High Dose Radioactive Iodine (I-131) Therapy for Treatment of Thyroid Cancer

What is radioactive iodine?

The radioactive form of iodine is also called radioiodine. It has been used for over 50 years to treat hyperthyroidism and thyroid cancer. This kind of treatment is used to kill any cancer cells that may have been left behind after thyroid removal, treat thyroid cancer that has spread (called metastases) or treat recurring cancer

Am I radioactive after treatment?

Yes, but only as long as the radioactive iodine remains in your body. Some radioactive iodine stays in your remaining thyroid tissue to get the desired treatment effect. The rest is eliminated in your urine, saliva, sweat and bowel movements. Most of the radioactive iodine that your thyroid does not use comes out the first 2 days after treatment. The amount you eliminate decreases after that. You need to follow precautions for 7-10 days to make sure you do not expose anyone to radiation after your treatment.

How are other people exposed?

The radiation given off by radioactive iodine in your body is similar to x-rays. People who stay close to you for long periods of time may be exposed to unnecessary radiation as well. They may also come in contact with small quantities of radioactive iodine eliminated by your body through urine, saliva or sweat. This is why you must follow special precautions for 7-10 days.

Time
The less time you spend around other people the better. This is very important with children and pregnant women. Avoid being close to pregnant women and children for at least 7-10 days.

When you are around people, spend no more than:
- 45 minutes a day at 1 meter or 3.5 feet or
- 2 hours a day at 2 meters or 7 feet or
- 7 hours a day at 3 meters or 10 feet

You can spend as much time as you like at 4 meters or 13 feet from other people. You may need to take time off work or school to meet these guidelines.

Distance

The greater distance from other people the better. For example, doubling your distance from someone decreases exposure by a factor of ¼. Examples of increasing distance include:
- Sleep alone.
- Do not sit right beside someone on a couch or in a vehicle.
- Sit as far away as you can from the person driving you home from the hospital.
- Do not use public transit.
- Do not go to the theatre or any event where you would be close to people.

You must sign a "Informed Consent" form on the day of your treatment. By signing this form, you are indicating that you agree to follow the special precautions in order to minimize radiation exposure to yourself and members of the public.

What about pregnancy?

Radioactive iodine treatment is not given during pregnancy. You should wait 6 months after treatment before becoming pregnant or fathering a child. There

may be other reasons why you should avoid being pregnant so talk to your doctor about this.

What about breastfeeding and caring for a baby?
You cannot breastfeed since radioactive iodine is secreted in breast milk. Limit time spent in close contact with your baby for 7-10 days. After 7-10 days, you can care for your baby again.

What is important after treatment?

Hygiene – Good hygiene is very important to reduce exposure to others. The following should be adhered to:

- Wash your clothes separately from your family's
- Use separate eating utensils, cutlery etc.
- Refrain from all contact with young children and pregnant women for 10 days
- Restrict close contact with other adults for 3-7days (this includes hugging and kissing)
- Avoid sharing a bed with another person for 3-7 days (this includes sexual intercourse)
- Wash your hands with soap and plenty of water each time you use the toilet.
- You must have at least 1 shower a day.
- Rinse the shower out after using
- Keep the toilet and surrounding area very clean.
- Men should urinate sitting down to avoid splashing.
- Flush the toilet 3 times with the lid closed after eachuse.
- Rinse the bathroom sink and tub thoroughly after using.
- Use a separate toothbrushthan you family
- After brushing your teeth, spit into the toilet then flush the toilet 2 times.
- Do not chew gum.

Will I stay in the hospital after I-131 treatment or will I go home?

You and the members of your health care team will decide the best treatment for you. Things like the amount of radioactive iodine that is being ordered for you as well as your home living arrangements are considered in the decision.

What happens before my treatment?

Before your treatment the doctor will talk to you about any changes to your medication. You may also be asked to follow a special diet. The diet is explained if you need to follow it. All modifications to medications and diet is intended to limit the amount of substances that may interfere with the adequate uptake of the radioactive iodine—see the table below:

Type of medication to stop:	Mechanism:	Recommended withdrawal time:
Thionamide medications	Interfere with iodination	3 d (can be resumed 2-3 after)
Multivitamins containing iodide	Competitive blockade	7-10 d
Natural/synthetic thyroid hormone	Block uptake	10-14 d for T3; 3-4 weeks for T4
Kelp, agar, carrageenan, Lugol solution	Competitive blockage	2-3 weeks (depending on iodide content)
Super saturated potassium iodide	Competitive blockage	2-3 weeks
Topical iodine (e.g. betadine)	Competitive blockage	2-3weeks
IV radiographic contrast agents:	Competitive blockage	
Water soluble		6-8 weeks (assuming normal renal function)
Lipophilic		1-6 months
Amiodarone	Competitive blockage	3-6 months or longer
Other drugs:		
Phenyl butazone		1-2 weeks
Salicylates		1 weeks
Steroids		1 weeks
Sodium nitroprusside		1 weeks
Benzodiazepines		4 weeks
Miscellaneous agents: Anti-coagulants; Anti-histamines; Anti-parasitics; Penicillins; Sulphonamides; Tobutamide; Thiopental		1 weeks

Women must be certain that they are not pregnant at the time they get the treatment. You may need to have a pregnancy test. If there is a chance that you are pregnant, the treatment is cancelled.

The day of treatment

On the day of treatment do not eat or drink anything for at least 2 hours before your appointment time. This is to make sure the capsule will be absorbed.

Follow-up appointments:

There are 3 appointments:

- Assessment and planning interview
- Treatment
- Follow-up body scan

Information for all Patients

How can I reduce radiation exposure to my other organs? Radioactive iodine that is not taken up by your thyroid is eliminated through your body fluids such as urine, saliva, sweat and bowel movements. Most of this elimination occurs in the first week after treatment. Any radioactive iodine that remains in your body naturally disappears over the next 3 months.

Most of the radioactive iodine is eliminated in your urine. It is important to drink fluids after your treatment and for the next 2 days. This lowers the amount of radiation exposure to your bladder. You may also be advised to suck on sour candies after treatment to help radioactive iodine come out in your saliva.

These guidelines depend on your personal health history. Before your treatment begins talk to the doctor who ordered the test about:

- When to start and stop sucking sour candy if you are allowed to suck candy
- The amount of fluids you should drink

What happens in the hospital?

Since radioactive iodine may be transferred by any body fluids, anything you touch may have radiation on it. Therefore, you use items such as disposable dishes. Permanent fixtures and furnishings in your room are also covered with disposable pads for easy cleaning. Although there is nothing about this treatment that causes nausea, if you should feel sick and cannot get to the toilet, use a basin or trash can.

You have a television and telephone with local calling in your room. To call long distance, you need to bring your own calling card. You cannot have any wireless equipment in the room. This means you cannot use a cell phone or laptop with wireless internet service. You can bring DVD player and/or a radio.

How is the treatment given?

The radioactive iodine is brought to you in a lead container by a nuclear medicine technologist and doctor. At this time, the technologist and/or doctor remind you of the special precautions to follow. You are also given your follow-up appointment for your body scan. You then swallow the capsule whole with a full glass of water. The technologist and doctor leave your room and you start to follow the special precautions.

May I have visitors? No.

How do I get my meals?

Your meals are brought to you and you eat in your room. The person delivering and picking up your tray follows special precautions too.

How do I handle my personal needs?

Bring your own personal items. For example, bring soap, shampoo, a toothbrush and toothpaste. You can wear your own clothing, or you can have a supply of hospital gowns in your room. Since your skin may have radioiodine on it due to sweat, you must shower 2 times and wash your hair at least once a day. Put on clean clothes after every shower.

What guidelines do I need to follow during my stay?

You need to keep up with your personal hygiene. You also need to follow these guidelines in your room:

- Put all leftover food and disposal items such as paper plates, forks, knives, spoons, and cardboard into a small plastic bag after each meal. If you have a snack, bag these leftovers too.
- At the end of each day you should have at least 3 small bags.
- Put all small bags into the large garbage can in your room.
- Make sure nothing is loose in the garbage can in your room.

- Flush all tissues and toilet paper down the toilet.
- Put paper towels in the garbage can in the bathroom.

How long will I be in the hospital?

The amount of time you stay in the hospital depends on the amount of radioactive iodine that has been given and how your body responds. Most people stay 24 to 72 hours. You may be able to speed up the process by drinking a lot of fluids. However, follow the instructions you are given. For example, some people with certain health problems may be advised to limit fluids.
A nuclear medicine technologist or physician comes to your room to monitor your radiation exposure. When you are within safe limits, you go home.

Do I need to follow precautions at home?

Yes. Even though the amount of iodine in your body is very low after discharge, a small amount remains for several months. Before you leave the hospital, you are given guidelines to follow to reduce radiation exposure to others.

Follow-up:

You can restart Eltroxin therapy after 3 days. You will receive a whole body scan prior to discharge.
A follow-up scan will be required after 6 months. Prior to this you will have to stop taking Eltroxin and substitute with T3 up until 2 weeks before the scan. Blood test will be taken to ensure your TSH levels are > 30 IU and that you don't have raised thyroglobulin levels. All these proceedings will be discussed with you and you will be furnished with a definitive plan.

What are the radiation risks involved?

Nuclear medicine procedures are very safe. Your doctor should have discussed the treatment you are having with you and will have considered the benefits of having or not having the therapy, before sending us your referral form. However, if you have any questions at all, please do not hesitate to ask us. Every day we live with all types of risk; this could be from travelling by road, rail or air, smoking a cigarette or using an electrical appliance. There is even a risk from background radiation depending on where we live.

Risks from radiation

There is a 1 in 10,000 chance of dying from a road traffic accident and this is considered very rare. Exposure to any type of radiation increases the risk of getting cancer. This includes naturally occurring radiation. Radiation dose (an amount of radiation) is measured in 'millisieverts' (usually abbreviated to 'mSv') and we naturally receive between 1.5mSv and 7.5mSv from the sun and our surroundings, depending on where we live. This is known as the average level of annual background radiation. Amount of radiation we can give in hospital tests is regulated by radiation protection authorities. We evaluate and test each radiation exposure and give the minimum amount to produce an effective test result. We give substantially less than our colleagues in the USA.

Your treatment

Nuclear medicine uses radioactivity to help diagnose and treat medical conditions. Risk for developing a cancer is relatively low, for example an average dose of 7.4 GBq has an 'effective dose' of 20mSv which gives a predicted lifetime risk of developing a cancer by 1 in 1000. Now compare this to the lifetime risk for developing cancer on its own – 1 in 2.32. This would mean you have to do 430 odd thyroid treatments before you have the same random lifetime risk for developing a malignancy. If you are concerned and/or your test is not identified, we will be happy to discuss this with you when you attend for your test and provide an exact value. Alternatively, see contact details on back page.

What damage can be expected if any?

As with all radiation, there is a theoretical risk of causing tissue damage. When this damage occurs in the DNA or chromosomes, the risk of a mutation in these regions is increased. Such mutations in a developing foetus can cause organ abnormalities or irreparable damage and if early enough with high enough radiation dose can even cause foetal death. Similarly, DNA damage may also lead to mutations that can cause cells to divide unchallenged. This is how cancer develops. The risk again is minimal with scans and only becomes a problem at increased activity associated with radiation treatment.

For this reason, and for safety purposes, all female

patient suspected of being pregnant or uncertain will be tested. For therapy patients, the benefit will be weighed against the risk and discussed with the patient.

Will I be a danger to my family?

The activity involved in therapy is still reasonably low and simply by maintaining a distance of approximately one meter from your relative protects them. There is no need for specialized shielding. In fact since Nuclear Medicine studies use high energy radiation, normally the radiation would simply pass straight through other parson without interacting with tissue. By wearing lead shields etc., you slow the beams down thus allowing it to deposit its energy into the body tissues which is not a desired effect. Finally, by limiting the time of exposure, your family members limit the likelihood that they will absorb any radiation. We recommend limiting time in close proximity to less than 2 minutes.
Even where a pregnant woman is exposed to gamma radiation, we have yet to see any effect to the foetus or the breast tissue. Theoretically it is possible. In practice it remains to be shown.

This informed consent form is based on an information pamphlet from:

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2015/038342/21

PR 0582 700

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