Implementation of CT Protocol Management Software to Detect Deviations From Master Protocols

K. Little[1], J. Jacobs[2], N. Fitousi[2], M. Robins[1], J. Carpenter[1], A. Rupe[1], D. Hintenlang[1]
[1]Ohio State University, Columbus, Ohio
[2]Qaelum NV, Leuven, Belgium

INTRODUCTION

- While CT protocol management is essential for obtaining consistently high-quality images at reasonable radiation doses, managing system protocols across different models and vendors can be time-consuming.[1]
- Master protocols are reviewed and revised regularly by radiologists, technologists, and physicists, often fulfilling regulatory and accreditation requirements.
- With dozens of parameters in each CT protocol, it is difficult to make sure thousands of system parameters match the standardized master protocols across an enterprise.[1-3]
- Previously, comparisons were made manually between each system protocol and our master protocol spreadsheet.

AIM

- This study implements software that aims to streamline the cumbersome task of standardizing and harmonizing scanner protocols.
- Having an automated tool to identify variations in protocol parameters between different scanners across a health care system may provide more consistent patient imaging and saves time and effort in the already busy imaging department.

METHOD

- Protocol management software was implemented to import system protocol backup files from the CT scanners at our main campus (8 scanners, 2 vendors, 7 models).
- For initial testing of the software, our master protocol spreadsheet for abdominal protocols was processed and imported by the software vendor (Qaelum NV).
- Imported system protocols were viewable via a web interface, which also allowed protocols for different models to be visually compared.
- Deviations between system parameters and master protocols for each system were flagged for review.

RESULTS

The tree that includes all the master protocol families was automatically created, with each family consisting of a generic description and the model-specific master protocols (Figure 1). The system protocols were compared against the standardized master protocols, and the deviations were automatically found. Figure 2 shows the number of deviations found for each unit. In 29 abdominal protocols across 8 scanners, 346 deviations from the master protocols were found. The type of deviations found are shown in Figure 3.

Figure 1: The tree with the master protocol families as shown in the protocol management software by Qaelum (left). The description of the standardized CT abdomen protocol is displayed (right) and can be reviewed and modified if necessary.
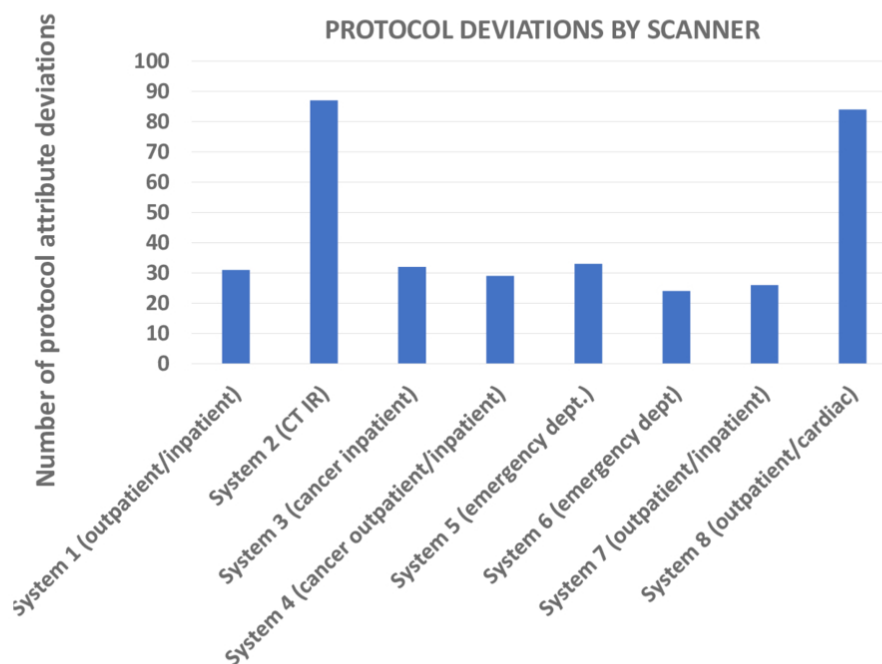

Figure 2: The number of deviations found by the protocol management software per system.
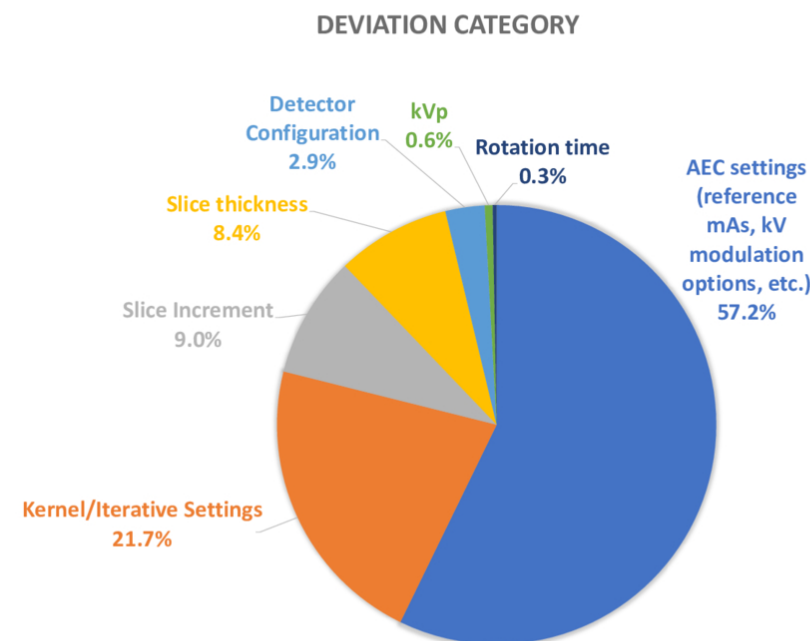

Figure 3: Categorization of the 346 deviations from the master protocols.

CONCLUSIONS

- We found a number of differences between system and master protocols in this initial implementation for abdominal protocols at our main campus.
- Differences occurred even though protocols were password-protected and lead technologists had previously worked many hours to match system protocols to master protocols.
- As we expand to other anatomy areas and include outlying sites, we expect identifying necessary changes to the myriad of protocol parameters on each system to be simplified using the dedicated protocol management software.

DISCLOSURES

REFERENCES

[1]K. Little, "Overview of CT Protocol Parameters and Protocol Management Pitfalls," presented at the 2019 Annual Meeting of the Radiological Society of North America, Chicago, IL, 8 Dec. 2019.

[2]J. Grimes, et. al., "Implementation and evaluation of a protocol management system for automated review of CT protocols," J Appl Clin Med Phys 17, pp. 523-533 (2016).

[3]T. P. Szczykutowicz, et. al., "A Wiki-Based Solution to Managing Your Institution's Imaging Protocols," J Am Coll Radiol 13, pp. 822-824 (2016).

CONTACT INFORMATION

Kevin Little can be reached at kevin.little@osumc.edu.