

Updates in Radiation Oncology

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Radiation therapy involves the delivery of high-energy x-ray beams or electrons beams for the treatment of cancer and well as non-cancerous (benign) disease. Radiation therapy may also be used in preparation for stem-cell transplant in patients with certain blood cancers. Radiation therapy may be curative if the cancer is localized and radiosensitive or it may be “palliative” to reduce symptoms such as pain by shrinking the tumor. It is often used in conjunction with surgery and/or systemic therapy (including chemotherapy, immunotherapy etc.) Radiation comes in many forms to treat different organs, sites and disease types.

Stereotactic body radiation (SBRT) and stereotactic radiosurgery (SRS): More over less time

Radiation can involve several weeks of therapy, daily Monday through Friday. SBRT and SRS involve the precise delivery of high-dose, highly targeted radiation therapy over 3-5 days or in one single treatment session. Such high-dose therapy may result in improved opportunities for cure. Precise delivery and targeting can reduce short and long-term side-effects and allows for treatment of small tumors in sensitive areas that may not be treated by surgery such as the brain and spine. SBRT is an important treatment option for patients with prostate, lung, breast and pancreas cancer and smaller brain and spine tumors.

Therapeutic Radioisotopes: Seek and Destroy

This is an exciting field in radiation oncology. For patients with cancer that has spread to different parts of their body, targeting the disease with cancer-seeking radiation therapy can be highly effective and safe. Radio-isotopes have been used for decades in treatment of thyroid cancer and cancer that has spread to bone. Patients are injected with a cancer-seeking drug linked to a radioactive material. The drug finds the cancer cells and exposes them to the radioactive material, destroying them in place. There are currently different radioisotopes that specifically target several kinds of cancer including pancreatic, prostate, liver and blood cancers with more in clinical trials for bladder, colon, melanoma and certain brain cancers. Some new treatments include:

- **Lutathera (lutetium Lu 177 dotatate):** used in the treatment of gastro-pancreatic neuroendocrine tumors
- **Xofigo (radium Ra 223 dichloride):** used in the treatment of patients with prostate cancer, with spread to bone only, when they become resistant to anti-testosterone therapy; has been shown to improve survival
- **Lutetium Lu 177 PSMA:** -- used in the treatment of patients with prostate cancer that has spread to other body sites when they become resistant to anti-testosterone therapy; in clinical trials at this time
- **Theraspheres (yttrium-90)** – for treatment of hepatocellular carcinoma (“liver cancer”) and other cancers than have spread to the liver; injected into liver circulation
- **Zevalin (ibritumomab tiuxetan+ yttrium-90)** – for treatment of low grade follicular lymphoma
- Clinical trials underway looking at **copper-67** for treatment of bladder, colon, melanoma and glioblastoma

Breast Cancer: Intraoperative and accelerated partial breast radiation therapy

IORT (intraoperative radiation therapy) is radiation therapy given during lumpectomy surgery, right after the cancer has been removed. While the underlying breast tissue is still exposed, a single, high dose of radiation is given directly to the area where the cancer was to reduce the growth of cancer cells. Available for early-stage breast cancer, this replaces the need for several weeks of post-operative radiation.

Accelerated, partial breast radiation allows women to complete targeted radiation therapy to their cancer tumor bed after lumpectomy over 5 days rather than 4-6 weeks. It also reduces the exposure of normal tissues like heart and lung to radiation.

Additional reading: <https://www.cancer.net/navigating-cancer-care/how-cancer-treated/radiation-therapy/what-radiation-therapy>