Purpose: The purpose of this study was to analyze observed treatment overrides in a multi-center, paperless radiation medicine department in regard to patient safety and workflow.

Methods: A script was written to extract overrides recorded in the Oncology Information System (OIS) over a nine-month period, for 8 linear accelerators at four centers and validated against a pre-existing report generated by the OIS. Further details not available in the pre-existing report were extracted for trends analyses.

Population estimates of shifts, magnitudes and the relative frequencies of overrides were computed. Discrepancies between planned and actual values were analyzed and an independent audit was conducted to assess the accuracy of override determination by the OIS relative to tolerance tables. Tolerance tables were subsequently streamlined and revised to balance the need for patient safety and operational overhead in implementing overrides.

Results: A total of 1897 unique overrides translated to 57601 actual overrides for 38985 of 142427 treatment fields, with an average of 1.5 overrides per overridden treatment field.Overrides were observed on 27 different parameters. In 47% of patients a single override combination unique to each patient was seen. Approximately 80% of all overrides were from linear accelerators operated with a 4D console. A significant fraction of fields overridden were independently assessed as being compliant with tolerance tables. No misadministrations were reported during this study. Three tolerance tables with strict, moderate and lenient settings were created based on multiples of observed standard deviations. Retrospective analysis of the same overrides with these new tolerance tables would have potentially saved several days of overhead in the need to implement overrides with little or no clinical impact.

Conclusions: Tolerance tables chosen with population based shift-estimates, combined criteria of patient safety and workflow and improved sub-systems integration between multi-vendor platforms could minimize the need for unnecessary overrides while maintaining safe delivery of radiation therapy.

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No Conflicts of Interest