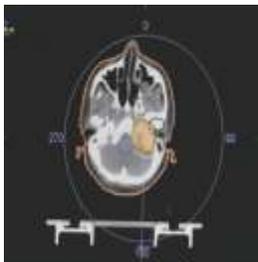


# CIMS RADIOTHERAPY

- **SBRT (Stereotactic Body Radiotherapy)** : It is the treatment for small sized tumor in body to give very high dose with high precision in less fraction (3-5 fractions).
- **SRT (Stereotactic Radiotherapy)** : Treatment technique with high dose rate for smaller tumor in brain to give very high dose with high precision in few fractions.
- **SRS (Stereotactic Radiosurgery)** : Treatment technique with high dose rate for smaller tumor in brain to give very high dose with high precision in single fraction.
- **Electron Beam**: It is useful in treating superficial tumors with less damage to the deeper areas.
- **FFF** : Used in stereotactic radiation techniques, provides higher dose rate and less treatment time.
- **Proton Therapy** : Proton therapy, or proton beam therapy, is a type of particle therapy that uses a beam of protons to irradiate diseased tissue. The advantage of proton therapy over other types of external beam radiotherapy is that as a charged particle the dose is deposited over a narrow range and there is minimal exit dose.
- **Palliative Radiotherapy** : It is used for the symptomatic relief in advanced cancers.



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## Patient Pathway in Radiotherapy Department.

This pathway illustrates progression of patient in radiotherapy department.

<b>Arrival</b>	Reception
<b>Before Treatment</b>	Consultation, Counselling, Consent
<b>Treatment Planning</b>	Radiotherapy Planning CT Scan Skin Marking/Tattoo
<b>Treatment</b>	Explanation about treatment Side effect



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CIMS Cancer Centre

### What is Cancer ?

Cancer is a disease where cells in the tissue divide and grow without normal controls. Treatment of Cancer is done by multi-modality approach, main treatment modality available are Surgery, Chemotherapy and Radiotherapy.

### What is Radiation Therapy (Radiotherapy)

Radiotherapy is the branch of medicine that deals with the treatment of tumors (malignant or benign) through ionizing radiations.

### How does Radiotherapy work ?

Radiation therapy, or radiotherapy, is the use of various forms of radiation to safely and effectively treat cancer and other diseases. Radiation therapy works by damaging the genetic material within cancer cells. Once this happens, the cancer cells are not able to grow and spread. When these damaged cancer cells die, the body naturally removes them. Normal cells are also affected by radiation, but they are able to repair themselves in a way that cancer cells cannot be able to repair. Main aim of Radiotherapy is to give maximum dose to target volume or tumor and give minimum dose to surrounding normal tissues.

### Brachytherapy:

Brachytherapy also known as internal radiotherapy, is a form of radiotherapy where a sealed radiation source is placed inside or next to the area requiring

treatment. It is commonly used as an effective for cervical, prostate, breast, sarcoma and skin cancer and can be used alone or in combination with other therapy such as External Beam Radiotherapy (EBRT) and Chemotherapy.

### LINAC (Radiation Machine):

- The radiation beam is usually generated by a machine called a linear accelerator, or LINAC. The linear accelerator is able to produce high-energy X-rays or electrons. Your treatment team controls the size and shape of the beam, as well as how it is directed at your body, to effectively treat your tumor while sparing the surrounding normal tissue.



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### Planning & Treatment delivery:

- For accurate and precise delivery of radiation, treatment planning must be proper.
- The region of body treated by radiation should not move during treatment, so the first step in radiation planning is immobilization of the patient. It is done for each patient using different specific devices e.g. thermoplastic mask, vacuum cushion etc. After that planning CT scan is done in the specific position in which patient will be treated.
- Radiation oncologist will mark out the different areas which are to be treated by radiation. Accordingly radiation planning is done to decide different directions of radiation beams and other parameters. This planning is verified by Radiation oncologist and the best plan is selected for treatment. Patient is treated on the LINAC according to the best plan selected after all safety measures and precautions.

### Treatment Parameters:

- Total radiation dose is decided by oncologist according to disease, site of disease, stage of disease, condition of patient and other factors and it is delivered in different fractions of small doses decided by oncologist which may vary from single to multiple. Multiple fractions usually delivered 5 days a week schedule.

### Techniques of Radiotherapy:

- 2D Radiotherapy** : It is based on simple X-Ray based planning, treats larger area of body.
- 3D CRT (3 Dimensional Conformal Radiotherapy)**: It is based on CT scan based planning and uses multiple beams & MLC(Multileaf Collimator) to form the shape of radiation beam according to tumor contour.
- IMRT (Intensity modulated radiotherapy)** : It is conformal radiotherapy which allows higher radiation doses to be focused to region within the tumor and minimizing the dose to surrounding normal critical structures.
- VMAT (Volumetric Modulated Arc Therapy)** : It is advanced form of IMRT giving more precision, accuracy and less treatment time.
- IGRT (Image guided radiotherapy)** : It uses X-ray images or X-ray volume imaging (XVI) to ensure and verify treatment position of patient during treatment delivery.

