Patient Information

RADIO-IODINE ABLATION
RADIO-IODINE ABLATION INFORMATION SHEET

Mechanism of action

The thyroid is the only part of the body that actively takes up radioactive iodine. It is used by the thyroid to make thyroid hormone. Radio-iodine is an isotope of the element iodine which emits radiation thereby destroying tissue it is concentrated in (remnant thyroid tissue and thyroid cancer).

There are several different dose levels of radioactive iodine we use:

1. Low scanning doses for diagnostic tests,
2. Medium treating doses for overactive thyroid glands, and
3. Higher ablative (thyroid removing) doses for the treatment of thyroid cancer.

Role of ablative radio-iodine

1. Reduces the risk of recurrent thyroid cancer.
2. Removing all the functioning thyroid cells means that the blood test thyroglobulin can be used for monitoring possible thyroid cancer recurrence.
3. Improves the ability of a diagnostic whole body radio-iodine scan to detect metastatic disease.

Do all patients with thyroid cancer benefit from radio-iodine ablation?

No. Some tumours have an excellent prognosis and radio-iodine does not in these case does not improve survival. For example, patients with a single tumour less than 15 mm diameter, no local invasion, no lymph node involvement, and no distal metastases. In addition, there are certain types of thyroid cancer that do not concentrate iodine (eg; medullary thyroid cancer).

Preparation for radioiodine ablation

Radiiodine ablation is generally performed six weeks after thyroid cancer surgery. After the operation patients are asked to avoid substances containing iodine such as iodised salt, fish, kelp, vitamin tablets, cough mixtures, naturopathic treatments or X-rays involving contrast. They are given no thyroxine at this point. Because patients have little if any functioning thyroid tissue, their thyroid-stimulating hormone will rise and residual thyroid tissue or metastases will be stimulated to avidly take up iodine.

6 Weeks before Scan: Stop Thyroxine and Start Tertroxine 3 per day. Avoid Natural remedies and food with iodine (seaweed, fish, iodised salt).

2 Weeks before Scan: Stop Tertroxine. Do not take any thyroid hormones of any type during these 2 weeks. You will feel tired, perhaps puffy around the face and ankles and feel the cold. You may temporarily lose your sense of taste and develop constipation.

3 Days before Scan: Have blood tests. This will test that the TSH is high (greater than 50) and that the T3 and T4 are low. It is also the best time to check that your thyroglobulin level (a blood test for thyroid cancer) is low. If you are female and in the reproductive age range we do a routine pregnancy test as it is harmful to the foetus to have radiation in early pregnancy.

On the day of the ablation the patient is admitted to a lead-lined room with its own bathroom. The radioiodine capsule is given and the door of the room is closed. Patients are not permitted to leave the room for three days and visitors are only allowed to remain for brief periods, sitting on the opposite side of the room. No pregnant woman or small children may visit.

Patients must bring their clothes and entertainment for three days (eg, books and laptops — there is no risk to the hard drive). Anything brought into the room can be taken home. Patients are encouraged to drink large volumes of fluids to increase radioiodine excretion. Men are advised to urinate sitting down to minimise radiation risk, and all patients are asked to double flush the toilet and carefully wash their hands.

On discharge day, patients undergo a whole body scan to ensure there is only uptake in the neck as expected and no metastases are evident. Patients are then started on thyroxine. They are advised not to drive for one week before and after the ablation because of their hypothyroid state.

What are the side effects of radio-iodine?

The most common side effect from radioiodine is nausea, which responds to antiemetics. Some patients notice pain in their salivary glands, which may be alleviated by sucking sweets. We encourage fluid intake to wash the excess iodine out of the system and minimise the dose in the salivary glands. Mostly those symptoms are mild.
The radioactive iodine can be concentrated in the tear ducts and occasionally cause problems with dry or watery eyes.

Very large doses of radioactive iodine can cause cancer such as leukaemia, but this is in cases of much higher levels than normally used to treat thyroid cancer.

If there is thyroid cancer in the lungs, sometimes a high dose of radiation can cause problems with inflammation of the air sacs (alveolitis).

If there is a large area of thyroid cancer of normal thyroid tissue in the neck, radioactive iodine can cause neck pain, or problems with the voice, breathing or swallowing.

**What precautions are required after treatment?**

Avoid lengthy contact with others (eg, long car or public transport trips and the cinema. If a long trip is required to get home, it is safer to defer this trip for a week). Avoid any contact closer than 2m with children or pregnant women. Do not sleep in the same bed as a child and, ideally, not an adult.

Careful handwashing is required when preparing food or going to the toilet. Toilets should be flushed twice and men should sit to urinate. Patients should drink large volumes of fluids. Avoid exchange of bodily fluids (eg, kissing, sex or sharing toothbrushes).

If the patient’s work involves close personal contact, it is advisable to delay a return to work for a week. If the patient works alone they may return to work immediately.

Women are advised not to become pregnant for at least six months after radioiodine treatment. Breastfeeding women must wean their babies before ablation. Women of reproductive age are asked not to have sex for 10 days before the ablation to minimise the risk of a pregnancy.

Men must be aware that radioiodine can reversibly reduce sperm counts for up to a couple of years. Sperm-banking may be considered for men contemplating babies in the near future.

Radioiodine takes several months to have its full effect. During this period the thyroxine replacement dose will be stabilised. Six to 12 months after the ablation a low-dose iodine scan will be performed to determine whether the ablation has been successful in removing all thyroid and metastatic tissue.

**Radio-iodine ablation for Graves’ disease**

For Graves’ disease, the dose is about 100 times less than for thyroid cancer, and patients do not require admission to hospital. However, they must follow the above precautions for four days. Some patients who have prominent eyes as part of their thyroid disease (Graves’ exophthalmos) can experience worsening of their eye bulging with radioactive iodine, and sometimes steroids are given to minimise this effect. It is one of the reasons for considering surgery rather than radioactive iodine treatment for this condition.

For toxic patients, the aim is to control hyperthyroidism before therapy with drugs, but to cease propylthiouracil or carbimazole (Neo-mercazole) four days before treatment to prevent these interfering with the trapping of the iodine in the thyroid gland. Medications are recommenced four days post-treatment. It may take a month or more before patients become euthyroid. Therefore, thyroid function tests are regularly monitored until replacement therapy is established.

It remains important to ensure the patient is not pregnant at the time of the treatment. TSH measurement is not required in toxic patients.

**Radio-iodine diagnostic scan**

This test is with a low dose of radioactive iodine and this will show possible uptake from normal thyroid cells routinely present even after the thyroid is removed as far as the naked eye can see. We also look for abnormal areas in the neck which might mean local spread or signs of uptake in the rest of the body. Iodine is found in a few routine places, such as the thymus (in young people), the salivary glands, the kidneys and bladder which is how the iodine is removed from the body and in the bowel. If there is uptake that shows residual normal thyroid tissue or possible cancer we usually bring you in to an isolation room for another big dose (ablative dose) of radioactive iodine which means another 3 days in isolation.