Cost-effectiveness of Proton Therapy Compared to Photon Therapy in the Management of Pediatric Medulloblastoma

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Background

• Proton therapy has the potential to spare healthy tissue, but it is unclear if benefit gained validates increased costs

• Radiation therapy, while providing cancer control, can lead to long-term side effects

• Despite higher capital and operational costs, proton therapy may prove to be cost-effective for pediatric medulloblastoma patients by decreasing late adverse events
Methodology

• No difference in tumor control was assumed. Therefore, cost-effectiveness was influenced by comparing the differences of developing eight adverse events, including hearing loss, four hormone deficiencies, coronary artery disease, heart failure, and secondary malignancy.

• Costs captured in the model were upfront capital cost of investment as well as downstream effects of managing eight adverse events. All costs were actual.

• This study used both data from real patients and modeling studies to inform the risk of adverse events in the model.
Analysis

• The goal was to assess the cost-effectiveness of proton therapy versus photon therapy, with the emphasis on side effects

• Proton therapy was more cost-effective than photon therapy
Conclusions

• This study did not attempt to explain if proton therapy is cost-effective in other malignancies

• With best available data, the utilization of proton therapy for the management of pediatric medulloblastoma is cost-effective, and, in most simulations, cost-saving