

## Opimasi kualitas citra dan dosis pada pemeriksaan thorak menggunakan computed radiography = Optimization of image quality and dose in thorax examination using computed radiography

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### Abstrak

Pemeriksaan Radiografi Thorak Posteroanterior (PA) merupakan pemeriksaan terbanyak didalam radiodiagnostik, diperlukan optimasi dosis dan citra radiografi Thorak PA. Penelitian teknik optimasi dengan menggunakan teknik kV tinggi pada pemeriksaan Radiografi Thorak PA dengan menggunakan reseptor system Kodak CR perlu dilakukan. Pengambilan citra radiografi Thorak PA dilakukan dengan objek fantom thorak dan sample pasien, untuk mengeliminir penilaian subjektif diambil citra radiografi fantom TOR 18 FG dan TOR CDR. Pada saat pengambilan citra radiografi thorak PA dilakukan pengukuran dosis masuk permukaan (Entrance surface dose / ESD) dengan menggunakan TLD. Evaluasi citra radiografi thorak PA menggunakan 'quality criteria' European Commission EUR 16260 EN (1996). European Guidelines On Quality Criteria For Diagnostic Radiographic Images. Evaluasi dosis dengan membandingkan dengan dosis referensi dari IAEA BSS 115. Hasil evaluasi dosis pada fantom thorak, dari tiga variasi faktor eksposi 66 kV 8 mA, 85 kV 6.3 mAs dan 109 kV 2.2 mAs, dosis paling kecil dihasilkan dari faktor eksposi 109 kV 2.2 mAs.

Hasil evaluasi citra pada TOR 18 FG dan TOR CDR didapatkan sensitifitas kontras rendah, sensitifitas kontras tinggi dan resolusi pada kondisi 109 kV 2.2 mAs lebih besar daripada kondisi 66 kV 8 mAs. Hasil evaluasi gambaran thorak PA dengan menggunakan kondisi eksposi 109 kV 2.2 mAs dibandingkan dengan kondisi eksposi 66 kV 8 mAs kontras pada jaringan yang memiliki perbedaan kerapatan yang besar akan terjadi penurunan kontras. Sedangkan pada jaringan yang memiliki perbedaan kerapatan yang relatif kecil atau sama akan menaikkan kontras.

.....The Posterior-Anterior (PA) Examination of the thorax is the most frequent radio-diagnostic procedure. Optimization of dose and image of the PA thoracic radiography is required. This research was conducted to determine the optimal of techniques using high kV technique on thoracic radiography PA examination by using the Kodak CR system receptor and the patient sample, to eliminate the subjective assessment of radiographic image taken TOR 18 FG and TOR CDR phantom. At the time of image acquisition PA Thorax radiographs were performed, entrance surface dose measurements (ESD) were made using the TLD. The evaluation of the thoracic radiographic image of the PA using the quality criteria European Commission EUR 16260 EN (1996) European Guidelines On Quality Criteria For Diagnostic radiographic Images were made. An evaluation of dose by comparing with a reference dose of the IAEA BSS 155 was conducted. In the results of dose evaluation in thoracic phantom of the three variations of exposure factor: 66 kV 8 mAs, 85 kV 6.3 mAs and 109 kV 2.2 mAs, the smallest dose resulted from 109 kV 2.2 mAs exposure factor. The result of the evaluation on TOR 18 FG and TOR CDR obtained low contrast sensitivity. The contrast sensitivity and higher resolution on the condition of 109 kV 2.2 mAs were larger than the condition of 66 kV 8 mAs. The results of the evaluation of thoracic image of PA by using the condition of 109 kV 2.2 mAs were comparable to the conditions of 66 kV 8 mAs contrast to the tissue that has large density differences that will decrease the contrast. While on a tissue that has relatively small density difference, or the same will

increase the contrast.