

Radiation Safety Practices for General Radiographyⁱ

1. The radiation exposure to the patient shall be the minimum exposure required to produce images of good diagnostic quality.
2. During a radiographic examination, the x-ray field shall be collimated to the area of interest.
3. When a patient or x-ray detector must be provided with auxiliary support during a radiation exposure:
 - a. Mechanical holding devices shall be used when the technique permits. Individuals may be used to hold a patient only when absolutely necessary, and no individual shall be used routinely for this purpose to the exclusion of others that might share the task.
 - b. If a human holder is required, the holder shall be positioned such that no part of the body will be struck by the primary x-ray beam unless protected by at least 0.5 millimeter lead equivalent, and shall be protected from the direct scatter radiation by a protective apron of not less than 0.25 millimeter lead equivalent.
4. Gonadal shielding of not less than 0.5 millimeter lead equivalent shall be used for patients who have not passed the reproductive age during radiographic procedures in which the gonads are in the primary x-ray beam, except for cases in which the shield would interfere with the diagnostic procedure.
5. Individuals under the age of 18 years are restricted to an occupational dose of 500 millirem per year.
6. Personnel monitoring devices shall be issued to any individual who is likely to receive more than 10% of the maximum permissible occupational dose per calendar quarter set forth in 12VAC5-481-640 A.
7. When protective shielding or devices are worn on portions of the body and a monitoring device is required, at least one such monitoring device shall be utilized as follows:
 - a. When an apron is worn and only one personnel monitoring device is in use, the device shall be worn at the collar outside the apron.
 - b. The dose to the whole body or the maximum dose attributed to the most critical organ shall be recorded. If more than one device is used, each dose shall be recorded and identified with the area where the device was worn on the body.
 - c. The position on the body at which a particular personnel monitoring device is worn and used should not be changed during any calendar quarter.
 - d. Personnel monitoring devices should not be deceptively exposed to alter the reported dose delivered to an individual.
 - e. If the personnel monitoring device is lost or damaged, the worker shall cease work immediately until a replacement personnel monitoring device meeting the requirements of 12VAC5-481-1350 A is provided and the exposure is calculated for the time period from issuance to loss or damage of the personnel monitoring device. The results of the calculated exposure and the time period for which the personnel monitoring device was lost or damaged must be included in the records maintained in accordance with 12VAC5-481-1490.
 - f. Control badges provided with personnel monitoring devices are intended to determine background radiation exposure and should be kept as far apart from the x-ray unit(s) as possible. No control badge should be placed in an exam room.
8. Individuals shall not be exposed to the primary x-ray beam except for healing art purposes, and such exposure shall be authorized by a licensed practitioner of the healing arts. This specifically prohibits deliberate exposure of an individual for training, demonstration, or other non-healing arts purposes.
9. The doors of the x-ray room should be closed before making an x-ray exposure.
10. The x-ray beam should not be directed towards doors, windows, x-ray controls or towards the darkroom walls unless no other geometry is possible.
11. No patient should wait or change in the x-ray room while another patient is being radiographed.
12. Except for patients who cannot be moved out of the room, only staff and necessary personnel required for the medical procedure shall be in the room during the radiographic exposure. Other than the patient being examined:
 - a. All individuals shall be positioned such that no part of the body will be struck by the primary beam unless protected by at least 0.5 millimeter lead equivalent.
 - b. Staff and ancillary personnel shall be protected from the direct scatter radiation by protective aprons or whole body protective barriers of not less than 0.25 millimeter lead equivalent.
 - c. Patients who cannot be removed from the room shall be protected from the direct scatter radiation by protective barriers of not less than 0.25 millimeter lead equivalent or shall be so positioned that the nearest portion of the body is at least two meters from both the tube head and the nearest edge of the image receptor.
13. Standard operating procedure is for the operator of the x-ray unit to remain behind a protective barrier with the ability to view the patient for the duration of the x-ray exposure.

Revision History

Date	Summary of Changes
12/4/2020	Original document posted to Virginia Regulatory Town Hall.
7/5/2023	Document reviewed and amended. Minor edits to improve grammar and clarity.

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ⁱ This guidance document is intended to emphasize select radiation safety practices that should be displayed for x-ray operators to view. Operators and owners of x-ray units are required to adhere to all regulatory requirements contained within the Virginia Radiation Protection Regulations (12VAC5-481). Page one of this document satisfies the posting requirement pursuant to 12VAC5-481-1591.