

PROTON THERAPY FOR HEAD & NECK CANCER

Fewer side effects and better results **BECAUSE A CURE IS NOT ENOUGH**

Head and Neck Cancer Treatment

Head and neck cancer is a broad term referring to cancers in the larynx, throat, lips, nose, base of skull, eye and salivary glands. Approximately 65,000 people will be diagnosed with a cancer of the head or neck this year.

Many head and neck cancers are treated with radiation therapy which is usually delivered via an external beam. The two most commonly used radiation treatments are intensity modulated radiation therapy (IMRT) and proton therapy. This radiation treatment can be done with other treatments such as chemotherapy or surgery.

Clinical Studies

A number of studies have been published documenting the benefits of proton therapy for head and neck cancer. These include:

- Studies out of MD Anderson found a 60% reduction in feeding tubes for nasopharyngeal patients² and a 50% reduction for oropharyngeal patients treated with proton therapy versus IMRT (X-Ray radiation).
- A study out of Memorial Sloan Kettering found significant reductions in mean or median dose to critical structures for patients receiving proton therapy at their institution versus those receiving IMRT⁴:

Structure	IMRT	Protons	Dose Reduction
Brainstem	29.7 Gy	0.62 Gy	98%
Spinal Cord	36.3 Gy	1.88 Gy	95%
Oral Cavity	20.6 Gy	0.94 Gy	95%
Parotid	1.4 Gy	0.0 Gy	100%

This resulted in significant reductions in grade 2 or greater acute dysgeusia/taste changes (5.6% vs. 65.2%), mucositis/oral pain (16.7% vs. 52.2%) and nausea (11.1% vs. 56.5%).

- A study out of the University of Pennsylvania found a nearly 2/3 reduction in grade 3 or greater (severe) side effects for patients receiving chemotherapy with radiation treatment for patients receiving proton therapy versus traditional X-Ray radiation therapy.
- Holliday EB, Garden AS, Rosenthal DI, et al. Proton therapy reduces treatment-related toxicities for patients with nasopharyngeal cancer: A case-match control study of intensity-modulated proton therapy and intensitymodulated photon therapy. *Int J Particle Therapy* 2015;2:19-28.
- Blanchard P, Garden AS, Gunn GB, et al. Intensity-modulated proton beam therapy (IMPT) versus intensity-modulated photon therapy (IMRT) for patients with oropharynx cancer - A case matched analysis. *Radiother Oncol.* 2016;120:48-55.
- Romesser PB, et al. Proton beam radiation therapy results in significantly reduced toxicity compared with intensity-modulated radiation therapy for head and neck tumors that require ipsilateral radiation. *Radiother Oncol.* 2016 Feb;118(2):286-92
- Baumann BC, Mitra N, Harton JG, et al. Comparative effectiveness of proton therapy versus photon therapy as part of concurrent chemo-radiotherapy for locally advanced cancer. *American Society of Clinical Oncology poster session.* June 1, 2019.

Benefits of Proton Therapy

The challenge with radiation for head and neck cancer is that there are critical structures near the tumor such as the esophagus, swallowing muscles, tongue, and brain stem. Patients can often suffer severe side effects from treatment as a result of radiation hitting healthy tissue. The good news is that proton therapy can help reduce these treatment related side effects.

With proton therapy, radiation can be stopped inside the tumor, reducing or eliminating radiation dose to critical structures of the head and neck region. This is different than X-ray radiation delivered with IMRT that passes through the body from one side to the other delivering unnecessary and damaging radiation to healthy tissue and critical organs.

Who Can Benefit

Common head and neck cancers treated at the Oklahoma Proton Center include:

- Oral Cavity
- Nasopharyngeal
- Laryngeal
- Oropharyngeal
- Salivary Gland
- Squamous Cell
- Hypopharyngeal
- Paranasal Sinus
- Nasal Cavity
- Base of Skull
- Eye
- Tongue
- Reirradiation for recurrent tumors

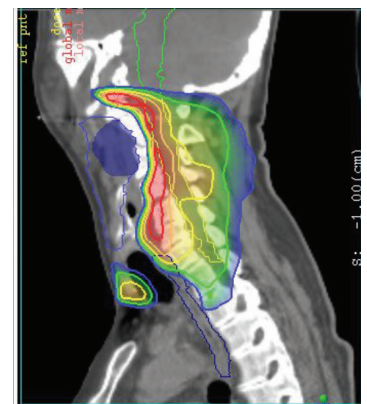
PROTON THERAPY PLAN



TRADITIONAL X-RAY RADIATION PLAN



DOSE DIFFERENCE (EXCESS RADIATION FROM X-RAYS)



FREQUENTLY ASKED QUESTIONS ABOUT PROTON THERAPY

What is the difference between Proton Therapy and other forms of radiation treatment?

Proton therapy and x-ray radiation therapy (such as IMRT, TomoTherapy, or Cyberknife) can both kill cancer cells, but unlike x-rays, protons go directly into the tumor and then stop. This allows protons to target the tumor while reducing damage to surrounding healthy tissue.

Is Proton Therapy proven?

The first cancer patient was treated with proton therapy in 1954 and nearly 200,000 patients have been treated worldwide. There are over 300 research papers outlining the clinical benefits of proton therapy. Many of the world's top cancer centers use protons to treat cancer and leading industry groups such as American Society for Radiation Oncology (ASTRO) and the National Comprehensive Cancer Network (NCCN) recommend the use of protons for many different cancers.

Is Proton Therapy covered by insurance?

Proton therapy is covered by Medicare and most private insurance plans. The Oklahoma Proton Center has financial counselors who will guide you through the insurance process. Please contact us if you have questions about your insurance coverage.

Can Proton Therapy be used with other treatments?

Proton therapy can be used in conjunction with other treatments such as chemotherapy, surgery, or immunotherapy. The doctors at Oklahoma Proton Center work closely with specialists at other facilities to help coordinate these treatments.

How do I know if I am a candidate for Proton Therapy?

Most patients with solid tumors can benefit from proton therapy's ability to deliver more radiation to the tumor and less radiation to healthy tissue. The doctors at Oklahoma Proton Center have many years of experience treating with all types of radiation and will carefully consider the best option for each patient at consult. It is important to speak with a radiation oncologist who actively treats with proton therapy to get the most complete information about its use for your particular cancer.

What services are available if I have to travel from out of town?

We have a dedicated concierge team that can help coordinate travel arrangements for out of town patients. We have partnerships with a number of hotels and extended stays in Oklahoma City with preferred rates, and we also partner with American Cancer Society to assist with accommodations for patients who may have financial hardship.

ABOUT OKLAHOMA PROTON CENTER

The Oklahoma Proton Center was the 6th proton center in the U.S. when it opened. It remains one of 30 centers in the country and one of just 5 in the Southwest. The clinical team is one of the most experienced in the country having successfully treated thousands of patients from across the U.S. over the past decade. Many of the techniques used today in other proton centers were developed at the Oklahoma Proton Center.

The facility is adjacent to the INTEGRIS Cancer Institute (ICI), one of the preeminent cancer centers in the region. The doctors at Oklahoma Proton Center work closely with their colleagues at ICI to provide a multi-disciplinary team approach to care. Patients often receive services at both facilities which are coordinated by the Oklahoma Proton Center.

Our goal is to provide great care focused on a patient's overall well-being throughout their cancer journey. We offer a number of services and activities besides the proton therapy treatment itself designed to maximize the healing process. These include patient lunches, group chat sessions, social events, support from former patients, educational seminars, nutritional and wellness counseling and more.

LEADERS IN CANCER CARE

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