

# PROTON THERAPY FOR BREAST CANCER

BECAUSE A CURE IS NOT ENOUGH

## Breast Cancer Treatment

About 1 in 8 women will develop breast cancer over the course of her lifetime. The good news is that outcomes have improved so that 5-year survival rates are greater than 90% overall. Therefore, it is critically important to consider the long-term impact that various treatments can have on overall health.

Radiation is often prescribed as an important component of the breast cancer treatment regimen. The challenge with radiation is that dose to healthy tissue, such as the heart and lungs, can cause severe side effects.

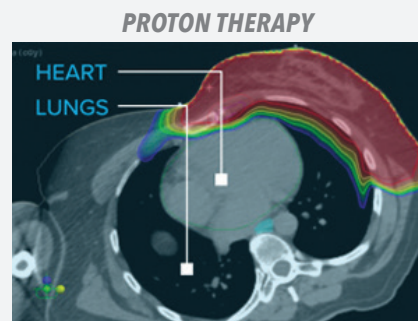
In fact, a large study of over 10,000 women published in the New England Journal of Medicine found that **even very small doses of radiation to the heart increases the risk of significant cardiac events (heart attacks resulting in hospitalization or death). This risk begins shortly after treatment and persist for decades.** This is why the American Heart Association recently released a scientific statement advising that “dealing with breast cancer means also keeping in mind heart health.”

Patients needing radiation after lumpectomy or mastectomy for left sided breast cancer, inner quadrant tumors, or regional nodal involvement were especially susceptible to radiation exposure to the heart.<sup>2</sup>

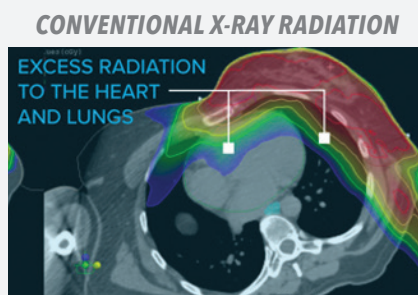
## Questions to Ask your radiation oncologist before making a treatment decision:

- What is the average radiation dose to the lungs from the treatment plan?
- Can you keep the average radiation dose to the heart to less than 1 Gray?

### Comparative Treatment Plans



Grey/white area indicates no radiation exposure.



Colored area indicates radiation exposure

## Benefits of Proton Therapy

The good news is that **with proton therapy, radiation can be stopped inside the tumor bed and breast tissue only, reducing or eliminating radiation dose to the heart and other critical structures.** This is different than X-ray radiation that passes through the body from one side to the other. This often exposes the heart, lungs, and other healthy tissue to unnecessary and damaging radiation.

A study out of the University of Florida showed that **proton therapy can reduce radiation by 96% to the heart and 54% to the lungs** compared to advanced forms of conformal X-ray radiation treatments such as IMRT.

Radiation to healthy tissue during breast cancer treatment has also been shown to increase the risk of second cancers.<sup>3</sup> A study out of Harvard showed that **proton therapy can reduce the incidence of second cancers by a factor of almost 50%** compared to X-ray radiation treatments.

A recent analysis of over 700,000 breast cancer patients showed comparable survival rates for proton therapy and conventional radiation treatment (91.9% and 88.9% respectively over all patients) demonstrating that proton therapy is as effective at treating the cancer as other radiation methods.<sup>2</sup>

Proton Therapy has also been shown to be well tolerated by patients with less than a 4% incidence of Grade 3+ side effects.<sup>4</sup>

## Who Can Benefit

Common conditions treated at the Oklahoma Proton Center include:

- Early-stage and locally advanced breast cancers (stage I, II, and III)
- Ductal carcinoma in-situ (DCIS)
- Inflammatory breast cancer
- Recurrent breast cancer
- ER, PR positive or negative
- Her2Neu positive or negative
- Triple-positive or triple-negative breast cancer

1 Early Breast Cancer Trialists' Collaborative Group, Darby S, McGale P, Correa C, Taylor C, Arriagada R, et al. Effect of radiotherapy after breast-conserving surgery on 10-year recurrence and 15-year breast cancer death: meta-analysis of individual patient data for 10,801 women in 17 randomised trials. *Lancet* (2011) 378:1707-16. doi: 10.1016/S0140-6736(11)61629-2

2 Chowdhary, et al. Is Proton Therapy a "Pro" for Breast Cancer? A Comparison of Proton vs. Non-proton Radiotherapy Using the National Cancer Database. *Front. Oncol.*, 14 January 2019.

3 Grantzau T, Mellekjaer L, Overgaard J. Second primary cancers after adjuvant radiotherapy in early breast cancer patients: A national population based study under the Danish Breast Cancer Cooperative Group (DBCG) Radiother Oncol. 2013;106:42-49.

4 Cuaron JJ, Chon B, Tsai H, et al. Early toxicity in patients treated with postoperative proton therapy for locally advanced breast cancer. *Int J Radiat Oncol Biol Phys.* 2015;92(2):284-291. doi:10.1016/j.ijrobp.2015.01.005

# 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

*Dr. John Chang*



Medical Director,  
Clinical Research  
and Education

**RESIDENCY**  
University Of  
Pennsylvania

*Dr. Mark Storey*



Medical Director,  
Clinical  
Operations

**RESIDENCY**  
MD Anderson



 (405) 773-6700

 [www.okcproton.com](http://www.okcproton.com)

 5901 W Memorial Road,  
Oklahoma City, OK 73142