

Proton Therapy With HYPERSCAN™

Only at MedStar Georgetown University Hospital

MedStar Georgetown University Hospital is proud to introduce proton therapy with HYPERSCAN™ technology to the Washington, D.C., metropolitan area. The new addition makes the MedStar Georgetown University Hospital Proton Therapy Center the first and only facility in the region, and the only one in the world to offer HYPERSCAN—greatly enhancing the care and convenience of patients throughout the area.

MedStar Georgetown's Mevion S250i with HYPERSCAN uses a unique technology, resulting in:

- **Greater precision:** HYPERSCAN's specialized adaptive aperture design produces a beam up to three times sharper than that of other systems, reducing damage to surrounding healthy tissues. Its layer-by-layer administration also allows for more precise sculpting, further protecting normal tissue.
- **Higher speed:** Faster than other proton pencil beam scanning (PBS) systems, HYPERSCAN can **reduce the margin of error in treating tumors** that are affected by breathing or organ motion, improving both treatment accuracy and patient comfort as patients need to spend less time lying still.
- **Better performance:** With **pinpoint accuracy**, HYPERSCAN can deposit its cancer-fighting dose directly into the tumor and then stop, **leaving no exit dose**. That allows for better dose distribution and fewer side-effects.

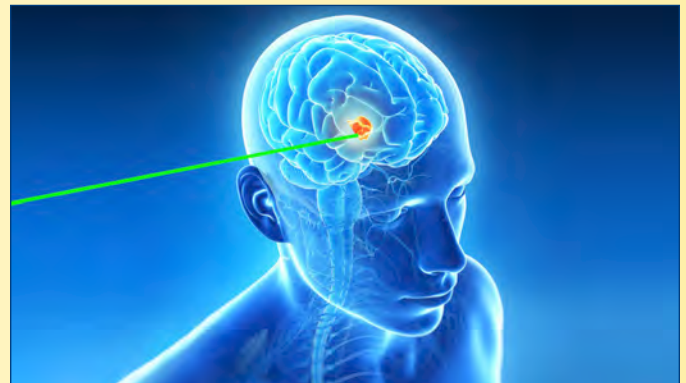
Applicable for tumors anywhere in the body, proton therapy is proving to be an especially valuable tool against esophageal cancers.

continued

Conventional Radiation



Proton Therapy



Proton therapy with HYPERSCAN™ targets the tumor, leaving virtually no exit dose as compared to conventional radiation.

Fewer Complications, Side-Effects for Esophageal Cancer Patients

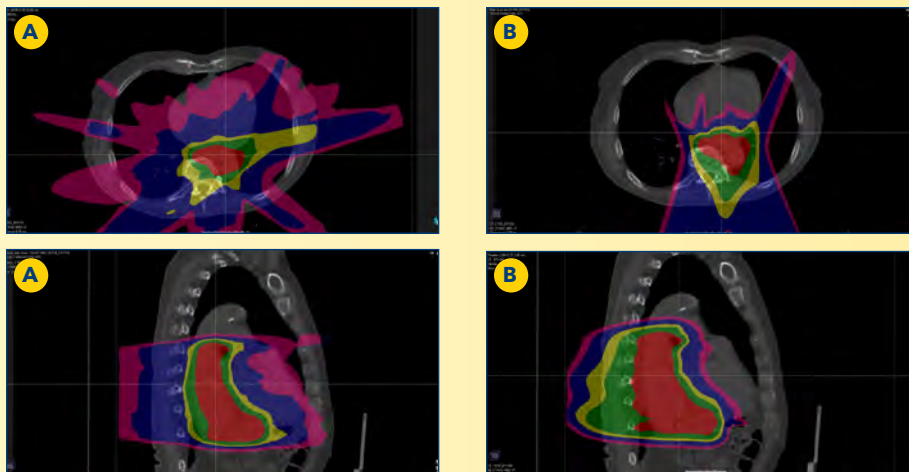
Because most esophageal cancers are in close proximity to many critical organs, the need to reduce exposure to surrounding, healthy tissue is a major treatment consideration. A number of clinical and modeling studies have demonstrated that proton therapy may be safer than, and equally effective as conventional radiation therapy in certain scenarios:

1. Locally advanced, unresectable esophageal cancer:

- Can be applied in higher doses with less cardiac and pulmonary toxicities ^[1]
- Demonstrates favorable cancer control rates using dose escalated proton therapy ^[2, 3]

2. Resectable esophageal cancer with neoadjuvant therapy:

- Reduces radiation exposure to the heart, lung, and liver ^[4]
- Results in lower rates of post-operative, cardiac, gastrointestinal, and wound complications as compared to conventional radiation ^[5]
- Produces fewer side-effects including less nausea and adverse hematologic reactions ^[5]



Intensity modulated radiation therapy (IMRT) plan is shown in panels "A" and proton therapy plan is shown in panels "B". Note the significantly reduced dose to the heart and lungs in the proton therapy plan as compared to the IMRT plan.

3. Recurrent esophageal cancer:

- Can re-irradiate with acceptable cancer control rates and safety ^[6]

Get the Best Care for your Patient

The MedStar Georgetown University Hospital Proton Therapy Center offers your patients with esophageal cancer their best option for optimal outcomes through:

- The most precise proton therapy technology currently available
- An experienced, multidisciplinary and compassionate team
- Access to clinical trials
- The complete suite of radiation modalities all under one roof

For more information or to refer a patient, contact Cheryl Savage, Administrator, Radiation Medicine at **202-444-4639** or savagech@gunet.georgetown.edu.

References

1. Wang, S.L., et al., *Investigation of clinical and dosimetric factors associated with postoperative pulmonary complications in esophageal cancer patients treated with concurrent chemoradiotherapy followed by surgery*. *Int J Radiat Oncol Biol Phys*, 2006. 64(3): p. 692-9.
2. Koyama, S., et al., *Proton beam therapy for patients with esophageal carcinoma*. *Jpn J Clin Oncol*, 1994. 24(3): p. 144-53.
3. Sugahara, S., et al., *Clinical results of proton beam therapy for cancer of the esophagus*. *Int J Radiat Oncol Biol Phys*, 2005. 61(1): p. 76-84.
4. Yu, J., et al., *Motion-robust intensity-modulated proton therapy for distal esophageal cancer*. *Med Phys*, 2016. 43(3): p. 1111-8.
5. Chuong, M.D., et al., *Improving Outcomes for Esophageal Cancer using Proton Beam Therapy*. *Int J Radiat Oncol Biol Phys*, 2016. 95(1): p. 488-97.
6. Fernandes, A., et al., *A Prospective Study of Proton Beam Reirradiation for Esophageal Cancer*. *Int J Radiat Oncol Biol Phys*, 2016. 95(1): p. 483-7.