RSNA Press Release

National Dose Levels Established for 10 Common Adult CT Examinations

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Kalpana M. Kanal, Ph.D.

OAK BROOK, Ill. (Feb. 22, 2017) — Using data from the world’s largest CT dose index registry, researchers have established national dose levels for common adult CT examinations based on patient size. Healthcare facilities can optimize these exam protocols so that dose is commensurate with the size of the patient, avoiding unnecessary radiation exposure.

Results of the two-year study published online in the journal *Radiology* established patient-size based diagnostic reference levels (DRLs) and achievable doses (ADs) for the 10 most common CT head, neck and body examinations.

While the impact of patient size on radiation dose is well established, national DRLs previously provided only one value for each examination based on a standard-size phantom representing an average patient, a single patient size or data averaged across all patient sizes.

For the study, Kalpana M. Kanal, Ph.D., a medical physicist, professor and section chief in
The use of DRLs has been shown to reduce the overall dose and the range of doses observed in clinical practice, Dr. Kanal said. In terms of using the benchmarks established in their research, she stresses that DRLs should be used to determine if a facility’s dose indexes are unusually high, and are not to be used as target doses.

“Both ADs and DRLs are provided to encourage facilities to optimize dose to a lower level than that indicated by the DRL,” Dr. Kanal said. “Image quality must be taken into consideration when using DRLs and ADs to evaluate CT protocols on each scanner to determine if protocols are optimized.”

Ideally, facilities should analyze and compare their median and size-grouped dose indexes with the respective size-based ADs and DRLs. If size-grouped dose indexes are not available, they should compare their overall median indexes with the average DRLs and ADs.
ADs across all patient sizes.

“DRLs and ADs are not intended to be used for comparisons with dose indexes for individual patients,” Dr. Kanal said. “Implementation of DRLs and ADs is most effective if the facility has a system to automatically monitor patient dose indexes so that aggregate results may be evaluated.”

Dr. Kanal and colleagues plan to expand their analysis to include high-dose examinations and various scanner configurations and will develop DRLs and ADs for the pediatric population.

Radiologists, radiation oncologists, medical physicists and other radiology professionals are working together to standardize CT protocols.

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“U.S. Diagnostic Reference Levels and Achievable Doses for 10 Adult CT Examinations.” Collaborating with Dr. Kanal were Priscilla F. Butler, M.S., Debapriya Sengupta, Ph.D., Mythreyi Bhargavan-Chatfield, Ph.D., Laura P. Coombs, Ph.D., and Richard L. Morin, Ph.D.

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