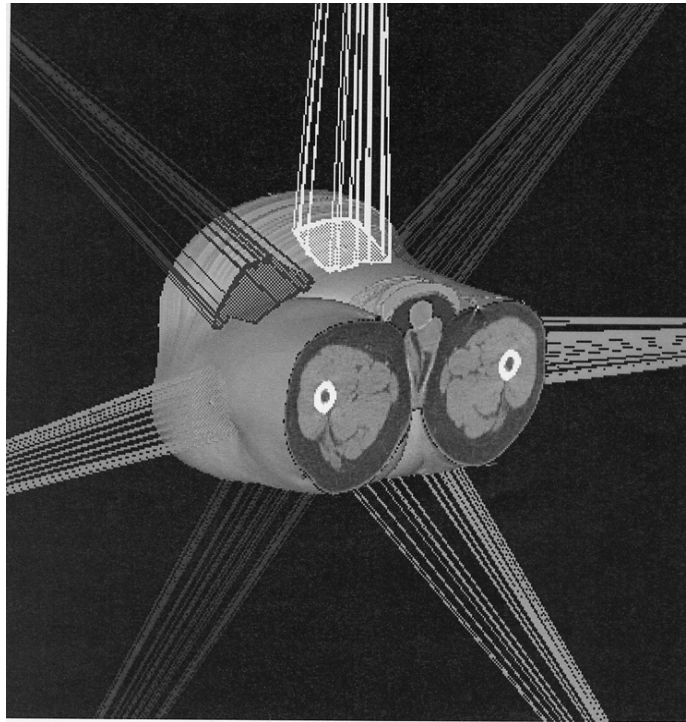


IMRT – INTENSITY MODULATED RADIATION THERAPY

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IMRT is now available at the Robert Boissoneault Oncology Institute in Citrus County at Drs Brant and Bennett's office in Lecanto. IMRT is a precise way to deliver irradiation in the treatment of cancer. It is accomplished by using extremely complex computer algorithms with the use of special shielding or blocking devices called multileaf collimators. With these tools the beam of irradiation can be shaped to cover the target (cancer and at risk tissues) and the intensity modulated such that normal tissues are spared as much as possible. This enables the Radiation Oncologist to prescribe more irradiation to the cancer with the normal tissues receiving less irradiation. The result is a higher chance of curing the cancer with less chance of causing complications. Because of the complexity of this treatment and other technical and anatomic considerations, it is now being used primarily for prostate cancer. Data from Memorial Sloan-Kettering and other institutions indicate that higher doses of irradiation can be given with IMRT without increasing complications.

Historically, irradiation has been used for treatment of many types of cancer that either cannot be removed surgically, the results of surgery would be unacceptable, or the patient could not withstand an operation because of other health related problems. The chances of curing the cancer with irradiation has depended on a number of factors. One of these is the dose of irradiation that can be safely administered without injuring the surrounding normal tissues.

In order for a patient to receive IMRT, special planning is required. This includes a strict simulation process where the patient is "immobilized" in the treatment position. This is accomplished by making a device that conforms to the patient's body shape. The

patient can be positioned in this device prior to each treatment. A planning CAT scan is then performed in the treatment position. Utilizing the images from the CAT scan, the Radiation Oncologist then delineates the Planning Target Volume (PTV) as well as other surrounding organs. Physicists trained in IMRT then utilize computers to design a plan that optimizes the dose of irradiation to the PTV while limiting the dose to the surrounding tissues.

As part of the planning process, particularly for prostate cancer, patients are required to drink liquids prior to planning and treatment each day. The reason for this is twofold. One, it allows for better visualization of the prostate, bladder and rectum with ultrasound examination which is performed prior to each treatment. The ultrasound is used to ensure that the patient is properly positioned and that the bladder is full and distended. Two, the bladder needs to be full to aid in keeping other organs, i.e. large and small bowel as well as some of the bladder out of the area which is receiving high dose irradiation.

With IMRT, doses of irradiation greater than 70 Gray (Gy) can be safely administered to the prostate. Studies have shown that doses higher than 70 Gy have a better chance of cure. Unfortunately, with the techniques of irradiation that have been used in the past, the incidence of complications also increases significantly when doses higher than 70 Gy have been used. One of the specific complications with irradiation that has been studied is rectal bleeding. Data from Memorial Sloan-Kettering comparing conventional irradiation with IMRT showed a statistically significant difference in particularly Grade 2 rectal toxicity.

With substantial data in regards to the efficacy and decreased complications with IMRT in prostate cancer, some institutions are proceeding with the use of IMRT in other cancers. Head and neck cancer in particular is an area in which IMRT has been used. The data in regard to this, however, is too sparse, and there is not long enough follow-up to draw any absolute conclusions. With additional follow-up from research institutions, IMRT may soon appropriately be used in other sites with good supporting data.