☐ ADMINISTRATE POLICY & PROCEDURE (APP)	☐ INSTITUTIONAL POLICY & PROCEDURE (IPP) ☐ INTERDEPARTMENTAL ☐ INTERNAL

TITLE		POLICY NUMBER/V#
Radiation Safety Regulation		MMC-RAD- 01(01)
INITIATED DATE	**EFFECTIVE DATE**	**REVISED DATE**
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APPLIES TO	RESPONSIBILITY
Radiology department	Radiology staff

1. PURPOSE

1.1. To ensure the maximum radiation protection and safety for the patients, radiation workers, other staff and public at Mayyara Medical Center

2. DEFINITION

2.1. MSv: Millisievert
2.2. RSO: Radiation Safety Officer
2.3. AEC: Automatic exposure control
2.4. FSD: Focal Spot Distance
2.5. DRL: Dose Reference Level
2.6. IAEA: International Atomic Energy Agency
2.7. N.R.R.C Nuclear and Radiological Regulatory Commission
2.8. TLD: Thermo-luminescence Dosimeter

3. CROSS REFERENCES

3.1. N/A

4. POLICY

4.1. Use of radiation in the medical field at Mayyara is based on the principles of justification, optimization and limitation. Exposure is kept as low as reasonably achievable (ALARA). Radiation dose to individuals other than patients shall be kept below the limits and investigation levels are set. The policy covers all areas that use radiation such as medical imaging department, OR, Dental and other areas.

5. PROCEDURE

5.1. Radiation Dose Limit:

5.1.1. Occupational:

5.1.1.1. Whole body annual effective dose equivalent limit of 20 mSv per year, averaged over defined periods of 5 years. The effective dose will not exceed 50 mSv in any one year.

5.1.1.2. An equivalent dose of 500 mSv to the skin at the normal depth of 7 mg/cm2 averaged over 1 cm2, regardless of the total area exposed, in any one year.

5.1.1.3. An equivalent dose of 150 mSv to the lens of either eye in one year.

5.1.1.4. An equivalent dose of 500 mSv to the hands and feet in any one year.

5.2. Pregnant women:

5.2.1. The radiation dose to the surface of the abdomen of pregnant radiation personnel will be restricted to 2 mSv for the remainder of the pregnancy. This remains effective for the remainder of the pregnancy dose to fetus to 1 mSv.

5.2.2. Occupationally exposed female staff should notify the RSO of pregnancy as soon as possible.

5.3. Dose investigation level:

5.3.1. Dose investigation level for personnel is set to 2 mSv per quarter a year.

5.4. Labeling & Warning Signs:

5.4.1. Labeling and warning signs include the following:

5.4.1.1. Sign for "Radiation Area"

5.4.1.2. Sign for "Only authorized persons and patients are allowed"

5.4.1.3. Sign for pregnant women to inform about their pregnancy.

5.4.1.4. Sign for red light alert during exposure.

5.5. Accessibility Control:

5.5.1. All x-ray rooms will be locked during preparation and exposure.

5.5.2. Only patients are allowed in x-ray room unless patient needs assistance; in this case companion(s), assisting nurse(s) or other persons may be allowed. And they have to wear the lead apron.

5.6. **Reporting Accidents and Incidents:**

5.6.1. Accident by Voice System will be send it to the Medical Committee.

5.7. <u>Radiation Personnel Protection:</u>

5.7.1.1. Personnel Monitoring Devices:

5.7.1.2. Individual monitoring devices (TLDs) will be provided to radiologists; radiographers;

5.7.1.3. Each dosimeter will be used only by the person to whom it is assigned. Staff will

always wear their personal dosimeters while working in controlled areas.

5.7.1.4. Frequency of dose evaluation:

5.7.1.4.1. A quarterly radiation exposure report will be sent from the TLD evaluation company to the RSO. Itincludes quarterly readings of each dosimeter. If the readings are found above Investigation Level; the radiation safety officer (RSO) will investigate the case.

5.7.2. Assessment of doses if dosimeter is lost:

5.7.2.1. The RSO will perform a dose assessment and record his evaluation of the dose and add it to the worker's dose record. The most reliable method for estimating an individual's dose is to use his orher recent dose history. In those cases where the individual performs non-routine work, it may be appropriate to use co-workers' doses as a basis for the dose estimate.

5.8. Protective Clothing:

5.8.1. All technologists, physicians, nurses or patient helpers working nearby the patient during exposure and not standing behind secondary shield will wear protective clothing.

5.8.2. **Lead aprons:**

5.8.2.1. Will be stored on hangers and not folded.

5.8.2.2. Will be assigned an ID code and tested each 12 months for shielding integrity.

5.8.2.3. Daily visual inspection of lead apron and immediately report any suspected damage to RSO, the apron will be taken out of use until tested and declared safe.

5.8.3. Thyroid Protection:

5.8.3.1. With potentially high radiation doses and dose rates during interventional radiology, the specialist medical practitioner will use thyroid protection.

5.8.3.2. Use of a suspended protective barrier between the patient and the interventionist can reduce the need for separate thyroid protection.

5.9. Public Radiation dose limits:

5.9.1. The limit is 1 mSv in a year. In some circumstances, a higher value of effective dose equivalent could be allowed in a single year, provided that the average over 5 years does not exceed 1 mSv per year. These limits do not include the dose to pregnant women.

5.9.2. An equivalent dose to the lens of the eye of 15 mSv in a year.

5.9.3. An equivalent dose to the skin of 50 mSv in a year.

5.10. Pregnancy:

5.11. Pregnant female patients are not allowed to be x-rayed unless it is declared

by the referring physician in the x-ray order stating the need for x-ray is higher than the radiation risk. And the patient is informed about the risk and the benefit.

5.12. Married female patients in childbearing age who are to undergo x-ray examination of the abdomen, pelvis, lower spine, etc., will be asked whether they are pregnant or not, if there is a possibility that they might be pregnant.

5.13. If yes, diagnostic x-ray procedure involving the exposure of the abdomen or pelvis must be avoided unless there are strong clinical indications for the examination. It is the responsible of medical practitioner to determine if the examination can be safely deferred.

5.14. If no, standard protective measures will nevertheless be applied

5.15. Records:

5.16. The following records will be kept and available in radiography department:

5.16.1. Radiation workers dose record.
5.16.2. Patient images reports. (In the MID reporting system)
5.16.3. Area radiation survey.
5.16.4. Protective clothing integrity.
5.16.5. X-ray machine maintenance.

6. Forms & attachments:

6.1 N/A

7. Resources:

7.1. Lead Apron, Lead gloves and barrier shields.

8. References:

8.1. Medical Diagnosis, New Zealand National Radiation Laboratory, NRL C5, 1994, Christchurch, New Zealand). section4.33, 4.34, 4.35, and 4.36, pages21-23 codes of Safe practice for the use of X-Ray in

8.2. IAEA, "International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Source". Safety Series No. 115, Vienna, 1996.

8.3. Practical Radiation Protection in Healthcare, C.J. Martin and D.G. Sutton, Oxford University Press, 2002

9. Approvals:

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