

# Proton Beam Therapy

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**Context-** India does not currently have any government facilities that provide proton beam therapy treatment. When treating solid tumors, particularly head and neck cancers, the treatment is thought to be a viable alternative to radiation.

## Proton Beam Therapy (PBT)

- PBT is a treatment for cancer that targets cancer cells with a beam of high-energy protons.
- A proton is an elementary particle with a positive charge that is a fundamental component of all atomic nuclei.
- PBT, in contrast to X-ray-based conventional radiation therapy, can precisely target the tumor while minimizing radiation exposure to healthy tissue surrounding it.
- Most of the time, a large, complicated machine called a cyclotron delivers PBT to the tumor site by accelerating protons to high speeds.

## Issues Relating to Proton Beam Therapy

- Due to safety concerns raised by the Department of Energy, setting up a PBT center presents numerous infrastructure and regulatory obstacles.
- Since hydrogen is a highly volatile element, safety concerns exist, and daily checks are required to prevent leaks.
- A PBT machine is a massive device that can be up to three stories tall and costs close to 500 crore rupees.

## **PBT in India**

- The only center in South and West Asia that offers PBT is Apollo Hospital in Chennai.
- Up to 900 patients have been treated at the hospital, with brain tumors accounting for 47% of cases.
- Patients with cancer of the prostate, ovaries, breast, lungs, bones, and soft tissues have also seen encouraging results from PBT.

## **Way Forward**

- In India, there is a significant unmet demand for PBT treatment access.
- To increase access to PBT for more cancer patients, the government should concentrate on setting up PBT centers across the country.
- When setting up the PBT center, it's important to solve problems with infrastructure, regulations, and safety.
- Other healthcare providers may be inspired to invest in this technology by Apollo Hospital Chennai's success with PBT.