Proton Beam Therapy

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Why is in news? Proton beam therapy out of reach for many with cancer

Proton therapy, also called proton beam therapy, is a type of radiation therapy. It **uses protons rather than x-rays to treat cancer.**

A proton is a positively charged particle. At high energy, protons can destroy cancer cells.

Doctors may use this therapy alone. They may also combine it with x-ray radiation therapy, surgery, chemotherapy, and/or immunotherapy.

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Cancer patients in India **face twin challenges** when it comes to accessing proton beam therapy (PBT): **not enough facilities** offering the treatment and **cost** running into many lakhs of rupees.

The PBT is considered a **viable alternative to radiation** for treating solid tumours, especially head and neck cancers.

Unlike radiation which uses X-rays, the PBT uses protons to tackle cancer. While radiation can prove toxic to the whole body, **protons can destroy cancer cells precisely by targeting tumours**, thus saving adjoining organs.

Over 24,000 people die each year because of brain tumours, according to the **International Association of Cancer Registries**.

Currently there are 42 PBT machine installations in the U.S., followed by Europe (35), Japan (26), China (seven), Taiwan (three) and South Korea (two), while India has only one.

Benefits:

Usually, up to 60% less radiation can be delivered to the healthy tissues around the tumor. This lowers the risk of radiation damage to these tissues.

It may allow for a higher radiation dose to the tumor. This increases the chances that all of the tumor cells targeted by the proton therapy will be destroyed.

It may cause fewer and less severe side effects such as low blood counts, fatigue, and nausea during and after treatment.

Drawbacks to proton therapy:

It requires highly specialized and costly equipment so it is available at just a few medical centers.

It may cost more than x-ray radiation therapy.

Not all cancers can be treated by this therapy.