INAHTA Brief

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Title Proton Beam Therapy for the Treatment of Cancer in Children and Adults: A Health Technology Assessment

Agency CADTH Suite 600, 865 Carling Avenue, Ottawa, Ontario, Canada, K1S 5S8
Phone: 1 613 226 2553, Fax: 1 613 226 5392; www.cadth.ca

Reference Proton beam therapy for the treatment of cancer in children and adults: a health technology assessment. Ottawa: CADTH; 2017 Aug. (CADTH health technology assessment; no.145). Available from: https://cadth.ca/proton-beam-therapy-treatment-cancer-children-and-adults

Aim

The objective of this health technology assessment was to inform on whether patients should continue to be sent out of country for proton beam therapy (PBT) or if PBT should be installed and implemented in Canada by assessing the clinical effectiveness and safety, budget impact, patient perspectives and experiences, ethical issues, and implementation issues associated with PBT for the treatment of cancer in children and adults.

Conclusions and results

The overall evidence from the assessment of the clinical effectiveness suggested that PBT, alone or in combination with photon radiotherapy, is comparable with other types of radiotherapy in most types of cancer and that its safety varies by cancer type. The budget impact analysis (BIA) suggested that installing a PBT facility in Canada, if the facility is in operation for more than nine years, and assuming current patient loads and an annual growth of 3%, may demonstrate cost savings, compared with sending patients out of country for treatment. The evidence from the reviews of patient perspectives and experiences, ethical issues, and implementation issues highlighted several important considerations to help decide whether patients should continue to be sent out of country for PBT or if PBT should be installed and implemented in Canada. The considerations included patient experiences with travel and associated mediating factors, fair access to and just use of the technology, and the availability and cost of resources for building and operating a PBT facility, respectively.

Methods

To assess the clinical effectiveness and safety, an overview of reviews and a narrative synthesis of the literature were conducted. A BIA was performed to assess, from a Canadian health ministry perspective, the budgetary impact of investing in the construction and maintenance of a PBT facility in Canada, compared with the current approach of out-of-country treatment referrals, over time horizons of one year to 15 years. For patient perspectives and experiences, a rapid review and thematic synthesis of the published qualitative literature was conducted. An ethics analysis of the published literature regarding the implementation of PBT for cancer treatment was performed. To understand the implementation issues associated with PBT, a three-stage research approach that included a survey, a review of the published literature, and telephone or email consultations with targeted experts and stakeholders, was used.

Further research/reviews required

More comparative studies of higher quality assessing the clinical effectiveness of PBT, alone or in combination with photon therapy, are needed. Research on the long-term effects of PBT on clinical effectiveness and safety is also warranted. In addition to the BIA conducted, a formal economic evaluation (e.g., a cost-utility or cost-effectiveness analysis) is needed to assess whether there are differences in the cost-effectiveness of treating different types of cancers. Research into implementation issues specific to the Canadian context is also warranted.

Written by: CADTH, Canada