University of Florida Health Proton Therapy Institute History

Recent advances in the technology used to locate tumors, such as three-dimensional imaging, and to calculate radiation dosages with complex dosimetry computer software have opened the way to make proton therapy a viable treatment option for many kinds of cancer. These advances, combined with the expertise of faculty at the University of Florida College of Medicine, Department of Radiation Oncology, were the foundation for building the first proton therapy treatment facility in the southeast United States – the University of Florida Health Proton Therapy Institute.

A proposal to build the Institute was developed in 1998. Following several years of feasibility study and planning, construction began in April 2003 in Jacksonville, Fla.

The UF Health Proton Therapy Institute opened in summer 2006, and at the time was the fifth in the nation designed for treatment of cancer patients. Proton therapy has been in existence for more than 50 years but typically available only at a few research facilities. As of 2025, there are 46 proton therapy centers operating in the U.S. and dozens more worldwide with facilities available, planned or in progress in China, England, France, Germany, Italy, Japan, Korea, Russia, South Africa, Sweden and Switzerland.

As a nonprofit organization affiliated with the southeast's most comprehensive academic health center, UF Health, the Institute has dual missions of delivering high-quality cancer treatment to patients and of furthering the field of cancer therapeutics through clinical and basic research. The UF Health Proton Therapy Institute is an integral part of the UF Health Cancer Center, one of a select group of prestigious cancer programs across the country to be designated an NCI-designated Cancer Center.

Today, more than 12,000 patients at the Institute have been treated, including more than 2,300 pediatric patients. It is in the top five proton therapy centers worldwide for the number of patients treated. The experience and expertise of the medical team

and staff is internationally recognized, and patients from all 50 states and 33 countries have been treated at the Institute.

The robust clinical research program has enrolled approximately 97% of adult patients and 76% of pediatric patients on clinical outcomes studies. Through collection and analysis of this data, researchers from University of Florida and the UF Health Proton Therapy Institute have authored more than 350 articles in peer-reviewed medical journals. Many of these studies are considered by the medical community as significant benchmarks for patient outcomes. Several prostate cancer studies served as early evidence of proton therapy's efficacy for both tumor control and excellent quality of life for patients after treatment. "Early Outcomes from Three Prospective Trials of Image-Guided Proton Therapy for Prostate Cancer" (2012)[1], as well as "Five-year Biochemical Results, Toxicity, and Patient-Reported Quality of Life Following Delivery of Dose-Escalated Image-Guided Proton Therapy for Prostate Cancer" (2016)[2], both published by the *International Journal of Radiation Oncology Biology Physics*, have shown promising results. A study is underway on the 10-year outcomes for prostate cancer patients.

Over the last decade, the Institute has treated more pediatric patients than any other proton center in the country and has authored some of the largest studies of children treated with proton therapy for tumors such as ependymoma[3] and low grade glioma[4]. The Institute's expertise in proton therapy for children is recognized worldwide, and pediatric patients have traveled from 38 states, 22 countries and 5 continents for treatment.

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[1] Early outcomes from three prospective trials of image-guided proton therapy for prostate cancer. Mendenhall NP, Li Z, Hoppe BS, Marcus RB Jr, Mendenhall WM, Nichols RC, Morris CG, Williams CR, Costa J, Henderson R. In J Radiat Oncol Biol Phys. 2012 Jan 1;82(1):213-21. Epub 2010 Nov 17. PMID21093164

[2] Five-year biochemical results, toxicity, and patient-reported quality of life following delivery of dose-escalated image-guided proton therapy for prostate cancer. Bryant CS, Smith TL, Henderson RH, Hoppe BS, Mendenhall WM, Nichols RC, Morris CG, Williams CR, Su Z, Li Z, Lee D, Mendenhall NP. 2016 May;95(1):435-43. In J Radiat Oncol Biol Phys. doi 10.1016/j.ijrobp.2016.02.038. Epub 2016 Feb 16.

[3] Outcomes following proton therapy for pediatric ependymoma. Indelicato DJ, Bradley JA, Rotondo RL, Nanda RH, Logie N, Sandler ES, Aldana PR, Ranalli NJ, Beier AD, Morris CG, Mendenhall NP. Acta Oncol. 2018 May; 57(5);644-648. doi: 10.1080/0284186X.2017.1413248. Epub 2017 Dec 14. PMID 29239262

[4] Outcomes following proton therapy for pediatric low-grade glioma. Indelicato DJ, Rotondo RL Uezono H, Sandler ES, Aldana PR, Ranalli NJ, Beier AD, Morris CG, Bradley JA. In J Radiat Oncol Biol Phys. 2019 May 1;104(1):149-156. doi: 10.1016/j.ijrobp.2019.01.078. Epub 2019 Jan 23. PMID: 3068466

In 2023, the final phase of a $44 million expansion and upgrades project that began in 2016 was completed. The expansion added a fifth treatment room and upgrades equipped all treatment rooms with pencil beam scanning. These upgrades began with a 10,000 sq. ft. expansion and addition of a compact, single-room proton therapy system in 2019 that has kept the Institute at the leading edge of radiation technology. With two cyclotrons, five gantries and a fixed-beam treatment room for eye cancers, the Institute is uniquely positioned to increase its capacity, treat more types of cancer patients and minimize equipment downtime. The Institute has both pencil beam scanning and double scattering technologies, making it one of the most versatile proton therapy systems able to treat the broadest possible spectrum of patients.

In 2024, a renovation of the simulation suite was finalized with an installation of Philips Ingenia 1.5T MRI scanner. The simulation suite is where patients receive MRIs and CT scans used to develop treatment plans. The state-of-the-art medical imaging devices and software capture and process high-quality images rapidly, which means patients spend less time in a stationary position during the scan. Beyond its clinical benefits, the MRI is designed with sustainability in mind. Unlike traditional MRI machines, which typically consume around 2,000 liters of helium, this model uses only 5 liters – a tremendous reduction in resource use and cost.

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