

How hospitals are deriving clinical, operational and business benefits from CT to improve diagnostic confidence and lower cost of care

By Karim Boussebaa

Computed tomography (CT) scanners are ubiquitous in healthcare as they are reliably fast, non-invasive and accurate in helping to detect a wide range of diseases and conditions for patients. In years past, healthcare organizations only considered the technology's quantitative specifications; today, the CT scanner is only part of what they are purchasing. Increasingly, healthcare providers also want integrated solutions, workflow advancements and quality improvements that can be leveraged across the organization and beyond the clinical domain to derive economic benefit.



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In this new world of radiology department economics, CT is a key enabler in addressing some of healthcare's most pressing challenges from a clinical, operational and business standpoint. Providers understand the importance of putting quality initiatives in place to ensure they are on a plan for continuous improvement. They want to know how they can consistently maximize their CT capabilities or improve the CT scanner experience for patients and staff while controlling costs across the organization. Most importantly, they want to ensure that they can maintain efficiency in the face of healthcare market consolidation and an outcomes-based environment.

DIAGNOSTIC CONFIDENCE OF CT PROVIDES TANGIBLE RESULTS

With imaging volumes growing exponentially, technologists need to be able to scan more patients and radiologists need to read more cases in less time.

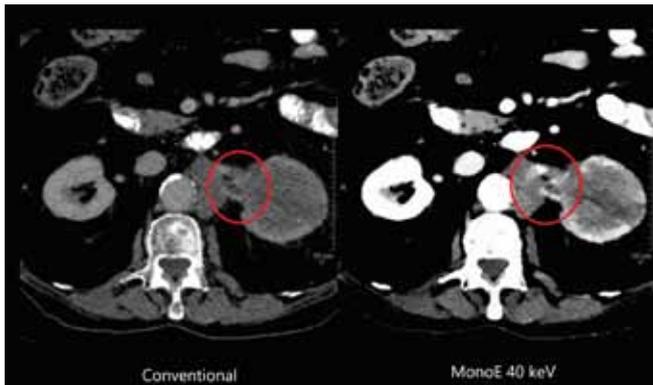
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This puts tremendous pressure on radiology departments to overcome imaging obstacles to not only improve diagnostic confidence on the first scan but also streamline workflows to improve patient care and staff efficiency. Intuitive technology advances from the CT scanner to the console to the reading room are helping to improve the patient experience and every step of the radiology workflow. More and more providers need superb image quality, fast results and consistency from scan to scan with solutions that keep the technologist close to the patient. From a diagnostic confidence standpoint, Spectral-detector CT is redefining the standard of care for



The low MonoE results of IQon Spectral CT allowed for improved visualization of the vascular structures on this delayed CT.

patients. One of the key benefits of [Philips IQon Spectral CT](#) technology is that it applies spectral technology 100% of the time, which gives radiologists the ability to find lesions that aren't visible with ordinary scans – lesions they may not have even been looking for that may be significant in determining a patient's diagnosis. There are tremendous benefits for both patients and healthcare organizations in eliminating the guess-work in image reading with Spectral CT. At the same time, it is a major workflow advancement, leading to fast procedures and an enhanced patient experience that may achieve a cost savings for hospitals as well.

BENEFITS OF CT IN THE REAL WORLD

Working with CARTI Cancer Center, we have seen first-hand how Spectral CT can provide not only diagnostic confidence for clinicians but also operational improvement and cost savings. Approximately 14 percent [1] of the general U.S. population suffer from chronic kidney disease (CKD) and these patients cannot tolerate typical contrast doses in imaging as this would increase their chance of getting contrast-induced nephropathy (CIN). At CARTI Cancer Center, these CKD patients were typically scanned with non-contrast CT and followed up with scans on other modalities such as MRI and ultrasound for further confirmation or diagnostic information. However, this sometimes increased the time-to-diagnosis and cost of follow-up scans for the center.

To address this, CARTI utilized IQon Spectral CT which allowed radiologists to make a confident diagnosis fast using low-contrast imaging and provided more insights than conventional CT at a low radiation dose. The low monoE results of IQon Spectral CT boosted the contrast enhancement in the area of interest, providing additional information for increased diagnostic confidence. By using IQon Spectral CT, CARTI was able to reduce the time-to-diagnosis by 34 percent and the need for additional follow-up scans by 25 percent, resulting in a savings of \$453 per follow-up scan on a patient population that would not have been eligible to receive contrast [2].

Another instance of the overall benefit to diagnostic

confidence and value of IQon Spectral CT is evident in a [study](#) by the University Hospitals in Cleveland related to incidental findings, a prevalent issue in imaging. In fact, incidental findings are so commonly encountered on abdomen CT scans (approximately 15-20 percent) that the American College of Radiology has issued guidance that recommends follow up imaging exams on different modalities depending upon the size and nature of the incidental finding to enhance diagnostic confidence.

To remedy the issue of incidental findings, University Hospitals started using Philips IQon Elite Spectral CT scanner which provides multiple layers of spectral results in every exam and retrospectively. This provided benefits even in patients who would not have been pre-selected for a dual-energy protocol. The site observed that the retrospective availability of IQon Spectral CT's rich spectral results resulted in a 30 percent reduction in follow up exams, which in turn could result in savings for the hospital of approximately \$55K per year [3].

OPERATIONAL RELIABILITY OF CT BRINGS PREDICTABILITY

Operationally, radiology department administrators are focused on ensuring the reliability or uptime of imaging equipment. If a piece of imaging equipment such as a conventional CT scanner is not working there is a tremendous negative ripple effect throughout the department and into patient satisfaction and care. Radiology administrators need a solution that will fit seamlessly within their operation from throughput to image quality to uptime. With proactive monitoring via remote services, radiology administrators are able to solve problems before they impact daily operations.

Actionable insights are also crucial to radiology administrators to ensure reliability, quality and continuous improvement in the imaging department. For example, radiation exposure for patients and staff is a key concern in any imaging operation. With radiation exposure management software such as [Philips DoseWise Portal](#), radiology departments can collect, measure, analyze and report on radiation exposure data automatically. This makes a radiology administrator's job easier and enables them to more readily make sure patient and staff safety and quality initiatives in their



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department are on track and meeting standards.

With imaging solutions that are integrated and data-driven, hospitals or healthcare providers are in a better position to achieve short- and long-term improvement gains. Meaningful operational analytics solutions, such as [Philips PerformanceBridge](#) can help radiology departments gather all the data and metrics around and beyond their practice to improve workflow, reduce manual processes, and achieve gains in many areas to run their practice more efficiently.

REDUCED LONG-TERM EXPENSE OF CT OFFERS VALUE AND FLEXIBILITY

With the shift to value-based care, radiology departments often operate more like a business within a hospital, with efficiency-driven KPIs and metrics that they are measured against. From a business standpoint, hospitals or health providers must remain competitive and profitable to survive with increasing consolidation in the market. This creates greater focus on increasing patient volumes and referrals to bring in revenue while, at the same time, lowering operating costs to save it. It also means there's many dimensions to "cost" and "value" in imaging that differ per hospital but can include: acquisition, integration, personnel, maintenance and replacement costs. There's also hidden costs when providers consider both short- and long-term value.

Clearly, each hospital or healthcare provider has to create their own measure and critical dimensions of what cost and value mean to them. Many providers are still trying to determine, "What does the value measure mean?" around the key areas of access, satisfaction and efficiency. There is still some uncertainty on how value-based care will be operationalized or reimbursed.

However, there are some imaging costs that are fairly consistent across healthcare organizations and straightforward. Take CT tube life for example. What if hospitals no longer had to worry about tube cost in their operating budget? The potential savings can be as high as \$400,000 for not having to replace the tubes of a CT scanner over a ten-year useful

life of a CT system [4]. With [Philips Incisive CT](#), hospitals can keep control of operational costs such as tube life that can then be reinvested into patient care. Incisive CT also offers upgradeable systems technology so that hospitals can purchase what they need now with an easy path to add up-to-date features as their clinical needs evolve. This enables hospitals to stay clinically advanced while maximizing their imaging investment with a right-sized solution.

Today's healthcare environment is full of surprises that include everything from financial obstacles to staff shortages to government mandates. There will always be new challenges or issues to overcome but imaging will always play a critical role in healthcare's future. The balancing act of assessing cost versus value will continue to be a factor in purchasing decisions of imaging technology in the context of value-based care. Ultimately, imaging is about providing accurate information to facilitate more confident decision-making that guides enhanced patient care and confident diagnostics in the future. Providers can maximize the value of their imaging equipment overall and CT in particular, by determining how imaging solutions and partners can best support them with actionable, intelligent insight at every step from acquisition through results and across all fronts - clinical, operational and financial - for continuous improvement.



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REFERENCES AND DISCLAIMERS:

- [1] National Institute of Health, <https://www.niddk.nih.gov/health-information/health-statistics/kidney-disease>
- [2] Results from case studies are not predictive of results in other cases. Results in other cases may vary.
- [3] Clinical Imaging Journal, Benefit and clinical significance of retrospectively obtained spectral data with a novel detector-based spectral computed tomography - initial experiences and results, 2017, <https://doi.org/10.1016/j.clinimag.2017.10.019>
- [4] Actual operating costs for customers vary significantly because many variables exist (such as CT make and model, hospital/imaging center size, case mix, system usage). The potential savings identified estimates the avoidance of purchasing replacement tubes over a ten-year useful life of a CT system, based on an average selling price of \$140,000 per replacement tube and estimated tube life of three years. There can be no guarantee that all customers will achieve this result.