidelines are intended to provide a broad framework for planning appropriate health care services for students with special health care needs. Because each student is different and has a unique array of needs, these guidelines should not be the sole source or a substitute for development of an IHCP that addresses the student's health care needs. The *Guidelines for Specialized Health Care Procedures* also should be used as a tool to help school staff care for students with special health care needs. It does not attempt to provide medical advice and should not be used as a substitute for professional medical consultation.

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.



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Care of the Circulatory System

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

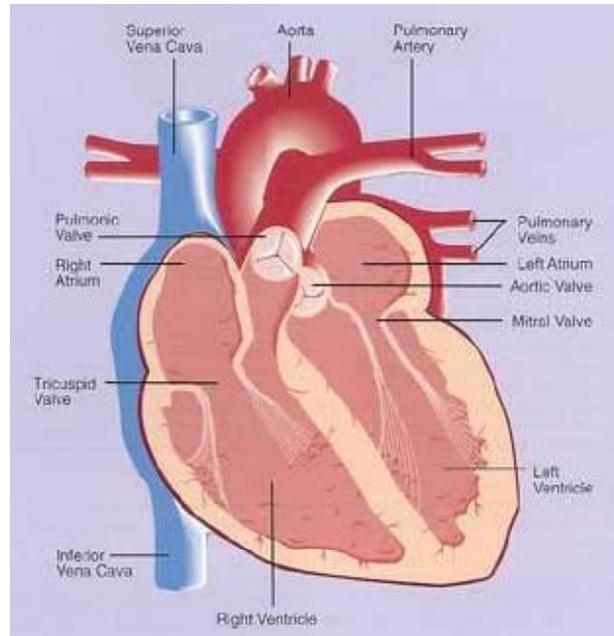
Circulatory System

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* collects deoxygenated blood from the body. The 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 via the *pulmonary vein* into the *left atrium* of the heart. 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 vessels. 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*.

Sources:

- American Heart Association. (2004). *Circulatory System*. Available online at www.americanheart.org/presenter.jhtml?identifier=4567
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the Human Heart and Cardiovascular System. Available online at

Illustration Source:

ImageMD. Used with permission. *Anatomy of the cardiac chambers and valves.*

Central Venous Catheter

Overview

A central venous catheter (CVC) is a sterile intravenous catheter inserted into a large central vein (e.g., subclavian vein). A student may receive a CVC 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 three main types of CVCs. The *tunneled catheter* is often called by its manufacturer's name---Hickman, Broviac, or Groshong. It is inserted surgically into the central vein, tunneled under the skin, and then exited from a site on 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. The tunneled catheter may have one, two, or three ports (lines), which will normally need to be flushed with heparin each day. Such flushing is usually done at home. The tunneled catheter will also have a sterile dressing covering it to prevent it from becoming infected. This dressing should be changed 2-3 times a week as specified by the health care provider and whenever it becomes wet, soiled, or the edges are no longer intact. Routine dressing changes are usually done at home, but dressing changes may need to be done at school only 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 CVC and not seen in the school setting very often 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, consider a safer environment, i.e., homebound.

The other commonly seen type of CVC is the *totally implanted device (TID)* such as the Port-A-Cath or Infus-A-Port. This CVC 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 CVC 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.

Potential Settings

Due to the risk for infection and the need for privacy, most CVC dressings are changed at home. CVC dressings may be reinforced at school and should be done in a clean, private room such as the health room. Privacy regarding the student's medical condition and need for a CVC 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.

injury, reinforcement of central line dressings should be performed by a registered school nurse using sterile technique. Non-medical school staff should not perform this procedure. Any school personnel who have regular contact with a student who has a CVC must receive general training from a health care provider covering the student's specific needs, potential problems, and implementation of the established emergency plan.

Components of the Individualized Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student with a central venous catheter. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student with a central venous catheter, the following elements should receive particular attention:

- The student's underlying condition and potential problems associated with the condition or treatment
- Type of CVC—tunneled, non-tunneled, or implanted
- The need for readily-available additional dressing supplies including a spare clamp
- Informing school staff, including bus drivers, who have regular contact with the student about the CVC and general safety guidelines
- Reporting any fever or site changes to the school nurse, family, and health care provider
- Determination of when and under what conditions the tubing or the dressing should be handled
- Steps to be taken if a complication occurs
- Latex allergy alert
- Standard precautions

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 325-346.
- Hockenberry, MJ (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 1198-1203.
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- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 1046-1058.

ns with Central Venous Catheters

Equipment Needed to be Available at all times for Emergencies (parent supplies equipment):

- Small smooth-edged clamp
- Sterile gauze
- Adhesive Tape
- Gloves
- Mask, if ordered

Assessment	Intervention/Rationale
Temperature elevation; redness, swelling, or drainage at the CVC site; Chills, increased fatigue, irritability or headache	<i>Notify the school nurse, family, and/or health care provider immediately as these are possible indications of infection. Swelling by itself may indicate infiltration.</i>
Arm, shoulder, or neck pain	<i>Infiltration or thrombosis could be developing. Also, if implanted Dacron cuff has not fully healed, catheter migration may be caused by excessive sneezing, coughing, or vomiting. Notify school nurse, family, and/or health care provider immediately.</i>
Difficulty breathing; chest pain	<i>Lie student on left 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 health care provider immediately.</i>
Blood in the tubing or bleeding from the end of the tubing	<i>Put on 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 cap. Notify the school nurse and the family. <i>If the clamp is not functioning properly, the tubing should be firmly pinched closed and the school nurse, family, and health care provider notified immediately according to the student's emergency plan.</i></i>

	Intervention/Rationale
	<p><i>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.</i></p> <p><i>If the tape or dressing has been disrupted, the dressing should be reinforced.</i></p> <p><i>If the catheter has fallen out, stay calm. Reassure the student. The CVC 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, health care provider and family immediately. Activate the school emergency plan.</i></p>
Catheter tubing breaks	<p><i>Clamp the catheter above the break and wrap the broken end with sterile gauze. Notify the school nurse, family, and health care provider immediately. Initiate the emergency plan.</i></p> <p><i>The catheter can often be repaired by the health care provider at the hospital.</i></p>

Sources:

Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 325-346.

CDC. (2002). *Guidelines for the prevention of intravascular catheter-related infections*. MMWR Vol. 51, No. 10: 1-26. August 9, 2002. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/rr55110a1.htm

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Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 1046-1058.

General Information for Students with Central Venous Catheters

Date: _____

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

Name of Student: _____

This student has a central venous catheter (CVC), 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 CVC should not cause any discomfort if it is secured properly.

The CVC 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 CVC care is done at home.

Most students with CVCs 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 CVC should not be bumped during activity and the tubing should not be pulled.

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 _____ (phone
number/pager) for additional information or if the student experiences any problems with the CVC.

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.

ement of PICC Lines

Overview

A peripherally inserted central catheter (PICC) is a long intravenous (IV) line which is inserted into a peripheral vein and threaded (often with a guide wire) to a large, central vein. It is usually used for short to moderate length IV therapy, 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 central venous IVs.

PICC lines are most often inserted into the antecubital fossa (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.

Procedure

PICC lines are generally treated like central venous catheters in catheter care. Dressing changes are usually done at home several times a week and heparin flushes are done at home daily. Dressing changes should not be done 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 health care provider must be notified.**

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 319-324.
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Intermittent Intravenous 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. A plug containing heparin or saline is inserted into the hub of the IV catheter. The heparin or saline in the intermittent device is replaced on a regular basis by injecting a prescribed amount of heparin or saline into the plug. 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.

Potential Settings

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 risk of infiltration or mechanical phlebitis from motion of the catheter inside the vein.

Staff Preparation

Due to the risk of infection, reinforcement of the IV catheter dressing should be performed by a registered school nurse using sterile technique. Non-medical school staff should not perform this procedure. Any school personnel with regular contact with a student with a heparin/saline lock or IV catheter should receive training that covers potential problems and implementation of the established emergency plan.

Components of the Individualized Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student with a peripheral heparin/saline lock. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student with a peripheral heparin/saline lock, the following elements should receive particular attention:

- Protection of the IV site from bumping or injury
- Signs of IV site infiltration or infection
- Symptoms which require notification of school nurse, family, and/or health care provider
- Latex allergy alert
- Standard precautions



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diatric Nursing Procedures. Philadelphia: Lippincott William &

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- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 1030-1032.
- Wong On Web. (2002). *Saline versus heparin flush for peripheral intermittent IV infusions in children*. Available online at www3.us.elsevierhealth.com/WOW/op049.html.

blems with a Heparin/Saline Lock

Assessment	Intervention/Rationale
Tender, red, swollen, or warm IV site	<i>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.</i>
Wet or bloody IV dressing	<i>Male adaptor (cap) may be dislodged. IV catheter itself may have slipped out of the vein or IV site may be infiltrated. Reinforce with dry dressing and call family.</i>
Red streak noted above IV site	<i>Vein may be inflamed (phlebitis). Notify school nurse, family, and/or health care provider.</i>

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 544-546.
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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 should not dislodge the tubing.

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.



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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 occur each year.

The Needlestick Safety and Prevention Act of 2000 was passed in an effort to reduce the risks of disease transmission and injury from needles and other sharps. During 2001, 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.

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, as well as 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 new products have been developed to reduce accidental needlesticks. 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 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 provides a list of all the manufacturers and their contact information, including phone number, fax number, email address, and mailing address. See: www.med.virginia.edu/medcntr/epinet/safetydevice.html.

Types of Safer Medical Devices

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

A. 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

re-attached sheath. After injection, user presses sheath surface, locking it in place over needle.

- Retractable needles
 - When user fully depresses plunger, the needle automatically retracts from patient and is encapsulated within the syringe
 - Safety sheath covers needle when user pushes button on the syringe
 - User rotates plunger to release needle and pull plunger back so 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 pre-filled with common medications and various needle safety devices
- B. IV Medication Delivery Systems (not usually done at school)
- Needleless IV access
 - Blunt plastic cannula with pre-slit, resealing synthetic injection sites
 - Needleless IV access
 - Valve/access ports and connectors
 - Two-way reflux valve activated by standard male luer lock; valve closes automatically when luer is removed
 - Capless valve activated by 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
- C. IV Insertion Equipment
- Shielded or retracting peripheral IV catheters
 - Needle retracts automatically into a needle shield when the needle is withdrawn from catheter
 - Push button shielding retracts needle into needle shield
 - Telescoping needle shield that covers stylet as it is withdrawn
 - Safety clip automatically engages and covers needle tip as it is withdrawn
 - Shielded midline catheters
 - Guidewire introducers
- D. Lancets
- Laser lancets

- E. Sharps Disposal Containersô list of manufacturers available on website
- F. 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

Sources:

- Chamblee, J. (2002). Needlestick safety and prevention act. *Plastic Surgical Nursing* 22 (3): 141-145.
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- Hurley, ML. (2001). Safer needle devices: resource review. *RN* 64(10): 24ns15-24ns24.
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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 regular trash.

1. Wash hands and apply 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 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 completely cap the needle.
7. At the first opportunity, dispose of the needle and syringe in an appropriate container.
8. Remove gloves and wash hands.



Source:

Potter, P.A., & Perry, A. G. (2001). *Fundamentals of nursing*. (5th ed.). St. Louis: Mosby, pp. 948-950.

Illustration Source: Vickie H. Southall.



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Care of the Endocrine System

Diabetes

Diabetes

Overview

Diabetes is a chronic disease in which the body does not make or properly use insulin, a hormone needed to convert sugar, starches, and other food into energy. People with diabetes have 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 main source of fuel.

When insulin is no longer made, it must be obtained from another source— insulin shots or insulin pump. 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 important. If not treated, diabetes can lead to serious health problems. The disease can affect the blood vessels, eyes, kidneys, nerves, gums, and teeth, and 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 greatly reduced or delayed by keeping blood glucose levels near normal.

Types of Diabetes

Type 1. Type 1 diabetes mellitus (T1DM) is a complex metabolic disease. In people with T1DM, the immune system attacks the beta cells (the insulin-producing cells of the pancreas) and destroys them. 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 begins most often in children and young adults. T1DM can not be prevented.

Symptoms

- Increased thirst and urination
- Constant hunger
- Weight loss
- Blurred vision
- Fatigue

Risk Factors

- Genetics
- Environment

Type 2. The first step in the development of type 2 diabetes mellitus (T2DM) is often a problem with the body's response to insulin, or insulin resistance. For reasons scientists do not completely understand, 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 after several years, insulin production may drop off.

overweight adults ages 40 or older. Now, as more children and some overweight and inactive, T2DM occurs more often in young people. To control their diabetes, children with T2DM may need to take oral medication, insulin, or both. The risk of getting T2DM can be decreased by avoiding obesity through healthy diet and plenty of exercise.

Symptoms

- Fatigue
- Increased thirst and urination
- Nausea
- Rapid weight loss
- Blurred vision
- Frequent infections
- Slow healing of wounds or sores

Risk Factors

- Being overweight (greater than 85th percentile for height/weight)
- Having a family member who has type 2 diabetes
- Being African American, Hispanic/Latino American, Native American, Asian American or Pacific Islander American

Understanding Diabetes and Ketoacidosis

The pancreas makes enzymes and hormones. 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. Enzymes help digest or breakdown the food into glucose. 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. When there is not enough 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 blood stream. 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 as a result of its inability to utilize the glucose from 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 that are left in the blood when fat is used for energy. Symptoms of nausea, vomiting, and eventually, coma occur. This is called *diabetic ketoacidosis*. The body will try to get rid of ketones through the kidneys and lungs. The ketones will show up in the urine and will also 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. As noted earlier, research

Glucose levels within the 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, and insulin or medication. As a general rule, food makes blood glucose go up, and exercise and insulin make blood glucose levels go down. Several other factors, such as growth and puberty, mental stress, illness, or injury also can 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 must check (or test) their blood glucose levels throughout the day by using a blood glucose meter. The meter gives a reading of the level of glucose in the blood at the time it is being checked. Monitoring involves pricking the skin with a lancet at the fingertip, forearm, or other test site to obtain a drop of blood and placing the drop on a special test strip that is inserted in a glucose meter. If blood glucose levels are too low (hypoglycemia) or too high (hyperglycemia), students can then take corrective action, such as eating, modifying their activity level, or administering insulin.

Low blood glucose levels, which can be life-threatening, present the greatest 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 when there are symptoms of hypoglycemia or hyperglycemia. 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 trained diabetes personnel. 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

lycemia—Low Blood Glucose

<i>Mild Symptoms</i>	
<ul style="list-style-type: none"> • Hunger • Shakiness • Weakness • Paleness • Blurred vision • Increased heart rate/palpitations 	<ul style="list-style-type: none"> • Sleepiness • Changed behavior • Sweating • Anxiety • Dilated pupils
<i>Moderate to Severe Symptoms</i>	
<ul style="list-style-type: none"> • Yawning • Irritability/frustration • Extreme tiredness/fatigue • Inability to swallow • Sudden crying 	<ul style="list-style-type: none"> • Confusion • Restlessness • Dazed appearance • Having a seizure or convulsion • Unconsciousness/coma

Possible Causes of Hyperglycemia

- Too little insulin
- Expired insulin
- Food not covered by insulin
- Decreased physical activity
- Illness, injury
- Stress or emotions
- Other hormones
- Menstrual periods

Signs of Hyperglycemia—High Blood Glucose

<i>Mild Symptoms</i>	
<ul style="list-style-type: none"> • Increased thirst • Increased urination • Dry mouth • Fatigue • Numbness or tingling • Agitation, fidgetiness, irritability 	<ul style="list-style-type: none"> • Increased hunger • Nausea • Blurred vision • Weakness • Lack of concentration
<i>Moderate Symptoms</i>	
<ul style="list-style-type: none"> • Decreased appetite • Nausea • Abdominal pain 	<ul style="list-style-type: none"> • Vomiting • Sunken eyes • Weight loss
<i>Severe Symptoms</i>	
<ul style="list-style-type: none"> • Continued vomiting • Sleepiness • Coma or unconsciousness 	<ul style="list-style-type: none"> • Very weak • Deep breathing, fruity smell • Possible ketones



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Although students with diabetes have the same nutritional needs as other students, there are special considerations for the school setting. Structured meals and snacks contribute to optimal glucose control and assist in preventing hypoglycemia. Timing of snacks is based on peak insulin action times (when the insulin is most effective in lowering the blood glucose). Therefore snacks must be allowed according to pre-scheduled daily snacks and /or for treatment of hypoglycemia. Students with diabetes usually have an individualized meal plan based upon carbohydrate counting or an exchange system. 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 or choices of carbohydrate the student eats. This information, which can be obtained from nutrition information on food labels, is used to determine the amount of insulin the student needs to control blood glucose for any given meal or snack. Carbohydrate counting is the preferred method for determining food choices and portion sizes.

The exchange system groups foods in six different lists, each with a set nutritional value. A meal plan is prepared that recommends several exchanges or servings from each food group for each meal and snack. The exchange list ensures that the meal plan is consistent in portion size and nutrient content while offering a wide variety of foods from each group. Students using this approach consume a prescribed number of exchanges at meal and snack times. 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 important for school personnel working with students who have diabetes to realize that any food eaten that contains carbohydrate must be worked into the meal plan, even if it is labeled "sugar free." Also, some sugar substitutes add carbohydrates. They can make blood sugar rise if they are not eaten as part of a meal plan.

Physical Activity

Exercise and physical activity are critical parts 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. To maintain blood glucose levels within their target ranges during extra physical activity, students may make adjustments in their insulin and food intake. To prevent hypoglycemia, they also may need to check their blood glucose levels more frequently while engaging in physical activity. General guidelines for blood glucose levels before exercise should be over 100 and under 250. When the blood glucose level is over 300, a test for ketones should be done (if authorized by the health care provider) before exercising. ***If ketones are positive, the student should not exercise.***

The student with diabetes should eat prior to exercising if 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

treatment of hypoglycemia.

able for treatment of low blood sugar, along with plenty of water. Sports coaches should be able to recognize and assist with the

Exercise increases the flow of blood in general, but especially to the muscles that are 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 in the arm before a run or swim, it may be absorbed quickly and cause a 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 and this may continue for up to 12 hours after exercising.

Students using pumps may disconnect from the pump for sports activities. If they keep the pump on, they may set a temporary, reduced rate of insulin 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 for taking medication, checking blood glucose, and eating and school personnel should help eliminate barriers to these activities. Students with hyperglycemia or hypoglycemia often do not concentrate well and blood glucose may need to be checked before and during academic testing. Students also may need to have additional access to food or drink and the restroom. If a serious high or low blood glucose episode occurs, a student may need to be excused with an opportunity for retake.

Planning for Disasters and Emergencies

In the event of natural disasters or other emergency situations, 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 meter
- Urine ketones strips
- Insulin and supplies
- Insulin pump and supplies, including syringes
- Other medications
- Antiseptic wipes
- Fast-acting source of glucose
- Carbohydrate-containing snacks
- Hypoglycemia food supplies (for 3 episodes): quick-acting sugar and carbohydrate/protein snacks
- Glucagon emergency kit

Potential Settings

As with all medical conditions, every effort should be made to protect the student's privacy. It is important for students 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 recommended by the health care provider, students may be permitted to check their blood glucose level and respond to the results at any school location or at any school activity. Taking immediate action is important so that the symptoms don't get worse 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 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 who have responsibility 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 in student-specific routine and emergency diabetes care tasks so that at least one staff member is always available for younger, less experienced students and for any student with diabetes in case of an emergency. All students with diabetes will need help with emergency medical care.

Components of the Individualized Health Care Plan

Each student's IHCP must be tailored to the individual's needs. The following section covers procedures for diabetic management as well as possible problems and emergencies that may arise.

The National Diabetes Education Program recommends developing a plan with three components: (1) the Diabetes Medical Management Plan (DMMP), which contains the prescribed diabetes health care regimen, (2) a Quick Reference Emergency Plan describing how to recognize hypoglycemia and hyperglycemia and what to do as soon as signs of these conditions are observed, and (3) an education plan explaining what accommodations, education aids, and services are needed. A sample DMMP and Quick Reference Emergency Plan follow this section. They may be copied and used to develop a plan for each student. A sample IHCP 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 schedule for quality control checks of equipment
- Specific medical orders
 - Blood glucose monitoring
 - Insulin, glucagon, and other medications to be given at school
 - Meal and snack plan
 - Exercise requirements
 - Additional monitoring, such as testing for ketones
- Typical signs, symptoms, and prescribed treatment for hypoglycemia
- Typical signs, symptoms, and prescribed treatment for hyperglycemia
- Latex allergy alert
- Standard precautions (Anticipating the tasks to be done, the risk involved, and the personal protective equipment needed will enhance protection of both the caregiver and student.)

Quick Reference Emergency Plan

- Symptoms of hypoglycemia and hyperglycemia
- Actions to take when hypoglycemia or hyperglycemia occur

ion and phone numbers

Education Plan

- Where and when blood glucose monitoring and treatment will take place
- Location of student's diabetes management supplies
- Identification of trained diabetes personnel who can conduct blood glucose checking, insulin and glucagon administration, and treatment of hypoglycemia and hyperglycemia
- Free access to the restroom and water fountain
- Nutritional needs, including provisions for meals and snacks
- Full participation in all school-sponsored activities and field trips, with coverage by trained diabetes personnel
- Alternative times for academic exams if student is experiencing hypoglycemia or hyperglycemia
- Flexible policies regarding absences for doctor's appointments and diabetes-related illness.
- Maintenance of confidentiality and the student's right to privacy

Sources:

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VIRGINIA DIABETES CARE PRACTICE AND PROTOCOL SUPPLEMENT FORMS

Virginia Diabetes Council, 2009

Medical Management Forms

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School _____ Effective Date _____

Date of Birth _____ Grade _____ Homeroom Teacher _____

Instructions:

- Part 1- Contact Information and Diabetes Medical History.** To be completed by parent/guardian and returned to school nurse (prior to beginning of each school year or upon diagnosis).
►Includes: Parent authorization for trained school designees to administer insulin and/or glucagon (required by Virginia Law).
- Part 2*- Diabetes Medical Management Plan (DMMP).** Student's physician/provider to complete Intensive Therapy or Conventional Therapy/Type 2 version of DMMP.
Please note that physician authorization for treatment by trained school designees must be included in the Diabetes Medical Management Plan or a separate form must be provided.
- Part 3*- Insulin Pump Supplement.** Have the physician/provider, diabetes educator, and parent/guardian collaborate to complete appropriate portions if your child wears an insulin pump.
- Part 4- Permission to Self-Carry and Self-Administer Diabetes Care.** To be completed by the physician/provider, school nurse and the parent/guardian if your child is going to carry and self administer insulin and/or perform blood glucose checks in the classroom.
- Virginia Diabetes Council School Diabetes Care Practice and Protocol** provides guidelines, accepted accommodations and references applicable to all students with diabetes. This document is available from your school nurse, the Department of Education Office of Student Services, or the Virginia Diabetes Council.

*Other Diabetes Medical Management Plans may be used for **Parts 2, 3 & 4** as long as all components are represented.

Return completed forms to the school nurse as quickly as possible. Thank you for your cooperation.

School nurse _____ Phone _____ Date _____

Part 1: Contact Information and Diabetes Medical History

Page 1 of 2

To be completed by Parent/Guardian:

Parent/Guardian #1: _____

Address: _____

Telephone-Home: _____ Work: _____ Cell: _____

Parent/Guardian #2: _____

Address: _____

Telephone-Home: _____ Work: _____ Cell: _____

Other emergency contact: _____

Address: _____ Relationship: _____

Telephone-Home: _____ Work: _____ Cell: _____

Physician managing diabetes: _____

Address: _____

Main Office # _____ Fax # _____ Emergency Phone # _____

Nurse/Diabetes Educator: _____ Office # _____

Student: _____

Response (check appropriate boxes and complete blanks)

Type of diabetes? _____

Date of last visit: _____

diabetes physician:																			
Nutritional needs	<ul style="list-style-type: none"> ◆ Snacks <input type="checkbox"/> ___AM <input type="checkbox"/> ___PM <input type="checkbox"/> ___Prior to Exercise/Activity <ul style="list-style-type: none"> <input type="checkbox"/> Only in case of low blood glucose <input type="checkbox"/> Student may determine if CHO counting <input type="checkbox"/> In the event of a class party may eat the treat (include insulin coverage if indicated in medical orders) <input type="checkbox"/> student able to determine whether to eat the treat <input type="checkbox"/> replace with parent supplied treat <input type="checkbox"/> may NOT eat the treat 																		
	◆ Other _____																		
Child's most common signs of low blood glucose	<table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> trembling</td> <td><input type="checkbox"/> tingling</td> <td><input type="checkbox"/> loss of coordination</td> </tr> <tr> <td><input type="checkbox"/> dizziness</td> <td><input type="checkbox"/> moist skin/sweating</td> <td><input type="checkbox"/> slurred speech</td> </tr> <tr> <td><input type="checkbox"/> heart pounding</td> <td><input type="checkbox"/> hunger</td> <td><input type="checkbox"/> confusion</td> </tr> <tr> <td><input type="checkbox"/> weakness</td> <td><input type="checkbox"/> fatigue</td> <td><input type="checkbox"/> seizure</td> </tr> <tr> <td><input type="checkbox"/> pale skin</td> <td><input type="checkbox"/> headache</td> <td><input type="checkbox"/> unconsciousness</td> </tr> <tr> <td colspan="3"><input type="checkbox"/> change in mood or behavior <input type="checkbox"/> other _____</td> </tr> </table>	<input type="checkbox"/> trembling	<input type="checkbox"/> tingling	<input type="checkbox"/> loss of coordination	<input type="checkbox"/> dizziness	<input type="checkbox"/> moist skin/sweating	<input type="checkbox"/> slurred speech	<input type="checkbox"/> heart pounding	<input type="checkbox"/> hunger	<input type="checkbox"/> confusion	<input type="checkbox"/> weakness	<input type="checkbox"/> fatigue	<input type="checkbox"/> seizure	<input type="checkbox"/> pale skin	<input type="checkbox"/> headache	<input type="checkbox"/> unconsciousness	<input type="checkbox"/> change in mood or behavior <input type="checkbox"/> other _____		
<input type="checkbox"/> trembling	<input type="checkbox"/> tingling	<input type="checkbox"/> loss of coordination																	
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<input type="checkbox"/> heart pounding	<input type="checkbox"/> hunger	<input type="checkbox"/> confusion																	
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<input type="checkbox"/> pale skin	<input type="checkbox"/> headache	<input type="checkbox"/> unconsciousness																	
<input type="checkbox"/> change in mood or behavior <input type="checkbox"/> other _____																			
How often does child experience low blood glucose and how severe?	<p>Mild/Moderate <input type="checkbox"/> once a day <input type="checkbox"/> once a week <input type="checkbox"/> once a month</p> <p>Indicate date(s) of last mild/moderate episode(s) _____</p> <p>What time of day is most common for hypoglycemia to occur? _____</p> <p>Severe (i.e. unconscious, unable to swallow, seizure, or needed Glucagon)</p> <p>Include date(s) of recent episode(s) _____</p>																		
Episode(s) of ketoacidosis	Include date(s) of recent episode(s) _____																		
Field trips	Parent/guardian will accompany child during field trips? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Yes, if available																		
Serious illness, injuries or hospitalizations this past year	Date(s) and describe _____																		
List any other medications currently being taken	_____																		
Allergies (include foods, medications, etc):	_____																		
Other concerns and comments	_____																		

I give permission to the school nurse and designated school personnel*, who have been trained and are under the supervision of the school nurse to perform and carry out the diabetes care tasks as outlined in my child's *Diabetes Medical Management Plan* as ordered by the physician. I give permission to the designated school personnel, who have been trained to perform the following diabetes care tasks for my child. (Code of Virginia§ 22.1-274).

Insulin Administration YES NO Glucagon Administration YES NO

I understand that I am to provide all supplies to the school necessary for the treatment of my child's diabetes. I also consent to the release of information contained in the Diabetes Medical Management Plan to staff members and other adults who have custodial care of my child and who may need to know this information to maintain my child's health and safety. I also give permission to contact the above named physician and members of the diabetes management team regarding my child's diabetes should the need arise.

Parent/Guardian Name _____ Date _____

Parent/Guardian Signature _____

School Nurse's Name _____ Date _____

School Nurse's Signature _____

*Note: If at any time you would like to have the names of the designated school personnel that have been trained, please contact the school nurse. Names and training records are kept in the school clinic.

Part 2: Virginia Diabetes Medical Management Plan (DMMP)

To be completed by physician/provider.

Notice to Parents: Medication(s) **MUST** be brought to school by the PARENT/GUARDIAN in a container that is appropriately labeled by the pharmacy or physician/practitioner.

In order for schools to safely administer medication during school hours, the following regulations should be observed:

- A new copy of the DMMP must be completed at the beginning of each school year. This form, an Authorization for Medication Administration form, or MD prescription must be received in order to change diabetes care at school during the school year.

Student Name (Last, First, MI)		Student's Date of Birth	
School		Student's Grade	Home Phone
Parent Name		Work/Cell Phone	
Home Address		City	State, Zip code
Student's Diagnosis: DIABETES: <input type="checkbox"/> Type 1 <input type="checkbox"/> Type 2 <input type="checkbox"/> Other		Today's Date	

MONITORING		
BLOOD GLUCOSE (BG) MONITORING with meter, lancets, lancing device, and test strips	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Student requires supervision <input type="checkbox"/> To be performed by school personnel <input type="checkbox"/> Student is independent <input type="checkbox"/> Permission to self-carry	<input type="checkbox"/> Before meals <input type="checkbox"/> For symptoms of hypo/hyperglycemia & anytime the student does not feel well <input type="checkbox"/> Before PE/Activity <input type="checkbox"/> After PE/Activity <input type="checkbox"/> Prior to dismissal <input type="checkbox"/> Additional BG monitoring may be performed at parent's request
	CONTINUOUS GLUCOSE MONITORING (CGM) Brand/Model: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No Alarms set for: Low: _____ (mg/dL) High: _____ (mg/dL)
<input type="checkbox"/> URINE KETONE TESTING <input type="checkbox"/> BLOOD KETONE TESTING	Anytime the BG > 300 mg/dL or when student complains of nausea, vomiting, abdominal pain. See page 3 for further instructions under hyperglycemia management.	

NAME OF MEDICATION	DOSE/ROUTE		TIME	
<input checked="" type="checkbox"/> GLUCAGON - INJECTABLE	<input type="checkbox"/> 0.5 mg subq/IM <input type="checkbox"/> 1.0 mg subq/IM		Immediately for severe hypoglycemia: unconscious, semi-conscious (unable to control his/her airway or unable to swallow), or seizing	
	DOSAGE	TIME	POSSIBLE SIDE EFFECTS	TREATMENT OF SIDE EFFECTS
<input type="checkbox"/> Glucophage® (Metformin) <input type="checkbox"/> to be administered at school	_____ mg po	_____ AM or PM	Nausea/vomiting, diarrhea	Clear liquids
<input type="checkbox"/> Other: _____® <input type="checkbox"/> to be administered at school				

Additional Instructions:

Specific duration of order: 2009-2010 SCHOOL YEAR	Physician/Provider Signature: _____	Provider Printed Name: _____	Office Phone: Office Fax: Emergency # 911
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SCHOOL YEAR 2009-2010 DIABETES SCHOOL CARE PLAN

Student:

Intensive Therapy/Multiple Daily Injections

Effective date:

Definitions

Insulin-to-Carbohydrate Ratio (CHO Ratio)	Insulin Sensitivity (Correction Factor)	Target Blood Glucose
<ul style="list-style-type: none"> the amount of insulin necessary to prevent hyperglycemia after ingestion of a specified amount of carbohydrate usually expressed as "1 unit for every ___ grams of carbohydrate" 	<ul style="list-style-type: none"> the predicted drop in blood glucose concentration after administration of 1 unit of regular or rapid-acting insulin usually expressed as "1 unit for every ___ mg/dl blood glucose is > target" 	<ul style="list-style-type: none"> a specific blood glucose value used to determine the correction dose of insulin administered with a meal

INSULIN	
Insulin to be given during school hours: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> May calculate/give own injections with supervision	
<input checked="" type="checkbox"/> Rapid-acting Insulin Type: _____ [®] <i>(all doses to be administered subcutaneously)</i>	Timing of Insulin Dose: Rapid-acting Insulin should always be given prior to <input type="checkbox"/> meals <input type="checkbox"/> snacks
<input type="checkbox"/> _____ units at _____ am or pm <input type="checkbox"/> may mix with rapid-acting insulin <i>(all doses to be administered subcutaneously)</i>	
CALCULATING INSULIN DOSES: According to CHO ratio and Insulin Sensitivity/Correction Factor (if needed) - the student requires meal time coverage with rapid-acting insulin based on the amount of carbohydrates in the meal and may require additional insulin to correct blood glucose to the desired range according to the following formula: Insulin Dose = [(Actual BG – Target pre-meal BG) divided by Insulin Sensitivity] + [# carbohydrates consumed/CHO Ratio]	
<ul style="list-style-type: none"> Fractional amounts of insulin from correction and carbohydrate calculation, when added together, may yield an even amount of insulin If uneven, then round to the nearest half or whole unit (May use clinical discretion; if physical activity follows meal, then may round down). 	
Target pre-meal BG: _____ mg/dL	Insulin Sensitivity/Correction Factor: _____ unit for every _____ > target
CHO Ratio: _____	<input type="checkbox"/> Parent has permission to adjust CHO ratio in a range from 1:_____ to 1:_____ Exercise/PE CHO Ratio: _____ <input type="checkbox"/> Not Applicable <ul style="list-style-type: none"> Less insulin may be required with meals prior to physical activity in order to prevent hypoglycemia. If so, the Exercise/PE CHO Ratio should be used instead of the CHO Ratio.
<input type="checkbox"/> Correction insulin to be administered for elevated blood glucose if 3 hours or more after last insulin dose	

Snacks

- In general, children with diabetes managed using Intensive Therapy/MDI do not require snacks.
- Scheduled snacks may be required prior to or after exercise in order to prevent hypoglycemia. Insulin is not administered with these snacks.
 - Before Exercise After Exercise
- Foods may be eaten at unscheduled times. Insulin may be ordered for these snacks in order to prevent post-meal hyperglycemia (see above).
- Snack time insulin = # carbohydrates consumed/CHO Ratio.
- Never provide insulin coverage for carbohydrate/glucose being used to treat hypoglycemia.

Exercise and Sports

- In general, there are no restrictions on activity unless specifically noted.
- A student should not exercise if his/her blood glucose is < _____ mg/dL or > 300 mg/dL (with positive ketones) immediately prior to exercise or until hypoglycemia/hyperglycemia is resolved.
- A source of fast-acting glucose & glucagon should be available in case of hypoglycemia.

Specific duration of order: 2009-2010 SCHOOL YEAR	Physician/Provider Signature: _____	Provider Printed Name: _____	Office Phone: Office Fax: Emergency # 911
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SCHOOL YEAR 2009-2010 DIABETES SCHOOL CARE PLAN

Student:
Effective date:

Hypoglycemia (Low Blood Glucose)

Hypoglycemia is defined as a blood glucose \leq _____ mg/dL

Signs of hypoglycemia:

Hunger	Sweating	Shakiness	Paleness	Dizziness
Confusion	Loss of coordination	Fatigue	Fighting	Crying
Day-dreaming	Inability to concentrate	Anger	Passing-out	Seizure

- If hypoglycemia is suspected, check the blood glucose level.

Hypoglycemia Management (Low Blood Glucose)	Severe Hypoglycemia: If student unconscious, semi-conscious (unable to control his/her airway or unable to swallow) or seizing, administer glucagon. <ul style="list-style-type: none"> • Place student in the "recovery position." • If glucagon is administered, call 911 for emergency assistance, and call Parents/Legal Guardian.
	Mild or Moderate Hypoglycemia: If conscious & able to swallow, immediately give 15 grams fast-acting glucose: <ul style="list-style-type: none"> • 3-4 glucose tablets or • 6 Life Saver® Candies or • 4 ounces of regular soda/juice or • 1 small tube Glucose/Cake gel
	Repeat BG check in 15 minutes <ul style="list-style-type: none"> • If BG still low, then re-treat with 15 gram CHO • If BG in acceptable range and at lunch or snack time, let student eat and cover CHO per orders • If BG in acceptable range and not lunch or snack time, provide student slowly-released CHO snack (Example: 3-4 peanut butter or cheese crackers or ½ sandwich)
	If unable to raise the BG > 70 mg/dL despite fast-acting glucose sources, call parents

Hyperglycemia (High Blood Glucose)

Signs of hyperglycemia:

Extreme thirst	Frequent urination	Blurry Vision	Hunger	Headache
Nausea	Hyperactivity	Dry Skin	Dizziness	Stomach ache

- If hyperglycemia is suspected, check the blood glucose level.

Hyperglycemia Management (High Blood Glucose)	If BG > 300 mg/dL, or when child complains of nausea, vomiting, and/or abdominal pain, ask the student to check his/her urine for ketones <ul style="list-style-type: none"> • If urine ketones are trace to small (blood ketones 0 - 1.0 mmol/L), give 8-16 ounces of sugar-free fluid (water), return to classroom • If urine ketones are moderate/large (blood ketones >1.0 mmol/L), give 8-16 ounces of sugar-free fluid (water) and call the Parent/Legal Guardian. •

My signature below provides authorization for the above written orders. I/We understand that all treatments and procedures may be performed by the school nurse, the student and / or trained unlicensed designated school personnel under the training and supervision provided by the school nurse (or by EMS in the event of loss of consciousness or seizure) in accordance with state laws & regulations. I also give permission for the school to contact the health care provider regarding these orders and administration of these medications.

School plan ordered by:	Physician/Provider Signature:	Provider Printed Name:	Date:
Acknowledged and received by:	Parent/Legal Guardian:		Date:
Acknowledged and received by:	School Representative:		Date:

SCHOOL YEAR 2009-2010 DIABETES SCHOOL CARE PLAN
CONVENTIONAL THERAPY OR TYPE 2 DIABETES

Student:
Effective date:

INSULIN			
Insulin to be given during school hours:		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Student can administer insulin if supervised
Insulin Types: <input type="checkbox"/> Rapid-acting Insulin Type: _____ [®] <input type="checkbox"/> Short-acting Insulin Type: Regular <input type="checkbox"/> Intermediate-acting Insulin Type: NPH <input type="checkbox"/> may mix with rapid or short-acting insulin <input type="checkbox"/> Long-acting Insulin Type: _____ [®] _____ units at _____ am or pm <input type="checkbox"/> may mix with rapid-acting insulin <i>(all doses to be administered subcutaneously)</i>	<input type="checkbox"/> Meal Plan: <input type="checkbox"/> according to the following distribution: Breakfast: _____ grams AM Snack: _____ grams Lunch: _____ grams PM Snack: _____ grams <input type="checkbox"/> Insulin:CHO Ratio: 1 unit for every _____ grams of CHO <input type="checkbox"/> decrease by 1 unit if pre-lunch reading is less than 80 mg/dL or if strenuous exercise is anticipated.		
<input type="checkbox"/> Pre-breakfast dose:	Regular _____ units	Humalog [®] or Novolog [®] or Apidra [®] _____ units	NPH _____ units
<input type="checkbox"/> Pre-lunch dose:	Regular _____ units	Humalog [®] or Novolog [®] or Apidra [®] _____ units	NPH _____ units
<input type="checkbox"/> Pre-dinner dose:	Regular _____ units	Humalog [®] or Novolog [®] or Apidra [®] _____ units	NPH _____ units
<input type="checkbox"/> Sliding scale to be administered at _____ (times) If blood glucose _____ Units of rapid-acting Insulin subq _____ give _____ _____ give _____ _____ give _____ _____ give _____ _____ give _____ _____ give _____		<input type="checkbox"/> Insulin Sensitivity (Correction Factor) to be administered at _____ (times) <ul style="list-style-type: none"> the predicted drop in blood glucose concentration after administration of 1 unit of regular or rapid-acting insulin usually expressed as "1 unit for every _____ mg/dl blood glucose is > target" If uneven, then round to the nearest half or whole unit (May use clinical discretion; if physical activity follows meal, then may round down) Sensitivity: _____ Target: _____	
<input type="checkbox"/> Other Instructions:			

Snacks

- Children using NPH insulin usually require snacks without additional insulin coverage (please, adhere to CHO amounts ordered above).
 - Scheduled snacks may be required prior to or after exercise in order to prevent hypoglycemia. Insulin is not administered with these snacks.
- Before Exercise After Exercise
- Foods may be eaten at unscheduled times. Insulin may be ordered for these snacks in order to prevent post-meal hyperglycemia (see above).
 - Snack time insulin = # carbohydrates consumed/CHO Ratio.
 - Never provide insulin coverage for carbohydrate/glucose being used to treat hypoglycemia.

Exercise and Sports

- In general, there are no restrictions on activity unless specified.
- A student should not exercise if his/her blood glucose is <100 mg/dL or > 300 mg/dL and ketones are positive.
- A source of fast-acting glucose & glucagon (if ordered) should be available in case of hypoglycemia.

Specific duration of order: 2009-2010 SCHOOL YEAR	Physician/Provider Signature: _____ Provider Printed Name: _____	Office Phone: _____ Office Fax: _____ Emergency # 911
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Institution Form #

SCHOOL YEAR 2009-2010 DIABETES SCHOOL CARE PLAN

Student:
Effective date:

Hypoglycemia (Low Blood Glucose)

Hypoglycemia is defined as a blood glucose < 80 mg/dL

Signs of hypoglycemia:

Hunger	Sweating	Shakiness	Paleness	Dizziness
Confusion	Loss of coordination	Fatigue	Fighting	Crying
Day-dreaming	Inability to concentrate	Anger	Passing-out	Seizure

- If hypoglycemia is suspected, check the blood glucose level.

Hypoglycemia Management (Low Blood Glucose)	Severe Hypoglycemia: If student unconscious, semi-conscious (unable to control his/her airway or unable to swallow), or seizing, administer glucagon. <ul style="list-style-type: none"> • Place student in the "recovery position." • If glucagon is administered, call 911 for emergency assistance, and call Parents/Legal Guardian.
	Mild or Moderate Hypoglycemia: If conscious & able to swallow, immediately give 15 gram fast-acting glucose: <ul style="list-style-type: none"> • 3-4 glucose tablets or • 6 Life Saver® Candies or • 4 ounces of regular soda/juice or • 1 small tube Glucose/Cake gel
	Repeat BG check in 15 minutes <ul style="list-style-type: none"> • If BG still low, then re-treat with 15 gram CHO • If BG in acceptable range and at lunch or snack time, let student eat and cover CHO per orders • If BG in acceptable range and not lunch or snack time, provide student slowly-released CHO snack (3-4 peanut butter or cheese crackers or ½ sandwich)
	If unable to raise the BG > 70 mg/dL despite fast-acting glucose sources, call parents

Hyperglycemia (High Blood Glucose)

Signs of hyperglycemia:

Extreme thirst	Frequent urination	Blurry Vision	Hunger	Headache
Nausea	Hyperactivity	Dry Skin	Dizziness	Stomach ache

- If hyperglycemia is suspected, check the blood glucose level.

Hyperglycemia Management (High Blood Glucose)	If BG > 300 mg/dL, or when child complains of nausea, vomiting, and/or abdominal pain, ask the student to check his/her urine for ketones <ul style="list-style-type: none"> • If urine ketones are trace or negative (blood ketones 0 - 1.0 mmol/L), give 8-16 ounces of sugar-free fluid (water), return to classroom. • • If urine ketones are moderate/large (blood ketones > 1.0 mmol/L), give 8-16 ounces of sugar-free fluid (water) and call the Parent/Legal Guardian. •
	(Empty row)
	(Empty row)

My signature below provides authorization for the above written orders. I/We understand that all treatments and procedures may be performed by the school nurse, the student and / or trained unlicensed designated school personnel under the training and supervision provided by the school nurse (or by EMS in the event of loss of consciousness or seizure) in accordance with state laws & regulations. I also give permission for the school to contact the health care provider regarding these orders and administration of these medications.

School plan ordered by:	Physician/Provider Signature	Provider Printed Name:	Date:
Acknowledged and received by:	Parent/Legal Guardian:		Date:
Acknowledged and received by:	School Representative:		Date:

T PLAN

Patient Label or MRN, Acct#, Patient name, DOB, Date of Service

Part 3: Insulin Pump Supplement
Effective Date:

To be completed by physician/provider, diabetes educator and parent/guardian.

Student Name: _____ Date of Birth: _____	
Pump Brand/Model: _____™ Pump Company Technical Assistance Number: _____	
Pump Trainer/Resource Person: _____ Phone/Beeper: _____	
Child-Lock On? <input type="checkbox"/> Yes <input type="checkbox"/> No Code: <u>17</u> (applicable to Cozmo Deltec™ Pump only) How long has student worn an insulin pump? _____ or _____ <input type="checkbox"/> Patient is new to pump therapy and is to initiate use of pump on _____ (date)	
INSULIN / PUMP SETTINGS	
<input type="checkbox"/> Rapid-acting Insulin Type: _____®	Timing of Insulin Dose (Bolus Insulin): Rapid-acting Insulin should always be given prior to <input type="checkbox"/> meals <input type="checkbox"/> snacks ➤ Treat hypoglycemia before administration of meal or snack insulin.
<input type="checkbox"/> Use pump bolus calculator to determine all meal, snack and correction doses unless set or pump malfunction occurs.	
Calculating Insulin Doses: According to CHO ratio and Correction Factor (if needed) - the student requires meal time coverage with rapid-acting insulin based on the amount of carbohydrates in meal and may require additional insulin to correct blood glucose to the desired range according to the following formula: Insulin Dose = [(Actual BG – Target pre-meal BG) divided by Insulin Sensitivity] + [# carbohydrates consumed/CHO Ratio] <ul style="list-style-type: none"> Fractional amounts of insulin from correction and carbohydrate calculation, when added together, may yield an even amount of insulin If uneven, then round to the nearest whole or half unit (May use clinical discretion; if physical activity follows meal, then may round down). 	
Target pre-meal BG: _____ mg/dL	Insulin Sensitivity/Correction Factor: _____ unit for every _____ > target
CHO Ratio: _____	<input type="checkbox"/> Parent has permission to adjust CHO ratio in a range from 1: _____ to 1: _____ Exercise/PE CHO Ratio: _____ <input type="checkbox"/> Not Applicable <ul style="list-style-type: none"> Less insulin may be required with meals prior to physical activity in order to prevent hypoglycemia. If so, the Exercise/PE CHO Ratio should be used instead of the CHO Ratio.
Extra pump supplies to be furnished by parent/guardian: <input type="checkbox"/> infusion sets <input type="checkbox"/> reservoirs <input type="checkbox"/> pods for OmniPod™ <input type="checkbox"/> dressings/tape <input type="checkbox"/> insulin <input type="checkbox"/> syringes/insulin pen <input type="checkbox"/> pump manufacturer instructions	
STUDENT PUMP SKILLS	
1. Count carbohydrates	<input type="checkbox"/> Independent <input type="checkbox"/> Needs Assistance
2. Bolus for carbohydrates consumed	<input type="checkbox"/> Independent <input type="checkbox"/> Needs Assistance
3. Calculate and administer correction bolus	<input type="checkbox"/> Independent <input type="checkbox"/> Needs Assistance
4. Disconnect pump	<input type="checkbox"/> Independent <input type="checkbox"/> Needs Assistance
5. Reconnect pump at infusion set	<input type="checkbox"/> Independent <input type="checkbox"/> Needs Assistance
6. Access bolus history on pump	<input type="checkbox"/> Independent <input type="checkbox"/> Needs Assistance
7. Prepare reservoir and tubing	<input type="checkbox"/> Independent
8. Insert infusion set	<input type="checkbox"/> Independent
9. Use & programming of square/extended/dual/combo bolus features	<input type="checkbox"/> Independent <input type="checkbox"/> Needs Assistance
10. Use and programming of temporary basals for exercise and illness	<input type="checkbox"/> Independent <input type="checkbox"/> Needs Assistance
11. Give injection with syringe or pen, if needed	<input type="checkbox"/> Independent <input type="checkbox"/> Needs Assistance
12. Re-program pump settings if needed	<input type="checkbox"/> Independent <input type="checkbox"/> Needs Assistance
13. Trouble shoot alarms and malfunctions	<input type="checkbox"/> Independent <input type="checkbox"/> Needs Assistance
Comments/Additional Instructions:	
School nurses/personnel are not routinely trained on use of specific insulin pumps. School personnel will not perform pump operation without training (to be coordinated with school by caregiver and healthcare provider). If child is not independent and trained RN/personnel are not available, parent/guardian to be contacted for set change. Insulin by injection until set is changed per DMMP orders. If administering via injection, pump must be suspended or disconnected unless ordered otherwise.	

Specific duration of order: 2009-2010 SCHOOL YEAR	Physician/Provider Signature: _____ Provider Printed Name: _____	Office Phone: _____ Office Fax: _____ Emergency # 911
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Part 3: Insulin Pump Supplement (continued)

Student Name: _____

HYPOGLYCEMIA MANAGEMENT (Low Blood Glucose):

Follow instructions in DMMP, but in addition:

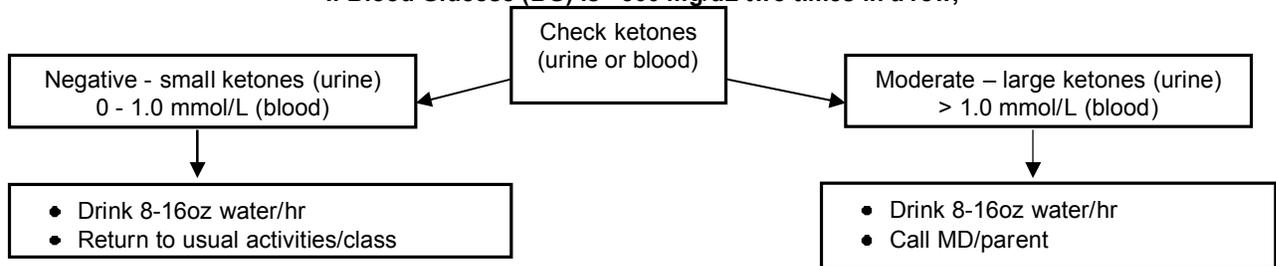
If seizure or unresponsiveness occurs:

1. **Treat with Glucagon** (See Diabetes Medical Management Plan)
2. **Call 911** (or designate another individual to do so)
3. **Stop insulin pump** by any of the following methods (Send pump with EMS to hospital):
 - Placing in "suspend" or stop mode (See manufacturer's instructions)
 - Disconnecting at site, pigtail or clip
 - Cutting tubing
4. Notify parent
5. If pump was removed, send with EMS to hospital

HYPERGLYCEMIA MANAGEMENT (High Blood Glucose)

Follow instructions in diabetes medical management plan (DMMP), but in addition:

Prevention of DKA (Diabetic Ketoacidosis)
If Blood Glucose (BG) is >300 mg/dL two times in a row,



ADDITIONAL TIMES TO CONTACT PARENT/GUARDIAN

- ◆ Soreness, redness or bleeding at infusion site
- ◆ Leakage of insulin at connection to pump or infusion site
- ◆ Insulin injection given for high BG/ketones
- ◆ Dislodged infusion set
- ◆ Pump malfunction
- ◆ Repeated Alarms

Other Instructions:

My signature below provides authorization for the above written orders. I/We understand that all treatments and procedures may be performed by the school nurse, the student and / or trained unlicensed designated school personnel under the training and supervision provided by the school nurse (or by EMS in the event of loss of consciousness or seizure) in accordance with state laws & regulations.

School plan reviewed by:	Physician/Provider Signature	Provider Printed Name:	Date:
Acknowledged and received by:	Parent/Legal Guardian:		Date:
Acknowledged and received by:	School Representative:		Date:



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Parent and Self Administer Diabetes Care

Parent/guardian and student. This form is not required by law, but it outlines rights and responsibilities.

Student Name: _____ **Birthdate:** _____

Student's physician or licensed nurse practitioner confirms that the student has a diagnosis of diabetes, is independent and can perform diabetes care, and has approval to self-administer his/her diabetes care including:

- glucose monitoring
- insulin calculation and administration (including pump operation & pump equipment)

The student understands that he/she is to promptly report to the school nurse or adult as soon as symptoms of high or low blood glucose appear or when not feeling well.

I agree to prepare a written Diabetes Medical Management Plan in consultation with student's parents and appropriate school personnel.

Specific duration of order: 2009-2010 SCHOOL YEAR	Physician/Provider Signature: _____	Provider Printed Name: _____	Office Phone: _____ Office Fax: _____ Date _____
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My child has been instructed in and understands his/her diabetic self-management. My child understands that he/ she is responsible and accountable for carrying and using his/her medication and equipment.

I will provide the school nurse/school administrator with a copy of my child's Diabetes Medical Management Plan signed by his/her physician.

I hereby give permission for the school to administer the medications as prescribed in the care plan, if indicated (ie. Student requests assistance or becomes unable to perform self-care).

I also give permission for the school to contact the above physician/nurse practitioner regarding my child's diabetes care (authorization required if contact is other than the school nurse).

I will not hold the school board or any of its employees liable for any negative outcomes resulting from the self-administration of diabetes medication by my child.

I understand that the school nurse, after consultation with the parent/guardian and school administrator, may impose reasonable limitations or restrictions upon my child's possession and self-administration of diabetes medications relative to his/her age and maturity or other relevant considerations.

I understand that the school administration may revoke permission to possess and self-administer said diabetes medication at any point during the school year if it is determined that my child has abused the privilege of possession and self-administration or he/she is not safely and effectively self-administering the medication. In addition, my child could be subject to further disciplinary action.

Parent/Guardian Signature

Date

Student Signature

Date

Date of Plan: _____

Medical Management Plan

Effective Dates: _____

This plan should be completed by the student's personal health care team and parents/guardian. It should be reviewed with relevant school staff and copies should be kept in a place that is easily accessed by the school nurse, trained diabetes personnel, and other authorized personnel.

Student's Name: _____

Date of Birth: _____ Date of Diabetes Diagnosis: _____

Grade: _____ Homeroom Teacher: _____

Physical Condition: Diabetes type 1 Diabetes type 2

Contact Information

Mother/Guardian: _____

Address: _____

Telephone: Home _____ Work _____ Cell _____

Father/Guardian: _____

Address: _____

Telephone: Home _____ Work _____ Cell _____

Student's Doctor/Health Care Provider:

Name: _____

Address: _____

Telephone: _____ Emergency Number: _____

Other Emergency Contacts:

Name: _____

Relationship: _____

Telephone: Home _____ Work _____ Cell _____

Notify parents/guardian or emergency contact in the following situations:

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	Yes	No
imed	Yes	No
Calculate and administer corrective bolus	Yes	No
Calculate and set basal profiles	Yes	No
Calculate and set temporary basal rate	Yes	No
Disconnect pump	Yes	No
Reconnect pump at infusion set	Yes	No
Prepare reservoir and tubing	Yes	No
Insert infusion set	Yes	No
Troubleshoot alarms and malfunctions	Yes	No

For Students Taking Oral Diabetes Medications

Type of medication: _____ Timing: _____

Other medications: _____ Timing: _____

Meals and Snacks Eaten at School

Is student independent in carbohydrate calculations and management? Yes No

<i>Meal/Snack</i>	<i>Time</i>	<i>Food content/amount</i>
Breakfast	_____	_____
Mid-morning snack	_____	_____
Lunch	_____	_____
Mid-afternoon snack	_____	_____
Dinner	_____	_____

Snack before exercise? Yes No

Snack after exercise? Yes No

Other times to give snacks and content/amount: _____

Preferred snack foods: _____

Foods to avoid, if any: _____

Instructions for when food is provided to the class (e.g., as part of a class party or food sampling event):

Exercise and Sports

A fast-acting carbohydrate such as _____ should be available at the site of exercise or sports.

Restrictions on activity, if any: _____

Student should not exercise if blood glucose level is below _____ mg/dl or above _____ mg/dl or if moderate to large urine ketones are present.

Diabetes Medical Management Plan *Continued*

Treatment of hypoglycemia: _____

Glucagon should be given if the student is unconscious, having a seizure (convulsion), or unable to swallow. Route _____, Dosage _____, site for glucagon injection: _____ arm, _____ thigh, _____ other. If glucagon is required, administer it promptly. Then, call 911 (or other emergency assistance) and the parents/guardian.

Hyperglycemia (High Blood Sugar)

Usual symptoms of hyperglycemia: _____

Treatment of hyperglycemia: _____

Urine should be checked for ketones when blood glucose levels are above _____ mg/dl.

Treatment for ketones: _____

Supplies to be Kept at School

_____ Blood glucose meter, blood glucose test strips, batteries for meter	_____ Insulin pump and supplies
_____ Lancet device, lancets, gloves, etc.	_____ Insulin pen, pen needles, insulin cartridges
_____ Urine ketone strips	_____ Fast-acting source of glucose
_____ Insulin vials and syringes	_____ Carbohydrate containing snack
	_____ Glucagon emergency kit

Signatures

This Diabetes Medical Management Plan has been approved by:

Student's Physician/Health Care Provider _____ Date

I give permission to the school nurse, trained diabetes personnel, and other designated staff members of _____ school to perform and carry out the diabetes care tasks as outlined by _____'s Diabetes Medical Management Plan. I also consent to the release of the information contained in this Diabetes Medical Management Plan to all staff members and other adults who have custodial care of my child and who may need to know this information to maintain my child's health and safety.

Acknowledged and received by:

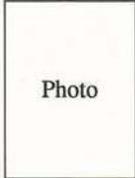
Student's Parent/Guardian _____ Date

Student's Parent/Guardian _____ Date

Source: U.S. Department of Health and Human Resources, National Diabetes Education Program. (June 2003). *Helping the Student with Diabetes Succeed: A Guide for School Personnel*. NIH Publication No. 03-5217, pages 49-52.

Emergency Plan

Student with Diabetes



Hypoglycemia (Low Blood Sugar)

Student's Name _____

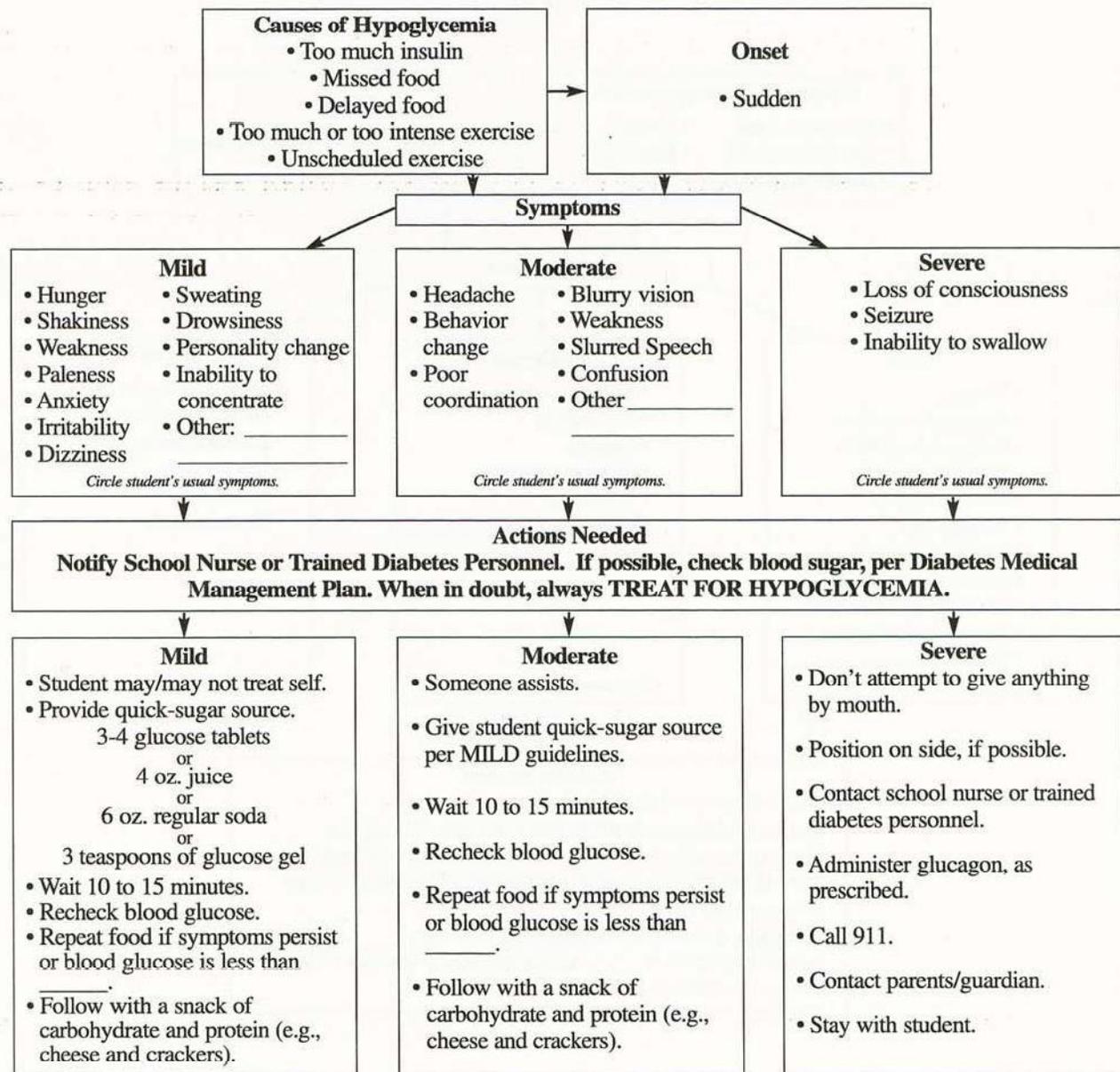
Grade/Teacher _____ Date of Plan _____

Emergency Contact Information:

Mother/Guardian			Father/Guardian		
Home phone	Work phone	Cell	Home phone	Work phone	Cell

School Nurse/Trained Diabetes Personnel _____ Contact Number(s) _____

Never send a child with suspected low blood sugar anywhere alone.



Diabetes Emergency Plan

Student with Diabetes



Hyperglycemia (High Blood Sugar)

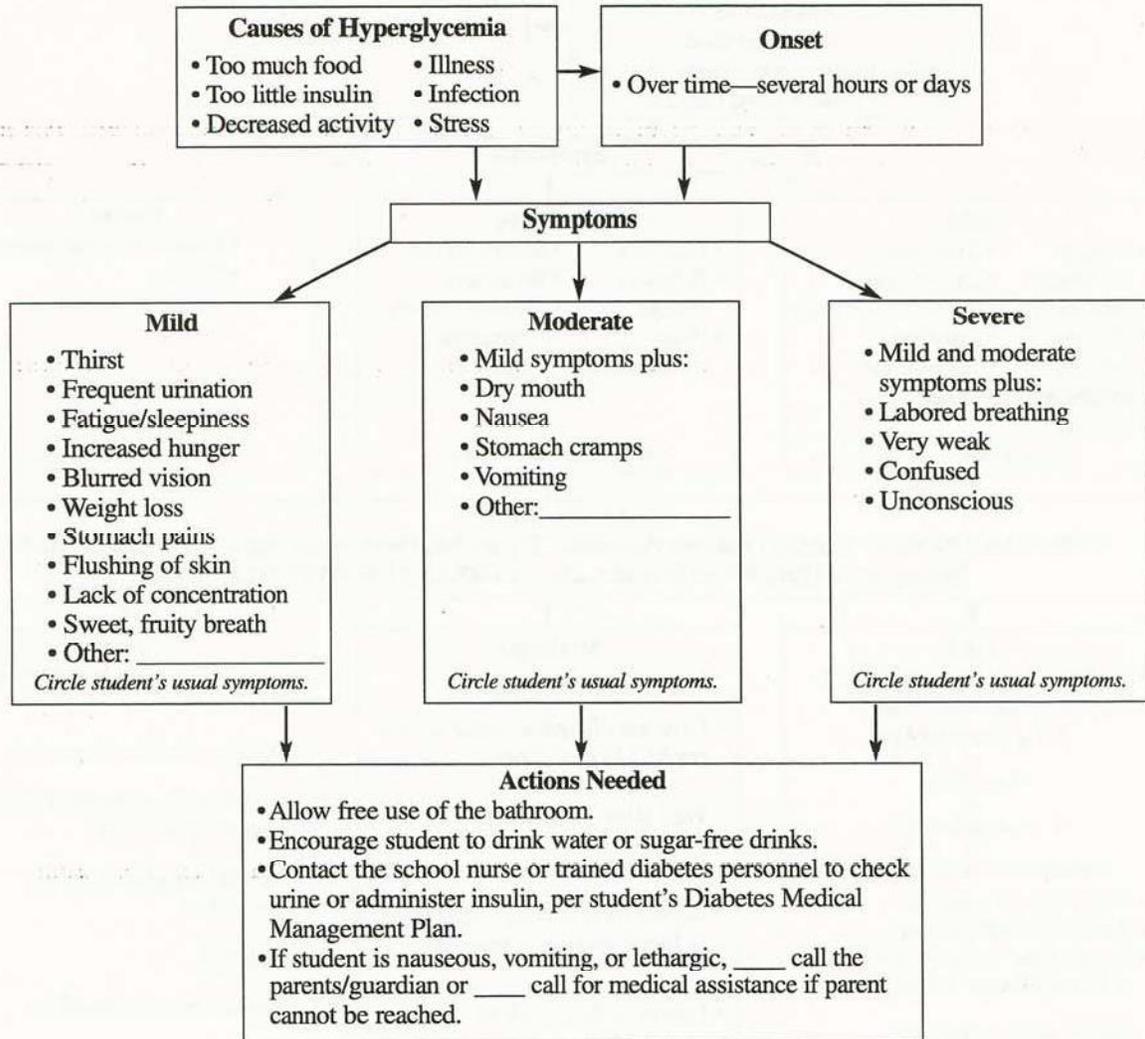
Student's Name _____

Grade/Teacher _____ Date of Plan _____

Emergency Contact Information:

Mother/Guardian			Father/Guardian		
Home phone	Work phone	Cell	Home phone	Work phone	Cell

School Nurse/Trained Diabetes Personnel _____ Contact Number(s) _____



Source: U.S. Department of Health and Human Resources, National Diabetes Education Program. (June 2003). *Helping the Student with Diabetes Succeed: A Guide for School Personnel*. NIH Publication No. 03-5217, pages 53, 54.

er Blood Glucose Testing

1. Review directions for blood testing meter if not familiar with it.
2. Wash hands.
3. Assemble equipment:
 - Alcohol prep pad
 - Finger lancing device
 - Blood glucose testing meter (for example, Accucheck Advantage, Bayer Elite, Lifescan UltraOne Touch, Therasense Freestyle, etc.)
 - Blood testing strips for specific electronic meter
 - Tissue or cotton balls or spot bandage
 - Gloves
 - Student log
4. Wash hands and area to be tested with soap and water. If the caregiver is performing the procedure, put on gloves. Washing student's hands and test site is sufficient for prepping the site; however, alcohol may be used for further prepping. The site selected **must** be dry before pricking.
Alcohol may cause toughening of the skin or burning sensation. If moisture (water or alcohol) remains on the skin it may alter test results.
5. Place glucose testing strip into electronic meter according to manufacturer's instructions.
6. Prepare lancing device according to manufacturer's instructions.
If school personnel are performing the procedure, then a disposable lancing device must be used. Some of the new 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.
7. Select a site. If using finger, use the top sides of fingertips. Hang the arm below the level of the heart for 30 seconds to increase blood flow.
The tips of the fingertips may be more sensitive.
8. Puncture the site with the lancing device. Gently squeeze the finger in a downward motion 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 causes hemolysis of sample and trauma to the site.
9. Place blood on testing strip and complete instructions according to manufacturer's instructions. Compress lancet area with tissue or cotton ball until bleeding stops.
10. Dispose of test strip and tissue or cotton ball in lined wastebasket. Dispose of lancing device in Sharps container.
11. Remove and dispose of gloves. Wash hands.
12. Record results in student log. Refer to student's individualized health care plan for actions. Refer to the "Quick Reference Emergency Plans" on the preceding two pages for sample actions.

Sources:

American Diabetes Association, in partnership with Metropolitan Educational Cooperative Service Unit. (2003). *Diabetes Care Tasks At School: What Key Personnel Need To Know*. Available at www.diabetes.org/schooltraining.

Zombeck, Mary, in partnership with the California Department of Education and the PADRE Foundation. (April 2002). *The Diabetes School Resource Guide: A guide for managing students with diabetes at school*. Available at www.pedsonline.org.

or Moderate Low Blood Glucose

low blood glucose. Ask student to describe how he/she feels. Refer to student's individualized health care plan, if possible.

Mild Symptoms

- Hunger
- Shakiness
- Weakness
- Paleness
- Anxiety
- Irritability
- Sweating
- Drowsiness
- Personality change
- Inability to concentrate
- Dizziness

Moderate Symptoms

- Headache
- Behavior change
- Poor coordination
- Blurred vision
- Slurred speech
- Confusion

If student is unable to swallow, combative, uncooperative, unconscious, or having a seizure, proceed immediately to 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 **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 student's health care provider.
 - Ensure that food eaten matches insulin dosing. Watch picky eaters. Provide information to families about school meals, as well as 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 moderate symptoms, provide immediate adult supervision during testing.
 3. **If blood glucose is below 80:** Have student eat or drink one of the following fast-acting carbohydrates:
 - 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 source of glucose with them at all times.

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

- recheck blood glucose.
- student is feeling better:
- ate and protein snack if over 1 hour until lunch or snack
- time, if ordered in student's individualized health plan.
- Resume classroom activities if fully recovered.
6. Repeat food if symptoms persist or blood glucose is less than 80.
 7. If no improvement, call family and school nurse.
 8. If pupil becomes unable to participate in care, proceed immediately to Emergency Procedure for Severe Blood Glucose.

Sources:

American Diabetes Association. (2003). Care of Children with Diabetes in the School and Day Care Setting. (Position Statement). *Diabetes Care* 26: S131-S135.

American Diabetes Association, in partnership with Metropolitan Educational Cooperative Service Unit. (2003). *Diabetes Care Tasks At School: What Key Personnel Need To Know*. Available at www.diabetes.org/schooltraining.

U.S. Department of Health and Human Resources, National Diabetes Education Program. (June 2003). *Helping the Student with Diabetes Succeed: A Guide for School Personnel*. NIH Publication No. 03-5217. Available at <http://www.ndep.nih.gov/resources/school.htm>.

Zombeck, Mary, in partnership with the California Department of Education and the PADRE Foundation. (April 2002). *The Diabetes School Resource Guide: A guide for managing students with diabetes at school*. Available at www.pedsonline.org.

Procedure for Severe Low Blood Glucose (Hypoglycemia/Insulin Reaction)

1. Verify signs of severe low blood glucose:

- Unable to swallow
- Unconscious
- Combative
- Uncooperative
- Having seizures

Signs are so severe that 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 student's health care provider.
- Ensure that food eaten matches insulin dosing. Watch picky eaters. Provide information to families about school meals, as well as 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. Student should not be left unattended.**

If seizure occurs, follow procedure for Managing a Seizure.

3. Place student on side or in 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.

Student may aspirate or choke.

5. Give glucagon injection, if ordered in student's individualized plan. See Procedure for Giving Glucagon on next page.

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

7. Document in student log.

Sources:

American Diabetes Association. (2003). Care of Children with Diabetes in the School and Day Care Setting. (Position Statement). *Diabetes Care* 26: S131-S135.

American Diabetes Association, in partnership with Metropolitan Educational Cooperative Service Unit. (2003). *Diabetes Care Tasks At School: What Key Personnel Need To Know*. Available at www.diabetes.org/schooltraining.

Zombeck, Mary, in partnership with the California Department of Education and the PADRE Foundation. (April 2002). *The Diabetes School Resource Guide: A guide for managing students with diabetes at school*. Available at www.pedsonline.org.

Glucagon

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 raises blood glucose levels.

Purpose

Glucagon injections are prescription medications used to treat serious hypoglycemia. If it is specified in the student's individualized health plan, 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 individualized health plan. It may be kept by the student. The expiration date should be checked and it should not be administered if 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 that are included with the glucagon kit. (Expired glucagon kits can be used for training sessions.)

Source:

American Diabetes Association, in partnership with Metropolitan Educational Cooperative Service Unit. (2003). *Diabetes Care Tasks At School: What Key Personnel Need To Know*. Available at www.diabetes.org/schooltraining.

Glucagon for Severe Hypoglycemia

low glucose:

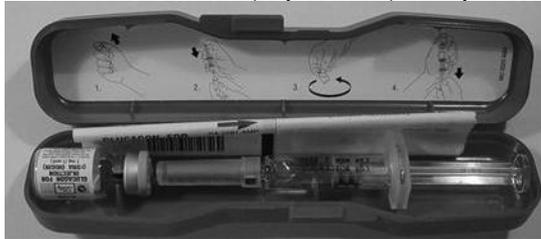
- Unable to swallow
- Unconscious
- Combative
- Uncooperative
- Having seizures

Signs are so severe that student cannot participate in care.

2. **Have someone call emergency medical services, school nurse, and family. Student should not be left unattended.**

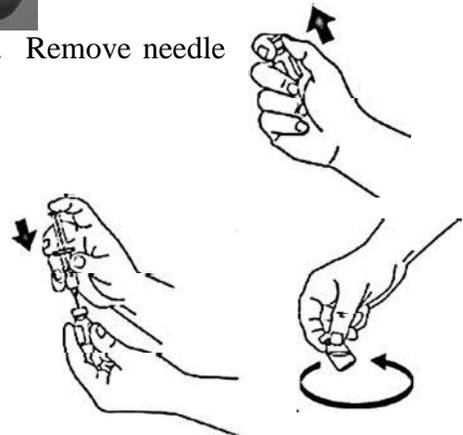
If seizure occurs, follow procedure for Managing a Seizure.

3. Place pupil on side or in upright position if restless/uncooperative. *Maintain head position to one side to prevent aspiration*
4. Obtain glucagon kit. Wash hands (if possible) and put on gloves.



5. Flip cap off glass vial (bottle) containing dry powder. Remove needle cover from syringe.

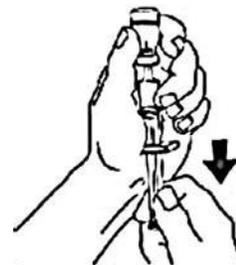
6. Take the fluid-filled syringe in the glucagon emergency kit and inject the fluid into the vial containing the glucagon powder. Shake gently or roll to mix until all powder is dissolved and solution is clear. Inspect medication for color, clarity, and presence of lumps. Solution should be clear and colorless.



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

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



14. Student may be given sips of fruit juice or regular soda once awake and able to drink. May follow with snack containing proteins and carbohydrates such as peanut butter sandwich or cheese crackers to keep blood sugar levels elevated to normal levels and to prevent recurrence.
15. Don't be surprised if student does not remember being unconscious, incoherent or has a headache. Blood sugar may also rise over 200 and nausea or vomiting may occur.
Glucagon can cause nausea/vomiting.
16. When emergency services arrive, student to be transported for medical care.
17. Document in student log.

Sources:

American Diabetes Association, in partnership with Metropolitan Educational Cooperative Service Unit. (2003). *Diabetes Care Tasks At School: What Key Personnel Need To Know*. Available at www.diabetes.org/schooltraining.

Zombeck, Mary, in partnership with the California Department of Education and the PADRE Foundation. (April 2002). *The Diabetes School Resource Guide: A guide for managing students with diabetes at school*. Available at www.pedsonline.org.

For High Blood Glucose Hyperglycemia

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

Mild Symptoms

- Increased thirst
- Increased urination
- Dry mouth
- Fatigue
- Numbness or tingling
- Agitation, fidgetiness, irritability
- Hunger
- Nausea
- Blurred vision
- Weakness

Moderate Symptoms

- Decreased appetite
- Nausea
- Abdominal pain/stomach cramps
- Vomiting
- Sunken eyes
- Weight loss
- Dry mouth

Severe Symptoms

- Continue vomiting
- Sleepiness
- Coma or unconsciousness
- Deep breathing, fruity smell
- Possible ketones

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
- Other hormones
- Menstrual periods

To prevent hyperglycemia:

- Eat, take insulin, test blood glucose, and exercise at the prescribed times.
- Have an up-to-date management plan from student's health care provider.
- Ensure that food eaten matches insulin dosing. Monitor food intake. Report binge eating.

families about school meals, as well as snacks and involving food. Consult family when snack, meal, or changed and prior to extra snacks.

- Take appropriate action if a missed dose is suspected or if an insulin pump malfunctions.
 - Avoid overtreating low blood sugar reactions.
 - Respect the students; realize their limits.
2. Test blood glucose. (See Procedure for Blood Glucose Testing)
 3. **Initiate care per health care 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 even further). Insulin administration during hyperglycemia may be referred to as a "sliding scale insulin" order. Refer to student's individualized health care plan.
 4. Check urine ketones if blood glucose >250. See Procedure for Testing Urine Ketones on next page.
 5. Encourage student to drink water, generally 16-24 ounces over 2 hours or 8 ounces per hour. Allow free use of the bathroom.
If student resumes classroom activities, he/she may need to use a water bottle in class to ensure adequate fluid intake.
 6. If student is feeling okay, he or she may resume classroom activities. If student does not feel well (nausea, lethargy, headache), then the family should be called.
 7. Recheck blood glucose according to student's individualized plan.
 8. If the student develops severe stomach pains, vomiting and/or rapid breathing, call emergency medical services, school nurse, and family immediately.
 9. Document care in student log.

Sources:

- American Diabetes Association. (2003). Care of Children with Diabetes in the School and Day Care Setting. (Position Statement). *Diabetes Care* 26: S131-S135.
- American Diabetes Association, in partnership with Metropolitan Educational Cooperative Service Unit. (2003). *Diabetes Care Tasks At School: What Key Personnel Need To Know*. Available at www.diabetes.org/schooltraining.
- U.S. Department of Health and Human Resources, National Diabetes Education Program. (June 2003). *Helping the Student with Diabetes Succeed: A Guide for School Personnel*. NIH Publication No. 03-5217. Available at <http://www.ndep.nih.gov/resources/school.htm>.
- Zombeck, Mary, in partnership with the California Department of Education and the PADRE Foundation. (April 2002). *The Diabetes School Resource Guide: A guide for managing students with diabetes at school*. Available at www.pedsonline.org.

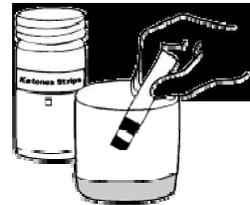
How to Test for Urine Ketones

When the body cannot use glucose, it uses its own fat and muscle tissue for energy. Ketones are acids that are left in the blood when fat is used for energy. Symptoms of nausea, vomiting, and eventually, coma occur. This is called *diabetic ketoacidosis*, also referred to as DKA, and may occur with hyperglycemia.

The body will try to get rid of ketones through the kidneys and lungs. The ketones will show up in the urine and will also cause the breath to smell fruity. Other symptoms include nausea, vomiting, 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, to reduce the level of ketones.

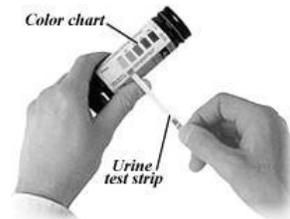
If ketones are not detected early, particularly during illness, they will build up in the body and DKA may result. DKA is the number one reason for hospitalizing children with diabetes. Early detection of ketones and treatment helps to prevent hospitalizations for DKA.

1. Review directions for urine ketone testing if not familiar with it. Wash hands.
2. Assemble equipment:
 - Bottle of ketone strips
 - Urine cup
3. Saturate the test strip with urine by one of the following methods:
 - Student urinates in cup, and then test strip is dipped into urine.
 - Student holds test strip in urine flow.

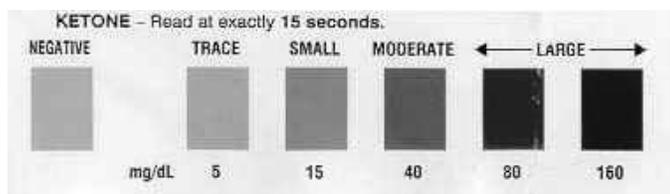


If assisting the student, wear disposable gloves during this procedure.

4. Dip the ketone test strip in the cup containing urine.
5. Wait the exact amount of time for test strip to develop, per directions on test strip bottle (usually 15-60 seconds).
6. Compare color of strip to chart on bottle. Results will be read as negative, small, moderate, or large. Refer to student's individualized health plan for actions.



Generally, if results are moderate or large, student should not engage in physical activity and family should be called to take student home for observation and/or medical care. If urine ketone results are trace or small, increase fluid intake.



7. Record results in student log.

Sources:

American Diabetes Association, in partnership with Metropolitan Educational Cooperative Service Unit. (2003). *Diabetes Care Tasks At School: What Key Personnel Need To Know*. Available at www.diabetes.org/schooltraining

Zombeck, Mary, in partnership with the California Department of Education and the PADRE Foundation. (April 2002). *The Diabetes School Resource Guide: A guide for managing students with diabetes at school*. Available at www.pedsonline.org.

Insulin

Insulin is a hormone constructed of proteins that is normally produced by the pancreas. Synthetically manufactured insulin is produced for the person with diabetes who lacks this hormone. Several days without insulin can cause a life-threatening condition of ketoacidosis, coma, and eventually death.

Storage

Insulin can be affected by extremes in temperature, which can denature the protein and decrease or eliminate its effect. Insulin remains stable at temperatures between 40-75 degrees. Once insulin is opened, the date should be written on the vial. **Refer to student's individualized health plan for instructions regarding storage.** Opened vials of insulin are sometimes left at room temperature for 30 days after opening, but will keep for 3 months if refrigerated. Some health care providers recommend storing any opened insulin in the refrigerator and using for one month. Unopened vials that are stored in the refrigerator are good until the expiration date. Refer also to manufacturer's instructions to ensure proper storage.

Dosage and Administration

Insulin doses are measured in units. There are 10 milliliters in one vial of insulin, which is equivalent to 1000 units. 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 health care provider--physician or nurse practitioner. The amount or dose of insulin will depend on several factors: body size, blood glucose levels, meal plan, and exercise. A sliding scale may be used, that is, the number of insulin units to be given is based on the blood glucose reading.

Insulin injections are given subcutaneously (area between the skin and the muscle). Sites should be rotated to avoid scar tissue or fatty cell growth under the skin.

Types of Insulin

Insulin can be classified as rapid-acting, short-acting, intermediate-acting, or long-acting. The different types vary in 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 spot dosing and correction doses (doses given in order to decrease an 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 student's individualized health plan. Correction or spot doses should not be given closer than 2 hours apart. Some insulin orders may call for the mixing of a short-acting insulin with a longer-acting insulin, but are usually not given during school hours. See chart below for insulin action times:

		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)	5-15 minutes	30-90 minutes	2-4 hours
	Aspart (Novolog)	5-15 minutes	1-3 hours	2-4 hours
Short-Acting	Regular	30-60 minutes	2-3 hours	3-4 hours
Intermediate-Acting	NPH	2-4 hours	6-10 hours	10-18 hours
	Lente	3-4 hours	6-12 hours	12-20 hours
Long-Acting	Ultralente	6-10 hours	10-16 hours	18-24 hours
	Glarine (Lantus)	1 hour	peakless	24 hours

Insulin Delivery Systems

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

Interactions with other Medications

The school nurse should be notified if additional medication is being used by the student. Other medications can increase or decrease the effect of insulin.

Sources:

- American Diabetes Association. (2003). Care of Children with Diabetes in the School and Day Care Setting. (Position Statement). *Diabetes Care* 26: S131-S135.
- American Diabetes Association, in partnership with Metropolitan Educational Cooperative Service Unit. (2003). *Diabetes Care Tasks At School: What Key Personnel Need To Know*. Available at www.diabetes.org/schooltraining.
- U.S. Department of Health and Human Resources, National Diabetes Education Program. (June 2003). *Helping the Student with Diabetes Succeed: A Guide for School Personnel*. NIH Publication No. 03-5217. Available at <http://www.ndep.nih.gov/resources/school.htm>.
- Zombeck, Mary, in partnership with the California Department of Education and the PADRE Foundation. (April 2002). *The Diabetes School Resource Guide: A guide for managing students with diabetes at school*. Available at www.pedsonline.org.

Insulin Administration by Syringe

Novolog Insulin (no mixing with other insulins)

1. Wash hands.
2. Assemble equipment:
 - Vial of insulin
 - Syringe with needle (use only an insulin syringe)
 - Alcohol prep pad
 - Cotton balls or spot bandage (optional)
 - Gloves (if done by anyone other than student)
 - Sharps container
3. If insulin is cold, warm in the palm of hand to room temperature.
Injecting cold insulin can cause pain and may affect absorption.
4. If this is a new bottle of insulin, remove the flat, colored cap. Do not remove the rubber stopper or the metal band under the cap. Check expiration date of the vial of insulin.
5. Clean the rubber top of the insulin vial and let dry for a few seconds.
6. Remove the cap from the syringe. Fill the syringe with air equal to the number of units of insulin needed. Inject air into Regular or Humalog/Novolog insulin bottle with syringe remaining in bottle, invert and pull plunger back beyond the number of units desired. Keeping the syringe in an upright position, clear any air by pulling plunger back and tapping syringe to raise air bubbles to the top. Push plunger to desired amount of units, ensuring that 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.
7. Slip needle back into cap without touching cap or needle. (See Procedure for One-Handed Needle Recapping if syringe must be recapped.) Select the site to be used and prep with alcohol and let dry. If area is dirty, the wash with soap and water and dry.
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) also hastens absorption of an injected area.
8. Pinch up 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 (area that lies directly in front or in back of the pinched up skin) at a 90 degree angle. Inject insulin in one to five seconds. (Do not aspirate or pull back the plunger.) Release pinched up skin and remove 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.
9. Dispose of syringe with needle intact into a sharps container.
Recapping a needle can result in a needlestick injury.
10. Document in student log.

Sources:

American Diabetes Association, in partnership with Metropolitan Educational Cooperative Service Unit. (2003). *Diabetes Care Tasks At School: What Key Personnel Need To Know*. Available at www.diabetes.org/schooltraining

Zombeck, Mary, in partnership with the California Department of Education and the PADRE Foundation. (April 2002). *The Diabetes School Resource Guide: A guide for managing students with diabetes at school*. Available at www.pedsonline.org.

Insulin Administration by Syringe

Two Types of Insulin Together

1. Wash hands.
2. Assemble equipment:
 - Vials of insulin
 - Syringe with needle (use only an insulin syringe)
 - Alcohol prep pad
 - Cotton balls or spot bandage (optional)
 - Gloves (if done by anyone other than student)
 - Sharps container
3. If insulin is cold, warm in the palm of hand to room temperature.
Injecting cold insulin can cause pain and may affect absorption.
4. If this is a new bottle of insulin, remove the flat, colored cap. Do not remove the rubber stopper or the metal band under the cap. Check expiration dates of the vials of insulin.
5. If NPH or Lente is used, it will require mixing. Gently roll the bottle between the palms or turn the bottle over from end to end a few times. Do not shake. If any clumps are visible, do not use.
Shaking can cause the protein to denature and decrease the potency. Clumps are an indication that the protein has been denatured.
6. Clean the rubber top of the insulin vial and let dry for a few seconds.
7. Remove the cap from the syringe. Fill the syringe with air equal to the number of units of intermediate or long-acting insulin needed. Keep the bottle upright and inject air into the intermediate or long-acting bottle. Pull empty syringe out of the bottle.
Air is always injected into the longer acting insulin first. Air is always injected into the vial to prevent creating a vacuum inside the vial as insulin is removed.
8. Inject air into Regular or Humalog/Novolog insulin bottle with syringe remaining in bottle, invert and pull plunger back beyond the number of units desired. Keeping the syringe in an upright position, clear any air by pulling plunger back and tapping syringe to raise air bubbles to the top. Push plunger to desired amount of units, ensuring that no air bubbles remain and withdraw the syringe.
Regular/Humalog/Novolog insulin is always drawn up first. This avoids potential contamination of longer acting insulin into the short acting (which could delay the action time of regular insulin. Air bubbles left in the syringe can alter the desired dose.
9. Inject needle into intermediate or long-acting insulin bottle and withdraw exact number of units to be given. Total number of units must equal the Regular/Humalog/Novolog unit dose plus the intermediate/long-acting insulin dose. Example: 5 u Regular and 10 u NPH equals 15 total units.
If there is any air in the syringe after withdrawing the needle, attempt to clear. If any insulin is inadvertently pushed out, the entire dose should be discarded and redrawn. Avoid pushing the plunger up in the intermediate/long-bottle to rid air. This could inadvertently push regular insulin up in to the intermediate/long-acting bottle and alter the entire dose.
10. Slip needle back into cap without touching cap or needle. (See Procedure for One-Handed Needle Recapping if syringe must be recapped.) Select the site to be used and prep with alcohol and let dry. If area is dirty, the wash with soap and water and dry.

used for injection sites. The best absorption is in the upper, outer arms, tops of the thighs and lastly the upper and heat (like the warmth from a heating pad or whirlpool) also hastens absorption of an injected area.

11. Pinch up 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 (area that lies directly in front or in back of the pinched up skin) at a 90 degree angle. Inject insulin in one to five seconds. (Do not aspirate or pull back the plunger.) Release pinched up skin and remove 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.
12. Dispose of syringe with needle intact into a sharps container.
Recapping a needle can result in a needlestick injury
13. Document in student log.

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Insulin Pen Delivery System

Insulin pen 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 (dose is indicated by visual numbers), a push button (this delivers the insulin), and a pen encasement. The purpose of an insulin pen is to provide insulin with a convenient and accurate device at school. Insulin pens will assist in preventing dose errors that may occur with a syringe and vial. Some pens can be purchased with the insulin cartridge already in place (these are considered "disposable pens") and other pens require "loading" of a specific insulin cartridge. Storage of cartridges may or may not require refrigeration. Specific manufacturer's instructions regarding handling and storage of insulin cartridges must be followed.

1. Obtain a blood glucose reading prior to insulin administration.
2. Determine insulin dose with health care provider's orders.
3. Wash hands.
4. Assemble equipment:
 - Insulin pen device
 - Pen needle
 - Alcohol prep pad
 - Cotton balls or spot bandage (optional)
 - Gloves (if done by anyone other than student)
 - Sharps container
5. Check insulin type/brand. This must match health care provider's orders.
6. Check 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 new needle. Remove outer plastic cap and plastic needle cap. Place outer cap on a flat surface with 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 needle tip. If it does not, repeat procedure.
Change in temperatures can cause air intake. This procedure ensures that any accumulated air will be released, thereby ensuring accurate insulin dosage.
9. Dial in prescribed dose.
10. Cleanse skin with alcohol and allow to dry before injecting.
11. Pinch up the skin at selected area and dart the needle into the soft pocket at a 90 degree angle.
The soft pocket lies directly in front of or in back of the pinched up skin.
12. Inject insulin at a steady rate.
13. Count slowly to three or five and then remove the needle.
Some pen manufacturers require a longer count.
14. Grasping the pen, place the needle into plastic needle cap that was left upright on a flat surface. Unscrew the needle tip and carefully discard into a sharps container.
Do not lift the cap up with fingers to cover needle tip. Leave cap on the counter and use the pen to place the needle into the cap to avoid possibility of fingerstick injury (see Procedure for One-Handed Needle Recapping). The needle must be changed after each injection, as



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...es an OPEN passageway into the insulin and

Information about different insulin pens, along with contact information for their manufacturers can be found at www.pedsonline.org.

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Insulin Pump Therapy

Insulin Pump Therapy is also referred to as Continuous Subcutaneous Insulin Infusion (CSII). The pump is worn outside the body and is about the size and weight of a pager. 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 that is covered by a cannula just below the skin. Once inserted, the needle is removed and the cannula stays in place for two to three days. When it is time to change the infusion set, a new infusion set is inserted into a different site.

Purpose

The goal of Insulin Pump Therapy is to achieve near normal blood glucose levels over 24 hours per day. The use of CSII has been shown to improve growth in children, decrease the incidence of hypoglycemia, and decrease the incidence of long-term diabetes complications.

The advantages of CSII are that it affords more flexibility of lifestyle with less variability of insulin absorption, more precise insulin administration matched with food intake and activity levels, and overall close attention to diabetes management.

Type of Insulin

The pump uses rapid-acting insulin (such as Humalog or Novolog) as opposed to conventional injections, which typically combine short and longer-acting insulins.

Insulin Pump Therapy combines a continuous basal of insulin for 24 hours and a bolus dose for meal or snack times and times of high blood glucose.

Basal rate: Amount of insulin required when no food is eaten; a pre-programmed feature measured in units per hour (U/H); can be altered based on the pumper's daily needs; can be temporarily changed for alteration in schedule activity, illness or food.

Bolus: When the pump is programmed to give a dose of insulin for meals, snacks and /or for correction of elevated blood glucose.

Pump Operation and Maintenance

The specific pump manufacturer instructions must be followed. Manuals, booklets, and videos are usually available free of charge by calling the number listed on the back of the pump.

If the supply of insulin is interrupted due to mechanical pump failure, dislodgment of the cannula, accidental severing of the tubing, or clogged or obstructed tubing, the blood glucose level can rise quickly. In case one of these incidents should occur, it is necessary for extra supplies to be kept at school to prevent or limit the subsequent hyperglycemia and possible ketoacidosis (can occur in as little as 3 hours).

The pump can be disconnected using a quick release set. This is usually done during water activities or contact sports.

model and serial number, and the pump manufacturer's name. The pump manufacturer's name is available in the health office for any problems that arise. The pump manufacturer's name, pump card and an alarm card or manufacturer's instructions should also be available in the health office for reference.

Insulin Pump Skills

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

- Appropriately counts carbohydrates
- Calculates appropriate correction dose based on health care provider orders
- Calculates total dose based on health care 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
- Uses standard precautions
- Fills reservoir and primes tubing
- Trouble shoots alarms appropriately
- Appropriately identifies high and low blood glucose levels

Actions/responsibilities of student and/or parent when student independently manages Insulin Pump Therapy:

- Proper needle/catheter preparation and insertion
- Programming the pump functions
- Reporting to school personnel any pump malfunctions (dead batteries, high pressure alarm, no delivery, etc.)
- Delivering appropriate insulin amount based on blood glucose testing values, anticipated exercise and planned food consumption
- Caring for skin site
- Inserting a new set if tubing becomes dislodged
- Using standard precautions, including proper disposal of sharps and contaminated wastes
- Ensuring pump/tubing safety during physical activities. If student chooses a quick-release set during activities, he/she will ensure that normal blood glucose is maintained as much as possible (checking blood glucose before, during, and after activities and taking extra carbohydrates as needed).

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Hypoglycemia with Pump Therapy

Glucose (previous section) and student-specific instructions 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 diabetic students 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.

School nurse will notify family and/or health care provider according to student’s individualized health plan.

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Procedure for Pump Alarms

1. Troubleshoot alarms.

Follow manufacturer’s instructions for alarm indication. A reference card can assist with troubleshooting steps of the manufacturer’s 800 number can be called (listed on the back of the pump).

LOW BATTERY	Insert new batteries according to instructions.
NO DELIVERY	Check insulin reservoir. If empty, have students or family refill it. If cannula becomes obstructed or kinked, new infusion set must be inserted.

- If unable to restart pump function or troubleshoot pump, call school nurse so student can be monitored closely and receive appropriate care.
An injection of short-acting insulin may be ordered.
- Follow Procedure for High Blood Glucose if necessary.
- Document any incidents in student log. Keep parents informed of any issues at school.

Contact information for companies that manufacture insulin pumps:

Animas	(877) 937-7867	< http://www.animascorp.com >
Disetronic Medical Systems	(800) 280-7801	< http://www.disetronic-usa.com >
MiniMed	(800) 646-4633	< http://www.minimed.com > (24-hour clinical service phone line 800-826-2099)

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Care of the Gastrointestinal System

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- Gastrostomy tube
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- Skin-level gastrostomy (G-Button)
- G-Button feeding
- Nasogastric tube
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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

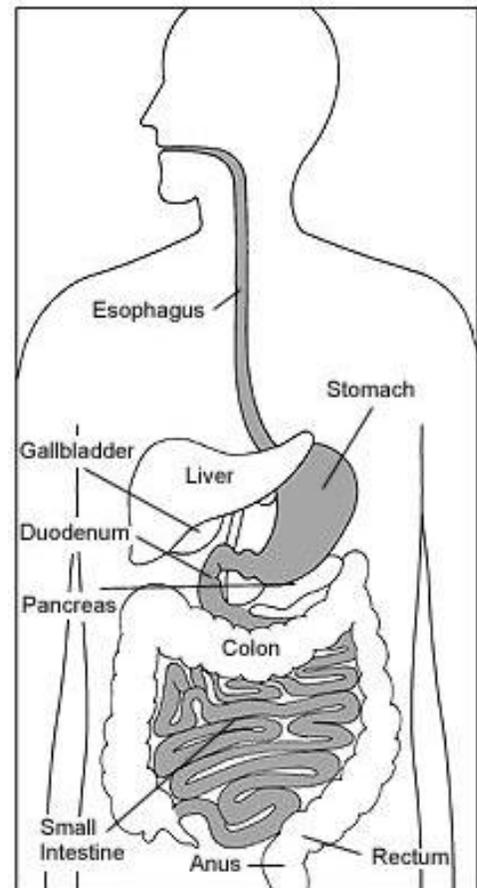
The large, hollow organs of the digestive system contain muscles that enable their walls to move. The movement of organ walls can propel food and liquid and also can mix the contents within each organ. This movement of the esophagus, stomach, and intestine is called *peristalsis*. The action of peristalsis 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 juice 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 intestine are mixed and pushed forward to allow



digested nutrients are absorbed through the intestinal 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. The bile is stored between meals 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.

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; then an enzyme in the lining of the small intestine (maltase) splits the maltose 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

estine. Here, several enzymes from the pancreatic juice
out the breakdown of huge protein molecules into small
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 the 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).

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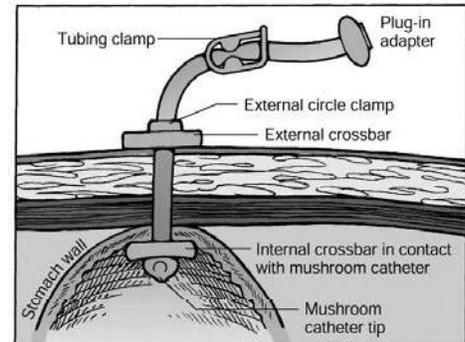
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Gastrostomy Tube

Overview

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

The G-tube is used to administer fluids and food 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.



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

- 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 foodpipe) or failure to thrive.
- Need for supplemental calories due to increased needs from a disease process, such as cystic fibrosis or malabsorption disorders.
- Risk for choking and aspiration due to impaired swallowing or severe reflux.

Potential Settings

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. Student's desire for privacy and possible need for stationary 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, eliminating the need for any feeds during the school day.

Students who require venting or drainage of their G-tubes should have this done in a clean, private area such as the health office. 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.

Staff Preparation

A G-tube feeding may be administered by the school nurse (RN or LPN) or a trained health assistant. If the feeding is administered by a non-licensed health assistant, it should be

the student should be encouraged to assist with the G-tube

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

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. It outlines specific procedures step by step. Once the procedures have been mastered, the completed checklist serves as documentation of training.

Components of the Individualized Health Care Plan

Each student's IHCP must be tailored to the individual's needs. The following section covers the procedure for G-tube care and possible problems and emergencies that may arise. It is essential to review it before writing the IHCP.

A sample plan is included in Appendix A. For a student with a gastrostomy tube, the following items should receive particular attention:

- 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)
- Whether the student receives bolus or continuous feeds
- Amount, type, and frequency of formula to be received
- Amount and type of flush liquid
- When the tube should be flushed, such as before and after administration of feeds or medications
- Volume of flushes
- Type of portable pump and its specific instructions
- Positioning during and after feeding
- Activity level during and after feeding
- Whether 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
- Patency of gastrostomy tract and time frame for reinsertion should the G-tube fall out
- 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 alert
- Standard precautions

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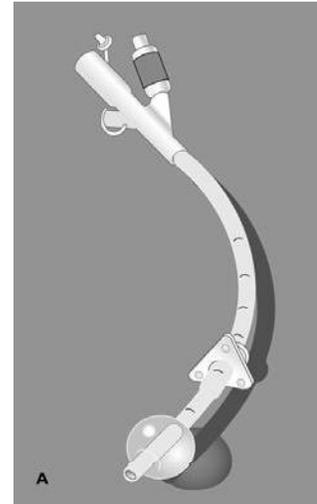
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Gastrostomy Tube Feeding—Bolus Method

Note: Equipment and feeding supplies provided by parent.

1. Wash hands.
2. Gather and assemble equipment:
 - Liquid formula or feeding solution, at room temperature
 - 60 ml catheter-tipped syringe or other feeding container for feeding
 - Clamp or plug for end of tube
 - Water (to flush tubing before and after feeding)
 - Rubber bands and safety pins (to secure G-tube to clothing)
 - Gloves



Identify size and type of G-tube. Shake can well to mix formula and note 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.

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 prescribed amount of formula to be infused.
4. Explain 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. Position student upright as specified in student plan.
Students usually sit (or may lie on their right side with their head elevated) during feeding. Tubing may be pinned to shirt. Make sure clamp is not pressing on skin.
6. Inspect skin at gastrostomy site for redness, tenderness, swelling or irritation, or presence of drainage or gastric leakage.
Report abnormal findings to school nurse and family.
7. Wash hands and don gloves.
8. Remove plug (cap) from G-tube and insert a catheter-tipped syringe into the end of feeding tube.
G-tube is still clamped. Do not pull on gastrostomy tubing as this can cause pain and injury to the site.
9. 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 stomach.

to have residuals checked. Note the amount that was
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 health care
provider's orders if a residual is present. If the residual is greater than recommended,
hold feeding, wait 30-45 minutes, and check again.

10. Clamp the gastrostomy tubing, disconnect the syringe, and remove plunger from syringe.
11. Reinsert catheter tip of syringe into tubing.
Syringe should be held 6 inches above level of stomach or at prescribed height.
12. Unclamp tube, and allow bubbles to escape.
13. G-tubes should be flushed with 15-30 cc tepid tap water before feedings or medication.
Follow guidelines in student's individualized health care plan.
14. Administer medication, if prescribed, either before or after a feeding, as specified in
student's individualized health care plan. Use liquid medication, if possible. Flushing
with water between each medication and not mixing the medications can help to prevent
clogging of tube.
15. Pour feeding/fluid into syringe and allow to flow in by gravity.
*If a container other than a syringe is used for the feeding, unclamp tubing and allow it to
flow in by gravity, using the same procedure. The flow of feeding may need to be
initiated by placing plunger into barrel of syringe and depressing slightly to get it started
(and then remove 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 formula is too cold.**

16. Continue to pour feeding into syringe as contents empty into stomach. Keep syringe
partially filled to prevent air from entering stomach.
*Depending on the age and capabilities of the student, have him/her assist with the feeding
by holding syringe or pouring fluid into it. Provide oral stimulation, if ordered.*
17. Raise or lower syringe or container to adjust flow to prescribed rate.
The higher the syringe is held, the faster the feeding will flow into the stomach.
18. When feeding is completed, pour prescribed amount of water, usually 15-30 cc, into
syringe and flush tubing. *This will clear tubing of feeding and medication.*
19. Open G-tube to air, if ordered.
*Venting allows drainage of fluid or release of gas bubbles in the stomach. May help if
student has a problem with gas.*
20. Clamp tubing, remove barrel of syringe, and reinsert plug into end of tubing.
Clamp tubing prior to removing the syringe or stomach contents may leak out of the tube.
21. Secure tubing and tuck inside clothes, but not inside diaper or underpants.
22. Refer to student's individualized health care plan for guidelines regarding positioning and
activity after feeding.
23. Wash 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 individualized health
care plan to determine how long it may safely be used. Open formula should be stored in*

l correctly (not the original can) in the refrigerator.
48 hours.

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

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 229-238, 249-256.
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- Steller, JJ & L Bevington. (2004). *Buttons and Bows: Understanding Enteral Devices*. Presentation at *GI Nursing: Regional Pediatric GI and Nutrition Nursing Conference*, Children's Hospital of Philadelphia, March 26, 2004.

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

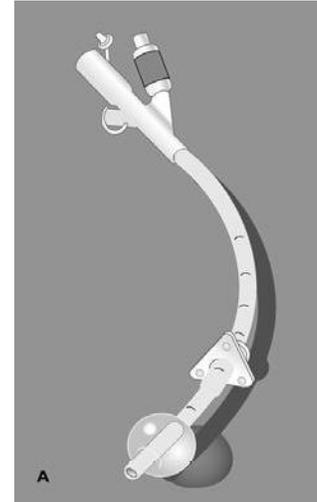
Note: Equipment and formula provided by parent.

1. Wash hands.
2. Gather and assemble equipment:
 - Liquid formula or feeding solution, at room temperature
 - 60 ml catheter-tipped syringe or other feeding container for feeding
 - Feeding bag and tubing
 - Feeding pump and stand or carry-pack, if needed
 - Clamp or plug for end of tube
 - Water (to flush tubing before and after feeding)
 - Rubber bands and safety pins (to secure G-tube to clothing)
 - Gloves

Identify size and type of G-tube. Shake can well to mix formula and note 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.

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 prescribed amount of formula to be infused.
4. Explain 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. Position student upright as specified in student plan.
Students usually sit (or may lie on their right side with their head elevated) during feeding. Tubing may be pinned to shirt. Make sure clamp is not pressing on skin.
6. Inspect skin at gastrostomy site for redness, tenderness, swelling or irritation, or presence of drainage or gastric leakage.
Report abnormal findings to school nurse and family.
7. Wash hands and don gloves.
8. Remove plug (cap) from G-tube and insert a catheter-tipped syringe into the end of feeding tube.
G-tube is still clamped. Do not pull on gastrostomy tubing as this can cause pain and injury to the site.
9. 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 stomach.



have residuals checked. Note the amount that was
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 health care
provider's orders 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 feeding bag. Run through tubing and fill drip chamber according to tubing directions. Run through rest of tubing to the tip. Clamp.
11. Hang bag on pole above pump or at height to achieve prescribed flow. If a pump is used, insert tubing in pump mechanism and set 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 manufacturer instructions for use and student's individualized health care plan for instructions for activity level.
12. G-tubes should be flushed with 15-30 cc tepid tap water before feedings or medication. Follow guidelines in student's individualized health care plan.
13. Administer medication, if prescribed, either before or after a feeding, as specified in student's individualized health care plan. Use liquid medication, if possible. Flushing with water between each medication and not mixing the medications can help to prevent clogging of tube.
14. Insert tip of feeding bag tubing into G-tube. Connection may be taped or luer-locked to prevent disconnection. Unclamp G-tube.
Be careful not to apply unnecessary pull on gastrostomy.
15. Open clamp of feeding bag tubing and adjust until drips flow at prescribed rate. If pump is used, open clamp completely, set rate on pump, and monitor for 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 formula is too cold.

16. For continuous feeding with pump, add feeding as needed to prevent 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 feeding bag tubing, and clamp G-tube.
18. Disconnect feeding bag and tubing from G-tube.
19. Unclamp G-tube and use a syringe to flush with water (usually 15-30 cc), unless ordered otherwise.
This will clear tubing of feeding and medication.
20. Open G-tube to air, if ordered.
Venting allows drainage of fluid or release of gas bubbles in the stomach. This may help if student has a problem with gas.
21. Clamp and plug G-tube.
22. Secure tubing and tuck inside clothes, but not inside diaper or underpants.
23. Refer to student's individualized health care plan for guidelines regarding positioning and activity after feeding.

ected while the student is being transported to and from

24. Wash 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 individualized health care plan 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.
25. Remove gloves. Wash hands.
26. Document feeding, record amount of formula, any medication, residual amount, feeding tolerance, and any concern about gastrostomy site in student's log and notify school nurse and family of any changes or concerns.

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 229-238, 249-256.
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Problems That May Occur with Gastrostomy Feeds

Assessment	Intervention/Rationale
Breathing difficulties, choking, coughing, and/or color changes	Stop feeding immediately. There may be aspiration of feeding into the lungs. Call school nurse if not present. Notify family and activate the school emergency plan.
Nausea and/or cramping	Make sure feeding is at room temperature. Check feeding rate. Rate may need to be slowed. Check the length of the G-tube to see if it may have migrated either inward or outward. If problem continues, notify school nurse, family, and/or health care provider.
Vomiting	If all the above have been checked, stop feeding, call school nurse or family. Remove residual and vent, if ordered.
Blocked gastrostomy tubing	May be due to inadequate flushing, slow flow rate, or very thick fluid. Check tube position. Flush with 20-30 cc warm water. Carbonated beverages and juice have not proven effective in unclogging the tubing. Make sure all clamps on tubing are open. Squeeze or roll gastrostomy tubing with fingers moving slowing down toward student's stomach. Do <u>not</u> use stylet (guidewire) to try and unclog as this may damage G-tube. If blockage remains, contact school nurse or family.
Leakage	Check position of tube. Make sure 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 balloon (if present). Adjust external stabilizer for appropriate fit.
Redness/irritation/bleeding at site	Check G-tube site for leakage. Clean stoma site if leakage of food/fluid/medication/stomach contents come in contact with skin. Keep site dry. Make sure tubing is not being pulled. Loosen 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 area. Avoid allowing tube to dangle—secure to clothing. Skin barrier or other protective skin preparations may be used, if ordered. Refer to student's individualized health care plan for cleaning or dressing instructions. Look for other signs of infection. Notify school nurse and family of gastrostomy site concerns.

Intervention/Rationale

<p>Follow guidelines in student's individualized health care plan. The G-tube may need to be reinserted immediately if a student's tract closes quickly (particularly if gastrostomy is less than 1-2 months old). Cover the site with a dry dressing or large bandage. Notify school nurse and family. Activate school emergency plan</p>
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Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 229-238, 249-256.
- Fidanza, S. (2003). *Gastrostomy Care*. Denver: The Children's Hospital. McKesson Clinical Reference Products. Available online at www.apria.com/resources/1,2725,48-53-G-2035,00.html.
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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 usually is 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 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/pager) for additional information or if the student experiences any problems with the G-tube.

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.

Low Profile Gastrostomy Devices (Skin-Level Gastrostomy Feeding Button)

Overview

A gastrostomy is a surgically created opening into the stomach through the surface of the abdomen. The skin-level or low profile gastrostomy device may also be called a G-button, MIC-KEY button, Nutriport, or Hideaport, depending on the manufacturer. The silicon 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. 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 tube to the device. When the feeding is over, the tube is removed and the safety plug 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:

- 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 foodpipe) or failure to thrive.
- Need for supplemental calories due to increased needs from a disease process, such as cystic fibrosis or malabsorption disorders.
- Risk for choking and aspiration due to impaired swallowing or severe reflux.

To allow healing of the gastrostomy, skin-level gastrostomy devices are typically not inserted until 1-3 months after the gastrostomy has been performed.

Potential Settings

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. Student's desire for privacy and possible need for stationary 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.

Staff Preparation

Feedings using skin-level gastrostomy devices can be administered by the school nurse (RN or LPN) or a trained health assistant supervised by a registered nurse. The student should be encouraged to assist with the feeding as much as possible.

providers, 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.

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. It outlines specific procedures step by step. Once the procedures have been mastered, the completed checklist serves as documentation of training.

Components of the Individualized Health Care Plan

Each student's IHCP must be tailored to the individual's needs. The following section covers the procedure for care of the skin-level gastrostomy device and possible problems and emergencies that may arise. It is essential to review it before writing the IHCP.

A sample plan is included in Appendix A. For a student with a skin-level gastrostomy device, the following items should receive particular attention:

- Underlying condition and possible problems associated with the condition or treatment
- Size and type of feeding device
- Length of G-button outside of the body (important to know in determining whether G-button has migrated either further into the stomach or out of the stomach)
- Whether the student receives bolus or continuous feeds
- Amount, type, and frequency of formula to be received
- When the tube should be flushed, such as before and after administration of feeds or medications
- Volume of flushes
- Type of portable pump and its specific instructions
- Positioning during and after feeding
- Activity level during and after feeding
- Whether 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
- Patency of gastrostomy tract and time frame for reinsertion should the device fall out
- 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 alert
- Standard precautions

Sources:

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

Note: Parents provide equipment and formula.

1. Wash hands.
2. Gather and assemble equipment:
 - Liquid formula or feeding solution, at room temperature
 - 60 ml catheter-tipped syringe or other feeding container for feeding
 - Adaptor with tubing and clamp (varies with type of device)
 - Water (to flush tubing before and after feeding)
 - Rubber bands and safety pins (to secure G-tube to clothing)
 - Gloves

Identify size and type of gastrostomy device. Shake can well to mix formula and note 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.

***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 prescribed amount of formula to be infused.
4. Explain 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. Position student upright as specified in student plan.
Students usually sit (or may lie on their right side with their head elevated) during feeding.
6. Inspect skin at gastrostomy site for redness, tenderness, swelling or irritation, or presence of drainage or gastric leakage.
Report abnormal findings to school nurse and family.
7. Wash hands and don gloves.
8. Rotate (turn 90 degrees) external stabilizer/bolster according to student's individualized health care plan.
This may help prevent adhesions.
9. Open the safety plug on the gastrostomy device.
10. Insert adaptor and tubing into gastrostomy device according to manufacturer instructions (some adaptors lock into place).
11. Flush with 10-30 cc tepid tap water before feedings or medications. Follow student's individualized health care plan.

scribed, either before or after a feeding, as specified in
are plan. Use liquid medication, if possible. Flushing
with water between each medication and not mixing the medications can help to prevent
clogging of tube.

13. Remove plunger from syringe and attach the adaptor tubing to the feeding syringe.

14. Pour feeding/fluid into syringe and allow to flow in by gravity.

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

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

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

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

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

17. When feeding is completed, pour prescribed amount of water into syringe and flush tubing. *This will clear tubing of feeding and medication.*

18. Clamp adapter tubing, remove barrel of syringe, and close safety plug into gastrostomy device.

19. Refer to student's individualized health care plan regarding positioning and activity after feeding.

20. Wash 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 individualized health care plan 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.

21. Remove gloves. Wash hands.

22. Document feeding, record amount of feeding, any medication, residual amount, feeding tolerance, and any concern about gastrostomy site in student's log and notify school nurse and family of any changes or concerns.

Sources:

Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 229-238, 249-256.

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Berly-Clark. Available by calling 1-800-528-5591.

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Level Gastrostomy Device (G-Button) p or Continuous Feeding by Pump

Note: Parents provide equipment and formula.

1. Wash hands.
2. Gather and assemble equipment:
 - Liquid formula or feeding solution, at room temperature
 - 60 ml catheter-tipped syringe or other feeding container for feeding
 - Feeding bag and tubing
 - Feeding pump and stand or carry-pack, if needed
 - Adaptor with tubing and clamp (varies with size and type of device)
 - Water (to flush tubing before and after feeding)
 - Rubber bands and safety pins (to secure G-tube to clothing)
 - Gloves

Identify size and type of gastrostomy device. Shake can well to mix formula and note 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.

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3. Measure prescribed amount of formula to be infused.
4. Explain 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. Position student upright as specified in student plan.
Students usually sit (or may lie on their right side with their head elevated) during feeding.
6. Inspect skin at gastrostomy site for redness, tenderness, swelling or irritation, or presence of drainage or gastric leakage.
Report abnormal findings to school nurse and family.
7. Wash hands and don gloves.
8. Rotate (turn 90 degrees) external stabilizer/bolster according to student's individualized health care plan.
This may help prevent adhesions.
9. Open the safety plug on the gastrostomy device.
10. Insert adaptor and tubing into gastrostomy device according to manufacturer instructions (some adaptors lock into place).

water before feedings or medications. Follow student's

12. Administer medication, if prescribed, either before or after a feeding, as specified in student's individualized health care plan. Use liquid medication, if possible. Flushing with water between each medication and not mixing the medications can help to prevent clogging of tube.
13. Insert adaptor and tubing into gastrostomy device according to manufacturer instructions (some adaptors lock into place).
14. Attach the adaptor tubing to feeding bag tubing.
15. Open clamp of feeding bag tubing and adjust until drips flow at prescribed rate. If pump is used, open clamp completely, set rate on pump, and monitor for 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 formula is too cold.

16. For continuous feeding with pump, add feeding as needed to prevent 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 feeding bag tubing, and disconnect feeding bag from adaptor tubing.
18. Use a syringe to flush the gastrostomy device with water (usually 15-30 cc), unless ordered otherwise.
This will clear device of feeding and medication.
19. Remove adaptor tubing and close safety plug.
20. Refer to student's individualized health care plan regarding positioning and activity after feeding.
The feeding tube can be disconnected while the student is being transported to and from school.
21. Wash 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 individualized health care plan 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.
22. Remove gloves. Wash hands.
23. Document feeding, record amount of formula and flush, any medication, residual amount, feeding tolerance, and any concern about gastrostomy site in student's log. Notify school nurse and family of any changes or concerns.

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 229-238, 249-256.
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Problems with Skin-Level Gastrostomy Devices (G-Button)

Assessment	Intervention/Rationale
Breathing difficulties, choking, coughing, and/or color changes	Stop feeding immediately. There may be aspiration of feeding into the lungs. Call school nurse if not present. Notify family and activate the school emergency plan.
Nausea and/or cramping	Make sure feeding is at room temperature. Check feeding rate. Rate may need to be slowed. Check the gastrostomy device to see if it may have migrated either inward or outward. If problem continues, notify school nurse, family, and/or health care provider.
Vomiting	If all the above have been checked, stop feeding, call school nurse or family. Remove residual and vent, if ordered.
Blocked gastrostomy	May be due to inadequate flushing, slow flow rate, or very thick fluid. Flush with 10-30 cc warm water. Carbonated beverages and juice have not proven effective in unclogging the tubing. Do <u>not</u> use stylet (guidewire) to try and unclog as this may damage device. If blockage remains, contact school nurse or family.
Leakage	Determine whether the leak is coming from the device or around the device. Make sure the anti-reflux valve is functioning properly. Gently pull on the device to make sure it is against the inside of the stomach wall. Check volume in balloon (if present). Rotate external stabilizer and make sure it is not too tight.
Redness/irritation/bleeding at site	Check gastrostomy site for leakage. Clean site if leakage of food/fluid/medication/stomach contents come in contact with skin. Keep site dry. Make sure tubing is not being pulled. Rotate external stabilizer and make sure it is not too tight. Skin barrier or other protective skin preparations may be used, if ordered. Refer to student's individualized health care plan for cleaning or dressing instructions. Look for other signs of infection. Notify school nurse and family of gastrostomy site concerns.
Gastrostomy device comes out	Follow guidelines in student's individualized health care plan. The gastrostomy device may

Intervention/Rationale

need to be reinserted immediately if a student's tract closes quickly (if gastrostomy is less than 1-2 months old). Cover the site with a dry dressing or large bandage. Notify school nurse and family. Activate school emergency plan

Sources:

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General Information for Students with Skin-Level Gastrostomy Feeding Devices

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 usually is 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/pager) for additional information or if the student experiences any problems with the G-button.

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.

Nasogastric Tube

Overview

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. If access to the stomach is needed for longer periods, a gastrostomy is often performed. NG-tubes have the advantage that they do not require surgery to insert, but they are more likely to dislodge or cause aspiration and reflux.

Potential Settings

Students can receive feedings in the classroom, cafeteria, or health room. Bolus feeds should be done in a clean area because they are open to the environment. Student's desire for privacy and possible need for stationary activities during a feed should be considered in determining where feeds will take place. If an NG tube needs to be inserted during school, this should be done in the health room or in another private setting by a registered nurse with specific orders from a physician.

Staff Preparation

A school nurse (RN or LPN) or health assistant with training in appropriate techniques and problem management and supervised by an RN should do the nasogastric tube feedings. Any school personnel who have regular contact with a student with an NG-tube should receive general training covering the student's specific needs, potential problems, and implementation of the established emergency plan.

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. It outlines specific procedures step by step. Once the procedures have been mastered, the completed checklist serves as documentation of training.

Components of the Individualized Health Care Plan

Each student's IHCP must be tailored to the individual's needs. The following section covers the procedure for NG-tube care and possible problems and emergencies that may arise. It is essential to review it before writing the IHCP.

A sample plan is included in Appendix A. For a student with an NG-tube, the following items should receive particular attention:

- Underlying condition and possible problems associated with the condition or treatment
- Size and type of feeding tube
- Whether the student receives bolus or continuous feeds
- Proper placement of the NG-tube
- Method of securing the NG-tube
- Amount, type, and frequency of formula to be received
- When the tube should be flushed, such as before and after administration of feeds or medications

- Positioning during and after feeding
- Measurement of gastric residuals, if needed
- Actions to take if student has vomiting, abdominal distension, or pain
- Medication administration schedule, if needed
- Amount of food or drink a student can take by mouth
- Manufacturer's specific instructions for any supplies or equipment
- Recommended cleaning of equipment
- Latex allergy alert
- Standard precautions

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 239-245.
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Procedure for Inserting Nasogastric Tube

This procedure is usually done at home. A school nurse (RN or LPN) with physician orders must do this procedure if done at school.

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
 - Appropriate size nasogastric tube (as ordered by health care provider)
 - ½ inch waterproof tape, preferably hypoallergenic
 - 5 cc syringe or catheter tip syringe
 - Stethoscope
 - Water soluble lubricant
 - Gloves

Guidelines for selection of nasogastric tube:

<i>Student's weight</i>	<i>NG size</i>
<i>10-20 kg</i>	<i>10F</i>
<i>20-30 kg</i>	<i>12F</i>
<i>30-50 kg</i>	<i>14F</i>
<i>50+ kg</i>	<i>16F</i>

3. Explain 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 student.
Place student in sitting or high Fowler's position. A pillow may be placed behind the head.
5. Wash hands and don gloves.
6. Measure the tube for the correct insertion length. Mark the tube with a piece of tape or felt marker at the measured length.
Measure from the tip of the nose to the ear lobe to the bottom of the xiphoid process. This is the approximate length of tube needed to reach the stomach, and the marking serves as a measurement landmark.
7. Lubricate about 3-6 inches of the end of the tube with sterile water or **water-soluble** lubricant.
Lubrication reduces the friction between the mucous membrane and the tube.
8. Stand on the student's right side if right-handed, left side if left-handed.
9. Lift the student's head, insert the tube into nostril, and pass it gently into the posterior nasopharynx. Direct the tube along the floor of the nostril and toward the ear on that side. As the tube is advanced and rotated, ask the student to swallow.
10. When the tube reaches the pharynx, the student may gag. Allow him/her to rest a few moments and then proceed.
If gag reflex is triggered by the tube, place student in sitting or high Fowler's position with the neck slightly flexed.
11. Continue to advance the tube gently each time the student swallows. Insert the tube until the tape mark is at the nostril.
Swallowing facilitates passage of the tube. Continue to explain to student that breathing and swallowing can help in passing the tube.

- ...t the tube from passing, **do not use force**. Rotating the
...successful, withdraw the tube, re-lubricate the tube, and insert
it into the outer nostril. If still unsuccessful, stop and notify family.
The tube should never be forced because of the danger of injury.
13. **If there are signs of respiratory distress, such as gasping, coughing, nasal flaring, tachypnea/tachycardia, wheezing, retractions, or cyanosis, immediately remove the tube.**
Signs of respiratory distress may indicate placement of the tube in the trachea or bronchus.
14. After inserting the tube to where the tape mark is at the nostril, verify placement of the nasogastric tube in the stomach using the following methods:
- Aspirate contents of stomach with a syringe.
Aspirated stomach contents would indicate that the tube is in the stomach. No stomach contents could indicate that the tube is in the lungs. Return stomach contents to stomach because they contain needed electrolytes and digestive enzymes.
 - Measure pH of aspirate.
Gastric aspirates have acidic pH values, usually less than 4 whereas respiratory secretions are usually greater than 5.5 or 6.
 - Place a stethoscope over the epigastric area, inject 5-10 ml of air into the nasogastric tube, and listen for the sound of air entering the stomach as air is injected into tube.
If the sound of air entering the stomach is heard over the epigastric area the nasogastric tube is in the stomach. No sound will be heard if the tube is in the lungs.
 - Ask the student to talk (if able).
Student will likely be unable to talk if NG-tube has passed through vocal cords.
- None of these methods of verification is totally reliable. Checking pH of aspirate is considered to be more reliable than the others. If possible, at least two methods of verification should be done to check placement.**
15. Secure the tube with hypoallergenic tape to nose or cheek using an overlapping V-pattern around the tube. Or, place protectant such as Duoderm on cheek and tape tube to the protectant.
Position tape and nasogastric tube so that the student's vision is not disturbed and that the tube does not rub against the nasal mucosa or cause pressure on nares.
16. Remove gloves. Wash hands.
17. Document procedure. Notify family of any problems.

Sources:

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*and Bows: Understanding Enteral Devices. Presentation at GI
and Nutrition Nursing Conference, Children's Hospital of*

Procedure for Checking Placement of the Nasogastric Tube

****Proper tube placement should be checked before every feeding (or medication administration) and whenever there is a question about position because the tube can migrate between feedings.***

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
 - 60 cc catheter-tipped syringe
 - pH tape
 - Stethoscope
 - Gloves
3. Explain 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 hands and don gloves.
5. Position student on left side for best results.
6. Unclamp or remove cap from NG-tube
7. Connect 60 ml catheter-tipped syringe to the end of the NG-tube.
8. Gently draw back on the plunger of the syringe until contents of stomach are seen.
*Aspirated stomach contents would indicate that the tube is in the stomach. No stomach contents could indicate that the tube is in the lungs. **Return stomach contents to stomach** after checking because they contain needed electrolytes and digestive enzymes.*
9. Measure pH of aspirate. If NG-tube is in the stomach, then the gastric aspirate will have an acidic pH 1-4. If pH is greater than 6, tube is likely either in the lungs or small intestine.
Acid blocking medications can raise the pH of stomach contents to 4-6.
10. Place a stethoscope over the mid-left abdomen and inject 5-10 ml of air with syringe. A whooshing sound may be heard if NG-tube is placed correctly. Although this method for checking placement has been very popular, research indicates it may not be as effective as checking pH aspirate. If NG-tube does not appear to be in place, **do not give feeding**. *Replacement or repositioning of the NG-tube should only be done by a school nurse with appropriate training and if ordered by the student's health care provider. (Check student's individualized health care plan.)*
11. Ask the student to talk (if able).
Student will probably be unable to talk if NG-tube has passed through vocal cords.
12. If ordered, gently draw back on the plunger to remove any liquid or medication that may be left in the stomach (i.e., residuals).
Refer to student's individualized health care plan for guidelines to check residuals. Note the amount that was withdrawn from the feeding tube and return the contents to the stomach (unless ordered otherwise). 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 feeding, wait 30-45 minutes, and check again. Some students may not need to have residuals checked. Follow student's individualized health care plan.
13. Clamp the tubing and disconnect the syringe.

l prescribed for student.

feeding given over a short period of time by gravity) or
slow drip (feeding given by pump or over a long period of time by gravity).

16. Document procedure. Notify school nurse and family of any problems.

Sources:

- Bindler, R.C., Ball, J.W., London, M.L., & Ladewig, P.W. (2003). *Clinical Skills manual for Maternal-Newborn and Child Nursing*. Upper Saddle River, NJ: Prentice Hall, pp.144-146.
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Nasogastric Tube Feeding-Bolus Method

Note: Parent provides equipment and formula.

1. Wash hands.
2. Gather and assemble equipment:
 - Liquid formula or feeding solution, at room temperature
 - 60 ml catheter-tipped syringe or other feeding container for feeding
 - Clamp or plug for end of tube
 - Water (to flush tubing before and after feeding)
 - Rubber bands and safety pins (to secure G-tube to clothing)
 - pH tape, to check placement
 - Stethoscope, to check placement
 - Gloves

Identify size and type of G-tube. Shake can well to mix formula and note 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.

***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 prescribed amount of formula to be infused.
4. Explain 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. Position student upright as specified in student plan.
Students usually sit (or may lie on their right side with their head elevated) during feeding. Tubing may be pinned to shirt. Make sure clamp is not pressing on skin.
6. Wash hands and don gloves.
7. **Check placement of NG-tube.** (Refer to procedure on preceding pages.)
Always check placement before giving a feeding or medication because tubing can migrate between feedings.
8. Remove plug (cap) from NG-tube and insert a catheter-tipped syringe into the end of feeding tube.
NG-tube is still clamped. Do not pull on nasogastric tubing as this can cause pain and injury to the nares.
9. 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 stomach.
Some students may 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

- in electrolytes and digestive enzymes. Removing them
ice. Adjust the feeding volume according to health care
provider's orders if a restaurant is present. If the residual is greater than recommended,
hold feeding, wait 30-45 minutes, and check again.
10. Clamp the NG-tube, disconnect the syringe, and remove plunger from syringe.
 11. Reinsert catheter tip of syringe into tubing.
Syringe should be held 6 inches above level of stomach or at prescribed height.
 12. Unclamp tube, and allow bubbles to escape.
 13. NG-tubes should be flushed with 15-30 cc tepid tap water before feedings or medication.
Follow student's individualized health care plan.
 14. Administer medication, if prescribed, either before or after a feeding, as specified in
student's individualized health care plan. Use liquid medication, if possible. Flushing
with water between each medication and not mixing the medications can help to prevent
clogging of tube.
 15. Pour feeding/fluid into syringe and allow to flow in by gravity.
*If a container other than a syringe is used for the feeding, unclamp tubing and allow it to
flow in by gravity, using the same procedure. The flow of feeding may need to be
initiated by placing plunger into barrel of syringe and depressing slightly to get it started
(and then remove 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 formula is too cold.

16. Continue to pour feeding into syringe as contents empty into stomach. Keep syringe
partially filled to prevent air from entering stomach.
*Depending on the age and capabilities of the student, have him/her assist with the feeding
by holding syringe or pouring fluid into it. Provide oral stimulation, if ordered.*
17. Raise or lower syringe or container to adjust flow to prescribed rate.
The higher the syringe is held, the faster the feeding will flow into the stomach.
18. When feeding is completed, pour prescribed amount of water, usually 15-30 cc, into
syringe and flush tubing.
This will clear tubing of feeding and medication.
19. Vent NG-tube to air, if ordered.
*Venting allows drainage of fluid or release of gas bubbles in the stomach. May help if
student has a problem with gas.*
20. Clamp tubing, remove barrel of syringe, and reinsert plug into end of tubing.
*Clamp tubing prior to removing the syringe; otherwise, stomach contents may leak out of
the tube.*
21. Make sure tubing is securely attached to cheek and not pulling on nose or causing
discomfort.
22. Refer to student's individualized health care plan regarding positioning and activity after
feeding.
23. Wash syringe and other reusable equipment in soapy water. Rinse thoroughly, dry, and
store appropriately.

hours. Check label or student's individualized health plan; 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.

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

Sources:

- Bindler, R.C., Ball, J.W., London, M.L., & Ladewig, P.W. (2003). *Clinical Skills manual for Maternal-Newborn and Child Nursing*. Upper Saddle River, NJ: Prentice Hall, pp.144-146.
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Nasogastric Tube Feeding—Slow Drip and/or Continuous Feeding by Pump

Note: Parent provides equipment and formula.

1. Wash hands.
2. Assemble equipment:
 - Liquid feeding solution/formula at room temperature
 - 60 ml or cc catheter-tipped syringe or other feeding container for feeding
 - Feeding pump and IV stand (optional)
 - Feeding bag and tubing
 - Clamp or cap for end of tube (optional)
 - Water (to flush tubing before and after feeding)
 - Rubber bands and safety pins (to secure NG-tube to clothing)
 - pH tape, to check placement
 - Stethoscope, to check placement
 - Gloves

Identify size and type of G-tube. Shake can well to mix formula and note 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.

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 prescribed amount of formula to be infused.
4. Explain 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. Position student upright as specified in student plan.
Students usually sit (or may lie on their right side with their head elevated) during feeding.
6. Wash hands and don gloves.
7. **Check placement of NG-tube.** (Refer to procedure on preceding pages.)
Always check placement before giving a feeding or medication because tubing can migrate between feedings.
8. Remove plug (cap) from NG-tube and insert a catheter-tipped syringe into the end of feeding tube.
NG-tube is still clamped. Do not pull on nasogastric tubing as this can cause pain and injury to the nares.

draw back on the plunger to remove any liquid or
the stomach (i.e., residuals). Return residuals to stomach.
*Some students may 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 according to health care
provider's orders 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 feeding bag. Run through tubing and fill drip chamber according to tubing directions. Run through rest of tubing to the tip. Clamp.
11. Hang bag on pole above pump or at height to achieve prescribed flow. If a pump is used, insert tubing in pump mechanism and set 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 manufacturer instructions for use and student's individualized health care plan for activity level.
12. NG-tubes should be flushed with 15-30 cc tepid water before administration of feeds or medications.
13. Administer medication, if prescribed, either before or after a feeding, as specified in student's individualized health care plan. Use liquid medication, if possible. Flushing with water between each medication and not mixing the medications can help to prevent clogging of tube.
14. Insert tip of feeding bag tubing into G-tube. Connection may be taped or luer-locked to prevent disconnection. Unclamp G-tube.
Be careful not to apply unnecessary pull on gastrostomy.
15. Open clamp of feeding bag tubing and adjust until drips flow at prescribed rate. If pump is used, open clamp completely and monitor for 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 formula is too cold.

16. For continuous feeding with pump, add feeding as needed to prevent 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 feeding bag tubing, and clamp NG-tube.
18. Disconnect feeding bag and tubing from NG-tube.
19. Unclamp NG-tube and use a syringe to flush with water (usually 15-30 cc), unless ordered otherwise.
This will clear tubing of feeding and medication.
20. Open NG-tube to air, if ordered.
Venting allows drainage of fluid or release of gas bubbles in the stomach. This may help if student has a problem with gas.
21. Clamp and plug NG-tube.
22. Secure tubing and tuck inside clothes, but not inside diaper or underpants.

l health care plan regarding positioning and activity after

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

24. Wash 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 individualized health care plan 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.

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

Sources:

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What May Occur with Nasogastric Tubes

Assessment	Intervention/Rationale
Breathing difficulties, choking, coughing, and/or color changes while receiving feeding	Stop feeding immediately. There may be aspiration of feeding into the lungs. Call school nurse if not present. Notify family and be ready to activate the school emergency plan.
Breathing difficulties, choking, coughing, and/or color changes when not receiving feeding	Color changes or breathing difficulties are not always related to NG-tube feeding. In addition to checking NG-tube placement, it is important to carefully assess the student for other problems. Notify school nurse and family and be ready to activate the school emergency plan. Do not initiate feedings if there is any question about correct placement of NG-tube.
Respiratory distress continues	Call for help and initiate school emergency plan.
Nausea and/or cramping	Make sure feeding is at room temperature. Check feeding rate. Rate may need to be decreased. If problem continues, notify school nurse and family.
Vomiting	If all the above have been checked, stop feeding, call school nurse or family. If not receiving feeding, carefully assess for other problems and contact school nurse and family. Remove residual, if ordered.
NG-tube falls out	Follow guidelines in student's individualized health care plan. Notify family, school nurse, and/or health care provider. NG tube may need to be replaced by properly trained person, but placement must carefully be checked prior to using.

Sources:

Bindler, R.C., Ball, J.W., London, M.L., & Ladewig, P.W. (2003). *Clinical Skills manual for Maternal-Newborn and Child Nursing*. Upper Saddle River, NJ: Prentice Hall, pp.144-146.

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Smith-Temple, J & JY Johnson. (2002). *Nurses' Guide to Clinical Procedures*. (4th ed.). Philadelphia: Lippincott Williams & Wilkins, 238-243.



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*and Bows: Understanding Enteral Devices. Presentation at GI
and Nutrition Nursing Conference, Children's Hospital of*

General Information for Students with Nasogastric Tubes

Date: _____

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

Name of Student: _____

This student has a nasogastric tube (NG-tube). The NG-tube runs from the nostril into the stomach and is used to administer food, medicines, and fluids directly into the stomach.

The NG-tube is held in place by tape and is clamped between feedings or medication administration. The student should experience no discomfort from the NG-tube.

The student may be able to participate in physical education classes as long as the tubing is not dislodged.

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

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

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.

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 silicon or polyurethane 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.

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.

Jejunal feedings are administered slowly as a continuous drip over a number of hours. The jejunum does not tolerate larger, bolus feeds.

Potential Settings

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 stationary 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 part vented continuously to 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.

Staff Preparation

A jejunostomy feeding may be administered by the school nurse (RN or LPN). It should not be done by a non-licensed health assistant. The student should be encouraged to assist with the J-tube feeding as much as possible.

contact with a student who has a J-tube should receive specific needs, potential problems, and implementation of the established emergency plan.

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. It outlines specific procedures step by step. Once the procedures have been mastered, the completed checklist serves as documentation of training.

Components of the Individualized Health Care Plan

Each student's IHCP must be tailored to the individual's needs. The following section covers the procedure for J-tube care and possible problems and emergencies that may arise. It is essential to review it before writing the IHCP.

A sample plan is included in Appendix A. For a student with a jejunostomy tube, the following items should receive particular attention:

- Underlying condition and possible problems associated with the condition or treatment
- Size and type of feeding device
- Amount, type, and frequency of formula to be received
- When the tube should be flushed, such as before and after administration of feeds or medications
- Volume of flushes
- Length of J-tube outside of the body (important to know in determining whether J-tube has migrated either in or out)
- Whether 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
- Medication administration schedule, if needed, and need for flushing before and after medication
- 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 student has vomiting, abdominal distension, or pain
- Manufacturer's specific instructions for any supplies or equipment
- Feeding guidelines during student transport
- Latex allergy alert
- Standard precautions

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 229-238.
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Nursing: Regional Pediatric GI and Nutrition Nursing Conference*, Children's Hospital of
Philadelphia, March 26, 2004.

Jejunostomy Tube Feeding— Continuous Feeding by Pump

Note: Parents supply equipment and formula.

1. Wash hands.
2. Gather and assemble equipment:
 - Liquid formula or feeding solution, at room temperature
 - 10 ml syringe
 - Feeding bag and tubing
 - Feeding pump and stand or carry-pack, if needed
 - Clamp or plug for end of tube
 - Water (to flush tubing before and after feeding)
 - Rubber bands and safety pins (to secure J-tube to clothing)
 - Gloves

Identify size and type of J-tube. Shake can well to mix formula and note 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.

***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 prescribed amount of formula to be infused.
4. Explain 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. Position student upright as specified in student's individualized health care plan. *Students usually sit (or may lie on their right side with their head elevated) during feeding. Tubing may be pinned to shirt. Make sure clamp is not pressing on skin.*
6. Inspect skin at gastrostomy/jejunostomy site(s) for redness, tenderness, swelling or irritation, or presence of drainage or gastric leakage. *Report abnormal findings to school nurse and family.*
7. Wash hands and don gloves.
8. Pour feeding/fluids into feeding bag. Run through tubing and fill drip chamber according to tubing directions. Run through rest of tubing to the tip. Clamp.
9. Hang bag on pole above pump or at height to achieve prescribed flow. If a pump is used, insert tubing in pump mechanism and set 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 manufacturer instructions for use and student's individualized health care plan for activity level.

-10 cc tepid water before the administration of feeds or individualized health care plan.

11. Administer medication, if prescribed, either before or after a feeding, as specified in student's individualized health care plan. 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 tube.
12. Insert tip of feeding bag tubing into J-tube. Connection may be taped or luer-locked to prevent disconnection. Unclamp J-tube.
Be careful not to apply unnecessary pull on jejunostomy.
13. Vent G-tube if ordered during feeding. Syringe or drainage bag may be used for venting.
14. Open clamp of feeding bag tubing and adjust until drips flow at prescribed rate. However, feeding pump will usually be ordered. If feeding pump is used, open clamp completely, set rate on pump, and monitor for 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 formula is too cold.

15. For continuous feeding with pump, add feeding as needed to prevent bag from becoming empty. No more than 4 hours worth of feeding should be hung at any time to prevent contamination.
16. If a feeding is completed (bag empties) during school time, clamp feeding bag tubing, and clamp J-tube.
17. Disconnect feeding bag and tubing from J-tube.
18. Unclamp J-tube and use a syringe to flush with amount of water, usually 5-10 cc, in student's individualized health care plan.
This will clear tubing of feeding and medication and help to prevent obstruction.
19. Clamp and plug J-tube.
20. Secure tubing and tuck inside clothes, but not inside diaper or underpants.
21. Refer to student's individualized health care plan regarding positioning and activity after feeding.
22. Wash 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 individualized health care plan 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 gloves. Wash hands.
24. Document feeding, record amount, any medication, residual amount, feeding tolerance, and any concern about jejunostomy/gastrostomy site in student's log. Notify school nurse and family of any changes or concerns.

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 229-238.
- National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2003). *Intestinal Pseudo-Obstruction*. NIH Publication Number 03-4550.



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Nursing: Regional Pediatric GI and Nutrition Nursing Conference*, Children's Hospital of
Philadelphia, March 26, 2004.

that May Occur with Jejunostomies

Assessment	Intervention/Rationale
Breathing difficulties/color changes	<i>Some students may experience increased respiratory secretions while receiving feedings and may need suctioning. Stop feeding and follow student's individualized health care plan for suctioning. If problem continues after suctioning, notify school nurse and family.</i>
Sweating, increased heart rate, pale skin color, irritability, diarrhea	<i>This may be signs of dumping syndrome, which can occur when volume or type of formula is increased. The feeding will usually need to be stopped until symptoms subside. Notify school nurse and family and follow student's individualized health care plan.</i>
Nausea and/or cramping	<i>Make sure feeding is at room temperature. Check feeding rate. Rate may need to be decreased. If problem continues, notify school nurse and family.</i>
Vomiting	<i>Jejunostomy tube may be dislodged from jejunum. Stop feeding. Notify school nurse, health care provider, and family. May need to vent G-tube if it was clamped during jejunal feeding.</i>
Jejunal feeding contents in G-tube drainage	<i>J-tube may be dislodged from jejunum. Stop feeding. Notify school nurse, family, and/or health care provider.</i>
Blocked jejunostomy tubing	<i>May be due to inadequate flushing, slow flow rate, or very thick fluid. Check tube position. Flush with 5 cc warm water. Carbonated beverages and juice have not proven effective in unclogging the tubing. Make sure all tubing clamps are open. Squeeze or roll jejunostomy tubing with fingers moving slowing down toward student's stomach. Do <u>not</u> use stylet (guidewire) to try and unclog as it may damage tube. If blockage remains, contact school nurse or family.</i>
Leakage	<i>Drainage from jejunostomy is very caustic. Make sure tubing is not being pulled. Check position of tube. Make sure length of tubing outside the skin remains the same (catheter has not migrated).</i>
Redness/irritation/bleeding at site	<i>Check site for leakage. Drainage from jejunostomy is very caustic. Clean stoma site if leakage of food/fluid/medication/stomach or intestinal contents come in contact with skin. Keep site dry. Make sure tubing is not being pulled. Loosen</i>

	Intervention/Rationale
	external stabilizer if it is too tight. Avoid allowing tube to dangle—secure to clothing. Refer to student’s individualized health care plan for cleaning and skin care instructions. Monitor for other signs of infection. Notify school nurse and family of any concerns.
J-tube falls out	Follow guidelines in student plan. The J-tube may need to be reinserted immediately if a student’s tract closes quickly. Cover the site with dry dressing or large bandage. Notify school nurse, family, and health care provider.

Sources:

Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 229-238.

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Steller, JJ & L Bevington. (2004). *Buttons and Bows: Understanding Enteral Devices*. Presentation at *GI Nursing: Regional Pediatric GI and Nutrition Nursing Conference*, Children’s Hospital of Philadelphia, March 26, 2004.

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.

The J-tube is held in place at all times and is clamped or capped between feedings or medication administration.

The J-tube is covered by clothing and should not cause the student discomfort.

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/pager) for additional information or if the student experiences any problems with the J-tube.

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.

Nasojejunal Tube

Overview

The two major sites for delivery of tube feedings are the stomach and the small intestine. The student with delayed gastric (stomach) emptying or a tendency to aspirate may benefit from transpyloric feedings (feedings into the jejunum or small bowel).

Despite its potential benefits, transpyloric feeding has its drawbacks. The feeding bypasses the stomach's anti-infective mechanisms and appears to result in less mixing of the food with pancreatic enzymes. Also, the position of the nasojejunal tubes must be ascertained frequently as they are likely to become malpositioned into the stomach instead of the jejunum.

Potential Settings

There are no restrictions as to where a student may be fed. The student may be fed with other students, or, if the student prefers, in a more private setting (e.g., health room). Students require feedings continuously or every 2-3 hours. Students may have their feeding administered in the classroom. They may need to remain stationary, but should be able to continue sedentary school activities (e.g., reading, doing art, singing, working on a computer). Some students do not require feedings during school hours.

Staff Preparation

Nasojejunal tube feedings should be administered by a registered nurse (RN or LPN). It should not be done by a non-licensed health assistant. School personnel who have regular contact with a student who has a nasojejunostomy should receive general training covering the student's specific needs, potential problems, and implementation of the established emergency plan.

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. It outlines specific procedures step by step. Once the procedures have been mastered, the completed checklist serves as documentation of training.

Components of the Individualized Health Care Plan

Each student's IHCP must be tailored to the individual's needs. The following section covers the procedure for J-tube care and possible problems and emergencies that may arise. It is essential to review it before writing the IHCP.

A sample plan is included in Appendix A. For a student with a J-tube, the following items should receive particular attention:

- Underlying condition and possible problems associated with the condition or treatment
- Size and type of feeding tube
- Whether the student receives bolus or continuous feeds
- Proper placement of the nasojejunal tube
- Amount, type, and frequency of formula to be received

shed, such as before and after administration of feeds or

- Volume of flushes
- Proper placement of the nasojejunal-tube
- Method of securing the nasojejunal-tube
- Activity level after feeding
- Positioning during and after feeding
- Measurement of gastric residuals, if needed
- Actions to take if student has vomiting, abdominal distension, or pain
- Medication administration schedule, if needed
- Amount of food or drink a student can take by mouth
- Manufacturer's specific instructions for any supplies or equipment
- Recommended cleaning of equipment
- Adherence to feeding schedule to prevent overfeeding or dumping syndrome symptoms
- Latex allergy alert
- Standard precautions

NOTE: The procedure for nasojejunal tube feedings is identical to nasogastric continuous/slow drip tube feedings with the exception of the placement check. (See nasogastric continuous/slow drip tube feeding procedure.) The next section contains the procedure for checking placement of the nasojejunal tube. Placement must be checked before every use of the nasojejunal tube.

Source: Skale, N. (1992). "Nasojejunal Tube Insertion." In *Manual of Pediatric Nursing Procedures*. Baltimore: J. B. Lippincott, pp. 410-412.

Checking Placement of Nasojejunal Tube

**Placement must be checked before every use of nasojejunal tube.*

Note: Equipment supplied by parent.

1. Wash hands.
2. Assemble equipment
 - 5- or 10- ml syringe
 - Stethoscope
 - Gloves
 - pH tape
3. Explain the procedure to the student at his/her level of understanding.
4. Position the student.
Place the student in sitting or high Fowler's position.
5. Wash hands and put on gloves.
6. Verification of nasojejunal tubes is best determined by x-ray. To check placement of the nasojejunal tube in the jejunum in the school setting:
 - Attach a 5 or 10 cc syringe to the tube and gently aspirate. Aspirated contents should be golden in color with a pH of 6 or above. If there is no aspirate, or pH is less than 6, **leave the tube in place and do not feed the student.** Notify the school nurse, family, and health care provider.
 - Placement may also be checked by injecting 2-5 cc of air into the tube, while holding a stethoscope over the right lower quadrant of the abdomen. If the tube is in position as air is injected, a crackling or swishing sound will be heard. **However, this method may not adequately ensure correct placement.**
 - Use verification guidelines in student's individualized health care plan.
7. If the tube is in place, feed student as ordered.
Procedure for nasogastric feedings can be used as a reference.
8. Document procedure.

Source: Skale, N. (1992). "Nasojejunal Tube Insertion." In *Manual of Pediatric Nursing Procedures*. Baltimore: J. B. Lippincott, pp. 410-412.

General Information for Students with Nasojejunal Tubes

Date: _____

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

Name of Student: _____

This student has a nasojejunal tube (NJ-tube) running from the nostril to the small intestine. The NJ-tube is used to administer food, medicines, and fluids directly into the small intestine.

The tube is held in place and is clamped closed between feedings or medication administration.

The NJ-tube is covered by clothing and should not cause the student any discomfort.

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/pager) for additional information or if the student experiences any problems with the NJ-tube.

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.

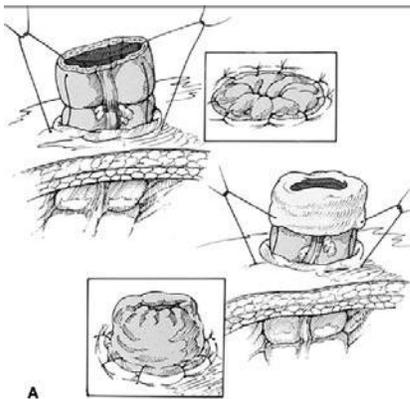
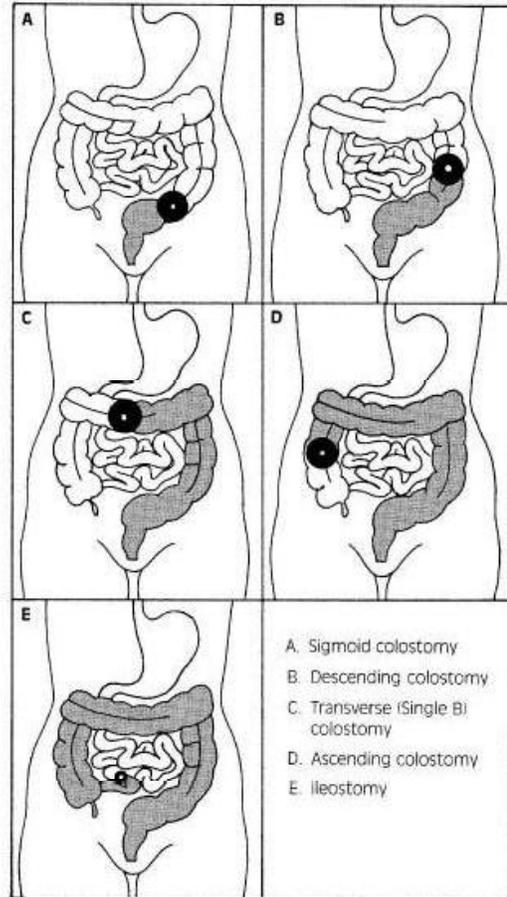
Colostomy

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 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

breakdown at the stoma site. If the opening of the pouch is too tight, it can cause irritation, redness, and leakage of stool 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.

Potential Settings

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 assured 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.

Staff Preparation

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 should be 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.

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. It outlines specific procedures step by step. Once the procedures have been mastered, the completed checklist serves as documentation of training.

Components of the Individualized Health Care Plan

Each student's IHCP must be tailored to the individual's needs. The following section covers the procedure for colostomy care and possible problems and emergencies that may arise. It is essential to review it before writing the IHCP.

A sample plan is included in Appendix A. For a student with a colostomy, the following items should receive particular attention:

- Underlying condition and possible problems associated with the condition or treatment
- Type of ostomy and pouch
- Ability for self-care
- Access to a change of clothing at school
- Access to private bathroom
- Stoma care—cleansing supplies and frequency
- Stoma appearance and changes that require reporting
- Usual stool consistency, frequency, amount
- Latex allergy alert
- Standard precautions

Pediatric Nursing Procedures. Philadelphia: Lippincott William &

- Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 1166-7.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 421-425.
- National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2003). *Ileostomy, Colostomy, and Ileoanal Reservoir Surgery*. NIH Publication No. 03-4641. Available online at <http://digestive.niddk.nih.gov/ddiseases/pubs/ileostomy/index.htm>.
- 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.
- Rice, R. (1999). *Manual of Pediatric and Postpartum Home Care Procedures*. St. Louis: Mosby, 192-193.
- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 760-762, 776-782.
- Smith-Temple, J & JY Johnson. (2002). *Nurses' Guide to Clinical Procedures*. (4th ed.). Philadelphia: Lippincott Williams & Wilkins, 327-340.
- United Ostomy Foundation. *My Child Has an Ostomy*. Educational brochure available online at: <http://www.uoa.org/new/files/childhas.pdf>.

Illustration Sources:

imagesMD. Used with permission.

- National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2003). *Ulcerative Colitis*. NIH Publication No. 03-1597. Available online at <http://digestive.niddk.nih.gov/ddiseases/pubs/colitis/index.htm>.

e for Emptying a Colostomy

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
 - Tissue, wet washcloth, paper towel, or wet wipe
 - Toilet or container to dispose of wastes
 - Gloves, if pouch is to be emptied by someone other than student
 - Clean pouch with clip closure

Student should have a complete set of ostomy supplies at school with a spare pouch and clip/pouch closure.
3. Explain 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 hands and don gloves.
5. Tilt the bottom of the pouch upward and remove the clamp.
6. Fold the bottom of the pouch up to form a cuff before emptying.
Cuff helps keep bottom of pouch clean during emptying.
7. Slowly unfold end of pouch and empty contents of pouch into toilet or container.
8. Wipe the bottom of the pouch with tissue, wet washcloth, paper towel, or wet wipe and unfold cuff.
9. Re-apply clamp closure.
10. 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 clamp.
11. Flush wastes in toilet.
12. Remove gloves and wash hands.
13. Report any change in student's usual pattern to school nurse and family.
14. Document actions.

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 463.
- Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 1166-7.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 424-425.
- National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2003). *Ileostomy, Colostomy, and Ileoanal Reservoir Surgery*. NIH Publication No. 03-4641. Available online at <http://digestive.niddk.nih.gov/ddiseases/pubs/ileostomy/index.htm>.
- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 760-762, 776-782.
- Smith-Temple, J & JY Johnson. (2002). *Nurses' Guide to Clinical Procedures*. (4th ed.). Philadelphia: Lippincott Williams & Wilkins, 336-340.

Changing a Colostomy Pouch

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
 - Water
 - Skin cleanser
 - Soft cloth or gauze or tissues
 - Clean pouch with clip closure
 - Protective paste or powder, if used
 - Skin barrier
 - Measuring guide, if needed
 - Belt, if used
 - Gloves, if pouch is to be changed by someone other than student
 - Tape, if needed
 - Scissors, if needed

Student should have a complete set of ostomy supplies at school with a spare pouch and clip/pouch closure.
3. Explain 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 hands and don gloves.
5. Empty contents of old pouch into toilet, bedpan, or other designated container.
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 nondominant hand.
7. **Save clamp** for reuse (unless specified otherwise). Dispose of used pouch in appropriate receptacle.
8. Wash the peristomal area with water and a clean cloth or gauze or whatever is specified in student's individualized health care plan. **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 to dry. *Scrubbing can damage the stoma and cause bleeding.*
9. Examine the stoma for integrity (note whether it has come further out or moved further in) and any of signs of necrosis. Assess the skin for redness, irritation, rash, bleeding, or breakdown.

***If there is any change in the stoma, notify school nurse and family immediately.** If there is skin irritation, follow student's individualized health care plan. 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 school nurse and family.*
10. If a skin barrier is used that requires fitting, measure stoma using measuring guide or per student's individualized health care plan. Cut wafer-barrier and pouch to fit stoma. Some wafer-barriers are single items, but many are attached to pouch. Remove paper from wafer. Save paper to use as a guide for cutting openings for future pouch changes (if stoma size is stable).

protective paste to opening on wafer barrier or apply gauze/tissue from stoma and discard in appropriate

- receptacle.
12. If one-piece wafer/pouch used, remove paper from outer adhesive area of pouch and apply wafer/pouch over stoma. If two-piece setup used, place wafer barrier on skin around stoma, remove backing from pouch, and apply pouch to wafer and skin. Some two piece systems require pouch 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 wafer and improve adhesion to skin
 14. Use clamp to seal pouch. Make sure bowed end of clamp is next to body.
Bowed end conforms to body providing a better fit and keeping clamp from sticking out through clothing.
 15. If a belt is used to fasten pouch, attach to pouch.
 16. Remove gloves and wash hands.
 17. Document in student log that procedure was done and condition of stoma and skin. Report to school nurse and family any change in stoma, skin, or tolerance of the procedure.

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 460-464.
- Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 1166-7.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 421-425.
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- United Ostomy Foundation. *My Child Has an Ostomy*. Educational brochure available online at: <http://www.uoa.org/new/files/childhas.pdf>.

When Changing a Colostomy Pouch

Assessment	Intervention/Rationale
Odor	<i>Odor should not be detected when the student keeps 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 pouch to release gas because doing so destroys the odor proof seal. Commercial deodorants are available if family wants them.</i>
Leakage	<i>Empty 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 pouch. Use skin barrier paste, if ordered, to help form a seal.</i>
Bleeding from stoma	<i>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 school nurse, family, and health care provider.</i>
Dark, dusky colored or black stoma	<i>Activate the school emergency plan and notify school nurse, family, and/or health care provider immediately.</i> <i>Integrity of stoma may be compromised.</i>
Irritation or skin breakdown around stoma; discharge from area; itching or burning under the pouch	<i>Make sure pouch and skin barrier are sized correctly. If leaking or incorrectly sized, replace with proper sized pouch and barrier. Follow student's individualized health care plan for skin care. Apply protective paste between barrier and skin, if ordered. Check to see if student is using any new ostomy products which could be causing an allergic reaction. Notify the school nurse, family, or health care provider.</i>
Red papular rash; rash may extend beyond peristomal area	<i>Student may have a yeast infection. Clean and dry the skin carefully and notify the school nurse and the family.</i>
Stoma appears to increase in size; part of intestine showing through stoma, or stoma sinks below skin surface	<i>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</i>

	<i>stoma sinks below skin level, it may be retracting. Contact the school nurse, family, and/or health care provider immediately.</i>
Change in stool pattern	<i>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 school nurse and family.</i>
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;	<i>Intestine or stoma may be developing an obstruction. Notify school nurse and family immediately.</i>
Student has body image concerns	<i>Encourage student to voice concerns. Discuss with family as appropriate. Refer to United Ostomy Association (www.UOA.org or 1-800-826-0826) or nearest enterostomal therapy nurse (wound ostomy certified nurse) for assistance. Videos and brochures are available from UOA and other organizations such as the Crohn's and Colitis Foundation of America.</i>

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 460-464.
- Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 1166-7.
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- United Ostomy Foundation. *My Child Has an Ostomy*. Educational brochure available online at: <http://www.uoa.org/new/files/childhas.pdf>.

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.

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/pager) for additional information or if the student experiences any problems with the colostomy.

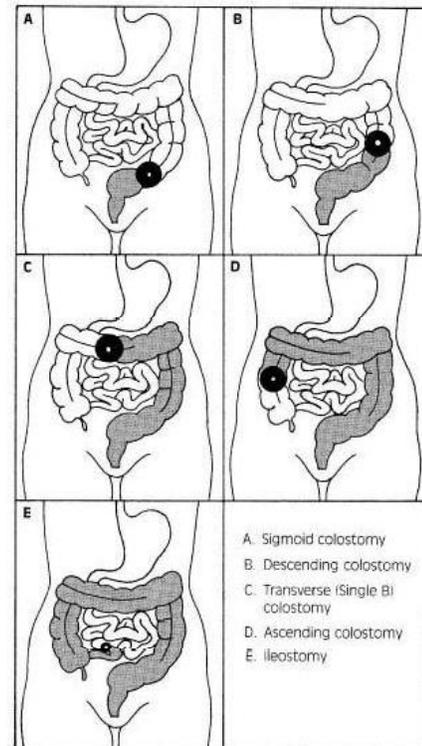
Source: Adapted from: Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and Youth Assisted by Medical Technology in Educational Settings: Guidelines for Care*. (2nd ed.). Baltimore: Paul H. Brookes Publishing.

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 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 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.

The *continent ileostomy* allows the student not to have to wear a pouch to collect wastes. In a continent ileostomy, the surgeon removes the diseased part of the large and small intestine, but leaves the outer muscles of the rectum intact. An internal pouch is made from the end of the ileum and connected to the rectum and anus. Fecal waste is stored in the pouch and passed through the anus in the usual manner. Or, a valve may be made from the intestine, which keeps gas and stool inside the pouch until it is emptied with a drain (4-6 times a day).

quent and watery than a student with an intact colon, but the need for an external pouch.

Potential Settings

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.

Staff Preparation

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 should be done by a registered or licensed practical school nurse if the student requires assistance. 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.

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. It outlines specific procedures step by step. Once the procedures have been mastered, the completed checklist serves as documentation of training.

Components of the Individualized Health Care Plan

Each student's IHCP must be tailored to the individual's needs. The following section covers the procedure for ileostomy care and possible problems and emergencies that may arise. It is essential to review it before writing the IHCP.

A sample plan is included in Appendix A. For a student with an ileostomy, the following items should receive particular attention:

- Underlying condition and possible problems associated with the condition or treatment
- Type of pouch and supplies
- Ability for self-care
- Access to a change of clothing at school
- Access to private bathroom
- Stoma care—cleansing supplies and frequency
- Stoma appearance and changes that require reporting
- Usual stool consistency, frequency, amount
- Diet modification, if needed
- Frequency of drainings, if type of continent ileostomy that requires draining.
- Latex allergy alert
- Standard precautions

Sources:

Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 460-464.

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lker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse,
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- National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2003). *Ileostomy, Colostomy, and Ileoanal Reservoir Surgery*. NIH Publication No. 03-4641. Available online at <http://digestive.niddk.nih.gov/ddiseases/pubs/ileostomy/index.htm>.
- 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.
- Rice, R. (1999). *Manual of Pediatric and Postpartum Home Care Procedures*. St. Louis: Mosby, 192-193.
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- Smith-Temple, J & JY Johnson. (2002). *Nurses' Guide to Clinical Procedures*. (4th ed.). Philadelphia: Lippincott Williams & Wilkins, 327-340.
- United Ostomy Foundation. *My Child Has an Ostomy*. Educational brochure available online at: <http://www.uoa.org/new/files/childhas.pdf>.

Illustration Source:

National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2003). *Ulcerative Colitis*. NIH Publication No. 03-1597. Available online at <http://digestive.niddk.nih.gov/ddiseases/pubs/colitis/index.htm>.

for Emptying an Ileostomy

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
 - Tissue, wet washcloth, paper towel, or wet wipe
 - Toilet or container to dispose of wastes
 - Gloves, if pouch is to be emptied by someone other than student
 - Clean pouch with clip closure

Student should have a complete set of ostomy supplies at school with a spare pouch and clip/pouch closure.
3. Explain 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 hands and don gloves.
5. Tilt the bottom of the pouch upward and remove the clamp.
6. Fold the bottom of the pouch up to form a cuff before emptying.
Cuff helps keep bottom of pouch clean during emptying.
7. Slowly unfold end of pouch and empty contents of pouch into toilet or container.
8. Wipe the bottom of the pouch with tissue, wet washcloth, paper towel, or wet wipe and unfold cuff.
9. Re-apply clamp closure.
10. 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 clamp.
11. Flush wastes in toilet.
12. Remove gloves and wash hands.
13. Report any change in student's usual pattern to school nurse or family.
14. Document actions.

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 463.
- Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 1166-7.
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Changing an Ileostomy Pouch

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
 - Water
 - Skin cleanser
 - Soft cloth or gauze or tissues
 - Clean pouch with clip closure
 - Protective paste or powder, if used
 - Skin barrier
 - Measuring guide, if needed
 - Belt, if used
 - Gloves, if pouch is to be changed by someone other than student
 - Tape, if needed
 - Scissors, if needed

Student should have a complete set of ostomy supplies at school with a spare pouch and clip/pouch closure.
3. Explain 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 hands and don gloves.
5. Empty contents of old pouch into toilet, bedpan, or other designated container.
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 nondominant hand.
7. **Save clamp** for reuse (unless specified otherwise). Dispose of used pouch in appropriate receptacle.
8. Wash the peristomal area with water and a clean cloth or gauze or whatever is specified in student's individualized health care plan. **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 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 of signs of necrosis. Assess the skin for redness, irritation, rash, bleeding, or breakdown.
If there is any change in the stoma, notify school nurse and/or family immediately.
If there is skin irritation, follow student's individualized health care plan.
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 school nurse and family.
10. If a skin barrier is used that requires fitting, measure stoma using measuring guide or follow guidelines in student's individualized health care plan. Cut wafer-barrier and pouch to fit stoma. Some wafer-barriers are single items, but many are attached to pouch. Remove paper from wafer. Save paper to use as a guide for cutting openings for future pouch changes (if stoma size is stable).

protective paste to opening on wafer barrier or apply gauze/tissue from stoma and discard in appropriate

- receptacle.
12. If one-piece wafer/pouch used, remove paper from outer adhesive area of pouch and apply wafer/pouch over stoma. If two-piece setup used, place wafer barrier on skin around stoma, remove backing from pouch, and apply pouch to wafer and skin. Some two piece systems require pouch 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 wafer and improve adhesion to skin.
 14. Use clamp to seal pouch. Make sure bowed end of clamp is next to body.
Bowed end conforms to body providing a better fit and keeping clamp from sticking out through clothing.
 15. If a belt is used to fasten pouch, attach to pouch.
 16. Remove gloves and wash hands.
 17. Document in student log that procedure was done and condition of stoma and skin. Report to school nurse and family any change in stoma, skin, or tolerance of the procedure.

Sources:

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- Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 1166-7.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 421-425.
- National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2003). *Ileostomy, Colostomy, and Ileoanal Reservoir Surgery*. NIH Publication No. 03-4641. Available online at <http://digestive.niddk.nih.gov/ddiseases/pubs/ileostomy/index.htm>.
- 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. R
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- United Ostomy Foundation. *My Child Has an Ostomy*. Educational brochure available online at: <http://www.uoa.org/new/files/childhas.pdf>.

When Changing an Ileostomy Pouch

Assessment	Intervention/Rationale
Odor	<i>Odor should not be detected when the student keeps 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 pouch to release gas because doing so destroys the odor proof seal. Commercial deodorants are available if family wants them.</i>
Leakage	<i>Ileostomy drainage is particularly caustic to the skin. Empty 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 pouch. Use skin barrier paste, if ordered, to help form a seal.</i>
Bleeding from stoma	<i>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.</i>
Dark, dusky colored or black stoma	<i>Activate the school emergency plan and notify the school nurse, family, and/or health care provider immediately.</i> <i>Integrity of stoma may be compromised.</i>
Irritation or skin breakdown around stoma; discharge from area; itching or burning under the pouch	<i>Make sure pouch and skin barrier are sized correctly. If leaking or incorrectly sized, replace with proper-sized pouch and barrier. Follow student's individualized health care plan for skin care. Apply protective paste between barrier and skin, if ordered. Check to see if student is using any new ostomy products which could be causing an allergic reaction. Notify the school nurse, family, or health care provider.</i>
Red papular rash; rash may extend beyond peristomal area	<i>Student may have a yeast infection. Clean and dry the skin carefully and notify the school nurse and the family.</i>
Stoma appears to increase in size; part of intestine showing through stoma, or stoma sinks below skin surface	<i>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</i>

	Intervention/Rationale
	may experience cramping and vomiting. If 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 school nurse and 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 output;	Intestine or stoma may be developing an obstruction. Notify school nurse and family immediately.
Student has body image concerns	Encourage student to voice concerns. Discuss with family as appropriate. Refer to United Ostomy Association (www.UOA.org or 1-800-826-0826) or nearest enterostomal therapy nurse (wound ostomy certified nurse) for assistance. Videos and brochures are available from UOA and other organizations such as the Crohn's and Colitis Foundation of America.

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 460-464.
- Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 1166-7.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 421-425.
- National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2003). *Ileostomy, Colostomy, and Ileoanal Reservoir Surgery*. NIH Publication No. 03-4641. Available online at <http://digestive.niddk.nih.gov/ddiseases/pubs/ileostomy/index.htm>.
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- Rice, R. (1999). *Manual of Pediatric and Postpartum Home Care Procedures*. St. Louis: Mosby, 192-193.
- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 760-762, 776-782.
- Smith-Temple, J & JY Johnson. (2002). *Nurses' Guide to Clinical Procedures*. (4th ed.). Philadelphia: Lippincott Williams & Wilkins, 327-340.
- United Ostomy Foundation. *My Child Has an Ostomy*. Educational brochure available online at: <http://www.uoa.org/new/files/childhas.pdf>.

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.

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/pager) for additional information or if the student experiences any problems with the
ileostomy.

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.



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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

al System and Mobility Care

Overview

Movement of the body is dependent on the proper functioning of the musculoskeletal and nervous systems. If any one of these parts of the body is altered or injured, the result can be loss or change in the body's ability to move.

Muscle movement and functioning may be altered by a number of causes. Damage to a portion of a student's brain may result in a break 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.

Normal daily activities keep the 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 pull the joint into an abnormal position, creating a contracture. The contracture causes greater effort for movement, increased wear on the joints, and decreased range of motion. Loss of normal muscle movement can make bones porous and soft.

Adaptive equipment (desk, chairs, feeding equipment) and frequent movement should be available as needed to assist 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.

Source:

Graff, J., Ault, M., Guess, D., Taylor, M., & Thompson, B. (1990). Therapeutic Management. In *Healthcare for Students with Disabilities, An Illustrated Medical Guide for the Classroom*. Baltimore: Paul H. Brookes Publishing, pp. 119-144.

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.

Potential Settings

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.

Staff Preparation

Support of the student who requires assistive devices for ambulation can be administered by the school nurse, physical therapist, occupational therapist, teacher 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, potential problems, and how to obtain assistance should problems occur, and appropriate lifting procedures.

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. The checklist outlines specific procedures. Once the procedures have been mastered, the completed checklist serves as documentation of training.

Components of the Individualized Health Care Plan

Each student's IHCP must be tailored to the individual's needs. The following section covers the procedure for assisting the student who requires assistance with mobility and possible problems and emergencies that may arise. It is essential to review it before writing the IHCP.

A sample plan is included in Appendix A. For a student who requires assistance with mobility, the following items should receive particular attention:

- Student's underlying condition and possible problems associated with the condition or treatment
- Student's baseline status (including skin condition, level of mobility)
- Type of physical mobility assistance student requires
- Reason student requires the physical mobility assistance
- When assistive device is to be used
- Care of any assistive device
- Standard precautions

Source:

Graff, J., Ault, M., Guess, D., Taylor, M., & Thompson, B. (1990). Therapeutic Management. In *Healthcare for Students with Disabilities, An Illustrated Medical Guide for the Classroom*. Baltimore: Paul H. Brookes Publishing, pp. 119-144.

Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 350-353

Precautions for Positioning a Student

Note: Equipment and supplies provided by parents.

1. 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. Wash hands.
4. Assemble equipment as needed for positioning of student. Know how the equipment works before using it with the student. Equipment varies with students and position. Talk with family to determine what 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 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 prevent back injury.
7. Change the student's position as needed or 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 without 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
Head is in alignment with the spine, both laterally, and front to back.	<i>Place pillow under head, so that it reaches under the shoulders.</i>
Position trunk so that hip flexion is minimized.	<i>Place small pillow under the small of the back, if comfortable.</i>
Slightly flex arms at elbow.	<i>Position arms comfortably at side with hands open. Use handroll if necessary.</i>
Extend legs in neutral position with toes pointed to ceiling.	<i>Support feet with a vertical support, so that student can brace his/her feet to keep them upright.</i>
Suspend heels in the space between cot and footboard.	<i>Place small pillow under ankles to prevent pressure on heels.</i>
Place hip rolls under greater trochanter (hip) in the area of hip joint and upper thigh.	<i>Place small pillows or rolled towels by the hips and upper thigh to prevent legs from turning outward.</i>
Align head with spine.	<i>Place pillow under head.</i>
Align body so that it is not twisted.	<i>Place pillow lengthwise at the back, anchor the pillow by pushing pillowcase edge under student's back. Then fold outer side of pillow</i>

	Action
	<i>under and tuck it against the student for added support.</i>
Support slight hip abduction by positioning hip slightly forward.	<i>Flex hip and knee of upper leg, bringing upper leg forward so that it doesn't rest on lower leg. Position pillow lengthwise under upper leg supporting the entire leg including the foot and ankle.</i>
Flex arm at elbow and shoulder joint.	<i>Position lower arm in comfortable position. Place upper arm and hand on pillow with elbow and shoulder flexed. Use hand roll if necessary.</i>
Turn head laterally and align with body.	<i>Turn head to side and place on small flat pillow if necessary.</i>
Abduct arms (slightly away from body) and externally rotate at the shoulder joint. Flex elbows.	<i>Place arms at side, using handrolls if necessary. Place small foam pads or pillows as needed under shoulders.</i>
Place small flat support under pelvis at level of umbilicus and extending to upper third of thigh.	<i>Place flat pillow under abdomen to align spine and help breathing (unless individual is obese or abdomen protrudes).</i>
Place lower extremities in neutral position.	<i>Extend legs in a comfortable position.</i>
Suspend toes over edge of cot.	<i>Either position 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 the cot.</i>

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

Sources:

Graff, J., Ault, M., Guess, D., Taylor, M., & Thompson, B. (1990). Therapeutic Management. In *Healthcare for Students with Disabilities, An Illustrated Medical Guide for the Classroom*. Baltimore: Paul H. Brookes Publishing, pp. 119-144.

Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 350-353

Smith-Temple, J & JY Johnson. (2002). *Nurses' Guide to Clinical Procedures*. (4th ed.). Philadelphia: Lippincott Williams & Wilkins, 366-374.

South Carolina Department of Health and Environmental Control, Division of Children's Health. (1990). Positioning. In *Manual of Nursing Procedures for South Carolina Schools*.

Assisting Student with a Cane

Note: Equipment and supplies provided by parents.

1. Review the health care provider's orders and student's individualized health care plan.
2. Verify if the student will be using 1 or 2 canes and the type of cane used:
 - Straight-legged or standard cane
 - Tripod or three-pronged cane
 - 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 20-30-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 gait:
 - Hold the cane on the stronger (unaffected) side.
 - Keep the cane close to the body to avoid leaning on it.
 - Advance the cane 4 inches in front of the body and move the weaker leg even with the cane.
 - Shift weight to affected leg and cane and move unaffected leg ahead of cane.

During teaching, accompany student by walking on 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 cane and weak leg together.

7. Teach stair climbing:
 - Upstairs: Advance unaffected leg up to next step; followed by the cane; followed by the weaker leg.
 - Downstairs: Place the cane and weaker leg on 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:
 - Make sure rubber cane tips are in good repair. Tips should be wide, provide good suction, and replaced promptly if worn. Check that screws and nuts are tight.
 - Designate a place in the classroom for the cane. (Cane should be kept next to the student in the classroom if possible).
 - Encourage student to keep hands free to handle cane. Student should be encouraged to carry possessions in a light backpack or have another person carry the possessions.

udent to leave each class 5 minutes early. Leaving early
of the hall during regular changing of classes.

11. Document teaching and student's ability to walk with a cane.

Sources:

Smith, S.F., Duell, D. J., & Martin, B. C. (2004). *Clinical Nursing Skills: Basic to Advanced Skills*. (6th ed.).
Upper Saddle River, NJ: Pearson/Prentice Hall, 364-366.

South Carolina Department of Health and Environmental Control, Division of Children's Health. (1990).
Cane. In *Manual of Nursing Procedures for South Carolina Schools*.

Assisting a Student with Crutches

Note: Equipment and supplies provided by parents.

1. 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. Stress safety. Encourage the student to participate as much as possible.
3. Encourage 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 and 6 inches to the side of the toes (tripod position). The arm-piece of the axillary crutch should be 2-3 finger widths from 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 student to place body weight on the palms, never on the axillae.
7. Check to ensure that the crutches have student's name on them.
8. Verify that the student is using the gait prescribed by the health care provider.

Crutch Gaits:

- 2-Point Gait
Advance right crutch and left foot together; then left crutch and right foot together.
Requires at least partial weight bearing on each foot. Requires more balance than 4-Point Gait.
 - 3-Point Gait
Balance weight on crutches. Advance both crutches and the weaker extremity at the same time; then advance the stronger extremity.
Requires strength and balance because the arms must support all the body's weight. Requires bearing all of weight on one foot. Useful when student cannot bear weight on one foot or when student has only one leg.
 - 4-Point Gait
Advance right crutch; left foot; left crutch; right foot.
This gait is used by a student who can move each leg separately and bear considerable weight on each foot.
 - Swing-To & Swing-Through Gait
Swing-to gait: advance both crutches forward; swing body to a position even with the crutches.
Swing-through gait: advance both crutches forward; swing body past crutches; bring crutches in front of body.
Usually used when student's lower extremities are paralyzed or the student uses braces.
9. Teach student how to stand:
 - Hold both crutches together in hand on affected side
 - Push down on stable support base with free hand; put weight on stronger leg; lift body

- Shift weight on stronger leg and crutches
level as feet
- Advance stronger leg while bearing down on crutches
 - Pull affected leg and crutches while bearing weight on stronger leg
10. Teach student how to sit:
- Make sure chair is stationary or braced against wall.
 - Place unaffected leg against chair.
 - Hold crutches together in hand on unaffected side.
 - Keep back straight and gently ease down supporting weight on crutches and stronger leg
 - When almost seated, gently hold on to arm of chair and complete the movement
11. Teach walking upstairs:
- Place crutches on same level as feet
 - Shift weight to crutches and advance unaffected leg to next step
 - Shift weight to unaffected leg and lift affected leg and crutches up to step
12. Teach walking downstairs:
- Place both crutches on same level as feet
 - Shift weight to stronger leg
 - Lower crutches to next step
 - Shift weight to crutches and transfer unaffected leg to step with crutches
13. 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.
14. Arrange transportation as needed for fire drills and emergency evacuations. Prearrange evacuation plans and make sure both student and staff are aware of them. Elevators are not available during fire drills.
15. Safety tips:
- Make sure rubber tips are in good repair. Tips should be wide, provide good suction, and replaced promptly if worn.
 - Make sure screws and nuts are tight.
 - Designate a place in the classroom for the crutches. (Crutches should be kept next to the student in the classroom if possible).
 - Encourage student to keep hands free to handle the crutches. Student should carry possessions in a lightweight backpack or have another person help carry the student's possessions.
 - If necessary, arrange for student to leave each class 5 minutes early to be out of the hall during regular changing of classes.
16. Document teaching and student's ability to walk with crutches.

Sources:

- Potter, P.A., & Perry, A. G. (2001). *Fundamentals of Nursing*. (5th ed.). St. Louis: Mosby, pp. 1008-1013.
- Smith, S.F., Duell, D. J., & Martin, B. C. (2004). *Clinical Nursing Skills: Basic to Advanced Skills*. (6th ed.). Upper Saddle River, NJ: Pearson/Prentice Hall, p. 368-373.
- Smith-Temple, J., & Johnson, J. Y. (2002). *Nurses' Guide to Clinical Procedures*. (4th ed.). Philadelphia: Lippincott, pp. 395-404.

Procedure for Assisting a Student with a Walker

Note: Equipment and supplies provided by parents.

1. 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. 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.
4. Make sure the walker has the student's name on it.
5. Teach and/or reinforce the gait:
 - Use the arms to move the walker forward 6-8 inches without flexing the trunk forward.
 - Move the weaker leg first while bearing weight on the walker.
 - Move the stronger leg even with the first.
 - 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 student and staff are aware of them.
9. Safety tips:
 - Make sure rubber tips are in good repair. Tips should be wide, provide good suction, and replaced promptly if worn.
Make sure screws and nuts are tight.
 - Designate a place in the classroom for the walker. (Walkers should be kept next to the student in the classroom if possible).
 - Encourage student to keep hands free to handle the walker. 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.
 - If necessary, arrange for student to leave each class 5 minutes early to be out of the hall during regular changing of classes.
10. Document teaching and student's ability to walk with a walker.

Source:

- Smith, S.F., Duell, D. J., & Martin, B. C. (2004). *Clinical Nursing Skills: Basic to Advanced Skills*. (6th ed.). Upper Saddle River, NJ: Pearson/Prentice Hall, p. 364.
- South Carolina Department of Health and Environmental Control, Division of Children's Health. (1990). Walker. In *Manual of Nursing Procedures for South Carolina Schools*.

Assisting a Student with a Wheelchair

Note: Equipment and supplies provided by parents.

1. 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.
4. Verify that the school is fully wheelchair accessible. Provide student with precautions regarding most accessible routes.
5. Teach and assist the student to move from a surface the height of the wheelchair seat to the wheelchair:
 - Position wheelchair towards student's strongest side at a 45-degree angle to the transfer seat. Lock the wheels.
 - Move student to the edge of the transfer seat.
Allow student to assist as much as possible.
 - Standing in front of student, place arms under student's axilla or around student's back.
 - Rock student and, on a count of three, pivot student into wheelchair.
 - Position student in wheelchair to minimize pressure areas.
 - Remain in front of student to assess stability.
Allow student to sit for 2 minutes. Observe for dizziness relating to orthostatic hypotension. Do not leave student until he/she is stable. Safety belt can be used with larger students. Smaller students may be moved more easily by putting one arm under student's knees and the other supporting neck/back while lifting from transfer seat to wheelchair. Maintain good body mechanics when doing any lifting.
6. Teach and assist the student to move to a standing position:
 - Lock wheelchair wheels.
 - Make sure student can bear weight. Allow student to help as much as possible.
 - Instruct student to move to edge of chair with hands on chair arms.
 - Place one knee between student's knees (if student has a weak knee, brace it with your knee).
 - Instruct student to put stronger foot slightly under him.
 - Bend knees, lean slightly forward, and place arms around student's waist. Grasp a strong belt around the student's waist.
Stand close to chair with feet wide apart for a broad base of support.
 - Instruct student to push down with his/her arms, lean forward, and stand up on the count of 3.
 - Hold student closely.
 - On count of 3, rock weight to back foot bringing student forward to standing.
Use a cue that both you and the student can understand.
 - Instruct student to lock knees.

to balance him/herself.
to move from a standing to a sitting position:

- Lock wheelchair wheels.
 - Allow student to assist as much as possible.
 - Remind student to feel back of chair with his/her legs
 - Instruct student to reach back for chair arms.
 - Hold the student at the waist by grasping a strong belt.
 - Shift weight to forward leg and guide student as he/she bends knees and sits in the chair.
 - Make sure student is safe and secure.
Use a seatbelt or harness as needed.
8. Recharge batteries on motorized chairs or scooters each day according to battery manufacturer's directions.
 9. 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.
 10. Arrange transportation as needed for fire drills and emergency evacuations. Prearrange evacuation plans and make sure both student and staff are aware of them.
Elevators are not available during fire drills.
 11. Wheelchair safety tips:
 - Check rear wheels for movement when brakes are locked.
Brakes need to be repaired when they are ineffective or out of alignment. (Note: Routine maintenance should be performed at home.)
 - Make sure seatbelt is fastened.
 - Feet should be on footrests.
 - Arms and legs should be inside the chair when passing through a doorway.
 - Always lock brakes when wheelchair is stopped, even if empty.
 - Push at a walking speed. Hold on to 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.
 - Never tilt chair far back, turn sharply, or stop rapidly.
 - Back wheelchair down ramps and curbs.
Both wheels should go over curb together so chair does not tip.
 - Push wheelchair forward going up ramps and curbs.
Tip chair back so that front wheels clear the curb. After clearing, put front wheels down on surface and lift back wheels over curb.
 12. If necessary, arrange for student to leave each class 5 minutes early.
Leaving early allows the student to be out of the hall during regular changing of classes.
 13. Document teaching and review student safety points.

Source:

- Smith, S.F., Duell, D. J., & Martin, B. C. (2004). *Clinical Nursing Skills: Basic to Advanced Skills*. (6th ed.). Upper Saddle River, NJ: Pearson/Prentice Hall, 322-331, 340-341.
- Smith-Temple, J., & Johnson, J. Y. (2002). *Nurses' Guide to Clinical Procedures*. (4th ed.). Philadelphia: Lippincott, pp. 356-365.
- South Carolina Department of Health and Environmental Control, Division of Children's Health. (1990). Wheelchair. In *Manual of Nursing Procedures for South Carolina Schools*.

Assisting a Student with a Prosthesis

Note: Equipment and supplies provided by parents.

1. Assess the need for assistance for the prosthesis— an orthopedic device that is a replacement for a missing body part.
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 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 gait and proper fit and function of the prosthesis.
 - Check health care provider's orders.
 - Observe student in prosthesis. Assure proper alignment of 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.
 - Assess the condition and cleanliness of prosthesis.
 - Encourage student/family to keep prosthesis clean.
5. If necessary, remove prosthesis and observe skin condition under prosthesis daily.
Observe for areas of redness or skin breakdown. Report any areas of concern to school nurse, family, and/or health care provider.
6. Make sure that the prosthesis has the student's name on it.
7. Verify the ability of the student to function with prosthesis on.
Note if the student is able to move and function as he/she should. Report any concerns to school nurse, family, and/or health care provider.
8. If necessary, determine student's ability to remove and put on prosthesis.
Watch student put on and remove prosthesis.
9. 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.
10. Arrange transportation as needed for fire drills and emergency evacuations. Prearrange evacuation plans and make sure both student and staff are aware of them.
Elevators are not available during fire drills.
11. Document care and findings on student log. Notify school nurse, family, and/or health care provider of any problems, changes, or concerns.

Source:

South Carolina Department of Health and Environmental Control, Division of Children's Health. (1990). Prosthesis. In *Manual of Nursing Procedures for South Carolina Schools*.

Assessments for a Student with a Prosthesis

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

Source:

South Carolina Department of Health and Environmental Control, Division of Children's Health. (1990). Prosthesis. In *Manual of Nursing Procedures for South Carolina Schools*.

Assisting a Student with an Orthosis

1. Assess the need for assistance for the orthosis— an orthopedic device that is used to support a body part. It may be called a splint or a brace. Specific orthoses are often abbreviated. For example, the ankle-foot orthoses are frequently referred to as AFOs.
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 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 gait and proper fit and function of the orthosis.
 - Check health care provider's orders.
 - Check full length of orthosis.
 - Observe student in orthosis. Mechanical joints should match body joints.
 - 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).
 - Encourage student/family to keep orthosis clean.
 - A layer of thin clothing (such as a cotton undershirt or socks) can be worn under most orthoses to protect the skin. Keep free from wrinkles.
5. If allowed, remove orthosis and observe skin condition under orthosis daily.
Observe for areas of redness or skin breakdown. Report any areas of concern to school nurse, family, and/or 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 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 school nurse, family, and/or health care provider.
9. Determine student's ability to put on and remove orthosis.
Watch student put on and remove orthosis.
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. Prearrange evacuation plans and make sure both student and staff are aware of them.
Elevators are not available during fire drills.
12. Document care and findings on student log.
Notify school nurse, family, and/or health care provider of any problems, changes, or concerns.

Potential Problems for a Student with an Orthosis	
Observation	Action
Inflamed joint	<i>Signs of inflamed joint are pain, warmth, swelling, or redness at joint. Notify school nurse, family, and/or health care provider of any signs of inflammation.</i>
Reddened area on the skin under orthosis	<i>May be beginning stage of pressure sore. Remove orthosis if allowed. If reddened area does not disappear after 20 minutes, notify school nurse, family, and/or health care provider.</i>
Too small or ill fitting equipment	<i>Notify school nurse, family, and/or health care provider.</i>
Joint contracture	<i>Characterized by stiffness or tightness in joint with resistance to movement. Notify school nurse, family, and/or health care provider of any decrease in movement of the joint.</i>

Source:

South Carolina Department of Health and Environmental Control, Division of Children's Health. (1990). Braces. In *Manual of Nursing Procedures for South Carolina Schools*.

Procedure for Cast Care

Note: Equipment and supplies provided by parents.

1. Review the health care provider's orders and student's individualized health care plan.
2. Determine the type of cast and whether the student is allowed to bear weight on it.

Casting Materials

- Synthetic (Fiberglass or Polyurethane resin) – most common casting material for children's casts. Available in colors and prints. Lightweight, allows for greater range of activity. Rough surface can snag clothing or be abrasive to skin.
 - Plaster of Paris – usually reserved for situations that require close conformity or small irregularly shaped areas such as the hand. Relatively heavy and must be kept dry.
3. Explain the procedure to the student at his/her level of understanding. Encourage the student to participate as much as possible.
 4. Check cast fit. Observe affected body part that is visible. Check for:
 - Color, swelling, and warmth of extremity
Extremity should be same color as a comparable extremity and warm, with no swelling (may have some swelling initially).
 - Capillary refill of toes or fingers
Capillary refill can be checked by pressing on the nailbeds of the toes or fingers. After releasing the nailbed, the color should return rapidly to the nailbed in 3 seconds or less.
 - Sensation and movement of toes or fingers
The student's ability to move and feel in the extremity can be evaluated by viewing his/her response to touch. Report any changes to school nurse, family, and/or health care providers.
 5. Observe the condition of the cast. Observe cast for cracks, dents, or soft spots. Edges should not be soft or crumbly. **Remind student not to put anything inside the cast**, especially pencils and other items found at school. Encourage student/family to keep cast clean.
 6. Observe for any complaints or problems noted by the student especially the five "P"s: pain, pallor, paresthesia, paralysis, pulselessness.
Notify school nurse, family, and/or health care provider of any pain, pressure, numbness, or decreased sensation in affected body part. Observe for skin rashes or reddened areas around the cast. Notify school nurse, family, and/or health care provider of any concerns.
 7. Protect cast from soiling. Some synthetic casts can be wiped with mild soap and water.
Cover cast with plastic wrap as needed at mealtimes and with elimination. If plastic wrap is soiled or wet, remove plastic wrap, clean skin, and reapply wrap.
 8. Skin may be rubbed with isopropyl alcohol (70%) 4 times a day, which may toughen the skin and help prevent breakdown. **Do not** use alcohol on red or irritated skin. **Do not** use oily substances (skin lotions) or powder in or around the edges of the cast. Oil softens

own, as well as softening of the cast. Powder will cake
breakdown.

9. If student is immobile, change position as needed to prevent breakdown. Avoid allowing affected limb to hang down for more than 30 minutes.
10. Do not put padding in cast.
*Padding such as cotton or tissues may fall down in cast and decrease circulation.
Petaling cast edges with adhesive tape or moleskin may decrease skin irritation and protect the edges of the cast.*
11. Caution 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.
12. If student has a spica cast, do not use the bar to lift student. Reclining wheelchairs can be used to accommodate the child in a spica cast.
Placing pressure on the bar may damage the cast.
13. 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.
14. Arrange transportation as needed for fire drills and emergency evacuations. Prearrange evacuation plans and make sure both student and staff are aware of them.
Elevators are not available during fire drills.
15. Document care and findings on student log.
Notify school nurse, family, and/or health care provider of any problems, changes, or concerns

Sources:

- American Academy of Family Physicians. (Updated March 2002). Cast Care. Available at <http://familydoctor.org/handouts/094.html>.
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- Graff, J., Ault, M., Guess, D., Taylor, M., & Thompson, B. (1990). Therapeutic Management. In *Healthcare for Students with Disabilities, An Illustrated Medical Guide for the Classroom*. Baltimore: Paul H. Brookes Publishing, pp. 119-144.
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- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 542-544.
- Smith, S.F., Duell, D. J., & Martin, B. C. (2004). *Clinical Nursing Skills: Basic to Advanced Skills*. (6th ed.). Upper Saddle River, NJ: Pearson/Prentice Hall, 1109-1113.

that May Occur with Casts

Intervention	Intervention/Rationale
Presence of pain greater than expected, decreased or absent movement, pain with stretching toes or fingers, decreased sensation in the affected extremity.	<i>These are indicators of pressure build-up under the cast. Pressure decreases circulation to affected extremity. Decrease in circulation can result in damage to muscle tissue and nerves. If pressure causes a decrease in circulation as described, raise casted extremity above rest of the student's body and contact school nurse, family, and health care provider immediately so that pressure can be relieved.</i>
Damaged cast	<i>Immobilize extremity and notify school nurse and health care provider of the extent of the damage.</i>
Plaster of Paris cast becomes wet or soiled	<i>Allow to air-dry. If wet area is large or cast is soiled, contact school nurse and family.</i>
Cast too tight	<i>Signs include: pale to white color of fingers or toes, 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 beginning of reduced circulation to extremity due to pressure under the cast. Elevate extremity and notify school nurse, family, and/or health care provider immediately.</i>
Pain or gestures of pain	<i>May be due to pressure areas resulting from improper molding of cast, food, or foreign particles under cast, which can cause irritation and skin breakdown. Report any complaints or gestures of pain to school nurse, family, and/or health care provider.</i>
Drainage on cast or odor from cast	<i>May be due to an open sore, sloughing of the skin under the cast, or infection. Report any drainage or odor to school nurse, family, and/or health care provider.</i>

Sources:

American Academy of Family Physicians. (Updated March 2002). Cast Care. Available at <http://familydoctor.org/handouts/094.html>.

Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 158-166.

Graff, J., Ault, M., Guess, D., Taylor, M., & Thompson, B. (1990). Therapeutic Management. In *Healthcare for Students with Disabilities, An Illustrated Medical Guide for the Classroom*. Baltimore: Paul H. Brookes Publishing, pp. 119-144.

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er, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse,
is & Wilkins, 542-544.
2004). *Clinical Nursing Skills: Basic to Advanced Skills*. (6th ed.).

Upper Saddle River, NJ: Pearson/Prentice Hall, 1109-1113.

of Good Body Mechanics

1. Obtain help to lift a large load or student. Do not lift a load that is too heavy for you. *Good body mechanics allow movement and lifting of heavy objects or students without injury to the staff member or student. Therefore, if possible, plan to move a heavy object when help is available.*
2. Explain the procedure to the student at his/her level of understanding. Encourage the student to participate as much as possible.
3. When moving a heavy object or student:
 - Use proper posture at all times. Maintain lower back in good alignment while standing or sitting.
Proper posture decreases the chance of back injuries.
 - Secure as much additional assistance as is needed for safe moves.
 - If possible, pull it, push it, roll it, or lower it rather than lifting it.
Work with the force of gravity by pulling, pushing, rolling or lowering, rather than working against the force of gravity by lifting the load.
 - Stand close to the object or student to be moved.
Provides a good center of gravity and good balance for moving the load and an even distribution of weight.
 - Provide a broad base of support.
Have feet at least 12 inches apart with one foot slightly in front of the other.
 - **Keep back straight, knees and hips flexed, weight distributed on both feet, and shoulders in line with pelvis.**
Avoid twisting movement of the spine. Do not keep back rigid because it will lead to back strain and decrease flexibility.
 - Use as many muscle groups as possible for moving the object or student.
Leg and arm muscles reduce the workload on the back and support the load.
 - When working at lower levels, do not stoop by bending over. Instead flex body at knees, and keeping back straight, use thigh and gluteal muscles to accomplish task.
 - Breathe during the moving effort.
Breathing provides for good oxygenation of the muscles and prevents dizziness and injury.
 - To change the direction of the movement, pivot feet, turn with short steps, and turn the whole body without twisting the upper torso.
To lower an object or student, always bend straight down toward the resting place, never twist to lower an object or student. Lowering straight down prevents twisting sprains and injuries to the back.
 - Use a verbal count of 1-2-3 to coordinate movements with the student or the staff member assisting with moving the student or object.
Coordination of movements will prevent jerky movements, which could lead to back strain and injury.
 - Take rest periods to avoid straining.
4. When lifting a heavy object or student:
 - Squat

- Carry using muscles that pull shoulder blades together
Lifting in this manner lessens back strain.

Sources:

- Graff, J., Ault, M., Guess, D., Taylor, M., & Thompson, B. (1990). Therapeutic Management. In *Healthcare for Students with Disabilities, An Illustrated Medical Guide for the Classroom*. Baltimore: Paul H. Brookes Publishing, pp. 119-144.
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Information for Students

Who Require Assistance with Physical Mobility

Date: _____

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

Name of Student: _____

This student uses one 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 to avoid falls or to otherwise keep the student safe:

Contact _____ at _____ (phone number/pager) for additional information or if the student experiences any problems when using these devices.



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Care of the Neurological System

Seizure management
Rectal diazepam administration
Vagal nerve stimulation
Ventricular shunt

Seizure Management

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. For example, the student may experience confusion, loss of awareness, aimless movements, or uncontrolled body movements. If the electrical disturbance affects the entire brain, the result is a generalized seizure.

Epilepsy or a *seizure disorder* is a chronic condition that is characterized by recurrent seizures. Many students with epilepsy have more than one seizure type and may have other symptoms as well.

Some seizures may result from an acute medical illness (e.g., with a diabetic during a hypoglycemic episode) 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

The following table summarizes the classification of seizures:

Generalized Seizures	Clinical Manifestations
<p>Tonic-clonic seizures (grand mal seizures; affects the entire brain)</p> <p>Onset: any age</p>	<p>Before the seizure, the student may have an aura or warning that the seizure is about to begin. The eyes roll upward, the student loses consciousness, falls to the ground, and becomes rigid as muscles tighten (tonic phase).</p> <p>This is followed by jerking movements of the entire body as muscles undergo rhythmic tightening and relaxation (clonic phase). 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, but renews as jerking movements end.</p> <p>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).</p>
<p>Absence seizures (petit mal seizures, ölapses, ö or östaring spellsö)</p> <p>Onset: age 4-15</p>	<p>These seizures are characterized by a brief loss of consciousness with minimal or no alteration in muscle tone and sometimes go unrecognized. The seizures can be mistaken for daydreaming or inattentiveness.</p> <p>Students may:</p> <ul style="list-style-type: none"> • Simply stare blankly for 5-10 seconds • Drop objects because of loss of muscle tone • Have minor movements such as lip-smacking • Experience twitching or slight hand movements

Clinical Manifestations	
	<p>student will be unable to recall what happened during these brief periods of blankness. If untreated, seizures may occur many times a day.</p> <p>Seizures can be precipitated by fatigue, stress, hypoglycemia, or hyperventilation.</p>
<p>Atonic seizures</p> <p>Onset: age 2-5</p>	<p>Manifested as a sudden, momentary loss of motor tone. The student may or may not lose consciousness.</p> <p>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 is worn to prevent injury to the head or face.</p>
<p>Myoclonic seizures</p>	<p>Characterized by sudden, brief contractures of a muscle or group of muscles without loss of consciousness.</p>

Partial Seizures	Clinical Manifestations
<p>Simple Partial Seizures (focal seizures; affects just one part of the brain)</p>	<p>Manifestations are dependent on the area affected and tend to be localized. The student may, or may not, lose consciousness and may be aware of the seizure. 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.</p> <p>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.</p> <p>Students may also experience a postictal stage after a partial seizure.</p>
<p>Complex Partial Seizures (psychomotor seizures)</p> <p>Onset: age 3-adolescence</p>	<p>The most common type of seizures. These seizures first begin with an aura. Most commonly, the aura is described as a strange feeling in the pit of his/her stomach that rises up to the throat. Often this sensation is accompanied by odd or unpleasant odors or tastes, auditory or visual hallucinations, or feelings of elation or strangeness.</p> <p>A student may cry or run for help. During this time, the student is often unaware of his/her environment and unable to respond to the environment.</p> <p>After the aura, the student may suddenly become limp or stiff, appear dazed, and confused and apathetic. The most obvious behaviors may be lip smacking, repeating words, chewing, drooling, swallowing, and nausea and abdominal</p>

ical Manifestations

followed by stiffness, a fall, and sleep.

Partial seizures may spread and become generalized.

Potential Settings

Many students with a history of seizures attend a regular classroom 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 are 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 a sample of medications available to treat seizures)

Generic Name	Trade Name	Seizure Type	Adverse Reactions
Carbamazepine	<i>Tegretol</i>	Secondary tonic/clonic Complex partial Simple partial	Allergic reactions, dizziness, ataxia, muscle incoordination, nausea, behavioral changes, blurred or double vision, aplastic anemia, hepatitis
Clonazepam	<i>Klonopin</i>	Absence Myoclonic Tonic/clonic	Sedation, hyperactivity, aggressiveness, slurred speech, double vision, behavior changes, increased salivation
Ethosuximide	<i>Zarontin</i>	Absence	GI upset, loss of appetite, headache, lethargy, behavior changes, dizziness, dystonia, myelosuppression, drug-induced lupus
Felbamate ^o used only with caution and informed consent due to serious adverse reactions	<i>Felbatol</i>	Partial, patients > 12 years	Aplastic anemia, hepatic failure , anorexia, weight loss, nausea, insomnia, headache, fatigue
Gabapentin	<i>Neurontin</i>	Partial, patients >12 years	Somnolence, dizziness, ataxia, fatigue
Lamotigine	<i>Lamictal</i>	Partial Tonic-clonic Absence Atonic	Somnolence, dizziness, rash, nausea

		Seizure Type	Adverse Reactions
		Myoclonic	
Phenobarbital	<i>Luminal</i>	Tonic-clonic Partial Febrile	Sedation, hyperactivity, changes in sleep pattern, inattention, irritability, cognitive impairment
Phenytoin	<i>Dilantin</i>	Tonic-clonic Complex partial Simple partial	Gingival hyperplasia, hirsutism, nystagmus, blurred or double vision, ataxia, rashes, folate deficiency, drug-induced lupus, myelosuppression
Primidione	<i>Mysoline</i>	Tonic-clonic Complex partial Simple partial	Sedation, hyperactivity, ataxia, behavior changes, rare hematological and hypersensitivity reactions
Tigabine	<i>Gabapril</i>	Partial	Dizziness, somnolence, headache, depression
Topiramate	<i>Topamax</i>	Partial Tonic-clonic Atonic Myoclonic Absence	Somnolence, anorexia, fatigue, difficulty with concentration, nervousness
Valproate	<i>Depakote Depakene</i>	Myoclonic Absence Tonic-clonic Mixed seizures types	Hair loss, tremor, elevated liver enzymes and liver failure, irregular menses, increased appetite, nausea and vomiting, pancreatitis thrombocytopenia

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 anticonvulsants.

The ketogenic diet is designed to induce and maintain a state of ketosis which has been found to metabolically improve seizure control in certain cases. The diet is high in fat (80-90%) and low in carbohydrates and proteins. 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 health care plan (IHCP). While a decrease in seizures as a result of a ketogenic diet have been documented, long term effects, such as increased blood lipids, are not known.

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. A change in medication may be needed because of a change in the student's metabolism. In addition, antiepileptic medication can be toxic. Therefore, any side effects from the medication should be documented and reported to the school nurse, family, and/or health care provider. Careful monitoring of the student can improve the management of seizures.

Signs of an Emergency

A series of consecutive seizures in which the student does not regain consciousness is called *status epilepticus*, which is a medical emergency. Immediate medical care is required. Seizures that 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.

Components of the Individualized Health Care Plan

Each student's IHCP must be tailored to the individual's needs. The following section covers the procedure for managing a seizure and possible problems and emergencies that may arise. It is essential to review it before writing the IHCP.

A sample plan is included in Appendix A. For a student with seizures, the following items should receive particular attention:

- Student's underlying condition and possible problems associated with the condition or treatment.
- Type of seizures student experiences and typical course of seizure
- Student's baseline or normal behaviors.
- Whether 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
- Determining the need for seizure precautions, and what these precautions will be



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Sources:

Epilepsy Foundation of America. (2002). Managing Seizures at School. Available at <https://www.efa.org/answerplace/teachers/managing.html>. Accessed 09 May 2003.

Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, pp 1684-1698.

Plan for Managing a Seizure

Note: Equipment and supplies provided by parents.

1. Prepare 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.

If the student has a seizure:

2. Remain calm.

No one can stop a seizure once it starts.

3. Have an adult stay with the student during the seizure to monitor his/her progress.

4. Put on gloves, if available.

5. Place student on side or stomach. If possible, put something flat and soft (like a folded blanket or jacket) under student's head so the student cannot bang against the floor.

This positioning prevents the tongue from blocking airway and helps the student not to choke on secretions.

6. **Do not place anything in the student's mouth.**

*Padded tongue blades and airways were accepted practice, but now are **not** recommended because they may induce vomiting, cause potential damage to teeth, and potential aspiration.*

7. Loosen tight clothing, especially around the student's neck.

8. If student is standing or sitting, gently lower student to the ground to avoid a fall. Clear the area of anything that could hurt the student. **Do not attempt to restrain student** or use force.

Even if the student is in a wheelchair /adaptive device, lower the student to the ground.

9. Do not give the student any oral medications or anything to drink during a seizure.

10. Document all the student's activity during the seizure: time the seizure began, area of body where the seizure began, any movement of the seizure from one area of the body to another, type of movements of the head, face, arms.

11. Call Emergency Medical Services if:

- Child stops breathing.
- There is evidence of an injury.
- Child is diabetic or pregnant.
- Seizure lasts more than 5 minutes.
- Pupils are not equal after seizure.
- Child cannot be awakened and is unresponsive to pain after seizure has ended.
- Child vomits continuously 30 minutes after seizure has ended.
- This is child's first seizure.

e:

1. After the seizure is over, clear secretions from the student's mouth with a bulb syringe or suction catheter. Keep child on his/her side.
Do not try to clear the student's mouth until the seizure has ended.
2. Monitor student's breathing.
Check position of head and tongue. Reposition if head is hyperextended. If student is not breathing, activate the school emergency plan and begin CPR.
3. Talk with student to determine student's level of awareness.
Note if the student is alert, confused, drowsy, etc. and document findings.
4. Determine and document whether or not the student is able to move arms and legs, or if there is change in the student's ability to move.
5. Check for injuries and provide care, if needed. If student remains unconscious after seizure is over, maintain 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. Make the student comfortable; allow him/her to sleep as needed. Do not give food or liquids until fully alert and swallowing reflex has returned.
After the seizure, the student may sleep for 30 minutes up to a number of hours (postictal period).
8. Document the length of seizure, what happened during the seizure, and postictal period.
Notify school nurse, family, and/or health care provider.

Sources:

Epilepsy Foundation of America. (2002). *Managing Seizures at School*. Available at <https://www.epilepsy.org/answerplace/teachers/managing.html>.

Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, pp 1684-1698.

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.

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 student is standing or sitting, gently lower student to the ground to avoid a fall. Place student on 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.

Contact _____ at _____ (phone
number/pager) for additional information or if the student experiences any problems with
seizures.

Diazepam for Seizures

A *seizure disorder* or *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.

Studies show that rectal diazepam can be a safe and effective treatment for acute repetitive or prolonged seizures. Although intravenous diazepam can produce serious respiratory depression, published studies of rectal diazepam have found no instances of serious respiratory depression. However, some anecdotal stories of respiratory depression exist. 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 or suppository. 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. It can be stored for three years at room temperature.

Potential Settings

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 aid available on the bus. Guidelines regarding where and how diazepam can be administered should be covered in the student's individualized health care plan.

Staff Preparation

Rectal diazepam can be administered by a registered school 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 individualized health care plan. 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 emergency plan.

Components of the Individualized Health Care Plan

Each student's IHCP must be tailored to the individual's needs. The following section covers the procedure for the administration of rectal diazepam and possible problems and emergencies that may arise. It is essential to review it before writing the IHCP.

A sample plan is included in Appendix A. For a student who requires rectal diazepam, the following items should receive particular attention:

ld necessitate the administration of rectal diazepam

- Need to call 911 and activate the school emergency plan when rectal diazepam is given
- 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 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
- Latex allergy alert
- Standard precautions

Sources:

Dreifuss, FE, et al. (1998). A Comparison of Rectal Diazepam Gel and Placebo for Acute Repetitive Seizures. *The New England Journal of Medicine* 338 (26): 1869-1875.

Epilepsy.com. Reviewed by Schachter, SC. (2004). *Diastat*. Available online at: www.epilpsy.com.

Epilepsy Foundation of America. (No date). *Use of New Treatments in Schools, Daycare, and Camps*. Available online at www.epilepsyfoundation.org.

Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 1692.

National Association of School Nurses. ((2003). *Position Statement: The role of the School Nurse Caring for a Student Requiring a Rectal Medication for Seizures*. Available online at www.nans.org/positions/rectalmeds.htm.

National Institute of Neurological Disorders and Strokes. (2001). *Safe and Effective Treatment for Acute Repetitive Seizures Available for At-Home Use*. Originally released June 1998. Available online at www.ninds.nih.gov

Administering Rectal Diazepam

Note: Equipment, supplies, and medications provided by parents.

1. Review procedure prior to having to implement it.
2. Verify the medication order.
3. Don gloves.
4. Obtain assistance of another adult, if possible.
5. Remove protective cover from the medication syringe and lubricate the rectal tip with lubricating jelly (comes with syringe).
6. 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.
7. 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.
8. Keep the student on their side facing you and note the time the medication was given.
9. **Call 911 and activate the emergency plan.**
911 must be called and the emergency plan activated whenever rectal diazepam is given by school personnel.
10. Observe the student 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.
11. Remove gloves and wash hands when appropriate.
12. Document the administration of diazepam, student's response, and implementation of the emergency plan.

Sources:

- Cerner Multum, Inc. (2004). Diastat. Available online at <http://www.drugs.com/MTM/D/Diastat.html>.
- Dreifuss, FE, et al. (1998). A Comparison of Rectal Diazepam Gel and Placebo for Acute Repetitive Seizures. *The New England Journal of Medicine* 338 (26): 1869-1875.
- Epilepsy.com. Reviewed by Schachter, SC. (2004). *Diastat*. Available online at: www.epilpsy.com.
- Epilepsy Foundation of America. (No date). *Use of New Treatments in Schools, Daycare, and Camps*. Available online at www.epilepsyfoundation.org.
- Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 1692.
- National Association of School Nurses. ((2003). *Position Statement: The role of the School Nurse Caring for a Student Requiring a Rectal Medication for Seizures*. Available online at www.nans.org/positions/rectalmeds.htm.
- National Institute of Neurological Disorders and Strokes. (2001). *Safe and Effective Treatment for Acute Repetitive Seizures Available for At-Home Use*. Originally released June 1998. Available online at www.ninds.nih.gov

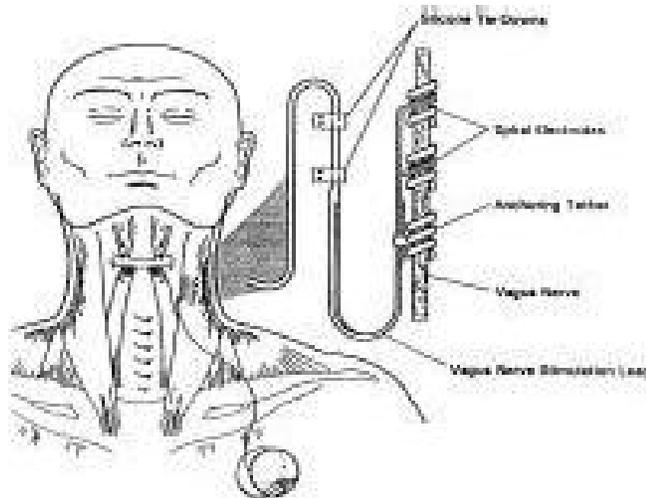
Vagal Nerve Stimulation for Seizures

A *seizure disorder* or *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 can send intermittent electrical signals to the brain by stimulating the left vagus nerve in the neck. The vagus nerve is one of the cranial nerves 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 apparent immediately. 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 for 30 seconds once every 5 minutes. 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.

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.



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, 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, cell phones, and computer disks.

on 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.

Staff Preparation

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.

Components of the Individualized Health Care Plan

Each student's IHCP must be tailored to the individual's needs. The following section covers the procedure for the vagal nerve stimulation and possible problems and emergencies that may arise. It is essential to review it before writing the IHCP.

A sample plan is included in Appendix A. For a student who requires vagal nerve stimulation, the following items should receive particular attention:

- Student's underlying condition and possible problems associated with the condition or treatment.
- Type of seizures student experiences and typical course of seizure
- Whether 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
- Side effects to monitor
- Student's baseline or normal behaviors.
- Other medications the student is taking and signs of adverse reactions or toxicity
- Standard precautions

Sources:

- Cyberonics, Inc. (2002). *Patient's Manual for Vagus Nerve Stimulation*. Houston, TX: Cyberonics, Inc.
- Kennedy PA & Schallert G. (2001). Practical Issues and Concepts in Vagus Nerve Stimulation: A Nursing Review. *Journal of Neuroscience Nursing* 33(2): 105-112.
- VNS Therapy*. (No date; accessed 22 May 2004). Available online at www.vnstherapy.com
- Zalvan, C et al. (2003). Laryngopharyngeal Dysfunction From the Implant Vagal Nerve Stimulator. *Laryngoscope* 113(2): 221-225.

Activating Vagal Nerve Stimulation

Note: Equipment and supplies provided by parents.

1. Review literature that comes with the vagal nerve stimulator.
2. Student or trained caregiver should keep magnet with 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 credit cards, televisions, computers, computer disks, microwave ovens, watches, or other magnets.
3. If 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 student needs to sing or speak in public, while eating, or if stimulation is ever painful, put the magnet over the Pulse Generator and leave it there. The Pulse Generator will not 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 school nurse and health care provider immediately.
7. If student complains, of sore throat, hoarseness, or any other problems with the VNS, document in student log and notify the school nurse and family.

Sources:

- Cyberonics, Inc. (2002). *Patient's Manual for Vagus Nerve Stimulation*. Houston, TX: Cyberonics, Inc.
- Kennedy PA & Schallert G. (2001). Practical Issues and Concepts in Vagus Nerve Stimulation: A Nursing Review. *Journal of Neuroscience Nursing* 33(2): 105-112.
- VNS Therapy*. (No date; accessed 22 May 2004). Available online at www.vnstherapy.com
- Zalvan, C et al. (2003). Laryngopharyngeal Dysfunction From the Implant Vagal Nerve Stimulator. *Laryngoscope* 113(2): 221-225.

Illustration Source:

- Cyberonics, Inc. (2002). *Patient's Manual for Vagus Nerve Stimulation*. Houston, TX: Cyberonics, Inc.

Ventricular Shunt

Overview

A ventricular shunt is a method of treatment for hydrocephalus, excess cerebrospinal fluid 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, 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, 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.



Potential Settings

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.

Staff Preparation

Monitoring of a ventricular shunt may be performed by the school nurse, 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.

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. The checklist outlines specific procedures. Once the procedures have been mastered, the completed checklist serves as documentation of training.

Components of the Individualized Health Care Plan

Each student's IHCP must be tailored to the individual's needs. The following section covers the procedure for monitoring a ventricular shunt and possible problems and emergencies that may arise. It is essential to review it before writing the IHCP.

A sample plan is included in Appendix A. For a student who requires monitoring of a ventricular shunt, the following items should receive particular attention:

on and possible problems associated with the condition

- 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
- Determination of the need for seizure precautions
- Latex allergy alert
- Standard precautions

Sources:

Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, pp 436-444.

Graff, J., Ault, M., Guess, D., Taylor, M., & Thompson, B. (1990). Monitoring a Shunt. In *Health Care for Students and Disabilities, An Illustrated Medical Guide for the Classroom*. Baltimore: Paul H. Brookes Publishing, pp. 159-169.

Illustration Source:

The Center for Pediatric Emergency Medicine (CPEM). Teaching resource for instructors in prehospital pediatrics. Illustrations by Susan Gilbert. Available at <http://www.cpem.org/html/giflist.html>

Monitoring a Ventricular Shunt

1. Document weekly observations of the student's:
 - Behavior
 - Level of activity
 - Response to, and awareness of, the environment
 - Coordination

Using knowledge of the student's usual behavior can help staff discriminate between usual and unusual behavior.
2. Obtain baseline measurements of 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 student's log. Alert school nurse and family of any changes or concerns.
See next page for signs of shunt malfunction or infection.

Sources:

- Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, pp 436-444.
- Graff, J., Ault, M., Guess, D., Taylor, M., & Thompson, B. (1990). Monitoring a Shunt. In *Health Care for Students and Disabilities, An Illustrated Medical Guide for the Classroom*. Baltimore: Paul H. Brookes Publishing, pp. 159-169.

Problems with Ventricular Shunts

Assessment	Intervention/Rationale
<p>Signs of increased intracranial pressure:</p> <ul style="list-style-type: none"> • Headache • Nausea • Vomiting • Double vision or blurred vision • Irritability or restlessness • Personality change • Lethargy or drowsiness • Inability to follow simple commands • Decreased orientation to time and place • Seizures <p>(Note: In the student whose fontanel--soft spot can still be felt, the soft spot becomes full.)</p>	<p><i>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.</i></p> <p><i>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 section on Seizures in this manual.</i></p>
<p>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.</p>	<p><i>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.</i></p>
<p>Signs of shunt infection:</p> <ul style="list-style-type: none"> • Nausea • Vomiting • Headache • Lethargy • Fever • Feeding problems 	<p><i>Any signs of shunt infection should be reported to the school nurse and/or family. A shunt infection requires administration of antibiotics. The shunt may need to be replaced if the infection is not treated successfully.</i></p>

Sources:

- Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, pp 436-444.
- Graff, J., Ault, M., Guess, D., Taylor, M., & Thompson, B. (1990). Monitoring a Shunt. In *Health Care for Students and Disabilities, An Illustrated Medical Guide for the Classroom*. Baltimore: Paul H. Brookes Publishing, pp. 159-169.

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/pager) for additional information or if the student experiences any problems with the
ventricular shunt.



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Care of the Respiratory System

- Overview
- Asthma
- Peak expiratory flow rate monitoring
- Inhalers and spacers
- Nebulizer treatments
- Oxygen use
- 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

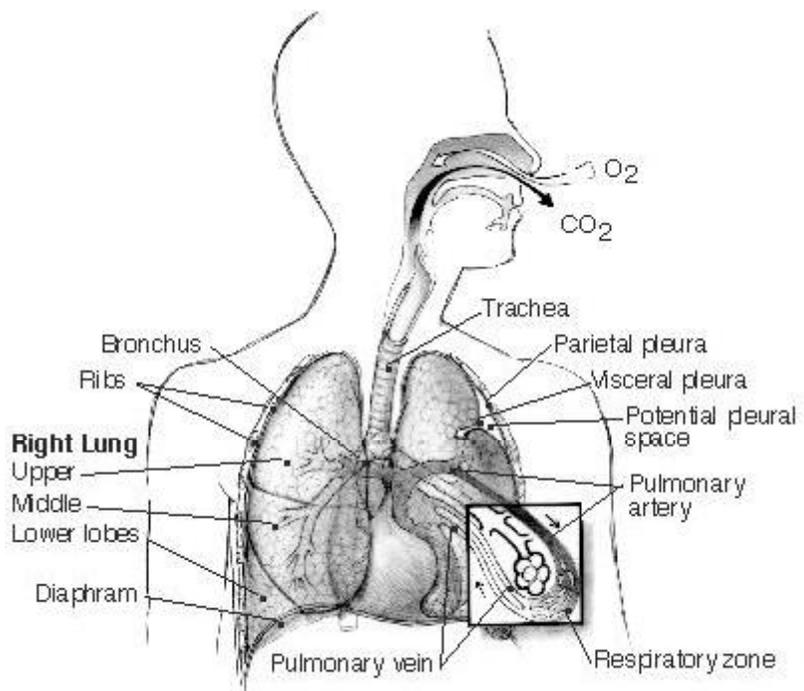
Respiratory System

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 to cells in all parts of the body. The cells use the 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 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 *ōwindpipeō*). 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 the strong wall of muscles 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

- Disorders affecting the facial muscles or bones
- Disorders affecting the respiratory system 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
 - 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)
- 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
 - Brain damage from birth, trauma, drowning
 - Progressive neurological conditions

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Illustration Source:

- National Heart, Lung, and & Blood Institute, Division of Lung Services. (1997). *The Lungs in Health and Disease*. National Institutes of Health Publication # 97-3279.

Asthma

Overview

Asthma is a major public health problem of increasing concern. According to the National Center for Health Statistics, approximately 10% of children in the United States have been reported to have asthma, and asthma prevalence among children has been increasing at an average rate of 4.3% per year. Asthma is one of the leading causes of school absences and the third leading cause for hospitalization. The Centers for Disease Control and Prevention (CDC) estimates that asthma results in 14 million lost school days each year and \$3.2 billion in treatment costs per 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 2010 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. In Virginia, funding from this program's initiatives was used to develop *Guidelines for Managing Asthma in Virginia Schools: A Team Approach*, which includes additional information for the school team addressing asthma and can be obtained through the Virginia Department of Health.

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. 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, persons 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, cockroaches, and grass.
- **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.

... during cold weather. Exercise-induced asthma (EIA) is 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 and exposure to chemical irritants in science and art classes, 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.

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 used frequently 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 student's 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

may be used before exercise to keep the airways open. These medications 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)
- Pirbuterol (Maxair)
- Terbutaline (Breathaire)

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, Vancril)
- Budesonide (Pulmicort)
- Flunisolide (Aerobit)
- Fluticasone (Flovent)
- Triamcinolone acetonide (Azmacort)

Long-acting beta2-agonists

- Formoterol (Foradil)
- Salmeterol (Serevent)

Nonsteroidal

- Cromolyn sodium (Intal)
- Nedocromil sodium (Tilade)

Oral Medications

Corticosteroids

- Methylprednisolone (Medrol)
- Prednisolone (Pediapred, Prelone)
- Prednisone (Orasone, Sterapred)
- Triamcinolone (Aristocort)

Leukotriene modifiers

- Montelukast (Singulair)
- Zafirlukast (Accolate)
- Zileuton (Zyflo)

Theophylline

- Slo-bid
- THEO-DUR

hms are coughing, wheezing, chest tightness, and shortness of breath. Symptoms may occur after physical exercise or at any time. 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. Do a peak flow reading and administer medication if this 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.

Stepwise Asthma Treatment

Asthma is divided into four levels or steps based on the seriousness of the symptoms. The symptoms include shortness of breath; wheezing; rapid, shallow breathing; or needing to use stomach muscles to breathe. The step approach to treatment may be used for all infants and children with asthma

With the Step System, children can step up to a higher step if they need more medicine to control their asthma or step down to a lower step if they need less medicine to control their asthma symptoms. The goals of asthma treatment using the step approach are for students to have:

- no symptoms during the day or night;
- no episodes of shortness of breath, wheezing, or difficulty breathing;
- no school missed because of asthma;
- no activities missed because of asthma;
- lung function as normal as possible;
- infrequent need for rescue medicines; and
- no side effects from the medicines.

Stepwise Asthma Treatment (abbreviated)

Step 1 Mild Intermittent Asthma

- A child has symptoms on 2 or fewer days a week
or
- A child has symptoms on 2 or fewer nights a month

Usually, a child only takes asthma medication when he or she has symptoms.

Step 2 Mild Persistent Asthma

- A child has symptoms on more than 2 days a week but less than once a day
or
- A child has symptoms on more than 2 nights a month

A child usually takes a medication every day to prevent symptoms when he or she has Mild Persistent Asthma.

Step 3 Moderate Persistent Asthma

- A child has symptoms every day
or
- A child has symptoms more than 1 night a week

A child with Moderate Persistent Asthma usually is on 1 or 2 medications every day to prevent asthma symptoms.

Step 4 Severe Persistent Asthma

- A child has continuous symptoms during the day
or
- A child has frequent symptoms at night

A child with Severe Persistent Asthma usually is on 2 or 3 long-acting medicines to prevent asthma symptoms.

Source: National Institutes of Health: *National Asthma Education and Prevention Program, 2002.*

Sports Adjustments

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 health care plan. Additional plans may need to be developed for activities occurring after school hours.

Asthma Education and Training

In general, students should 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. Guidelines for, and examples of, asthma training programs can be found in *Guidelines for Managing Asthma in Virginia Schools: A Team Approach*, a publication of the Virginia Department of Health, which includes additional information for the school team addressing asthma.

The Individualized Health Care Plan: Issues for Special Consideration

Each student's IHCP must be tailored to the individual's needs. It is extremely important for the student with asthma to have a **written** plan in place outlining how to manage the student's asthma on a daily basis and what to do in an emergency.

An IHCP for the student with asthma may 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.

Sample plans follow this section and can be used in developing individual plans. For a student with asthma, the following items should receive particular attention:

cluding, color, respiratory rate, pulse, and blood pressure
in this status

- 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 student may carry/use medication outside the school clinic
- Student's self-care skills and knowledge of early signs of respiratory distress
- Need for peak flow monitoring; if used, include student's best peak flow reading, the frequency/timing of measurements, and reasons for obtaining additional measurements
- Symptoms usually exhibited by student at the onset of asthma flare-ups
- Symptoms exhibited by 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 school nurse and family
- Emergency contact information for family and health care provider
- Activity modifications, if any
- Identity of school personnel who need to know the student's Action Plan and identity 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

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Emergency Asthma Action Plan

Student: _____
 Grade/Room: _____
 Emergency Medication: _____
 Parent: _____
 Contact Numbers: _____

If you see this:	Do this:
<ul style="list-style-type: none"> • Complains of chest tightness • Coughing • Difficulty breathing • Wheezing 	<ul style="list-style-type: none"> • Stop activity • Have student take 1 puff of rescue inhaler • Wait 1 minute • Have student take 2nd puff of rescue inhaler • Have student rest • If no improvement in 15 minutes, repeat 2 puffs • If still no improvement, call school nurse • If symptoms worsen, call 911 & call parents

If you see this:	Do this immediately:
<ul style="list-style-type: none"> • Coughs constantly • Struggles or gasps for breath • Chest and neck pulled in with breathing • Stooped over posture • Trouble walking or talking • Lips or fingernails are gray or blue 	<ul style="list-style-type: none"> • Call 911 • Give rescue medication • Call school nurse • Call parents

Source: Praeger & Zickler, 2002.

ASTHMA HEALTH CARE ACTION PLAN & AUTHORIZATION FOR MEDICATION

TO BE COMPLETED BY PARENT:

Child's Name _____ Date of Birth _____ School _____ Grade _____
 Parent/Caregiver _____ Phone (H) _____ Phone (W) _____ Phone (Cell) _____
 Address _____ City _____ Zip _____
 Emergency Contact _____ Relationship _____ Phone _____
 Name of Physician _____ Office phone number _____

What triggers your child's asthma attack: (Check all that apply)

- Illness Cigarette or other smoke Food _____
 Emotions Exercise Allergies cat dog dust mold pollen
 Weather changes Chemical odors Other _____

Describe the symptoms your child experiences before or during an asthma episode: (Check all that apply)

- Cough "Tightness" in chest Rubbing chin/neck
 Shortness of breath Breathing hard/fast Feeling tired/weak
 Wheezing Runny nose Other _____

TO BE COMPLETED BY PHYSICIAN:

The child's asthma is: mild persistent moderate persistent severe persistent EXERCISE-INDUCED

Symptoms	Peak Flow OR Monitoring	Treatment		
		Controllers	How much	When
<ul style="list-style-type: none"> No cough or wheeze Able to sleep through the night Able to run and play Usual medications control asthma 	GREEN ZONE WELL > _____	<input type="checkbox"/> Advair <input type="checkbox"/> Flovent (with spacer) <input type="checkbox"/> Pulmicort <input type="checkbox"/> Singulair <input type="checkbox"/> Corvasant <input type="checkbox"/> Other _____		
<ul style="list-style-type: none"> Increased asthma symptoms (shortness of breath, cough, chest pain) Wakes at night due to asthma Unable to do usual activities Needs reliever medications more often 	YELLOW ZONE SICK _____ to _____	Relievers <input type="checkbox"/> Albuterol (with spacer/nebulizer) 2 puffs 1 minute apart prn <input type="checkbox"/> Other _____	2 puffs 1 minute apart prn	<input type="checkbox"/> 20 min before exercise
<ul style="list-style-type: none"> Very short of breath, difficulty breathing Constant cough Reliever medications do not help 	RED ZONE EMERGENCY! < _____	1. <input type="checkbox"/> Continue daily controller medications 2. Give albuterol 2 puffs (one minute between puffs) with spacer or by nebulizer <input type="checkbox"/> If no improvement, repeat 2 puffs or nebulizer and wait 20 minutes <input type="checkbox"/> If no improvement, repeat 2 puffs or nebulizer. This will be 3 doses in one hour, proceed to 3 3. If child returns to Green Zone: <input type="checkbox"/> Continue to give albuterol 2 puffs every 4 hours for 1 to 2 more days AND <input type="checkbox"/> Increase controller to _____ for next 7 days 4. <input type="checkbox"/> No physical exercise <input type="checkbox"/> Physical exercise as tolerated If child remains in Yellow Zone for more than 1-2 days or requires albuterol more than every 4 hours, call your doctor NOW!	Give albuterol (2 puffs with spacer or by nebulizer) NOW, and repeat every 20 minutes for 2 more doses – Call your doctor Seek emergency care or call 911 if: <ul style="list-style-type: none"> Child is struggling to breathe and there is no improvement 20 minutes after taking albuterol Trouble talking or walking Lips or fingernails are gray or blue Chest or neck is pulling in with breathing 	

For inhaled medications:

- Student is able to perform procedure alone and may carry the inhaler with them, consult school nurse for local protocol Student is able to perform procedure with supervision
 Student requires a staff member to perform procedure

Notify health care provider if:

- More than 2 absences related to asthma per month The child is persistently in the Yellow Zone
 Albuterol is being used as a rescue medication 2 times per week at school

Provider Signature _____

Date _____

Current school year

I give my permission for school personnel to follow this plan, administer medication and care to my child and contact my physician if necessary. I assume full responsibility for providing the school with prescribed medication and monitoring device. I approve this Asthma Management Plan for my child.

Parent Signature _____

Date _____

Peak Expiratory Flow Rate Monitoring

Overview

A 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 used frequently over a two-week period to determine the student's peak expiratory flow rate. 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.

Potential Settings

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.

Staff Preparation

Peak flow rate monitoring can be performed by the student, school nurse, 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.

Components of the Individualized Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student who needs peak flow rate monitoring. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student who needs peak flow rate monitoring, the following elements should receive particular attention:

- Need for student to measure peak flow rates
- 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 school nurse, family, and/or health care provider
- 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



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Available at www.nhlbi.nih.gov/health/prof/lung/asthma/asth_sch.pdf.

or Peak Flow Rate Monitoring

Note: Equipment and supplies provided by parents.

1. Review standard baseline ratings and assessment ratings from medical provider.
Assess student's status: respiratory rate, depth, effort, pulse, restlessness, color, retractions, cough, wheezing, and lung sounds.
2. Wash hands.
3. Assemble equipment:
 - Peak flow meter
 - Chart or log of student's peak flow readings
4. Explain 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. 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 mouthpiece to 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 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 normal or usual peak flow rate. Many health care providers advise measuring peak flow rates close to the same time each morning.
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 student-specific guidelines. Compare any peak flow rates with student's personal best or normal peak flow rate. Follow health care provider's guidelines for any recommended actions. A medical provider's order is needed to use peak flow readings for treatment.

Generally, three zones (correlated to traffic light colors of green, yellow, and red for easy interpretation) are used to interpret peak flow rates. The following are general guidelines, however, follow the health care provider's specific guidelines for each student:

Zone	Peak Flow Rate	Action
Green	80-100%	Continue 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 action plan predetermined by health care provider. Notify school nurse, family, and/or health care provider if peak flow rate does not return to yellow or green zone.

14. Document 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 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.

Sources:

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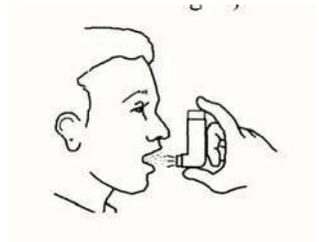
Using a Metered Dose Inhaler (MDI)

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. However, the medication sprayed from the MDI may not reach the lungs if correct technique is not used. A prescription from the student's health care provider is required for inhalers to be used at school.

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 not work** and can harm the inhaler. 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 four times a day (8 puffs total per day), then it should last 25 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.

Note: Medication and supplies provided by parents.

1. Wash hands.
2. Explain procedure at 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 face.
4. Remove the cap and shake the inhaler.
5. Tilt the head back slightly and breathe all the way out.
6. Position the inhaler in one of three ways:
 - Hold inhaler 1-2 inches away from open mouth.
 - Use a spacer to hold inhaler. See Procedure for Using Spacers.
7. Press down on the inhaler to release medication while starting to breathe in slowly for 3-5 seconds.
8. Hold breath for 10 seconds to allow medicine to reach deeply into the lungs.
9. Repeat puff as directed by the student-specific order. For emergency, quick-relief, or rescue medicine (beta2-agonists), wait 1 minute between puffs.
Waiting one minute allows airway to dilate from 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. Wash hands.





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student log (and student response, if specified in plan).

Sources:

- American Academy of Family Physicians. (2000). *Metered-Dose Inhaler: How to Use It Correctly*. Available at <http://familydoctor.org/x2995.xml>.
- Berger, William. *Metered-Dose Inhalers*. Allergy and Asthma Network, Mothers of Asthmatics. Available at www.aanma.org/pharmacy/ph_dev_metereddose.htm.
- National Asthma Education and Prevention Program. (July 2003, revised). *Managing Asthma: A Guide for Schools*. Bethesda, Maryland: National Institutes of Health, National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. NIH Publication No. 02-2650, page 35. Available at www.nhlbi.nih.gov/health/prof/lung/asthma/asth_sch.pdf.
- National Asthma Education and Prevention Program. (1997). *Practical Guide for the Diagnosis and Management of Asthma*. Bethesda, Maryland: National Institutes of Health, National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. NIH Publication No. 97-4053, page 44.

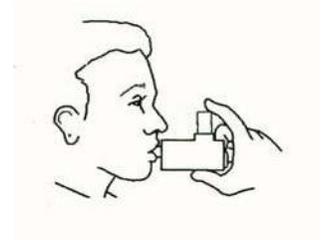
Spacers with Metered Dose Inhalers

Many people (especially young children) find it difficult to time the spraying of a metered dose inhaler (MDI) and the inhalation of the medication. Sometimes the puffs are mis-timed and only make it part of the way into the airways, and some of the medication is deposited in the mouth and on the back of the throat instead of the lungs. Spacers and holding chambers place additional space between the patient and the MDI. 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 on the mouth or throat.

Using an Aerochamber Spacer with a Metered Dose Inhaler

Note: Medications and supplies provided by parents.

1. Wash hands.
2. Explain procedure at 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 Aerochamber.
4. Shake the MDI and insert into the back of the Aerochamber.
5. Breathe out deeply.
6. Put the mouthpiece of the Aerochamber 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 Aerochamber.
8. Take a long slow breath through the mouth and hold breath for 5-10 seconds.
If a whistling sound is heard, the student is breathing in too quickly.
9. Take the Aerochamber out of the mouth and breathe normally.
10. If a second puff is ordered, wait at least one minute between puffs.
11. Document medication given in student log.
12. At least once a week, wash the Aerochamber in warm water and thoroughly dry.



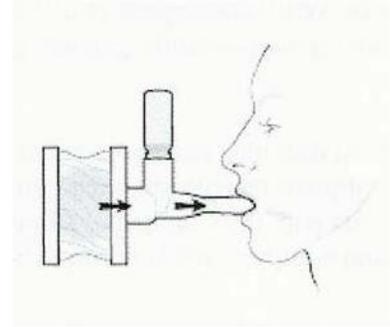
Using an Inspirease Spacer with a Metered Dose Inhaler

Note: Medication and supplies provided by parents.

1. Wash hands.
2. Explain procedure at 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.

reservoir bag until it is completely open.
Securely into the adaptor port of the mouthpiece.

7. 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 breath for 5-10 seconds.
If a whistling sound is heard, the student is breathing in too quickly.
11. Breathe out into the bag slowly, keeping the lips around the mouthpiece.
12. Breathe in again slowly and hold breath for 5-10 seconds.
13. If a second puff is ordered, wait at least one minute between puffs.
14. Document medication given in student log.
15. Wash and dry the mouth piece with warm water and dry 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:

- Health Information Center at the Cleveland Clinic. (2001). *How to Use a Metered Dose Inhaler with Inspirease Spacer*. Available at www.clevelandclinic.org/health/health-info/docs/0300/0357.
- Pediatric Advisor, University of Michigan Health System. (2003). *Metered-Dose Inhaler Used with an Aerochamber*. Available at www.umich.edu/llib/pa/pa_mdaeroch_hhg.htm.
- Skales, N. (1992). Parent Teaching Guide: Holding Chambers for Aerosol Drugs. In *Manual of pediatric nursing procedures*. (pp. 165-167). Philadelphia: J.B. Lippincott.
- University of Massachusetts Pulmonary, Allergy & Critical Care Medicine. (2003). *Instructions for Use of Aerochamber*. Available at www.umassmed.edu/pulmonary/aerochamber.cfm.

How to Use 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 it might with some MDIs. General instructions for most DPIs:

Note: Medication and supplies provided by parents.

1. Wash hands.
2. Follow the manufacturer's instructions to prime the DPI and load a prescribed dose of the dry-powder medicine.
Do not shake the DPI. Shaking can result in losing some powder.
3. Breathe out slowly for 3-5 seconds.
4. Put mouth on mouthpiece and 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.
5. Hold breath for 10 seconds and then exhale slowly.
6. If specified in student plan, 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.
7. Document medication given in student log.

Using a Rotahaler® Dry Powder Inhaler

Note: Medication and supplies provided by parents.

1. Wash hands.
2. Inspect the mouthpiece for presence of foreign objects.
3. While holding the Rotahaler® upright (mouthpiece down), hold the darker colored end in one hand, and turn the lighter colored end as far as it will go in either direction.
4. Insert the clear (thinner) end into the raised hole located in the lighter colored end of the Rotahaler®. Push the new capsule in until it is level with the top of the hole.
This will force the previously used capsule shell into the Rotahaler® chamber.
5. Hold the Rotahaler® level (horizontally) with the white spot up and turn the lighter colored end as far as it will go in the opposite direction.
This will open the capsule.
6. Gently breathe out.
7. Seal lips around the mouthpiece (the darker colored end).
8. Breathe in through the mouth as quickly and as deeply as possible.
9. Hold breath for up to ten seconds.
This allows the medication time to deposit in the airway.
10. Remove Rotahaler® from mouth and resume normal breathing.
11. Repeat steps 2-10 if student is ordered more than one capsule.
12. After each use, pull the two halves of the Rotahaler® apart and throw away the loose capsule shell.

Separate the two halves of the Rotahaler® in warm water (after
soaking for 10 minutes). Shake off any excess water and thoroughly dry Rotahaler®
before reassembling it.

Regular cleaning will prevent powder accumulation inside the Rotahaler®.

14. Document medication given in student log.

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 used 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 at

<http://asthma.nationaljewish.org/treatments/devices/diskus.php> and at

<http://www.asthma.ca/adults/treatment/diskhaler.php>.

Spinhalers are no longer manufactured in the United States, but may be found in Canada.

Sources:

Berger, William. *Dry-Powder Inhalers*. Allergy and Asthma Network, Mothers of Asthmatics. Available at www.aanma.org/pharmacy/ph_dev_drypowder.htm.

National Jewish Medical and Research Center. (2003). *Using a Rotahaler® Dry Powder Inhaler with Asthma Medications*. Available at <http://asthma.nationaljewish.org/treatments/devices/rotahaler.php>

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 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 cause 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 face mask or T adaptor (fits in the mouth). The mask directs air to the nose and mouth, and the T adaptor directs air to the mouthpiece while allowing exhaled air to escape.

Potential Settings

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 school 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.

Staff Preparation

A nebulizer treatment can be administered by the school nurse (RN or LPN) or health assistant supervised by the registered nurse. 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.

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. It outlines the procedure step by step. Once the procedures have been mastered, the completed checklist serves as documentation of training.

Components of an Individualized Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place with a nebulizer treatment. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student requiring nebulizer treatments, the following elements should receive particular attention:

- Determining the need to receive nebulizer treatment

ed and side effects and precautions
comes shaky or jittery during nebulizer treatment

- Frequency of treatments and whether treatments are on a regular or "as needed" basis
- Student's self-care skills and knowledge of need for treatments
- Student's knowledge of early signs of respiratory distress
- Response to treatment and necessity for repeat treatments (per health care provider order)
- Whether there is a need for activity modifications
- Identification of allergens and triggers of wheezing for students with asthma
- Whether there is a need for peak flow readings before and/or after treatment
- Need for chest physical therapy and/or suctioning
- Frequency and type of cleaning for nebulizer components
- Latex allergy alert
- Standard precautions

Sources:

- Medical Network, Inc., HealthAtoZ.com (2004). *Nebulizer*. Available online at:
www.healthatoz.com/healthatoz/Atoz/dc/tp/tpnebulizer_pr.html
- National Jewish Medical and Research Center. (2003). *Using a Nebulizer: Instructions for Correct Use*. Available at: http://asthma.nationaljewish.org/treatments/devices/nebulizers_using.php
- 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.
- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 546.

Nebulizer Aerosol Treatment

Note: Parent provides equipment, supplies, and medications.

1. Determine need for treatment based on 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 hands.
3. Assemble equipment:
 - Compressor
 - Connecting tubing
 - Nebulizer medication chamber
 - Mask, or mouthpiece with T adaptor
 - Medication
 - Diluting solution
 - Syringe, if needed for measuring
 - 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.
7. Place the prescribed amount of medicine and diluting solution, if needed, into the nebulizer cup and screw the cup back together.
Some medications do not require diluting solution.
8. Attach the other end of the connecting tubing to the bottom of the medication cup.
9. Keeping the cup vertical, attach face mask or T tube with mouthpiece to the top of the cup.
10. Have the student sit in a comfortable position.
11. Turn on power switch.
A fine mist should be visible.
12. Have student place mouthpiece in mouth and seal lips around mouthpiece, or place mask over nose and mouth (or tracheostomy).
13. Instruct student to breathe normally in and out of the mouthpiece or mask.
14. Every 1-2 minutes have 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. When all the medication has been aerosolized, turn off power.
16. Remove mouthpiece or mask.
17. Assess student's respiratory status. **If student is still having difficulty breathing after nebulizer treatment or is wheezing, follow student's individualized health care plan.**
18. Wash mouthpiece or mask and allow to thoroughly dry before storing. Refer to cleaning instructions for other parts.
19. Wash hands.
20. Document treatment. Report to 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 medication cup, mouthpiece, and mask under warm running water for 30 seconds. Shake off excess water. Allow to dry. When parts are dry, store them in a clean plastic bag. Do not wash tubing. Once or twice a week: Clean nebulizer parts more thoroughly according to manufacturer's instructions. If no instructions, parts can be soaked in 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 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:

Medical Network, Inc., HealthAtoZ.com (2004). *Nebulizer*. Available online at:
www.healthatoz.com/healthatoz/Atoz/dc/tp/tpnebulizer_pr.html

National Jewish Medical and Research Center. (2003). *Using a Nebulizer: Instructions for Correct Use*. Available at: http://asthma.nationaljewish.org/treatments/devices/nebulizers_using.php

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.

Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 546.

Problems That May Occur During a Nebulizer Treatment	
Assessment	Interventions/Rationale
Chest tightness Coughing Wheezing Shortness of breath Retractions (i.e., pulling in of rib cage)	Follow Emergency Asthma Action Plan or other similar plan. <i>Give nebulizer treatment, if ordered.</i> <i>Nebulized bronchodilators can act quickly to help with breathing. Notify school nurse and family.</i>
Breathing gets increasingly difficult Cough or wheeze worsens	<i>Stay calm. Reassure student. Document vital signs. Follow Emergency Asthma Action Plan and notify school nurse and family.</i>
Struggling to breathe or hunching over after treatment is finished	Follow Emergency Asthma Action Plan. Call 911. <i>Notify school nurse, family, and health care provider.</i>
Dizziness, lightheadedness	<i>Student may be breathing too rapidly. Encourage student to take slower breaths. If persists, stop treatment and continue when student is feeling better.</i>
Becomes shaky or jittery during bronchodialator treatment	<i>Medication may be causing increased heart rate. Follow student guidelines for care.</i>

Sources:

Medical Network, Inc., HealthAtoZ.com (2004). *Nebulizer*. Available online at: www.healthatoz.com/healthatoz/Atoz/dc/tp/tpnebulizer_pr.html

National Jewish Medical and Research Center. (2003). *Using a Nebulizer: Instructions for Correct Use*. Available at: http://asthma.nationaljewish.org/treatments/devices/nebulizers_using.php

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.

Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 546.

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 individualized 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 nurse.

Please contact _____ at _____ (phone number/pager) 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
- Anxious look
- Confusion or change in behavior
- Headache
- Visual disturbances
- Tachypnea
- Tachycardia
- Dyspnea

Chronic hypoxia:

- Polycythemia
- Clubbing of fingers and toes
- Peripheral edema
- Elevated $p\text{CO}_2$
- Chronic $p\text{O}_2 < 55$
- Right-sided heart failure

Advanced hypoxia:

- Hypotension
- Bradycardia
- Cyanosis
- Metabolic acidosis

Oxygen Sources

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 -300° 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

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.
- 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 alarm sounds when oxygen stopped.
- 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.
- Keep the name of the home oxygen company and its telephone contact posted on/near the oxygen equipment and in the student's individualized health care plan. Contact the company if any equipment does not appear to function correctly.
- Notify the fire department that oxygen is in use at the school.

Potential Settings

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.**

gen supply at least daily, or as specified by student's 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, school 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, to 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.)

Staff Preparation

The school nurse (RN or LPN) may administer oxygen through a nasal cannula or mask. Use of a tracheostomy collar may require a registered school 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.

Components of the Individualized Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student requiring supplemental oxygen use. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student requiring supplemental oxygen use, the following elements should receive particular attention:

- Student's underlying condition and possible problems associated with the condition or treatment

y status, including color, breath sounds, respiratory rate,

- 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
- Spare oxygen supply and safe storage when not in use
- Latex allergy alert
- Standard precautions

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 465-472.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 346-351.
- 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.
- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 888-896.

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.

Note: Parent supplies equipment, supplies, and oxygen.

1. Review oxygen safety precautions (see previous section).
2. Wash hands.
3. Assemble equipment:
 - Oxygen source and backup
Make sure that tank has enough oxygen.
 - Cannula and tubing
 - Humidity source, if needed
 - Adaptor for connecting tubing
 - Extra connecting tubing, if needed for mobility
4. Explain 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 cannula tubing to oxygen source.
Usually a "Christmas tree" adaptor is used to attach the tubing to the oxygen source. Attach humidifier, if ordered. Make sure that all connections are secure to prevent leaks.
6. Turn on the oxygen source. A highly visible information card stating oxygen liter flow should be attached to the regulator.
7. Set flowmeter to the flow rate prescribed by 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 student's needs.
8. Check 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 oxygen supply (make sure tank still has oxygen), connections for leaks, flow rate, and tubing for obstruction.
9. Gently place cannula prongs into each of 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.
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 hands.



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log sheet. Notify the school nurse and family if there is a change in the pattern.

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for Using an Oxygen Mask

In an oxygen mask, oxygen flows in through 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.

Note: Parent supplies equipment, supplies, and oxygen.

1. Review oxygen safety precautions (see previous section).
2. Wash hands.
3. Assemble equipment:
 - Oxygen source and backup
Make sure that tank has enough oxygen.
 - Mask and tubing
 - Humidity source, if needed
 - Adaptor for connecting tubing
 - Extra connecting tubing, if needed for mobility
4. Explain 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 mask tubing to oxygen source.
Usually a “Christmas tree” adaptor is used to attach the tubing to the oxygen source. Attach humidifier, if ordered. Make sure that all connections are secure to prevent leaks.
6. Turn on the oxygen source. A highly visible information card stating oxygen liter flow should be attached to the regulator.
7. Set flowmeter to the flow rate prescribed by 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 student’s needs.
8. Check oxygen mask for flow.
Hold mask up to your hand and feel for flow coming out. If no flow is felt, check oxygen supply (make sure tank still has oxygen), connections for leaks, flow rate, and tubing for obstruction.
9. 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.
10. Wash hands.
11. Document procedure and problems on student’s log sheet. Notify the school nurse and family if there are any changes in student’s usual pattern.

Sources:

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Students Requiring Supplemental Oxygen

Assessment	Intervention/Rationale
Redness, dryness, or bleeding of the nares, face or tracheostomy area	<p><i>Check to make sure devices are not attached too tightly and that they have sufficient humidity. Never use powders or petroleum products on the student's face. Petroleum products are combustible and difficult to clear from mucosa. Powders can be aerosolized and irritate the airways.</i></p> <p><i>Notify school nurse and family who can discuss problem with health care provider.</i></p>
<p>Rapid breathing or shortness of breath</p> <p>Agitation, confusion, dizziness, or headache</p> <p>Retractions or pulling in of the muscles at the neck or chest</p> <p>Rapid or pounding pulse</p> <p>Blue color or pallor of the lips or nails</p> <p><i>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.</i></p>	<p><i>Stay calm and reassure student.</i></p> <p><i>Check student:</i></p> <ul style="list-style-type: none"> • <i>Check nasal cannula, mask, or tracheostomy collar for correct placement.</i> • <i>Make sure student's mouth, nose, or tracheostomy tube is not obstructed by food or mucus and that student is positioned so that airway is not blocked.</i> • <i>Check tracheostomy tube placement.</i> • <i>Make sure collar is not out of position or obstructing tracheostomy tube.</i> <p><i>Check equipment. Check oxygen flow—if flow is weak or inadequate:</i></p> <ul style="list-style-type: none"> • <i>Make sure regulator, flowmeter, and valve are on correct settings.</i> • <i>Make sure tank still has gas and is working properly. If not, replace with backup.</i> • <i>Check all connections.</i> • <i>Check that tubing is not kinked or blocked.</i> • <i>Make sure tubing is not obstructed by water condensing in the tubing. Empty water from tube frequently when using humidified mist.</i> <p><i>Increased oxygen flow may be needed. Notify school nurse, family, and/or health care provider.</i></p>
Continues to show signs of respiratory distress, becomes unconscious, or has a respiratory arrest.	<i>Initiate school emergency plan</i> and notify school nurse and family. <i>Begin cardiopulmonary resuscitation if needed.</i>

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 465-472.
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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 nurse.

Open flames and smoking should be prohibited in rooms in which a student is using oxygen.

Please contact _____ at _____ (phone
number/pager) 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

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 (SaO_2). 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 (SaO_2), not the actual amount of oxygen in the blood. The partial pressure of oxygen (PaO_2) can be correlated with the SaO_2 by means of the oxyhemoglobin dissociation curve. A SaO_2 reading of 90% correlates with a PaO_2 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 SaO_2 of 93% as the lowest acceptable value (correlates to PaO_2 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. **Acceptable values for students requiring pulse oximetry should be specified in their individualized health care plans.**

Potential Settings

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.

Staff Preparation

Pulse oximetry can be performed by the school nurse, teacher aide, or other staff person with 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.

Components of the Individualized Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student who requires pulse oximetry. The information should be reviewed prior to developing the individualized health care plan.

plan is included in Appendix A. For the student who
ng elements should receive particular attention:

- Need for 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 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 alert if child is latex sensitive, clip-on probes (not adhesive probes) should be used
- Standard precautions

Sources:

- Bartow, SL. (2000). Home Care Oximetry: A Practice Under Scrutiny. *AARC Times* 24 (11): 51-55.
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for Measuring Pulse Oximetry

Note: Parent supplies equipment and supplies.

1. Determine need for oximetry. The student may ask for a measurement.
Assess student's status: respiratory rate, depth, effort, pulse, restlessness, color, retractions, cough, wheezing, and lung sounds.
2. Wash hands.
3. Assemble equipment:
 - Oximeter
 - Oximeter probe or sensor
4. Explain 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. Position student as recommended.
Usually performed while the student is sitting to decrease 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.
6. Instruct student to breathe normally, if necessary.
Normal breathing prevents large fluctuations in minute ventilation and possible changes in oxygen saturation.
7. Select appropriate site to apply sensor/probe based 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.
8. Attach pulse oximeter sensor/probe to 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 light source is on one side of finger and detector is directly opposite facing it.
9. Attach sensor cable to oximeter and turn machine on. Observe waveform display and listen for audible beep.
Light or waveform fluctuates with each pulsation and reflects pulse strength. Poor light waveform may indicate signal is too weak to give accurate oxygen saturation readings.
10. Correlate oximeter pulse rate with 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 placement of sensor/probe.
11. Read saturation level on digital display when readout reaches constant value (after at least 10 seconds) and pulse display is strong.
12. If continuous oxygen saturation monitoring is ordered, verify the alarm limits and alarm volume. Limits should be set as ordered in student-specific plan. Assess

hours and rotate site every 4-8 hours to prevent burns

13. If intermittent monitoring is ordered, remove probe and turn off oximeter power after reading. If adhesive sensor is used, place on the plastic backing for future use. Store probe and oximeter in appropriate location.
14. Wash hands. If the oximeter probe is used for more than one student, it should be cleaned between uses according to manufacturer recommendations.
15. Record oxygen saturation readings in student log. Note any change in respiratory status at this time.
16. Compare readings with student baseline and acceptable values. Report to the school nurse and family any changes from the student's usual pattern.

Sources:

- Bartow, SL. (2000). Home Care Oximetry: A Practice Under Scrutiny. *AARC Times* 24 (11): 51-55.
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Problems with Pulse Oximetry

Assessment	Intervention/Rationale
No reading on oximeter	<i>Check to see if sensors are properly aligned. Make sure wires are intact and securely fastened. Check that oximeter is plugged in and electrical outlet is functioning.</i>
Low oxygen saturation readings but student has no signs of respiratory distress.	<p><i>Check:</i></p> <ul style="list-style-type: none"> • <i>Correlation between pulse rate and oximeter pulse reading. If they differ, re-position probe.</i> • <i>Capillary refill. Loosen any tight-fitting clothes. If circulation decreased, choose different site for probe.</i> • <i>Light source on probe.</i> • <i>If limb is being moved during reading. May need to switch to another site.</i> • <i>Adhesion of sensor/probe to skin site.</i> • <i>Assess for hypothermia. If extremity is cold, move probe or warm extremity.</i> • <i>Lighting in the room. Bright direct lighting or bright sunlight can affect readings.</i> • <i>Probe/sensor site for sweating, nail polish.</i>
Low oxygen saturation readings and student has signs of respiratory distress.	<i>Follow guidelines in student's individualized health care plan. Administer oxygen or suction student, if prescribed. If distress persists, notify school nurse, family, and/or health care provider. Be prepared to implement school emergency plan.</i>
Irritation at probe/sensor site	<i>Move probe/sensor. Assess site every 2-8 hours as needed or specified. Notify school nurse and family of irritation.</i>

Sources:

- Bindler, R.C., Ball, J.W., London, M.L., & Ladewig, P.W. (2003). *Clinical Skills Manual for Maternal-Newborn and Child Nursing*. Upper Saddle River, NJ: Prentice Hall, pp.118-119.
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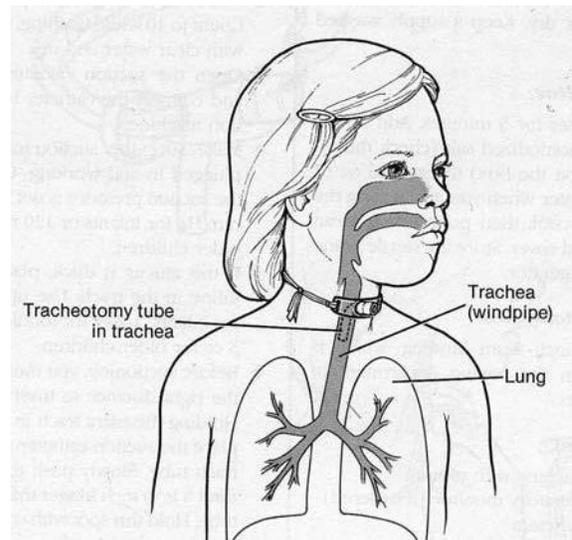
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Tracheostomy

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 chronic lung disease (CLD) 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 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 student-specific guidelines
- Sterile or clean cotton-tip swabs, if required
- Pipe cleaners, if needed for cleaning of an inner cannula
- Saline dosettes, only if prescribed—no longer routinely used with suctioning
- Manual resuscitator with adaptor (Ambu bag)
- ½ strength hydrogen peroxide (diluted with saline or distilled water) or saline

- IME), more commonly known as artificial nose, for protecting 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 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 child's brief medical history

Potential Settings

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 excessive 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.

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 school 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 dōgo bag.ö

Staff Preparation

Tracheal care for students who require care in school, such as suctioning, use of a tracheostomy collar, or other daily care, 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.**

Under some circumstances, after a student with a tracheostomy has been in the school setting for a period of time and it is clear that the student's medical condition is stable, it may be appropriate for the health care team and the family to consider using a nonmedical caregiver

ing and supervision by a school nurse who is in the
tioning.

Some students need less frequent care or require no routine tracheostomy care at all. The decision regarding the placement of the caregiver for such a student must be made by the family, health care provider, and school nurse and be based on the student's medical condition, tracheal care needs, and adaptation to school. Such decisions should be included in the student's individualized health care plan and be well known to all the caregivers involved.

If the trained caregiver and back-up personnel are unable to be available on a given school day, the student should not attend school. However, an optional arrangement can be made between the school and the family so someone from the family would be available to attend school to function as the caregiver for the student.

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.

The basic skills checklists in Appendix B can be used as a foundation for competency-based training in appropriate techniques and problem management. They outline specific procedures step by step. Once the procedures have been mastered, the completed checklists serve as a documentation of training.

Components of the Individualized Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student who has a tracheostomy. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student with a tracheostomy, the following elements should receive particular attention:

- Underlying condition and possible problems associated with the condition or treatment
- 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 catheter, special instructions
- 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 student or caregivers
- Staffing needs to provide safe care for the student and plan for absences

; in the air, such as chalk dust, aerosols, glitter, small

- Need for additional fluids
- Speech and communication needs
- Means of communicating between school personnel when immediate help is needed (e.g., walkie-talkies, intercoms, telephones)
- Latex allergy alert
- Standard precautions

Do 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.

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Illustration Source:

- Wong, DS & Hess CS. (1990). *Wong and Whaley's Clinical Manual of Pediatric Nursing.* (3rd ed.) St. Louis: Mosby, 573.

for Students with Tracheostomies

Assessment	Intervention/Rationale
Signs of respiratory distress: <ul style="list-style-type: none"> ● Difficulty breathing ● Increased respiratory rate ● Increased heart rate ● Wheezing, grunting, or noisy breathing ● Pale blue color around lips, eyes, nails ● Restlessness, agitation ● Retractions ● Anxious, frightened look 	<p><i>Tracheostomy tube may be blocked with mucus or foreign matter. Suction tracheostomy. Change tracheostomy tube if needed. Check placement of tracheostomy tube and air movement from tracheostomy. Reassure student. If symptoms do not clear with suction or tube change, activate emergency plan. Do not leave student alone.</i></p>
Tracheostomy tube becomes dislodged	<p><i>Stay calm and do not leave student alone. Reposition tracheostomy tube, if possible. If unable to reposition or tube has come totally out, insert new (spare) tracheostomy tube using obturator immediately. If regular size tube cannot be inserted, use one size smaller. If spare trach is not available, replace with the one that came out. Check air movement. Give breaths with resuscitation bag, if indicated. Administer oxygen if prescribed in emergency plan. Initiate school emergency plan and begin cardiopulmonary resuscitation, if necessary. Notify school nurse, family, and health care provider.</i></p>
Suction catheter cannot be inserted into tracheostomy tube.	<p><i>Do not leave student alone. Reposition head/neck and try again. Change inner cannula (if present) or replace tracheostomy tube. Give breaths with resuscitation bag, if needed. Check for air movement. Give oxygen, if prescribed in emergency plan. Initiate school emergency plan and begin cardiopulmonary resuscitation, if necessary. Notify school nurse, family, and health care provider.</i></p>
Aspiration of foreign material (e.g., food, sand) into tracheostomy	<p><i>Do not leave student alone. <u>Suction first</u>. Do not give breaths with resuscitation bag because forcing air could push aspirate further into lungs. Give breaths with resuscitation bag <u>after</u> initial suctioning. Check for air movement. If tube remains blocked, replace with new trach tube. If mucus is very thick and saline has been</i></p>

	Intervention/Rationale
	<p><i>prescribed, saline may be added. However, saline is no longer routinely recommended and may cause more harm than good.</i></p> <p><i>If student experiences bronchospasm causing wheezing, medications may be required, if prescribed.</i></p> <p><i>If respiratory distress continues, initiate school emergency plan. Begin CPR, if needed. Notify school nurse, family, and health care provider.</i></p>
Distress during suctioning	<p><i>Limit suctioning to 10 seconds or less. Suction more frequently for shorter periods. Make sure catheter is no more than ½ the diameter of the tracheostomy. Hyperinflate the lungs with oxygen prior to suctioning, if prescribed (no longer routinely recommended). Activate emergency plan if distress persists.</i></p>
Dressing becomes wet	<p><i>Replace dressing with similar dressing. Use 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 tracheostomy ties around outer opening of tracheostomy tube.</i></p>
Excessive secretions requiring frequent suctioning	<p><i>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 to school nurse and family..</i></p>
Fever; yellow or green secretions; foul odor, congested lung sounds; listlessness, increased mucus	<p><i>Possible signs of infection. Notify school nurse and family.</i></p>
Redness or skin breakdown at the stoma	<p><i>Clean site as specified and make sure dressing stays dry. Check that ties are not too tight (should allow one finger to be inserted comfortably between tie and neck). Document appearance of site in student log and notify school nurse and family of any changes.</i></p>
Bleeding or pain at stoma site	<p><i>Notify school nurse and family. May be due to infection, trauma, or excessive coughing.</i></p>
Pink or red streaked secretions from tracheostomy	<p><i>May occur as a result of suctioning. Check suction pressure (should always be less than 120). Limit suctioning to 5 seconds at a time. Notify school nurse and family. If actual bleeding observed, notify school nurse and</i></p>

Intervention/Rationale

<i>family immediately and activate school emergency plan.</i>

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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 breath 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.

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 nurse.

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.

Please contact _____ at _____ (phone number/pager) 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, chest percussion and drainage

Potential Settings

Routine suctioning can be done in a classroom if a clean area is available, but in most cases is done in a clean, private area to protect 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 electric outlet must be available. Portable suctioning equipment should accompany the student at all times.

Staff Preparation

Tracheal suctioning should be provided by a registered school nurse, licensed respiratory therapist, licensed practical nurse under the supervision of a registered school nurse, or other specifically trained paraprofessional 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.**

Under some circumstances, after a student with a tracheostomy has been in the school setting for a period of time and it is clear that the student's medical condition is stable, it may be appropriate for the health care team and the family to consider using a nonmedical caregiver

ing and supervision by a school nurse who is in the
tioning.

Some students need less frequent care or require no routine tracheostomy care at all. The decision regarding the placement of the caregiver for such a student must be made by the family, health care provider, and school nurse and be based on the student's medical condition, tracheal care needs, and adaptation to school. Such decisions should be included in the student's individualized health care plan and be well known to all the caregivers involved.

If the trained caregiver and back-up personnel are unable to be available on a given school day, the student should not attend school. However, an optional arrangement can be made between the school and the family so someone from the family would be available to attend school to function as the caregiver for the student.

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.

The basic skills checklists in Appendix B can be used as a foundation for competency-based training in appropriate techniques and problem management. They outline specific procedures step by step. Once the procedures have been mastered, the completed checklists serve as a documentation of training.

Components of the Individualized Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student who requires tracheal suctioning. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student who requires tracheal suctioning, the following elements should receive particular attention:

- Underlying condition and possible problems associated with the condition or treatment
- 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 catheter, special instructions
- Length of tracheostomy tube measured to determine depth of suctioning
- Appropriate pressure settings if suction machine has a vacuum setting
- Need for breaths with a manual resuscitation bag
- When and if saline is to be instilled, no longer routinely recommended
- Equipment and supplies needed
- Back up equipment and personnel

responsibility for transporting equipment
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
- Latex allergy alert
- Standard precautions

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Equipment for Tracheal Suctioning

Equipment for suctioning must be available for use at ALL times.

Note: Parents supply equipment and supplies.

1. Wash hands.
2. Gather equipment and materials:
 - Suction machine and manual backup
Student 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.
 - Correctly-sized suction catheter
Suction catheters should be no greater than $\frac{1}{2}$ 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.
 - Sterile saline or sterile water to clear catheter
 - Container for saline or water
 - Disposable gloves, powder free; sterile or clean according to student's individualized health care plan
 - Self-inflating manual resuscitation (Ambu) bag with adaptor for tracheostomy
 - Plastic bag for disposal of materials
 - Saline dosettes, **ONLY** if prescribed; no longer routinely used
3. Position student as specified in their individualized health care plan. Although not required, it is advisable to have another person available for assistance if needed.
Most students are suctioned while seated upright at school.
4. Explain 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. Encourage 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.
6. Turn on suction machine. A suction of 80-100 mm Hg is usually recommended (may go as low as 60 and as high as 120, depending on size of child). Put finger at end of connecting tube to confirm suction.
7. Wash hands.
8. Open suction catheter or kit.
Peel paper back without touching the inside of the package to maintain sterility.
9. Open saline dosette **ONLY** if instillation is ordered, but do **not** routinely instill saline.
10. Pour a small amount of sterile saline or sterile water into container.
This will be used to moisten the catheter and to clear out secretions in the catheter.
11. Don gloves. A mask, goggles, or face shield may be required with some students to fully protect caregiver from coughed-up mucus.

the suction catheter in the dominant hand, secure it to the nondominant hand). Leave the other end of catheter in its covering.

The dominant hand should remain “sterile/clean.” It should not touch anything but the sterile catheter. The nondominant hand should be used to turn on switches or touch other objects.

13. Do **NOT** manually ventilate with resuscitation bag and/or hyperoxygenate prior to suctioning **unless** prescribed.

There is some controversy over whether this intervention is helpful. 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 suction catheter 2-3 inches from tip with dominant hand, insert tip of catheter in sterile saline or sterile water.

15. Cover vent hole with thumb of nondominant hand to suction a small amount of saline through 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 lubricant other than water because the lubricant can dry and cause airway occlusion.

16. With thumb off vent hole, gently but quickly insert catheter into tracheostomy. **Do not suction while catheter is being inserted** because it can damage tracheal mucosa, as well as increase hypoxia. Do not insert catheter beyond the distal end of the tracheostomy tube.

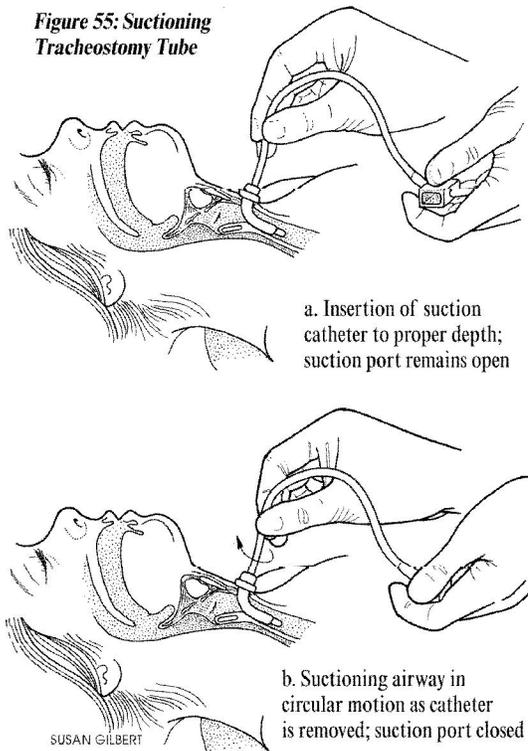
Guide catheter with sterile, dominant hand. If the catheter is inserted too deeply, this can cause irritation/injury to the trachea, as well as bronchospasm. Determine the length of the tracheostomy tube from the package, family, or health care provider prior to suctioning. Coughing indicates that the suction catheter possibly has passed the end of the tracheostomy tube.

17. Cover vent hole intermittently with thumb while withdrawing catheter. Rotate 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 tracheal mucosal lining. Uncovering intermittently and rotating catheter helps prevent damage to 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 student’s oxygen level.

Figure 55: Suctioning Tracheostomy Tube



- ... breathe or give breaths with resuscitator bag between
... of each suctioning pass and the length of the rest period
... depend on student's tolerance of the procedure and absence of complications. Suction
... saline again through catheter to rinse secretions from catheter and tubing.
This helps student get new oxygen/air into lungs.
19. **Do not routinely use saline to loosen secretions.** Only if prescribed, insert several drops of saline into tracheostomy with nondominant hand. Manually ventilate with 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. New research indicates it may increase airway contamination, decrease oxygen saturations, and do a poor job of thinning secretions.
 20. If moist, gurgling noises or whistling sounds are still heard, or if mucus is seen at the tracheostomy opening, repeat suctioning procedure (steps 16-19). Assess student's color and respiratory status throughout the procedure. If student was receiving oxygen by mask before suctioning, reapplication of mask between passes might be needed.
If appropriate, ask the student if he or she needs repeat suctioning.
 21. 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.*
 22. Rinse catheter and connecting tubing with normal saline until clear. Use continuous suction.
Remove secretions in the tubing. Secretions left in tubing decrease suctioning efficiency and provide environment for growth of microorganisms.
 23. Disconnect catheter from suction tubing. Wrap catheter around gloved hand. Pull glove off inside out so that catheter remains rolled in glove. Place first glove in remaining gloved hand. Pull off other glove over first glove to seal in 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 not used to suction nose and mouth. Consult family and health care provider for student-specific use.
 24. Discard used suction catheter in appropriate receptacle. Turn off suction. Wash hands.
 25. Note color, consistency (e.g., thin, thick), and quantity of secretions. Compare student's respiratory assessments before and after suctioning. Document procedure on student's log sheet and notify school nurse and family of any changes from student's usual pattern.
 26. Be sure 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. Available at <http://www.cpem.org/html/giflist.html>

Tracheal Suctioning Using a Sleeved Catheter

Sleeved 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 now 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 school 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.

Procedure

Note: Parent provides equipment and supplies.

1. Follow steps 1-10 for tracheal suctioning.
2. Don gloves.
3. Attach the control valve of the sleeved catheter to the connecting suction tubing (if not already connected).
4. Turn on machine to appropriate vacuum setting for student.
5. 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.
6. If student is ventilator dependent, attach a T-piece to the ventilator breathing circuit and connect the T-piece to the student's tracheostomy.
7. 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.
Do not suction while catheter is being inserted because it can damage tracheal mucosa, as well as increase hypoxia. Do not insert catheter beyond the distal end of the tracheostomy tube.
8. Cover vent hole intermittently with thumb while withdrawing catheter. Rotate 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 tracheal mucosal lining. Uncovering intermittently and rotating catheter helps prevent damage to mucosal lining.

**of the catheter must take no longer than 5-10 seconds.
the airway and cause a serious drop in student's oxygen**

- level.
9. Allow the student to rest and breathe or give breaths with resuscitator bag between suctioning passes. The timing of each suctioning pass and the length of the rest period depend on student's tolerance of the procedure and absence of complications. Suction saline again through catheter to rinse secretions from catheter and tubing.
This helps student get new oxygen/air into lungs.
 10. **Do not routinely use saline to loosen secretions.** Only if prescribed, insert several drops of saline into tracheostomy with nondominant hand. Manually ventilate with resuscitation bag to disperse saline, if ordered.
Saline may push secretions back down the airway. It was once used to loosen or thin thick or dry secretions. New research indicates it may increase airway contamination, decrease oxygen saturations, and do a poor job of thinning secretions.
 11. If moist, gurgling noises or whistling sounds are heard or if mucus is seen at the tracheostomy opening, repeat suctioning procedure (steps 7-9). Assess 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 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 student-specific guidelines. They can not be reused in the trachea if they are used to suction the mouth and nose.
 14. Remove gloves. Wash hands.
 15. Note color, consistency (e.g., thin, thick), and quantity of secretions. Compare student's respiratory assessments before and after suctioning. Document procedure on student's log sheet and notify school nurse and family of any changes from student's usual pattern.
 16. Be sure suction equipment and supplies are restocked, checked daily, and ready for immediate use.

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Problems When Suctioning

Assessment	Intervention/Rationale
<p>Student develops signs of respiratory distress:</p> <ul style="list-style-type: none"> ● Difficulty breathing ● Increased respiratory rate ● Increased heart rate ● Wheezing, grunting, or noisy breathing ● Pale blue color around lips, eyes, nails ● Restlessness, agitation ● Retractions ● Anxious, frightened look 	<p><i>Limit suctioning to 10 seconds or less. Suction more frequently for shorter periods. Make sure catheter is no more than ½ the diameter of the tracheostomy. Hyperinflate the lungs with oxygen prior to suctioning, if prescribed (no longer routinely recommended). Tracheostomy tube may be blocked with mucus or foreign matter. Suction tracheostomy. Check placement of tracheostomy tube and air movement from tracheostomy. Reassure student. Change tracheostomy tube if suctioning does not clear.</i></p> <p><i>If symptoms do not clear with suction or tube change, activate school emergency plan. Do Not Leave Student Alone.</i></p>
<p>Tracheostomy tube or inner cannula becomes dislodged</p>	<p><i>Stay calm and do not leave student alone.</i> Reposition inner cannula or tracheostomy tube, if possible. If unable to reposition or tube has come totally out, insert new (spare) tracheostomy tube using obturator <i>immediately</i> (replacing inner cannula will not require use of obturator). If regular size tube cannot be inserted, use one size smaller. If spare trach is not available, replace with the one that came out. Check air movement. Give breaths with resuscitation bag, if indicated. Administer oxygen if prescribed in emergency plan. <i>Initiate school emergency plan</i> and begin cardiopulmonary resuscitation, if necessary. Notify school nurse, family, and health care provider.</p>
<p>Bleeding during suctioning:</p> <ul style="list-style-type: none"> ● Pink or blood streaked secretions ● A large amount of blood is suctioned or the student develops respiratory distress while being suctioned 	<p><i>Check suction pressure (should always be less than 120). Limit suctioning to 5 seconds at a time. Notify school nurse and family.</i></p> <p><i>Activate the school emergency plan</i> and notify school nurse and family. Reassure student.</p>
<p>Suction catheter cannot be inserted into tracheostomy tube.</p>	<p><i>Do not leave student alone.</i> Reposition head/neck and try again. Change inner cannula (if present) or replace tracheostomy tube. Give breaths with</p>

	Intervention/Rationale
	resuscitation bag, if needed. Check for air movement. Give oxygen, if prescribed in emergency plan. Initiate school emergency plan and begin cardiopulmonary resuscitation, if necessary. Notify school nurse, family, and health care provider.
Bronchospasm during suctioning	May be due to excessive suctioning. Reassure student and help student to calm down. If unable to withdraw catheter, disconnect from connecting tubing and hold oxygen near end of suction catheter. If bronchospasm relaxes, remove catheter. If bronchospasm remains, student may require medication (e.g., bronchodilator). Notify school nurse, family, and health care provider. Be prepared to initiate school emergency plan.

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Information for Students Who Need Tracheal Suctioning

Date: _____

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

Name of Student: _____

This student has a tracheostomy to allow the student to breath 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.

Please contact _____ at _____ (phone number/pager) 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 1-4 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.

Potential Settings

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.

Staff Preparation

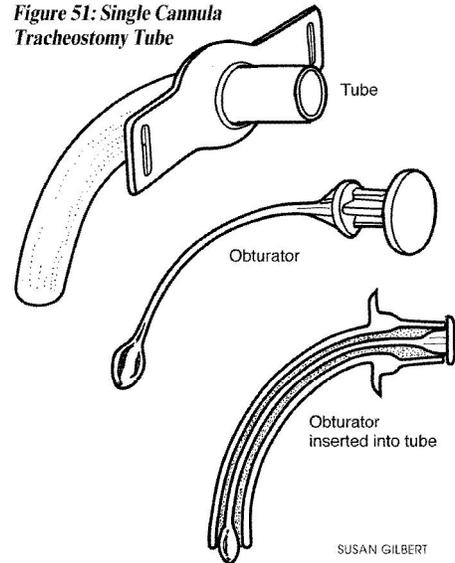
Tracheostomy tube changes should be provided by a registered school nurse or licensed practical nurse only in emergency situations. These caregivers should have proven, competency-based training in appropriate techniques and problem management. **All staff in contact with students who have tracheostomies 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.**

If the trained caregiver and back-up personnel are unable to be available on a given school day, the student should not attend school. However, an optional arrangement can be made between the school and the family so someone from the family would be available to attend school to function as the caregiver for the student.

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.

The basic skills checklists in Appendix B can be used as a foundation for competency-based training in appropriate techniques and problem management. They outline specific procedures step by step. Once the procedures have been mastered, the completed checklists serve as a documentation of training.

Figure 51: Single Cannula Tracheostomy Tube



Individualized Health Care Plan

The individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student who needs a tracheostomy tube change. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student who needs a tracheostomy tube change, the following elements should receive particular attention:

- Underlying condition and possible problems associated with the condition or treatment
- Size and type of tracheostomy tube
- Use of an obturator
- Type of ties, gauze, and/or skin care
- Portable equipment and supplies and responsibility for transporting them with 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
- Latex allergy alert
- Standard precautions

Sources:

- A Parent's Guide to Pediatric Tracheostomy Home Care.* (2002). St. Louis: Mallinckrodt, Inc.
- Bissell, C. (2004). *Changing a tracheostomy tube.* Available at www.tracheostomy.com.
- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures.* Philadelphia: Lippincott William & Williams, 577-580.
- Brown, J and Kiker, M. *Taking Care of Your Child with a Tracheostomy.* University of Virginia patient education brochure.
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Illustration Source:

The Center for Pediatric Emergency Medicine (CPEM). Teaching resource for instructors in prehospital pediatrics. Illustrations by Susan Gilbert. Available at <http://www.cpem.org/html/giflist.html>

Changing a Tracheostomy Tube

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Gather equipment and materials:
 - Exact size and type of tracheostomy tube ordered for student
Always have a spare clean tracheostomy tube available and ready for use.
 - Tracheostomy tube one size smaller than currently being used.
Used if difficulty encountered with insertion of regular-sized tube
 - Velcro ties, twill tape, or other ties
 - Obturator, if needed (used as a guide for insertion)
 - Blunt scissors
 - Syringe to inflate and deflate cuff, if tube has a cuff
 - Sterile water-soluble lubricant or sterile saline
Never use Vaseline or oil-based lubricants.
 - Resuscitation bag
 - Blanket roll, if needed, to position student's neck
 - Stethoscope
 - Oxygen, if ordered
 - Suctioning device and supplies
 - Gloves
 - Another person to assist, if possible
3. Explain 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 student as recommended/ordered.
Best positioning is usually to have student lie on back with a blanket roll under the shoulders.
5. Wash hands.
6. Have spare Velcro ties or pre-cut tracheostomy ties ready.
7. Open tracheostomy tube package. Keep tube clean. **Do not touch** curved part of tube that is inserted into trachea.
8. Put on gloves. Protective facial gear may be needed if student has excessive secretions and coughs during insertion.
9. Insert obturator into clean tracheostomy tube.
10. Attach Velcro holder or tracheostomy ties to one side of new tube.
11. If ordered, lubricate end of 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 assistant hold old tube in place while cutting/removing the ties. If tube is being changed by one person, do not remove ties until clean tracheostomy tube is in hand.
Always hold the tube when ties are not secure because a cough can dislodge the tube.

hand), have assistant remove old tube. Remove old 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 inner cannula, if it is used, at this time. Continue to hold in place until 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 tracheostomy tube. Observe the student for signs of respiratory distress. Assistant may listen with stethoscope for breath sounds.
18. Secure tube in place with ties or Velcro holder. The tracheostomy ties should be tied in a double or triple knot. They should never be tied in a bow. The ties should be loose enough that one finger can be slipped in between the ties and the neck.
19. Listen with stethoscope to assess breath sounds. Watch chest rise with breath. Give 2-4 breaths with resuscitation bag or provide oxygenation as ordered, if indicated based on student's respiratory status.
A small amount of bleeding may occur around 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. Do skin care, if needed (see student-specific guidelines), and reapply gauze around and under 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 tracheostomy.
21. Discard used equipment according to standard precautions guidelines.
22. Remove gloves and wash hands.
23. Document procedure and problems or concerns on student's log sheet. Notify school nurse and family of tracheostomy change.

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with Tracheostomy Tube Changes

Assessment	Intervention/Rationale
<p>If the tracheostomy tube comes out and:</p> <ul style="list-style-type: none"> • Student is not showing signs of distress. 	<p><i>Call for assistance. Do not leave student alone. Follow procedure for tracheostomy tube change.</i></p>
<ul style="list-style-type: none"> • Student shows signs of respiratory distress 	<p><i>As soon as possible, attempt to insert tracheostomy tube as outlined in procedure.</i></p>
<ul style="list-style-type: none"> • Tube has been inserted and the student is still having difficulty 	<p><i>Listen for breath sounds and assess airway. Tube may need to be repositioned or reinserted. Administer oxygen via the tracheostomy. Suction tracheostomy. Consider using bronchodilators, if ordered. If distress persists, initiate school emergency plan. Begin cardiopulmonary resuscitation (CPR), if necessary. Use manual resuscitation bag, if indicated.</i></p>
<p>Tracheostomy tube cannot be reinserted</p>	<p><i>Never leave student alone. Call for assistance.</i> <i>This may be due to a bronchospasm or poor positioning:</i></p> <ul style="list-style-type: none"> • <i>Reassure and reposition the student. Retry.</i> • <i>Try using obturator if it has not been used.</i> • <i>Try to insert one size smaller tracheostomy tube.</i> • <i>Encourage the student to take a deep breath—be prepared to insert tube if stoma opens.</i> • <i>Administer flow of oxygen directly to the tracheostomy stoma.</i>
<p>If tracheostomy tube cannot be inserted and the student has increasing respiratory distress and/or respiratory arrest.</p>	<p><i>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 thumb if an air leak is present.</i></p>
<p><i>Aspiration of foreign material into tracheostomy</i></p>	<p><i>Always suction first. If the manual resuscitator bag is used prior to suctioning, it can force the foreign material further into the lungs.</i> <i>Check air movement. If tracheostomy tube remains blocked by matter, change tracheostomy tube. Give breaths with resuscitation bag after initial suctioning. Check for air movement and give breaths with resuscitation bag if indicated. Administer oxygen if prescribed in emergency plan. If bronchospasm occurs, give medication, if prescribed.</i></p>

	Intervention/Rationale
	<p><i>Respiratory distress or arrest can occur with any aspiration. Be prepared to initiate emergency plan. Begin CPR after suctioning, if needed. Notify school nurse, family, and health care provider.</i></p> <p><i>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..</i></p>

Sources:

A Parent's Guide to Pediatric Tracheostomy Home Care. (2002). St. Louis: Mallinckrodt, Inc.

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Rice, R. (1999). *Manual of Pediatric and Postpartum Home Care Procedures.* St. Louis: Mosby, 204-206.

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: Parent provides equipment, supplies, and oxygen.

1. Review oxygen safety precautions (see previous section).
2. Wash hands.
3. Assemble equipment:
 - Tracheostomy collar
 - Humidifier
 - Heating device, if indicated
 - Oxygen tubing
 - Wide bore tubing
 - Nipple adaptor
 - Oxygen source, if needed
4. Set up humidification device according to student-specific guidelines.
5. Explain 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. Securely attach tubing to 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 humidifier, if ordered. Make sure that all connections are secure to prevent leaks.
7. If oxygen prescribed, turn on the oxygen source. A highly visible information card stating oxygen liter flow should be attached to the regulator.
8. Set flowmeter to the flow rate specified by 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 student’s needs.
9. Connect to 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 cool mist.
10. 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.
11. 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.
12. Place collar on student’s neck over tracheostomy tube in the midline.
Adjust tracheostomy collar so that it is snug but not uncomfortable for student.
13. Wash hands.



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log sheet. Notify the school nurse and family if there is a change in the pattern.

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 465-472.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 346-351.
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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 (nonrebreathing) 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.

Potential Settings

In emergency situations, manual resuscitation bags should be used wherever the student might be. Routine care using resuscitation bags should be done in a clean, private area such as the health office.

Staff Preparation

Manual resuscitation should be performed by a registered school nurse or a respiratory therapist or a specially-trained adult with proven competency-based training in appropriate techniques and problem management.

Any school personnel who have regular contact with a student who may require the use of a manual resuscitator should receive training covering the student's special needs, potential problems, and implementation of the established emergency plan.

If a trained caregiver and back-up personnel are unavailable on a given school day, the student should not attend school. However, special arrangements can be made between the family and the school to allow a family member to attend school with the child and function as backup caregiver.

Sources:

- Department of Critical Care Nursing, Ohio State University Medical Center. *Using a Resuscitation Bag.* Health for Life patient education handout. Available <http://devweb3.vip.ohio-state.edu/Materials/PDFDocs/dis-cond/respirat/resusbag.pdf>
- 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. .
- Rice, R. (1999). *Manual of Pediatric and Postpartum Home Care Procedures.* St. Louis: Mosby, 183-184.

Manual Resuscitator with a Tracheostomy

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
 - Manual resuscitator bag (e.g., Ambu bag)
 - Adaptor for tracheostomy tube
 - Oxygen source with appropriate tubing, if needed
 - Tracheostomy or ventilator supplies, as appropriate
3. Explain 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. Keep bag near the student for quick access. Make sure tracheostomy connector is in place. If oxygen is to be used, connect 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 tracheostomy tube with nondominant hand while securing 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 student-specified number of breaths per minute. If no rate is specified, give 16-20 breaths for younger students and 12-16 for older students and adolescents.
7. Assess respiratory status, including skin color, for effectiveness of bagging.
8. When bagging is no longer needed, carefully remove resuscitation bag from tracheostomy tube. Hold tracheostomy tube steady with nondominant hand to prevent pulling or accidentally dislodging it. If student requires a tracheostomy collar with oxygen, be sure to re-connect this when resuscitation bag no longer needed.
9. Wash hands.
10. Document procedure on student's log sheet. Notify school nurse and family of any problems.

Sources:

- Department of Critical Care Nursing, Ohio State University Medical Center. *Using a Resuscitation Bag.* Health for Life patient education handout. Available <http://devweb3.vip.ohio-state.edu/Materials/PDFDocs/dis-cond/respirat/resusbag.pdf>
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nd 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 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.

Potential Settings

Emergency suctioning should be done wherever the student is located. For this reason, students 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.

Staff Preparation

Suctioning of the nose and mouth can be performed by a caregiver 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 health assistant 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 implementation of the established emergency plan.

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. It outlines specific procedures step by step. Once the procedures have been mastered, the completed checklist serves as a documentation of training.

Components of the Individualized Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student who needs suctioning of the nose and mouth. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student who needs suctioning of the nose and mouth, the following elements should receive particular attention:

- 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

piratory distress (e.g., noisy breathing, agitation)
test assistance or suctioning

- Frequency of suctioning and routine indications for suctioning
- Indications for additional suctioning
- Position of 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
- Latex allergy alert
- Standard precautions

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 424-427.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 341-344.
- 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 .
- Smith-Temple, J & JY Johnson. (2002). *Nurses' Guide to Clinical Procedures*. (4th ed.). Philadelphia: Lippincott Williams & Wilkins, 127-136.

Mouth Suctioning Using Suction Machine

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Gather equipment and materials:
 - 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)
 - Saline dosettes, if prescribed
 - 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 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 student's individualized health care plan.
4. Explain 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 suction machine and check for suction by placing finger at end of connecting tubing. Set suction as specified, usually between 60-120 mmHg pressure.
6. Encourage student to cough and expel secretions.
Coughing may eliminate need for suctioning or bring secretions up for easier suctioning.
7. Open suction catheter or kit, being careful not to touch the inside of the package.
Keeps catheter clean and reduces risk of infection.
8. Don gloves.
9. Holding the connecting end of the suction catheter in the dominant hand, secure it to the suction machine tubing (held in nondominant hand). Leave the other end of catheter in its covering.
The dominant hand should remain clean/sterile. It should not touch anything but the catheter. The nondominant hand should be used to turn on switches and touch other objects.
10. Remove covering from end of suction catheter with nondominant hand while holding catheter in dominant hand.
11. Hold suction catheter 2-3 inches from its tip with dominant hand and insert tip in water.
12. Cover vent hole with thumb of nondominant hand to suction a small amount of saline through 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 lubricant other than water because the lubricant can dry and cause airway occlusion.
13. With thumb off vent hole, insert catheter gently into the nose to the prescribed depth specified in student guidelines. Always suction the nose first because there are more bacteria in the mouth.

*have the anterior part of the nose suctioned. Be gentle
If the nose secretions are too thick, few drops of saline
can be put in each nostril.*

14. Cover vent hole with nondominant thumb while suctioning and withdrawing catheter. Gently rotate 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 thumb from vent hole to release suction.*
15. If student is still congested, repeat nasal suction. Between passes, suction water to rinse secretions out of catheter.
16. With thumb off vent hole, insert catheter gently into the mouth.
17. Cover vent hole with nondominant thumb. Gently rotate catheter between 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 suction catheter, insert Yankauer into mouth along gum line and move around mouth until 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 mouth suctioning procedure with same catheter. Monitor 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 catheter and connecting tubing with water until clear, using continuous suction. *Secretions left in tubing decrease suctioning efficiency and provide environment for growth of microorganisms.*
21. Disconnect catheter from suction tubing. Wrap catheter around gloved hand. Pull glove off inside out so that catheter remains rolled in glove. Place first glove in remaining gloved hand. Pull off other glove over first glove to seal in contaminated tubing. If Yankauer (or tonsil tip) suction catheter only is used for oral suctioning, it may be stored in clean container for future use. Follow student-specific guidelines.
22. Discard used suction catheter with gloves in appropriate receptacle. Turn off suction. Wash hands.
23. Note color, consistency (e.g., thin, thick), and quantity of secretions. Document procedures on student's log sheet and notify school nurse and family of any changes or problems.
24. Be sure suction equipment and supplies are restocked and checked daily and are ready for immediate use.

Sources:

- Bindler, R., Ball, J., London, M., & Ladewig, P. (2003). *Clinical Skills Manual for Maternal-Newborn & Child Nursing*. Upper Saddle River, NJ: Prentice Hall, pp. 133-135.
- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 424-427.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 341-344.



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al Settings: Guidelines for Care*. (2nd ed.). Baltimore: Paul H.

Potter, P.A., & Perry, A. G. (2001). *Fundamentals of Nursing*. (5th ed.). St. Louis: Mosby, pp. 1164-1171.

Rice, R. (1999). *Manual of Pediatric and Postpartum Home Care Procedures*. St. Louis: Mosby, pp. 202-203.

Smith-Temple, J & JY Johnson. (2002). *Nurses' Guide to Clinical Procedures*. (4th ed.). Philadelphia:
Lippincott Williams & Wilkins, 127-136.

1 Mouth Suctioning with a Bulb Syringe

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Gather and assemble equipment:
 - Bulb syringe (nasal aspirator)
 - Saline
 - Tissues
 - Disposable gloves
3. Explain 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 student as recommended in student's individualized health care plan.
5. Don gloves.
6. Hold bulb syringe in palm of hand with long tip between index and middle finger. Squeeze the bulb syringe flat with 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 nose and mouth are clear.
9. If nose secretions are too thick, a few drops of saline can be put in each nostril before suctioning with bulb syringe.
10. Clean bulb syringe in hot soapy water, rinse with fresh water, let dry, and store.
11. Dispose of tissues in appropriate receptacle.
12. Remove gloves.
13. Wash hands.
14. Note color, consistency, and amount of secretions on student's log sheet and notify school nurse and family of any changes or problems.

Sources:

- 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.
- Wong, DS & Hess CS. (2000). *Wong and Whaley's Clinical Manual of Pediatric Nursing*. (5th ed.) St. Louis: Mosby.

Procedures with Nose and Mouth Suctioning

Assessment	Intervention/Rationale
Nosebleed during suctioning	<i>Stop suctioning. Gently squeeze bridge of nose and hold for 5 minutes. After bleeding has stopped, refrain from using that side of the nose for suctioning until cleared by family or health care provider.</i>
Gagging or vomiting during suctioning	<i>Gagging is probably caused by catheter going down too far. Withdraw a little and try to finish suctioning. If vomiting occurs, remove catheter and position student to keep airway open. Calm student and make sure that he or she is breathing without problems. If student still needs suctioning, proceed carefully and try suctioning less deeply.</i>

Sources:

- Bindler, R., Ball, J., London, M., & Ladewig, P. (2003). *Clinical Skills Manual for Maternal-Newborn & Child Nursing*. Upper Saddle River, NJ: Prentice Hall, pp. 133-135.
- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 424-427.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 341-344.
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- Potter, P.A., & Perry, A. G. (2001). *Fundamentals of Nursing*. (5th ed.). St. Louis: Mosby, pp. 1164-1171.
- Rice, R. (1999). *Manual of Pediatric and Postpartum Home Care Procedures*. St. Louis: Mosby, pp. 202-203.
- Smith-Temple, J & JY Johnson. (2002). *Nurses' Guide to Clinical Procedures*. (4th ed.). Philadelphia: Lippincott Williams & Wilkins, 127-136.

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.

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 nurse.

Please contact _____ at _____ (phone
number/pager) 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

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. 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.

Potential Settings

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.

Staff Preparation

CPT may be administered by the school nurse (RN or LPN), health assistant, 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.

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. The checklist outlines specific procedures. Once the procedures have been mastered, the completed checklist serves as documentation of training.

Components of the Individual Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student who needs chest physiotherapy. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student who needs CPT, the following elements should receive particular attention:

- Student's underlying condition and possible problems associated with the condition or treatment
- 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

by the student when not receiving adequate oxygen (e.g.,

- Possible need for pulse oximeter readings during CPT
- Standard precautions

Sources:

- Bindler, R., Ball, J., London, M., & Ladewig, P. (2003). *Clinical Skills Manual for Maternal-Newborn & Child Nursing*. Upper Saddle River, NJ: Prentice Hall, pp. 137-141.
- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 177-181.
- Graff, J., Ault, M., Guess, D., Taylor, M., & Thompson, B. (1990). Therapeutic Management. In *Health Care for Students with Disabilities. An Illustrated Medical Guide for the Classroom*. (pp. 119-144). Baltimore: Paul H. Brookes Publishing.
- Skales, N. (1992). Postural drainage: Chest physiotherapy. In *Manual of Pediatric Nursing Procedures*. (pp. 188-194). Philadelphia: J.B. Lippincott.
- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 884-886
- Smith-Temple, J & JY Johnson. (2002). *Nurses' Guide to Clinical Procedures*. (4th ed.). Philadelphia: Lippincott Williams & Wilkins, 103-111.

er Chest Physiotherapy (CPT)

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Assemble the equipment:
 - Pillows
 - Tissues
 - Suction equipment, if needed
 - Wastebasket with plastic liner
 - Vest airway clearance system, if prescribed

Choose a time for the procedure when several hours have passed since the student has eaten.

3. Perform a baseline respiratory assessment.
Student may be placed on a pulse oximeter during CPT because desaturation may occur during CPT.
4. Explain 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.

5. Place vest airway clearance system on student according to student's individualized health care plan for percussion and vibration, if it has been prescribed.

Vest airway clearance systems generally consist of an inflatable fitted vest, connected by hoses to an air pulse generator, which gently compress and release the chest wall 5-20 times per second. This process moves mucus toward the large airways where the mucus can be cleared by coughing or suctioning.

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 student-specified amount of time.
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. 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.

or specified areas.

1, 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.

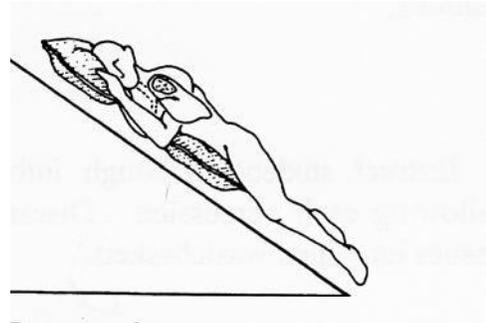
- Instruct student to cough into tissue following percussion of each location. Discard used tissues into lined wastebaskets. Coughing is most effective if the student is sitting up so that diaphragmatic excursion is maximal. Ideally, the student should take several deep breaths and then follow the last 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 stomach with right side of torso and right arm elevated on pillow: used for percussing posterior segment of right, upper lobe, over right scapular area. Depending on the student's weight, additional pillows may be needed to obtain desired elevation in all positions.



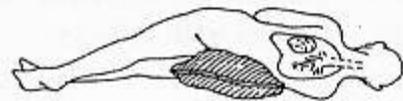
- Position 2: student on stomach with left side of torso and left arm elevation on pillow: for posterior segment of left upper lobe, over left scapular area. The left bronchus is more vertical, thus requiring a nearly 45 degree elevation.



- Position 3: student flat on back with pillows placed under head and knees: anterior segments of the right and left upper lobes, between the clavicle and nipple area.



- Position 4: student on back. Turn hips 1/4 turn to the right. Elevate hips 10-12 inches with pillows. Use additional pillows as needed to hold hips to the right: for percussing lingular process of the left lung, from left armpit to nipple area.

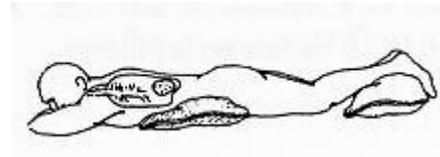


- Position 5: student on back. Turn hips 1/4 turn to the left. Elevate hips 10-12 inches with pillows. Use additional pillows as needed to hold hips to



right middle lobe, from right armpit to nipple area.

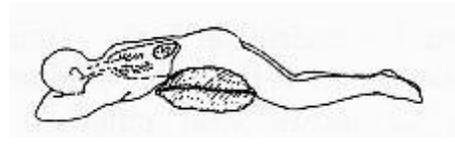
- Position 6ô student flat on stomach with pillows under stomach and lower legs/feetô *for apical segments of right and left lower lobes, over lower scapular area.*



- Position 7ô student on back with hips elevated 16-18 inches with pillowsô *for anterior basal segment of right and left lower lobes, over lower chest area below nipples.*



- Position 8ô student on stomach with hips elevated 16-18 inches with pillowsô *for basal segments of right and left lower lobes, over lower chest areas (avoid kidneys).*



- Position 9ô student on right side with hips elevated 16-18 inches with pillows ô *for lateral basal segment of left lower lobe, over left side from beneath armpit to end of rib cage.*



- Position 10ô student on left side with hips elevated 16-18 inches with pillowsô *for lateral basal segment of right lower lobe, over right side from beneath armpit to end of 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 student face up on your lap with the student's head resting on the pillow.

percussing anterior segments of lower lobes, over the area
rib cage.

9. At the end of the procedure, have wastebaskets contents disposed of utilizing standard precautions.
10. Document CPT on student's health record or treatment log.

Sources:

- Bindler, R., Ball, J., London, M., & Ladewig, P. (2003). *Clinical Skills Manual for Maternal-Newborn & Child Nursing*. Upper Saddle River, NJ: Prentice Hall, pp. 137-141.
- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 177-181.
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Mechanical Ventilators

This section on mechanical ventilators provides a general overview of ventilators, their components, parameters, ventilation modes, alarms, and possible problems. It is NOT intended to be a comprehensive guide to understanding, maintaining, or troubleshooting ventilators. Other manuals and training are available for this. Also, each student on mechanical ventilation should have a plan describing student-specific guidelines.

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, body shell (cuirass) ventilator, and the body wrap (raincoat) ventilator are much larger and used primarily for neuromuscular disorders. They are much larger and rarely encountered in the school setting.

The ventilator can provide total respiratory support for the student 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.

Potential 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 ðgo bagö or other supply kit containing a manual resuscitation bag, a spare tracheostomy tube, and suction equipment and supplies. See ðgo-bagö checklist in Appendix B.

The student who uses a ventilator should have a trained caregiver at all times. This care should usually be performed by a qualified school nurse (RN or LPN with RN supervision) or respiratory therapist. Any health professional caring for a student assisted by a ventilator, should have taken a competency-based training program and be certified in cardiopulmonary resuscitation (CPR). Decisions regarding personnel who will care for the ventilated student should be discussed with the school nurse, family, health care provider, and other school personnel as needed. Determinations should be included in the guidelines developed for the student's care. The caregivers should be immediately available to the student (including transport) and should have information regarding the student's specific care guidelines and equipment.

If the trained caregiver and back-up personnel are unavailable on a given school day, the student should not attend school. However, an optional arrangement may be made between the school and the family so that someone from the family would attend school to function as the caregiver for the student.

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.

Components of the Individual Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student who requires mechanical ventilation. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A, which may be copied and used to develop a plan for each student. For the student who requires mechanical ventilation, the following elements should receive particular attention:

- Underlying condition and the possible problems arising from the condition or treatment
- Degree of ventilator dependency
- Ventilator settings and the frequency that settings should be checked
- Ability to request assistance
- Baseline respiratory status
- Signs and symptoms of respiratory distress
- Appropriate response to ventilator alarms
- Personnel needed to provide qualified care; plan for caregiver absences

able at all times

- Emergency card with ventilator settings posted near ventilator at all times
- Phone list with numbers of family, health care provider, home care agency, and medical equipment supplier
- Routine suctioning schedule and guidelines/indications for additional suctioning
- Tracheostomy tube size and type
- Plans 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 alert
- Standard precautions

Sources:

- A Parent's Guide to Pediatric Tracheostomy Home Care.* (2002). St. Louis: Mallinckrodt, Inc, 26-27
- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures.* Philadelphia: Lippincott William & Williams, 638-645.
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ntilator Equipment

Standard ventilator features should be checked each day when student arrives at school and more often as specified by student's individualized health care plan. Check the following:

Note: Parent provides equipment and supplies.

1. Power source:

Power source must be available and **must be connected for machine to function.**

- Accessible, functioning grounded outlets
- 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.
- Back-up battery
The back-up battery may be kept at home.
- Emergency power supply

2. Ventilator circuit: Drain tubing of excess water. Inspect for wear and cracks. Check connections for tightness. Make sure tubing is routed to prevent water from draining into the student's airway or back into the humidifier or ventilator.

Tubing and spare tubing 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 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 spares of each one
Routine cleaning of ventilator circuits should be done at home daily or as needed.

3. Oxygen source (if prescribed for the student):

- Adequate supply of oxygen, functioning gauge and a 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

4. Humidification source:

The student whose nose and mouth is bypassed by a tracheostomy tube needs a humidifier. The humidifier must have an adequate amount of water and be set at a safe temperature. Some students may use a heat-moisture exchanger for humidification.

- Passive condenser
- Heat-moisture exchanger

Alarms should never be turned off. All ventilator alarm settings should be written on the emergency card posted visibly on the ventilator.

- High and low pressure
 - Volume
 - Power source
7. Other equipment that should be checked daily:
Each student with a ventilator should have a “go bag” containing all of these supplies.
- Manual resuscitator 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 student individualized health care plan, or more frequently if student's status changes. A clearly-visible card stating the student's ventilator settings should be mounted on the ventilator.

Parameters	Points to Remember
1. Tidal volume (V_T)	<i>The amount of air passing in and out of the lungs with each breath. Based on child's size. Usually 6-10 cc/kg for children, but may be 8-12 for adolescents.</i>
2. Respiratory rate	<i>Number of breaths per minute delivered by the ventilator; also called frequency.</i>
3. Oxygen percentage (FiO_2)	<i>Percentage of air which is oxygen. Room air is 21%. Rate may be higher based on student needs.</i>
4. Peak inspiratory pressure (PIP)	<i>Amount of pressure needed to inflate the lungs to the specified tidal volume.</i>
5. Positive end expiratory pressure (PEEP)	<i>Amount of pressure needed to keep the lungs from collapsing during exhalation.</i>
6. Inspiratory time (I Time)	<i>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.</i>
7. Sigh volume	<i>Ventilator-delivered breath that is 1 ½ times as large as the tidal volume.</i>

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Ventilator Modes

Ventilator mode describes the type of respiratory support administered by the ventilator. The mode is determined by the student's respiratory ability.

Ventilator Modes	Points to Remember
1. Assist control (AC)	<i>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.</i>
2. Intermittent mandatory ventilation (IMV)	<i>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.</i>
3. Synchronized intermittent mandatory ventilation (SIMV)	<i>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.</i>
4. Control Mode; Controlled mandatory ventilation (CMV)	<i>A mechanical breath is automatically given at a preset rate and tidal volume. Used for apneic or chemically paralyzed students.</i>
5. Pressure regulated volume control (PRVC)	<i>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.</i>

Sources:

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Ventilator Alarms

Ventilator alarms must remain on at all times.

Alarms	Points to Remember
1. High-pressure alarm	<i>Reflects an excessive inspiratory pressure. May indicate increased resistance or obstruction.</i>
2. Low-pressure alarm	<i>Indicates a too-low inspiratory pressure. Warns of a leak in the system; may signal that adequate volume is not being delivered.</i>
3. Power source alarm	<i>Indicates a change in power. Alarms should never be turned off.</i>
4. Temperature alarm	<i>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.</i>
5. High-pressure alarm	<i>Reflects an excessive inspiratory pressure. May indicate increased resistance or obstruction.</i>

Sources:

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Problems When Using a Ventilator

Assessment	Intervention/Rationale
Respiratory Distress: <ul style="list-style-type: none"> • Increased shortness of breath • Agitation • Blueness or pallor of lips or nail beds • Retractions (e.g., pulling in of chest muscles) • Rapid or pounding pulse • Confusion 	<p>Immediately check and reassure the student. Call for assistance. Never leave the student alone.</p> <p>Check:</p> <ul style="list-style-type: none"> • If student needs suctioning • For occlusion of the tracheostomy tube by a plug or secretions • Whether student may be coughing or doing something else to raise pressure transiently • For a dislodged tube or other airway problems • Connections to the ventilator. • Exhalation valve to see if it is obstructed. • Power source for ventilator. • Adequacy of oxygen supply. <p>Student may be disconnected from the ventilator and ventilated by a manual resuscitation bag if needed while being checked.</p>
Dislodged tracheostomy	Change the tracheostomy tube.
Blocked tracheostomy	Suction tracheostomy. If still blocked, replace trach.
Increased secretions	Suction tracheostomy more frequently.
Wheezing	Check student's individualized health care plan. Administer bronchodilators or give nebulizer treatment, if ordered. Notify school nurse and family if continued wheezing.
Respiratory distress persists or student becomes unconscious	Activate school emergency plan immediately. Continue using manual resuscitator.
Distress is relieved by disconnecting from ventilator and using manual resuscitation	<p>While using the manual resuscitator to ventilate student, check, or have assistant check, ventilator.</p> <p>Check:</p> <ul style="list-style-type: none"> • Water condensation • Connections • Leaks • Valves, tubing, circuit for obstruction • Power supply <p>If unable to locate and correct problem, continue using manual resuscitator and call the home care company, school nurse, family, and others as specified in the student plan. Activate school emergency plan.</p>

	Intervention/Rationale
<p>equipment malfunction)</p> <p>High-pressure alarm goes off. This is usually an intermittent alarm accompanied by a flashing red light.</p> <p>Note: If the condition that caused this alarm to be triggered is stopped, the audible alarm may stop but the visual alarm may need to be reset. The high pressure alarm should be set to student's prescribed setting, usually 5-10 cm H₂O above the peak inspiratory pressure.</p>	<p>Use manual resuscitator to ventilate student until back-up power supply is in operation.</p> <p>Always check the student first.</p> <ul style="list-style-type: none"> • The student may have mucus plugging the tracheostomy tube and need suctioning. • Check position of tracheostomy tube and correct as needed. 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 individualized health care plan. • If student is anxious and "fighting" the ventilator, the high pressure alarm may be activated. Attempt to calm student. <p>Remove the student from ventilator and give breaths with resuscitator bag and then check ventilator.</p> <p>Check:</p> <ul style="list-style-type: none"> • Tubing for kinks. • For condensation (water) in the tubing. • Exhalation valve to make sure it is not being obstructed. • Ventilator settings for accidental change. <p>Test system after cause of problem is found and fixed. Place student back on ventilator.</p>
<p>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.</p> <p>The low pressure alarm should be set to student's prescribed setting, usually 5-10 cm H₂O below the peak inspiratory pressure.</p>	<p>Always check the student.</p> <ul style="list-style-type: none"> • Tube may be disconnected from ventilator. Reconnect. • Check for loose connections, leaks or cracks in system. Tighten, if needed. • Check tracheostomy tube for correct placement • If student has a cuffed tube, check for leak in cuff. • Exhalation valve may be wet or punctured. • Check for accidental change in ventilator settings. <p>Remove the student from ventilator and give breaths with resuscitator bag and check the ventilator.</p> <p>Test system after cause of problem is found and</p>

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	Intervention/Rationale
<p>Power alarm sounds. This is a continuous alarm, usually accompanied by a flashing light as well.</p>	<p><i>fixed. Place student back on ventilator.</i></p> <p><i>The alarm may sound whenever power source is interrupted (e.g., battery change). Check to see that power source is functioning (e.g., AC power, external and internal battery). Make sure ventilator plugged in outlet and power supply available if using AC power. If all three power sources fail, remove student from ventilator. Give breaths with resuscitator bag and activate the school emergency plan.</i></p>

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Information for Students on 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 individualized health care plan will address care needs during the day, feeding issues; and avoidance of exposure to respiratory infections including colds.

Please contact _____ at _____ (phone number/pager) for additional information about ventilators or if the student experiences any difficulty 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



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Special Care Issues

Attention Deficit/Hyperactivity Disorder
Food allergies
Managing anaphylaxis
Latex allergies
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 rejection by peers, academic difficulties 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. The National Institutes of Mental Health estimates that 3-5% of school age children have ADHD (other estimates range from 2-15%), with a higher rate among boys than girls.

Current Diagnostic Criteria

According to the Diagnostic and Statistical Manual, 4th Edition (DSM-IV), there are three subtypes of ADHD:

- Primarily Hyperactive/Impulsive Type exhibit 6 or more symptoms of hyperactivity/impulsivity
- Primarily Inattentive Type exhibit 6 or more symptoms of inattention.
- Combined Type exhibits 6 or more symptoms of both hyperactivity/impulsivity and inattention; most children with ADHD fall in this subtype.

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 seven.

It is important to realize that students with ADHD may have other co-existing 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,

reaction, obsessive-compulsive disorder, family
atal 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-IV* 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** have persisted for at least 6 months to a degree that is maladaptive and inconsistent with the developmental level:
 - Often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities.
 - Often has difficulty sustaining attention in tasks or play activities.
 - Often does not listen when spoken to directly.
 - 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).
 - Often has difficulty organizing tasks and activities.
 - Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort such as schoolwork or homework).
 - Often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, or books).
 - Is often distracted by extraneous stimuli.
 - Is often forgetful in daily activities.
2. Six or more of the following symptoms of **hyperactivity/impulsivity** have persisted for at least six months to a degree that is maladaptive and inconsistent with the developmental level:
 - Hyperactivity
 - Often fidgets with hands or feet or squirms in seat.
 - Often leaves seat in 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 leisure 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).
2. Some hyperactive impulsive or inattentive symptoms that caused impairment were present before 7 years of age.

symptoms is present in two or more settings (e.g., at home and at school).

4. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.
5. The symptoms do not occur exclusively during the course of a pervasive developmental disorder, 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).

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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 and school-based professionals to monitor the progress and effectiveness of interventions.

Recommendation 1: Primary care clinicians should establish a management program that recognizes ADHD as a chronic condition. Clinicians should establish a management program that recognizes ADHD as a chronic condition, with possibly 60-80% persistence into adolescence. They should provide information and counseling about the condition, including educating parents and children about the ways in which ADHD can affect learning, behavior, self-esteem, social skills, and family function. Clinicians should ensure the coordination of health care services and help families set specific goals. What distinguishes this condition from most other chronic conditions managed by primary care clinicians is the important role that the education system plays in the treatment and monitoring of children with ADHD (AAP, 2001).

Recommendation 2: The treating clinician, parents, and the child, in collaboration with school personnel, should specify appropriate target outcomes to guide management. At least three to six target outcomes should be developed to guide management and monitoring by clinician, parents, child, and school personnel. The primary goal of treatment should be to maximize function. The guideline identifies six desired results.

Recommendation 3: The clinician should recommend stimulant medication, as appropriate, to improve target outcomes in children with ADHD. Extensive research demonstrates the efficacy of stimulant medications on measures of observable social and classroom behaviors and on core symptoms of attention, hyperactivity, and impulsivity with modest effects on intelligence and achievement tests.

- **First-Line Treatment:** Methylphenidate, dextroamphetamine, and amphetamine salts are approved in various forms (short, intermediate, and long-acting) and do not require serologic, hematologic, or cardiac monitoring. Stimulant dosages are not weight dependent and different dosages should be tried to determine the optimal dose. Appetite suppression and weight loss are common side effects, although no long-term impairment of growth/height has been found.
- **Second-Line Treatment:** Tricyclic antidepressants and bupropion are the only other supported medications, although they should only be used after 2 or 3 stimulants have failed. Clonidine falls outside the scope of this guideline and its use is documented primarily in children with coexisting conditions, especially sleep disturbances. Pemoline is no longer recommended as first or second line treatment due to its rare, but potentially fatal, hepatic effects.

Recommendation 3A: For children on stimulants, if one stimulant does not work at the highest feasible dose, the clinician should recommend another. 80% of children are reported to respond to one of the stimulants.

The guideline discusses behavior therapy, describing it as a broad set of specific interventions with the goal of modifying the physical and social environment to alter or change behavior. Behavior therapy is usually implemented by training parents and teachers in positive reinforcement or consequences for behavior.

(such as play therapy or cognitive therapy) are differentiated from behavioral therapy. Psychological therapy is designed to change emotional status or thought patterns and has little proven efficacy in treating ADHD.

Effective behavioral techniques such as positive reinforcement, time-out, response cost, and token economies are discussed. Behavior therapy may improve results of medication therapy and commonly includes parent training and classroom management. Results of the MTA study, which found parents and teacher satisfaction with behavior therapy, are noted. Students can receive behavior therapy as part of an individualized education plan (IEP) or Section 504 plan. IEPs and Section 504 plans require schools to make classroom adaptations to help children with ADHD and may include preferential seating, decreased assignments and homework, and behavior techniques implemented by the teacher.

Recommendation 4: When the selected management for a child with ADHD has not met target outcomes, clinicians should evaluate the original diagnosis, use of all appropriate treatments, adherence to the treatment plan, and presence of coexisting conditions.

Information should come from multiple sources in this evaluation. Criteria for treatment failure are described, along with the recommendation that the child should be referred to a mental health specialist.

Recommendation 5: The clinician should periodically provide a systematic follow-up for the child with ADHD. Monitoring should be directed to target outcomes and adverse effects by obtaining specific information from parents, teachers, and the child.

One major new medication has been approved for the treatment of ADHD since these guidelines were developed in 2001. Atomoxetine, a non-stimulant selective norepinephrine reuptake inhibitor, was approved by the FDA in 2003 for the treatment of ADHD. In research trials, it was found to be as effective as stimulants in the treatment of symptoms of ADHD. It is the first non-stimulant approved by the FDA for the treatment of ADHD. Because it is not a controlled drug, it is considered to have less risk of abuse and may be refilled without a doctor's appointment.

Pharmacotherapies

Psychopharmacologic agents represent one part of a thorough treatment plan 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 3 above, involve the use of one of three 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. In recent years, several long-acting forms of ADHD medications have been approved for use. They have gained popularity because their once-daily dosing can be done at home and does not require administration during the day at school.

Since the publication of these recommendations, the non-stimulant atomoxetine has been approved by the FDA for use after it demonstrated similar efficacy to stimulants in

Public use of this medication remains to be tested. The (Cylert) was once widely used, but is no longer recommended due to its risk of hepatotoxicity.

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.

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. (See Virginia Department of Education SuperintendentsøMemo #54 dated August 16, 2002 for details.)

The table below summarizes the medications used for ADHD:

Drug	Pharmacokinetics (T1/2=Half-life) DBE=Duration of behavioral effect)	Comments
Amphetamine Mixtures		
• <i>Adderall</i>	T1/2=4-6 hrs DBE=4-6 hrs	May require multiple dosing.
• <i>Adderall XR</i>	T1/2=9-11 hrs DBE=12 hrs.	Once daily dosing.
Dextroamphetamine		
• <i>Dexedrine tablet</i>	T1/2=4-6 hrs. DBE=4-6 hrs.	Inexpensive. May require multiple dosing. Greater abuse potential?
• <i>Dexedrine Spansule</i>	T1/2=12 hrs. DBE 6-8 hrs.	Slow onset.
Methylphenidate Preparations		
• <i>Concerta</i>	T1/2=3-4 hrs. DBE=12 hrs.	Once daily. Quick onset; long duration. Cannot be crushed.
• <i>Metadate CD</i>	T1/2=6-8 hrs DBE=9 hrs.	Once daily. Quick onset.
• <i>Ritalin</i>	T1/2=2-3 hrs. DBE=3-5 hrs.	Requires multiple daily dosing.
• <i>Ritalin SR</i>	T1/2=3-4 hrs DBE=8 hrs.	Intermediate acting. May require multiple dosing.
Selective Norepinephrine Reuptake Inhibitor		
Atomoxetine • <i>Strattera</i>	T1/2=4-5 hrs.	Non-stimulant. Usually once daily, but may be divided into two doses. Less

	Pharmacokinetics (T1/2=Half-life) DBE=Duration of behavioral effect)	Comments
		insomnia than stimulants.
Antidepressants		
<ul style="list-style-type: none"> • Bupropion (<i>Wellbutrin</i>) 	T1/2=20-37 hrs.	Second line treatment. Long half-life. Not associated with cardiac concerns of TCAs.
<ul style="list-style-type: none"> • Tricyclic Antidepressants <ul style="list-style-type: none"> ○ Desipramine (Norpramine, Pertofrane) ○ Imipramine (Tofranil) ○ Nortriptyline (Pamelor, Aventyl) 	T1/2=12 hrs	Second-line treatment. Sometimes used in children with co-morbid depression or anxiety. Some concern about effects on cardiac conduction.

Source:

Virginia Department of Health. (November 2002). *The Prevalence of Methylphenidate and Amphetamine Prescriptions in the Commonwealth*. House Document No. 12 pursuant to House Joint Resolution 122. Richmond, VA.

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 in 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 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 teacher
- Colorize/organize subjects with folders and/or notebooks

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 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

...ing the appropriate behavior
es

- Directly verbalize expectations
- Plan ahead for new activities or unstructured events
- 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 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 child must be evaluated on an individual basis and his strengths must be emphasized.

Students with ADHD may also have great difficulty complying with parental instructions. The parents, 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 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 consensus development conference on

and addressed six key questions with the following

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 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 appear 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

communities and physicians, suggesting no consensus. Over-diagnosed and sometimes be over-diagnosed. 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 limit 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.

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Food Allergies in Schools

Overview

Food allergies can be life threatening. They refer to reactions involving immunologic (usually IgE) reactions 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.

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. Avoidance of the offending food(s) is the only way to prevent a reaction.

The list of foods that can cause allergic reactions is unlimited. However, several foods typically cause the vast majority of severe allergic reactions in school-age children and include:

- Peanuts and tree nuts
- 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

Reactions to these foods, however, tend to be less severe and may lessen as the child gets older.

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.

Potential Settings

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

reaction.

classroom can trigger a reaction. Contact with other
with allergy-causing food(s) can also cause an allergic

Staff Preparation

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.

Components of the Individualized Health Care Plan

Each student's individualized health care plan (IHCP) must be tailored to the individual's needs. Any student with prescribed epinephrine should have an IHCP that discusses continuous monitoring, emergency plans, and evaluation. A sample Food Allergy Action 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
- 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
- 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)
- Consider informing parents of other students if a severe allergy exists
- Teach classmates (especially adolescents) how to respond to an allergic reaction
- Teach food service workers to avoid cross-contamination in preparing or cleaning up foods

Food Allergy Action Plan

Place
Child's
Picture
Here

ALLERGY TO: _____

Student's Name: _____ D.O.B.: _____ Teacher: _____

Asthmatic Yes* No *High risk for severe reaction

◆ **SIGNS OF AN ALLERGIC REACTION** ◆

Systems: **Symptoms:**

- MOUTH** itching & swelling of the lips, tongue, or mouth
- THROAT*** itching and/or a sense of tightness in the throat, hoarseness, and hacking cough
- SKIN** hives, itchy rash, and/or swelling about the face or extremities
- GUT** nausea, abdominal cramps, vomiting, and/or diarrhea
- LUNG*** shortness of breath, repetitive coughing, and/or wheezing
- HEART*** "thready" pulse, "passing-out"

The severity of symptoms can quickly change. *All above symptoms can potentially progress to a life-threatening situation.

◆ **ACTION FOR MINOR REACTION** ◆

1. If **only** symptom(s) are: _____, give _____
medication/dose/route

Then call:

2. Mother _____, Father _____, or emergency contacts.
 3. Dr. _____ at _____

If condition does not improve within 10 minutes, follow steps for Major Reaction below.

◆ **ACTION FOR MAJOR REACTION** ◆

1. If **ingestion** is suspected and/or symptom(s) are: _____,
 give _____ **IMMEDIATELY!**
medication/dose/route

Then call:

2. Rescue Squad (ask for advanced life support)
 3. Mother _____, Father _____, or emergency contacts.
 4. Dr. _____ at _____

DO NOT HESITATE TO CALL RESCUE SQUAD!

Parent's Signature _____ Date _____ Doctor's Signature _____ Date _____

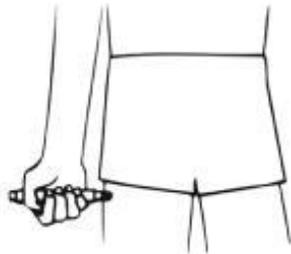
EMERGENCY CONTACTS	TRAINED STAFF MEMBERS
1. _____ Relation: _____ Phone: _____	1. _____ Room _____
2. _____ Relation: _____ Phone: _____	2. _____ Room _____
3. _____ Relation: _____ Phone: _____	3. _____ Room _____

EPIPEN® AND EPIPEN® JR. DIRECTIONS

1. Pull off gray activation cap.



2. Hold black tip near outer thigh (always apply to thigh).



3. Swing and jab firmly into outer thigh until Auto-Injector mechanism functions. Hold in place and count to 10. The EpiPen® unit should then be removed and taken with you to the Emergency Room. Massage the injection area for 10 seconds.

For children with multiple food allergies, use one form for each food.



Managing Anaphylaxis

Overview

Anaphylaxis is a severe, sudden, systemic, potentially fatal allergic reaction that can involve the skin, respiratory tract, gastrointestinal tract, and cardiovascular system. Symptoms occur within minutes to two hours after contact with the allergy-causing substance, but in rare instances may occur up to four hours later.

Common food triggers include:

- Peanuts
- Tree nuts (walnuts, cashews, etc.)
- Shellfish
- Fish
- Milk
- Eggs

Individuals who are allergic to foods and have asthma are believed to be at a higher risk for developing an anaphylactic reaction. Adolescents who have peanut and tree nut allergy and asthma 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, a sensation of warmth, wheezing, chest tightness, swelling of the mouth and throat, difficulty breathing, vomiting, diarrhea, cramping, a drop in blood pressure, and loss of consciousness. These symptoms may begin as a tingling sensation, itching, or metallic taste in the mouth. Symptoms may occur within a few minutes but may worsen over hours. Symptoms also may resolve but recur two to three hours later.

Treatment

Epinephrine is used to treat an anaphylactic reaction by reversing the symptoms. This medication is available via prescription as an EpiPen® or EpiPen® Jr. Epinephrine Auto-Injector.

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.

Antihistamines and asthma medications should never be prescribed **instead of** epinephrine because they cannot reverse the symptoms of anaphylaxis.

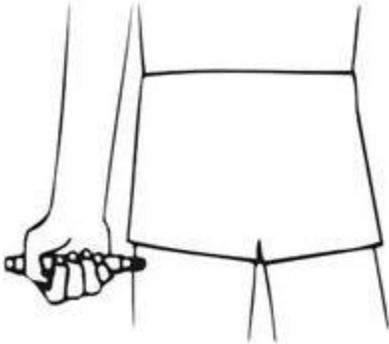
3 R's for treating anaphylaxis

- Recognize symptoms early
- React quickly
- Review what happened and be sure to prevent it from reoccurring (avoid the trigger)

Using an Epinephrine Auto-Injector

Note: Parent provides equipment, supplies, and medications.

1. Pull off gray safety cap
2. Place black tip on outer thigh (always apply to thigh)



3. Using a swing and jab motion, press hard into thigh until Auto-Injector mechanism functions. Hold in place and count to 10.
4. The EpiPen® unit should then be removed and discarded. Massage the injection area for 10 seconds.

How to Dispose of an EpiPen®

After using an EpiPen®, throw away the gray cap. Place a penny in the bottom of the plastic tube, slip the EpiPen® into the tube, and close it. Return the used EpiPen® to your doctor for disposal.

Source: Food Allergy and Anaphylaxis Network. Available online at <http://www.foodallergy.org>.

anaphylactic reaction:

- Act quickly!
- Follow the Allergy Action Plan
- Call Emergency Medical Services (or 911)

School Food Allergy Program

School divisions in Virginia are encouraged to establish local policies and procedures for caring for students with food allergies. Resources that school divisions may use in developing these policies can be found in the VDOE *Superintendents Memos #170* dated December 20, 2002 and include:

1. *The School Food Allergy Program*, The Food Allergy and Anaphylaxis Network (FAAN), 10400 Eaton Place, Suite 107, Fairfax, VA 22030-2208, Telephone Number 1-800-929-4040 FAX 703-691-2713, website www.foodallergy.org.

The Food Allergy and Anaphylaxis Network has developed a comprehensive manual for managing food allergies in school. The program provides information on food allergy basics for teachers, school nurses, principals, parents, and food service workers, as well as a model school program, information on legal issues, sample forms, a training video, and an EpiPen trainer.

Each school principal must submit a written request to the Food Allergy and Anaphylaxis Network at the above address or website to obtain copies of this program.

2. *Spokane Public Schools Staff and Parent Guidelines for Students with Life Threatening Allergies* (Washington State) provide information for parents, students, and school staff relative to 504-plans and enrollment procedures. Sample forms are provided for emergency action plans, medication requests, letters, and school food substitutions. <http://www.sd81.k12.wa.us/NutritionServices/Allergies/index.stm>
3. *Managing Life Threatening Food Allergies in Schools*, Massachusetts Department of Education, 350 Main Street, Malden, MA 02148, telephone (781) 338-3000. This document published in 2002 provides information for parents, students, and school staff, sample individualized health care plans, sample 504 plans, and enrollment recommendations. <http://www.doe.mass.edu>
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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*. Section II includes a section on food allergies.

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) *Superintendents Memos #8* dated October 11, 2002.

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.**

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aging 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:
<ul style="list-style-type: none"> • Ace wraps • Band-Aids • Catheters • Elastic bandages • Gloves • Intravenous set up ports • Medication vials • Pads on crutches • Tape • Tourniquets • Wheelchair cushions 	<ul style="list-style-type: none"> • 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.

Recent medical studies report that there is a link between latex allergies and certain food allergies. The studies indicate 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

Items with latex allergies:

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.

The *First Aid Guide for School Emergencies (2003)* describes steps to be taken in the event of an allergic reaction. 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 annually. An updated list can be obtained online at <<http://www.sbaa.org>>.

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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.

LATEX in the Hospital Environment

Updated Summer 2002

Frequently contain LATEX	LATEX-SAFE alternatives
Adhesives and skin (Smith&Nephew)	Mastisol (Ferndale)
Anesthesia: circuits, bags, oxygen masks	Neoprene (Anesthesia Associates, Ohmeda adult), some Vital Signs
Band-aids	Active Strip (3M), CURAD Neon, Readi-Bandages, NHP, Coverlet, some Airstrip
Blood pressure cuff and tubing (J&J)	Cleen Cuff (Vital Signs), nylon, some Trimline
Bulb syringe	SOME DAVOL, MEDLINE, RUSCH, PRÄMIUM, Baxter
Casts: Delta-Lite Podiatry, Orthoflex (J&J)	Scotchcast soft, Delta-Lites, recent Conformable (J&J), Caraglas Ultra, 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, Neotech, Rusch, Vitaid, Adapters & plug (ADULT)
Catheters: cardiac, vascular, pulmonary	Some World Medical, Am BioMed
Catheters: straight, coude	Mentor, RobNel (Sherwood), Coloplast, selected Bard, Rusch catheters
Catheters: feeding	Accumark feeding catheter (Sims Portex)
CPR manikins and medical training aids	Most Laerdal products
Dressings: Dyna-flex, butterfly closures (J&J), BDF Elastoplast, Action Wrap, Coban (3M), Lyofoam (Acme), Spandage (Medi-tech), Telfa	Dressings: Dyna-flex, butterfly closures (J&J), Duoderm, Reston foam (3M), Opsite, Venigard, Comfeel, Sorbaview, Telfa (some) Xeroform, PinCare, Bioclusive, Montgomery strap (J&J), Webril, Metalline, Seloapor, Opraflax, Centurion brief, some Airstrips, Rainbow Net (Surgilast), VAC, Warm-up
NOTE: latex in package only: Steri-strip wound closure system, Tegaserb, Active Strips (3M), Nu-Derm (J&J), CURAD	
Ear Plugs	Grainger (5F767)
Elastic wrap: ACE, Esmarch, Zimmer Dyna-flex, Elastikun (J&J)	E-Cotton, CEB elastic (coNco), Champ (Carolon), Adban Adhesive, X-Mark (Avcör) Lo-Flex, PowerHex (Andover), Comprilan (Jobst), Esmark (DeRoyal, NHP)
Electrode bulbs, pads, grounding	Some Baxter, Dantec EMG, Conmed, ValleyLab, Vermont Med, Staodyn, Neotrode
Endotracheal tubes, airways	Selected Berman, Mallinckrodt, Polamedco, Portex, Rusch, Sheridan, Shiley
Enemas	Dabylax, Titeravac, Bowel Management Tube (MIC), PHARMASOL SET, all Fleet Ready-to-Use, cone irrigation set (Convatec), silicone retention cuff tip (Lafayette)
G-tubes, buttons	Silicone (Bard, Flexiflo, MIC, Rusch, 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
Incentive deep breathing exerciser	Vooldyne 5000 (Sherwood David & Geck), Triflo II
IV access: injection ports, Y-sites, bags, pumps, buretrol ports, PRN adapters, needleless systems	Cover Y-sites and bag ports - do not puncture. Use stopcocks for meds. Polymer injection caps, burettes and Safsite (Braun), Abbott Systems, Walrus, Gemini (IMED), selected Baxter (InterLink), Statlock, Ready Med, ConMed, Clave, Alaris, Hudson, selected Sims, IV boards (Avcor), Terumo Pumps, Mach II, AD3 100, Cili-Open (vial top remover - SÉPHÀ PHARM)
OR/Infection Control masks, hats, shoe covers	Some by Kimberly Clark, TECNOL, OR and sterile packs (CML, DeRoyal) twill ties
Medication vial stoppers	Some AmRegent, Astro, Bedford Labs, Fujieawa, Gonio, Glaxo, Lilly, Nochi
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
Respirators	Advantage (MSA), HEPA-Tech (Uvex), PFR 95 (Technol), 3M 1860
Resuscitators, manual	Certain Ambu, Armstrong, Laerdal, Puriton Bennett, Vital Blue, Respironics, Rusch
Spacer (for metered dose inhalers)	ACE spacer (Center Labs), OptiHaier (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 Abboject, Norm-Ject (Air-Tite), EpiPen, selected BD syringes, AdvantaJet (Activa)
Tapes: pink, Waterproof (3M), Zonas, Moleskin cloth, Waterproof (J&J), adhesive felt (Acme)	Dermicel (J&J), Durapore, Microfoam, Micropore, Transpore (3M) Cath-Strip (Genetic Labs), Ice Tape (P.O.Pak), All-Felt (Universal Foot Care), Hypafix
Tonopen disposable covers (glaucoma tester)	None
Tourniquets	Children's Medical, Graeco, VelcroPedic, X-Tourn straps (Avcor), Free-Band (Kent)
Theraband (also strip, tube), other OT supplies	REP Bands and Cords (OPTIP), Exercise putty (Rolyan), new Thera-Band Exercisers
Tubing, sheeting	Plastic tubing - Tygon LR-40 (Norton), elastic thread, sheets (IPS Elastomeric)
Vascular stockings (TEDS)	Compriform Custom (Jobst)



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.

LATEX in Home and Community *Updated Summer 2002*

Frequently contain LATEX	LATEX-SAFE alternatives
Art supplies: paints, glue, erasers, fabric paints	Elmers (School Glue, Glue-All, GluColors, Carpenters Wood Glue, Sno-Drift paste) FaberCastel erasers, Crayola (except stamps, orange), Liquitox paints, DickBlick tempera, acrylic paints and soap erasers, Play-Doh
Balloons	Mylar balloons, self-sealing Myloons
Balls: Koosh balls, tennis balls, bowling balls, Ball Pits	PVC (Hedstrom Sports Ball), Nerf Foam Balls
Carpet backing, gym floor, basement sealant	Provide barrier - cloth or mat
Chewing gum	Bubblicious, Trident (Warner-Lambert), Wrigley gums (check new products)
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 Diaphragm (Milox), Trojan Supra Condom
Crutches: tips, axillary pads, hand grips	Cover with cloth or tape
Dental dams, cups, bands, root canal material, orthodontic rubber bands	PUR0/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, some Attends, Drypers Diapers (not training pants), Confidence (Paper-Pak), Pampers, Luvs
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
Infant toothbrush-massager	Soft bristle brush or cloth, Gerber/NUK
Kitchen cleaning gloves	PVC MYPLEX (Megle), cotton liners (Allerderm)
Latex paint	There is no natural rubber in latex paint
Miscellaneous items	Some medical stickers by MediBadge, UAL, Cushie Tushie Potty Seat
Newsprint, ads, coupons, lottery scratch tickets	None
Pacifiers	Soothies (Children's Med Ventures), selected Binkv, Gerber, Infa, Kip, MAM
Rubber bands, bungee cords	Plasti bands
Toys - Stretch Armstrong, old Barbies	Jurassic Park figures (Kenner), 1993 Barbie, Disney dolls (Mattel), many toys by Fisher Price, Little Tikes, Playschool, Discovery, Trollis (Nortin), Silly-putty
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

NOTE: Associated allergies: Foods include: banana, avocado, chestnut, kiwi. 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 of America 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 SBAA website at www.sbaa.org or send a SASE with 37¢ postage to Spina Bifida Association of America, 4590 MacArthur Blvd., NW, Suite 250, Washington, DC 20007-4226, 800-621-3141.

A.L.E.R.T, Inc.: 888-972-5378, www.latexallergyresources.org.

Latex-free products can be ordered through these catalogs:

- Decent Exposures: 800-524-4949
- CETRA products for Latex-free Living: 888-LATEX-NO
- Catalog #: 800-525-4949
- www.latexfree.com
- www.schoolhealth.com

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 schools. **Glass thermometers should not be used in schools** due to concerns regarding the safety of mercury within the thermometers.

Axillary Temperature Measurement Using Electronic Thermometer

1. Assess need for axillary measurement. For example, young children may not be able to hold thermometer under their tongues properly for accurate temperature measurement.
2. Wash hands. Put on 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 importance of maintaining proper thermometer position until reading is complete.
Students can be curious about such measurements and may remove thermometer to check results before they are complete.
4. Remove thermometer pack from charging unit and grasp top of oral probe.
5. Move clothing away from shoulder and arm. Raise student's arm and gently place probe into the center of axilla. Lower arm over probe and place arm across student's chest.
6. Leave thermometer probe in place until audible signal occurs and student's temperature appears on digital display.
7. Remove probe from axilla and discard oral probe cover.
8. Return probe to storage position of thermometer. Return thermometer to charger.
9. Remove gloves, if worn, and dispose of appropriately. Wash hands.
10. Record temperature. Notify school nurse and family if there is a change from 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 hands. Put on clean gloves (optional).
2. Explain the way temperature will be taken and importance of maintaining proper position until reading is complete.
Students may not be familiar with chemical dot thermometer and may remove thermometer to check results before they are complete.

thermometer under the student's tongue in the left or right posterior pocket in front of the tongue).

- Heat from superficial blood vessels in sublingual pocket produces the temperature reading.*
4. Have child keep mouth closed without biting the thermometer.
 5. Leave thermometer probe in place for 3 minutes (for some brands, one minute).
 6. Remove 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.
 7. Dispose of thermometer in appropriate receptacle.
 8. Wash hands.

Oral Temperature Measurement Using Electronic Thermometer

1. Assess factors which may influence oral temperature measurement. Recent intake of cold or hot beverages or use of oxygen mask can affect accuracy of measurement.
2. Wash hands. Put on 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 importance of maintaining proper thermometer position until reading is complete.
Students can be curious about such measurements and may remove thermometer to check results before they are complete.
4. Remove thermometer pack from charging unit and grasp top of oral probe.
5. Slide probe into disposable plastic probe cover.
6. Gently place 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 sublingual pocket produces the temperature reading.
7. Have child keep mouth closed without biting the thermometer.
Holding the thermometer may achieve more accurate readings for some students.
8. Leave thermometer probe in place until audible signal occurs and student's temperature appears on digital display.
9. Remove thermometer probe from under client's tongue. Discard plastic probe cover into appropriate receptacle.
Note: Small digital thermometers designed for home use may run on batteries/microprocessor chip 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 probe to storage position of thermometer. Return thermometer to charger.
11. Remove gloves, if worn, and dispose of appropriately. Wash hands.
12. Record temperature. Notify school nurse and family if there is a change from student's usual temperature.

Oral Temperature Measurement Using Glass Thermometers

Glass thermometers should not be used in schools.

Measurement Using Plastic Strip Thermometers

Plastic strip thermometers that use temperature-sensitive patch or tape to measure temperature. Their accuracy has been variable.

1. Wash hands.
2. Explain the way temperature will be taken.
3. Place strip on forehead until color change occurs, usually about 15 seconds.
4. Remove strip and dispose in appropriate receptacle.
5. Wash hands.
6. Record temperature. Notify school nurse and family if there is a change from 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.

1. Wash hands.
2. Explain the way temperature will be taken.
Students may not be familiar with temporal artery thermometer and may fear it.
3. Remove protective cap. Be sure lens is clean.
4. Gently position the probe flat on the center of the forehead, midway between the eyebrow and hairline. Press and hold the SCAN button.
5. 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 reading is increased if both forehead and neck are scanned, especially if moisture or sweat is present on forehead.
6. Release the SCAN button and remove the thermometer from the head.
7. Read the temperature on the display. Temperatures obtained by temporal artery thermometers are generally 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.
8. Replace the protective cap on thermometer to protect the sensor when not in use.
9. Wash hands.
10. Record temperature. Notify school nurse and family if there is a change from 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.

2. Explain the way temperature will be taken and importance of maintaining proper position until reading is complete.
Students may not be familiar with tympanic thermometer and may fear that it could cause pain.
3. Right-handed persons should measure temperature from student's right ear and left-handed persons should measure from 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 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 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 thermometer from ear canal.
9. Press the ejector button and dispose of probe cover in appropriate receptacle.
Pressing ejector button causes digital reading to disappear.
10. Wash hands.
11. Record temperature. Notify school nurse and family if there is a change from student's usual temperature.

Sources

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Care of the Urinary System

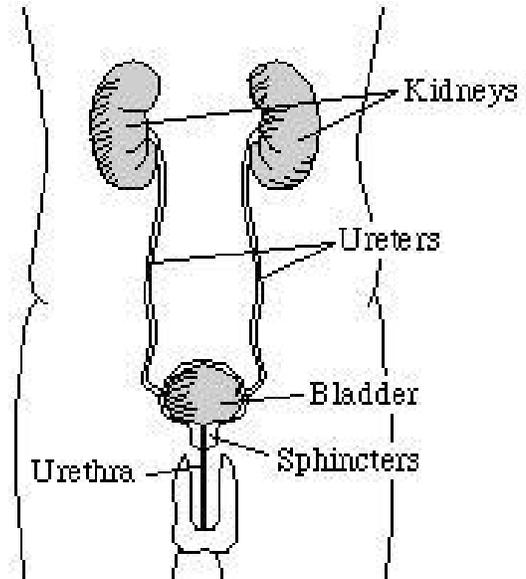
- Overview
 - Clean intermittent catheterization
 - Indwelling urinary catheter
 - External urinary catheter
 - Urostomy
- Continent urostomy, vesicostomy, appendicovesicostomy,
or umbilical stoma
- Peritoneal dialysis
- Hemodialysis

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. 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, the creation of red 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.

Sources:

National Institute of Diabetes and Digestive and Kidney Diseases. (March 2002). *Your urinary system and how it works*. Bethesda, MD: National Institutes of Health. NIH Publication No. 02-3195. Available online: <http://kidney.niddk.nih.gov/kudiseases/pubs/yoururinary/index.htm>.

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Illustration Source:

National Institute of Diabetes and Digestive and Kidney Diseases. (March 2002). *Your urinary system and how it works*. Bethesda, MD: National Institutes of Health. NIH Publication No. 02-3195. Available online: <http://kidney.niddk.nih.gov/kudiseases/pubs/yoururinary/index.htm>.

Intermittent Catheterization

Overview

Clean intermittent catheterization (CIC) is a clean (not sterile) procedure used to empty the bladder. It is generally performed on 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 such *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.

Many children can be taught to perform the CIC procedure for themselves. For most children, intermittent self-catheterization is a clean procedure and 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.

Potential Settings

CIC can be done in a regular bathroom, health office, or any other facility **where the student's privacy is assured**. Appropriate accommodations such as screens or doors should be made if a recommended site is not private. Toilet facilities will need to be wheelchair accessible and have bars or supports for the student needing such assistance. Students may also lie down on a bed or cot to be catheterized.

Staff Preparation

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.

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. It outlines specific procedures step by step. Once the procedures have been mastered, the completed checklist can serve as documentation of training.

Components of the Individualized Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student requiring clean intermittent catheterization. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student requiring CIC, the following elements should receive particular attention:

possible problems associated with the condition or

- Individual baseline status, including urine color, amount, and pattern of continence
- Position of student during catheterization
- Student's ability to self-catheterize
- Whether catheterization is to be done using clean or sterile technique
- Frequency of catheterizations
- Flexible timing of catheterization to accommodate classroom schedule, field trips, and other school events
- Medications that may affect urine color, amount, and odor
- Student's need for assistance with clothing and leg braces
- Fostering independence in performing the procedure, depending on the student's developmental ability
- 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
- Latex allergy alert
- Standard precautions

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 609-612.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 516-519.
- 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.

Intermittent Catheterization—Male

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
 - Water-soluble lubricant (e.g., K-Y Jelly, Lubrifax, Surgilube)
 - Catheter (e.g., plastic, polyvinylchloride, metal)
 - Wet wipes or cotton balls (nonsterile) 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
 - Gloves, if person other than student does procedure
If the student does the procedure unassisted, gloves are not needed.
3. Have another adult present for the procedure, if possible.
Having two adults present protects both the student and the caregiver.
4. Explain procedure using explanations the student can understand. Encourage him to do as much of the procedure as he 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, 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.
6. Wash hands and don gloves.
7. Lubricate the first 3 inches of the catheter with a water-soluble lubricant and place on clean surface.
8. Cleanse the penis by washing the glans with soapy cotton balls or student-specific cleansing supplies. 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.
Starting at the meatus and washing toward the base of the penis helps remove bacteria from the area.
9. Holding the penis at a 45-90 degree angle from the abdomen, use the dominant hand to gently insert catheter into the urethral opening.
*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 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.*
10. 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 catheter slightly more and then withdraw a little to make sure all urine is drained. Rotate the catheter so that catheter openings have reached all areas of the bladder.
*It maybe helpful to have the student bear down a couple of times while the catheter is in place. If trained to do so and ordered by health care provider, external manual pressure may be applied to encourage the urine flow until the flow stops. This can **only** be done with the catheter in place.*

uch catheter and withdraw.
ter from flowing back into the bladder during
winarawai.

12. If the student is uncircumcised, pull the foreskin back over the glans when finished. *Failure to return the foreskin can lead to swelling of the penis and impairment of circulation.*
13. Wipe off excess lubricant or urine.
14. Assist student in dressing, if needed.
15. Measure and record the urine volume, if ordered. Dispose of urine appropriately.
16. Wash, rinse, dry, and store the catheter in appropriate container. *Examples of storage receptacles include a sealed plastic bag, a urine specimen container, and a clean pencil case. The used catheter(s) should be sent home with student to be cleaned. Dispose of catheters when they become brittle upon repeated use.*
17. Remove gloves and wash hands.
18. Document on 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:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 610-611.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 516-519.
- 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.

Intermittent Catheterization—Female

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
 - Water-soluble lubricant (e.g., K-Y Jelly, Lubrifax, Surgilube)
 - Catheter (e.g., plastic, polyvinylchloride, metal)
 - Wet wipes or cotton balls (nonsterile) 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
 - Gloves, if person other than student does procedure

If the student does the procedure unassisted, gloves are not needed.
3. Have another adult present for the procedure, if possible.
Having two adults present protects both the student and the caregiver.
4. Explain 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 hands and don gloves.
7. Lubricate the first 3 inches of the catheter with a water-soluble lubricant and place on clean surface.
8. Separate the labia and hold open with 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.
10. When urine flow stops, insert catheter slightly more. If no more urine is obtained, withdraw it slightly and rotate catheter so that 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. If trained to do so and ordered by health care provider, external manual pressure may be applied until the urine stops flowing. This can **only** be done with the catheter in place.*
11. After bladder is completely empty, pinch catheter and withdraw.
This prevents urine still in catheter from flowing back into the bladder during withdrawal.
12. Wipe off any excess lubricant or urine.
13. Assist student in dressing, if needed.
14. Measure and record the urine volume, if ordered. Dispose of urine.

- catheter in appropriate container.
- include a sealed plastic bag, a urine specimen container, and a clean pencil case. The used catheter(s) should be sent home with student to be cleaned. Dispose of catheters when they become brittle upon repeated use.
16. Remove gloves and wash hands.
 17. Document on 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:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 609-611.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 516-519.
- 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.

Problems for Students Using Intermittent Catheterization

Assessment	Intervention/Rationale
Cloudy urine, blood in urine, foul odor, color changes, unusual wetting between catheterizations, nausea/vomiting, urgency	<i>These may be signs of a urinary tract infection. Always report to school nurse and family any changes in the student's usual pattern or tolerance of procedure.</i>
Inability to pass catheter	<p><i>This may be due to increased sphincter tone caused by anxiety or spasm. Encourage the child to relax by breathing slowly and deeply.</i></p> <p><i>In boys: Reposition the penis and use gentle but firm pressure until the sphincter relaxes. Sometimes it helps to have boys flex at hips to decrease reflex resistance of bladder sphincter.</i></p> <p><i>In girls: Check catheter placement because the catheter may be in the vagina. If catheter is in the vagina, leave catheter in vagina temporarily as a landmark indicating where not to insert, and insert another clean catheter.</i></p> <p><i>If still unsuccessful, notify school nurse, family, and health care provider for further instructions.</i></p>
No urine obtained during catheterization	<p><i>Check position of catheter. This may be due to improper placement of catheter or the bladder may be empty.</i></p> <p><i>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.</i></p>
Bleeding from urethra	<i>This may be due to trauma to the urethra or to a urinary tract infection. Contact school nurse, family, and health care provider.</i>

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 609-611.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 516-519.
- 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.

General Information for Clean Intermittent Catheterization

Date: _____

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

Name of Student: _____

This student needs to use a urinary catheter, or small tube, 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 to do catheterizations before field trips or other activities when access to a bathroom may be a problem.

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 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.

Potential Settings

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 school nurse's office or any other facility where the student's privacy is ensured.

Staff Preparation

Care of an indwelling catheter may be managed by the school nurse, health assistant, 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.

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. The checklist outlines specific procedures. Once the procedures have been mastered, the completed checklist serves as documentation of training.

Components of the Individualized Health Care Plan

Each student's IHCP must be tailored to the individual's needs. The following section covers the procedure for monitoring an indwelling catheter and possible problems and emergencies that may arise. It is essential to review it before writing the IHCP.

A sample plan is included in Appendix A. For a student who requires an indwelling catheter, the following items should receive particular attention:

- Student's underlying condition and possible problems associated with the condition or treatment
- 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

g and collection device/bag
eter is dislodged, leaking, or obstructed

- Instructions for maintaining a closed system
- Access to an additional adult's presence when school staff perform catheterization
- Latex allergy alert
- Standard precautions

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 597-608.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 499-503.
- Skale, N. (1992). Indwelling Urethral Catheter. In *Manual of Pediatric Nursing Procedures*. Baltimore: J.B. Lippincott, pp. 466-471.
- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 717-725.

Inserting an Indwelling Urinary Catheter

Note: Parent provides equipment and supplies.

1. To empty the drainage bag:
 - Wash hands and don gloves.
 - Open outlet valve or clamp on urinary collection device and allow contents of bag to drain into a urinal or other collection device
 - Do not allow end of outlet tubing on collection device/bag to touch collection device or floor.
Bacteria on the collection device could be transferred to the urinary collection system, which could result in urinary tract or kidney infection.
 - Do not lift collection device/bag or tubing above level of student's bladder.
Urine can flow back into the bladder if tubing or bag is raised, which could increase risk of infection.
 - Close the clamp or valve on the urinary collection device/bag.
 - Do not disconnect catheter itself from drainage tubing unless ordered by health care provider.
Opening the drainage system can allow contaminants to enter, increasing the risk of infection.
 - Dispose of urine from collection device into toilet.
 - Dispose of gloves and wash hands.
2. Observe and document on student's log the color, amount, sediment buildup, and appearance of urine each time the collection device/bag is emptied.
3. Monitor amount of urine in the urinary collection device/bag every 2 hours.
Urine output should be at least 1 ml per kg per hour. A student who weighs 20 kg 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 is lifted higher than the student's bladder. Avoid raising it whenever possible to prevent reflux of urine into the bladder.
6. Any blood or discharge from the urethra or any change in the student's urine should be immediately reported to the school nurse and the family.
Blood, discharge, change in urine could be a sign of trauma to, or infection of, the urinary system.

NOTE: Only qualified persons (i.e., registered or licensed practical school nurse) should reinsert or remove an indwelling catheter and only with a physician's order.

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 597-608.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 495-499.
- 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.

with an Indwelling Urinary Catheter

Assessment	Intervention/Rationale
Bleeding from urethra	<i>This may be due to trauma to the urethra or urinary tract infection. Contact school nurse, family, and/or health care provider.</i>
Cloudy urine, mucus, blood, foul odor, color changes in the urine	<i>This may be due to a urinary tract infection. Always report to school nurse and family any changes in the student's usual pattern.</i>
Urine output less than 1 ml/kg/hour	<i>Notify school nurse, family, and/or health care provider.</i>
Dark, concentrated urine	<i>Increase fluid intake.</i>

Sources:

- Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 597-608.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 495-499.
- Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 1264-1267.
- 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.
- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 717-725.

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 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.

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.

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.

Crede's Method

Crede's method was once a common procedure used to assist the student in completely emptying his/her bladder. However, it is currently NOT recommended practice because of the risk of bladder rupture. Therefore, it is not included in the manual.

Sources:

- Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, pp. 1326-1328.
- Reinberg Y., Fleming T., & Gozalez, R. (1994). Renal Rupture After the Crede Maneuver. *Journal of Pediatrics* 124(2): 279-281.

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.

Potential Settings

The removal and application of a condom-type external urinary collection device is ordinarily done outside school hours. 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 school nurse's office or any other facility where the student's privacy is assured.

Staff Preparation

Removal and application of an external urinary catheter may be performed by the school nurse, health assistant, 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.

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. The checklist outlines specific procedures. Once the procedures have been mastered, the completed checklist serves as documentation of training.

Components of the Individualized Health Care Plan

Each student's IHCP must be tailored to the individual's needs. The following section covers the procedure for monitoring an external catheter and possible problems and emergencies that may arise. It is essential to review it before writing the IHCP.

A sample plan is included in Appendix A. For a student who requires an external urinary catheter, the following items should receive particular attention:

- Underlying condition and problems associated with the condition or treatment
- Student's ability for self care and fostering independence in performing the procedure
- Individual baseline status, including urine color and amount
- Medications that would affect urine color, amount, and odor
- Student's need for additional fluids and type of recommended fluids
- Positioning of catheter tubing and collection device/bag
- Access to a change of clothing in the educational setting
- Access to an additional adult's presence when school staff perform catheterization
- Latex allergy alert
- Standard precautions



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...amentals of Nursing. (5th ed.). St. Louis: Mosby, 1428-30.

...er, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 505-508.

Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 708-711.

tion and Removal of External Catheter

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
 - 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
 - Gloves
3. Explain procedure using explanations the student can understand. Encourage him to do as much of the procedure as he is capable, so as 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 hands and don gloves.
7. Remove previously applied urinary collection device as follows:
 - Carefully clip condom and tape near junction of the penis.
 - Pull condom and tape off gently.
8. Inspect skin of penis. If it is irritated, **DO NOT** apply collection device until area clears.
Disposable waterproof undergarments (diapers) can be used until skin clears.
9. If necessary, cleanse shaft of penis with adhesive remover.
Old adhesive must be removed so that new adhesive will adhere well.
10. If necessary, cleanse shaft of penis and perineal area with soap and water. Dry 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.
Paper towel must cover pubic hair to protect it from adhesive spray.
12. Roll condom-type collection device onto glans of penis, leaving ½-2 inch space between the end of the tubing and the end of the penis.
Space is left to prevent irritation from plastic insert rubbing against glans. Space also allows for elongation of penis during an erection.
13. Holding condom in place on glans (condom prevents contact of spray on glans):
 - Spray thin layer of adhesive around 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.
14. Unroll condom-type collection device to cover shaft of penis.

er, spiral wrap penile shaft with strip of **elastic** adhesive

Do not wrap tape completely around the penis. Strip should be spiral wrapped and not overlap itself. Overlapping tape may cause constriction of blood supply to penis.

16. Clip and remove ring of condom.
Ring must be completely removed to prevent pressure damage.
17. Attach condom to leg bag or drainage bag. Be sure condom is not twisted.
Positioning of leg bag may vary according to student's activity and level of functioning. Twisted condom obstructs urine flow.
18. Empty collection bag before it becomes full.
Full bag puts more tension on the catheter and may contribute to problems keeping the catheter intact.
19. Remove gloves. Dispose of gloves and used supplies.
20. Wash hands.
21. Document on student's log the application and removal of external catheter and condition of student's skin.
Report to school nurse and family any change in student's usual pattern.

Possible Problems with an External Urinary Catheter

Assessment	Intervention/Rationale
Bleeding from the urethra	<i>This may be due to trauma to the urethra or urinary tract infection. Contact school nurse, family, and health care provider.</i>
Cloudy urine, mucus, blood, foul odor, color changes in the urine	<i>May indicate a urinary tract infection. Always report to school nurse and family any changes in the student's usual pattern.</i>
Skin of penis irritated	<i>Remove external catheter and put incontinence garments (diapers) on the student until skin clears. Notify school nurse and family.</i>
Leaking of urine around condom catheter	<i>Use smaller condom to provide wrinkle-free application. Make sure penis is dry before applying condom system. Replace or rewrap adhesive.</i>

Sources:

- Potter, P.A., & Perry, A. G. (2001). *Fundamentals of Nursing*. (5th ed.). St. Louis: Mosby, 1428-1430.
- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 503-504.
- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 708-711.
- Smith-Temple, J & JY Johnson. (2002). *Nurses' Guide to Clinical Procedures*. (4th ed.). Philadelphia: Lippincott Williams & Wilkins, 268-272.

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 brought out to an opening on the surface of the abdomen and folded back onto itself, then stitched in place on 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:

- Urostomyô a general term used to describe any surgically-created opening into any part of the urinary tract
- Nephrostomyô a surgically-created opening leading to the kidney
- Ureterostomyô a surgically-created opening leading to one of the ureters
- Vesicostomyô a surgically-created opening leading to the bladder
- Appendicovesicostomyô a surgically-created opening using the appendix as a passageway to the bladder
- Ileal conduitô a surgically-created opening in the urinary tract using a piece of the ileum as the passageway (conduit) and stoma; drains urine, not stool

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 (i.e., umbilical clean intermittent catheterization).

The continent stoma can be covered with a small bandage or left open depending on the student's preference.

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.

Staff Preparation

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.

The basic skills checklist in Appendix B can be used as a foundation for competency-based training in appropriate techniques. It outlines specific procedures step by step. Once the procedures have been mastered, the completed checklist serves as documentation of training.

Components of the Individualized Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student with a urostomy. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student with a urostomy, the following elements should receive particular attention:

- 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)
- 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 alert
- Standard precautions

Sources:

- Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 429, 1166-1167.
- 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.
- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 738-744.

Changing a Urostomy Pouch

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
 - Soap and water or student-specific cleanser
 - Soft cloth or gauze
 - Skin prep
 - Skin barrier
 - Replacement pouch and belt
 - Measuring guide, if needed
 - Scissors, if specified
 - Adhesive
 - Gloves, if pouch is to be changed by someone other than student
 - Tape, if needed
 - Container to store used pouch
 - Disinfectant solution for cleaning 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 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 hands and don gloves.
5. Empty contents of used pouch into toilet or appropriate receptacle.
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 student-specific guidelines to measure stoma and prepare 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 student-specific cleanser 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 skin for redness, rash, bleeding, blistering, or drainage.

If there is skin irritation, follow student's individualized health care plan 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 skin dry with dry gauze or cloth.
12. Using student's individualized health care plan to prepare skin, place skin barrier on skin around stoma, starting at the bottom and working up around the stoma.

Starting at the bottom helps ensure a good seal there, where leaks most commonly occur.

- in appropriate receptacle.
- pouch and apply adhesive to pouch.
15. Center the new pouch directly over the stoma.
 16. Using fingertips, firmly press adhesive of the pouch to the skin barrier making sure there are no wrinkles and no leaks.
The pouch can be opened to allow in a small amount of air. Seal the bottom if the pouch. If a belt is used to secure pouch, attach to pouch.
 17. Dispose of used pouch and supplies in appropriate receptacle.
 18. Remove gloves and wash hands.
 19. Document completion of the procedure in log, including any significant observations.
Notify school nurse and family of any change in stoma or urine pattern.

Sources:

- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 505-508.
- 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.
- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 738-744.

Catheterizing a Continent Urostomy, Appendicovesicostomy, or Umbilical Stoma

Note: Parent provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
 - Soap and water or alcohol-free towelette
 - Gloves, if pouch is to be changed by someone other than student
 - Catheter
 - Water-soluble lubricant (e.g., KY jelly)
 - Catheter storage bag
 - Container to collect and dispose of urine if unable to perform procedure while student sits on toilet
 - Small adhesive bandage or stoma covering

Students should maintain adequate supplies at school for multiple catheterizations.

3. Explain 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 hands and don gloves.
5. Wash the stoma using cleansing supplies.
6. Lubricate catheter tip with water-soluble lubricant.
Lubrication aids insertion and may prevent tissue trauma.
7. 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.
8. 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 stopped by a mucus plug. If this occurs, the catheter should be removed and rinsed, lubricated, and reinserted. Sometimes the continent urostomy may need to be gently irrigated if there is presence of persistent mucus. **A physician's order is needed for urostomy irrigation.***
9. Slowly withdraw the catheter.
Sometimes there is an additional gush of urine. Pinching the catheter can prevent urine still in catheter from flowing back into the stoma during withdrawal.
10. Cover stoma with bandage or stoma covering.
11. Record urine volume, if ordered. Dispose of urine in toilet.
12. Wash and dry equipment. Store in appropriate container, such as a sealed plastic bag.
13. Remove gloves and wash hands.
14. Document procedure in log. Report to the school nurse and family any changes--cloudy urine, mucus, blood, foul odor, color changes, or unusual wetting between catheterizations.



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- 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.
- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 742-744.
- University of California at San Francisco Pediatric Urology Department. (Accessed April 2004). *Clean Intermittent Catheterization (CIC) Through an Abdominal Stoma (Appendicovesicostomy)*. Available online at: urology.ucsf.edu/patientGuides/pdf/pedUro/Appendicovesicostomy.pdf.

Problems with Urostomies

Assessment	Intervention/Rationale
Urine leakage	<i>Empty 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 new pouch if necessary. The continent stoma may be getting too full and need more frequent catheterizations.</i>
Foul odor, cloudy urine	<i>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. Notify school nurse and family.</i>
Change in the flow of urine, especially a decrease	<i>This can occur if there is inadequate intake or if the urostomy (especially a ureterostomy) has narrowed. Report any changes in urine flow to the school nurse and family.</i>
Irritation or skin breakdown around stoma; raw or weeping skin	<i>This may be due to improper stoma care or to inadequate barrier on the skin. In addition, some skin preparations or products can cause a reaction. Notify the school nurse, family, and health care provider.</i>
Bleeding from stoma	<i>The stoma becomes irritated very easily. This can happen if it is rubbed too hard during cleaning or scratched with a fingernail. Usually the bleeding stops quickly, but if it does not, apply gentle pressure and notify the school nurse and family. If a large area of the stoma is bleeding, notify the school nurse, family, and health care provider.</i>
Rash with small red spots on the stoma or skin around the stoma	<i>Clean and dry the skin carefully and notify the school nurse and family. Student may have a yeast infection. Notify school nurse and family.</i>

Sources:

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.

Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 738-744.

University of California at San Francisco Pediatric Urology Department. (Accessed April 2004). *Clean Intermittent Catheterization (CIC) Through an Abdominal Stoma (Appendicovesicostomy)*. Available online at: urology.ucsf.edu/patientGuides/pdf/pedUro/Appendicovesicostomy.pdf.

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 lining of the abdomen, the *peritoneum*, to filter waste products. 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 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.
- 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.

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 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.

need for privacy, procedures such as dialysate exchange or dressing changes should take place in a clean, private room such as the health room. The student can participate in school activities, but participation in some physical education activities must be determined on an individual basis by the student's health care provider.

Staff Preparation

Only 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. Changing the dressing at the exit site can be performed by the school 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.

Components of the Individualized Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student with a peritoneal dialysis catheter. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student receiving peritoneal dialysis, the following elements should receive particular attention:

- Student's underlying condition and potential problems associated with the condition or treatment
- Observations which need to be reported to the health care provider
- Medication requirements
- Diet restrictions, most significantly, foods with high potassium and protein content
- Susceptibility to infections, especially chicken pox and peritonitis
- Restrictions about touching the tubing or the dressing
- Activity restrictions
- Date the new catheter comes to school
- Latex allergy alert
- Standard precautions

Sources:

- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 479-482, 510-516.
- National Institute of Diabetes and Digestive and Kidney Diseases. (April 2003). *Treatment Methods for Kidney Failure: Peritoneal Dialysis*. Bethesda, MD: National Institutes of Health. NIH Publication No. 03-2412. Available online: <http://kidney.niddk.nih.gov/kudiseases/pubs/yoururinary/index.htm>.
- 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.
- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 1282-1287.

The Student Requiring Peritoneal Dialysis

Assessment	Intervention/Rationale
Abdominal pain, fever, nausea, vomiting, unusual color or cloudiness of used dialysate, redness or pain around the catheter	<i>This is a potential emergency. Be prepared to activate the school emergency plan. Have student rest. Take vital signs. Notify school nurse, family, and dialysis unit immediately because peritonitis can develop within a few hours.</i>
White gelatin-like material in dialysate	<i>This may represent a shedding of the peritoneal lining's old skin. An increase in this fibrin indicates potential peritonitis. Notify school nurse, family, and dialysis unit immediately because peritonitis can develop within a few hours.</i>
Catheter is pulled or tugged	<i>Examine catheter tubing for any leaks or breaks. Using sterile technique, remove dressing, and check for any trauma or tears in the skin. If any leaking or trauma has occurred, notify school nurse, family, and dialysis unit immediately. Cover site with a sterile dressing.</i>
Tubing becomes disconnected	<i>If the catheter and tubing become disconnected, cover 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. Notify school nurse, family, and dialysis unit immediately.</i>
Cover on the end of the catheter comes off	<i>Cover the catheter end with sterile gauze. Make sure roller clamp is intact and dialysate not leaking. If clamp is open, close it. Notify school nurse and family.</i>
Dressing at exit site comes off	<i>Using sterile technique, place sterile split gauze on the skin around the catheter. Cover both the catheter and gauze with second gauze and secure with specified tape. Notify school nurse and family.</i>

Sources:

- Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 479-482, 510-516.
- National Institute of Diabetes and Digestive and Kidney Diseases. (April 2003). *Treatment Methods for Kidney Failure: Peritoneal Dialysis*. Bethesda, MD: National Institutes of Health. NIH Publication No. 03-2412. Available online: <http://kidney.niddk.nih.gov/kudiseases/pubs/yoururinary/index.htm>.
- 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.
- Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 1282-1287.

ns for Student with Renal Failure

Assessment	Intervention/Rationale
Chest pain, numbness in face or limbs, and generalized weakness	<p>Activate the school emergency plan and notify the school nurse, family, and health care provider.</p> <p>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 irregular heartbeat and possibly even cardiac arrest. These symptoms may indicate an unsafe potassium level. Potassium is a mineral found in salt substitutes, bananas, oranges, vegetables, chocolate, and nuts.</p>
Shortness of breath	<p>The child could be developing fluid in the lungs. Check vital signs and record. Have the student sit and rest. If difficult breathing continues or increases, activate the emergency plan and notify the school nurse and family. Keep the student in a sitting position while waiting for the ambulance. Leaning forward over a table or chair may facilitate ease of respiration.</p>
Sudden onset of localized pain, usually felt while moving or walking	<p>Activate the school emergency plan and notify the school nurse and family.</p> <p>Many students with renal failure lose calcium, causing bones to become brittle and break with even a minor injury. Document location of pain and assess need for immobilizing area of pain.</p>

Sources:

- National Institute of Diabetes and Digestive and Kidney Diseases. (April 2003). *Kidney Failure: Choosing a Treatment That's Right for You*. Bethesda, MD: National Institutes of Health. NIH Publication No. 03-2412. Available online: <http://kidney.niddk.nih.gov/kudiseases/pubs/choosingtreatment/index.htm>
- 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.

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

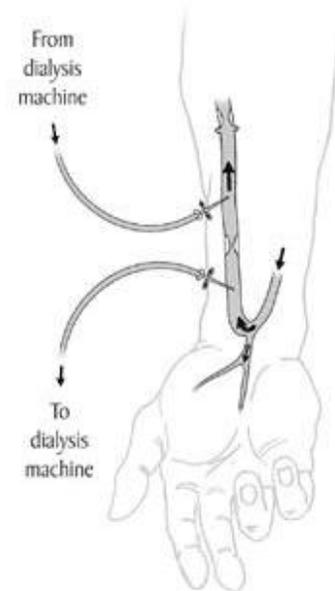
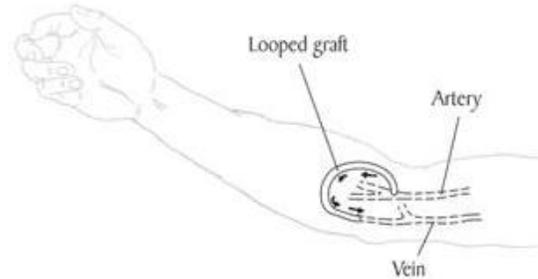
Overview

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 cleaned 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.

Access to the student's blood must be obtained for hemodialysis to occur. 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 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 should receive special care. The fistula can be checked by lightly placing fingers over to feel a vibration, the *thrill*, or by placing a stethoscope over it and listening for a loud buzzing sound, the *bruit*. If any changes are noted in the bruit, the student's emergency plan should be initiated. Anything that causes decreased blood flow to the fistula area should be avoided. **Do not draw blood or take blood pressures 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.

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 activities where the student is around sharp equipment can be decided on an individual basis by the health care provider.

Staff Preparation

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.

Components of the Individualized Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student on hemodialysis. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student on hemodialysis, the following elements should receive particular attention:

- 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
- Notifying the school nurse and family or health care provider 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 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 alert
- Standard precautions

be considered when working with a student needing

- Reducing amount of written homework.
- Using tape recorders and computers if fistula placement affects student's ability to write.
- Frequent hospitalizations.
- Dialysis scheduling.
- Using flexibility in scheduling subjects during dialysis time.
- Providing textbooks, workbooks, and worksheets for hospital tutor.
- Giving credit for tutorial attendance.
- Monitoring student performance, both in class and in the hospital.
- Make-up work and tests.
- Home tutoring when illness prevents student from attending school.
- Evaluation of performance and review work after long absences.
- Making outlines and notes available to student.
- Contracts to modify amount of work and still achieve realistic educational goals.
- Assessing for fatigue.
- Avoiding after-school tutorial sessions.
- Access to school elevator in the event of fatigue or bone disease.

Sources:

Houska AE, Doyle, R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 488-495.

National Institute of Diabetes and Digestive and Kidney Diseases. (April 2003). *Kidney Failure: Choosing a Treatment That's Right for You*. Bethesda, MD: National Institutes of Health. NIH Publication No. 03-2412. Available online:<http://kidney.niddk.nih.gov/kudiseases/pubs/choosingtreatment/index.htm>.

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.

Illustration Source:

National Institute of Diabetes and Digestive and Kidney Diseases. (April 2003). *Kidney Failure: Choosing a Treatment That's Right for You*. Bethesda, MD: National Institutes of Health. NIH Publication No. 03-2412. Available online:<http://kidney.niddk.nih.gov/kudiseases/pubs/choosingtreatment/index.htm>.

r the Student Requiring Hemodialysis

Assessment	Intervention/Rationale
Oozing or bleeding	Usually due to the scab from the last needle puncture coming off. Don 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 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 large 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. Don sterile gloves and apply pressure with sterile gauze (if available) directly to the bleeding site. If bleeding cannot be controlled, apply a tourniquet above the fistula and activate the school emergency plan.
No bruit detected when fistula is palpated or listened to with a stethoscope	Try both palpation and auscultation to assess bruit. Palpate distal pulses and observe capillary refill in extremity digits to check circulation. Have the student lie down and check blood pressure. If blood pressure is low or bruit still cannot be felt, notify the school nurse, dialysis unit, and the family. If clotting has occurred, success of de-clotting depends on how quickly treatment is initiated.

Sources:

- National Institute of Diabetes and Digestive and Kidney Diseases. (April 2003). *Kidney Failure: Choosing a Treatment That's Right for You*. Bethesda, MD: National Institutes of Health. NIH Publication No. 03-2412. Available online: <http://kidney.niddk.nih.gov/kudiseases/pubs/choosingtreatment/index.htm>.
- 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.

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 usually is done at home or in the school clinic.

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.

**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.



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Appendix A

Individualized Health Care Plans
 Emergency plan
 Procedure information sheet
 Daily log
 Medical order forms
 Parent authorization forms

of an Individualized Health Care Plan

Who should have an Individualized Health Care Plan (IHCP)?

Students with mild to severe health care needs and require frequent nursing services at school should have an IHCP.

What is the purpose of an IHCP?

The IHCP 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 IHCP should be individualized to meet the needs of the student.

What should the IHCP include?

The IHCP should include the following four components:

1. Nursing assessment
2. Nursing diagnoses
3. Nursing interventions
4. Expected outcomes

Each IHCP may include additional components to meet the needs of the student. The IHCP should be revised when the student's physical condition or care changes. Each IHCP should be consistent with minimum standards of care.

IHCPs 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 IHCP?

The following individuals should help develop and then sign the IHCP:

- Parents
- Student
- Medical provider (optional)
- Registered school nurse

Parents or legal guardians **must** authorize, in writing, care provided for their minor children.

Health care practitioners, physician assistants) **must** provide written
documentation of the plan developed at school.

How often should the IHCP be updated?

The IHCP 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?

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 IHCP.

Source:

Legal Issues in School Health Services.

National Association of School Nurses. (1998, Revised 2003). *Position Statement: Individualized Health Care Plans.*

Individualized Health Care Plan (IHCP)

1. **Assessment**

The assessment provides the background information for the IHCP 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 IHCP. 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.

Health Care Plan (IHCP)

Student: _____
Name Date of Birth

Prepared By: _____
School Nurse Date

Approved By: _____
Parent(s) Date

Parent(s) Date

Approved By: _____
Student Date

Approved By: _____
Medical Provider (optional) Date

Next Review & Revision Due: _____

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Personalized Health Care Plan

Demographics

Student Name _____ Birth Date _____
Home Address _____

Mother/Guardian _____ Phone _____
Father/Guardian _____ Phone _____
Caregiver _____ Phone _____
Language spoken at home _____

Emergency Contact:

_____	_____	_____
Name	Relationship	Phone

Medical Care

Primary Physician _____ Phone _____
Specialty Physician _____ Phone _____
Specialty Physician _____ Phone _____

Health History

Brief health history _____

Special health care needs _____

Other considerations _____



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Allergies _____

ation & Dietary Needs

Current Medications (dose, route, time)

Special Dietary Requirements

Allergies

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Individualized Health Care Plan - Components

Assessment Data	Nursing Diagnosis	Goals	Nursing Interventions	Expected Outcomes

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 _____

Emergency Plan

Student Name _____

Class/Grade _____

Parent _____

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 plan.

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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 _____

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 _____



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Appendix B

Skills checklists for procedures

- Gastrointestinal system
- Musculoskeletal system
 - Neurological system
 - Respiratory system
 - Urinary system

Feeding Bolus Method

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
• _____ cc (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. Removes cap, inserts syringe and aspirates							
7. Measures residual (if needed) and returns to stomach							
8. If stomach contents are over _____ cc, subtract from feeding							
9. Clamps tubing and removes syringe							
10. Attaches syringe without plunger to feeding port							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
11. Flushes with 15-30 cc water (or as specified)							
12. Administers medications, if ordered, flushing before and after							
13. Pours room temperature formula into syringe							
14. Allows feeding to flow in slowly by gravity							
15. Adjusts height of syringe to achieve prescribed flow rate							
16. Observes tolerance of feeding							
17. Keeps syringe partially filled until feeding complete							
18. Flushes with prescribed amount of water, usually 15-30 cc							
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

Feeding Slow Drip or Continuous Method

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
• _____ cc (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							
6. Removes cap, inserts syringe and aspirates							
7. Measures residual (if needed) and returns to stomach							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
8. If stomach contents are over _____ cc, subtracts from feeding							
9. Clamps tubing and removes syringe							
10. Fills feeding bag with room temperature feeding, primes tubing, and hangs bag							
11. Flushes with 15-30 cc water (or as specified)							
12. Administers medications, if ordered, flushing before and after							
13. Inserts tip of tubing into G-tube, secures, and unclamps							
14. Adjusts flow rate							
15. Observes tolerance of feeding							
16. Keeps bag partially filled until feeding complete; does not hang more than 4 hours worth of feeding at one time							
17. If single feeding completed, disconnects, and flushes with prescribed amount of water, usually 15-30 cc							
18. Opens G-tube to air, if ordered							
19. Clamps tubing, removes syringe, and reinserts plug							
20. Secures tubing							
21. Washes and dries supplies as specified							
22. Washes hands							
23. Documents procedure and observations							
24. 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

Gastrostomy Feeding Bolus Method

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
• _____ cc (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							
6. Inspects skin and rotates bolster, if ordered.							
7. Opens safety plug							
8. Inserts adaptor and tubing							
9. Flushes with 15-30 cc water (or as specified)							
10. Administers medications, if ordered, flushing before and after							
11. Attaches syringe without plunger to feeding port							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
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 cc							
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

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 IHCP 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							
• _____ cc (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							
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.							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
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 cc 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 cc. 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

Nasogastric Tube

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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 nasogastric tube							
Identifies supplies:							
1. Appropriate size nasogastric tube (as ordered by health care provider)							
2. ½ inch waterproof tape, preferably hypoallergenic							
3. 5 cc syringe or catheter tip syringe							
4. Stethoscope							
5. Water soluble lubricant or water							
6. Gloves							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Positions student and explains procedure							
4. Washes hands and dons gloves							
5. Measures for insertion length and marks tube							
6. Lubricates tube with water or water-soluble lubricant							
7. Inserts tube gently and properly							
8. Encourages swallowing. Allows to rest if student gags							
9. Does not force tube if resistance met or any signs of respiratory distress							
10. Inserts to tape mark							
11. Always checks placement of NG-tube before using it according to student-specific guidelines: _____ _____ _____ (actions) (See procedure for placement check.)							
12. Secures tube with hypoallergenic tape, or tape and protectant							
13. Removes gloves and washes hands							



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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
14. Documents procedure and observations							
15. Notifies family of any problems							

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

Placement of Nasogastric Tube

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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 why tube placement must be checked before every use of NG-tube							
Identifies supplies:							
1. 60 cc catheter-tipped syringe							
2. pH tape							
3. Stethoscope							
4. Gloves							
Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Positions student on left side and explains procedure							
4. Washes hands and dons gloves							
5. Unclamps NG							
6. Connects syringe to NG-tube							
7. Gently aspirates stomach contents							
8. Measures pH of aspirate							
9. Notifies school nurse and family if pH > 6							
10. Injects air and listens for whooshing sound							
11. Asks student to talk							
12. Checks for residuals if ordered							
13. Recognizes any signs of respiratory distress							
14. Withholds feedings and notifies school nurse and family if any question of whether tube is located in the stomach							
15. Proceeds carefully with feedings if tube placement is in the stomach							

Procedure approved by:

Parent/Guardian signature

Date



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training.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Tube Feeding Bolus Method

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
• _____ cc (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 NG-tube to clothing)							
6. pH tape, to check placement							
7. Stethoscope, to check placement							
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							
6. Always checks placement of NG-tube before using it according to student-specific guidelines: _____ _____ _____ (actions)							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
7. Removes plug/cap and inserts catheter tipped syringe							
8. Checks residuals and returns to stomach. If volume is over _____ cc, subtracts from feeding. If volume is over _____ cc, holds feeding.							
9. Clamps tubing and disconnects syringe							
10. Flushes with 15-30 cc water (or as specified)							
11. Administers medications, if ordered, flushing before and after							
12. Attaches syringe without plunger to nasogastric tube							
13. Pours room temperature formula into syringe							
14. Allows feeding to flow in slowly by gravity							
15. Adjusts height of syringe to achieve prescribed flow rate							
16. Observes tolerance of feeding							
17. Keeps syringe partially filled until feeding complete							
18. Flushes with prescribed amount of water, usually 15-30 cc							
19. Clamps tubing, removes syringe, and reinserts plug							
20. Washes and dries supplies as specified							
21. Removes gloves and washes hands							
22. Documents procedure and observations							
23. 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

Tube Feeding Slow Drip or Continuous Method

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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 NG-tube							
7. Identifies student-specific instructions for guidelines as to:							
• _____ time(s) of feeding							
• _____ cc (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 NG-tube to clothing)							
8. pH tape, to check placement							
9. Stethoscope, to check placement							
10. 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. Always checks placement of NG-tube before using it according to							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
student-specific guidelines: _____ _____ _____ _____ (actions)							
7. Removes cap, inserts syringe and aspirates residual							
8. Checks residuals and returns to stomach. If volume is over _____ cc, subtracts from feeding. If volume is over _____ cc, holds feeding.							
9. Clamps tubing and removes syringe							
10. Fills feeding bag with room temperature feeding, primes tubing, and hangs bag							
11. Flushes with 15-30 cc water (or as specified)							
12. Administers medications, if ordered, flushing before and after							
13. Inserts tip of feeding tubing into NG-tube, secures, and unclamps							
14. Adjusts flow rate							
15. Observes 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 15-30 cc							
18. Opens NG-tube to air, if ordered							
19. Clamps tubing, removes syringe, and reinserts plug							
20. Secures tubing							
21. Washes and dries supplies as specified							
22. Removes gloves and washes hands							
23. Documents procedure and observations							
24. 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

Feeding Continuous Feeding by Pump

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
• _____ cc (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							
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							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
8. Opens safety plug							
9. Inserts adaptor and tubing							
10. Flushes with 5-10 cc 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 cc. 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

Tube Feeding Slow Drip or Continuous Method

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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 NJ-tube							
7. Identifies student-specific instructions for guidelines as to:							
• _____ time(s) of feeding							
• _____ cc (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 NG-tube to clothing)							
8. pH tape, to check placement							
9. Stethoscope, to check placement							
10. 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. Always checks placement of NJ-tube before using it according to							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
student-specific guidelines: _____ _____ _____ _____ (actions) Holds feeding and notifies family if pH \leq 6 or air not heard when injected.							
7. Removes cap, inserts syringe and aspirates residual							
8. Checks residuals and returns to stomach. If volume is over _____ cc, subtracts from feeding. If volume is over _____ cc, holds feeding.							
9. Clamps tubing and removes syringe							
10. Fills feeding bag with room temperature feeding, primes tubing, and hangs bag							
11. Flushes with water _____ cc (amount specified in IHCP)							
12. Administers medications, if ordered, flushing before and after							
13. Inserts tip of feeding tubing into NJ-tube, secures, and unclamps							
14. Adjusts flow rate							
15. Observes tolerance of feeding. Stops if any signs of distress							
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 _____ cc							
18. Opens NJ-tube to air, if ordered							
19. Clamps tubing, removes syringe, and reinserts plug							
20. Secures tubing							
21. Washes and dries supplies as specified							
22. Removes gloves and washes hands							
23. Documents procedure and observations							
24. 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

Colostomy

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
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



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training.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Colostomy Pouch

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
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							



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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
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

Ileostomy

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
10. Disposes of wastes							
11. Removes gloves and washes hands							
12. Documents procedure and reports any changes							

Procedure approved by:

Parent/Guardian signature

Date



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training.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Ileostomy Pouch

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
7. Reviews student's IHCP 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							
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							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
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

Student

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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

Student with a Cane

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
12. Explains procedure							
13. Assembles equipment as needed							
14. Obtains assistance if needed							
15. Checks fit of cane							
16. Teaches/reinforces gait							
17. Teaches stair climbing as needed							
18. Arranges for use of elevator							
19. Arranges transportation during emergencies and drills							
20. Describes safety tips							
21. Cleans and stores equipment as needed							
22. 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

Student with Crutches

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Student with a Walker

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Student with a Wheelchair

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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. Teaches and assists moving from a surface to wheelchair							
6. Teaches and assists moving from sitting to standing							
7. Teaches and assists moving from standing to sitting							
8. Locks wheelchair whenever appropriate							
9. Uses a seatbelt or harness whenever needed for safety							
10. Stays with student until stable							
11. Maintains good body mechanics							
12. Recharges batteries as needed							
13. Arranges for use of elevator							
14. Arranges transportation during emergencies and drills							
15. Describes safety tips							
16. Cleans and stores equipment as needed							
17. Documents and reports any changes							

Procedure approved by:

Parent/Guardian signature

Date



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training.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Student with a Prosthesis

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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

Student with an Orthosis

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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 Signature (RN)

Date

Supervising RN Signature

Date

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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 weightbearing 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 R's+							
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 Signature (RN)

Date

Supervising RN Signature

Date

Principles

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 Signature (RN)

Date

Supervising RN Signature

Date

g Rectal Diazepam

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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



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training.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Magical Nerve Stimulation for Seizures

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
7. Documents and reports any complaints of sore throat, hoarseness, or other problems							
8. Reports any changes to family							

Procedure approved by:

Parent/Guardian signature

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I have received and understand the training.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Ventricular Shunt

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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 Signature (RN)

Date

Supervising RN Signature

Date

ate Monitoring

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
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							



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Metered Dose Inhaler

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
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							

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Date

Supervising RN Signature

Date

atments

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
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							
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							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
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 to family							

Procedure approved by:

Parent/Guardian signature

Date

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Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Order

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
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							



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Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

en System

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
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

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Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Oxygen Concentrator

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
11. Washes hands							
12. Documents procedure and observations							
13. Notifies family of any changes							

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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 IHCP 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 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							
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:

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Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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 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							
11. Washes hands							
12. Documents procedure and observations							
13. Notifies family of any changes							

Procedure approved by:

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training.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

try

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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. 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 site for sensor							
6. Attaches sensor correctly; makes sure light source and photodetector are directly opposite							
7. Attaches sensor cable to oximeter							
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							
13. Washes hands							
14. Documents readings and observations of respiratory status							
15. Notifies family of any changes							

Procedure approved by:

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training.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Supplies

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 cc 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 IHCP							

Checklist approved by:

Parent/Guardian signature

Date

I have received and understand the training.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Suctioning

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
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. Allows rest and gives breaths with resuscitator bag between passes							
17. Does <u>not</u> routinely instill saline unless							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
specifically ordered							
18. Repeats suctioning as needed for removal of secretions							
19. Suctions nose and mouth if indicated							
20. Rinses catheter and tubing until clear							
21. Disconnects catheter from tubing and disposes of catheter and gloves properly							
22. Turns off suction							
23. Washes hands							
24. Documents color, consistency, and quantity of secretions as well as respiratory status							
25. Notifies family of any changes							
26. Makes sure equipment and supplies are restocked and ready for next use							

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Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Suctioning Using a Sleeved Catheter

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
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							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
each suctioning pass							
17. Allows rest and gives breaths with resuscitator bag between passes							
18. Does <u>not</u> 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 IHCP							
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. Notifies family of any changes							
27. Makes sure equipment and supplies are restocked and ready for use							

Procedure approved by:

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Date

I have received and understand the training.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Tracheostomy Tube Changes

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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. 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:							
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							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
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							
25. Makes sure 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 Signature (RN)

Date

Supervising RN Signature

Date

Procedure for Care of a Student with a Tracheostomy Collar

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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. 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							
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. Notifies family of any changes or concerns							

Procedure approved by:

Parent/Guardian signature

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training.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Manual Resuscitator with a Tracheostomy

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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 student's breaths and delivers correct rate							
8. Assesses effectiveness of bagging							
9. Disconnects when bagging no longer needed							
10. Washes hands							
11. Documents procedure and respiratory status							
12. Notifies family of any changes or concerns							

Procedure approved by:

Parent/Guardian signature

Date



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training.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Nasopharyngeal Suctioning Using Suction Machine

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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. Saline dosettes, if prescribed							
4. Bulb syringe or other manual backup suction							
5. Disposable gloves							
6. Plastic bag for disposal of materials							
7. 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							
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							



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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
17. Removes gloves and washes hands							
18. Documents procedure and respiratory status							
19. 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

Adolescent Suctioning with a Bulb Syringe

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
13. Disposes of tissues appropriately							
14. Removes gloves and washes hands							
15. Documents procedure and character of secretions							
16. Notifies family of any changes							

Procedure approved by:

Parent/Guardian signature

Date



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training.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Therapy (CPT)

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
9. Performs CPT over each area specified							
10. Disposes of tissues appropriately							
11. Washes hands							
12. Documents CPT and notifies family of any changes							

Procedure approved by:

Parent/Guardian signature

Date



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training.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

Machine/Circuit and Settings

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							
8. Spare tracheostomy tube and supplies (go-bag supplies)							
9. Suctioning equipment							
Ventilator Parameters:							
1. Tidal volume							
2. Respiratory rate							
3. Peak inspiratory pressure							
4. Positive end expiratory pressure							
5. Inspiratory time							
6. Sigh volume							
Ventilator Modes							
1. Assist control (AC)							
2. Intermittent mandatory ventilation (IMV)							
3. Synchronized intermittent mandatory							



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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
ventilation (SIMV)							
4. Controlled mandatory ventilation (CMV)							
5. Pressure regulated volume control (PRVC)							

*****Use of this checklist alone does not 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 Signature (RN)

Date

Supervising RN Signature

Date

Troubleshooting Alarms

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:							
<ul style="list-style-type: none"> Student may have mucus and need suctioning. Suctions as needed 							
<ul style="list-style-type: none"> Checks position of tracheostomy tube. Corrects or replaces as needed 							
<ul style="list-style-type: none"> Checks for student coughing, sneezing, talking, or laughing which can trigger alarm 							
<ul style="list-style-type: none"> Assesses for bronchospasm 							
<ul style="list-style-type: none"> Observes for student anxiety and fighting of ventilator. Calms as needed 							
<ul style="list-style-type: none"> Checks tubing for kinks 							
<ul style="list-style-type: none"> Checks for condensation in tubing 							
<ul style="list-style-type: none"> Checks exhalation valve for obstruction 							
<ul style="list-style-type: none"> Checks for accidental change of ventilator settings 							
5. Identifies low pressure alarm sound:							
<ul style="list-style-type: none"> Checks for tubing disconnection. Reconnects if needed 							
<ul style="list-style-type: none"> Checks for loose connections, leaks, or cracks in system. Tightens, if needed 							
<ul style="list-style-type: none"> Checks tracheostomy tube for correct placement and corrects or replaces 							
<ul style="list-style-type: none"> Checks for leak in cuff, if present 							
<ul style="list-style-type: none"> Checks exhalation valve for moisture or puncture 							
<ul style="list-style-type: none"> Checks for accidental change of ventilator settings 							
6. Identifies power alarm sound:							
<ul style="list-style-type: none"> Makes sure ventilator plugged into outlet if using AC power 							
<ul style="list-style-type: none"> Checks AC power, internal battery, external battery 							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
<ul style="list-style-type: none"> 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 not 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

Intermittent Catheterization--Male

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
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							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
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. 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

Intermittent Catheterization--Female

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
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							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
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. 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

Insertion and Maintenance of an Indwelling Urinary Catheter

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCIP 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. Closes clamp/valve							
8. Measures and records urine volume							
9. Does <u>not</u> disconnect catheter from drainage tubing							
10. Disposes of urine and gloves appropriately							
11. Washes hands after any contact with drainage bag, tubing, or catheter							
12. Documents procedure and characteristics of urine							
13. Notifies family of any changes							

Procedure approved by:

Parent/Guardian signature

Date



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training.

Trainee Signature

Date

Trainer Signature (RN)

Date

Supervising RN Signature

Date

External Urinary Catheter

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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							
9. Cleanses shaft of penis as needed and dries thoroughly							
10. Makes small hole in center of paper towel and places it 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							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
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. 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

Urostomy Pouch

Teacher: _____

Person Trained: _____

Position: _____

Instructor: _____

Explanation/Return Demonstration	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
Preparation:							
1. Reviews student's IHCP 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. 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							
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							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
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

Perineal Care, a Continent Urostomy, Vesicostomy, and Mitrofanoff (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 IHCP 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							
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							

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	Training Date	Return Demon Date	Supervision				
			Date	Date	Date	Date	Date
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. 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