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Clinical implementation from the regional (AFRA) training course on quality assurance of record and verify systems

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In equipping clinical medical physicists across the African Member States with both theoretical and practical information on the quality assurance (QA) procedure of records and verify systems (R&VSs), the International Atomic Energy Agency (IAEA) organized a regional (AFRA) training course. The main focus of the course was to equip participants to validate data integrity that will be followed for patients from the time of finalizing a treatment plan until just before and during treatment. The participants from Ghana and Kenya with similar radiotherapy setup carried out a joint comprehensive R&VS QA and an end-to-end test (i.e. from TPS to R&VS) after the course. A CIRS thorax phantom was CT scanned head first supine and imported into Oncentra MasterPlan Treatment Planning System (TPS). 3D treatment plans were generated to include different fields to test all relevant geometric settings of the treatment unit that are applied clinically. The approved plans were exported from the TPS and imported into MosaiQ R&VS. The plans were then transferred onto the Linac treatment console and treatment fields set up and checked. These checks were classified as general (demographic), geometric and dosimetric, and dose delivered error sections. The transfer of fundamental treatment parameters (e.g. energy, gantry angle, collimator angle, couch angle, field size, wedge, MU) were manually checked by comparing the data in the R&VS with TPS printouts prior to the treatment. The light field (e.g. X and Y jaws and MLC) pattern on the treatment unit was verified against printouts of the light field projection generated in the TPS. From a total of 30 items checked with the end-to-end test, no mismatch between treatment planning system data and R&VS data were observed. For the R&VS QA, out of a total of 34 tests conducted, the relative discrepancies of items checked were 8.5% in the general section, 13.3% in the geometric and dosimetric section, and 4.9% in the dose delivered section. There was a high data integrity observed for the end-to-end test between the TPS and R&VS due to the two systems sharing a single DICOM database. The observed discrepancies in the QA test points out the system's inability to totally eradicate all errors, hence extra vigilance on the part of radiotherapists and medical physicists. These QAs and tests contributed to achieving a better understanding of the system and helped resolved issues related to its data integrity.

Country

Ghana

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