

AbstractID: 8685 Title: Development and application of a structural quality indicator for radiotherapy clinical equipment

Purpose: There is an increasing emphasis on quality indicators for documenting the performance of clinical radiotherapy equipment and processes. Such indicators, if relevant and unambiguous, can facilitate both external peer review audit (AAPM's- TG103) and internal review as a component of a quality improvement program. We present, for discussion, a graduated structural quality indicator to assess QC protocol compliance with existing performance standards and illustrate its use for linear accelerators and CT-simulators.

Method and Materials: Our structural quality indicator is based on four features of the equipment QC protocol; tolerance level, action level, frequency and documentation of each test. The structural quality indicator is divided into five levels of compliance: full, substantial, partial, minimal, and non compliance. Each individual test in a local QC protocol can be assigned to one of the five categories using the proposed indicator. To evaluate the indicator for relevance, absence of ambiguity and ease of use, it was used to check the compliance of local Tom Baker Cancer Centre QC procedures (daily, monthly, and annually) against Canadian standards (www.medphys.ca) and the AAPM's-TG40 and TG66.

Results: The results show that our Linac QC protocols were 82% and 88% in full or substantial compliance with CAPCA and AAPM's-TG40 respectively. However, in the case of the CT-simulator, full compliance was only 42% for CAPCA and 65% for AAPM's TG66. The form of the indicator facilitates the accurate identification of the discrepancies between the local protocol and the standard and hence guides remedial measures where necessary.

Conclusion: A simple structural quality indicator for the evaluation of the documentary basis of a quality control program has been developed and applied. It is easy to use, relatively unambiguous and could form an objective component of a peer review exercise or a formal quality improvement program.