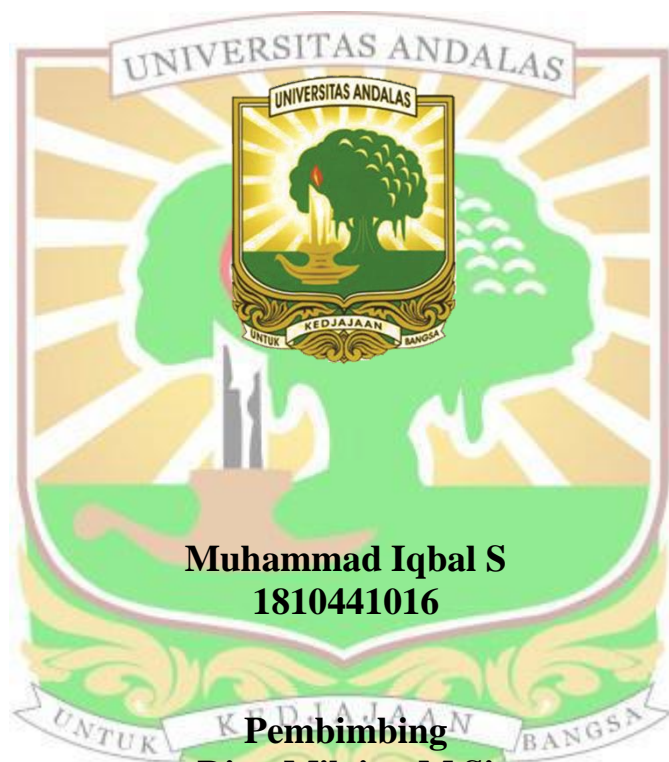


**VERIFIKASI DOSIS PENYINARAN TEKNIK
INTENSITY MODULATED RADIOTHERAPY (IMRT)
PADA PASIEN KANKER SERVIKS MENGGUNAKAN
*ELECTRONIC PORTAL IMAGING DEVICE (EPID)***

SKRIPSI



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ABSTRAK

Telah dilakukan verifikasi dosis penyinaran dengan teknik IMRT EPID (*Electronic Portal Imaging Device*). Penelitian menggunakan rekam medis pasien kanker serviks stadium IV dan pesawat Linac di Instalasi Radioterapi Universitas Andalas. EPID digunakan sebagai pengganti pasien dan detektor pendeteksi nilai *gamma index*. Perancangan *Treatment Planning System* (TPS) dilakukan oleh peneliti dan dosis radiasi pada TPS diverifikasi berdasarkan *Planning Target Volume* (PTV) dan *Organ At Risk* (OAR). Dosis radiasi yang diterima PTV didapat berdasarkan perhitungan nilai *Conformity Index* (CI) dan *Homogeneity Index* (HI). Perhitungan tersebut berdasarkan *International Commission on Radiation Units and Measures* (ICRU) *Report 62* dan *83*. Dosis radiasi pada OAR diverifikasi berdasarkan standar *Radiation Therapy Oncology Group* (RTOG) *1203*. Verifikasi dosis radiasi dilakukan perbandingan antara TPS dan penyinaran pada EPID menggunakan nilai *gamma index* sesuai standar *International Atomic Energy Agency* (IAEA) *31*. Uji kesesuaian TPS berdasarkan dosis PTV dari hasil perhitungan nilai CI didapatkan mendekati 1 sedangkan nilai HI mendekati 0. Dosis yang diterima OAR masih dalam batas aman. Hasil verifikasi dosis radiasi pada teknik IMRT berdasarkan *gamma index* berada dalam keadaan baik dan dapat digunakan dalam pengobatan kanker serviks. Namun penggunaan teknik IMRT perlu ditinjau ulang dan kurang tepat untuk kasus kanker serviks yang berada di permukaan kulit pasien.

Kata kunci : *Planning Target Volume, Conformity Index, Homogeneity Index, Organ At Risk, Gamma Index*



DOSE VERIFICATION OF INTENSITY MODULATED RADIOTHERAPY (IMRT) TECHNIQUE IN CERVIC CANCER PATIENTS USING ELECTRONIC PORTAL IMAGING DEVICE (EPID)

ABSTRACT

The irradiation dose verification has been carried out using the IMRT EPID (Electronic Portal Imaging Device) technique. The study used medical records of stage IV cervical cancer patients and Linac aircraft at the Andalas University Radiotherapy Installation. EPID is used as a patient substitute and detector for detecting gamma index values. The design of the Treatment Planning System (TPS) was carried out by researchers and the radiation dose at the TPS was verified based on the Planning Target Volume (PTV) and Organ At Risk (OAR). The radiation dose received by PTV is obtained based on the calculation of the Conformity Index (CI) and Homogeneity Index (HI) values. The calculation is based on the International Commission on Radiation Units and Measures (ICRU) Reports 62 and 83. The radiation dose in OAR is verified based on the Radiation Therapy Oncology Group (RTOG) standard 1203. Verification of radiation dose is carried out by comparison between TPS and irradiation on the EPID using the appropriate gamma index value. International Atomic Energy Agency (IAEA) standard 31. TPS suitability test based on PTV dose from the calculation results the CI value was obtained close to 1 while the HI value was close to 0. The dose received by OAR was still within safe limits. The results of the radiation dose verification on the IMRT technique based on the gamma index are in good condition and can be used in the treatment of cervical cancer. However, the use of IMRT technique needs to be reviewed and is not appropriate for cases of cervical cancer that are on the surface of the patient's skin.

Keywords: *Planning Target Volume, Conformity Index, Homogeneity Index, Organ At Risk, Gamma Index*