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Computed tomography



Accelerating clinical boundaries with spectral-detector CT at Hennepin County Medical Center

Healthcare system upgrades to the latest spectral-detector CT, enhancing clinician confidence, patient comfort, and technologist ease

Who/Where

Gopal Punjabi, MD
Chair, Department of Radiology
Hennepin Healthcare, Minneapolis, MN.

Challenge

The volume of CT scans that Hennepin Healthcare performs annually has significantly increased year after year for a population made up of extremely acute care patients. While Dr. Punjabi and his staff were pleased with their Philips IQon scanners – especially their ability to do spectral imaging – they needed the ability to do cardiac scans and further enhance their workflow.

Solution

Hennepin Healthcare partnered with Philips to upgrade to the Spectral CT 7500 system to take their existing standard of Spectral imaging to the next level of clinical capabilities.

Results

Using the Philips Spectral CT 7500, Hennepin Healthcare was able to optimize patient comfort, improve technologist efficiency, particularly for cardiac studies, and decrease time to diagnosis.

In 2019, 90 million CT scans were performed throughout the United States with about half of these procedures being done on an emergency basis.¹

The stats don't surprise Dr. Gopal Punjabi, Chair of the Department of Radiology at Hennepin Healthcare. Located in Minneapolis, MN, Hennepin Healthcare and its integrated system – including a HCMC, Level I Adult Trauma Center and Level 1 Pediatric Trauma Center with the largest emergency department in Minnesota – has experienced a substantial increase each year in scan volume of its most acute patients.



Upgrading to the latest CT technology: a decision two years in the making

Hennepin Healthcare is also a comprehensive academic medical center and public teaching hospital that prides itself, according to Punjabi, on its long history of supporting and investing in technology. So when it was time to replace one of the CT scanners in their Radiology department, Punjabi and his team knew they wanted the same ability to have spectral imaging always on as they have with their two existing Philips IQon Spectral CT's.

"We really liked the ability to do spectral imaging and the ability to have spectral recons on every scan. So in other words, to have spectral imaging always on, and that was a huge advantage to us. And that was something that we wanted to have in the new scanner." Dr. Punjabi.

The team also knew they needed the latest innovative features to meet the demands of their patients.



"The [Spectral CT] 7500 in my mind, is a spectral CT on steroids. It adds a lot of advantages to what spectral already provided us."

Gopal Punjabi, MD
Chair, Department of Radiology
Hennepin Healthcare, Minneapolis, MN

"We also wanted the scanner to be able to do cardiac scans. We wanted a large bore, faster scanner and a longer detector. I think the best combination of all those things that we were looking for, was in the Spectral CT 7500."

Dr. Punjabi

He explained that although the decision wasn't a hard one for him and his team to make, it was something that was weighed very carefully to take into account the benefits to patients, technologists and the health system as a whole.

"As the Department Chair, I'm responsible for the clinical quality of all imaging that happens. I'm responsible for protocols and policies, patient safety, to make sure that we do the right study for the right patient using the right amount of contrast and things like that. I'm responsible for recruitment and retention of radiologists. I'm responsible for budgeting for radiologists," Punjabi explained.

The innovative features on the Spectral CT 7500 has allowed Punjabi and his team to meet the dynamic needs within the healthcare system.

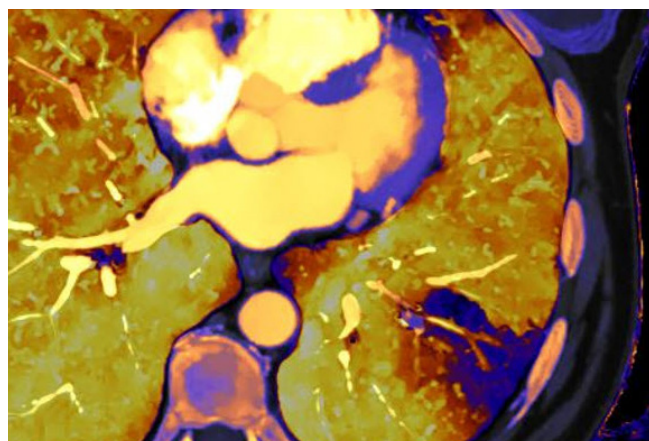


Spectral results, 100% of the time

This detector-based spectral CT makes every scan work harder by providing layers of rich results and improving tissue characterization and visualization. Because spectral is always on, you get more information in every scan. Spectral data along with the conventional CT image are sent to PACS and then, with a single click, you can launch MagicGlass on PACS and view a wide range of spectral images along side the conventional CT image.

“With routine CT scans, we’re used to the axial, coronal and sagittal reconstructions. We look at them, we’re done. With a spectral CT scanner, you can generate an iodine map, take the iodine out, generate the virtual non-contrast, generate different energy levels. You can do effective atomic number, calcium subtraction, all kinds of things.”

Dr. Punjabi



According to Punjabi, his team are now doing advanced scanning for some of the most challenging patient types, including pediatric and bariatric, and even cardiac imaging with the Spectral CT 7500’s full field-of-view and ability to reduce calcium blooming in coronary arteries.

Diagnostic confidence in every scan

The ability to have spectral results directly on PACS has enabled the radiology team to give a confident answer right away. In a clinical study, the Spectral CT 7500 was shown to reduce the need for follow-up scans due to incomplete diagnosis by 26%.² Dr. Punjabi has noticed this increased diagnostic certainty first-hand.

“Before, for example, with a small sub-segmental pulmonary emboli, we would hem and haw. Maybe there is one, maybe there isn’t one. Now [with the CT 7500], I call the pulmonologist and I tell them, ‘There’s a PE, 100%.’ Increasing that level of confidence I think is a big, big plus.” Dr. Punjabi.

Faster time to diagnosis

The increased clinical certainty that the Spectral CT 7500 provides, goes hand-in-hand with a reduced time to diagnose. In a clinical study, routine scans with detector-based spectral CT have demonstrated 34% shorter time to diagnose,³ something that enables Dr. Punjabi and his team to deliver enhanced care.

“We’re [able to focus] on what’s really important to the patient. We’re focusing on what is probably making them sick and what is most likely to get them better, instead of focusing on a lot of the incidental stuff. So that is a big plus. We spend so much of our time on incidental stuff that is of no particular relevance. And I think it just sucks up the oxygen.”



He explains that with the Spectral CT 7500, he is now able to do an entire chest, abdomen and pelvis CT in two seconds. With the speed, comes an improved workflow, especially for Hennepin Healthcare's technologists.

Simplifying and enhancing workflow

With the always-on layers of spectral information in every scan, the need for rescanning is greatly reduced. Explains Scott Morgan, a technologist at Hennepin Healthcare, "With all the Spectral information given, the doctors have a lot more information to go through and see. Say that somebody has a pulmonary embolism, on a regular scanner, they would just see that contrast. With [the 7500], they can pull a lot of the Spectral data to see something that may be missed on a non-Spectral scanner.

Using the Spectral CT 7500, Dr. Punjabi says, has reduced the technologists' time to as low as it can be. Features, like Magic Glass, cuts out the need for radiologists to go to a separate workstation to launch spectral capabilities, saving precious time per scan. He explains that this is important because technologists are already stressed for time and their jobs are incredibly challenging every day and every single hour.

"Everything is an emergency, and everything needs to be done right away. And that brings with it tremendous pressure while at the same time, trying to do the right thing for every patient. So the margin for error here is minuscule."

Dr. Punjabi

The advantages of the Spectral CT 7500 extend far beyond clinicians and technologists. The system is specifically designed to accommodate a variety of patients and provide a better imaging experience comfortably.

A more comfortable scan

One of the bigger advantages of spectral CT, is the ability to reduce the number of acquisitions performed. Dr. Punjabi explains that they can take away a true non-contrast sequence for some indications and for other indications, multiple phases are able to be combined, reducing radiation dose for patients.

"One thing that I'm really excited about, is the ability to reduce contrast dose. I think we've done CT angiograms of the aorta with as little as 16 mL of contrast. And we can go a lot lower than that." Dr. Punjabi.

Patients at Hennepin Healthcare also appreciate the level of care that the Spectral CT 7500 helps afford them. David Cofman is one such patient. In his early 50s, he is a type one diabetic who had a cardiac incident, elevated blood pressure and chest pain, and who, after also having lingering complications from COVID, was advised by his doctor to forego a stress test in lieu of a heart scan.

"I live in the Western suburbs, and I chose to come to Hennepin county because I read that the technology was cutting edge, had the least amount of radiation, and that was important to me."

Patient David Cofman

Cofman says that the lower radiation dose wasn't the only thing that gave him added peace of mind. With a larger 80 cm bore, there's more room inside the Spectral CT 7500.

"It went really smooth. I tend to be a little claustrophobic and I really appreciated the larger bore. I didn't feel confined at all."

Technologist Scott Morgan says the Spectral CT 7500 also boasts other features that enhance patient comfort, like the table itself.

"The table goes low enough, [that patients] can just scoot over easily."

Technologist Scott Morgan

Reflecting on the upgrade to a new imaging system, Dr. Punjabi says he can measure the impact of the Spectral CT 7500 by the amount of demand there is for spectral scans throughout Hennepin Healthcare from ER doctors and residents, to technologists and patients. He sums up:

"I think this is the technology of the future. It really lets us focus on what's important and lets us give a diagnosis with a much higher degree of confidence. This is the whole reason why I'm a radiologist: to be able to provide a clinical diagnosis [the] first time [with] high confidence."

Dr. Punjabi



Benefits achieved at Hennepin Healthcare*

- Lower radiation dose for patients
- Fewer repeat scans
- Reduced time to diagnosis
- Increased clinical confidence
- Expanded clinical capabilities to include cardiac imaging

Conclusion

Hennepin Healthcare invested in technology once again with the Spectral CT 7500, allowing the Radiology Department to stay in step with innovation to enhance employee satisfaction and deliver quality patient care.

To learn how Philips Spectral CT 7500 can help your healthcare organization improve clinical confidence, streamline technologist workflow and enhance patient comfort, contact your Philips representative or [click here for more information](#).

1. Fischer, John R. (2020, February 10). *CT procedure volume in U.S. hits all-time high in 2019*. DOTmed HealthCare Business News. <https://www.dotmed.com/news/story/50081>.
2. Analysis by LSU, New Orleans, LA, USA. Results from case studies are not predictive of results in other cases. Results in other cases may vary.
3. Analysis by CARTI Cancer Center, Little Rock, AR, USA. Results from case studies are not predictive of results in other cases. Results in other cases may vary.

