Kontrol kualitas sistem mamografi digital: Direct Radiography (DR) = Quality control of digital mammography system: Direct Radiography (DR)

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Abstrak

Teknologi pesawat mamografi telah mengalami perkembangan yang cukup pesat, dimulai dari mamografi konvensional yang menggunakan reseptor film/screen (Screen Film Mammography) sampai mamografi digital. Dalam penelitian ini dilakukan kontrol kualitas dengan menerapkan protokol International Atomic Energy Agency (IAEA) Human Health Series no.17 untuk mengetahui kinerja pesawat mammografi digital Direct Radiography (DR). Pengukuran dosis radiasi yang direpresentasikan dengan Mean Glandular Dose (MGD) dan evaluasi kualitas citra juga dilakukan dalam penelitian ini. Uji kontrol kualitas yang meliputi evaluasi: mekanis sistem, sistem kompresi dan AEC, kinerja reseptor citra, ghosting, uniformitas dan homogenitas, kualitas berkas (HVL), sistem kolimasi, tampilan monitor, dan laser printer, menunjukkan hasil yang baik.
Sedangkan berdasarkan hasil uji luminansi, perlu dilakukan koreksi pada viewbox. Dari ketebalan fantom 2 cm, 3,8 cm, 4,3 cm, dan 6 cm diperoleh estimasi dosis rata-rata berturut-turut 0,501 mGy, 1,041 mGy, 0,845 mGy, dan 1,956 mGy. Hasil Mean Glandular Dose (MGD) ini masih memenuhi syarat yang direkomendasikan oleh IAEA no. 17 dengan pertimbangan faktor koreksi=0,154.(Ketebalan kompresi)+0,624. Hasil evaluasi kualitas citra yang menggunakan fantom CIRS 011 A dan fantom Nuclear Associates 18-220 masih dalam batas direkomendasikan oleh Computerized Imaging Reference Systems (CIRS) dan American College of Radiology (ACR).
<hr>Mammography technology has been developed rapidly, starting from conventional mammography using screen/film receptor (Screen Film Mammography) to digital mammography. In this study, the quality control protocol is adopted from International Atomic Energy Agency (IAEA) Human Health Series No.17 to determine performance of digital mammography: Direct Radiography (DR). Dose measurement which is represented by Mean Glandular Dose (MGD) and image quality evaluation have been studied as well.
The results of quality control tests included evaluation of mechanical system, compression system, Automatic Exposure Control (AEC), performance of image receptor, ghosting, uniformity and homogeneity, beam quality (HVL), collimation system, display monitor, and laser printers are in good conditions. Otherwise, according to luminance test result, viewboxs need to be corrected. From the phantom thickness of 2 cm, 3,8 cm, 4,3 cm, and 6 cm, obtained estimation of the average dose are respectively 0,501 mGy, 1,041 mGy, 0,845 mGy, and 1,956 mGy. This MGD?s results are still eligible recommended by IAEA no. 17, with considering correction factor=0,154.(compressed thickness)+0,624. Phantom image quality evaluation results which use CIRS 011A and Nuclear Associates 18-220 phantom are still within the limits recommended by Computerized Imaging Reference Systems (CIRS) and American College of Radiology (ACR).