Peer Review of CT Examination Quality at the University of Alabama at Birmingham Hospital
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RESULTS
The following representative data items collected before and after implementing the exam audit process:
1) Radiologists did not often provide feedback for image quality improvement to CT technologists; 2) CT technologists were often unaware of image quality issues; 3) Image quality was not always consistent among staff; 4) No process was in place to audit CT examination quality; 5) No process was in place to disseminate information about improving examination quality based on systematic reviews.

CONCLUSION
The efforts of this project have resulted in numerous benefits, including: 1) Fostering of teamwork among radiologists and technologists to establish examination quality guidelines and provide feedback for improvement to technologists; 2) Radiologists have demonstrated improved examination quality (quarterly scores improved from a baseline score of 73% in October 2009 to a fourth quarter FY13 average of 100% (July — September 2013)) for CT examinations that are acquired for optimal image quality; 3) There was a widespread improvement of improved examination quality among technologists and radiologists which has been achieved within a collegial environment.

NEXT STEPS
A) At the end of fiscal year 2010, the team agreed that the review process was improving but there was still a need to continue to improve CT examination quality. In the spirit of continuous improvement, the next steps will be the working on the following:
1) Creating a process to provide real time notification when quality related issues are observed. While the audit tool is able to capture specific data on exam quality, there are some issues that are less visible and when reviewing CT image quality retrospective. For example, in order for radiologists or CT technologists to identify exam quality related issues such as technologists deviate from radiologists requesting special protocol, and so forth. As a result, we are in the process of creating a process to notify the CT manager when staff can effect a designated physician to document pertinent information related to CT exam quality. This will allow the appropriate process to call out the CT manager to investigate the issue in real time and provide immediate feedback to technologists.
2) Upon implementation of the new PACS (expected early in 2011), it is hoped that the team will be able to more accurately and comprehensively capture data from reviewer’s work and the CT exam images that are randomly selected for review.
3) During the development of the exam scoring software, team members raised the question: “How do we know for sure if the rules and criteria are appropriate?” As a result, a team of physicists and radiologists are in the process of collecting parameters and reviewing images in an effort to create a technique chart for mAs and kVp.

Audit Tool Scoring Criteria
1. Were the entire area of interest scanned? The exam defined protocol, was the entire area of interest scanned, and was the entire pathology of question scanned?
2. Positioning and contouring, Full appropriate? Depending on body habitus and considering the needs for the exam and what the physician is asking for in the positioning/contouring and goal of (Full appropriate?) Was the table raised appropriately to center the patient both vertically and horizontally in the gantry? No missing, no incorrect.
3. Appropriate kVp? kVp = 120 for most exams, lower for children/small adults and is higher for larger patients. Should be matched on protocol. (kVp) range may vary from 80 – 120, and (kVp) CT exams may be 140. For (kVp) chest exams, (kVp) is noted in technical comments.
4. Removable objects causing artifacts? Remove objects that may be removed and not patient care related. Examples include bar not limited to surgical, jewelry, any body piercing, keys, belt buckles, etc. Important not to connect any equipment (are not in use for patient care). Examples of types of objects that are necessary for patient care that should NOT be removed include coiled, hair, ear, wires, etc.
5. Available artifact present? Artifacts include items from body parts such as an arm resting on the chest, etc. If the patient cannot move his arms out of the scan, the tech should note this in a (brief comment), e.g., “patient can not move arm”, under technical comments.
6. Documented contrast dose appropriate? Exam protocol determines appropriate contrast dose which is included based on examination type and radiologists.
7. Contrast enhancement diagnostic? Depending on the enhancement used, a contrast agent will appear. Do not want images to be washed out.
8. For CT image: (R) placed appropriately? Look at the graph accompanying the images to determine if scoring was started at the appropriate threshold during the exam.

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