

Abstract ID: 17240 Title: Educational Course Imaging

Diagnostic Exposure Tracking in the Medical Record

The Electronic Medical Record (EMR) represents the collection of diagnostic tests and procedural test information related to an individual patient's history of care at a health center. In the context of medical diagnostic imaging, this relates to the access to imaging procedures, the written diagnoses from the imaging experts, and of increasing relevance and importance, the radiation dose reports for the procedures. The EMR is also emerging as the gateway for computerized order entry for imaging exams, in which the imaging history and accumulated radiation dose will be made available for the referring physician from various imaging procedures, such as interventional radiology and cardiology, computed tomography, and nuclear medicine. Integrating the Healthcare Enterprise (IHE) Radiation Exposure Monitoring (REM) profile specifies how information related to dose can be extracted from modalities that are compliant with the DICOM Radiation Dose Structured Report (RDSR). However, once the information is collected via the RDSR, appropriate steps must be taken to parse the data according to exam types, body area scanned, and dose metrics provided in order to apply conversion factors to estimate an effective dose for a procedure. Effective dose estimates can be considerably under or overestimated, depending on the modality, the patient size, machine calibration errors, and a host of issues that are under current investigation. In this presentation, a review of the various dose metrics for the modalities is discussed, as are current methods to calculate the effective dose. Ultimately, to post the dose information in the EMR, a dose-management actor described by the IHE REM profile captures the pertinent dose information from each modality and study, parses the data and computes the effective dose according to defined conversion methods. Each individual dose report message transmitted to the EMR is stored in the patient dose report file defined by medical record number, which updates the dose index raw data (e.g., DAP in Interventional radiology, CTDIvol, DLP in CT), the calculated effective dose per procedure, and total cumulative effective dose for the patient.

Learning objectives:

1. Understand the various dose metrics produced by the imaging modalities.
2. Determine how effective dose can be estimated for a given procedure with the dose index values provided by a modality.
3. Understand limitations of effective dose calculations, the wide range of under/over estimates that can occur for a specific procedure, and the limitations of the total cumulative patient effective dose.