NEW YORK
PROTON CENTER

Proton Therapy for Upper Gastrointestinal Tumors

Proton therapy achieves similar or even improved cancer outcomes compared with traditional radiotherapy, but with **significantly less radiation exposure to normal tissues.**

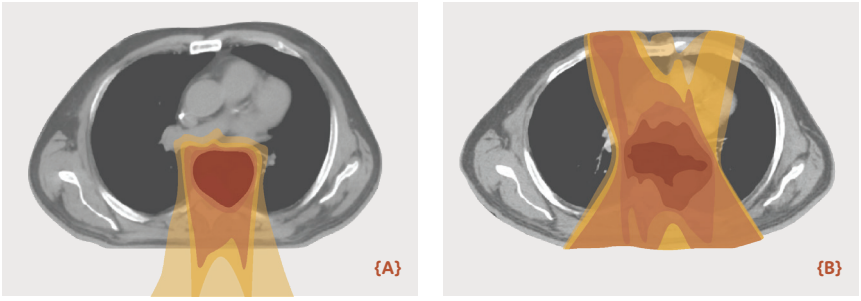
About Proton Therapy

Proton therapy is a highly advanced, ultra-precise form of radiation therapy that can treat many types of cancers. A key benefit is its ability to deliver more radiation to the tumor and less radiation to the surrounding healthy organs, allowing for fewer side effects and better preservation of quality of life.

Proton Therapy for Gastrointestinal Tumors

FIGURE A
proton therapy treatment

FIGURE B
traditional radiation with photons



Protons are positively charged particles in the nucleus of an atom. They are uniquely suited for cancer treatment because they can be more precisely controlled than photons, which are high energy X-rays used in traditional radiation therapy. Protons enter the body and travel to the tumor site just as photons do. However, unlike traditional radiation, protons have no "exit dose," meaning they do not travel beyond the tumor into healthy tissues.

About pencil beam scanning proton therapy

Pencil beam scanning proton therapy is the most sophisticated and precise type of proton therapy, and every patient at the New York Proton Center is treated with this next-generation technology. It allows our highly experienced clinical team to create a customized treatment plan based on the unique shape, size and location of your tumor, with even greater protection of your nearby healthy tissues.

As the name implies, pencil beam scanning proton therapy uses an extremely narrow beam—just a few millimeters wide—to "dot" protons onto the cancer with pinpoint specificity. The process is repeated, layer by layer, like paint applied by the tip of an incredibly fine brush.

Life during treatment

Most of our patients continue to carry out their regular activities, including work, exercise, hobbies, and other daily activities during the weeks they are receiving proton radiation treatment. The treatment itself is non-invasive and painless. You will not see or feel the radiation and will never emit any radiation from your body.

Not a substitute for surgery and/or chemotherapy

Proton therapy is not a substitute or replacement for other treatment modalities such as surgery or chemotherapy that may have been recommended for you. Our Radiation Oncology clinical team will work closely with your physicians to ensure you receive the best multidisciplinary care.

Questions & Answers

Proton therapy is a non-invasive, highly advanced form of radiation therapy that is used for the treatment of cancers of the upper gastrointestinal (GI) tract.

Patients who receive proton therapy for upper gastrointestinal tumors are at **lower risk of long-term side effects** than those who receive traditional radiation therapy with photons.

Q. What types of upper GI cancers can be treated with proton therapy?

A. Proton therapy is highly effective in the treatment of esophageal cancers such as esophageal adenocarcinoma and squamous cell carcinoma.

Proton therapy can also be an effective treatment for primary liver cancers, including hepatocellular carcinoma (HCC), bile duct cancers (cholangiocarcinoma), pancreatic cancers, and liver metastases or cancerous tumors that originated elsewhere but spread to the liver.

Recurrent upper GI tumors are often treatable with proton therapy, even tumors that were previously treated with radiation therapy.

Q. What are the benefits for esophageal tumors?

A. Proton therapy for esophageal cancer allows a higher radiation dose to be delivered directly to the tumor while less radiation is delivered to surrounding healthy tissues and organs. Specifically, the heart, lungs, and healthy abdominal organs receive significantly less radiation, greatly reducing the risk of short- and long-term side effects involving these essential organs.

A randomized control trial has shown that proton therapy is safe and effective for both operable and non-operable esophageal cancers with significantly less toxicity as compared to traditional photon radiation.

Q. What are the benefits of proton therapy for liver, biliary, and pancreatic cancers?

A. Like proton therapy for esophageal cancer, proton therapy delivers more radiation to the tumor and significantly less to the surrounding normal organs, including the healthy liver, stomach, bowel, and kidneys. Research shows this allows proton therapy to be a less toxic option for the treatment of liver cancers.

Q. Are there side effects?

A. Side effects of proton therapy depend on the location of the tumor and the types of healthy tissue near the tumor. The most common side effects of radiation therapy for upper GI tumors are fatigue, skin irritation, and nausea.

Q. Can I have proton therapy if I had previous radiation for another type of cancer?

A. Yes—patients who previously received radiation are good candidates for proton therapy because proton therapy minimizes exposure to healthy tissue and organs. This is extremely important as the human body can only tolerate a certain amount of radiation over a lifetime. Reducing the cumulative dose to the normal tissues may reduce the risk of side effects and allow for more radiation dose to be focused to the tumor, allowing for a better chance of a cure.

Q. How many treatments are required?

A. The number of treatments varies according to the unique characteristics of your tumor. However, treatment is usually administered five days a week for between one to six weeks.

Q. Does the New York Proton Center offer clinical trials?

A. With an active research program, we are pleased to offer a growing number of clinical trials for a variety of cancers. We are currently enrolling eligible patients in:

- A Phase III Randomized Trial of Protons Versus Photons for Hepatocellular Carcinoma: NCT03186898