

Purpose: To reduce entrance surface air Kerma (ESAK) of routine radiological examinations in some heavy loaded radiology departments using proper equipments and training.

Methods: ESAK for 12 routine radiographic examinations has been measured in 10 high loaded radiology departments belonging to country main health insurance organization after quality control for x-ray units and proper training for all radiographers of each departments to use proper technical charts for each room, mainly according to EUR 16260 and optimized exposure factors. The ESAK were measured according to X-ray tube output, optimized exposure parameters including tube potential(kVp), tube current (mA), focus to skin distance (FSD) for each technique.

Results: The mean reduced ESAK values after optimization of exposure parameters for abdomen, AP and lateral cervical spine, PA and lateral chest, AP and lateral lumbar spine, pelvis, PA and lateral skull, AP and lateral thoracic spine 4.61 , 1.19 ,1.20 , 0.26 , 0.59 4.63 , 6.56, 4.23 , 2.90 , 2.55 , 3.89 and 4.94 mGy, respectively. There were very significant reduction in ESAK by a factor of 36% for abdomen,28% and 35% for AP and lateral cervical spine,62% and 60% for PA and lateral chest, 41% and 53% for AP and lateral lumbar spine, 35% for pelvis, 27% and 22% for AP and lateral skull, 47% and 53% for AP and lateral thoracic spine. Mean, median, first and third quartile of values of ESAK are reported.

Conclusion: Significant dose reduction was achieved with proper and simple training and without considerable change in repeat and reject analysis. This reasonable outcome will lead us to establish optimized National Diagnostic Reference Levels (NDRLs).