

Estimating Demand for Proton Beam Therapy (PBT) in Singapore



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Purpose

More than 40,000 patients have been treated with proton beam therapy (PBT) worldwide. Given the growing interest in proton beam therapy in Singapore, we sought to estimate the number of patients who could potentially benefit from PBT.

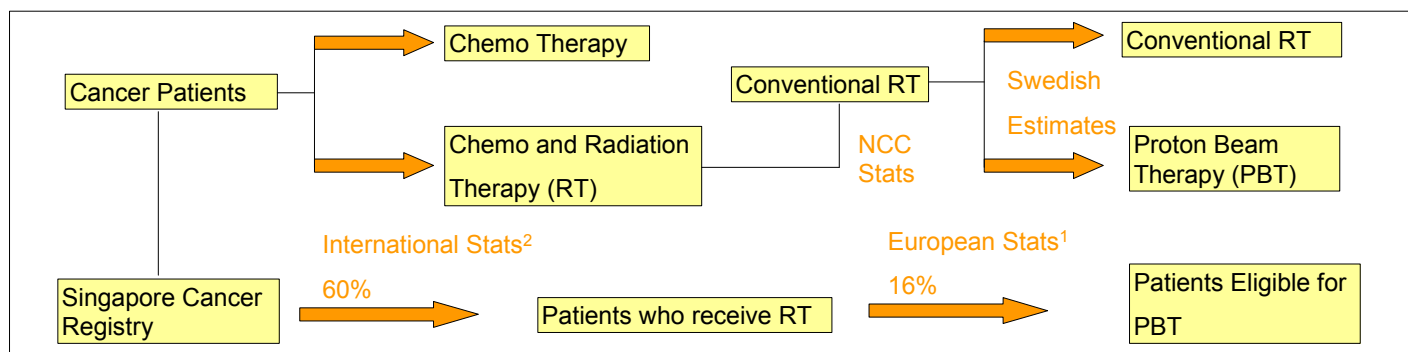
Key Considerations in Estimating Demand

1. The methodology should account for the fact that not all cancer patients would benefit from radiation therapy.
2. The methodology should also account for the fact that PBT is not demonstrably superior to conventional therapy, for all cancer types and all stages of the disease.

Methods

A literature search was conducted to review studies that had been done to estimate the demand for PBT based on cancers amenable to PBT as indicated by the current level of evidence. Estimates from the literature were then extrapolated to estimate the demand for PBT based on the profiles of patients treated with radiation therapy at National Cancer Centre (NCC), Singapore.

As a sensitivity check, a second estimate was also derived, based on data from Singapore Cancer Registry, international estimates of cancer patients who receives radiotherapy, as well as European estimates of proportion of irradiated patients who are eligible for proton beam therapy.



Results

Only one comprehensive study was found. The study was conducted by Swedish radiation oncologists and hospital physicists to estimate the demand for PBT¹, based on a number of criteria, including scientific support from clinical trials and model dose planning studies.

Given the number of patients treated in NCC in 2007 and extrapolating from the Swedish study, 1,524 patients in Singapore can potentially benefit from PBT annually.

Applying the second approach indicated that approximately 957 patients would stand to benefit from PBT.

Conclusion

An estimated 957—1,524 patients annually in Singapore can potentially benefit from PBT. It is however probable that the demand for PBT will increase over the years, as more clinical evidence of the viability of PBT in other forms of cancer is developed.

References

- 1 Glimelius B, Ask A, Bjeikengren G, Bjork-Eriksson T, Blomquist E, Johansson B, Karlsson M, Zackrisson B (2005) Number of patients potentially eligible for proton therapy. *Acta Oncologica*, 44, pg 836-849.
- 2 Lievens Y, Bogaert WV (2005) Proton beam therapy: too expensive to become true? *Radiotherapy and Oncology*, 75, pg 131-133.
- 3 WHO (2006) Mortality Country Fact Sheet. Available at: http://www.who.int/whosis/mort/profiles/mort_euro_swe_sweden.pdf
- 4 Singapore Cancer Registry Report No. 6. Trends in Cancer Incidence in Singapore 1968-2002.

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Limitations

1. The estimates in the Swedish study were based on the subjective opinions of Swedish radiation oncologists and hospital physicists.
2. The disease profile of Swedish patients does differ from that in Singapore. (The 3 most common cancers in Sweden in 2002 were lung cancer, prostate cancer, and colon cancer³ while that in Singapore were liver cancers, lung cancers and breast cancers in females⁴.)
3. The estimate did not account for growth in number of cancer patients and development of more indications for PBT.