Technologist Considerations in I131 MIBG Therapies
• What is Mibg Therapy?

  A radioisotope treatment for refractory neuroblastoma

  Also used for treatment of pheochromacytoma
• What is Neuroblastoma?

It is a neuroendocrine tumor.

Neuroblastoma is the most common extra cranial solid cancer in childhood and the most common cancer in infancy. Neuroblastoma has an annual incidence of about 650 new cases per year in the US. Close to 50 percent of neuroblastoma cases occur in children younger than two years old.

1/3 of patients cured with minimal therapy

Majority of patients die despite aggressive multimodal therapy
- Technologist Primary Consideration in Mibg therapy

- The Patient
Ordering the Dose:

Receiving the Dose:

Unpacking the Dose:

Thawing the Dose:
Ordering the dose

• The prospective date of the next month’s patients are e-mailed to the nuclear medicine staff by the nurse oncologist

• The day before treatment an e-mail with prescribed dose is sent to the nuclear medicine staff and the ordering oncologist

• The oncologist respond via e-mail confirm the patient’s ID and dose
Receiving the dose
Receiving the dose

• Dose is shipped frozen

• Dose is packed in dry ice

• Dose can be transported by outside carrier
Unpacking the dose
Thawing the dose
Room Prep: standard prep for in-patient radiopharmaceutical therapy

Nursing Prep: typically SSKI given night before therapy and continuing for six weeks, pregnancy test results if relevant, anti-nausea med given 30 minutes prior to start of therapy, all vitals recorded before dose is brought to room

Patient Prep: SSKI given night before therapy and continuing for six weeks, anti-nausea med given 30 minutes prior to start of therapy, Foley catheter placed (age appropriate), two patient identifiers, parent/patient consent needed
QC:

For percent of tagged mibg, value must be greater than 90%

SEP-PAK FILTER USED
The Children's Hospital of Philadelphia  
Division of Nuclear Medicine  
I131 MIBG Dose Chromatography

**Supplies:**  
- Waters Accell Plus CM SepPac  
- Ethanol  
- Sterile Water  
- I131 Mibg  
- 3-10 ml test tubes  
- Well counter  
- Calculator

**Protocol:**  
1. Using Waters Accell Plus CM SepPac cartridge,  
   wet with 5 ml ethanol.  
2. Rinse SepPac with 5 ml sterile water.  
3. Draw approximately .5 uci I131 Mibg in a 1 ml  
   syringe. (volume should be at least .1 ml)  
   you can put air behind dose.  
4. Over a 10 ml test tube label tube B push I131 Mibg  
   thru SepPac.  
5. Flush SepPac with 5 ml sterile water into a 10 ml  
   test tube.(tube B)  
6. Place SepPac cartridge into test tube. (tube A)  
7. Count using well counter at I131 setting  
   A=SepPac cartridge tube  
   B=Flush Tube  
   \((A / (A+B)) \times 100 = \% tag\)  
8. $\%$ tag must be greater than 90%  
9. Dispose of test tubes in proper receptacle.  
10. Fax results to Dr. Maris at fax #43770

\[ A= \quad \quad B= \quad \quad \]

\[ A+B= \quad \quad (A / (A+B)) \times 100 = \% tag \]

\( \frac{\text{__________/__________}}{} \times 100 = \text{__________} \% \text{ tag} \)

**Patient**

**Date**

**Technologist**

Rev 2/08 KWE
QC

The Children’s Hospital of Philadelphia
Division of Nuclear Medicine
I131 MIBG Dose Chromatography

Supplies:  Waters Accell Plus CM SepPac
           Ethanol
           Sterile Water
           I131 Mibg
           3-10 ml test tubes
           Well counter
           Calculator

Protocol:  1. Using Waters Accell Plus CM SepPac cartridge,
           wet with 5 ml ethanol.
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              syringe. (volume should be at least .1 ml)
              you can put air behind dose.
           4. Over a 10 ml test tube label tube B push I131 Mibg
              thru SepPac.
           5. Flush SepPac with 5 ml sterile water into a 10 ml
              test tube. (tube B)
           6. Place SepPac cartridge into test tube. (tube A)
           7. Count using well counter at I131 setting
              A=SepPac cartridge tube
              B=Flush Tube
              \( (A/A+B) \times 100 = \% \text{ tag} \)
           8. \% tag must be greater than 90%
           9. Dispose of test tubes in proper receptacle.
           10. Fax results to Dr. Maris at fax #43770

\[
A = 607,418 \quad B = 1022
\]

\[
A+B = 608,440 \quad (A/A+B) \times 100 = \% \text{ tag}
\]

\[
\left(\frac{607,418}{1,608,440}\right) \times 100 = 99.33 \% \text{ tag}
\]

Patient  Bobby Ego
Date     6-17-08    Technologist KWE

Rev 2/08 KWE
Authorized users:

- Good idea to have at least two per institution
Preparing for Infusion

Drawing the Dose:

Assaying the Dose:

Transporting the Dose:
Drawing the Dose
Transporting the Dose
Transporting the Dose
Infusing the Dose
Infusing the Dose:

- usually thru central line,
- peripheral IV may be used

- 90 minutes infusion time followed by 20ml flush over twenty minutes

Post infusion:
- NM tech monitored by radiation safety at the end of infusion.
- IV tubing transported back too NM department
- monitor cart, iv pump, hot lab and person
- record dosimeter reading.
- Perform Bioassay 6-72 hours post therapy
Post infusion Imaging

- Pt is imaged when exposure reading is less than 7mr/hr typically 3-5 days post treatment

- Images are acquired as overlapping static images for 2 min/apiece
I131  MIBG POST RX #1
Exposure
Exposure Rates

- Parent is trained by Radiation Safety in the handling of radioactive material

- Allows parent to be categorized as radiation workers

- This allows parent to remain in room with their child

- We have never had a significant exposure to a parent

- Parent exposure typically less than NM technologist
Exposure Rates

- Maximum total yearly exposure for an individual non-nuclear staff member was 75mrem for 2006.

- Maximum total yearly exposure for an individual nuclear medicine technologist was 194.6 for 2006.

- Parent exposure significantly less than tech exposure.
Exposure rates

6’3’ tech highest exposure was 206.4 mrem

Approximately 5’0’ tech highest exposure was 49 mrem
learning opportunities

1. double glove
2. pressure tubing should be used
3. nursing ready before transporting dose to patient room
4. don’t pour I131 in utility sink
5. don’t let the patient use a urinal or (don’t let mom empty the urinal)
Takeaways

1. The patient is our top consideration
2. Mibg therapy is safe for the technologist
3. Attention to detail is priority for mibg therapy
Thank You