

## عنوان مقاله:

Pre-treatment Verification Performed with Electronic Portal Imager Device (EPID) and IMatriXX for ۲۰۴ Cancer Patients Treated with Intensity Modulated Radiotherapy (IMRT) – Phantom Based Study

## محل انتشار:

مجله فیزیک پزشکی ایران, دوره 18, شماره 6 (سال: 1400)

تعداد صفحات اصل مقاله: 8

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## خلاصه مقاله:

Introduction: State-of-art radiotherapy technique as Intensity Modulated Radiotherapy (IMRT) and Volumetric Modulated Arc Therapy (VMAT) are being used to treat cancer with high accuracy. Verification of planned and delivered dose distribution is critical; in this study we evaluated quality assurance (QA) results and effectiveness of Electronic Portal Imaging Device (EPID) and IMatriXX. Material and Methods: Performance of EPID and IMatriXX was assessed with dose measurements using ionization chamber. Calibrated IMatriXX and EPID are used for pre-treatment patient-specific quality assurance (PSQA) for ۲۰۴ patients plans with IMRT treatment technique on LINAC. Dose image were compared for gamma evaluation ( $3\%/3\text{mm}$ ) and combination of three scalar parameters were assessed against EPID to quantify gamma results within region of interest; namely average  $g(g_{avg})$ , maximum  $g(g_{max})$  and Area  $\text{Gamma} < 1$ . Results: The  $g$  correlation comparisons yielded an average correlation of ۰.۹۹۱ for IMatriXX and ۰.۹۷۸ for EPID. The maximum gamma value is ۰.۹۹, while the minimum gamma is ۰.۸۷۲ for IMatriXX and ۰.۹۲۶ for EPID, which can be used as baseline. Our result suggests that EPID dosimetry, provides lower gamma correlation values than IMatriXX. Students Unpaired t-Test analysis was applied to two data sets. The calculated p-value ۰.۰۰۱ shows good correlation. Conclusion: The EPID and IMatriXX have significantly improved dosimetric properties, providing more sensitive, accurate pre-treatment PSQA. The result shows EPID can replace other ۲D dosimetry methods and ionization chamber measurements. It's an efficient, sensitive and accurate dosimetry tool and is primary protocol of pre-treatment quality assurance.

## کلمات کلیدی:

Portal imaging, patient specific quality assurance, Dosimetry

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