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PAPER TITLE Brachytherapy Dose Inhomogeneity Correction Using I-125 Seeds in the Management of
Carcinoma of the Nasopharynx:

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ABSTRACT (See instructions overleaf)

The influence of bone inhomogeneity in brachytherapy dose distribution is commonly ignored in dose calculation for treatment of carcinoma of the nasopharynx (NPC). This results in an uncertainty in dose determination for the tumor and critical organs near bony structures such as the nasopharynx. The influence of bone inhomogeneity in dose distribution from an ^{125}I source model 6702 was measured. For comparison, a similar study was conducted using ^{192}Ir , another commonly used isotope in NPC. The measurements were performed using LiF thermoluminescent dosimetry (TLD) chips and ion chamber dosimetry. Special phantoms were designed to hold the sources and TLD chips. These phantoms consisted of solid water for homogenous phantoms or a combination of solid water and solid water and solid bone in different configurations to create inhomogeneous phantoms. A human skull was also used to determine the dose to the critical tissues around the nasopharynx from both ^{125}I and ^{192}Ir sources. For ^{125}I a decrease in the dose delivered to the proximal side of the bone of as much as 25%. On the distal side of 1.5 cm of bone, the decrease was as much as 70% as compared to the homogeneous phantom. No significant dose reduction due to the presence of the bone was noted for ^{192}Ir .