

This presentation reviews the dosimetry and dosimetry protocols for kilovoltage x-ray beams, the physics background of the formalisms used in the AAPM TG-61 report, and the clinical aspects of kilovoltage x-ray dosimetry and the TG-61 recommendations. The AAPM TG-61 protocol deals with kilovoltage ( $40 \text{ kV} \leq \text{tube potential} \leq 300 \text{ kV}$ ) x-ray beam dosimetry for radiotherapy and radiobiology. The new protocol is based on ionization chambers calibrated in air in terms of air kerma. If the point of interest is at or close to the surface, this protocol recommends one unified approach over the entire energy range to determine absorbed dose to water at the surface of a water phantom based on an in-air measurement (the “in-air” method). If the point of interest is at a depth, this protocol recommends an in-water measurement at a depth of 2 cm for tube potentials  $\geq 100 \text{ kV}$  (the “in-phantom” method). The in-phantom method is not recommended for tube potentials  $< 100 \text{ kV}$ . The protocol is based on an up-to-date data set of basic dosimetry data, which produce consistent dose values for the two methods recommended. The TG-61 report is published in Med. Phys. 28 (6) 2001 868-893.

Educational Objectives:

1. Literature review
2. Fundamentals of kV x-ray dosimetry
3. Dosimeters and calibration procedures
4. Formalisms for kV x-ray beam dosimetry
5. TG-61 recommendations for reference dosimetry
6. TG-61 recommendations for relative dosimetry