AbstractID: 1359 Title: Characteristics of the Photoneutron Contamination of a Medical Linear Accelerator: Yields and Spectra vs. Field Size

Photoneutron contamination in medical linear accelerators (linacs) is of concern both to the patient receiving the radiation treatment as well as to the personnel working around the treatment room. In this work, the characteristics of the photoneutron contamination arising from a Varian 2300 linac is evaluated by means of Monte Carlo simulation. Photoneutron spectra and yields were evaluated for four radiation field sizes: 5x5,10x10,20x20, and 30x30, using the Monte Carlo N-Particle X (MCNPX) code. Whereas the total production of photoneutrons is found to decrease with increasing field size, the number of photoneutrons reaching the isocenter increases with field size. The ratio of photons to photoneutrons at the machine isocenter ranges from 1000:1 to 10,000:1
The data derived in the simulations can be used to evaluate the neutron dose to the patient undergoing radiation treatment and to determine the degree of concrete shielding required around a radiotherapy room.
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