

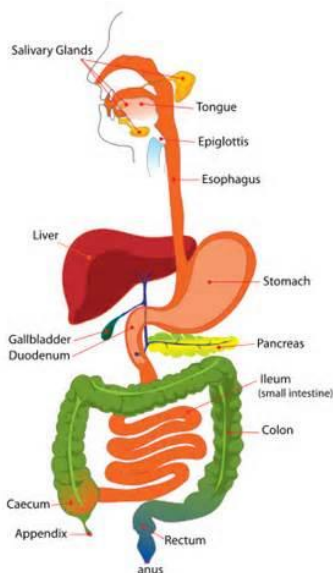
# PRRT (Peptide Receptor Radionuclide Therapy) Treatment for Carcinoid Neuroendocrine Tumors

## What is a neuroendocrine tumor?

The neuroendocrine system is made up of cells that are both nerve cells and endocrine cells. Neuroendocrine cells can be found in several organs and organ systems such as the digestive system and the lungs.

A neuroendocrine tumor, or NET, begins in endocrine cells - cells that make and release hormones. NETs can occur anywhere in the body where there are neuroendocrine cells, such as the bowel, pancreas, and lungs.

Tumors start from a change, or mutation, in one of your genes. Genes tell the cell what to do, so when there's a mutation, it can change the way the cell works. When the cell multiplies, all the new cells have the abnormality. The abnormal cells begin to crowd out the normal cells. In the case of a neuroendocrine tumor, the abnormal cells may now produce more hormone than the normal cells did. High levels of hormones in the blood can cause symptoms such as flushing and diarrhea. These signs and symptoms are commonly called *carcinoid syndrome*. NETs are most commonly found in the middle section of the small intestine, which is called the jejunum. These tumors are called *midgut neuroendocrine tumors* because of their location. NETs also occur in the rest of the digestive tract. These tumors are called *GEP-NETs* (gastroenteropancreatic neuroendocrine tumors).



## What is Lutathera?

Lutathera is the brand name of a medication called Lu 177-dotate, a radioisotope used in Peptide Receptor Radionuclide Therapy or PRRT. PRRT is used to treat GEP-NETs.

Lu 177-dotate combines a small dose of radioactive material with octreotide, a synthetic (man-made) version of the hormone somatostatin. Somatostatin slows down your body's release of other

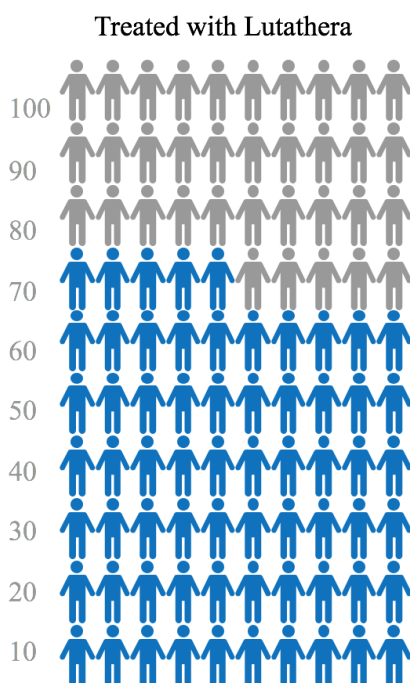
hormones such as growth hormone (HGH), thyroid stimulating hormone (TSH), and insulin, the hormone that helps glucose (sugar) move from the blood into the cells where it is used for energy.

Lutathera was tested in several trials to determine how beneficial it was in treating NETs. The NETTER study compared Lutathera against the standard treatment (octreotide by itself) in 2 groups of patients with inoperable midgut NETs. Half of the patients received Lutathera and half of the patients received octreotide.

- After 20 months, there was no disease progression in 65 out of the 100 patients who received Lutathera.
- In the group that took octreotide alone, there was no disease progression in 11 out of 100 patients.
- The patients taking Lutathera lived longer without their disease getting worse. They also had an overall better response than those who took octreotide alone.



11 out of 100 patients on octreotide had no disease progression after 20 months



65 out of 100 patients on Lutathera had no disease progression after 20 months

## **How does Lutathera work?**

Lutathera is administered through an IV (intravenous) catheter. You will have an infusion every 8 weeks for 4 treatments. Lutathera targets the tumor. It delivers a dose of radiation to the tumor and preserves the remaining healthy tissue.

NETs contain specific receptors that like to bind to a hormone called somatostatin. With Lutathera, the synthetic somatostatin guides the radioactive material to the NETs because of its affinity to bind with those receptors. As a result, when Lutathera is given, it enters the bloodstream and binds to cancer cells throughout the body to deliver a dose of radiation to the surrounding tumors.

## **What are the possible side effects?**

Although Lutathera is generally well tolerated, side effects are possible.

- Nausea and vomiting can occur during and after treatment. We will give you 2 medications through your IV about 30 minutes before the Lutathera infusion to help with discomfort during your treatment. Your doctor may prescribe medications to take at home, as needed, to help with any nausea after treatment.
- Low white blood cell counts or low platelet counts can occur after treatment. Your doctor will monitor your blood cell counts before and during your treatment to check for changes.
- Fatigue and weakness can occur after treatment. These side effects generally last a week or less.
- There is a risk of kidney impairments after treatment because your kidneys have to filter out the excess radiation. This risk is higher if you have kidney problems before starting Lutathera. Your doctor will check the health of your kidneys before treatment and monitor any changes in your kidney function. An amino acid solution is given before and during your Lutathera infusion to help protect your kidneys from damage. (Your body uses amino acids to make proteins.)

## **What do I need to tell my doctor before I begin PRRT?**

- You must tell your doctor about all the medications you are currently taking, including vitamins, supplements, and over-the-counter (nonprescription) medications. .
- Tell your doctor if you are specifically taking any other forms of somatostatin analogs (SSA) drugs such as lanreotide (Brand name Somatuline®) or octreotide (Brand name Sandostatin®). They could interfere with the medication properly binding to the tumor.
  - Note: If you are receiving lanreotide or octreotide injections, you must be off them for 28 days before you can have a Lutathera treatment.
- Lutathera is known to cause harm to an unborn fetus. You must tell your doctor if you are, or think you may be, pregnant.

## What should I expect before my treatment?

- Your oncologist will do several tests within 2 weeks of your scheduled treatment to check that your blood, kidneys, and liver are healthy enough for treatment.
- If your oncologist has concerns about your health, they may postpone treatment.



## What should I expect on the day of treatment?

On the day of your treatment, come to Roswell Park and check in with Patient Access (registration) in the lobby.

- Registration will direct you to the appropriate section of the hospital.
- Once you arrive, a nurse will walk you to the room where you will receive treatment. This will be a private room with an attached bathroom.
  - To reduce the risk of radiation exposure, the floor of your treatment room will be covered with plastic.
  - Anyone who enters your treatment room will wear disposable sterile attire over their clothing.
- A nurse will place an intravenous catheter (IV) in your arm to deliver the medications. An IV is a thin, flexible tube that goes into your vein that delivers fluids and medications directly into your bloodstream. If you have a port in place, that can be used instead of starting a new IV.
- Medications to prevent or lessen nausea and vomiting will be given through the IV.
- After you receive these medications, the nurse will begin administering an amino acid solution through your IV to help protect your kidneys. This solution will infuse for 30 minutes.
- Once the amino acid has infused for 30 minutes, the radiation technician will begin the Lutathera. The amino acid solution and the Lutathera will continue to infuse together for the next 3.5 hours.
  - You are free to use electronics, such as your phone, or watch TV during your treatment.
  - Once the Lutathera infusion begins, it is important that you remain inside your room to avoid exposing others to radiation.
  - Lunch from the cafeteria can be provided to you in your room upon request.
  - Nurses will continue to check on you throughout your infusion.
  - If you experience any side effects throughout your treatment such as a headache, nausea, or muscle cramps, your nurse will administer medications as needed.
- When your infusion is done, a radiation technician will disconnect and remove your IV.
- You will be discharged on the day of your treatment after a radiation technician has confirmed that your radiation exposure is at a safe level to leave.
- Before you leave, we will review your discharge instructions with you, including precautions.

## What should I expect after treatment?

- You will come back to the clinic the day after your treatment to see your oncologist and receive an injection of octreotide (Brand name: Sandostatin®) or lanreotide (Brand name: Somatuline®).
- Typically, the octreotide or lanreotide injections are given within 24 hours of having a Lutathera treatment. The injections can be done at Roswell Park or with a local oncologist, if that has been your routine.
- After you have had 2 Lutathera treatments, you will have a follow-up scan every 16 weeks, to monitor your response to treatment.
- The scan may be done a CT, MRI, or gallium PET scan. The type of scan may vary depending on which test was best at showing your cancer before you began treatment.

## What should I be aware of after treatment?

This chart answers the most frequently asked questions about daily life after a Lutathera treatment.

General rule	<ul style="list-style-type: none"><li>• Your body will emit low levels of radiation. Even though the level is low you must take certain actions to reduce the radiation exposure of those around you. For 2-3 days after treatment, avoid close contact with people who live with you and distance yourself from others by at least 3 feet (1 meter).</li></ul>
Bodily fluids	<ul style="list-style-type: none"><li>• When you receive Lutathera, most of the radioactive material in the drug will be absorbed by the cancer cells it is targeting. What isn't absorbed by the cells leaves your body through your urine, stool, sweat, saliva, vaginal secretions, semen, and tears.</li><li>• Urine is the bodily fluid that tends to be the most potent source of radioactive material.</li></ul>
Using the restroom	<ul style="list-style-type: none"><li>• The more you urinate, the quicker you will eliminate the radioactive materials from your body. Try to urinate every hour on the day of your treatment and for 2 days afterwards. Follow your doctor's advice on how much fluid to drink.</li><li>• Both men and women should use the toilet in the seated position for the first few days after treatment. You must use toilet paper each time you use the restroom.</li><li>• Wash your hand thoroughly after using the restroom.</li></ul>
Contact with others	<ul style="list-style-type: none"><li>• Limit close contact with other people for 7 days after treatment.</li><li>• For children under age 10 and pregnant women, limit the time to less than 15 minutes a day and stay at least 3 feet/1 meter away from them.</li><li>• Sleep in a separate bed for 7 days after treatment; 15 days in case of pregnant partners or children under 10. Beds should be at least 3 feet/1 meter apart.</li><li>• Sexual activity is not advised for the next 7 days after your treatment.</li></ul>

Hygiene	<ul style="list-style-type: none"> <li>• Maintain good general hygiene during and after treatment to reduce the risk your bodily fluids will expose others to radiation. This includes things like washing your hands and brushing and flossing your teeth.</li> </ul>
Pregnancy	<ul style="list-style-type: none"> <li>• Pregnancy must be ruled out before beginning your treatment.</li> <li>• Women who could get pregnant must use effective contraception such as birth control pills, intrauterine device (IUD), or a condom throughout their Lutathera treatment and for 6 months after each treatment.</li> </ul>
People who need extra assistance	<ul style="list-style-type: none"> <li>• If a caregiver helps you use the restroom, they must wear gloves while assisting you for 2-3 days after treatment. This helps avoid exposing them to the radioactive material in your urine.</li> <li>• If you use special medical equipment (catheters, colostomy bags, bedpans, water nozzles) or anything that could be contaminated by your bodily fluids, immediately empty them in the toilet and then clean them.</li> <li>• If anyone helps clean up bodily fluids (vomit, blood, urine, stool), they should wear plastic gloves.</li> </ul>
Trash disposal	<ul style="list-style-type: none"> <li>• For 2 days after treatment: Flush any tissue or other items that contain bodily fluids down the toilet.</li> <li>• If items cannot be flushed (menstrual pads and bandages), you must put them in a separate plastic bag before putting them in the trash. Keep plastic bags away from children and animals.</li> <li>• A staff member will tell you how and when to get rid of these trash bags. You might be asked to bring the bag back to the hospital, or, after 70 days, the bag may be removed with other household waste.</li> </ul>
Laundry	<ul style="list-style-type: none"> <li>• Wash your underwear, pajamas, sheets, and any clothes that contain sweat, blood, or urine separately from anyone else's laundry.</li> <li>• Wash your items 2 or 3 times using a standard washing machine. You do not need to use bleach and you do not need extra rinses.</li> </ul>
Release card	<ul style="list-style-type: none"> <li>• Keep your letter of treatment with you at all times while you are being treated and for 3 months after your treatment ends.</li> <li>• If you need emergency care or if you are hospitalized during the first week after your treatment, tell the healthcare team that is treating you about the nature, the date and the dose of your Lutathera treatment.</li> </ul>
Questions	<ul style="list-style-type: none"> <li>• Please contact your GI Oncology Nurse Coordinator: <b>716-845-3895</b>.</li> </ul>

## When to Call Your Doctor

- If you believe that you may be suffering from a side effect of Lutathera, tell your doctor right away. Some side effects may cause your doctor to pause, change, or stop your Lutathera treatment.
- If you have an unplanned hospitalization, be sure to notify your Roswell Park doctor.
- If you are unexpectedly in an emergency room within a week of getting your Lutathera, or if you have questions after hours, please call Roswell Park at **716-845-2300** and ask for oncologist on call. She or he can help the team caring for you and share any radioactive material handling questions they may have.



## Notes

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