



Big Easy Health System Overcomes CT Imaging Challenges with an Innovative Partnership

Outsourcing computed tomography (CT) protocol optimization can save time and money and harmonize patient imaging for large health care systems. This article reviews Ochsner Health's implementation of the University of Wisconsin Madison's CT protocols, disseminated through GE Healthcare.



Ochsner Health is southeast Louisiana's largest non-profit, academic, multi-specialty, healthcare delivery system. Since 1942, this organization has expanded from its flagship hospital in Jefferson to include various clinics and medical centers committed to patient care, education and research in Greater New Orleans, Baton Rouge, Shreveport, Monroe, Lafayette and Hancock, Mississippi. To facilitate consistency in ordering, acquisition and appearance of a given study, regardless of location, Ochsner Health has piloted a centralized Protocol Governance Committee. Led by Dr. Joseph Hajjar, Roxy Bayne and Drew Roberson, protocols across all scanners are refined through a clinical indication-driven protocol selection and standardization process.

What is Wrong with Originality

Most societies value individuality and uniqueness as they often lead to innovation and invention. In a healthcare system, however, it often results in non-standardization, which can negatively impact efficiency and patient care.

As health systems acquire new institutions, the variation in imaging equipment—including make, model and age—increases the likelihood that patients have imaging studies conducted at multiple locations which may result in inconsistent radiologist, patient and provider experiences. To ensure a consistent imaging experience, scanning protocols are developed by modality. A CT protocol is a set of parameters that specify the specific exam acquisition and contrast delivery requirements in order to ensure that patient scans can be performed safely and effectively. This includes all the details that optimize the imaging of any suspected condition, including, slice thickness, x-ray energy, the number of x-rays, scan speed, the volume of contrast agent needed, and the time delay from injection of contrast, among others.

Through strategic acquisitions, Ochsner Health acquired hundreds of unique but overlapping protocols. To prevent “protocol creep”, which occurs when an organized “playbook” of protocols does not exist and individual radiologists and technologists alter protocols at will and on a case-by-case basis, Ochsner established a Protocol Governance Committee.

Ochsner Health recognized the need to create a more efficient and uniform environment across their enterprise:

- To ensure that each patient received a comparable level of quality care
- To simplify patient preparation and scan execution for the CT technologists
- To achieve uniformity in CT data sets making comparisons more accurate
- To address regulatory compliance issues uniformly across all sites
- To realize some cost savings from this effort

Ochsner partnered with GE Healthcare and the University of Wisconsin, Madison, (UW) to help standardize their CT imaging by implementing the comprehensive protocols developed, validated, and optimized by UW for currently marketed GE CT scanners. Transitioning to the UW protocols involves more than simply re-programming the CT scanner settings. The team at UW has augmented the scanner-based parameters with technologist instructions covering everything to do with the scanning experience. This includes details such as patient positioning, centering, coaching, IV needle size, and flow rate guidance. In addition, the UW team created a “[quick protocolling guide](#)” which matches clinical indications to specific UW protocols. Reducing the need to rely on radiologists or technologists to know what scanner protocol should be used for a given clinical indication alleviates much of the protocolling burden on sites.

The Results of Implementing a Standardized Solution

After a lengthy pilot trial, Ochsner proceeded with the installation of the UW protocols across all the GE CT scanners in their enterprise. The extensive implementation required collaboration among UW, GE Healthcare and Ochsner’s Radiologists and Technologists.

Following implementation, Ochsner and GE Healthcare held regular meetings to check progress and ensure any concerns or issues were raised and resolved. Several months after the conversion, UW and GE Healthcare met with the radiologists, physicists, and technologists at Ochsner to evaluate the impressive results:

Dr. Jerome Jones, senior Ochsner medical physicist, said, “We accomplished something we could never do in 15 years of trying,” speaking about the level of standardization now present across the enterprise. Additional feedback included the consistency of image quality.

Ochsner radiologists expressed positive feedback regarding the new UW/GE protocols:

- All radiologists surveyed were very confident in arriving at a correct diagnosis using the new protocols
- 100% were “satisfied” or “very satisfied” with the protocols
- 100% supported the transition
- 67% felt their workflow had improved

Technologists’ satisfaction was also evident in the survey results:

- 97% were satisfied or very satisfied with the new protocols
- 84% said they now had a better workflow

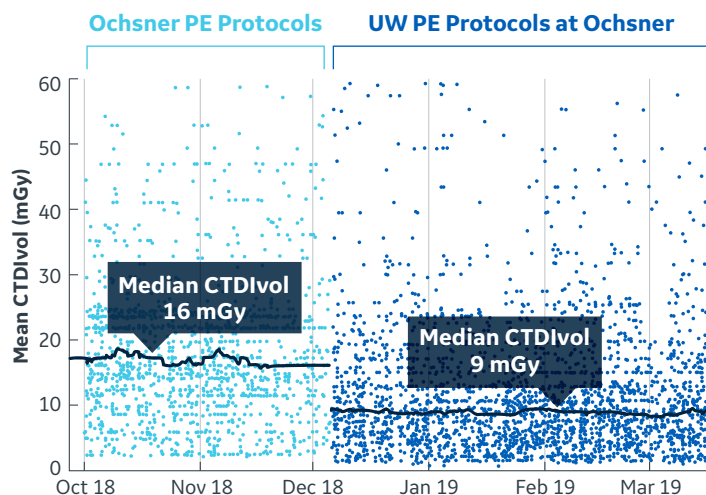


Figure 1. This figure shows the CTDIvol (a measure of patient radiation dose) for patients receiving a CT exam for rule out pulmonary embolism before and after the implementation of the UW CTPA protocol at Ochsner. The UW protocol allowed for a reduction of 1.8 times in patient dose. Note, the large variation in patient dose before and after the UW trial accounts for the wide range of doses needed to scan all body sizes from adolescents to bariatric adults.

All of the technologists surveyed supported the transition, offering such perspective as:

- “My radiologists tell me they trust what I am sending them”
- “Makes protocolling exams easier”
- “Faster workflow”
- “Patients from any area can be scanned at any site with the same imaging outcome”
- “Now I have uniformity, and I am much happier”

Dose data gathered pre and post conversion illustrates some of the positive impacts Ochsner has seen:

- 44% reduction in dose for pulmonary embolism studies
 - *Deep dive:* Dose data was analyzed for patients receiving a CT Pulmonary Arteriogram (CTPA) scan to rule out pulmonary embolism. *Figure 1* reveals that the dose decreased by a factor of 1.8 after the switch. CTPA exams are inherently high contrast, with the contrast filled pulmonary vasculature against the background of air-filled lungs. This allows for lower doses to be used with no sacrifice in diagnostic accuracy.
- 50% reduction in dose for routine abdomen/pelvis exams
- 78% decrease in unneeded series for abdomen/pelvis exams
 - *Deep dive:* Prior to the Ochsner UW protocol implementation, routine abdominal imaging was being performed using a scanner protocol that included multiple scan phases. Use of more than one phase for routine abdominal imaging is not indicated and against guidance provided by societies like the ACR [Guite, ACR]. Use of multiple phases, however, does ensure a site always gets enough information from a study for those rare cases that truly require multiphase imaging. Use of multi-phase imaging can significantly increase the patient dose. As a result, sites should strive to protocol only as many phases as are clinically indicated. Since the UW protocolling implementation, multi-phase scans have dropped by 78%. *Figure 2* makes it clear how before the UW protocols, Ochsner was using on average two or more scan phases for the majority of their routine abdominal studies.

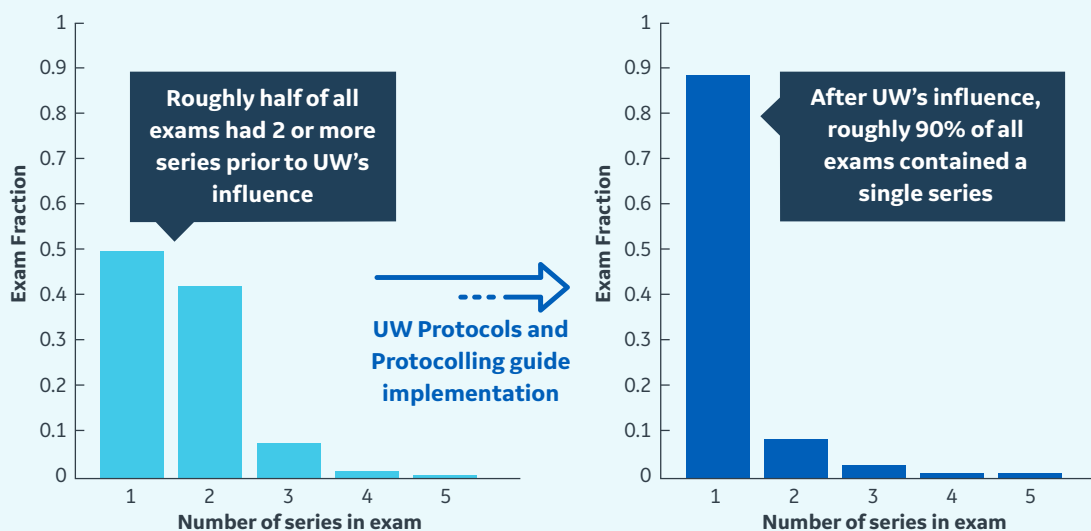


Figure 2. This figure shows the number of scan phases for patients receiving a CT exam for a routine abdominal-pelvis indication. Prior to the implementation of UW CT protocols and the UW protocolling guide, roughly half of all studies at Ochsner contained 2 or more scan phases. With UW influence, this was reduced to only 10% of the scan volume.

The patient experience improved:

- Patients were spending less time on the table after a reduction in unneeded series
- Average patient time in the radiology department was decreased:
 - *Deep dive:* The original Ochsner protocols required almost all patients scheduled for a routine CT abdomen/pelvis examination to be prepped with oral contrast. Most patients were instructed to drink for a period of two hours prior to the scan. This “blanket” policy was intended to ensure that any patient who might benefit from bowel opacification would have oral contrast present throughout their small and large intestines during the scan. While not all indications require contrast enhancement, a system of selective enhancement, allowing some patients to be scanned with no or minimal bowel contrast, would either have required development and implementation of a very robust protocol set or would require pre-scan radiologist input with specific instructions provided to the CT

technologists and schedulers for every patient. Prior to the introduction of the UW CT protocols, such guidance did not exist for the Ochsner technologists. After conversion to the UW protocols, Ochsner patients were triaged by indication into three different groups: those requiring no oral prep; those requiring a smaller volume of positive contrast and therefore, shorter drinking times; and a few requiring a longer prep and a larger volume of oral contrast. These oral prep guidelines are clearly detailed in each specific clinical scan protocol. Ochsner saved money on oral contrast material as the volume administered decreased. More importantly, patient wait times were markedly reduced for many patients from 2 hours to one hour, and in many cases, to only a few minutes.

The Lead CT Radiologist experience:

- According to Dr. Hajjar, the Ochsner radiologist who motivated the standardization effort, “My life has been greatly simplified since this conversion.”

Summary Statement:

The conversion to the UW CT protocols at Ochsner Health positively impacted care on many levels, including improved patient care, increased efficiency, cost savings, increased patient satisfaction, and faster patient throughput. Off-loading the burden of protocol development/standardization greatly simplified life for the Ochsner CT leadership. These protocols are available at no additional charge on newly purchased GE CT scanners, immediately maximizing the clinical utility of new CT scanners and reducing the need to transfer existing protocols to a new platform. We encourage you to join Ochsner in realizing the patient care and workflow benefits of protocol standardization.

Results listed here are of this specific customer and may not be typical. Results are based on factors specific to each customer. GE Healthcare cannot guarantee these or similar results.

References

Guite, K. M., Hinshaw, J. L., Ranallo, F. N., Lindstrom, M. J., & Lee Jr, F. T. (2011). Ionizing radiation in abdominal CT: unindicated multiphase scans are an important source of medically unnecessary exposure. *Journal of the American College of Radiology*, 8(11), 756-761.

<https://www.acr.org/-/media/ACR/Files/Practice-Parameters/ct-abd-pel.pdf>
accessed 8/4/2021

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