

## Radionuclides

Treatment	Indication	Mechanism	Administration	Nursing Considerations
Radium 223 (Xofigo®)	Prostate cancer	Mimics calcium and forms complexes with bone mineral in bone metastases, gives off radiation as it decays and causes anti-tumor effect on metastases	Given as a 1-minute IV injection	<ul style="list-style-type: none"> <li>Hematologic labs monitored throughout treatment</li> <li>Excretion mainly in feces (some in urine)</li> <li>Use condoms and effective birth control</li> <li>Alpha particle</li> </ul>
Yttrium-90 Ibritumomab Tiuxetan (Zevalin®)	Lymphomas	Radiolabeled antibodies bind to CD20 positive B-cells	IV infusion in combination with rituximab (three-part infusion) Extravasation possible	<ul style="list-style-type: none"> <li>Monitor platelet counts</li> <li>Embryo-fetal toxicity potential</li> <li>Avoid live vaccines for 12 months</li> <li>Body shields the radiation</li> </ul>
90Yttrium (TheraSphere®)	Unresectable hepatocellular carcinoma, metastatic liver cancer, and cholangiocarcinoma	Glass microspheres emit pure beta radiation into tumorous liver tissue providing a therapeutic effect	<ul style="list-style-type: none"> <li>Catheter is placed in the major right or left hepatic artery which supplies the tumor, microspheres are injected and release radiation directly into the tumor</li> <li>Outpatient procedure</li> </ul>	<ul style="list-style-type: none"> <li>Side effects can be dependent on dose, LFTs monitored post-procedure</li> <li>Microspheres can be shunted to GI tract or lungs</li> <li>Body provides radiation shielding</li> <li>Microspheres remain in liver permanently</li> </ul>

<p>Lutetium 177 PSMA</p> <p>**Currently in clinical trial, not FDA approved</p>	<p>Prostate cancer</p>	<p>The PSMA molecule is bound with Lutetium-177 which emits beta radiation, damaging the cancer cells when it is in proximity</p>	<p>IV infusion/injection, outpatient</p>	<p>Advise hydration</p>
<p>Radioiodine I-131</p>	<p>“Gold standard” treatment for thyroid cancer</p>	<p>Thyroid cells take up radioiodine from the bloodstream</p>	<p>Oral pill or solution, may be outpatient or inpatient</p>	<p>Radiation room plus Radiation safety precautions dependent on dose Avoid pregnancy for up to 12 months after treatment</p>
<p>iodine-131 apamistamab</p> <p>**Currently in clinical trial, not FDA approved</p>	<p>Novel conditioning with an iodinated CD45-targeted antibody prior to allogeneic HCT for relapsed/refractory acute myeloid leukemia (AML)</p>	<ul style="list-style-type: none"> <li>• Delivering the radioactive component of the drug directly to the cancer growth within the bone marrow</li> <li>• Killing the cancer and bone marrow cells while avoiding the effects of radiation on most healthy tissues</li> </ul>	<p>Infusion</p>	<p>Radiation room plus</p>
<p>Lutetium 177 Dotatate (Lutathera®)</p>	<p>Refractory NET</p>	<p>Targeted therapy at somatostatin receptors on cancer cells</p>	<p>IV infusion</p>	<ul style="list-style-type: none"> <li>• Radiation room plus</li> <li>• Premedication with antiemetics and amino acid solution</li> <li>• Verify pregnancy status of patient prior to treatment</li> <li>• Periodic lab monitoring</li> </ul>