Medical Physics Seminar
Monday, December 7th 2015
1345 HSLC - 4:00 P.M.

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Rotating Shield Brachytherapy for Prostate and Cervical Cancer

The use of imaging techniques such as magnetic resonance imaging guided brachytherapy has enabled the precise identification and contouring of tumor volumes for treatment planning, as well as demonstrated the challenges associated with using conventional brachytherapy approaches to conform the dose to the target and avoid sensitive healthy tissue. The target conformity of conventional brachytherapy dose distributions is restricted based on the geometrical constraints imposed by the position and shape of the applicators, as well as the radially-symmetric radiation dose distributions produced by sources. Dose distribution conformity for cervical and prostate cancer can be significantly improved relative to conventional brachytherapy through the use of rotating shield brachytherapy. With rotating shield brachytherapy, radiation sources are partially shielded and have the freedom to rotate in an optimized fashion such that radiation dose is directed away from sensitive structures and into the targeted tissue. In this presentation, rotating shield brachytherapy techniques for intracavitary cervical and prostate cancer will be presented. For cervical cancer, the multi-helix approach for intracavitary brachytherapy in curved applicators will be introduced, and, for prostate cancer, the approach of using multiple platinum-shielded gadolinium-153 sources in order to provide unprecedented urethral sparing will be described. Both approaches are promising techniques for improving care for the respective patient populations by improving therapeutic ratio.

1345 HEALTH SCIENCES LEARNING CENTER— 4:00 to 5:00 P.M.
University of Wisconsin– Madison School of Medicine and Public Health