

AL-Mustaqbal University College



Nuclear Medicine

for B.Sc. Students

By Lecturer

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Lecture 10 / Image-guided radiation therapy

1- Image-guided radiation therapy or IGRT

Image-guided radiation therapy, is a type of cancer treatment that uses imaging technologies such as PET, MRI, and CT to more accurately and safely deliver radiation to cancer cells. The machines that are used to deliver the radiation, called linear accelerators, are equipped with the imaging equipment so that doctors can confirm exactly where the tumor is in the body before and during treatments.

2. What are the advantages of IGRT?

The main advantage of IGRT is that it is very precise. It makes it possible to

- use higher doses of radiation to kill the cancer
- avoid harm to healthy tissue
- keep radiation side effects to a minimum

3. How is IGRT given?

At the beginning of each treatment session, your radiation therapist will position you on the treatment table. Scans will be taken to make sure your body is **properly** positioned. We may take more images or move you again during your treatment sessions to guide where the

radiation will be delivered. IGRT sessions may take a bit longer than other types of radiation treatments because of the time needed to collect and view the scans.

Our specialists use imaging technologies such as PET, MRI, and CT both before and during IGRT to more precisely and safely map the location of the cancer. For some IGRT procedures, small dots called fiducial markers — which are made of gold, plastic, or another material — may be placed in the body within or near the tumor to help your treatment team locate the cancer. Your skin may also be marked to help align the equipment that delivers the radiation.

Over the course of your therapy, we will use imaging technologies to continually monitor and adapt to changes that may be occurring in your tumor, such as shrinkage, growth, or changes in shape.

4. How many treatments do I need?

IGRT requires multiple sessions. Typically, you will have IGRT five days a week for several weeks. The total number of treatments that you receive depends on a number of factors, including the type of cancer you have and the size and location of the tumor.

5-When do doctors recommend IGRT?

IGRT is often used for tumors located close to sensitive structures and organs in the body. It's also useful for tumors that are likely to move during treatment or between treatments, such as lung tumors, which can be affected by breathing.

IGRT is used at MSK most often to treat lung cancer, breast cancer, prostate cancer, brain cancer, spine cancer, bladder cancer, esophageal cancer, liver cancer, and bone cancer, as well as for lymphoma.

6. Why choose Memorial Sloan Kettering for IGRT?

Our experts developed many of the techniques that are used for IGRT and have more than 10 years of experience in using this type of radiation treatment for our patients.

Our radiation oncologists are experts at using imaging technology to more precisely and safely target the tissue that contains cancer cells and avoid harming healthy tissue. Our PET and MRI simulators allow us to map out the treatment area with great accuracy, so we can deliver a safe but effective dose of radiation to the tumor.

MSK's expertise enables us to provide each patient with the most accurate treatments possible and offer the best possible result.

