Targeted Cancer Treatment with Nuclear Medicine Therapy

**What is Radioisotope Therapy?**

Precision treatment in which a radioactive drug compound seeks and destroys cancer cells.

- **Thyroid Cancer**
  - Approximately 60,220 new cases estimated in the United States in 2013
  - **Treatment:** sodium iodide iodine-131
  - Cure rates in excess of 90%

- **Non-Hodgkin’s Lymphoma**
  - Approximately 69,740 new cases estimated in the United States in 2013
  - **Treatment:** yttrium-90 labeled ibritumomab tiuxetan
  - Effective in 75% of patients

- **Neuroblastoma**
  - Approximately 700 new cases in infants in the United States each year
  - **Treatment:** iodine-131 metaiodobenzylguanidine (MIBG)
  - Overall survival rate of 69%

**Benefits of Radioisotope Therapy**

- Highly selective—kills cancer cells and spares healthy cells
- Can be tailored to the unique biologic characteristics of the patient and the molecular properties of the tumor
- Virtually all performed as outpatient procedures
- Side effect rates less than other treatments

- **Liver Cancer (Hepatocellular Carcinoma) and Liver-Dominant Metastatic Disease**
  - Approximately 30,640 new cases of liver cancer and intrahepatic bile duct cancer diagnosed in the United States in 2013
  - **Treatment:** Selective internal radiation therapy (SIRT) with Yttrium-90 microspheres
  - Median survival rate for liver cancer patients of 20.5 months vs. 17.4 months with SIRT as compared to chemoembolism, with less toxicity. In liver-dominant metastatic disease from colon cancer, partial response, stable disease, and progressive disease seen in 10.2, 60, and 30 percent of patients, respectively.

- **Bone Metastases from Castration-Resistant Prostate Cancer**
  - Approximately 238,590 new cases of prostate cancer in the United States in 2013
  - **Treatments:** radium-223 dichloride, samarium-153 lexidronam, and strontium-89
  - Nearly comparable adverse events and 3.6-month overall survival benefit and 5.6-month benefit in time to first skeletal-related event with Ra-223 dichloride compared to placebo

Sources available at www.snmmi.org/therapyinfographic