

PEPTIDE RECEPTOR RADIONUCLIDE THERAPY (PRRT) & NEUROENDOCRINE TUMOURS



Neuroendocrine tumours (also called NETs), develop in the neuroendocrine system. This system is made up of nerve (neuro) and hormone (endocrine) cells. It is responsible for producing hormones and other chemicals that control normal body functions.

What are neuroendocrine cells?

Neuroendocrine cells are like nerve cells that can also make and release hormones. Their role is to make sure the body functions run smoothly. Most of these cells have special 'switches' (called receptors) sitting on the surface which turn cells on and off.

They do this by:

- Receiving (sensing) messages from the environment around them.
- Releasing hormones and other chemicals to control many body functions such as digestion, body heat and metabolism.

What are NETs?

NETs develop when neuroendocrine cells undergo changes and divide without control, growing into a tumour. These cells can potentially spread through the bloodstream to other parts of the body. Some of these tumours can also over-produce hormones and other chemicals, causing a range of symptoms like flushing and diarrhea.

Many NETs have a large number of special receptors on them called 'somatostatin receptors' or SSTRs.

What is Peptide Receptor Radionuclide Therapy (PRRT)?

PRRT is a type of radiation treatment. A radioactive medicine (typically Lutetium) is attached to a special protein called 'Octreotate', to form a compound called 'Lutetium-Octreotate' (also known as LuTate). When injected into the bloodstream, LuTate travels and binds to the somatostatin receptors on NET cells, delivering a high dose of radiation causing direct damage to these cancer cells.

The main aim of PRRT is to slow or control the tumour growth, and to improve symptoms and quality of life, however it rarely destroys them completely. Outcomes vary from patient to patient and this is best discussed with your individual clinician.

Is PRRT treatment for you?

Patients referred to Peter Mac with NETs are discussed at the NET multi-disciplinary meeting, this is known as the NET MDM.

The NET MDM is attended by many Peter Mac Specialists from departments such as Nuclear Medicine, Medical Oncology, Surgical Oncology, Endocrinology and Pathology (when needed).

During this meeting, your case will be discussed. Your imaging (scans) and other test results will be reviewed by the Specialists.

Your PET scan will show whether or not your tumours have enough somatostatin receptors for PRRT to be effective. Many other factors are assessed to see if you are suitable for treatment.

Should it be decided that PRRT is a suitable treatment option for you, a consultation with the Nuclear Medicine Specialist will be arranged. This will involve a discussion of the benefits and risks of PRRT and answer any questions you may have.

What preparation is needed?

If you are having regular Octreotide (Sandostatin[®], Sandostatin LAR[®]) or Lanreotide ([Somatuline[®]](#)) injections, the Nuclear Medicine Specialist will discuss when to withhold these injections. Ideally they should not be in your system immediately prior to PRRT.

Radiation safety precautions

Because PRRT uses radioactivity, you will be radioactive for a short period of time. We will give you radiation safety information before treatment to allow you to arrange any travel or accommodation requirements. We will also give you written instructions to take home with you.

In general, we advise that you:

- Do **not** use public transport on the day of treatment.
- Do **not** travel long distance for at least two days after your PRRT treatment.

The Peter Mac Accommodation Co-ordinator may be able to assist you with accommodation arrangements. See '**How to contact us**' at the end of this brochure.

What does PRRT involve?

PRRT is usually given as four cycles. There is a break between each cycle of about 6-10 weeks. The total time for the four cycles is anywhere from 6-10 months.

For some patients, a low dose of chemotherapy is also given to prepare or sensitise the tumour cells for PRRT. Chemotherapy (if needed) will be provided and monitored by your Medical Oncologist.

Each treatment cycle requires you to attend the Nuclear Medicine department for 3 consecutive days, see section '**What happens during each cycle of PRRT?**'

Usually PRRT is an outpatient therapy and does not require hospital admission, however, if the tumours are highly active and producing hormones we may need to monitor you for a period of time in hospital. This may involve an overnight stay. Your Nuclear Medicine Specialist will discuss these details with you before treatment.

What happens during each cycle of PRRT? (DAY 1, 2 and 3)

Day 1: Day before treatment (up to 1 hour)

You will meet with the Nuclear Medicine team to sign a consent form and check any recent blood test results and discuss radiation safety

Day 2: Treatment day (up to 5 hours)

- Register at admissions (Ground floor) then attend Cancer Imaging (5C).
- A staff member will show you the treatment area and put a cannula in a vein in your arm. You will then be given some medications to prevent nausea.

- The treatment will be given through the cannula slowly together with an infusion called amino acids which helps protect the kidneys from radiation.
- The total time of the infusion is about four hours.
- After treatment, you may go home. You will be given written radiation safety instructions to follow at home.
- You will need someone to pick you up and drive you home as occasionally a sedative is used to help with nausea.

Day 3: Day after treatment (up to 2 hours)

- You will return the next day for a scan and meeting with the Nuclear Medicine Specialist to discuss follow up.

Is there follow up after treatment?

After your Day 3 scan, the Nuclear Medicine Specialist will discuss follow up with you, including:

- When to take any medications.
- Your next appointment for scans or further treatment cycle.
- Blood tests to monitor you between cycles.
- What to do if you feel unwell.

It is important for you to have ongoing follow-up appointments with your treating medical Oncologist in between PRRT cycles. These should be arranged directly with you Oncologist.

Are there any side effects?

Treatment is usually very well tolerated. Patients sometimes experience some side effects. Your doctor will discuss these with you and prescribe medications if needed.

Some short term side effects can include:

- Tiredness
- Some pain at the site of your tumour/s
- A flare up of hormone related symptoms
- Nausea

Other potential side effects include:

- A temporary decrease in white blood cells and platelets. If this is the case, further PRRT will be given when blood counts recover to satisfactory levels
- A temporary (short-term) worsening in liver function in patients who have a large volume of tumours in the liver
- Possible kidney impairment, therefore an infusion with amino acids is given during treatment to protect the kidneys. Those most at risk are patients with known kidney disease
- A rare but more serious longer term side effect is potential development of a bone marrow condition called Myelodysplastic Syndrome (MDS) that may lead to leukaemia.

Your Nuclear Medicine Specialist will discuss the risks and benefits and all potential side effects with you before treatment.

What will you need to bring?

- Medicare, health insurance, ambulance and pension information (i.e. DVA, Centrelink)
- GP and Oncologist / Specialist contact details
- Your regular medications
- Any items to keep entertained such as books, magazines or an iPad
- Overseas patients: copies of blood test results

What about visitors?

No visitors are allowed during treatment time within the treatment area as it involves using radioactivity.

How much does PRRT cost?

Unfortunately, Medicare does not cover this treatment. Peter Mac provides this therapy at no charge for Victorian and Tasmanian patients.

Interstate and overseas patients are required to pay for PRRT therapy and in these instances; we provide quotations for this treatment. If you have private health insurance, you may be able to claim a level of rebate through your private health insurance provider but it is up to you to make your own enquiries with your insurer.

Further Information

The Unicorn Foundation

Visit: www.unicornfoundation.org.au

Peter Mac Accommodation Co-ordinator

Hours: Tuesday to Friday

Ph: (03) 8559 7454 (Tues-Fri)

Em:

accommodationcoordinator@petermac.org



Important information

For more PRRT information or advice, please talk to your Specialist or the Peter Mac Nuclear Medicine Team.

Peter Mac's Nuclear Medicine Department

Hours: Monday to Friday

8:30am and 5:00pm

Ph: (03) 8559 6667

Fax: (03) 8559 5149

Em: RNTherapy@petermac.org

In the event of an emergency, please dial **000** for an ambulance or go to your nearest hospital emergency department.