



AAPM Computed Tomography Automatic Exposure Control Education Slides

Many of the terms used in these slides can be found in the CT
Terminology Lexicon

<http://www.aapm.org/pubs/CTProtocols/documents/CTTerminologyLexicon.pdf>

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Motivation

- These slides are provided to aid in understanding the factors that affect performance of Automatic Exposure Control, specifically image quality and radiation dose, in CT studies



Outline

- Effect of CT localizer on AEC
- Image quality reference parameter for AEC
- Effect of patient size on AEC
- Effect of scanned anatomy
- Effect of first or expected reconstruction settings
- Advanced AEC features



Effect of CT Localizer

- The CT localizer(s) provide the initial data to inform the behavior of the AEC
- The apparent size of the patient on the localizer(s) or the measured attenuation are used to set the initial dose level for the exam
- The localizer(s) may also be used to adjust the longitudinal or angular tube current modulation
- The use of multiple localizers and the order of their acquisition may affect the behavior of the system's AEC



Image quality reference parameter for AEC

- The image quality reference parameter for AEC is generally a measure of image quality in the reconstructed images
- The image quality reference parameter for AEC has a unique relationship with both tube output and patient size
- Specifically, the Image quality reference parameter is used together with the patient attenuation profile (as estimated by the CT localizer) to determine the tube output for a particular exam
- The operation of the AEC may be independent of the reconstruction parameters, or related to them



Advanced AEC Features Outline

- AEC in cardiac exams
- Unusual attenuation profiles
 - Head/Neck exams (strategy to handle abrupt change of attenuation profile)
 - Extremity exams
 - Neonates and very small children
 - Metal/Foreign objects within Scan FOV
 - Obese patients
- Automatic tube voltage selection
- Organ based tube current modulation