

Being Able to See More, Know More with Less Dose: High Definition CT Imaging

An interview with Gene Saragnese, Vice President and General Manager,
Molecular Imaging & Computed Tomography, GE Healthcare

What Is the GE Vision for the Future of MDCT?

Our goal at GE Healthcare has always been to develop solutions for clinicians that enable them to see more distinctly the images (anatomy) before them, and in turn have confidence to know more accurately the diagnostic quality of those images. Also, we strive to lower the radiation dose to the patient as a part of a comprehensive dose-reduction strategy.

This vision is really all about helping clinicians see more and know more with less dose.

See More...

If clinicians struggle to see anatomy or pathology, how can they make a confident diagnosis? Consider that greater than 80 percent of all CT examinations are of the head, abdomen or pelvis. While today's coverage and temporal resolution is more than adequate for these procedures, better image quality and lower dose will always benefit and favorably impact the vast majority of patients undergoing these procedures.

From a technical standpoint, clinicians continue to challenge us to improve CT imaging quality so that they can see more of the diagnostic landscape staring at them on the screen. Visually, radiologists still struggle to confidently evaluate any anatomical structure that is less than 2 mm in diameter. For example, this creates a diagnostic challenge for the physician to confidently diagnose a coronary stenosis greater than 50 percent across a lesion. At GE, we are investing our primary research funding and development priorities to help improve that conundrum.

Know More...

Knowing more of the diagnostic landscape is more than adding slices to a CT scanner. This is why prioritizing image quality, specifically creating an increase in spatial resolution is one of GE's priorities. Knowing more includes the ability to visualize a volume with lengths of up to 220 mm while also providing useful perfusion and functional information to assist in the diagnosis of the disease.

Also at the forefront of our research is utilizing dual energy imaging. Our single-source dual energy technology shows promise for meaningful material discrimination.



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Less Dose...

Seeing more and knowing more without addressing radiation dose would miss one of our key objectives – that is maintaining GE's position as the low dose leader. We not only want our customers to see their images better, but we want them to do so with a lower radiation dosage. Quite simply, minimizing radiation exposure to patients is the responsible thing to do. We have earned the respect of clinicians by manufacturing CT systems with dose optimization features. These attributes expose patients to the lowest dose possible while still maintaining or improving image quality. This is an important endeavor that will continue to receive our highest level of commitment.

What Are the Challenges with Developing a Better Image Quality or Lower Dose CT System?

Traditionally, obtaining better image quality meant increasing radiation dose to the patient. Today, GE is aggressively developing technologies that enhance image quality while maintaining or actually reducing dose. With redesigned electronics, detector technologies and reconstruction algorithms, these improvements put us on track to obtain better images without increasing dose.

What Are the Implications of High Resolution and Lower Dose in the Clinical Setting? How Will Patients Benefit?

It's all about seeing structures more clearly. Better visualization will certainly help the clinician but it will also dramatically improve image post-processing as well. Once a clinician sees a structure more confidently, they can then use the power of the computer to segment or isolate it, quantitatively measure the target, and lastly, characterize the structure and appropriately diagnose it.

Seeing more of the anatomy, knowing more of the diagnostic landscape and performing all of this with less dose is the GE CT vision and our technology development priority. Personally, I can't imagine a more important mission than to deliver what clinicians have requested, which is to raise their diagnostic confidence while at the same time improving patient care. ■