Title: Use of a Statistical Phantom for Extremity Computed Radiography.

Abstract: An anthropomorphic hand phantom without any abnormalities was demonstrated to be ineffective for fine-tuning of the radiographic technique and the image processing in a computed radiographic system. A commercially available test object (ALVIM™)[*], containing holes of different sizes and various kinds of materials, is about the size of a hand and can be imaged with the same radiographic techniques of an extremity. Images of this test object were taken from 50 kVp to 65 kVp. An analysis of the visual detection of the holes by ten radiologists showed a higher accuracy at 50 kVp. An image taken at 50 kVp was processed by changing all the parameters in the computer radiography system. An analysis of the visual detection of the holes by two radiologists and two physicists determined the desirable changes from the default values of the parameters. Four out of five radiologists preferred an image of an anthropomorphic hand phantom with the new values to an image processed by the old default values. This statistical phantom apparently has helped us in the selection of radiographic techniques and the adjustment of parameters in image processing.

* Test object was donated by Nuclear Associates, a Division of Victoreen, Inc.