

AbstractID: 10794 Title: Design and Clinical Implementation of a TG-106 Compliant Linear Accelerator Data Management System

Purpose: Minimize errors in linear accelerators beam dosimetry by designing and clinically implementing a computerized commissioning data management system (CDMS). **Method and Materials:** The Microsoft Visual Basic programming language was used to develop CDMS. A user friendly GUI allows users to access all of the system's features. These are organized in modules that mimic all the steps behind the commissioning of a linear accelerator. The process begins by creating a new machine and configuring the commissioning project. Output factor are acquired by radiation type, energy and accessory. PDDs, TMRs and OARs tables are imported directly from the scanning software. Beam modeling tools such as a dose rate table generator are provided. Treatment machine data can be compared for purposes of verification or annual calibration. MU calculations can be performed manually by entering the corresponding beam parameters or through the use of CDMS' DICOM RT import filter. Tools for TG-51 and Monthly Calibrations are provided as well as a documents manager to handle associated documentation. **Results:** A total of 22 commissioning projects were included in the study. Out of the 22, 12 were completed without, and 10 with, the use of CDMS. As expected, errors in collected data were reduced by a factor of 3.0. Beam modeling errors have all but been eliminated. Data books errors were reduced drastically (a factor of 7.0) while completions on time were improved 6 times. As a result, the overall satisfaction of the clinic with the commissioning task improved by a factor of 2. **Conclusion:** The introduction of CDMS for clinical use appears to have achieved its primary goal of reducing errors in the physics data during the commissioning of Linear accelerators. Finally, although CDMS was developed independently of the Radiation Therapy Committee of the AAPM, it complies with most of TG-106 recommendations.