

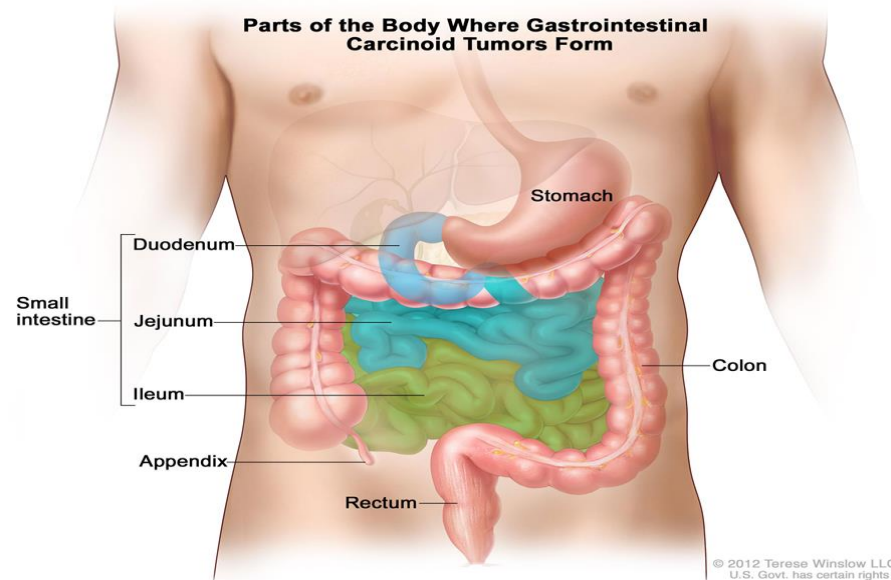
# Radiopharmaceutical Peptide Receptor Radionuclide Therapy (PRRT)

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# Radiopharmaceutical Peptide Receptor Radionuclide Therapy (PRRT)

Most common location for cancerous neuroendocrine tumors :

- The middle portion of the gastrointestinal tract
- The midgut

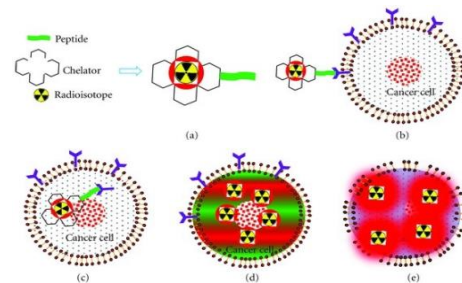


# Radiopharmaceutical

## Peptide Receptor Radionuclide Therapy (PRRT)

PRRT mechanism of action:

- Injected into the bloodstream where it concentrates in GEP-NET sites.
- Binds to somatostatin receptors overexpressed by GEP-NET cells.
- Internalized into GEP-NET cells where it delivers radiation within the cells which leads to their death.



# Radiopharmaceutical

## Peptide Receptor Radionuclide Therapy (PRRT)

Radiopharmaceuticals safety measures to minimize radiation exposure:

- Use waterproof gloves and effective radiation shielding when handling PRRT.
- Radiopharmaceuticals should be used by or under the control of physicians who are qualified
- Qualification requires specific training and experience in the safe use and handling of Radiopharmaceutical.
- Training must be approved by the appropriate governmental agency authorized to license the use of radiopharmaceuticals.

# Radiopharmaceutical

## Peptide Receptor Radionuclide Therapy (PRRT)

PRRT can cause serious side effects which may require adjustment in dose or discontinuation of treatment.

### **Serious side effects may include:**

- Radiation exposure
- Bone marrow problems
- Kidney problems
- Liver problems
- Hormonal gland problems (carcinoid crisis)
- Fertility problems

# Radiopharmaceutical Peptide Receptor Radionuclide Therapy (PRRT)

Somatostatin analogs may affect how PRRT treatment works.

- Patients may be asked to stop taking long-acting somatostatin analogs 4 weeks before PRRT.
- Patients may continue taking short-acting somatostatin analogs up to 24 hours before PRRT.

# Radiopharmaceutical Peptide Receptor Radionuclide Therapy (PRRT)

Most common and most serious side effects of PRRT include but not limited to:

- Abdominal pain
- Vomiting
- Nausea
- Diarrhea
- Fatigue
- Some hair loss
- Anemia (low red blood cells)
- Thrombocytopenia (low platelets)
- Low white blood cells
- Increased liver enzymes

# Radiopharmaceutical Peptide Receptor Radionuclide Therapy (PRRT)

## Treatment:

During a specific PRR treatment the patient is administered long-acting octreotide 30 mg intramuscularly between 4 to 24 hours after each dose.

- The long-acting octreotide can not be administered within 4 weeks of each subsequent dose of this specific treatment.
- Short-acting octreotide may be given for symptomatic management during PRR treatment, but must be withheld for at least 24 hours before each dose of the PRRT.
- Following PRRT: Continue long-acting octreotide 30 mg intramuscularly every 4 weeks after completing PRRT until disease progression or for up to 18 months following treatment initiation.



# Radiopharmaceutical Peptide Receptor Radionuclide Therapy (PRRT)

**Antiemetic :** Must be administered 30 minutes before the recommended amino acid solution.

**Amino Acid Solution:** Must be administered as an intravenous solution containing L-lysine and L-arginine 30 minutes before administering PRRT.

- Use of a three-way valve to administer amino acids using the same venous access as PRRT.
- If not possible administer amino acids through a separate venous access in the patient's other arm.
- Continue the infusion during, and for at least 3 hours after PRRT infusion.

# Radiopharmaceutical Peptide Receptor Radionuclide Therapy (PRRT)

## **Patient Education on Safety precautions:**

The Advanced Provider instructs patient to follow these simple precautions for the first 2-3 days (48-72 hours) after each treatment:

- Avoid close contact with the people you live with. Stay at least 6 feet from them.
- Must drink plenty of water and urinate frequently to clear radiation from your bladder.
- Must urinate sitting down (even men). Do not use urinals, use toilet paper each time and flush paper down the toilet.
- Items that cannot be flushed down a toilet (sanitary pads, adult diapers, etc.) must be placed in a separate trash bag. Trash bag can be disposed of in regular trash after 7 days.
- Wipe up any spilled urine completely with toilet paper and flush the paper down the toilet.

# Radiopharmaceutical Peptide Receptor Radionuclide Therapy (PRRT)

## **APP Patient Education on Safety precautions continues...**

- Close the lid and flush the toilet 2 times after using it.
- Be sure to wash your hands thoroughly after urinating and bowel movements.  
Avoid contaminating door handles
- If urine, blood or, sweat get on your clothing and bed linens, separate from any other clothing.
- Preferable to move bowels every day, make take a laxative if necessary.
- Sleep in a separate bed or at least 6 feet apart from anyone.
- Sleep in separate bedrooms from a pregnant woman for 15 days.
- Do not breast feed during the entire treatment period and for 1 and ½ half months after. Women must avoid getting pregnant for at least six months after treatment stops.
- Men must avoid getting anyone pregnant for at least six months after treatment stops.

## Radiopharmaceutical Peptide Receptor Radionuclide Therapy (PRRT)

### **APP Patient Education on Safety precautions continues...**

#### **Follow these precautions for 7 days (one week) after each treatment:**

- Limit contact with children less than 10 years of age for one week.
- Sleep in separate bedrooms from infants and children less than 10 years of age for one
- No sexual activity for one week after treatment.
- Avoid close contact with pregnant women for a week.
- Shower every day.

In most case may return to work in 2-3 days.

Avoid extended time in public for 2-3 days.

# Radiopharmaceutical Peptide Receptor Radionuclide Therapy (PRRT)

## **APP Care givers instructions :**

- When caring for the patient in the bathroom wear disposable gloves for the first 2-3 days after treatment.
- Discard gloves in separate trash bag and wash hands immediately. Trash bag can be disposed of in regular trash after 7 days.
- If the patient needs help with their catheter, urinal, bedpan, ostomy, etc., Wear disposable gloves for the first 2-3 days after treatment.
- Discard gloves in separate trash bag and wash hands immediately.
- Trash bag can be disposed of in regular trash after 7 days

# Radiopharmaceutical Peptide Receptor Radionuclide Therapy (PRRT)

## **PRRT Administration**

- The process is lengthy process usually a full day
- The day starts in the Infusion center. Occasionally patients may have be seen in the clinic first.
- IV will be started (or port accessed).
- Premedication is given
- Amino acids are started through the IV.
- Pt is educated that these help protect your kidneys as this is a large amount of fluid
- That can take several hours to complete.
- After the patient is given a certain amount of amino acids, the patient is taken to the nuclear medicine department where the PRRT is given.
- After the PRRT is given patient is returned back to the infusion dept and given the rest of your amino acids.

# Radiopharmaceutical Peptide Receptor Radionuclide Therapy (PRRT)

## **After Treatment the APP will review potential side effects and discharge instructions :**

- Abdominal pain
- Some hair loss
- Nausea
- Vomiting
- Diarrhea
- Fatigue
- Anemia (low red blood cells)
- Thrombocytopenia (low platelets)
- Low white blood cells

## **Patient should Call the doctor for:**

- Fever with a temperature 100.5 degrees Fahrenheit or higher
- Vomiting of three time or more per day
- An increase of four or more bowel movements over your normal bowel habits per day

# REFERENCES

- \*Neuroendocrine Tumor Research Foundation, [netrf.org](http://netrf.org), January 16, 2018.
- \*European journal of nuclear medicine and molecular imaging 43 (5), 839-851, 2016.
- \*Kam BL, Teunissen JJ, Krenning EP, de Herder WW, Khan S, van Vliet EI, et al. Lutetium-labelled peptides for therapy of neuroendocrine tumours. *Eur J Nucl Med Mol Imaging*. 2012;39(Suppl 1):S103–12.
- \*de Jong M, Breeman WA, Valkema R, Bernard BF, Krenning EP. Combination radionuclide therapy using  $^{177}\text{Lu}$ - and  $^{90}\text{Y}$ -labeled somatostatin analogs. *J Nucl Med*. 2005;46 Suppl 1:13S–7S.



THANK YOU!!!

QUESTIONS WELCOME

