

Abstract

Patient-specific quality controls are important components of QA processes, designed to identify discrepancies between calculated and delivered radiation doses. Quality standards and criteria, against which the quality of the activity in question are assessed, are usually issued as recommendations by various international organizations. Nonetheless, they doesn't always reflects the capabilities of radiotherapy centers, since according to staff experience, technology and instruments available, this standards could either be too strict or too loose. Developing locally defined tolerances allows for process quality assessment by comparing them with universally defined recommendations.

IMRT and VMAT commissioning was assessed in HalcyonTM plataform using TG-119 in order to set a baseline to develop locally defines tolerances. TG-218 methods were implemented to determine action and tolerance limits for γ test as a method for comparing predicted and evaluated dose distributions. To this end, an average of 27 IMRT plans were measured with PortalVisionTM aS1200, MapCHECK[®] 2 and ArcCHECK[®], an average of 30 VMAT plans with PortalVisionTM aS1200 and ArcCHECK[®], and an average of 17 3D plans with PortalVisionTM aS1200 and MapCHECK[®] 2.

No correlation was found between measurements done with the available detection devices. 3%/2mm criteria was adopted for γ analysis, and locally defined action and tolerance limits calculated were found to be higher than the universal limits recommended.

Finally, this work concludes with a set of recommendations developed to better make use of determined limits, and observations about 3D results that hints the presence of systematic errors in the dose delivery system.

Keywords: HALCYON, TG-218, TG-119, AAPM, FUESMEN, INSTITUTO BALSEIRO