AbstractID: 11458 Title: Near Source Dosimetry of HDR Base of Tongue Treatments Using BrachyVision TPS & GrafChromic HD-810 Film

<u>Purpose</u>: To determine the accuracy of the BrachyVision HDR treatment planning computer at predicting near source doses in the presence and absence of bone scatter in base of tongue treatments.

<u>Materials & Methods</u>: A HDR treatment plan was developed to deliver a uniform planer dose at a depth of 1cm from a custom made planer geometry applicator with 5 catheters separated by 1cm. Plan dwell times were scaled to deliver doses of 10, 20, 50, 75, and 150Gy for a dose calibration curve for GrafChromic HD-810 film. Dose measurements were performed at distances of 0mm, 1mm, 2mm, 3mm, 5mm, 7mm, & 10mm from the surface of the catheters. Three prescription doses were used for these measurements depending on distance from the catheters; 10Gy (0mm), 15Gy (1mm), & 25Gy (2, 5, 7, 10mm). Measurements were performed in solid water and in solid water directly against and 1mm away from a bone equivalent backscatter (Schedule 80 PVC). Doses were compared using 35 point doses (7 along each of 5 catheters) at 1cm increments.

<u>Results</u>: Analysis of the films showed average percent differences of; $24\pm13\%$, $-0\pm6\%$, $4\pm4\%$, $2\pm6\%$, $2\pm6\%$, $4\pm3\%$ (0, 1, 2, 5, 7, 10mm respectively) for solid water, 31%, 5%, 9%, 11%, 16%, & 14% (0, 1, 2, 5, 7, 10mm respectively) with similar standard deviations to solid water, for directly against the PVC.

<u>Conclusions</u>: For this planar geometry are within a standard deviation of predicted doses for a homogeneous media except directly against the catheter. At a plane 5mm from the catheter the presence of high-z back scatter produced an average increase in dose of 5%.