**Investigation of imaging parameters and radiation dose in chest radiographic imaging: A comparison of computed radiography and direct radiography**

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**Purpose:** The aim of the study was to investigate the optimal imaging parameters for chest radiographic imaging using computed radiography (CR) and direct radiography (DR) systems, with regards to the relationship between tube potential and tube current time and radiation dose.

**Methods:** The study was performed on a chest phantom made from sheets of plastic tubing, copper and aluminium, which were shaped to resemble frontal radiographic projections of human thoracic structures. Regional test objects were incorporated into the chest phantom for image quality assessment in the lungs, heart and retrodiaphragmatic areas. Chest phantom images were taken using CR on an Agfa system and DR on a Philips Optimus system. Imaging parameters were selected with mAs ranging from 0.5, 1.0, 2.0, 4.0 and 8.0, and tube potential ranging from 100, 110 and 120 kV. Entrance skin dose (mGy) was measured using a solid state detector. Quantitative measurements of image quality were performed at 7 regions of interest to determine the relationship between image noise and imaging parameters.

**Results:** The radiation dose was lower using DR system when compared to that measured with CR system, although it did not reach significant difference. Radiation dose increased significantly when the mAs was increased ($p<0.05$) using both CR and DR systems. However, no significant difference of radiation dose was found among the varying kV values ($p>0.05$). The image noise measured in different regions of interest increased significantly ($p<0.001$) when the kV was increased, with 120 kV generating the lowest noise value.

**Conclusion:** Our results showed that CR and DR chest radiography produced optimum image quality following the protocol of 120 kV and 2 mAs. The chest image quality in CR imaging can be improved by increasing the tube potential while maintaining relatively low dose.