HEALTH HOLDING

HAFER ALBATIN HEALTH CLUSTER
MATERNITY AND CHILDREN HOSPITAL

Department:	Radiology Department		
Document:	Multidisciplinary Policy and Procedure		
Title:	Radiation Safety Policy		
Applies To:	All Radiology Staff and Bio – Medical Engineer		
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1. PURPOSE:

1.1 The purpose of this policy is to establish a facility- wide standard for the safe and efficacious use of radiological examinations and to establish a safe working environment by minimizing radiation exposure patients, physicians, and a staff to levels of As Low As Reasonably Achievable (ALARA)

2. DEFINITIONS:

2.1 **Radiation Protection** - Protection of patients, hospital staff and radiology personnel against exposure to ionizing radiation.
2.2 **TLD** – Thermo Luminescent Dosimeter.
2.3 **RSO -** Radiation Safety Officer.
2.4 **RPS** - Radiation Protection Supervisor

3. POLICY:

3.1 It is the policy of the Radiology Department at Maternity and Children Hospital that ensure the minimal radiation exposure and offer the high quality diagnostic images to all patients within the hospital.

3.2 Derivable from such assessment of all Radiologic and Medical imaging request and specific guideline for all radiological examinations.

3.3 **ALARA Principle** – "As Low As Reasonable Achievable" is a safety principle designed to minimize radiation doses and releases of radioactive materials. More than merely best practice, ALARA is predicated on legal dose limits for regulatory compliance, and is a requirement for all radiation safety programs.

3.3.1 **TIME** – Minimize the time of exposure.
3.3.2 **DISTANCE** – Double the distance between your body and the radiation source; this reduces the radiation exposure by a factor of 4.
3.3.3 **SHIELDING** – Use absorber materials such as Plexiglas® for beta particles and lead for X – rays and gamma rays.

4. PROCEDURE:

4.1 **The Radiation Protection**

4.1.1 **Patient Protection**

4.1.1.1 Avoid examination if pregnant women specifically in the first trimester. For pregnant women requiring examination than abdominal radiograph. Must have the fetus directly protected or shielded from primary and secondary radiation beam. This can be achieved with the full wrap – around lead rubber protection. Whenever possible particularly in CT Scan.

4.1.1.2 The 10-days rule correspondent or child bearing age period. The first day of the 10-day rule corresponding to the first day of the treatment cycle or the first day of the onset of normal menstruation.

4.1.1.3 The minimum target to film distance in radiography is 40 inches while in fluoroscopy is 18 inches should be used.

4.1.1.4 Appropriate beam collimation should be enforced

4.1.1.5 Gonad shielding protection must be used for all patients and companions as long as this will not interfere with the examination.

4.1.1.6 For fluoroscopy, used intermittently and the maximum exposure time should not be less than or equal to minutes

4.1.2 **Staff Protection**

4.1.2.1 Always wear lead impregnated gloves and apron for at least 0.5mm lead equivalent

4.1.2.2 All workers in Radiology Department should avoid restraining, position or accompanying patient during exposure even if they are wearing protective clothing. When assistance is required near the radiation field, protection clothing should be obtained to patient's relative or other member of hospital staff who are not working in Radiology Department.

4.1.2.3 The Radiographer will initiate the exposure only for interesting area in patient's body which is not covered by lead aprons.

4.1.2.4 All primary radiation will only be directed toward area specifically design for such use.

4.1.2.5 No room will be entered while the red light is "ON".

4.1.2.6 For Portable X – ray, equipped with an exposure cord that allows the operator to move a minimum of 6 feet for the exposure limit and apply the lead apron.

4.1.3 **Pregnant Radiographer**

4.1.3.1 The first responsibility for the protection of the fetus lies with the woman herself, who should declare her pregnancy to management as soon as the condition is confirmed.

4.1.3.2 When a Radiographer is known to be pregnant, there are two options that are often considered in medical radiation facilities:

4.1.3.2.1 No change in assigned working duties.

4.1.3.2.2 Change to another area where there is no radiation exposure: (MRI Unit, Ultrasound, PACS or reception area).

4.1.3.3 The National Council on Radiation Protection and Measurements (NCRP) recommends an occupational radiation fetal dose limit of 5.0 mSv during an entire pregnancy (with a daily limit of 0.025 mSv), and less than 0.5 mSv per month. The ICRP recommends less than 1.0 mSv total fetal exposure during an entire pregnancy. In general, these limits are achievable with the proper precautions in place.

4.2 **Monitoring Radiation Exposure**

4.2.1 All physicians and personnel working in areas using radiation shall wear radiation monitoring device.

4.2.1.1 **Rules in Wearing TLD Badges** – the estimate of radiation exposure made from the monitoring devices will be accurate only if badges are worn correctly. The following guidelines shall apply:

4.2.1.1.1 Employees or Physician may not be perform a fluoroscopy procedure if not wearing a film badge.

4.2.1.1.2 The film shall be worn at all times while working in any radiation areas of the hospital.

4.2.1.1.3 Leave the badges in a safe place in your work area when not on duty. Do not take it out of the hospital.

4.2.1.1.4 Never wear a film badges issued to another person

4.2.1.1.5 The badges shall be worn with the name facing the body. The name of the person is shown through a red colored window on the BACK of the TLD. The TLD bump should face outward.

4.2.1.1.6 The badges shall be worn with the name facing the body. The name of the person is shown through a red colored window on the BACK of the TLD. The TLD bump should face outward.

4.2.1.1.7 The colored label should not be written on

4.2.1.1.8 Personnel using lead aprons shall wear the TLD badges over the top of the apron, as close to the collar as possible. This is to measure the exposure to unprotected parts of the body, (i.e eyes and thyroid).

4.2.1.1.9 Report loss badge immediately to the supervisor of the RSO

4.2.2 **Distribution and Collection of Film Badges:**

4.2.2.1 Distribution and collection of film badges shall be the responsibility of RSO **Quarterly.**

4.2.3 **Processing of Film Badges:**

4.2.3.1 The film badge shall be processed every 3 months (quarterly). The maximum exposure that the personnel received quarterly will not be exceeded 0.5mSv. however, an individual film badge shall be processed immediately when it is suspected that he/she might have received a single exposure > 1 mSv (100mRem) or cumulative exposure > 3 mSv (300mRem) in 1 week.

4.2.3.2 RSO will receive TLD readings. If personnel exposure in excess of permissible dose limit is suspected to have occurred. RPS (Radiation Protection Supervisor) shall notify him/her to initiate corrective action to preclude recurrence of the event and to detect the secondary health damage due to over exposure.

4.3 **Radiation Warning Sign**

4.3.1 Safety warning signs should be fixed on all the doors in Radiology Department rooms.

4.3.1.1 Each radiation area shall be posted with a sign showing the standard radiation caution symbol and words. "CAUTION-RADIATION AREA" or "DANGER-RADIATION AREA"

4.3.1.2 Standard radiation symbol appears in appendix 7.1. it is magenta or black on a yellow background

4.3.1.3 Each radiation area shall be posted with a pregnancy sign.

4.4 **Protective Equipment**

4.4.1 Protective equipment that must be worn by all physicians and personnel working in radiation areas includes: Lead Apron, Thyroid Shields, Gonadal Shields and Eye Glasses.

4.4.1.1 Lead Apron. A 0.5 mm lead equivalent apron (preferably wrap around type) with full front coverage.

4.4.1.2 Thyroid shield shall be worn by all physicians and personnel working in fluoroscopy areas.

4.4.1.3 Eye shields, Lead Goggles or Lead Glass shall be worn by all physicians and other personnel working in close proximity to the patient during high-output fluoroscopy procedure when no lead glass shield is in the place between the radiation source and the fluoroscopist's eyes

4.4.1.4 If Gonadal shielding is not less than 0.5 mm lead equivalent shall be used for patients who have not passed the reproductive age.

4.4.2 All Radiation protection devices must be tested under fluoroscopy **Annually**.

4.4.3 Equipment maintenance. Radiation producing units and protective equipment shall be checked regularly to ensure proper operation

4.4.4 All diagnostic radiologic equipment's fixed, and mobile should be calibrated **Annually**.

5. MATERIALS AND EQUIPMENT:

5.1 Red Lights

5.2 Lead Gowns, Thyroid and Gonadal Shielding, Protective Eye Wear

5.3 Thermo Luminescent Dosimeter (TLD)

6. RESPONSIBILITIES:

6.1 Bio – Medical Engineer
6.2 Medical Physicist
6.3 All Radiology Staff

7. APPENDICES:

7.1 Radiation Warning Sign
7.2 Pregnancy Sign
7.3 Thermo Luminescent Dosimeter
7.4 Dose Limits By ICRP

8. REFERENCES:

8.1 AHRA.com American Health Radiology Administration.
8.2 http://www.icrp.org/

9. APPROVALS:

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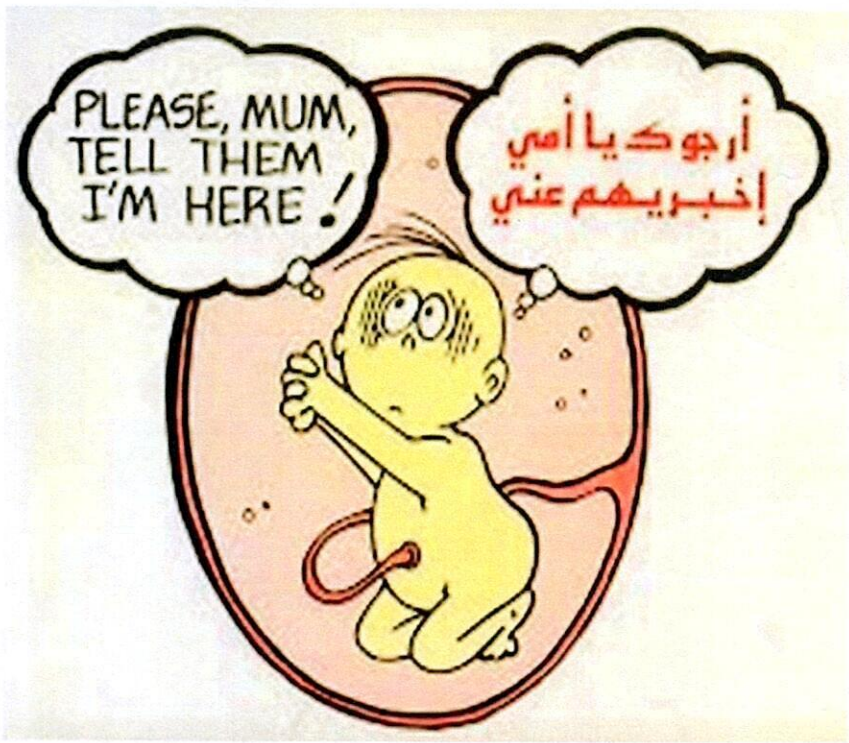
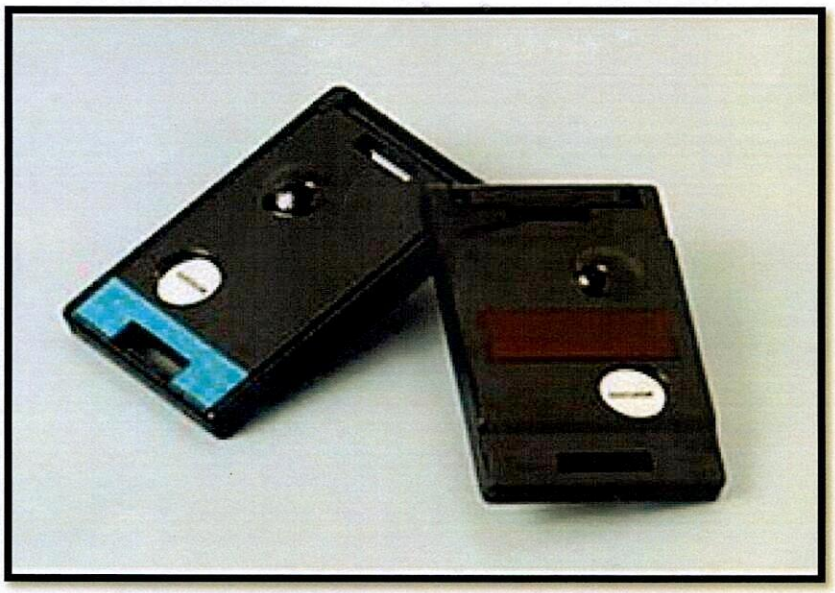
Appendices 7.1 Radiation Warning Sign

Appendices 7.2 Pregnancy Sign



Appendices 7.3 Thermo Luminescent Dosimeter



Appendices 7.4 Dose Limits By ICRP

Dose Limits set by ICRP

(International Commission on Radiation Protection)

	Occupational	Public
Effective Dose (mSv/y)	20*	1
Equivalent Dose (mSv/y) to:		
Lens of eye	150	15
Skin	500	50
Hands and Feet	500	-

* Averaged over 5 years and not more than 50 mSv in any 1 year

Radiation Protection in PET/CT 7