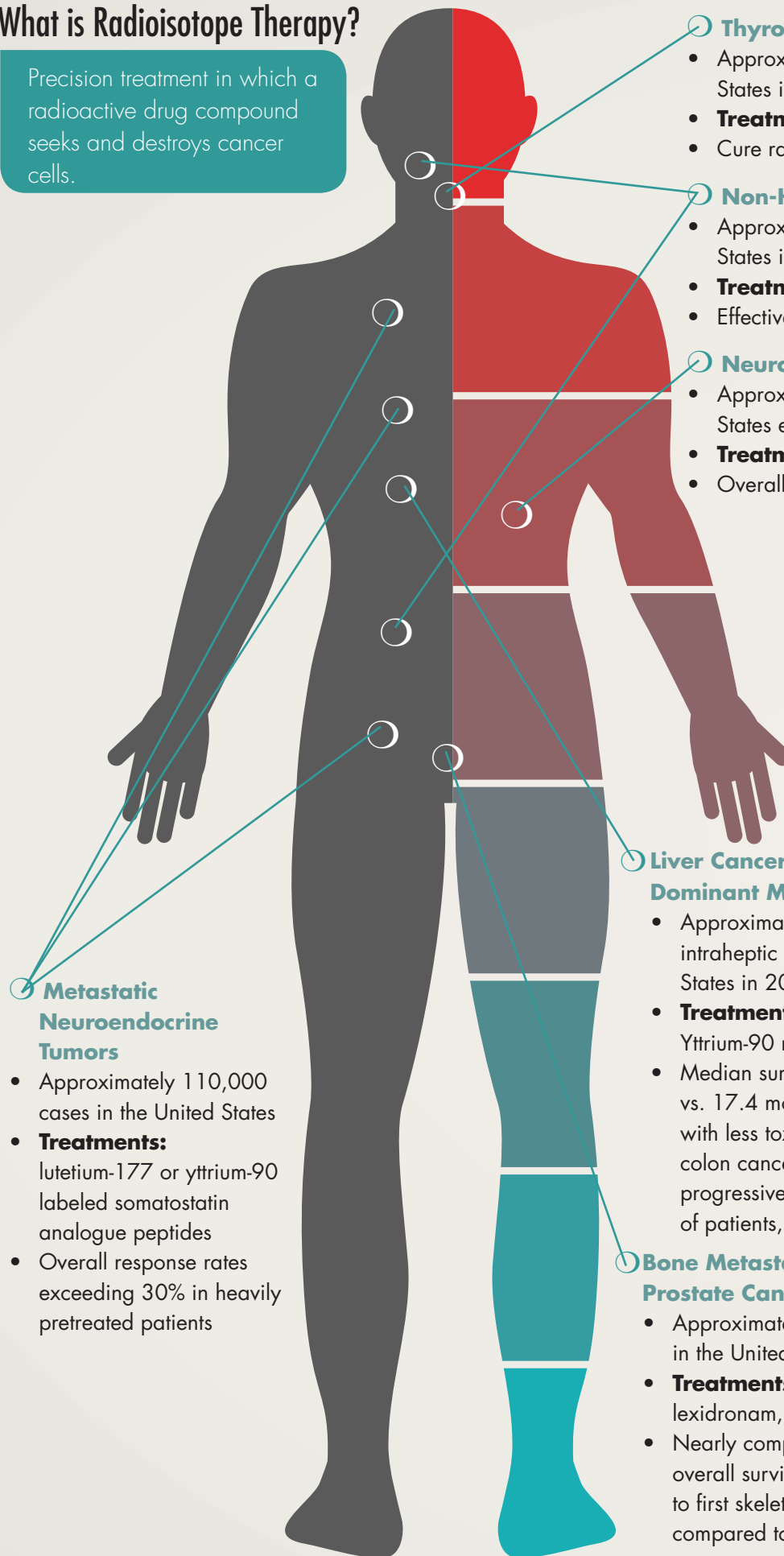# Targeted Cancer Treatment with Nuclear Medicine Therapy

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

Metastatic Neuroendocrine Tumors
- Approximately 110,000 cases in the United States
- **Treatments:** lutetium-177 or yttrium-90 labeled somatostatin analogue peptides
- Overall response rates exceeding 30% in heavily pretreated patients

Liver Cancer (Hepatocellular Carcinoma) and Liver-Dominant Metastatic Disease
- Approximately 30,640 new cases of liver cancer and intraheptic 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