Radiation Dose Reduction

- According to the graph, since the early 1980s our dosage in Medical radiation has increased considerably. Most of the reason for that is the man-made radiation that we are exposed to, such as CT, Interventional radiology and Nuclear medicine. Coincidently, the Background radiation has decreased. Most of the background radiation we receive is from radon, which is naturally occurring.

How is radiation dose being reduced

- Over the last 10 to 15 years, awareness of the risks of radiation exposure in medical imaging and efforts to reduce dose have escalated exponentially. Imaging equipment vendors have answered the call with dose-reducing strategies that include more sensitive image receptors, better image reconstruction techniques, dose alerts and post-processing software. Radiologists, technologists and physicists have been hard at work as well, edging down dose without compromising image quality.

- A recent policy change in VCU Health in Richmond, VA reduced the number of pulses per second on the facility’s fluoroscopy systems from 15 to 10. It began with one radiologist, who made the shift and then closely examined the diagnostic quality of each image. When it was confirmed there was no drop in image quality, the department’s interventional radiologists all embraced the new parameter, reducing radiation dose by 33 percent for each patient.

Why is radiation dose reduction important in the future

- As stated in Utilization of a Dose Management Solution to Lower Radiation in Medical Imaging from Imaging Technology News, "Reducing radiation in high doses increases the risk of developing cancer, but the danger posed by lower doses such as those from medical imaging is still controversial."

Phase Contrast Imaging

- As x-ray passing through an object, a phase shift is occurring in the x-rays placing the image receptor at certain distance, interferences between waves are being used to improve contrast in an image.

How phase contrast imaging is improving quality and phasing out attenuative x-ray

- Phase contrast techniques are being developed to reduce the concern by detecting the slight refractive bending of x-rays in an object, instead of relying on attenuation.

- Focuses on density which change the phase of the wave front of an x-ray beam. Changes are then converted into an image.

- Uses Talbot-Lau X-ray interferometer, which contains several absorption and phase shift gratings with micron size pitch.

Why is phase contrast imaging so important in the future

- Displaying contrasts with soft tissue at a low radiation dose
- Blood vessels can be visible without using contrast agents
- Able to differentiate tumor at different stages of growth
- Reduces radiation doses and utilizes radiation free method to achieve high quality imaging results

References APA


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