

USING TEAM AUDITS TO IMPROVE IMAGE QUALITY: Our Institution's Experience

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UAB Health System



University Hospital

900-bed Facility and Level 1 Trauma Center



The Kirklin Clinic of UAB Hospital

Outpatient Center providing examinations and treatment
rooms for 660 physicians



UAB Highlands

219-bed facility acquired by UAB Health System in 2006

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UAB Radiology

81 resident, fellow and faculty radiologists working in various imaging subspecialties

Imaging Areas include:

Abdominal Imaging
Breast Imaging
Chest Imaging
Cardiopulmonary
Emergency Radiology
General Radiology
Interventional Radiology
Molecular Imaging and Therapeutics
Musculoskeletal Imaging
Neuroradiology
Pediatric Imaging
Physics & Engineering
VAMC

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Background

- Radiologists believed that image quality was sub-optimal too often
- Avoidable errors were being made
- Sub-optimal image quality could negatively affect patient care
- Overall patient experience could be negatively affected

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Background

- In response, Image Quality Audit Teams were formed
- Teams Consist of:
 - Radiologists
 - Technologists
 - Radiology Educator
 - Facilitator

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Background

- This new image quality project was sponsored by:
 - Radiology Vice Chair of Quality Improvement and Patient Safety
 - Radiology Vice Chair for Operations
 - Administrative Director of Radiology, UAB Hospital

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Exam Quality Audit Team Timeline

2009: CT Exam Quality Audit Team formed

(UAB Hospital and UED only)

2011: TKC and UAB Highlands CT added to CT Audit Team

2011: Diagnostic Radiograph Audit Team formed

(UAB Hospital and UED only)

2013: MRI Exam Quality Audit Team formed

(UAB Hospital, UED, TKC, and UAB Highlands)

2015: TKC Diagnostic, Highlands Diagnostic and Highlands Orthopedic will be added to the Diagnostic Radiograph Audit Team

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Audit Process Overview

- Each month team members review a set of exams randomly selected by the team facilitator.
- Team members use a predetermined list of criteria based on the factors that are most critical to optimal image quality. Each item is scored with “yes” or “no.”
- Criteria include but are not limited to:
 - Appropriate area scanned
 - Appropriate field of view and centering
 - Appropriate technical factors
 - Are avoidable artifacts present
 - Is the area of interest over scanned
 - Appropriate contrast dose and documentation
 - Appropriate contrast enhancement
 - Are markers present and correct (no electronic markers used)
 - Is the exam or protocol correct for the indication given on the order

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Audit Process Overview-continued

- Completed audits are returned to the facilitator to be summarized.
- Summarized audits are reviewed at the monthly team meetings.
- Feedback from the meetings is given back to radiology staff through staff meetings, email, notice boards and one to one meetings.
- The number of exams in each audit are based on a 95% confidence interval
- The same basic protocol is used for all of the audit teams, however, some variation in image selection and review is allowed due to the differences in the imaging modalities being reviewed

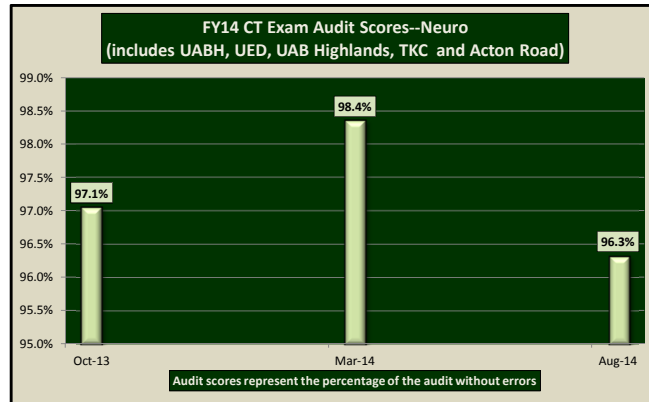
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CT Exam Quality Audit

- Each month the team reviews images selected from a designated section.
 - Auditing by section allows for more exams of each type to be reviewed
 - Physicians are able to attend the meetings related to their specialty/section and provide feedback for improvement
- Sections for CT include:
 - Neuro
 - Body
 - Chest
 - Musculoskeletal
 - Vascular Interventional
- Top opportunities for improvement are identified
- Yearly summaries are given for each section and for CT overall

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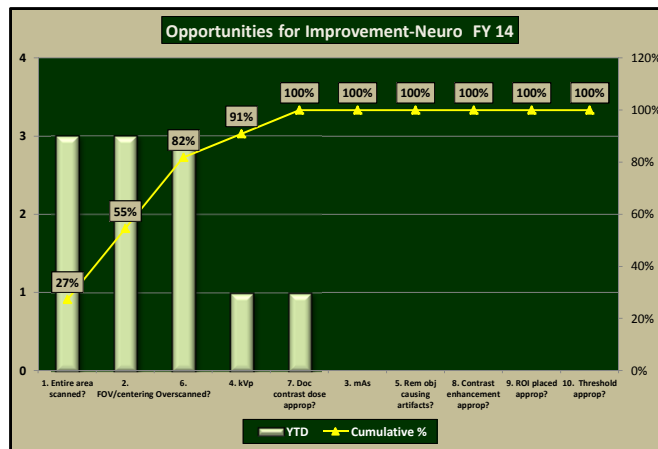
Example of Audit Summary: CT



Audit scores for each section are reported to the team after the audits are reviewed in the monthly meeting. The audit summary report for CT shows the percentage of the audit without errors.

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Pareto of Audit Summary Opportunities for Improvement: CT Neuro



Opportunities for improvement are identified and tracked

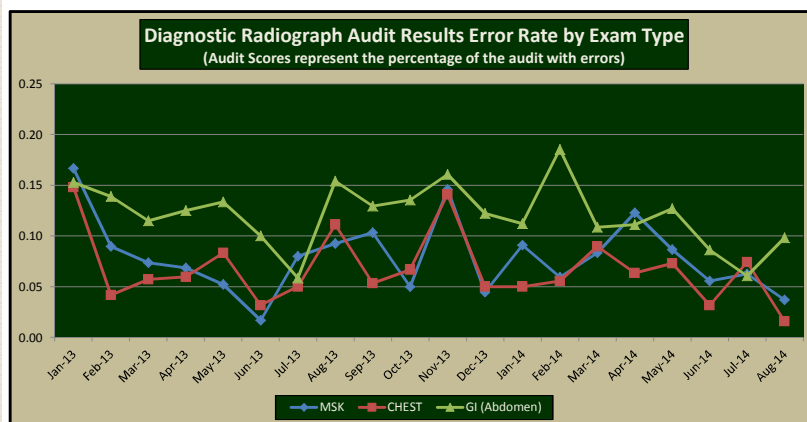
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Diagnostic Radiography

- Each month, techs review a selection of images from Chest, Musculoskeletal and GI imaging (excluding fluoro).
- The top opportunities for improvement are identified.
- Current top three opportunities for improvement being tracked are:
 - Markers missing or electronic markers used
 - Poor positioning
 - Anatomy excluded
- Overall monthly audit results are given for each of the three sections
- Audit results for the top opportunities for improvement are tracked
- Yearly summaries are given for each section and for the top opportunities for improvement

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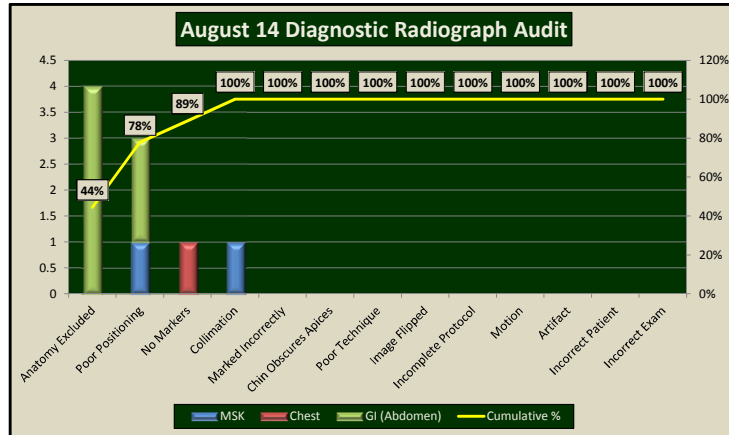
Example of Audit Summary: Diagnostic Radiography



The audit summary report for Diagnostic Radiography shows the percentage of the audit with errors

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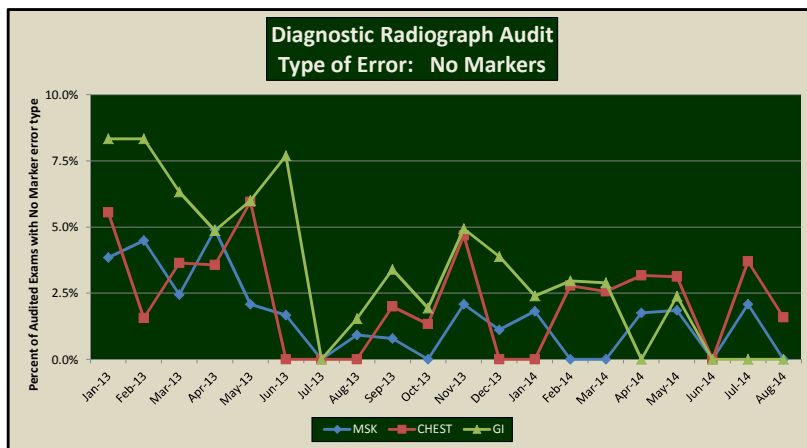
Pareto of Audit Summary Opportunities for Improvement: Diagnostic Radiography



Opportunities for improvement are identified and tracked

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Example of Audit Summary: Diagnostic Radiography



The opportunities for improvement that are most often seen are tracked for each exam type. Note: Electronic markers are not permitted and are considered "No Markers."

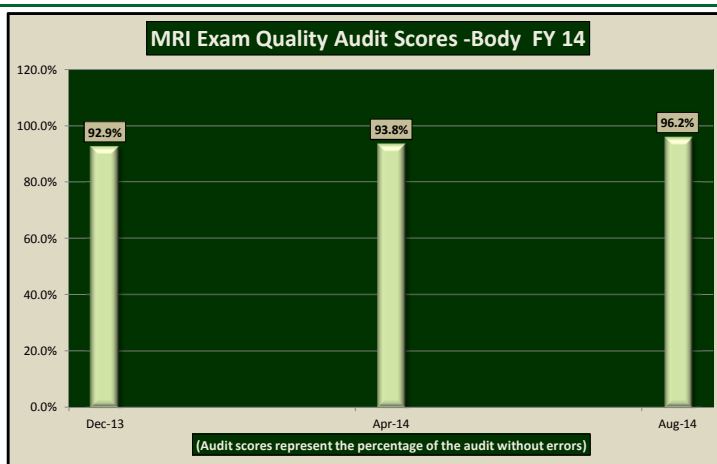
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MRI

- Each month the team reviews images from a particular section.
- Sections for the MRI audit includes:
 - Neuro
 - Body
 - Breast
 - Musculoskeletal
- Top opportunities for improvement are identified
- Current top opportunities for improvement include:
 - Patient motion
 - Artifacts present
- Yearly summaries are given for each section and for MRI overall

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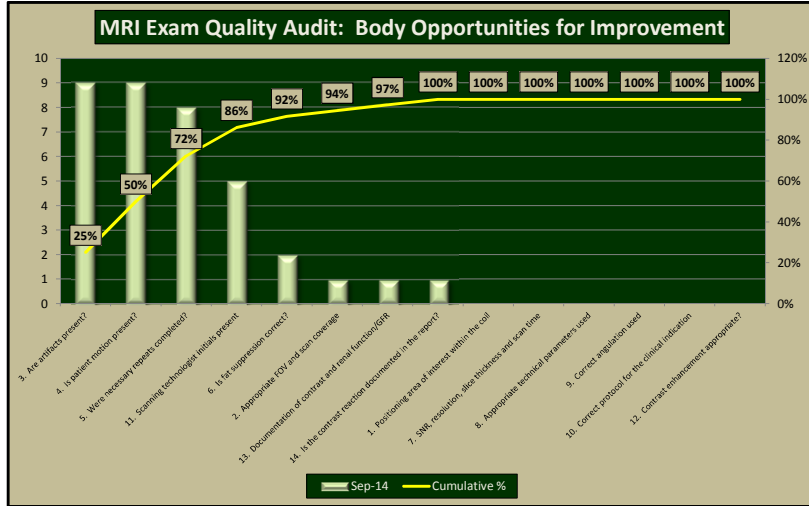
Example of Audit Summary: MRI



Audit scores for each section are reported to the team after the audits are reviewed in the monthly meeting. The audit summary report for MRI shows the percentage of the audit without errors.

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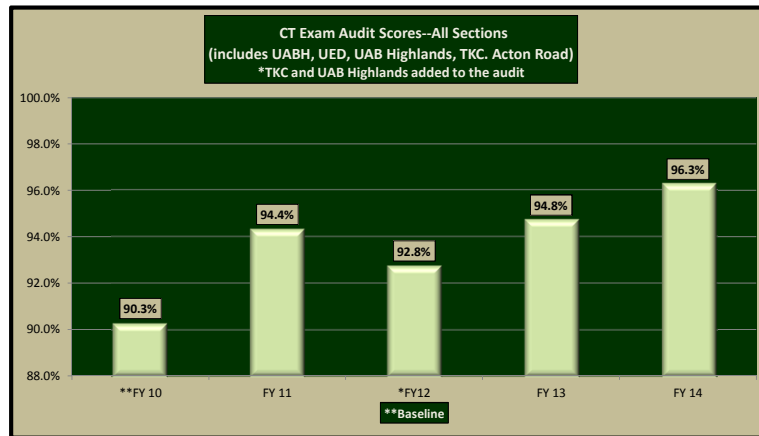
Pareto of Audit Summary Opportunities for Improvement: Body MRI



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Opportunities for improvement are identified and tracked.

Results: CT

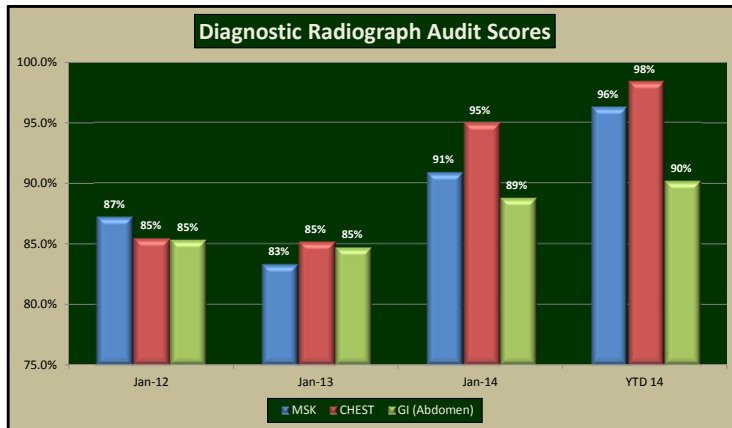


6.3% decrease in errors from the baseline to Present

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This report represents the percentage of the audit without errors.

Results: Diagnostic Radiography

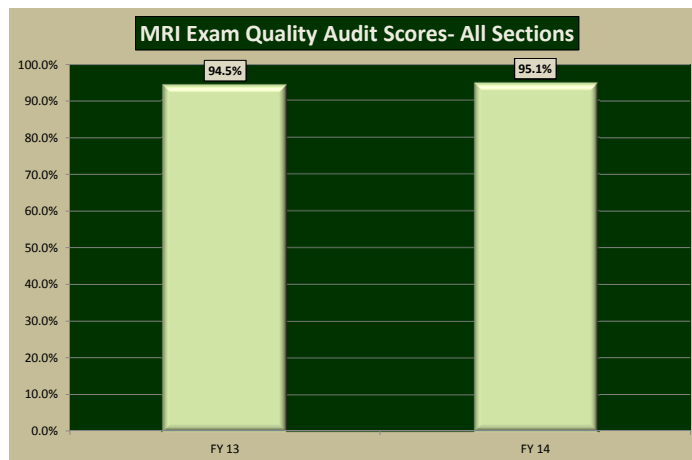


Decrease in errors from baseline
 MSK: 9.0%
 Chest: 12.9%
 GI (Abdomen): 4.8%

This report represents the percentage of the audit without errors.

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Results: MRI



0.2% decrease in errors from the baseline

This report represents the percentage of the audit without errors.

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Conclusions

- All areas have seen a decrease in preventable errors
- Opportunities for improvement are more easily identified and tracked
- Improvement plans are determined jointly by the technologists performing the exams and the radiologists reading them
- Communication between the technologists and radiologists is more open both in and outside of the teams

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Conclusions-continued

- Staff members are more engaged in quality improvement because they are active participants in the process
- Team members are publicly recognized for excellent work identified during the audits
- Staff with outstanding recognitions are identified as potential mentors for new staff members
 - Best practices in exam performance and quality management are taught to new staff from the beginning of employment

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Sources

UAB School of Medicine Department of Radiology
<http://www.uab.edu/medicine/radiology/>

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