Purpose: The International Atomic Energy Agency (IAEA) has a mandate to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world. Through its Human Health Division, this is done by developing guidance documents on standards of practice in radiation medicine. In recent years, there have been major advances in the technology of radiation oncology which have allowed for a transition from conventional 2-D radiation therapy to the implementation of 3-D conformal radiation therapy (CRT), intensity modulated radiation therapy (IMRT), image-guided radiation therapy (IGRT), adaptive radiation therapy (ART), and 4-D imaging and motion management in radiation therapy. Brachytherapy procedures have also evolved both for high dose rate (HDR) techniques as well as permanent implants, especially for prostate cancer treatments. Multiple imaging modalities are now available for target volume and normal tissue delineation for radiation treatment planning both for external beam radiation therapy and brachytherapy. With these new advanced technologies and improved outcome considerations for both external beam and brachytherapy, there is also a recognized need for greater accuracy in the radiation treatment process.

Methods: While a number of reports and publications have defined accuracy needs in radiation oncology, most of these reports were developed in an era with different radiation technologies and date back to the 1980s and 90s.

Results: In view of the new technologies and techniques, improvements in dosimetry methodologies and new clinical dose-volume data, the IAEA is developing a new international guidance document on Accuracy Requirements and Uncertainties in Radiation Therapy in order to reduce these uncertainties to provide more effective and safer patient treatments.

Conclusions: This review will summarize the new IAEA report which is expected to be published later in 2012.

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