

Name of Policy: Quality assurance and safe operating procedures Policy Number: 3364-135-086 Approving Officer: Chief Executive Officer Responsible Agent: Assistant Professor & Deputy Clinical Service Chief Director Radiology Scope: The University of Toledo Medical Center		 Effective date: Original effective date: June 6, 2000	
Key words: Quality assurance policies, safe operating procedures, radiation safety training, personal radiation protection (lead apron)			
	New policy proposal		Minor/technical revision of existing policy
X	Major revision of existing policy		Reaffirmation of existing policy

(A) Policy statement

As prescribed by the Ohio Administrative Code, quality assurance policies and safe operating procedures shall be developed which are specific to the facilities and equipment at The University of Toledo Medical Center.

(B) Purpose of policy

To provide quality assurance policies and procedures for the safe operation of radiation-generating equipment, to minimize the possibility of over-exposures and radiation incidents.

(C) Procedure

(1) Authorization.

- (a) Radiologic procedures are to be performed only at the request of a physician or Advanced Practice Provider as ordered by an appropriate requisition. Order needs to be digitally-signed or handwritten order to specify exam to be performed and body part to be imaged.

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- (b) Procedures shall be performed only by licensed UPMC staff, licensed physicians, or student radiographers under the direct supervision of licensed personnel. These personnel must be trained in the radiologic procedures as well as having been instructed in these quality assurance and safe operating procedures.
 - (c) Procedures should normally be performed according to the departmental procedure manual. Any variation from the ordered examination must be noted in the requisition by the individual approving the change.
- (2) Information.
 - (a) The Ohio Radiation Protection Rules are located in the office of the director of radiology, online at <https://codes.ohio.gov/ohio-administrative-code/3701:1>, and in the files of the University of Toledo Medical Center individual responsible for radiation protection (IRRP).
 - (b) Several “notice to employee” cards, containing the telephone number of the Bureau of Radiation Protection, Ohio Department of Health, are posted in the department. Any employee having a question regarding these procedures or any aspect of radiation protection may contact The University of Toledo Medical Center IRRP at extension 383-4301
 - (c) All department of radiology technical staff shall attend training in radiation safety and quality assurance policies. Changes in radiation safety and quality assurance policies will be communicated at department meetings or by memorandum.
 - (d) All hospital personnel receive basic radiation safety training as part of their orientation. Ancillary personnel (e.g., environmental services, security, and facilities management) shall complete online radiation safety training or attend an in-service.
 - (e) In case of any unusual event or incident involving the use of radiation-generating equipment, a radiology supervisor should be notified. If deemed appropriate, that person may contact the individual responsible for radiation protection for assistance.
- (3) Employee radiation protection.

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- (a) Radiology procedure rooms and control areas (including computed tomography, mammography, MRI, and cardiovascular-interventional imaging) are restricted to use by authorized personnel.
- (b) All employees must stand behind a protective barrier when a radiographic exposure is made. Exposure switches have been mounted so that it is not possible to make an exposure from outside the operator's barrier.
- (c) All individuals must wear personal radiation protection (full lead apron) when in a room during fluoroscopy or when performing portable radiography. When practical, protective lead drapes or pull-down shields should also be used during fluoroscopy.
- (d) For mobile fluoroscopy, a spacer cone must be available and must be used, unless the medical procedure prohibits its use.
- (e) No employee shall hold a patient during an x-ray exposure unless absolutely necessary for the completion of the examination. All other means of patient restraint should be used before consideration of an employee holding a patient. If holding is necessary, the individual shall wear a full lead apron for protection, as well as gloves if the holder's hands are in the primary beam.
- (f) The maximum permissible whole body radiation dose (MPD) to employees in restricted areas is 1250 mrem/calendar quarter. Exposure to minor employees is limited to 125 mrem/quarter. The dose to the fetus of an employee is limited to 500 mrem during the pregnancy.
- (g) Any employee who is likely to receive more than 10% of the MPD, will be assigned one or more dosimeters.
- (h) All employees should keep their radiation exposure as low as reasonably achievable (ALARA). This means that, even for exposures well below limits, personnel should minimize their exposure consistent with providing quality patient care. Techniques for reducing exposure include maximizing distance from a source, minimizing time near the source, and employing appropriate shielding.
- (i) Exposure records are maintained in the files of the individual responsible for radiation protection. They are reviewed by the X-ray QA committee. Readings that exceed 10% of the quarterly MPD are noted and their

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appropriateness is considered. Exposures exceeding 30% of the MPD are investigated. Recommendations for reducing exposures are made.

- (j) The Radiation Safety Officer or IRRP will report any exposure to personnel, which exceeds the maximum limits set in the Ohio Administrative Code 3701:1-38. This exposure will be reported either by telephone, written report, or both, as specified by Ohio Administrative Code 3701:1-38 within the required timeframe.
- (4) Patient education.
 - (a) To inform, alleviate anxiety and enlist cooperation, all patients shall be provided with an explanation of the study before any radiologic examination is performed.
 - (b) A brief explanation of the examination will be provided by the technologist before beginning the study, and any questions will be answered.
 - (c) For more complex examinations, patient education pamphlets will be provided.
 - (5) Employee quality control (QC).
 - (a) Completion of individuals and operator competency form requirements.
 - (b) Will complete the QC responsibilities associated with each specific imaging unit at designated intervals per manufacturing recommendations and document accordingly.
 - (6) Patient radiation protection.
 - (a) The identity of the patient will first be confirmed in radiology reception. Before performing the procedure, the radiographer will use the two patient identifiers (patient's name and date of birth for outpatients, patient's name, and MR number for inpatients) to ensure they have the correct patient for the procedure.
 - (b) The radiographer must also verify the exam to be performed, including identification of the appropriate body part.
 - (c) Accurate technique is essential to reducing retakes. When manual technique

factors are used, reference should be made to charts available for the equipment and patients should be measured. The radiation should always be restricted to the area of clinical interest using collimation or cones. The patient must always be observed from the control area when any exposure is made.

- (d) Typical radiation exposure data is available for a representative selection of studies performed on each x-ray machine. The exposures are based on radiation measurements performed on the equipment.
 - (e) The gonadal area of all patients under the age of 60 years should be shielded when in or near the primary beam, unless contraindicated for the procedure. The thyroid and orbits may also require shielding. An abdominal shield should be used for chest radiography of those patients under 45 years of age.
 - (f) All female patients of child-bearing age (12 through 60 years) must be questioned as to their pregnancy status, and the status must be recorded on their requisition. If their status is in doubt, a radiologist or ordering physician shall be consulted. The physician will determine if
 - (i) The study is to be performed and if any special shielding precautions are necessary;
 - (ii) A negative pregnancy test is required prior to the examination; or
 - (iii) The study is to be deferred.
 - (g) No person, other than the patient, shall normally be present in the room during an x-ray exposure. If someone must hold a patient, that person shall be protected with a lead apron and gloves.
- (7) Radiation protection of the public.
- (a) Areas where ionizing radiation may be present are restricted to use by employees, patients, and others necessary to provide care to patients.
 - (b) Restricted areas are identified with signs or warning lights.
 - (c) Radiation shielding is provided to limit the exposure of any member of the public to less than 2 mR in any one hour and 100 mR/year.
 - (d) A radiation survey is performed for each new installation to verify that shielding is adequate.

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