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HealthCare Appraisers' Industry Insight

# VALUATION OF PROTON THERAPY SYSTEMS

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Proton Therapy, also known as proton beam therapy, is a radiation oncology treatment that uses subatomic particles (protons) to destroy malignant cancer cells. Proton Therapy is a highly accurate form of radiation therapy when compared to traditional treatment systems such as a linear accelerator or gamma knife. The shape and speed at which the protons enter the body are controlled by powerful magnets, allowing radiation oncologists to destroy cancer cells while limiting exposure of harmful radiation to the surrounding healthy tissue, a key factor when treating tumors in close proximity to sensitive organs or tissues.

In 1946, Robert Wilson, considered “the father of proton therapy,” was the first to propose the use of proton beam therapy for cancer treatment. The first treatments were performed at Berkley Radiation Laboratory in 1954 and duplicated in a laboratory in Sweden in 1957. In the 1970s, the development of imaging equipment, such as CT Scanners, MRI, and PET scanning, allowed for the treatment of almost any site in the body. There are currently 43 Proton Therapy Centers (“PTCs”) in the United States, with 6 more under construction, which tend to be built at academic facilities and/or centers of excellence.

## CURRENT TECHNOLOGY

Most patients’ exposure to proton therapy equipment is limited to the treatment rooms. The treatment process actually begins in a three-story vault behind the walls of the treatment rooms, where particle accelerators weighing up to 200 tons subdivide atoms. The resulting protons are guided down magnetic pathways to the treatment rooms. Beams of protons are deposited onto the tumor but stop short of entering other parts of the body. This unique feature of proton therapy significantly reduces complications due to radiation exposure to otherwise healthy tissues and organs, a risk seen in more traditional radiation therapy treatments. Therapy delivery methods include fixed beam, incline beam, pencil beam scanning, and the highly versatile gantry, and each method is assessed when creating a treatment plan for a subject patient. Various types of cancers are treated using proton therapy, including ocular, brain, head and neck, lung, breast, prostate, gastrointestinal, pediatric, and more.

## APPRAISAL CONSIDERATIONS

Appraising a proton therapy system involves unique considerations. Typically, when appraising capital equipment, the cost and/or market approaches are used. When appraising a proton therapy system, however, a market approach becomes very difficult as the systems are not readily traded on a secondary market. Therefore, although the market approach may be considered, the cost approach is generally the sole approach relied upon to value a proton therapy system.

- **Replacement Cost New** - A proton therapy system is a large integrated system with equipment costs ranging from \$60 to \$90 million, depending on the size of the cyclotron and the number of patient treatment rooms. Capitalized interest needs to be considered when determining the replacement cost new, as a system takes approximately two to three years to build.



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- Normal Useful Life – Service and maintenance of the system can extend the life, but the typical normal useful life used in the cost approach appraisal is in the range of 30 to 35 years.
- Economic Obsolescence – After the real estate is considered, costs can be \$180 million or more depending on the size of the center and where it's located. The corresponding treatment costs can range from \$30,000 up to \$120,000, often resulting in insurance approvals pushing patients to more traditional treatments. These constraints may result in underutilization of proton therapy systems. Therefore, when appraising a proton therapy system, financial distress and lack of equipment utilization may result in economic obsolescence.
- Functional Obsolescence – Proton therapy is considered the world's most technologically advanced method of radiation therapy. Advancements in technology, smaller footprints, and treatment capabilities, may result in a consideration of functional obsolescence.

## CONCLUSION

Though considered the world's most advanced technology for radiation therapy, the high build-out costs, operating costs, and maintenance costs may result in many PTCs encountering financial trouble due to low utilization (patients). The sale of existing centers may involve compulsory sellers that are experiencing financial difficulty.

If an appraisal of a proton therapy system becomes necessary, it is essential to hire an appraiser that has knowledge of the nuances of the proton therapy business, including lead time, cost to build, and the regulatory environment in which proton therapy exists. All of these factors will uniquely impact the appraisal of a specific PTC. Healthcare Appraisers has been involved in the appraisal of nearly 20 percent of the PTCs throughout the US, and is uniquely qualified to perform these appraisals.

