

KINGSTON GENERAL HOSPITAL

IMAGING SERVICES DEPARTMENT MANUAL

Subject:	Overexposure in Diagnostic Radiology	Number:	17-003
Prepared by:	Director, Imaging Services	Page:	1 of 2
		Original Issue:	1997.02
Reviewed by:	Department Head	Last Revision:	2009.08
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PREAMBLE

An overexposure in diagnostic radiology is in principle any examination where the risk is due to where the radiation exposure exceeds the expected medical benefit of the examination.

POLICY

OPERATIONAL DEFINITION

An overexposure is defined as one of the following:

1. Irradiation of a fetus as a result of the examination of a woman with an unsuspected pregnancy.
2. An incorrect examination, or examination of the wrong patient, where the Effective Dose Equivalent to the patient is greater than 5 mSv.
3. An operation error or malfunction of the equipment during an examination which results in a skin entrance exposure for an individual projection greater than 10 times the HARP guidelines for the body part, or with fluoroscopy, an Effective Dose Equivalent greater than 5 mSv.

MANAGEMENT OF OVEREXPOSURE

1. In the event that an overexposure occurs or is suspected of having occurred, a ***KGH Safe Reporting Form*** will be completed on line and the details of the incident will be written up, including ***Information Required for the Estimation of Patient Dose*** (Appendix), by the technologist(s) involved and submitted to the Charge Technologist or designate. If the incident is due to an equipment malfunction, the technologist(s) will also fill out a ***Request for Service*** form and submit it to the Charge Technologist or designate as soon as possible. In this case, if it is feasible, the patient may be imaged on another machine.
2. The Charge Technologist or designate will submit the information to the Department Manager and Radiation Protection Officer. The RPO/Designate shall immediately notify the Director of X-ray Safety at the Ministry of Health, as per Regulation 7(14) of the HARP Act. The RPO/Designate shall also submit to the Director of X-ray Safety, a written report on the incident no later than 5 days after the incident.
3. The Charge Technologist and Medical Physicist will (a) determine whether an overexposure has occurred, and (b) investigate the circumstances surrounding the incident and make a recommendation to minimize the chances of similar incidents occurring.
4. The Medical Physicist will estimate the exposure or Effective Dose Equivalent received by the patient, and provide the dosimetry information to the Head of Radiology/Radiation Protection Officer.

Appendix: Information Required for Estimation of Patient Dose

The information required for estimation is given below. As much of the listed information as possible should be supplied so that an accurate dose estimation can be made. (Taken from the *CAR Appropriateness Guidelines for Diagnostic Imaging*)

1. Details of x-ray equipment used, including waveform (single or three phase) and added filtration.

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2. Plain Films: Type and number of exposures plus the relevant entrance exposure information as determined in the QA program. For each projection: type of projection, kVp, mA, exposure time (or for phototimed exposures, average mAs for this projection), half-value layer, geometry (source surface distance, source-image distance). It is not usually necessary to have details of the film-screen combination and grid, but this information can be helpful when the main exposure factors are unavailable.
3. For fluoroscopy: type of fluoroscopic examination including total fluoroscopic exposure time (estimated if necessary), field size and maximum entrance exposure rate as determined in the QA program. Details of the image intensifier, i.e. ZcCdS or Csl, whether or not there was automatic brightness control, field size. Quality assurance data relating to average patient exposure rate, if available.
4. For computed tomography (CT) examination, full technical details, including the make and model of the scanner, and the complete scan protocol especially kVp, mA, exposure time per slice, slice thickness and number slices.
5. Data relating to the patient: i.e. age, height, weight, lateral and AP dimensions in the region irradiated.
6. Details of any other radiological examination carried out at the same time as the x-ray examination such as a radionuclide scan.

Given the above information, in as complete a form as possible, the medical physicist can make a reasonable estimate of the dose to the patient and/or fetus. If, as is usually the case, some of the data is unavailable, the physicist will have to estimate the values of the missing factors and this will increase uncertainty of the final result. The largest uncertainty usually relates to the total exposure time in fluoroscopy and it is therefore important that this time should be routinely recorded in the patient's notes, especially where direct exposure of the abdomen or pelvis of a female patient is involved. The final estimate of dose may be subject to an uncertainty of $\pm 50\%$.

Authorizing Signature:

Dr. Annette McCallum
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