AbstractID: 1129 Title: Measurement of Dosimetric Parameters for a New HDR Ir-192 Source

Purpose:

Since 1998, a new HDR Ir-192 source , manufactured by Alpha-Omega of California, is available for use in the Nucletron microSelectron HDR afterloader. The dimensions of Iridium core and steel encapsulation for the new Alpha Omega source and the original Nucletron source are the same. It is therefore expected that critical parameters for treatment planning, like doserate constant, radial dose function or asymmetry, remain unchanged. However, in view of the widespread clinical use of this new and cheaper source, these assumptions should be confirmed by measurement.

Methods:

Measurements of anisotropy and radial dose function were performed with TLD rods (LiF,1mm diameter, 6mm long) of similar sensitivity (+/-3%) in a precisely machined polystyrene phantom (25x25x0.66 cm^3), as described before (Med.Phys.21, 1131,1994).
The anisotropy was measured in 1cm intervals along rays at 0^o, $+/-15^o$, $+/-30^o$, $+/-45^o$, and $+/-90^o$ from the longitudinal source axis.
The radial dose function was measured up to 10 cm, following the TG43 protocol, and the dose rate constant was determined with a NIST traceable calibrated wellchamber, equipped with a special source holder for the HDR source.

Results:

Measurement results are compared with Monte Carlo calculations for the Nucletron HDR source by Williamson (Med.Phys.22,809,1995), as well as with unpublished Monte Carlo calculations performed for the Alpha-Omega source by T.D.Solberg and J.J.DeMarco of UCLA. In general, measurements and Monte Carlo calculations for the Alpha Omega source agreed well with published data for the Nucletron source.