UW CT Protocols: An Implementation Guide for Health Care Providers

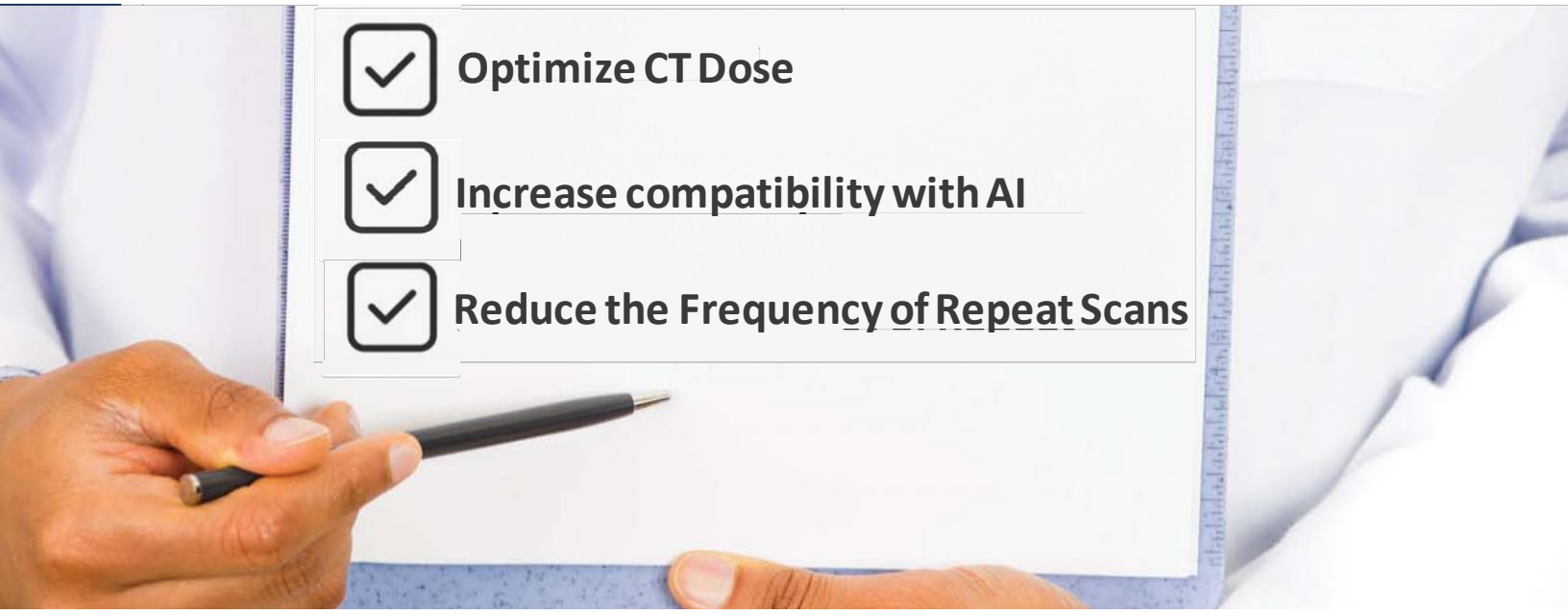
Purpose of the Implementation Guide: This *site implementation guide* has been designed to help radiology departments who are considering converting to UW-developed CT protocols on their GE Scanners plan for a successful implementation process.

Development of the Implementation Guide: The University of Wisconsin Institute for Clinical and Translational Research Dissemination and Implementation Program worked closely with UW Radiology to prepare this site implementation guide for you anticipated conversion to the UW CT protocols. We found that the train-the-trainer model and implementation process was most successful and hope you will consider it in your CT conversion processes.

Intended use of the Guide: Ideally, this guide would have been part of your initial sales packet presented to sites considering and/or in the initial planning stages for converting to the UW protocols. But it can be referenced at any time during the process.

The UW CT Protocols

An implementation guide for health care providers



UW Institute for Clinical and Translations Research (ICTR) -University of Wisconsin School of Medicine and Public Health

University of Wisconsin CT Protocol Implementation Guidelines

Developed by the
UW Institute for Clinical and Translational Research and
the Department of Radiology at the
School of Medicine and Public Health

with additional support and technical guidance from GE Healthcare

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This guide was developed from evidence-based implementation practices, is a work-in-progress, and contains suggestions intended to assist sites in implementation activities. The Board of Regents of the University of Wisconsin System does not warrant that all implementation practices will be appropriate for every site. Sites remain responsible for managing their implementation activities.

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DEPARTMENT OF Radiology
UNIVERSITY OF WISCONSIN
SCHOOL OF MEDICINE AND PUBLIC HEALTH

Dissemination & Implementation Launchpad
INSTITUTE FOR CLINICAL & TRANSLATIONAL RESEARCH
UNIVERSITY OF WISCONSIN-MADISON

CONTENTS

OVERVIEW

Ready for CT Protocol Conversion?

There are many factors to consider determining whether your organization is ready for the challenge of CT protocol conversion. Some factors are related to having the right equipment and software and others are related to your organization. Assess your organizational readiness by reflecting on the questions below as you look through this guide.

- Are all of your staff and radiologists committed to converting to a single universal set of protocols?
- How willing is your organization's management to provide the resources to support your conversion?
- How ready are your staff to undergo change at this point in time? Do they have a positive attitude and working relationships that can support an organizational change process?
- How ready is the overall workplace environment for change in terms of workflow, number of staff, or other activities that will compete for time and attention?
- How ready is your organization to commit staff time and expertise to conduct the various tasks necessary to implement and sustain protocol conversion?

Refer to the other sections of this guide to better understand the activities needed for a successful implementation of new CT protocols.

Ready for Success

Hospital A pulled together a team of technologists, radiologists, and their medical physicist to help decide which scanner to buy. The team initially struggled to find consensus on the purchase, but after much exploration, they selected a GE scanner. They intended to use the new, standardized UW CT protocols across the multiple sites where their radiologist read studies. The team worked together to teach their technologists about the new GE scanner and the standardized CT protocols. The team made sure the training schedule included time for GE to train several "superusers". These "superusers" were able to train their peers on the new technology. It was not easy, there was a steep learning curve for the technologists, but in the first 2 months they completed enough training to ensure the new protocols were sustained. The results made it worth all the effort!

Background

Need: Since 2007, there have been several initiatives aimed at Computerized Tomography (CT) dose reduction, yet dose reduction efforts stumble because many centers do not have the expertise or the time to adapt and customize protocols for their scanner platforms. Efforts at protocol development performed by well-intentioned but marginally qualified individuals can result in varied image quality as well as differing radiation doses to patients, some of which may exceed the American Association of Physicists in Medicine standards.[1]

Solution: The University of Wisconsin Madison (UW -Medical Physics and Radiology Departments) entered into unique collaboration with GE Healthcare aimed at reducing CT dose, while optimizing CT image quality, and decreasing the frequency of repeat scans. The result of this work is a comprehensive set of dose-optimized, weight adjusted, and clinically validated protocols fine-tuned to individual scanner platforms. The protocols cover nearly all clinical applications for CT, with most applications split into three sizes for adults and five sizes for pediatrics; in total more than 160 protocols. Currently, the protocols are supplied on a disc with a robust manual. Additional support material is available online at uwgect.wiscweb.wisc.edu

Why UW CT Protocols?

Standardization of Care: Some patients are scanned as often as every 3-4 months. These patients are often scanned at different imaging centers or on different equipment using different CT protocols. The differences in images that result from various techniques can make it difficult for radiologists to assess whether they are seeing real change versus differences in scan technique. Standardized protocols make comparisons more consistent and elevate the level of confidence in interpretation.

Human resources: Consistent protocols across sites of the medical enterprises would support the sharing of technologists among sites without having to retrain them in different scan techniques.

Timely Adoption of New Industry Standards: Recent Joint Commission standards state that CT protocols must be maintained/updated annually as medical knowledge advances. The protocols were rigorously tested at UW before being made available to GE customers using stringent ISO-9001 processes and procedures. The quality of this testing meets the American Association of Physicists in Medicine (AAPM) Medical Physics Practice Guidelines. Subsequently, the working relationship between UW, who will annually update the protocols as new standards are set, and GE, an industry partner who will help organizations implement the updates, provides a mechanism for timely adoption of new CT radiology protocols and the fulfillment of the Joint Commission Standards.

Greater Success and Compatibility with AI Tools: Although AI tools show tremendous promise in medical imaging, they fail to perform as well in the real world compared to *in silico*. The variability that currently exists in CT scanning protocols dramatically increases the work needed to implement and deploy AI in the clinical environment. Once deployed, lack of adherence to "expected" protocols naturally degrades AI performance. Robust protocol uniformity will help these new tools to perform as advertised and more rapidly reach their potential in providing meaningful clinical value. The UW CT protocols have already shown greater AI success rates and easier implementation.

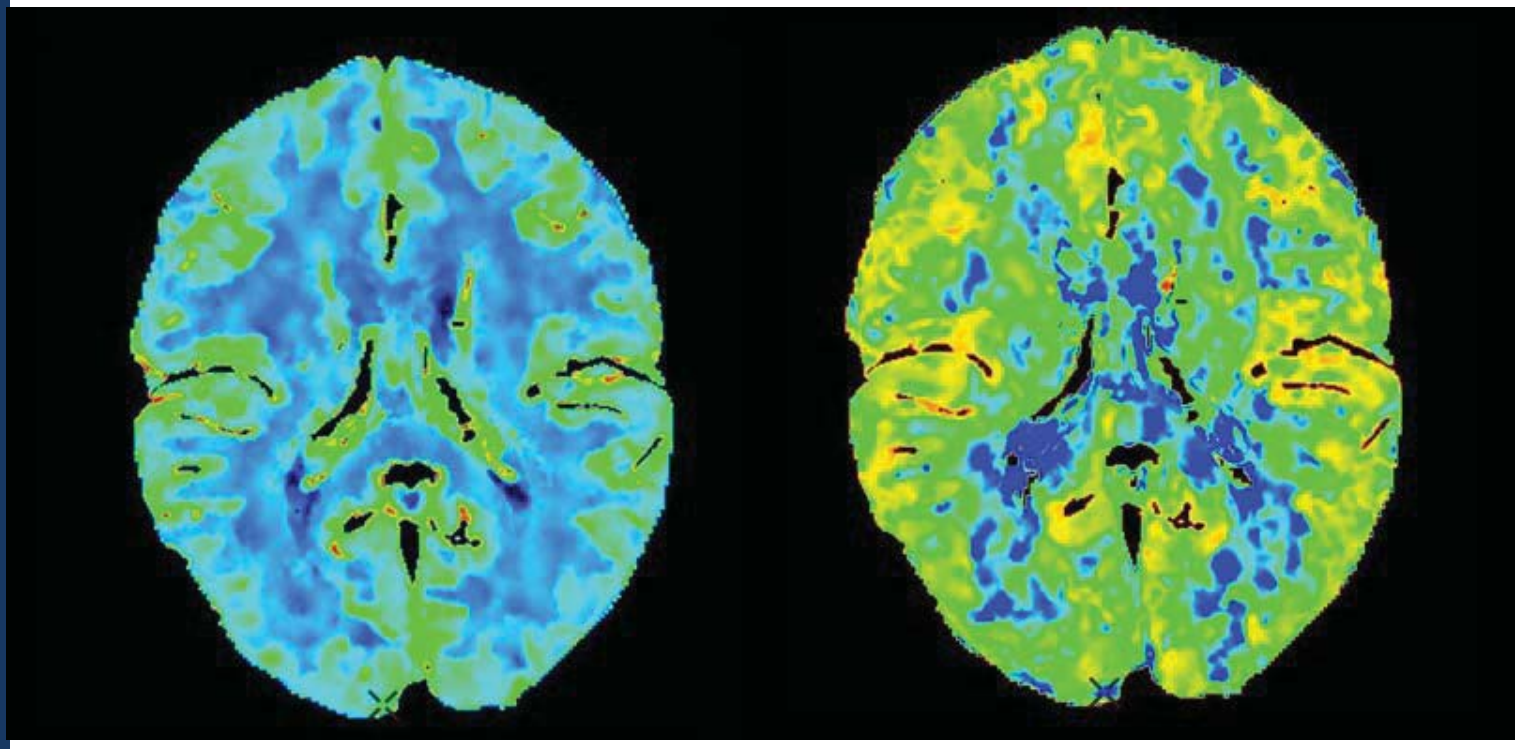
Protocols are Customized for each GE Scanner: Protocols are customized for each GE Scan Platform. There are many organizations and societies that offer access to dose optimized protocols. They are rarely, however, optimized to your particular scanner. Factors we considered in fine-tuning the protocols include: tube heat capacity, generator power, rotation time, detector efficiency and array, and recon algorithms. Working with GE has allowed the UW to customize protocols for your particular GE scanner.

Training and Implementation Processes: Despite a growing awareness for optimizing CT dose, and the installation of the protocols on the scanners, there are barriers to implementing dose-optimized protocols in practice settings. This guide outlines processes that have led to successful implementation at other sites. You may need to allocate time and internal resources to adapt to the new protocols during the implementation process. We have included a checklist and other resources that will help you navigate the implementation process.

Return on Investment

Significant cost savings for the end-users/organizations: UW scanner protocols are now included at no extra charge with new scanners and available to current users of GE CT scanner systems. Using these protocols removes the need for individual protocol creation. They also offer significant cost savings to end-users/organizations. A study presented at the annual meeting of the Radiology Society of North America demonstrated that an estimated annual cost of reviewing and optimizing 30 protocols can exceed $150,000.[2] Dr. Tim Szczykutowicz, a UW Physicist, says that to date, UW has spent well over $2 million over the course of their 7-year CT protocol optimization project.

Enterprises may decide to standardize protocols to increase organizational efficiency and lower radiation exposure to their patients while maintaining diagnostic image quality. An effective CT protocol program should provide savings in both direct costs and indirect costs. Direct costs vary, depending on the staff involved and number of protocols that are optimized. One study reported an estimated cost of $12,488 for a single routine head protocol that involved 57 person hours. [1] The UW Radiology team estimates their annual optimizing costs to be around $200,000.[2] The costs of not regularly optimizing CT protocols are simply too complex to quantify.[3]



1. Siegelman JR, Gress DA. Radiology stewardship and quality improvement: the process and costs of implementing a CT radiation dose optimization committee in a medium-sized community hospital system. Journal of the American College of Radiology. 2013;10(6):416–422.

2. Szczykutowicz TP, Bour RK, Pozniak M, Ranallo FN. Compliance with AAPM Practice Guideline 1. a: CT Protocol Management and Review—from the perspective of a university hospital. Journal of Applied Clinical Medical Physics. March 2015. 16(2): 443-457.

3. Szczykutowicz TP, Pozniak M. A team approach for CT protocol optimization. Radiology Management. 2016; Nov/Dec; 19-22.

KEY CONSIDERATIONS

- Create a site implementation team of CT Protocol Implementation champions (**plural**). It is important to include the lead CT technologist, CT radiologist, medical physicist and other important team members in the implementation planning and roll-out to ensure everyone is on the same page.

- Let staff know what to expect ahead of time so they can mentally and logistically prepare for changes.

- Engage staff in preparations for implementation so they have input in the process.

- Pick appropriate implementation roles based on staff member characteristics and ability/availability to fill the role. For example, a *Superuser* might be your main radiologist contact, a technologist who can change shifts to accommodate training needs, etc.

- Make sure your training schedule allows all technologists to get adequate training from the onsite GE Application Specialist or one of your *Superusers*.

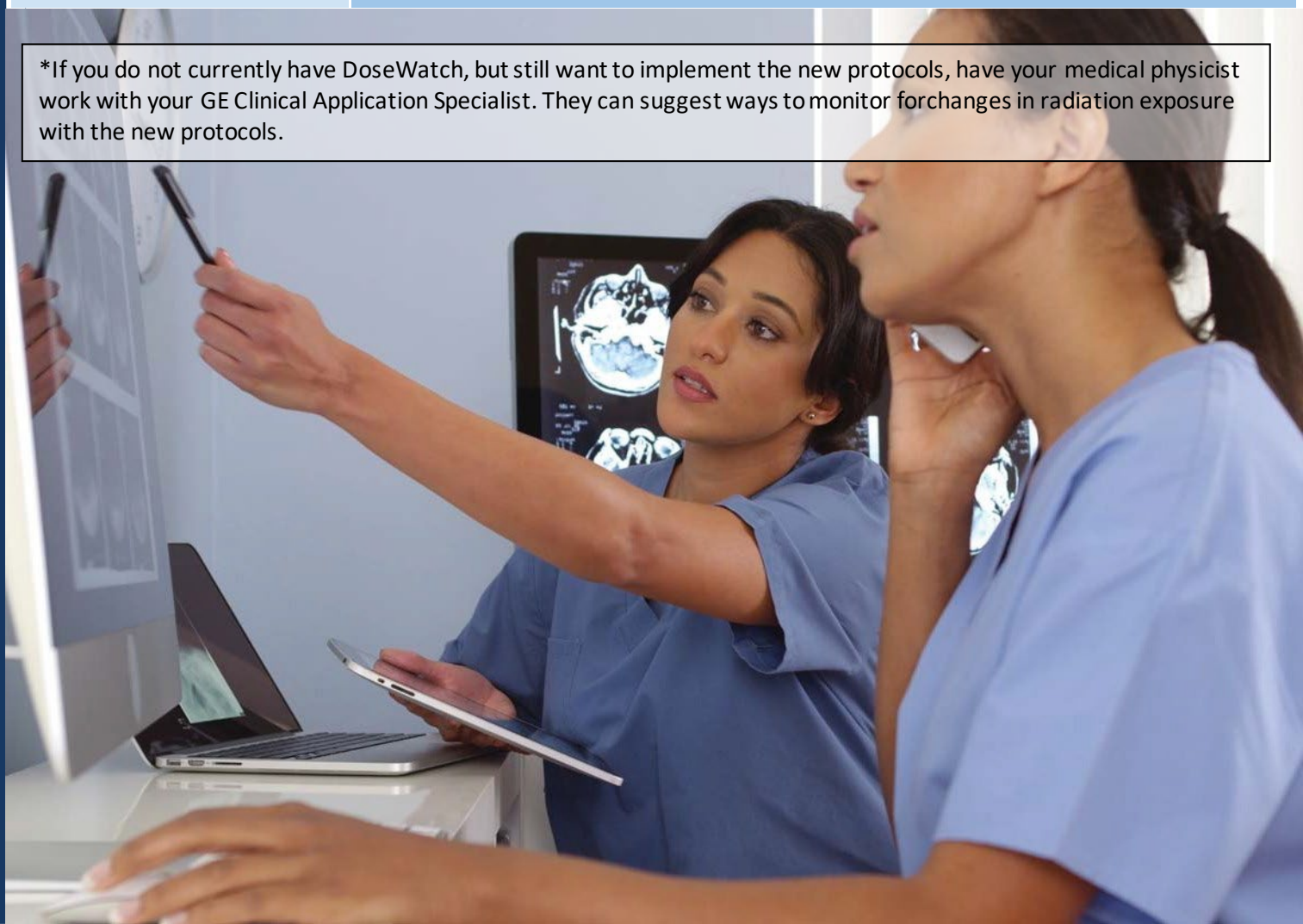
Finding A Champion and Being Prepared

Hospital A's Medical Physicist understood and accepted the science behind the UW CT protocols. He helped explain the science to the CT technologists before their onsite training with GE. He also explained the differences between the new and old protocols, which helped staff prepare for their training. A little preparation went a long way to help technologists accept the new procedures.

EQUIPMENT AND TECHNOLOGY NEEDS

Equipment	Reason
GE Scanner with the new UW CT protocols installed.	The new protocols are delivered with the scanner to eliminate any extra programming time for your staff.
A dose monitoring system such as the GE DoseWatch program installed on the GE Scanner.	A dose monitoring system allows health care professionals to monitor radiation exposure and IV contrast dose for their patients. The dose monitoring system will be used to assess changes in radiation exposure with the implementation of the new protocols. In addition, it can be used to monitor and document compliance with the protocols for regulatory authorities. *
Dose Check	The NEMA XR-25 standard requires operator notification of potential excess dose before a scan is started. GE Healthcare CT scanners are compliant via a feature named “Dose Check”. This feature allows the set-up of scanner output warnings at the scan series level on a protocol-by-protocol basis. UW provides a Dose Check Manual on our website https://uwgect.wiscweb.wisc.edu/ to assist with set-up of Dose check values.

*If you do not currently have DoseWatch, but still want to implement the new protocols, have your medical physicist work with your GE Clinical Application Specialist. They can suggest ways to monitor forchanges in radiation exposure with the new protocols.



IMPLEMENTATION PROCESS TIMELINE

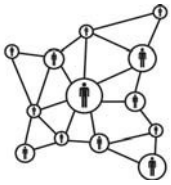
To ensure successful implementations of the UW CT protocols, we have identified several research-based key components. Work with your GE representative to incorporate these components as you design your implementation process, being thoughtful to include planning meetings, preliminary educational sessions, onsite training, follow-up training, and ongoing quality improvement/evaluation (surveys, dose monitoring checks, follow-up protocol refreshers, and celebratory milestone events). Make sure you build time in the schedule to collect and disseminate information about the change process to your staff. Plan for the following activities and any additional items as necessary on your timeline.

4 Components for Success

1. Establish your purpose

2. Get buy-in from staff

3. Document your dose baseline



4. Build your system capacity to support implementation

Pre-Implementation Period		
TIMELINE	**What GE Will Do**	**What the Site Needs to Do**
8-10 Weeks Prior to new CT Protocol Installation	• Take part in preliminary remote or onsite informational meetings with the site-specific implementation team. • Complete a pre-implementation technical consultation with the site's medical physicist to establish/affirm adequate baseline and post implementation dose monitoring data (install DoseWatch, if desired). • Actively provide the sites with the link to download the UW site implementation guide. • Guide the site towards holding pre-implementation information sessions with protocol experts.	• Create a site-specific implementation team (e.g. lead CT technologist, CT Radiologist, and medical physicist at minimum). • Plan the local implementation processes/strategies (i.e. who will get trained by GE; how will you train your staff and shift workers; how will you monitor the process?). See the Resources section for tools and strategies. • Meet with the GE coordinator to align the onsite training with your plan. • Get staff (radiologists, medical physicist, technologists?) buy-in by informing your staff about the purpose of the new GE protocols and the science behind it. See www.radiology.wisc.edu/protocols/CT/ for resources.

Train-the-Trainer Implementation Process – Putting New Practices In Place		
TIMELINE	**What GE Will Do**	**What the Site Needs to Do**
Start of New Protocols		
At Least ONE MONTH Prior to Onsite Training	• Confirm implementation schedule and expectations with site. • Verify the appointed GE Clinical Application Specialist(s) for the site is adequately trained on the protocols.	• Ensure that training schedules and systems are set at your site (i.e. technologists, radiologists, and medical physicists know if their schedules will have temporary changes to accommodate training needs.)* • Identify and confirm onsite training schedule and expectations with GE.
	• Help the site coordinator prepare for the onsite training needs of the Superusers.	• Ensure all technologists and radiologists complete reading/video/virtual training. • Ensure all staff know who to contact for technical questions. • Identify and communicate training and implementation expectations with staff and address any concerns. • Oversee any onsite quality assurance activities are ready for the training and implementation process. (e.g. document throughput times, data monitoring systems, get the technologists' QA checklists ready, etc.)
Start of First Onsite Training		
WEEK ONE Of First Onsite Training	• A GE Clinical Application Specialist delivers 4 days of onsite training to staff. • Document the training delivered (e.g. time, protocols reviewed, staff involved, etc.) and any immediate follow-up training needs. • GE Clinical Application Specialist contacts UW Radiology about any technical issues or protocol feedback.	• Ensure that all appropriate staff attend on-site UW CT protocol training with a GE Clinical Applications Specialist. • Lead CT technologist determines the follow-up training needs with the GE Clinical Application Specialist. • Oversee any quality assurance activities related to the training and implementation of the new protocols such as technologist training checklists.
Start of Second Onsite Training *(as determined by GE and the site)*		
FOLLOW-UP Onsite Training	• GE Clinical Application Specialist/online support provides continued technical assistance via phone/internet. • GE Clinical Application Specialist documents follow-up training needs from the site's technologists prior to visiting. • GE Clinical Application Specialist contacts UW Radiology about any technical issues or protocol feedback.	• Site staff contact the GE Clinical Application Specialist/on-call support with any technical questions about the protocols. • Lead CT technologist announce upcoming GE onsite follow-up training schedule to staff and ensures that appropriate staff attend the onsite training with the GE Clinical Applications Specialist. • Oversee any quality assurance activities related to the training and implementation of the new protocols.
Start of Third Onsite Training *(if days are purchased)*		
Suggested TWO DAYS or MORE ONSITE (*~4 Weeks after First Onsite training*)	• GE Clinical Application specialist provides an onsite follow-up training. • Document the training delivered (e.g. time, protocols reviewed, staff involved, etc.) • Provide continued technical assistance via phone/internet.	• Oversee any quality assurance activities related to the training and implementation of the new protocols. • Ensure that all staff's questions are answered by the GE applications specialist or another expert • Site staff contact the GE Clinical Application Specialist/on-call support with any technical questions about the protocols.

Final Implementation Steps – Working Towards Fidelity and Sustainable Outcomes		
TIMELINE	**What Ge Will Do**	**What the Site Needs to Do**
Following Completion of Implementation: 3-4 Months Total	Check-in to see if any additional training is needed.	• Conduct quality assurance (QA) activities to highlight successes, challenges, and solutions for working with the new protocols (e.g. technologist QA checklist, radiologist image quality feedback, and dose monitoring data). • Share QA activity results with staff and make any changes to improve implementation. • Send feedback about the protocols or training needs to your GE Clinical Applications Specialist.

Learning Opportunity

Hospital B's head radiologist had heard about the new UW CT protocols. She was interested in the opportunity to reduce radiation dose for her patients. The hospital already had a GE scanner and decided to "test" the new protocols before committing to them. The lead CT technologist attended the implementation planning meetings, but did not set up a training schedule for the technologists to train with the GE Application Specialist or one of the technologists he had trained. Also, some technologists considered training their peers on the new protocol as extra work, outside the scope of their jobs. No transfer of learning occurred at the site and the technologists found it too difficult to learn from the protocol documents alone. The technologists became frustrated implementing the new protocols. After struggling with the transition for 2 months, the site returned to their old protocols. A site review also found that Hospital B was in the midst of other organizational changes, which made it difficult for them to plan and implement for the new CT protocols. This site was not ready for implementation and the implementation design failed to match their staff workflow. As a result, the implementation was unsuccessful.

SETTING EXPECTATIONS

Staff engagement plays a key role in successfully implementing the new UW CT protocols. Informed staff are more likely to have a positive attitude during change. It is important to tell staff what will be expected of them during the implementation period and to share processes that are set in place to help them during the transition period. The following expectations will help ensure implementation success.

Expectations for Internal Staff

Technologist

- Complete video training and attend/listen to appropriate informational meetings
- Train with either the onsite GE Clinical Applications Specialist or GE trained onsite technologists
- Provide feedback about their support/learning needs
- Adhere to the protocols unless otherwise indicated
- Use the UW CT Protocol website for FAQ's

Radiologist

- Spend an appropriate amount of time training with the onsite GE Clinical Application Specialist during the first week of implementation
- Work with technologists to adhere to the protocols as much as possible
- Complete video training and attend/listen to appropriate informational meetings
- Complete any quality assessments and provide feedback about CT study quality to support ongoing training

Physicist

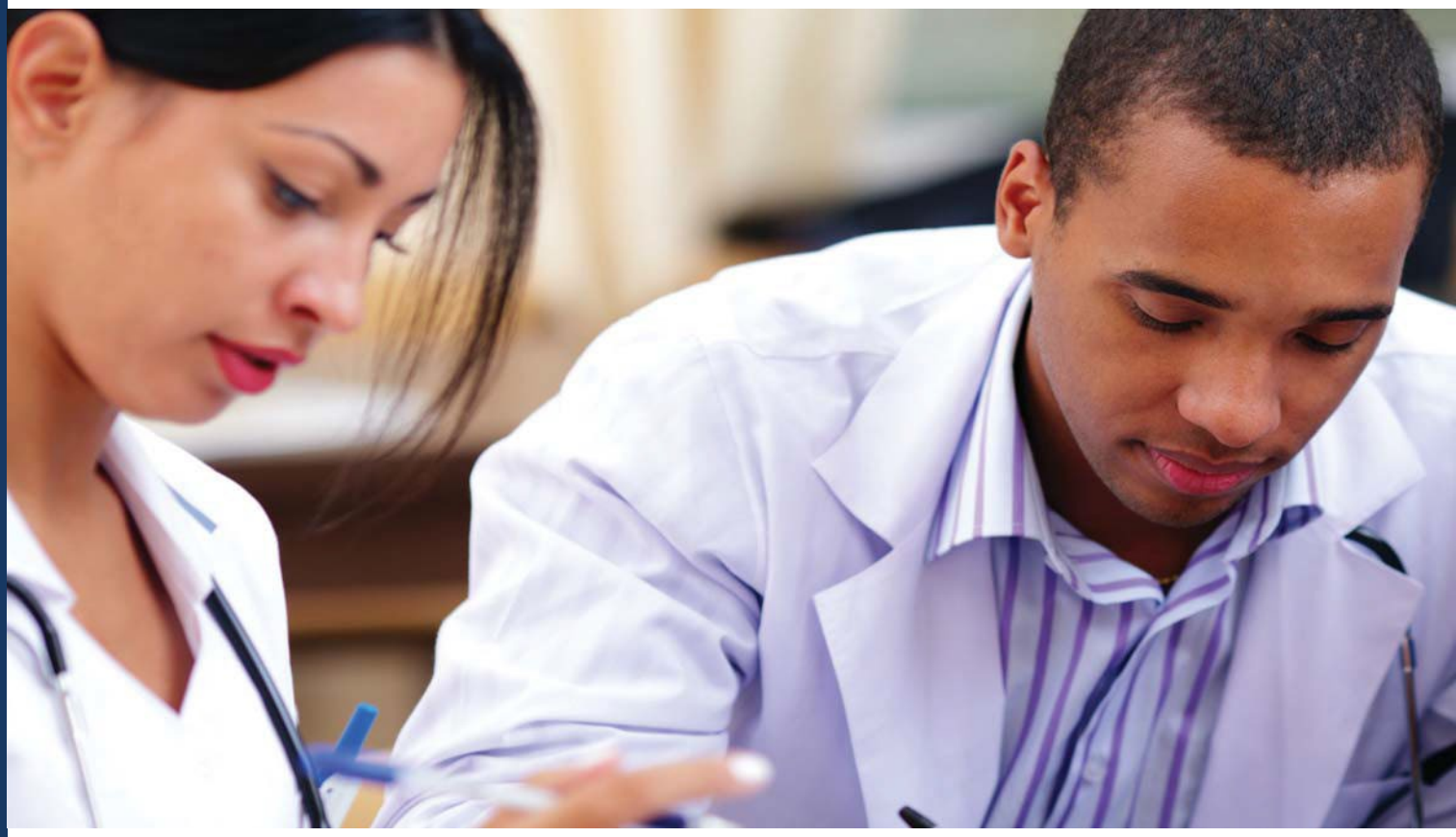
- Analyze dose monitoring data for protocol adherence and compare to baseline radiation dosages when possible
- Teach staff about the science behind the new UW CT Protocols

SETTING EXPECTATIONS

Expectations for Leaders and Champions

Identify a technologist, radiologist, and physicist to assume a leadership/champion position during the change process. Team leaders/champions will need the **skills and time** to:

- Document questions, barriers, and areas of resistance to report to the internal and external teams.
- Participate in quality improvement activities. This may include identifying methods for information transfer, such as implementation briefs, training quality assurance checklists (see resources), adherence and monitoring measures, web-based meetings, on site meetings, etc.
- Ensure participants are well informed about the implementation project and processes (i.e. they know the design philosophy and value of the UW/GE protocols; the implementation training schedule and processes; preliminary and final outcomes of the implementation process; and how to troubleshoot with GE on-call support).
- Convey and maintain a positive attitude about the implementation process, despite challenges that arise.
- Attend all implementation meetings and regularly check in with staff about implementation progress.
- Encourage staff to take steps to overcome learning hurdles (i.e. call support, use the manual/Wiki, UW website, etc.).
- Serve as a liaison between the organization and external personnel, including those at GE and University of Wisconsin scientists.
- Celebrate important milestones during the implementation process.



RESOURCES

Evidence Base for UW/GE CT Protocols

Szczykutowicz TP, Bour RK, Rubert N,Wendt G, Pozniak M, Ranallo FN. CT protocol management: simplifying the process by using a master protocol concept. *Journal of Applied Clinical Medical Physics.* July 2015; 16(4): 228-243. DOI: 10.1120/jacmp.v16i4.5412external_link

Szczykutowicz TP, Bour R, Pozniak M, Ranallo F. Compliance with AAPM Practice guideline 1.a: "CT Protocol Management and Review" from the perspective of a University Hospital. external link *Journal of Applied Clinical Medical Physics. 2015; 16:2.*

Administrators

TJC Compliance: See ACR/TJC section on our General resources page.
https://uwgect.wiscweb.wisc.edu/general-resources/

Technologists

Szczykutowicz TP, Rubert N, Belden D, Ciano A, Duplissis A, Hermanns A, Monette S, Saldivar EJ. A wiki based solution to managing your institutions imaging protocols. *Journal of the American College of Radiology*. July 2016; 13(7): 822-824.

Szczykutowicz TP, Rubert N, Belden D, Ciano A, Duplissis A, Hermanns A, Monette S, Saldivar EJ. A wiki based CT protocol management system. *Radiology Management*. 2015; 37(6): 25-9.

Radiologists

https://uwgect.wiscweb.wisc.edu/wp-content/uploads/sites/1268/2019/11/DesignPhilosphy.pdf

Medical Physicists

Szczykutowicz TP, Bour RK, Rubert N,Wendt G, Pozniak M, Ranallo FN. CT protocol management: simplifying the process by using a master protocol concept. *Journal of Applied Clinical Medical Physics.* July 2015; 16(4): 228-243. DOI: 10.1120/jacmp.v16i4.5412external_link

RESOURCES

UW CT Protocol Informational Videos
https://uwgect.wiscweb.wisc.edu/videos/

General Information and Resources
https://uwgect.wiscweb.wisc.edu/general-resources/

Workflow
https://uwgect.wiscweb.wisc.edu/an-efficient-workflow/

Publications and Presentations
https://uwgect.wiscweb.wisc.edu/publications-and-presentations/

GE Training in Partnership Clinical Applications Training
GE's Training in Partnership (TiP) Clinical Applications Training programs deliver a blended learning approach that combines online and face-to-face training, innovative technology, and ongoing support. The curriculum caters to varying facility circumstances and needs. As you prepare to implement the UW CT protocols, please include your GE Clinical Applications Specialist in your training discussions and planning.

Dose Monitoring We provide dose statistics in the form of CTDIvol, DLP, SSDE, and total exam DLP for the 25th/50th/75th mean percentiles of data collected at UW Madison Hospital and Clinics and our community hospital affiliates. These data can be used to assess how your implementation of the UW CT protocols compare to the doses we see at UW. We also provide notification values for each series of every protocol. These values are set to be indication and size appropriate. The implementation and rationale for our notification and alert values are explained in detail in the Dose Check manual: uwgect.wiscweb.wisc.edu/wp-content/uploads/sites/1268/2019/11/UW_dose_check_manual.pdf

Technologist Training Progress Check List (see pages 17-22): This tool was created to help the lead technologist monitor and assess the areas where the technologists have been sufficiently trained or need more training as they convert to new CT protocols or train new technologists.

Radiologist Image Quality Check (see page 23): This tool was created to conduct a brief check on image quality with the new CT protocols. It can be used to gather radiologist-informed feedback/data shortly after the GE Clinical Applications Specialist engages in on-site and/or several weeks after initial training to monitor and assess the quality of the studies and help determine if more training is needed to improve quality.

UW/GE CT Protocol Training Progress Checklist

1= Good to Go, 2 = Need Practice, 3 = Need More Training

Technologist Name: _____

BODY	Comments	Oral Contrast	IV Contrast Parameters	Correctly Setting Protocol	Reformatting
Routine A/P w/IVC					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
Flank Pain					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
Urography					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
Biphasic					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
Triphasic					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3

General Notes:

UW/GE CT Protocol Training Progress Checklist

1= Good to Go, 2 = Need Practice, 3 = Need More Training

Technologist Name: _____

CARDIO	Comments	Oral Contrast	IV Contrast Parameters	Correctly Setting Protocol	Reformatting
Non gated C/A/P					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
Gated Chest					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
Lower Extremity CTA					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2	1 2 3	1 2 3	1 2 3
TAVI					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
Coronary					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
General Notes:					

UW/GE CT Protocol Training Progress Checklist

1= Good to Go, 2 = Need Practice, 3 = Need More Training

Technologist Name: _____

MSK	Comments	Oral Contrast	IV Contrast Parameters	Correctly Setting Protocol	Reformatting
Knee					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
Wrist					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
Elbow					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
Bony Pelvis					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3

General Notes:

UW/GE CT Protocol Training Progress Checklist

1= Good to Go, 2 = Need Practice, 3 = Need More Training

Technologist Name: _____

CHEST	Comments	Oral Contrast	IV Contrast Parameters	Correctly Setting Protocol	Reformatting
Routine Chest w/o IVC					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
Routine Chest w/IVC					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
PE Chest					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3

General Notes:

UW/GE CT Protocol Training Progress Checklist

1= Good to Go, 2 = Need Practice, 3 = Need More Training

Technologist Name: _____

NEURO	Comments	Oral Contrast	IV Contrast Parameters	Correctly Setting Protocol	Reformatting
Head w/o IVC					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
Sinus w/o					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
T-bone w/o					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
Neck w/ivc					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
C-spine					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
T-spine					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3
L-spine					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3

UW/GE CT Protocol Training Progress Checklist

1= Good to Go, 2 = Need Practice, 3 = Need More Training

Technologist Name: _____

NEURO	Comments	Oral Contrast	IV Contrast Parameters	Correctly Setting Protocol	Reformatting
CTA Head/Neck/perfusion					
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3

General Notes:

PEDIATRIC CASES	Comments	Oral Contrast	IV Contrast Parameters	Correctly Setting Protocol	Reformatting
Date 1:		1 2 3	1 2 3	1 2 3	1 2 3
Date 2:		1 2 3	1 2 3	1 2 3	1 2 3
Date 3:		1 2 3	1 2 3	1 2 3	1 2 3

General Notes:

DAILY RADIOLOGIST QUALITY CHECK QUESTIONS

The purpose of this form is to do a basic assessment of study quality. This form should be completed by radiologists at the end of each day for 1 week after technicians have been trained.

Radiologist Name:							
	Date 1 / /	Date 2 / /	Date 3 / /	Date 4 / /	Date 5 / /	Date 6 / /	Date 7 / /
FROM THE GE SCANNER							
How many CT studies did you read today?							
How many CT studies had proper contrast enhancement?							
How many CT studies had issues with image quality?							
How confident were in you in arriving at a correct diagnosis? *1=Not at all confident* *2=A little confident* *3=Moderately confident* *4=Very confident*							