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Quality assurance of a record-and-verify system

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ABSTRACT

Aims and background. With the introduction of more complex three-dimensional conformal radiotherapy and intensity-modulated radiotherapy techniques in clinical practice, the use of record-and-verify systems is recommended to improve the accuracy of radiotherapy treatments. The aim of the present study was to evaluate, for a commercial record-and-verify system, the efficiency, integration with the treatment planning system, and impact of manual checking of data. The most frequent errors or misses were also evaluated.

Materials and methods. The development of internal protocols to systematically implement new technologies has been identified as a priority in the departmental quality assurance process. Data electronically fed into the record-and-verify system were compared with those manually recorded in the clinical paper chart over a period of almost 6 years (October 2000 to December 2006). A total of 7768 treated patients was reviewed. The check was performed by using a homemade data base in which the errors are stratified as follows: 1) general section, 2) geometric and dosimetric section, and 3) delivered dose section.

Results. On a total of 7768 checked patients, one or more mismatches between treatment planning system data and record-and-verify system data or paper chart data were observed for 452 patients (5.8% of total number of inspected patients). The percentage of discrepancies out of the total was: 2.2% in the general section, 3.3% in the dosimetric and geometric section, and 4.2% in the delivered-dose section.

Conclusions. Although record-and-verify systems assume a crucial role in the accuracy and reproducibility of radiation treatment, their inability to eradicate all the errors requires vigilance on the part of the radiation therapy and physics team.

Key words: electronic chart, errors in radiation delivery, quality assurance, record-and-verify systems.

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