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The Dosimetric Verification of Commercial Two- and Three- Dimensional Radiation Treatment Planning Systems

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Abstract: For the quality assurance (QA) of radiation treatment planning systems (RTPSs) and planning computed tomography (CT), a simple cylindrical phantom was developed. The phantom was constructed by using materials and geometries appropriate for the routine clinic setups. A Siemens Somatom HiQ CT, two-dimensional (2D) and three-dimensional (3D) RTPS and a linear accelerator Siemens Mevatron MD2 were used in this study. The 2D and 3D RTPSs gave good results when compared to actual doses measured in the phantom. While the 3D system showed accuracy similar (-1.0% vs. -0.8%) to that of the 2D system for 6 MV and better accuracy (+1.4% vs. +2.2%) for 15 MV, but the improvement was not large. The phantom described in this study provides simple measurements that enable one to check an RTPS calculation algorithm under inhomogeneous conditions and it gives accurate and reproducible results.

Key Words: Quality assurance, treatment planning system, phantom

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