

**ANALISIS DOSIS RADIASI SINAR-X PADA PARU-PARU  
PASIEN KANKER PAYUDARA BERDASARKAN  
GRAFIK *DOSE VOLUME HISTOGRAM***

**SKRIPSI**



**JURUSAN FISIKA  
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# **ANALISIS DOSIS RADIASI SINAR-X PADA PARU-PARU PASIEN KANKER PAYUDARA BERDASARKAN GRAFIK *DOSE VOLUME HISTOGRAM***

## **ABSTRAK**

Telah dilakukan analisis dosis radiasi sinar-X pada paru-paru pasien kanker payudara berdasarkan grafik *Dose Volume Histogram*. Penelitian ini bertujuan untuk memenuhi asas optimasi dan asas limitasi dalam proteksi radiasi dengan mengevaluasi dosis radiasi yang diterima target kanker berdasarkan *International Commission on Radiation Units Report 62*, dan dosis radiasi yang diterima paru-paru pasien kanker payudara berdasarkan *Quantitative Analysis of Normal Tissue Effects in the Clinic*, serta mengetahui efek yang ditimbulkan pasca terapi. Pengambilan data dilakukan pada hasil kurva DVH yang didapatkan dari perencanaan penyinaran oleh dokter dan fisikawan medis di Rumah Sakit Universitas Andalas. Nilai dosis radiasi yang diterima paru-paru diamati pada pasien terapi sinar-X 6 MV dengan 6 pasien menggunakan teknik *Three Dimensional Conformal Radiation Therapy* dan 6 pasien menggunakan teknik *Intensity Modulated Radiation Therapy*. Hasil penelitian yang didapatkan ada 2 orang pasien dengan teknik IMRT tidak memenuhi asas optimasi karena tidak mendapatkan dosis radiasi yang maksimal pada daerah target kanker. Hasil dosis radiasi pada paru-paru ada 3 pasien dengan teknik 3D-CRT dan 3 pasien dengan teknik IMRT menerima dosis radiasi yang tidak memenuhi asas limitasi karena melebihi aturan yang ditetapkan oleh QUANTEC, dan salah satu dari pasien dengan metode 3D-CRT mengalami pneumonitis. Dari hasil evaluasi dosis radiasi pada PTV dan paru-paru, didapatkan bahwa dosis radiasi yang diterima paru-paru pasien melebihi aturan QUANTEC menjadi salah satu risiko terjadinya pneumonitis.

Kata kunci : kanker payudara, DVH, QUANTEC, pneumonitis

# **ANALYSIS OF X-RAY RADIATION DOSE IN LUNGS OF BREAST CANCER PATIENTS BASED ON DOSE VOLUME HISTOGRAM CHART**

## **ABSTRACT**

Analysis of X-ray radiation dose in lungs of breast cancer patients based on the Dose Volume Histogram chart has been done. This study aims to fulfill the principle of optimization and the principle of limitation in radiation protection by evaluating the radiation dose received by the cancer target based on International Commission on Radiation Units Report 62 and the radiation dose received by the breast cancer patient's lungs based on Quantitative Analysis of Normal Tissue Effects in the Clinic, as well as knowing the effect caused post-therapy. Data was collected on the results of the DVH curve obtained from radiation planning by doctors and medical physicists at Andalas University Hospital. The value of the radiation dose received by the lungs was observed in 6 MV X-ray therapy patients with 6 patients using the Three Dimensional Conformal Radiation Therapy technique and 6 patients using the Intensity Modulated Radiation Therapy technique. The results of the study found that there were 2 patients with IMRT technique not fulfilling the principle of optimization because they did not get the maximum radiation dose in the cancer target area. The results of radiation doses in the lungs were 3 patients with the 3D-CRT technique and 3 patients with the IMRT technique received radiation dose that did not meet the limitation principle because they exceeded the rules set by QUANTEC, and one of the patients with the 3D-CRT method had pneumonitis. From the evaluation results of radiation dose on PTV and lungs, it was found that the radiation dose received by the patient's lungs exceeding the QUANTEC rule is one of the risks of pneumonitis

Keywords : breast cancer, DVH, QUANTEC, pneumonitis