AbstractID: 8690 Title: Quality Assurance for SRS/SRT IMRT

Purpose: Investigate proper QA procedures, standards, and difficulties for IMRT SRS/SRT, which has high dose proscription (≥10 Gy for a fraction) and high dose rate (600-1000 MU/minute). Under these situations, the films, diodes, or electron portal imaging devices (EPIDs) all have some limitations, such as dose saturation and dose rate dependence. **Method and materials**: Our initial QA procedure is staying with conventional ion chamber plus film, to which each field is exposed to get around the saturation problem. SRS/SRT Patient IMRT plans were generated with Eclipse Treatment Planning System (Varian Medical Systems, Mountain View, CA). The plans then were copied to a verification plan with a polystyrene QA phantom. The generated QA plan was delivered with the same gantry, collimator, and couch angles from the patient plan. Point dose was measured at isocenter with Capintec PR-05P (Capintec, Inc. Ramsey, New. Jersey, USA) and compared with the calculated value from the Eclipse TPS. At the same time, each field was filmed with EDR2 film (Kodak Inc., Rochester, NY). The film was processed and compared with the exported dose map from Eclipse TPS by Vidar scanner (Vidar Systems, Herndon, VA) and RIT113 software (Radiological Imaging Technology, Colorado Springs, CO). **Results**: The planned point dose agreed well with the measurements. For five plans, the ratios of measured dose over the planned dose are from 97.0% to 98.0%, with an average of 97.7%.The individual film also agrees with the exported two-dimensional dose distribution, respectively. This IMRT QA procedure takes about 2-3 hours for each patient. **Conclusion**: Despite the problems arising from high dose and dose rate, conventional procedure of ion chamber plus film (EDR2) is reliable for SRS/SRT IMRT QA. Other QA methods, such as EPIDs, MapCheck, and ion chamber arrays, need to be investigated for quicker and reliable verification.