PROCEDURE

Radioiodine therapy

Radioiodine therapy uses swallowed radioactive iodine to destroy overactive or cancerous thyroid cells.

PURPOSE
Destroy overactive or cancerous thyroid tissue

PROCEDURE TYPE
Therapeutic, minimally invasive oral nuclear medicine treatment

WHERE IT IS DONE
Outpatient nuclear medicine clinic; sometimes inpatient isolation

ANAESTHESIA
None

HOW LONG IT TAKES
About 5 to 15 minutes

PREPARATION
Low-iodine diet, medication review, pregnancy testing when relevant

RECOVERY
Same day usually; temporary radiation precautions restrict close contact

MAIN RISKS
Hypothyroidism, salivary problems, neck inflammation, worsened thyroid eye disease

RESULTS
Thyroid tests and imaging over weeks to months

Overview

Radioiodine therapy is a treatment using iodine-131, a radioactive form of iodine. You swallow it as a capsule or liquid. Because thyroid cells naturally absorb iodine, most of the radiation is delivered directly to thyroid tissue.

The radiation gradually damages or destroys targeted thyroid cells. It does not produce an immediate result. The effect usually develops over several weeks or months.

Radioiodine can treat an overactive thyroid, also called hyperthyroidism. It may also destroy thyroid cancer cells left after surgery for certain differentiated thyroid cancers, mainly papillary and follicular cancers.

Treatment doses are higher than the small doses used for thyroid scans. A nuclear medicine

team plans the amount according to the condition being treated, test results, previous treatment and local safety rules.

Why the procedure is performed

For hyperthyroidism, radioiodine reduces the amount of hormone made by an overactive thyroid. It may be offered for Graves disease or for one or more overactive thyroid nodules.

For thyroid cancer, it may be given after surgery to:

Not everyone with thyroid cancer needs radioiodine. Its value is based on the cancer type, tumour features, spread and estimated risk of recurrence.

- Destroy small amounts of thyroid tissue left behind
- Treat iodine-absorbing cancer that has spread
- Lower recurrence risk in selected higher-risk cases
- Make later blood tests or scans easier to interpret

Who should and should not have it

You may be offered radioiodine if your thyroid remains overactive, if medicines are unsuitable or have not provided lasting control, or if you prefer it to surgery. For thyroid cancer, it is considered when the expected benefit is greater than the possible harm.

Radioiodine is not used during pregnancy because it can damage the developing baby's thyroid. Pregnancy testing is normally required when pregnancy is possible.

It is also not given while breastfeeding. Breastfeeding must stop before treatment and cannot restart for the current baby because radioactive iodine can collect in breast tissue and breast milk. It may still be possible to breastfeed after a future pregnancy.

Treatment may be avoided, delayed or reconsidered if:

Kidney disease, urinary problems, incontinence or difficulty swallowing can affect planning because radioactive iodine leaves mainly through urine. Tell the team if any of these apply.

- The thyroid cancer does not absorb iodine
- The expected benefit for a low-risk cancer is very small
- Recent iodine contrast, supplements or medicines could block uptake
- You cannot safely follow temporary radiation precautions

- Severe or active thyroid eye disease could worsen
- Another health problem needs stabilising first

How to prepare

Your treating facility's own instructions take priority because preparation and radiation rules differ by dose, diagnosis and local regulation.

Tell the team about every medicine, vitamin and supplement you take. Iodine supplements, kelp products, some heart medicines, thyroid hormone and antithyroid medicines can affect treatment. Do not stop a prescribed medicine unless your team tells you when and how to do so.

You may be asked to follow a low-iodine diet for a short period. This is not the same as a salt-free diet. The facility should give you a specific food list.

If treatment is for thyroid cancer, your thyroid-stimulating hormone, or TSH, may need to rise so remaining thyroid cells absorb more iodine. This may involve temporarily stopping thyroid hormone or receiving injections of laboratory-made TSH.

You may need to avoid food and drink for several hours around the dose. Tell the team about recent scans using iodine contrast, pregnancy plans and breastfeeding.

Plan for the radiation precautions you will follow afterward. These may include sleeping separately, limiting close contact, avoiding close contact with children and pregnant people, and taking extra care with toilet hygiene. Arrange work, transport and caregiving in advance.

What happens during the procedure

A nuclear medicine professional confirms your identity, treatment plan and safety information. You may have blood tests, a pregnancy test or imaging before the dose.

You swallow the radioiodine as one or more capsules or as a liquid. It has little or no taste. No incision, needle-based anaesthetic or sedation is normally needed.

Swallowing the dose takes only a few minutes. You may then need to wait briefly while the team checks radiation levels and reviews your written precautions.

Most people leave the same day. Higher-dose treatment may require a short hospital stay in a specially prepared room, depending on local regulations and your home circumstances.

Recovery and what to expect afterward

Pain: The treatment itself is painless. Some people later develop mild neck tenderness, throat discomfort, nausea or swelling near the salivary glands. Salivary glands make saliva and can also absorb iodine.

Eating: Follow the facility's instructions about when to eat and drink after the dose. Drinking fluids helps your body remove unused iodine through urine. Ask before using sour sweets or lemon products because advice about their timing is not the same for everyone.

Activity: You can usually do ordinary activities if you feel well. However, radiation precautions temporarily limit close physical contact, shared sleeping arrangements and some social activities. Wash your hands carefully and follow the provided bathroom and laundry instructions.

Driving: Radioiodine does not usually impair alertness because no sedation is used. You can often drive if you feel well, but transport or proximity restrictions may affect the journey home. Follow your facility's instructions.

Work: Returning to work depends on the dose, travel arrangements and whether your job involves close contact with children, pregnant people or the public. Your team should provide a written date for returning.

Risks and possible complications

An underactive thyroid, called hypothyroidism, commonly develops after successful treatment for Graves disease and can also occur after treatment of overactive nodules. It is treated with thyroid hormone replacement and regular blood tests.

Other possible effects include:

Higher or repeated doses used for thyroid cancer can sometimes affect tear ducts, blood-cell production, fertility or reproductive organs. There is also a small long-term risk of another cancer after substantial cumulative radiation exposure. Your team should explain how these risks apply to the planned treatment.

Radioactive iodine can harm a pregnancy. You and your partner may be told to avoid pregnancy or fathering a pregnancy for a specific period after treatment. Follow the written timeframe given for your treatment.

- Temporary nausea, neck soreness or thyroid inflammation
- Dry mouth, altered taste or salivary gland pain and swelling

- Dental problems if reduced saliva continues
- A temporary rise in thyroid hormone levels
- Worsening of thyroid eye disease, especially in people with active eye problems

Results and follow up

Radioiodine does not work immediately. For hyperthyroidism, blood tests over the following weeks and months show whether hormone levels are falling. Some people need another treatment or a different option if the first dose does not control the condition.

Long-term blood tests are important because an underactive thyroid may develop months or years later. If it does, daily thyroid hormone usually restores normal hormone levels.

After thyroid cancer treatment, you may have a whole-body scan within days to show where iodine was absorbed. Later follow-up may include thyroglobulin blood tests, neck ultrasound or other imaging. Thyroglobulin is a protein made by thyroid cells and can help monitor some thyroid cancers.

Alternatives

For hyperthyroidism, alternatives include antithyroid medicines and surgery. Antithyroid medicines avoid radiation and can control hormone production, but they require monitoring, may cause side effects and do not always produce lasting remission. Beta blockers like metoprolol or propranolol can ease symptoms such as a racing heartbeat, but they do not treat the overactive thyroid itself.

Surgery removes part or all of the thyroid and works more quickly. It requires anaesthesia and carries risks such as bleeding, low calcium and injury to nerves controlling the voice. It may be preferred for a large thyroid, suspicious nodules, significant compression or certain eye problems.

For selected mild cases, monitoring may be reasonable, but it leaves the thyroid overactive and requires ongoing review.

For thyroid cancer, surgery is usually the main treatment. Some low-risk cancers can be monitored after surgery without radioiodine, avoiding radiation precautions but accepting continued surveillance and some remaining recurrence risk. Carefully selected very small cancers may be monitored without immediate surgery.

Cancers that do not absorb iodine need other approaches. These can include surgery,

external-beam radiation, targeted medicines or other systemic treatments. These options have different side effects and are chosen according to where the cancer is and how it behaves.

When to call your healthcare team

Contact the nuclear medicine team promptly if you vomit soon after taking the dose. The vomit may contain radioactive material, so do not clean it up until you have received safety instructions.

Call your healthcare team for persistent vomiting, worsening neck swelling, significant salivary gland pain, new eye symptoms or a dry mouth that does not improve. Also arrange routine review if you later notice ongoing tiredness, feeling unusually cold, constipation or other possible signs of an underactive thyroid.

Seek emergency help for trouble breathing, severe difficulty swallowing, fainting, confusion, chest pain, or a very fast or irregular heartbeat with fever or severe agitation.

Common questions

Will I be asleep?

No. Radioiodine is swallowed while you are awake. Anaesthesia and sedation are not normally needed.

Can I drive home?

Usually, because the treatment does not cause sedation. Your facility may recommend different transport arrangements to limit close contact with other people.

How painful is it?

Swallowing the capsule or liquid is not painful. Mild neck soreness, nausea or salivary gland discomfort can develop later.

When will I know whether it worked?

Hyperthyroidism results become clear through blood tests over weeks to months. Thyroid cancer follow-up may begin with a scan within days, followed by blood tests and imaging over subsequent months.

Will I be radioactive around my family?

You will give off a small amount of radiation for a limited time, and iodine also leaves in urine,

saliva and other body fluids. Written precautions reduce other people's exposure. The duration is based on your dose and household circumstances.

Will my hair fall out?

Radioiodine does not usually cause the widespread hair loss associated with some chemotherapy. Temporary hair thinning can occur when thyroid hormone levels change.

Sources

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