

RADIATION MEDICINE

PHYSICIAN REFERRAL

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Chair

The Department of Radiation Medicine offers patients the most advanced cancer care in a supportive setting. We provide a variety of individualized treatment options for our patients. Our goal is to provide the most up-to-date cancer therapy in a socially and emotionally supportive setting to help our patients cope with their diagnosis and treatment.

As part of the dynamic UK Markey Cancer Center, Radiation Medicine enjoys a close relationship with a variety of specialty teams, including medical oncology, surgical oncology, anesthesiology (pain management) and various surgical sub-specialties. Those multidisciplinary teams ensure excellent continuity of care and integration of needed services. Patient care is carefully coordinated to assure that the unique needs of each individual treated are identified and addressed in a caring and compassionate manner.

SPECIALTIES

- Brachytherapy—high-dose rate (HDR) and low-dose rate (LDR)
- Emergency radiotherapy (e.g. spinal cord compression, SVC syndrome)
- Eye plaques for ocular melanoma
- Gamma Knife® Perfexion™ Radiosurgery
- General radiotherapy for malignancies at any site
- Image guided radiation therapy (IGRT)
- Intensity modulated radiation therapy (IMRT)
- Interstitial seed implants, temporary and permanent, for prostate and gynecological cancers
- Palliative radiotherapy
- Pediatric radiotherapy
- Stereotactic body radiation therapy (SBRT) (e.g. lung, spine)
- Three-dimensional and computed tomography based treatment planning
- TomoTherapy® Hi-Art® treatment
- Total body irradiation (TBI) for blood and marrow transplantation
- Total skin electron beam irradiation for treatment of mycosis fungoides
- Treatment of leukemia/lymphoma

DETAILED DESCRIPTION OF SPECIALTIES

Brachytherapy

Brachytherapy allows doctors to place radioactive sources close to the tumor site.

- High-Dose Rate (HDR) Brachytherapy HDR brachytherapy delivers high-dose rate radiation through temporarily placed radiation sources. The radiation is quickly and precisely delivered to a tumor. Patients receiving HDR brachytherapy can often be treated on an outpatient basis. We currently use HDR brachytherapy for many gynecological cancer treatments and occasionally for other types of cancer such as lung and head and neck. Patients with other local tumors can be considered for HDR therapy on an individual basis.
- Low-Dose Rate (LDR) Brachytherapy LDR brachytherapy has been successfully used in the treatment of cervical and uterine cancers and other gynecological malignancies whether a patient receives LDR or HDR, brachytherapy depends on the individual's cancer location and situation, among other factors.

Eye Plaques for Ocular Melanoma

Plaque therapy delivers a highly concentrated radiation dose to eye tumors with relatively little radiation to surrounding healthy tissues. The radiation sources used come in the form of small "rice-sized" radioactive seeds. These seeds are attached within a gold or steel bowl called a plaque. This allows preservation of the eye and useful vision in most cases.

Gamma Knife® Perfexion™ Radiosurgery

As part of the UK Brain & Body Radiosurgery program, UK Radiation Medicine works in conjunction with the Kentucky Neuroscience Institute to treat patients in Kentucky's only Gamma Knife® Radiosurgery Center. The Gamma Knife® Perfexion™ uses advanced three-dimensional planning based on high resolution CT or MRI scans to focus nearly 200 beams of cobalt-60 radiation onto a tumor or lesion. Gamma Knife® radiosurgery is an important option for patients with abnormal blood vessels of the brain (arteriovenous malformations), various types of brain tumors, and functional disorders such as trigeminal neuralgia. This treatment method is accurate to <1 millimeter, does not require surgery and typically is performed on an outpatient basis.

Image Guided Radiation Therapy

Image-guided radiation therapy (IGRT) is the use of frequent imaging during radiation therapy to improve the precision and accuracy of the delivery of treatment. Necessary adjustments are made to the patient's position and/or radiation beams in order to more precisely target radiation at the tumor and avoid healthy surrounding tissue. IGRT is used to treat tumors in areas of the body that are prone to movement, such as the lungs and prostate gland as well as tumors located close to critical organs and tissues.

Intensity Modulated Radiation Therapy

IMRT is a sophisticated form of three-dimensional conformal radiotherapy that focuses multiple radiation beams on a tumor. Radiation beams with varying or "modulated" intensities deliver the dose to the tumor and minimize radiation to nearby tissues and organs.

Interstitial Seed Implants

Implanting radiation sources inside the body close to the cancer can protect normal tissues and produce excellent outcomes. A variety of tumors can be treated in this fashion. In particular, interstitial seed implants are used for many early stage prostate cancers. Using ultrasound guidance, dozens of tiny radioactive "seeds" measuring about two mm in length are carefully placed in the prostate to destroy the tumor while sparing the urethra, bladder and other nearby organs. This provides a treatment option that only requires a few visits for selected patients. UK also has significant experience in using permanent interstitial implants for locally recurrent gynecologic cancers after previous treatment as well as in the up-front management of selected patients.

Pediatric Radiation Therapy

Comprehensive radiation oncology services are available for children with malignant diseases. Clinical services include external beam radiation, with photons and electrons as needed. Three-dimensional conformal therapy, IMRT, brachytherapy and stereotactic radiosurgery are also options, depending on the patient. Pediatric anesthesia services are available when needed.

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Stereotactic Body Radiation Therapy

Stereotactic body radiations therapy (SBRT), also called Stereotactic Radiosurgery (SRS), is used to treat early stage lung cancers as well as other selected tumors. Even patients who are not good candidates for surgical resection can be cured with this option. SBRT precisely delivers very high dose radiation therapy in just a few fractions using special positioning of the patient along with radiologic techniques to accurately pinpoint tumors and reduce the radiation to healthy tissues.

Three-Dimensional and Computed Tomography Based Treatment Planning

UK Radiation Medicine has a dedicated CT (computed tomography) scanner for imaging and three-dimensional radiation planning for patients requiring radiation treatment. Four-dimensional planning, taking into account respiratory variation, is also performed.

TomoTherapy® Hi-Art® Treatment System

TomoTherapy® is one of the most advanced and versatile radiation therapy systems available. The Hi-Art® treatment system uses its unique CT scanner design to deliver radiation continuously from all angles around the patient. More angles and precise beam modulation result in dose distributions that tightly conform to tumors, minimizing damage to surrounding healthy tissue.

Total Body Irradiation

TBI is a critical component of the Blood and Marrow Transplantation program. The entire body is slowly exposed to radiation to facilitate the success of the transplant. Sensitive normal structures are protected with customized field blocking.

Total Skin Electron Beam Irradiation

This technique delivers high doses of radiation to the entire skin surface without treatment of the underlying tissues and organs. This is particularly useful in treating cutaneous T-cell lymphoma (Mycosis Fungoides) and other rare lymphomas. UK Radiation Medicine has more than 20 years of experience providing this service.

PROGRAMS

UK Brain & Body Radiosurgery Program

The revolution in computers and new imaging techniques have enabled us to closely target cancers and deliver potentially curative doses of radiation in just a few sessions. UK Radiation Medicine has developed the UK Brain & Body Radiosurgery Program to treat cancers which are localized or limited to one area of the brain or body. This program provides the most advanced, up-to-date cancer treatment available in the USA. The UK Brain & Body Radiosurgery Program combines two of the most modern technologies available for superior, non-invasive cancer treatment: Gamma Knife® Perfexion™ brain radiosurgery and the TomoTherapy® Hi-Art® treatment system.

