

June 7, 2016

To: New Users of University of Wisconsin-Madison CT Protocols

We encourage you to review the UW Madison CT protocol manual that should have been provided with your scanner. This user manual has extensive instructions covering set up of direct multi-planar reformats, smart prep locations, patient positioning, protocol-specific reformat instructions (including pictures), and more. We also included a Frequently-Asked Questions (FAQs) section in the manual. In addition, there are informational videos, a lung cancer screening protocol, a dose check manual (with series-specific dose check values), the FAQs and more on UW Radiology's CT Protocol website <https://www.radiology.wisc.edu/protocols/CT/>.

The list below includes some common issues first-time users of our protocols have expressed. Please review the entire manual, and especially the items on this list, with your CT protocol optimization team as soon as possible.

1. We do not use dynamic transition for our bolus tracking (SmartPrep)—you must manually begin the exam when using SmartPrep. We find that uncontrollable breath-hold and Valsalva variation occasionally cause sub-optimal opacification, thereby limiting the effectiveness of this well-intentioned tool.
2. Our cervical spine doses on current versions of our protocols using a head 16 cm phantom will produce a dose output reading 2.4 higher than with a 32 cm body phantom. This does NOT mean the patient dose was 2.4 times higher. The same dose delivered to the 16 cm phantom is read out as 2.4 times than when using the 32 cm phantom. Change the scan field of view to 'large body' to avoid this problem. The median dose for our cervical spine protocol at the UW is 45 mGy (this value is for a 32 cm phantom which we have derived by dividing the 16 cm CTDIvol value by 2.4).

We are aware this dose is a little on the high side and have addressed it in the next version of the protocols, which are due to be released within the year. This next revision of the protocols comes with a small/medium/large protocol for the cervical spine. The median dose for a cervical spine using this new version is 30.7 mGy (CTDIvol using a 32 cm body phantom) for medium adults. Here are some items to keep in mind when using our cervical spine protocol:

- a. We scan the head and neck region in one series. Some other sites commonly break this up into separate scans of the head and neck. This has the potential to make our DLP look higher than protocols that break up their scan range into two series/groups.

- b. UW Madison's dose is high enough to provide adequate image quality at the critical juncture of the cervical to thoracic vertebrae. This location is prone to streak artifact due to the shoulders. This is why we use a low pitch, 140 kV and a relatively high maximum allowable mA. We want to make sure that if needed, the scanner will have enough output to properly penetrate the shoulders.
 - c. One method for reducing dose on any cervical spine exam is to ensure the patient's shoulders are not hunched up towards their ears. This causes the mA to be higher needlessly through the majority of the cervical spine region and will increase the dose.
 - d. The mA is designed to hit the minimum mA value through the neck (with no shoulders in the scan FOV) and head. This allows the image quality through the neck and head to be determined by the minimum mA setting and the image quality in the shoulder region to be determined by the NI value.
3. Our SmartPrep enhancement thresholds and timing delays are set assuming you follow our scan description instructions. If you deviate from them, the enhancement thresholds and delays are no longer valid and may need to be adjusted. Please carefully read the protocol manual before implementing these protocols at your facility. Our SmartPrep locations may be different than where you have historically placed them.
4. Reformats need to be constructed the first time you get a scanner or change protocols. Please carefully follow the instructions in the CT protocol manual to populate the DMPR settings. UW Madison's protocols are set up to follow a specific DMPR naming convention.

If you have any questions, or would like to have any of the above clarified, please contact you GE applications specialist.

Sincerely,

The CT Protocol Optimization Team