AbstractID: 14457 Title: QA of Radiation Delivery Systems: TG-142 Quality Assurance of Medical Accelerators

The task group (TG) for quality assurance of medical accelerators was constituted by the American Association of Physicists in Medicine's Science Council, under the direction of the Radiation Therapy Committee and the Quality Assurance and Outcome Improvement Subcommittee. The report was published in the Journal of Medical Physics in September of 2009. [http://aapm.org/pubs/reports/RPT_142.pdf] The task group (TG #142) had two main charges. First to update, as needed, recommendations of Table II of the AAPM TG-40 Report on Quality Assurance, and second, to add recommendations for Asymmetric Jaws, Multileaf Collimation (MLC), and Dynamic/Virtual Wedges. The TG accomplished the update to TG-40, specifying new test and tolerances, and has added recommendations for not only the new ancillary delivery technologies, but also for imaging devices that are part of the linear accelerator. The imaging devices include x-ray imaging, photon portal imaging, and cone-beam CT. The TG report was designed to account for the types of treatments delivered with the particular machine. For example, machines that are used for radiosurgery treatments, or intensity modulated radiotherapy (IMRT) require different tests and/or tolerances. There are specific recommendations for MLC quality assurance for machines performing IMRT. There are specific tables according to daily, monthly, and annual reviews, along with unique tables for wedge systems, MLC, and imaging checks. The report is geared to be flexible for the physicist to customize the QA program depending on clinical utility. This is consistent with the philosophy of TG-100, "Method for Evaluating QA Needs in Radiation Therapy." The report also gives recommendations as to action levels for the physicists to implement particular actions, whether they are inspection, scheduled action, or immediate and corrective action. The report also gives specific implementation recommendations regarding setup of a QA program by the physicist, such as; building a QA team, establishing procedures, training of personnel, documentation, and end-to-end system checks. The tabulated items of this report have been considerably expanded as compared with the original TG 40 report and the recommended tolerances accommodate differences of the intended functionality (i.e., non-IMRT, IMRT, or Stereotactic Delivery).

Learning Objectives:

1. To understand the updates to TG-40 in the new TG-142 report.
2. To understand the recommend QA tests for wedge, MLC, and imaging systems as they pertain to accelerator type and procedures performed (i.e. IMRT).
3. To understand the implementation plan and action level and response recommendations.