

Local Rules for Use of I – 131 for Therapeutic Procedures

**Radioactive Iodine Treatment Unit
Provincial General Hospital
Badulla.**

1. INTRODUCTION

- 1.1 These local rules lay down principles by which the Iodine – 131 radioisotopes are safely used, administered to patients, stored and disposed of.

All the persons involved in the use and handling of radio iodine and personnel attending to patients administered with Iodine shall adhere to the rules given in this manual.

1.2 Aim

To ensure that work with radio iodine is controlled such that.

- (a) During normal working, doses to all persons are as low as reasonably achievable. (ALARA)
- (b) Precautions are taken to minimize the risk of procedure failure or other occurrence, which might result in significant doses to patients and any other persons.
- (c) No doses exceed those specified in the Atomic Energy Safety Regulations No. 1 of 1999.

1.3 Name & duties of key personnel with respect to radiation protection.

The following personnel are responsible for implementation of radiation protection in the hospital.

(I). License holder

Name : Dr L.A.A.H.K De Silva
Position : Director
Contacts : Office: 0552222261

Responsibilities

- (a) Ensuring that work with radioactive materials are carried out in accordance with the requirements of the Sri Lanka Atomic Energy Regulatory Council (the Council) Regulations & Code of Practices.
- (b) Taking all reasonable steps to ensure that local rules are obeyed.

(II). Radiation Protection Officer/ Medical Physicist

Name : Jagath De Silva
Contacts: Office: 0552222261 EXT 1471 Home: 0714324342

1.4 Designation of Areas

1.4.1 Controlled areas

The following areas in the hospital have been designated as controlled areas:

All patients' isolation rooms, Radioisotope handling areas and dispensing laboratories.

N.B: Definition for controlled area is given in the Annex-5.

Special requirements, if any shall be given in the rules.

Example:

Only patients and authorized personnel with TLDs are permitted to enter these areas.

Details can be found in Regulation 32 of the Atomic Energy Safety Regulations No. 1 of 1999.

Instructions to be given to workers who work in controlled area should also be given in the local rules. (These instructions are given in sections, 2,3,4 and 5 of this guidance.)

1.4.2 Supervised areas

The following areas in the hospital are classified as supervised areas.

Nurse's observation room

N.B: Definition of a supervised area is given in annex –5.

2. WORK RULES FOR RADIATION USERS

2.1 All the workers should ensure that radioisotopes are handled in accordance with the following procedures. These rules are displayed in the radioisotope dispensing room.

- ⇒ Laboratory coats must be worn.
- ⇒ Eating, drinking, smoking and application of cosmetics is forbidden.
- ⇒ No unnecessary materials are permitted to the isotope room. E.g. Brief cases, text books etc.
- ⇒ Cover any wounds with waterproof dressing prior to entering the active area.
- ⇒ Wear a TLD badge if you are given one.
- ⇒ Ensure containers of radioactive material are properly labeled, sealed and shielded.
- ⇒ Maintain an efficient monitoring and cleaning program.
- ⇒ Report spills, wounds, or other emergencies to the Radiation Safety Officer or Head of the Department immediately.
- ⇒ Contaminated items should be kept in the container provided.
- ⇒ All areas where radioactive materials are handled must be monitored for contamination, if contamination is found, the area should be decontaminated and waste product should be collected to polyethylene bags and sealed & labeled. (Decontamination procedure is given in section 4)

2.2 Female Workers

All female workers are requested to inform the Head of the Department, as soon as they become aware of the condition of pregnancy in order to adjust their working conditions.

The Head of the Department will make arrangements to alter their working condition so as to ensure that the embryo or fetus is afforded the same broad level of protection as required for members of the public.

3. Emergency Procedures

Emergencies that can be expected in the use of I-131 for therapeutic uses are as follows.

-) Over exposure of a worker.
-) Personal or surface contamination
-) Vomiting of a patient after administration of I-131.

3.1 Over exposure of a worker.

3.1.1 Suspected over exposure.

If an over exposure of a worker is suspected, the Head of the Department should be immediately informed by the person exposed or by the supervising officer attending the work at the time of exposure.

The Head of the Department is responsible for carrying out the following course of action.

- Send TLD badge immediately to Sri Lanka Atomic Energy Board (SLAEB) for dose estimation.
- Examination of exposed person including blood count testing.
- Attending to medical requirements depending on the doses & symptoms.

3.1.2 Over Exposure found by TLD

If an over exposure is notified by SLAEB after assessing TLDs used by workers which are returned at the end of survey period, the following course of action will be taken by the Head of the Department depending on the dose.

- (a) If the dose is more than 5 mSv for the survey period or the cumulated dose is 10 mSv or more during the current year, the hospital will carry out an investigation to find out the reasons for the over exposure including a radiation survey. If the exposure is found to be genuine, suitable arrangement will be made by the Head of the Department to avoid such exposures in the future.
- (b) If the dose is 100 mSv or more a thorough medical examination will be carried out and suitable remedial action will be taken.

3.2 Personnel & surface contamination

All workers are requested to follow emergency procedures given below in case of a contamination (These emergency procedures are displayed in the control areas).

3.2.1 If radioactivity spill is on your self:

- a. Remain where you are and call another person
- b. Have another person to call the Department Radiation Protection Officer.
- c. Put on new pair of gloves.
- d. Use a radiation monitor to locate the contamination.
- e. If shoes are contaminated remove them.
- f. Proceed to washbasin or shower.
- g. Remove contaminated clothes and put them in a plastic bag.
- h. If spill is on skin, wash thoroughly with water and toilet soap for 5 minutes. Monitor and repeat if necessary, but not to the point of skin irritation.

3.2.2 If radioactivity is spilled on premises:

- a. Take any immediate action to minimize spread of radioactivity without contaminating yourself, E.g. righting container, throwing absorbent material over liquid spill.
- b. Call for the assistance of another person.
- c. Clean up spill as per the decontamination procedure given in section 4.

3.3 Vomiting of a patient

If patient is vomited, the nurse on duty will carry out the following course of action.

-) Inform the Head of the Department immediately
-) Find the location of contamination using a contamination monitor
-) If clothing is contaminated (clothing of patient or bed linen) advise to remove clothing and have a wash and wear new clothing. Contaminated

clothing should be kept in polyethylene bags and seal with labels. These bags should be kept in the containers provided.

-) If floor is contaminated, advise patient to be away from the affected area until the area is decontaminated. Use the procedure described in section 4 for decontamination.
-) Advise of Radiation Protection Officer or the Council should be sought whenever required.

4. Decontamination Procedures

These procedures should be carried out once the contamination is under control and the injured and contaminated persons have been assisted.

- (a) Ask for the assistance of another person if required
- (b) Put on protective clothing, plastic gloves and plastic overshoes. These items available in the spill kit (annex-6).
- (c) Use the monitor to find the exact spot of the contamination and mark it with marking pens or by other means.
- (d) Spread absorbent materials over spill. If it is necessary to walk over the contaminated area, lay a trail of plastic backed absorbers (incontinence pads), plastic surface up.
- (e) Use forceps to put wet absorbers into plastic bags. Replace with dry absorbers until all liquid is mopped up.
- (f) If necessary scrub contaminated area with absorber wetted with DECON 90 or equivalent decontaminating detergent. Dry the area with other absorbers.
- (g) Monitor and repeat if necessary
- (h) If there is residual contamination, mark and cordoned off the area. In the case of small areas it may be sufficient to cover them with plastic sheets taped in place.
- (i) Place all waste in plastic bags and seal and label them.
- (j) Wash and monitor yourself before leaving the area.

5. Death of a Patient following administration of a radioisotope

Precautions that should be taken are depending on the residual activity. The Head of the Department, in consultation with RPO will advise for safe cremation of the body.

Necessary advice if required will be given by the RPO on the following

-) Burial or cremation
-) Occupancy of personal in close contact with the body
-) Handling of the corpse
-) Handling of contaminated object and clothing
-) Embalming & autopsy if required

6. Instructions for Patients

For the safety of workers and other patients, the sister in duty or therapy technician will provide following instruction to the patients before they are administered with I-131 (These instructions are displayed in the patient's rooms)

- ⇒ Stay in the room
- ⇒ Use only the private toilet and flush 2 time. (Men should sit down to avoid splashing)
- ⇒ Wash hands well in soapy water after using toilet
- ⇒ Wear footwear when leaving the bed
- ⇒ In the event of vomiting or inconvenience notify the nurse immediately
- ⇒ Cutlery and dishes should be washed in the patient's room and reused.
- ⇒ Personal clothing changed should be kept in the plastic bag or container provided for.

7. Disposal of Radioactive Wastes

7.1 Disposal of contaminated items

The RPO is responsible for clearance of wastes. The RPO will check contamination levels of wastes collected in polyethylene bags after allowing decay for 10 days. If any detectable contamination is not found the waste is cleared for disposal. If any contamination is found, the wastes is stored with label until it decays to permissible levels.

7.2 Disposal of patients' excreta

The RPO keeps records of radioactivity collected to delay tanks. (separate log books are maintained for all tanks) When a tank is full, total activity collected is estimated. The RPO will calculate the time required to reduce the activity to 10 MBq and content is released when the activity come down to 10 MBq (total annual release)

If the Tank needs to be released before activity reduces to 10 MBq, prior approval of Sri Lanka Atomic Energy Regulatory Council shall be obtained.

Note : *Any instructions given by time to time by the Sri Lanka Atomic Energy Regulatory Council, will supersede the requirements given in this manual.*

Access Route to Iodine Therapy Unit

1. Give steps to reach the Iodine Therapy facility.
2. Draw the lay out of the facility indicating radio pharmacy, storage, isotope rooms, waste storage room and location of delay tanks.
3. Show access roots to the facility by arrows in the above drawing.

Annual Dose Equivalent Limits

The dose equivalent limit recommended by the Council is as follows.

Application	Dose Limit	
	Occupational	Public
Effective Dose	20 mSv per year, averaged over a period of 5 consecutive calendar years ^{2,3}	1 mSv in a year ¹
Annual equivalent dose in the lens of the eye	20 mSv per year averaged over a period of 5 consecutive calendar years ²	15 mSv
the skin	500 mSv	50 mSv
the hands and feet	500 mSv	-

¹ In special circumstances, a higher value of effective dose could be allowed in a single year, provided that the average over 5 years does not exceed 1 mSv per year.

² With the further provision that the dose in any single year shall not exceed 50 mSv

³ When a pregnancy is declared by a female employee, the embryo or foetus shall be accorded the same level of protection as for members of the public.

Important Instructions for Users of TLD Badges

All users of TLD badges at Iodine therapy unit should follow the instructions given below.

- ⇒ Before entering a Radiation Field or handling a Radiation source, ensure that you wear a proper personnel monitoring device.
- ⇒ Ensure that the TLD Badge holder is properly loaded with the TLD card valid for the current service period and that it is the card assigned to you. No one else should ever use your TLD.
- ⇒ Once loaded the TLD badge holder should not be opened until a replacement is received
- ⇒ Use the badge at chest level. (When a lead rubber apron is used, wear the chest badge under the apron)
- ⇒ A badge is precious instrument to record your radiation doses. Handle it with care.
- ⇒ Do not use damaged holders with its metal filter detached. Inform RPO for replacement.
- ⇒ If at any time a higher radiation exposure is suspected, promptly report it to Head of the Department and return the TLD card for urgent processing, along with the details of the incident to SLAEB.
- ⇒ When the badge is not worn, ensure that it is stored at a safe place away from Radiation Source. Never leave the badge in a radiation area in the vicinity of hot plates, ovens, furnaces etc.

Emergency Contact Numbers

Head of the Department, Dr M Chenthuran (Consultant Oncologist)

Hospital : 0552222261

Home :

Mobile :

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Definition:

Controlled Area

A controlled area is defined in “Radiation Protection and Safety of Radiation Sources International Basic Safety Standards” – General Safety Requirements Part 3 (GSR Part 3) as follows.

A defined area in which specific protection measures and safety provisions are or could be required for

- a) Controlling exposures or preventing the spread of contamination in normal working conditions, and
- b) Preventing or limiting the extent of potential exposures.

Areas that can be classified, as control areas according to the above definition should be listed in the local rules under item 1.4.1

Definition:

Supervised Area

A supervised area is defined in “Radiation Protection and Safety of Radiation Sources International Basic Safety Standards” – General Safety Requirements Part 3 (GSR Part 3) as follows.

A defined area not designated as a controlled area but for which occupational exposure conditions are kept under review, even though specific protection measures or safety provisions are not normally needed.

Areas that can be classified, as supervised areas according to the above definition should be listed in the local rules under item 1.4.2

Items for Spill Kit

- 1) Rubber gloves
- 2) Shoe covers
- 3) Polyethylene sheets (~ 2m²)
- 4) Yellow colour tape for demarcation of area
- 5) Forceps (~ 1 ft)
- 6) Absorbent cotton pads (~ 2 kgs)
- 7) Soap
- 8) Decontamination detergent
- 9) Polyethylene bags

