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Altering Beamline Components to Reduce the Cost of Prostate Cancer Treatment T. JONES, A. GEIBLER, R. ZHANG, W.D. NEWHAUSER, The University of Texas M. D. Anderson Cancer Center — Proton beam therapy is an advanced technique used for the control of localized cancers. Currently it is one of the most cutting edge treatment options for prostate cancer but is still scarce and expensive. The expense is due, in part, to the unique beam collimators and range compensators that are manufactured for each treatment beam. The purpose of this study is to determine whether the custom collimator could be replaced by a reusable multileaf collimator and by eliminating the range compensator. Treatment plans were retrospectively selected for 10 patients who were treated for prostate cancer with 69 Gy delivered by two proton treatment fields. The originals were altered to include the multileaf collimator and to eliminate the range compensators. The dose distributions for each plan were calculated using a treatment planning system, which uses an analytical dose algorithm. They were then verified with Monte Carlo simulations, which are able to take into account individual particle trajectories and calculate dose resulting from stray neutron exposure. The calculated dose distributions for the altered treatments were dosimetrically equal or superior to the original plans. Our findings suggest that the proton-beam treatment technique for prostate cancer could be substantially simplified, thus yielding substantial cost savings.

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