



# Proton Therapy for Recurrent Cancers

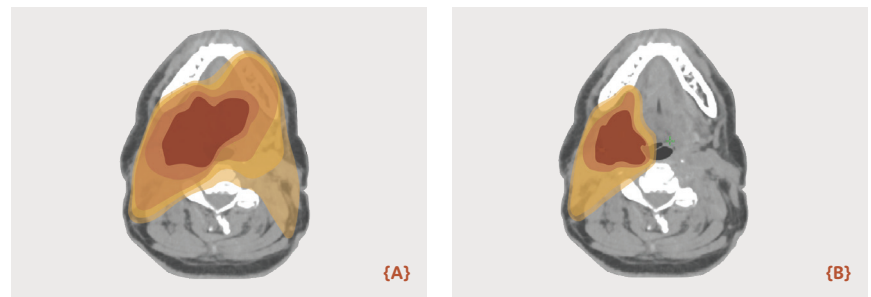
## About Proton Therapy

It is widely believed that a tumor previously treated with radiation therapy cannot receive radiation again if the cancer recurs. While it is true that the human body can only tolerate a certain amount of radiation over a lifetime, reirradiation is possible with proton therapy, a highly advanced form of radiation therapy.

### Proton Therapy for Recurrent Cancer

**FIGURE A**  
 Proton therapy  
 treatment

**FIGURE B**  
 traditional radiation  
 with photons



Proton therapy is the safest and sometimes the only radiation treatment that **effectively treats recurrent tumors while protecting healthy normal tissues.**

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### How is proton therapy different from conventional radiation therapy?

Proton therapy is unique because it uses protons, not photons, to destroy cancer cells. Protons are positively charged particles found in the nucleus of an atom. A major difference between the two is that protons are much more easily controlled than the photons used for conventional radiation, allowing our treatment team to target the tumor with millimeter precision, thereby reducing irradiation of healthy tissues near the tumor.

The images above demonstrate how proton therapy targets the tumor and delivers less radiation to the nearby organs and tissues. In this example, for a recurrent head and neck tumor, the patient's oral cavity and neck receive significantly less irradiation with proton therapy.

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## Questions & Answers

### Q. Can all recurrent cancers be treated with proton therapy?

- A.** Proton therapy is a noninvasive treatment option for many cancers including:
- Anal and colorectal cancers
  - Brain tumors
  - Breast cancers
  - Esophageal cancers
  - Head and neck cancers
  - Gynecologic cancers
  - Liver cancers
  - Lung and thoracic cancers
  - Lymphomas
  - Pediatric cancers
  - Prostate cancers
  - Spine tumors

### Q. What are the benefits of receiving reirradiation at the New York Proton Center?

- A.** **The New York Proton Center treats more patients with radiation for recurrent cancer than any other proton center in the country.** More than 40 percent of our patients come to our proton center for management of difficult-to-treat recurrent tumors, far exceeding the national average of 11 percent. Our renowned experts in this area have advanced the research and lead multiple national and international guideline papers on reirradiation.

**More radiation focused directly to the tumor.** Proton therapy aims a very high dose of radiation at the tumor—and only the tumor. There is no “exit dose” into the healthy tissues behind the tumor like there is with traditional radiation therapy.

**Fewer side effects.** Because proton therapy is so precise, there is less risk of short- and long-term side effects from radiation. Healthy tissues and organs near the tumor are better spared from unnecessary irradiation.

**Pencil beam scanning enhances precision.** The New York Proton Center utilizes pencil beam scanning, or intensity-modulated proton therapy, the most sophisticated and precise form of proton therapy available today. This technology uses an extremely narrow proton beam to precisely “paint” the protons onto the tumor to destroy the cancer cells’ DNA. It is especially useful when treating complex tumors including those that are irregularly shaped.