AUCKLAND
DISTRICT HEALTH BOARD
Te Toka Tumai

Auckland DHB
Chief Executive's Office
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Auckland City Hospital
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14 July 2020

[redacted]

Re Official Information Request – Controlled documents on managing isolation with radioactive isotopes

I refer to your official information request dated 23 June 2020 requesting the following additional information:

I am looking to develop some guidelines for managing isolation associated with radioactive isotopes for treatment. To ensure regional consistency on the matter, I would appreciate any controlled documents (eg policies, guidelines, protocols etc) that ADHB have that relate to this.

Please find attached four documents to assist, including the following:

- Radioactive Iodine Therapy – Guidelines for Nursing Staff
- Consent Form
- Radioactive Iodine Therapy – General Guidelines for Patients returning to Care Facilities or other Hospitals after discharge from Auckland Hospital
- Radioactive Lutetium Therapy – Guidelines for Nursing Staff

You are entitled to seek a review of the response by the Ombudsman under section 28(3) of the Official Information Act. Information about how to make a complaint is available at www.ombudsman.parliament.nz or freephone 0800 802 602.

Please note that this response, or an edited version of this response, may be published on the Auckland DHB website.

Yours faithfully

Ailsa Claire, OBE
Chief Executive

GENERAL GUIDELINES – AUCKLAND CITY HOSPITAL

RADIOACTIVE IODINE-131 THERAPY:
PATIENTS RETURNING TO CARE FACILITIES or OTHER HOSPITALS AFTER DISCHARGE FROM AUCKLAND HOSPITAL

(INDIVIDUAL LICENCEES MAY ADD FURTHER RESTRICTIONS AS APPROPRIATE)

Patients receiving large therapy activities of radioactive iodine are hospitalised until the level of radioactivity has fallen to a point where they can be considered as outpatients. They return home or to a care facility under the direction of the hospital clinical licencee, and are subject to certain voluntary restrictions. These pertain to the journey time to the place of abode, mode of transport used, care givers and other members of the public in the home or care facility. The necessity of avoiding public gatherings and places of entertainment is stressed. These restrictions can be in place for a number of days depending on circumstances, and are indicated on the yellow card given to the person.

Basic guidelines that are to be followed during the initial period in the care facility

1. Person to have their own room if possible.

2. A large % of the radioiodine material is excreted in the URINE. Urine should be passed while sitting down and the toilet shall be flushed twice. If urine is passed into a bottle or bedpan then the person disposing of the urine must wear gloves and work quickly. Again the toilet should be flushed twice.

3. No visiting restrictions in terms of time spent with the person need apply. However visitors should not be closer than 2 metres and children or pregnant women should not be allowed to visit.

4. Visits to other parts of the house/building should be discouraged. For example, avoiding time spent in communal areas such as day rooms/television rooms. There are no restrictions on showering etc. but preferably at quiet times. If the person is required to reattend a hospital/laboratory/xray dept. for investigation, the clinician in charge/licencee at Auckland hospital should be advised in case advice on radiological protection is required.

5. Staff in care facilities are free to make short visits to the person's room consistent with carrying out their duties. They should wear disposable gloves particularly if changing bed linen. Generally, staff who are pregnant should not attend the radioiodine patient.

6. Attending public gatherings and places of entertainment are to be avoided.

A T Stewart
Physicist
ONCOLOGY PHYSICS 09 3074949 extension 24095
AUCKLAND HOSPITAL

Original Sept. 1998.
Most recent update March 2015

AUCKLAND
DISTRICT HEALTH BOARD
Te Toka Tumai

Attach hospital sticker here and file sheet in notes after signing.

A checklist for your particular dose:	**How long in days?**
o Be 2 metres separate from others:	2 4 6 days
o Sleep alone:	2 4 6 days
o Can return to work:	2 4 6 8 days
o Don't travel by public transport:	1 2 3 days
o Brief (< 3 mins) contact with young children or pregnant women:	7 10 14 21 days

I have read and understood the above information and agree to the radioiodine treatment, and acknowledge the recommended radiation safety precautions outlined above.

Patient_____

Doctor_____

Date_____

Further information or queries, can be obtained from the scheduler or, if needed, you can speak to a Nurse or one of the Clinic Doctors via the Clerk or Team Support numbers as shown below.

Thyroid Clinic & Radioiodine Scheduler :	Ph 307-4949	Ex 26 460
Clerk:	"	Ex 26 856
Team Support :	"	Ex-26 851

RADIOACTIVE LUTETIUM THERAPY

GUIDELINES FOR NURSING STAFF

WARD 64 Auckland City Hospital

In the event that a patient who has recently received this therapy presents acutely in Auckland City Hospital and is directed to Ward 64 for admission

Prepared by Allan Stewart

NURSING INFORMATION

GENERAL

Human beings have always been exposed to a small but finite level of radiation, primarily from naturally occurring radioactive materials eg Potassium-40, and from cosmic radiation reaching earth from origins in outer space. The level of radiation from these sources varies from place to place on the surface of the earth and is termed natural background radiation.

Radiation exposure above background can arise from sources such as medical diagnostic radiation both from x ray sources and radionuclides (radioisotopes). Certain occupational groups are subject to radiation above background levels in their work. Included in this group are those that come into contact with patients undergoing therapy with radionuclide sources and those who work in x ray departments. Radiation exposure from necessary medical procedures are not however included in the determination of the occupational radiation exposure status of the individual.
(It is also interesting to note that modern air travel at high altitude, results in a small increase in radiation exposure to air crew and members of the travelling public).

When using radionuclides for therapeutic purposes consideration must be given to the potential for radiation exposure (however small) to nursing staff and visitors in the hospital environment as well as other people in the home environment.

Lutetium 177 Prostate Specific Membrane Antigen (PSMA) is a radiopharmaceutical used against advanced stage prostate cancer. Lutetium 177 Dotatate is another radiopharmaceutical used in the treatment of neo Endocrine tumours.
Presently these therapies are administered in Private Medical Facilities by a licenced Medical Practitioner and Ward 64 staff would only come across the patients if they were admitted acutely post therapy. The patient would arrive with radiation safety instructions given by the licenced Clinician who carried out the treatment.

The 177 Lutetium radionuclide circulates in the blood stream with concentration in target organs and then is excreted in the urine. The urine can be highly radioactive in the first few days after treatment. Radioactive decay of the 177-Lutetium only results in the emission of beta particles. The beta particles travel only a few millimetres in soft tissue before expending all their energy and this is what delivers the locally absorbed dose to tissue in which the radioactive material concentrates. There are only very low energy gamma rays emitted from this radio isotope and consequently there is no major radiation risk when in close proximity to the patient (as is the case with radioactive 131 Iodine). Thus these radiation types and energies do not penetrate very far in

tissue

once the radiopharmaceutical is injected intravenously and so some simple instructions re minimising close contact with others for 7 days will minimise any external risk However it is always good practice to distance oneself outside 2 metres unless nursing duties such as routine observations, need to be carried out.

However very large activities (amounts) are given for the treatment, in this case 7GigaBeqeral (GBq), and a large % of the radioactivity is excreted in the urine within 3 to 4 days after the treatment and lesser amounts in subsequent days. Consequently good hygiene is important and double flushing the toilet after each use is recommended in the first 3 to 4 days. Good hydration is also recommended to increase the clearance of the radiopharmaceutical

However by 96 hours post treatment, the risk of contamination from body fluids is minimal.

NB: The radiation precautions when attending a patient who has had radioactive 177 Lutetium are significant less than that required for the radioactive 131 Iodine thyroid treatment that is common on Ward 64

Although if these patients are admitted to Ward 64 they should be placed in a side room with ensuite toilet facilities. If this room is one of the four specially designed single rooms which have dedicated toilet and shower facilities that are used for the 131 radioactive iodine treatments so much the better as the toilet facilities are plumbed directly through to the sewage delay tanks in the basement of Building 32, but use of these rooms is not mandatory.

Nursing staff should minimise contact with the patient for extended periods of time but could certainly access the room to carry out regular nursing duties.

Urine samples can be taken and assessed by physics staff to determine radioactive concentrations if this is required

The FOLLOWING PROCEDURE is suggested for handling emergency acute admissions to Hospital for out-patients who have recently undergone THERAPEUTIC procedures using radioactive 177 Lutetium material at a private care facility.

- Ward 64 should be the ward of choice for admission.

- An initial check should be made to establish whether the patient is still under radiation safety instructions of the Clinician or Establishment providing the treatment. All patients who have had therapeutic radioactive material treatments should be given a radiation safety instruction sheet by the administering Clinician or Establishment at the time of treatment.
- This sheet should indicate the last date for the radiation safety restrictions to be in force. If the date is past then no special precautions need be followed.

- If the last day has not yet passed then the patient should be considered radioactive and placed in a side room with ensuite toilet facilities (this can be one of the 131 Iodine ablation therapy side rooms), pending radiation safety assessment.

- Access to the room by nursing staff should be minimised where possible and gowns and gloves should be worn (overshoes if any urinary continence is suspected or confirmed)

- Blood samples can be taken if required

- Assistance of a Medical Physicist should be sought (on call physicist over weekends) to carry out a radiation assessment in conjunction with the Clinician and decide whether the isolation situation needs to continue or whether de escalation can be carried out and the patient moved elsewhere.

- At discharge the patient simply continues to follow the radiation safety instructions of the Clinician or Establishment providing the initial treatment until the last day indicated.

Allan STEWART
Medical Physicist
July 2019

RADIOACTIVE IODINE THERAPY

GUIDELINES FOR NURSING STAFF

WARD 64 Auckland City Hospital

Charge Nurse Ward 64
and
Allan Stewart
Medical Physicist Auckland City Hospital

May / December 1992 / nursing information section update February 2000/ March 2002

/ radiation protection update November 2003 and May 2005(A Stewart)

/ general update July 2007and March 2014(A Stewart)

/ general update June 2020 (A Stewart)

CONTENTS

RADIOACTIVE 131-IODINE (131-I)

NURSING INFORMATION

GENERAL

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Radiation exposure above background can arise from sources such as medical diagnostic radiation both from x ray sources and radionuclides (radioisotopes). Certain occupational groups are subject to radiation above background levels in their work. Included in this group are those that come into contact with patients undergoing therapy with radionuclide sources and those who work in x ray departments. Radiation exposure from necessary medical procedures are not however included in the determination of the occupational radiation exposure status of the individual.

(It is also interesting to note that modern air travel at high altitude, results in a small increase in radiation exposure to air crew and members of the travelling public).

When using radionuclides for therapeutic purposes consideration must be given to the potential for radiation exposure (however small) to nursing staff and visitors in the hospital environment as well as other people in the home environment.

The radionuclide 131-I, as Sodium Iodide (NaI), is used in cases of thyroid disease for its ability to concentrate in the thyroid gland and destroy thyroid tissue. It is administered as a capsule (or occasionally as a solution) by a trained Medical Physicist on prescription from a licenced Medical Practitioner.

The radionuclide circulates in the blood stream with concentration in thyroid tissue. Excretion is via the kidneys and thus the urine is highly radioactive. However other body excretions such as perspiration, vomit and saliva do contain small amounts of radioactive material Although concentration is in thyroid tissue, organs such as oesophagus, stomach, kidneys and bladder do receive radiation.

Radioactive decay of the 131-I results in the emission of both beta particles and gamma rays.

Beta particles travel only a few millimetres in soft tissue before expending all their energy and this is what delivers the locally absorbed dose to thyroid tissue.

Gamma rays produced by radio-isotopes distribute their energy throughout the body, and significant amounts can pass out of the body without a reduction in intensity. While these gamma rays are useful in imaging the distribution of 131 – Iodine in the body, they do result in radiation dose to persons near to the patient.

In addition to the radiation that penetrates out of the body, a large proportion of the radioactive iodine is excreted in the urine over the first 48 hours and lesser amounts on subsequent days. Much smaller amounts are present in saliva and perspiration, as noted above. Consequently, avoiding contact with body fluids whenever possible is important, as is the checking of items in the patient's room for contamination prior to removal for disposal.

By 72 hours, the risk of contamination from body fluids is minimal.

During the first 12 hours any vomiting will result in loss of 131-I in the vomitus.

For treatment the patient is admitted to one of the four specially designed single rooms which have dedicated toilet and shower facilities. Additionally, the walls of these rooms are constructed of concrete to afford the correct amount of radiation shielding to surrounding are

RADIOACTIVE MATERIAL

In general, radioactive material undergoes physical decay with time, and in addition if the material is introduced into the human body, is subject to biological excretion with time.

Both processes result in a time dependent reduction in the amount of radioactivity present in the patient, with a corresponding reduction in radiation dose in the patient's vicinity.

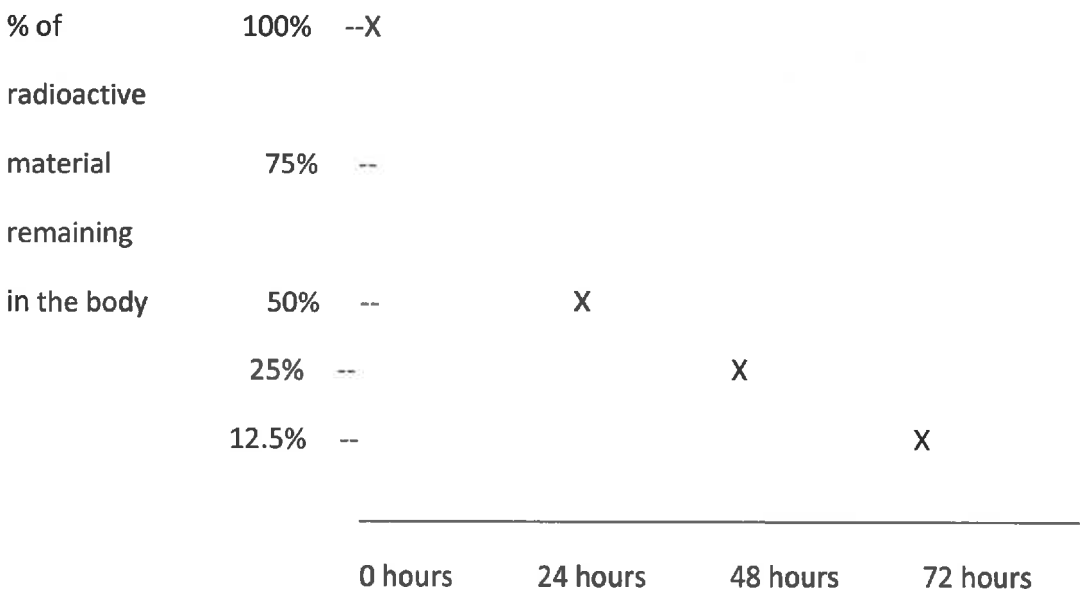
Factors affecting radiation dose rate from the patient.

1. Time

The radiation emitted from patients after administration of 131-I is at its greatest during the first 24 hours in most cases. In the cases of patients admitted for treatment of thyroid malignancies, at the end of 24 hours following 131-I, approximately 50% of the radioactive material has been excreted in the urine. Thus the radioactive emissions from the body are half that which immediately followed administration.

Table 1. Decay in time of radio-active emissions following 131-I.

This results from both physical decay of the radioactive iodine and its biological excretion.



If there is a requirement to enter the room the time spent close to the patient should be kept to a minimum. (see also the section below on the use of the mobile lead shield)

2. Distance

The radiation dose rate varies inversely as the square of the distance from the source, the further away from the patient, the less radiation.

With each doubling of the distance from the patient, the radiation dose rate is quartered, i.e. reduced to 25% of the original level.

Radiation surveys in and around the side rooms used for 131 Iodine ablation therapy have not demonstrated any significant radiation doserate above background at the doorway with the patient seated on the bed or chair by the window. Doors from the corridor leading into the room were left open for the assessment and are therefore NOT required to be closed during treatment. This means that staff may safely stand at the patients doorway as long as the patient is at least 3 metres away. However as an extra precaution a mobile shield is provided at the door for staff to stand behind when in the doorway.

PATIENTS ROOM

PATIENT'S BED

	A	0.6 m	++ radiation
	B	1.2m	25% of the radiation at **A**
Doorway	**C**	>3 metres	Background levels only

3. Shielding

At times it may be necessary to move closer to the patient to administer medication for example. In addition to the other precautions such as wearing of gloves etc., nursing staff should walk into the room behind the small mobile lead shield provided at the door

PATIENT'S ARRIVAL IN THE WARD

On the morning of the planned treatment patients will be seen by an Endocrinology Clinician at Greenlane Clinical Centre before travelling to Auckland Hospital. The treatment prescription for the iodine will be signed during this consultation along with other instructions for patient rouine medication while in the Ward

Nursing staff will carry out the usual patient assessment.

Go through the 'patient information' sheet with the patient and family, ensuring that both the patient and the family understand their roles following administration of 131-I. The patient will also have an information sheet sent to them by Endocrinology prior to the appointment for treatment in hospital. They will also have a green sheet with radiation safety instructions to be followed after discharge

The treating Physician is responsible for obtaining informed consent for the therapy. This will carried out at the Endocrinoplogy Department at Greenlane Clinical Centre. They will also arrange for any blood samples required. The hospital admission documentation will have been completed and this will be sent with the patient.

Where appropriate a pregnancy test will have been requested and a mandatory negative result is required before therapy proceeds. This will be entered on the physical 131 Iodine prescription form, accompanying the patient.

Patients on thyroxine replacement therapy will have stopped this medication prior to the radioactive iodine treatment. They will also have been advised when to restart (this varies but is usually a day or two after the iodine is given. They will also have an appointment for a whole body scan at the Nuclear Medicine Department at either Auckland Hospital or Greenlane Clinical Centre the following week.

Anti nausea medication will have been charted by the Endocrinology staff at Greenlane Clinical Centre along with any other medication required. This should be given to the patient in preparation for the radioactive iodine

The Physicist responsible for giving the iodine will arrive on the Ward at 12.00 midday. If for any reason the patient is not ready please notify the Physicist on Extensions 24095 or 24093 or mobile 021918107.

The Physicist will often reinforce radiation safety aspects of the treatment and also patient conduct after discharge according to the green safety sheet given to the patient as part on the consent process at Greenlane Clinical Centre. If the patient does not have a green sheet the Medical Physicist will provide one . The Physicist will then collect the iodine capsule from the radioisotope laboratory and administer it to the patient. This will be entered in the patient's note

NURSING ASSESSMENT

Patients are assessed at Endocrinology clinic at the Greenlane Clinical Centre prior to arriving in the ward as to their suitability to have this therapy and and also to comply with the precautions necessary after administration of 131-I.

However, if the nurse feels that the patient is not, or has the potential not to be in a suitable condition for this therapy and all it entails, she/he must discuss this with the Endocrinology team.

Factors to be considered:

1. Continence

Patients who exhibit the potential for incontinence of urine present an unacceptable risk to nursing staff, and should not receive 131-I unless in the nurses opinion, continence can be assured by regular toileting.

4. Potential for vomiting

Any patient who may vomit within the first 12 hours despite anti nausea medication must have the therapy delayed until their condition stabilises and the risk of vomiting subsides

2. Cognition

Those patients who show signs of confusion or intellectual impairment need to be carefully assessed as to their ability to comprehend and observe the precautions outlined for distance isolation and for dealing with body fluids via the on suite toilet facilities.

3. Ability to self-care

Patients for 131-I therapy should be independent. Any patient who requires nursing care should be assessed as to the degree of nursing input necessary. Patients who require more than 15 minutes of close nursing attention per duty may not be suitable for 131-I.

Spending time with the patient prior to the therapy and going through the information sheet step by step does much to assist the patient to learn the process and our expectations for their part in their hospitalisation. The Medical Physicist will be able to assist with the radiation safety.

If the patient is not fluent in the English language you may need to enlist the help of a bilingual relative or the translation service. It is crucial that you are quite sure of the patients understanding of the process prior to the administration of 131-Iodine.

PATIENT INFORMATION

RADIOACTIVE 131-IODINE THERAPY

Welcome to ward 64.

Your stay in Hospital will be approximately 2 - 4 days.

We have assigned you a single room with a toilet and shower so that others are not affected when you have radioactive iodine in your body.

After you have settled into your room, the Nurse will talk to you about your hospital stay and take your temperature, pulse and blood pressure etc, and to discuss any medications that you may require.

Very few people experience side effects after taking radioactive iodine, but there is a slight possibility that you may feel queasy as a result of it. To make sure that you don't, the Nurse will give you medication before you are given your radioiodine, and afterwards at your request.

When this is completed, the Medical Physicist will talk to you and outline the process of the administration of the iodine, and also what is necessary after your discharge from hospital. Following that the Physicist will bring your radioactive iodine which is contained in a small capsule transported in a special plastic tube. The physicist will explain the removal of the end cap from the tube and then how to place the open end in your mouth , tilting your head back until the capsule falls into your mouth to be swallowed with a drink of water

Subsequently the Physicist will visit you every day to check the radiation levels, and will advise the nurses as to when you can go home.

Once you have taken your radioactive iodine **you must remain inside your room,**

While your body contains radioactive iodine your visitors must be restricted and signs will be placed outside your room

DAILY SHOWER

You may have a shower when you wish - discard any hospital linen into the hamper inside your room.

HOUSEKEEPING

We would appreciate it if you would make your bed and tidy your room.

Any rubbish can be placed in the bag marked 'rubbish' inside your room. The Physicist will remove this daily for radioactive contamination checks.

Soiled linen must be placed in the linen hamper inside your room.

The Nurse will bring you any clean linen you may require.

ROOM DOORS

There is no requirement to have either of the outer doors leading to the ward corridor closed for radiation safety purposes. They can be open or closed as the patient requires

MEALS

Fish and seafood food should be avoided prior to the iodine drink and for 2 hours afterwards. Thereafter there are no dietary restrictions.

The nurse will place your meal tray on the table just inside the outer door to the corridor outside your room. When you have finished your meal, please scrape any leftover food into the bin marked 'food scraps'. **The cutlery should be plastic and must be discarded in the rubbish bin in your room.** If the cutlery, cups and plates are of the disposable type, place them in the dry rubbish bag. Otherwise rinse cutlery,cups and plates under the tap and return them to the food tray. Place your food trays on the table at the floor by the door and staff will remove them.

You can pour any leftover liquids down the sink.

Your jug of water will stay in your room and this may be refilled from your tap.

Any food or fluids brought in for you must remain in the room until you leave. Any disposable containers must be placed in the rubbish bin in your room.

TOILET

Your urine will contain radioactivity. Please be conscious of hygiene and also flush the toilet twice afterwards.

ENTERTAINMENT

To entertain yourself you may bring items such as knitting, painting, reading / writing material, T.V., radio(with earphones please) etc.

NURSING CARE

You will have a nurse assigned to you for each 8 hour shift, they will be different nurses every day.

If you have an enquiry or request, please ring your bell to summon your nurse.

When the nurse arrives, they will listen to your request from the doorway. Please remain 3 metres away from the doorway while they are there.

MAIN POINTS

- **Remain inside your room. The door(s) can be left open if required**
- **Anything that comes into your room must remain inside the room until you go home. However you can take home with you whatever you brought in with you**

- **Keep a 3 metre distance between yourself and the staff**
- **Visitors are generally discouraged particularly on DAY 1**
- **On subsequent days visitors are permitted but only for a maximum of 15 mins at a time and are to remain at the door and observe the restrictions on the sign.**
- **NO sharing of food or drinks with visitors is permitted**

We hope that your stay with us is comfortable and restful.

Nursing staff

Ward 64

PREPARATION OF PATIENT'S ROOM PRIOR TO RADIOACTIVE 131-IODINE THERAPY

Prepare one of the shielded single rooms

Equipment:

Linen trundler with **white** linen bag.

2 rubbish bins with **white** plastic bags: - one marked **'rubbish'**

- one marked '**foodscraps**'

1 vomit carton

soap / towels / face cloth

1 fluid jug and glass

patient information sheet

Bed

It is not necessary to place any additional lead shields around the bed. The walls of the room have been designed to provide adequate radiation shielding to the surrounding areas.

Toilet area

1 rubbish bin with **white** plastic bag

Outside of room

2 long sleeved gowns (only required for emergency situations)

box of gloves

Yellow absorbent material and plastic 'spill' sheet. These are usually found in a slot in the back of the mobile shield

Radiation warning signs and instruction signage

Make sure that you know where to locate the mobile shield and the warning signs. The signs will be displayed by the Physicist after the radioactive iodine is given to the patient

POST ADMINISTRATION NURSING CARE

The activity (amount) of radioactive 131-I prescribed for these patients is relatively large, between 3.5 GBq and 7GBq (GBq : gigabecquerel).

The instructions for nursing care reflect this.
The Physicist will hang the 'radiation warning' and 'any other necessary' signs outside the room.

Leave the patient's doors open unless they wish them to be closed.

NURSES LOOKING AFTER THESE PATIENTS ARE TO WEAR THEIR RADIATION MONITORING DEVICE (Thermo Luminescant Dosimeter "badge") DURING THE ENTIRE SHIFT

If you need to enter the room:

- wear a gown and gloves
- do not stand within three metres of the patient for more than 15 minutes per 24 hours
- avoid direct contact with the patient where possible

If you absolutely must perform a nursing duty close to the patient, keep the mobile shield in front of you. (This reduces radiation exposure considerably)

Before you leave the room:

- wash your hands with gloves still on
- discard your gown and gloves inside the room
- carefully wash your hands in the closest handbasin outside the room

If you are pregnant or suspect that you may be pregnant you should not enter the patient's room.

Talking to the patient from the doorway is perfectly safe for all staff including those who are pregnant, as long as the patient is three metres away standing at the back of the room. The mobile shield may also be used.

Any articles which are brought into the patients room must be left inside the room and may not be removed until declared safe by the physicist. (Patients may take their property home on discharge)

The patient must remain inside the room at all times. However it is not necessary to shut the door

Linen can be discarded in the linen hamper inside the room

Medications and meal trays are placed on the table outside the room and the patient asked to collect these after the nurse has left.

Foodscraps are discarded by the patient in the special bin provided.

Liquids may be poured down the sink as it is the container rather than the liquid that is contaminated.

If meals are served on disposable plates with plastic utensils and cups then all items are to placed in the rubbish bin in the room. The trays can then be placed at the door for collection. If crockery and cutlery is not disposable then the patient should rinse the items after disposing of liquids in the sink and foodscraps in the rubbish bin, and then return the items to the tray which is then placed by the door for collection.

Staff members providing beverages should be reassured that it is safe to leave the drinks on the table just inside the door.

The patient is expected to self care, and should make their own bed etc. If they are unable to do so, the nurse, wearing gown and gloves can quickly make the bed and do other chores necessary for no more than 15 minutes for that duty period.

If practical, have the patient sit within the en suite area while you attend to the work to minimise radiation exposure to you.

Urine is radioactive and so any incontinence will pose a problem

radiation levels The physicist will monitor radioactivity levels regularly and is available for information and advice: Results of the monitoring and any comments will be entered in the patient's chart at each visit.

0800 - 1700 hours Mon to Fri.	**ext 24095 or 24093 or mob 021918107**
0900 – 2100 hours Weekends	**phone 'on call' Physicist via the hospital**
	24 hr Centre telephone

Ablation therapy is considered to be free of risk to staff as long as the precautions outlined are adhered to. Monitoring is done continuously by the Physicist, and no staff member has received any detectable radiation as a result of caring for patients after this therapy.

No radiation has been detected from tests at the doorway to the room of patients who have received high doses of 131-I or in the adjacent room.

It is important that nurses are well informed and comfortable with all aspects of this therapy, and the role of the nurse in patient care.

Nurses can do much to allay feeling of loneliness and isolation that the patient may experience during their isolation period, by stopping in the doorway to chat, informing the patient of their progress (in conjunction with the Physicist) and by providing explanations of the isolation process as required

OF BODY FLUIDS

Radioiodine is excreted mainly in the urine. There is very little activity in the faeces.

Anti nausea medication is given to prevent expulsion of the medication from the stomach before it is absorbed.

If the patient should vomit during the first 12 hours, or become incontinent of or spill urine at anytime:

- do not attempt to clean it up, simply cover the area with absobent material provided at the door or paper towels.
- if you step into the body fluid, step out of your shoes and leave them behind
- remove any clothing that has contacted the body fluid and leave this in the room
- if your skin has contacted urine or vomitus, wash this off with copious amounts of water straight away - if necessary you may go to the shower
- keep people 2 to 3 metres away from the spill
- do not allow any person who has been near the spill to leave the area until cleared by the Physicist
- **contact the Physicist for advice and assistance**

0800 - 1700 hours Mon to Fri.	**ext 24095 or 24093 or mob 021918107**
0900 – 2100 hours Weekends	**phone 'on call' Physicist via the hospital**
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In an emergency only:

Throw absorbent material or paper towels over the spill

Place the plastic spill sheet over the paper towels

You can now walk over the plastic sheet to the patient

EMERGENCY CARE OF THE PATIENT AFTER 131-I

Wear gown and gloves before entering the room

Adhere to the 'care of body fluids' guidelines in the case of the presence of body fluids

Use the 'blob mask' and laerdal bag to ventilate the patient Is this current practice?

Change staff working within 2 metres of the patient every 15 minutes

If any person has to remain with the patient for more than 15 minutes, that person must work from behind the mobile lead shield.

Maximum time within 2 metres of the patient without the lead shield is 15 minutes per person

Organise equipment so that procedures such as drawing up drugs are done 2 metres from the patient.

Notify the Physicist

0800 - 1700 hours Mon to Fri.	**ext 24095 or 24093 or mob 021918107**
0900 – 2100 hours Weekends	**phone 'on call' Physicist via the hospital**
	24 hr Centre telephone

Do not remove any equipment or allow any staff member who has attended the patient to leave until checked by the Physicist

DISCHARGE

The level of radiation doserate around the patient is monitored daily by the Physicist. When this has reduced to the required level the patient is now ready for discharge from isolation from a radiation protection perspective. The Physicist will note this is the patient chart. This is usually on the 2 nd or 3rd day. Occasionally this may be longer depending on the retention of the radioactive iodine by the patient.

No medical or nursing personnel may discharge the patient until the Physicist clears the patient for discharge, but the patient may be kept longer if it is decided that this is necessary for the patients wellbeing or if other clinical work has to be done. If this occurs, isolation should still continue, although the radioactive emissions will have lessened considerably.

Following the discharge process the patient must remain in the room until ready to leave the hospital. It is **not** permissable for the patient to wait in the TV room or the discharge lounge.

After the patient is discharged, the room and its contents are then left undisturbed. The signs denoting radioactivity are to be left in place until the room is declared free of radiation contamination by the Physicist. The Physicist will remove any contaminated rubbish and linen.

Once the room is officially cleared, the Physicist will remove the radiation warning signs. Precautions may then be discontinued and all articles left in the room may be discarded in the usual manner.

Patients are discharged into the home environment with various isolation restrictions placed on them. The length of time the restrictions are in place depends on initial activity and clinical status (rate of excretion etc). These restrictions govern physical segregation in the household, in particular avoiding young children and women who are pregnant, avoiding public places and transport and when to return to work. (In the latter case someone who works outdoors on a farm could return to work sooner than someone who worked in a restaurant or a playschool). Generally this has been covered at the assessment and follow up appointments in the clinic and by and large these patients are well versed in what they can and cannot do. The Physicist will be able to help answer any radiation protection questions that they may have. Additionally the patient will have been given a green coloured sheet with details of the restrictions and the length of time that they are in place. These are normally given to the patient by the prescribing clinician as part of the consent process. If this is not available pr perhaps misplaced the Physicist will provide one. However the patient MUST have one when leaving hospital

Medical Physics

ONCOLOGY PHYSICS extension 24095 or mobile 021 918107

Auckland City Hospital

MAY 1992 (UPDATES: OCTOBER 1994

MARCH 1995

OCTOBER 1997

MARCH 2002

MAY 2005

JULY 2007

MARCH 2014

JULY 2017 (capsule)

JUNE 2020

Background information on radiation doserates in the vicinity of the patient and the Ward in general

Radiation doserates

Generally radiation surveys using special calibrated instruments to measure doserates in absolute units of µSieverts / hr are carried out from time to time. These are required to ensure compliance with the New Zealand Radiation Safety Codes of Practice. These are drawn from th eRadsiation Safety Act which in turn is based od international standards set down by the International Commission on Radiation Protection

Obviously the doserates around the patient and in the vicinity of the treatment room would vary with the activity given to the patient and the time since it was given. However, typical doserates at the mid point of an average activity iodine 131 treatment in side rooms such as those in Ward 64 would be:

Position	Dose rate (2GBq)
@ 0.5m from patient's chest	190 uSv/hr
@ 1.0 m from patient's chest	70 uSv/hr

@ bedside	85 uSv/hr
@ bedside with LEAD SCREEN	13 uSv/hr
doorway of iodine treatment room	4 uSv/hr (max)
	1.7 uSv/hr (generally)
middle of corridor opposite door of iodine treatment room	1.3 uSv /hr

Note 1milli Sievert (mSv) equals 1000 micro Sieverts (µSv)

To provide some perspective on the small level of radiation present outside the room, consideration should be given to the levels at the doorway to the iodine therapy room. Using the mean ionisation chamber reading of 1.7 uSv/hr, assuming all patients remain 48hrs, and ratioing for an annual workload of 160 GBq prescribed activity for 40 patients, the total dose at the doorway would be some 6.5mSv (6500uSv).

This is not large considering the annual level of background is 2mSv (2000µSv). To receive 6.5mSv (6500µSv) absorbed dose a person would have to remain constantly at the maximum doserate area of the doorway for 48 hrs for every one of the 40 patients undergoing therapy. By comparison, a CT chest study delivers an effective dose of 7mSv and a whole body CT around 10mSv (Health Physics Society fact sheet, Jan 2010)

- To reach the maximum annual permissible dose of 1mSv (1000µSv) for the general public, would require positioning at the door constantly for about 7.5hrs for every one of 40 patients treated annually.

- Standing at the door for 30 hours would result in the same radiation dose that you receive on a 10 hour aircraft flight at high altitude

Occasionally there may be a requirement to isolate a patient who has had an amount of radioactive iodin rmuch lower than that described above. Guidelines for this scenario are described below

GENERAL GUIDELINES for LOW ACTIVITY RADIO ACTIVE IODINE AUCKLAND CITY HOSPITAL

131-RADIOIODINE THERAPY : NURSING OF WARD PATIENTS WITH ADMINISTERED ACTIVITY UP TO AND INCLUDING ONE THOUSAND MEGA BECQUERELS (1GBq)

(INDIVIDUAL LICENCEES MAY ADD FURTHER RESTRICTIONS AS APPROPRIATE PARTICULARLY IF THE PATIENT IS ADMITTED TO ANOTHER HOSPITAL)

Generally, patients receiving an administered activity up to and including one thousand mega-becquerels of 131-Iodine can return home under the direction of the licencee, provided certain restrictions pertaining to the journey time, mode of transport used, numbers and ages of family members in the same home and the desirability of avoiding places of entertainment are followed. These restrictions can be in place for up to 14 days depending on circumstances. A example of the green information sheet that patients receive from the clinic prior to agreeing to this type of radioiodine treatment is included in the ablation therapy manual. This is done for staff information only.

In certain cases activities of up to one thousand mega-becquerels may be administered to patients in the ward and the usual extensive restrictions on isolation (refer to protocol for activities greater than one thousand mega-becquerels) will obviously not apply. However some simple rules are suggested to cover the period of hospitalisation.

1. Patient to be in one of the four rooms designed for radiation therapy. They should not be placed in a general ward. All patients must pass urine sitting down and the toilet shall be flushed twice. A radiation warning sign is to be placed outside the door of the room at eye level.

2. No visiting restrictions in terms of time spent with patient need apply. However visitors should not be closer than 2 metres and children or pregnant women should not be allowed to visit the patient.

3. Patients should be discouraged from making visits to other parts of the ward. For example not to spend time in day room watching television. If the patient is required to attend other departments for investigation, the clinician in charge/licencee must authorise these and should give instruction as to protection requirements.

4. Nursing staff are free to make short visits to the sideroom/ward and patient consistent with carrying out their duties. They should wear disposable gloves particularly if changing bed linen. Staff who are pregnant should not attend the radioiodine patient.

5. A large % of the radioiodine material is excreted in the URINE. If the patient requires a bedpan caution must be exercised by nursing staff in transferring the urine to disposal. In addition a plastic

apron

and gloves should be worn and the bedpan should be well flushed before returning it to use. Urine samples for laboratory analysis should not routinely be taken without consulting the clinician in charge/licencee

* NB - For patients known to be incontinent of urine special arrangements have to be made prior to 131-Iodine therapy. However should unexpected urinary incontinence occur clothing and bed linen should be handled wearing an apron and gloves, and checked for level of contamination by a physicist or the licencee.

6. Discharge of the patient and the subsequent precautions at home are the medical licencee's responsibility.

7. Generally no special precautions are necessary relating to the cleaning of the ward after the patient's discharge. However this can be checked with the physicist or licencee.

Medical Physics

ONCOLOGY PHYSICS EXT 24095

AUCKLAND HOSPITAL

MAY 1992 (UPDATES: OCTOBER 1994

MARCH 1995

OCTOBER 1997

MARCH 2002

MAY 2005

JULY 2007

REFERENCES

New Zealand Radiation Protection Act 2016

New Zealand Radiation Protection Regulations 2016

Code of Practice for Radiation Therapy. ORS C3 New Zealand Office of Radiation Safety

Code of Practice for Nuclear Medicine. ORS C2 New Zealand Office of Radiation Safety

PATIENTS having RADIOACTIVE 131-IODINE Therapy

TUTORIAL for NURSING STAFF involved (updated 2017 and 2020)

General Overview of radionuclides

- Iodine131 is a radioactive material used to treat patients with Thyroid Cancer .

- The radioactive material poses a number of different radiological protection problems, not only for ward staff, but also for family and members of the general public. Contamination of body fluids is frequently a problem.

- Iodine 131 gives off two of different *types* of radiation. Beta particles and gamma rays.

- Additionally the radioactive half life is considerably longer (8.04 days) than the radioactive 99m Technetium (6 hrs) used by Nuclear Medicine for diagnostic imaging scans. This means that the radiation is present for much longer in the case of Iodine 131

- Beta particles only travel a short distance & stay inside the patient's body carrying out the treatment, whereas the Gamma rays are much more penetrating and are the main problem for radiation protection because they penetrate out of the patient's body. This, in addition to the urinary excretion, is why we have to take precautions.

131 – Iodine

In the chemical form of sodium iodide
Physical half-life of 8.4 days (how long it takes for the radioactivity to halve)
The beta particles have a maximum range in tissue of 3mm
Also emits high energy gamma radiation.

- Iodine 131 is a widely used radioactive source. It is given orally for treatment of both benign and malignant thyroid conditions.

- Radiation safety is a major consideration when delivering 131-I therapy. The patient effectively becomes a source of radiation.

- Personal Protection Equipment (gloves mainly) should be worn if attending to a radioactive patient because large amounts of the Iodine are excreted in the urine. Also some is excreted in saliva and perspiration as well.

- The scale of radioactivity for treating patients with radioactive iodine ranges from 300 megabequerels (MBq) up to 10 gigabequerels (GBq) and where prescribed levels of radioactivity are at the lower end of this scale the patient can remain as an outpatient. However radiation safety of members of the immediate family and indeed the general public is important. For higher levels of radioactivity patients need to be admitted to the Ward and obviously when patients are on the ward, protection of ward staff and other patients is very important.

- Patients who receive radioactive iodine to treat thyroid cancer and metasteses are admitted to the ward & stay in rooms 1-4 where access is restricted. Radiation dose rates are measured around the patient until a level is reached when the patient can go home.

- After discharge other restrictions are also in place for the patient. These restrictions are:
    - Physical separation from other people in the household, in particular avoiding young children and women who are pregnant, sleeping alone etc.
    - avoiding public places and transport
    - And when the patient can return to work. (In the latter case someone who works outdoors on a farm could return to work sooner than someone who worked in a restaurant or a playschool).

- Acceptance of the restrictions and obligations towards family and the general public, is an important part of the consent process for this treatment.

- The use of Radioactive Materials for therapy is governed by the New Zealand code of safe practice which outlines the "ALARA principle" which means that exposure to people other than the patient is kept
  As Low As Reasonably Achievable

- Contra indications to radioactive iodine therapy are a decreased life expectancy, incontinence, pregnancy, breastfeeding and a major inability to self-care when in isolation.

Radiation Protection / Safety

Three important principles to bear in mind to minimise radiation exposure particular from gamma emitters such as radioactive iodine 131

- **Shielding**

  High atomic number materials reduce the intensity of gamma radiation.

  Examples are the concrete in the wall of the four specially designed treatment rooms and both the fixed and mobile lead shields. Also the radioactivity is transported in lead containers.

- **Distance**

  Inverse square law for radiation dose.

  Double your distance from a source of Radiation and the dose rate reduces by a factor of **four**.

  Thus, minimising the time spent close to sources is very important.

- **Time**

  Generally, all procedures involving radioactive material should be carried out as quickly as possible.

  Nursing the patient is generally kept to a minimum. Accessing the room to deliver medication should be done while standing behind the mobile lead shield.

- **General:**

  If you are the nurse looking after the patient having radioactive iodine treatment, wear your monitoring TLD "badge" during your shift. It would be important in assessing your radiation dose if you had to attend the patient in an emergency

- Additionally it is important to understand that linen and rubbish in the ward could be contaminated and so wearing of gloves is very important in the vicinity of the patient. There are special requirements for handling the linen and the rubbish and indeed the room in general, after the patient goes home. There are also special rules that govern what should happen in a clinical emergency.

- **Because the radioactive material gives off radiation all the time and is in the patient's body the radiation cannot be switched off. The rules governing these patients whilst in hospital are therefore very strict.**

- The aim is to minimise the radiation dose to members of staff and other patients while the patient is in hospital.

To achieve this patient stays in a side room and generally looks after themself.

They are not permitted to walk around the ward or to visit the lounge.

All routine diagnostic examinations are carried out **before** therapy is commenced.

Other patients and visitors are subject to the instructions displayed at the door and are NOT permitted in the room at all but may stand at door. However, in general visitors are discouraged and are NOT permitted at all on day 1

Warning signs are required at the door.

Linen and rubbish bags are to be kept in the room until monitored by physics staff.

When cleared for discharge the patient must stay in the room until ready to leave the hospital and then go straight home. Use of the transition lounge is not an option. However, when cleared, the patient may attend Nuclear Medicine for a scan prior to leaving the hospital.

Meal trays are delivered to the door for collection by the patient and the patient returns the tray to the door for removal after dealing with the crockery, cutlery and plates as per the general instructions in te Ward information document

Discharge:

The Physicist will verbally discharge the patient when their radiation doserate is at the acceptable level, after ensuring they have a followup appointment for a scan and to see tha Clinician thereafter. The patient will let the ward clerk know when they leave the ward & the Physics staff will come up and check the room for radioactive contamination. Once cleared the room can be cleaned as per usual procedures

Cleaners are not permitted in the room until it has been cleared by physics staff.

Physics will let reception know when the room is ready to be cleaned

Radiation doserates

Generally radiation surveys using special calibrated instruments to measure the doserate in absolute units of micro Sieverts/hour are carried out from time to time.

The doserate in the corridor outside the patient's room is very small

If you stood outside the door for 30 hours you would receive the same radiation dose that you get on a 10 hour aircraft flight at high altitude.