

DPH-08-015
Medical and Dental X-ray Quality Assurance

Reference List
For 15-Day Public Availability

1. "Quality Assurance Program for Medical Diagnostic X-Ray Machines," published by the State of New Jersey Bureau of X-ray Compliance in 2011.

REFERENCE 1

**“Quality Assurance Program for Medical Diagnostic X-Ray
Machines,” published by the State of New Jersey Bureau of
X-ray Compliance in 2011.**

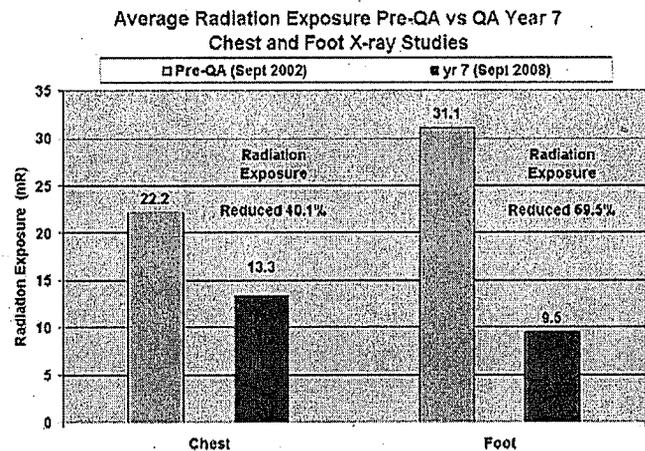
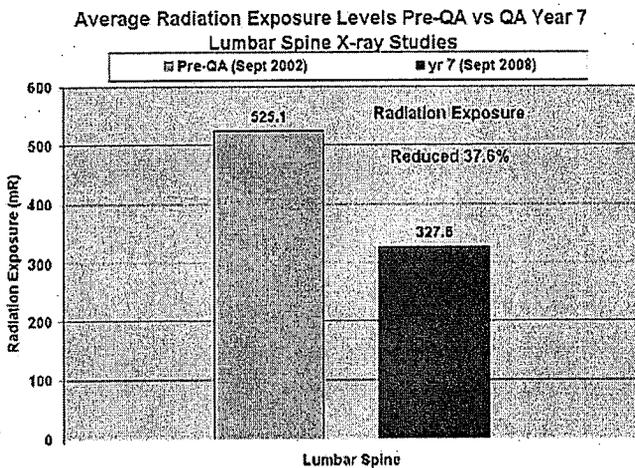
Quality Assurance Program For Medical Diagnostic X-Ray Machines

Introduction

Since 2001, New Jersey medical x-ray facilities have been continuously implementing a quality assurance (QA) program as required by New Jersey radiation protection regulations with the goal of reducing patient radiation exposure while increasing x-ray image quality.

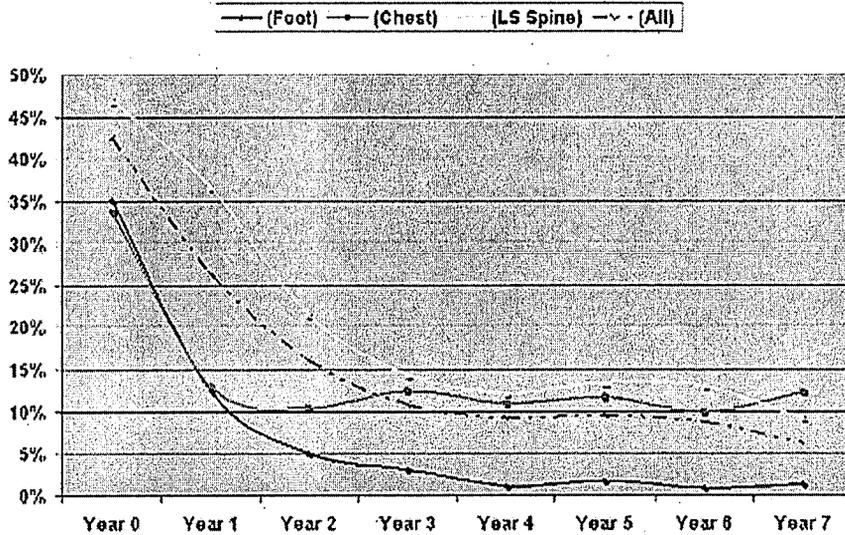
To measure the effectiveness of this program, the Bureau of X-Ray Compliance monitors Entrance Skin Exposure (ESE) and radiographic image quality (IQ) for three commonly performed radiographic exams: AP lumbar spine, PA chest and AP foot.

The Bureau is pleased to report that these efforts have resulted in reduced radiation exposure to patients while simultaneously improving radiographic image quality.



Patient radiation exposure measured as "Entrance-Skin-Exposure" (ESE) and reported as milliroentgens (mR).

Combined High & Extremely High Radiation Exposure By Discipline



Machines that measured high or extremely high radiation have steadily dropped from 42% prior to QA to just 6% in year-seven. Each discipline has demonstrated similar reductions in radiation exposure.

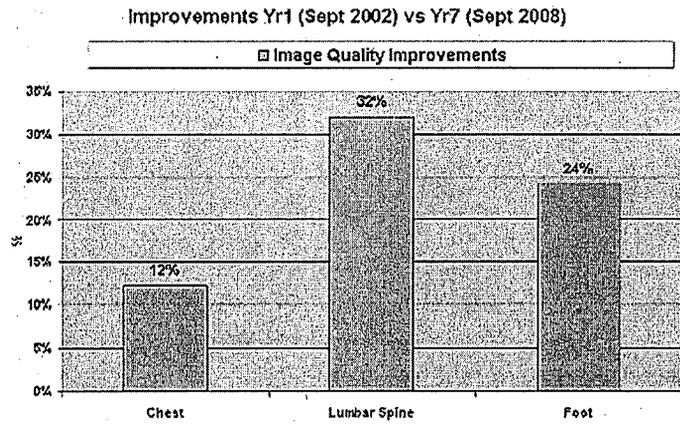
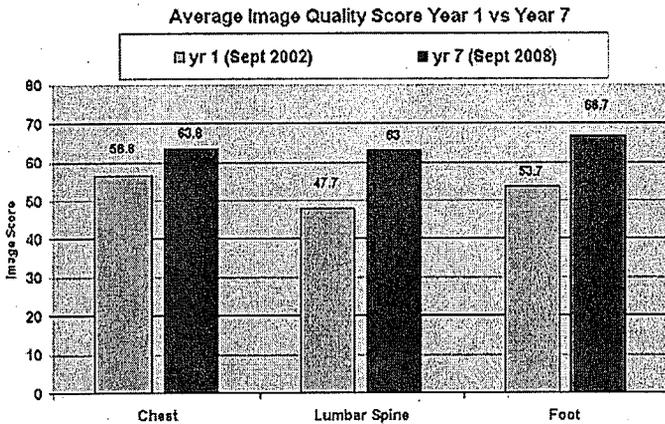


Image quality scores are measured and reported on a scale of zero to one hundred. Image quality scores are determined by the inspector's evaluation of a radiograph taken of an image quality phantom tool and processed using the facility's x-ray film/digital processor. The total image quality score is compiled by the inspector evaluating six areas of image quality including background density, high contrast resolution, low contrast resolution, density uniformity and noise/artifacts. Image quality scores of 0-29 are reported as poor; 30-49 as fair; 50-69 as good and 70 or greater as excellent image quality.

Distribution of IQ Scores Yr 1 vs Yr 7

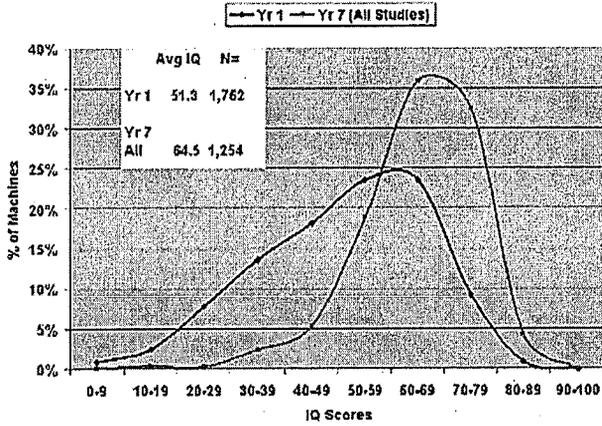
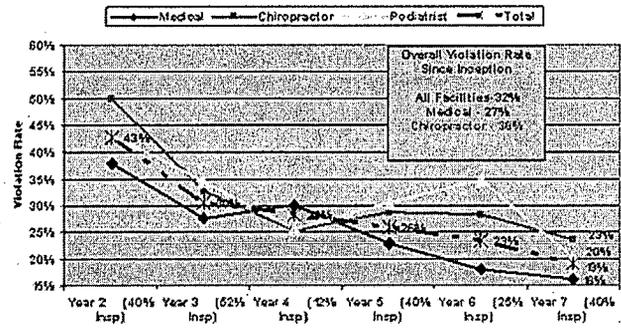


Image quality scores have dramatically improved from year-one to year-seven of the quality assurance program. In year-one, 43% of machines evaluated had image quality scores of 49 or lower. In year-seven, 9% of all machines evaluated had image quality scores of 49 or lower.

Violation Rate by Discipline



The above chart depicts the percentage of facilities in which violations of quality assurance regulations are discovered during inspections. In general, compliance with quality assurance regulations has improved.