Present-day radiographic equipment QA techniques rely primarily on qualitative evaluations of images. For example, a QA test may determine whether a low contrast object is visible in an image. These techniques do not provide quantitative equipment parameters, such as x-ray tube voltage and focal spot size or modulation transfer function and detector quantum efficiency. Frequent quantitative measurements are at the heart of statistical quality control (SQC) techniques. These statistical techniques have been applied very successfully to improve quality in many areas. With quantitative measurements, SQC techniques such as control charts could be applied to the diagnostic imaging process. These statistical techniques allow problems with equipment and procedures to be identified and corrected before they have a significant impact on patient care. Therefore, their application could result in improvement of the quality of diagnostic images produced in the day-to-day functioning of medical organizations.

Measurement of quantitative parameters with present-day tools requires difficult and time-consuming operations by Ph.D. level physicists. Digital imaging equipment, however, allows these tests to be done simply and at low cost. By making images of phantoms with precisely known physical properties, the digital information can be used to compute system performance parameters automatically. The information is then immediately available to the radiological technologists to point out problems with the system. The detailed parameters can also be stored on a database for later use in SQC techniques.

We describe a phantom and associated software QA tools for computed radiography systems.

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