Alegent Creighton Health

Tracking Results: A Novel Approach to Tracking Resident Miss Rates on Trauma Patients While Improving Education and Satisfying Trauma Certification Requirements for a Level 1 University Hospital

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Introduction

- The primary goal of this quality improvement project is to create a sustainable system that monitors radiology resident trauma miss rates to satisfy our states level 1 trauma designation requirements.
- Secondary objectives are:
  - Create opportunities for residents to participate in inter-professional teams to promote and enhance safe care
  - Satisfy the ACGME requirement that requires residents to evaluate their personal practice
  - Engage residents in the use of data to improve patient outcomes
  - Provide data to our ED regarding quality of resident preliminary reads

Introduction:

- American College of Surgeons' requirements for a hospital's radiology dept. for maintaining level 1 trauma certification:
  - Radiologist promptly available to interpret exams.
  - Written report in a timely manner.
  - Verbally communicating critical results and monitoring changes between preliminary and final interpretations.
  - Monitoring of resident/attending discrepancies by the institution's PIPS (Patient Improvement/Patient Safety) system.
    - These discrepancies need to be made available for trend analysis.

Introduction cont.

Resident and Attending Discrepancies

- Currently a highly discussed topic
- This technique allows us to monitor resident performance on a monthly basis.
  - We only evaluate trauma cases, however these represent the majority of our on call cross-sectional imaging
- Monitoring discrepancy rates is vital to proving that residents are safe and appropriately managing patients while under indirect supervision.

Introduction cont.

ACGME Requirements

- Currently, the ACGME requires radiology residents to "*Evaluate their personal practice, utilizing scientific evidence, best practice and self-assessment programs with the intent of practice improvement.*"
  - Utilizing our monthly results, residents are informed if they have a discrepancy and can focus on self-improvement in that particular area.

Introduction cont.

Satisfying our Emergency Department

- Our emergency department has requested that our resident to attending discrepancy rates be made available to them.
  - Our data provides current and accurate representation of resident discrepancy rates for each PGY year.
  - Allows us to compare these numbers with published resident-attending and attending-attending miss rates.
    - Goal is to meet or exceed the national standards for resident discrepancy rates.

Methods

Data Collection

- Data collection began in July 2012
  - We review approximately 20% of our total trauma activations/month (correlates with 20 patients/month).

    ***NOTE: Prior to Dec 2012 we evaluated 50 trauma patients/month. On review this was over-sampling and the number of patients/month was decreased to 20.**
  - These cases are randomly selected by our institution's trauma coordinator.
    - All imaging studies of the randomly selected patients are then evaluated.
    - The resident's preliminary report is compared to the final report and any discrepancies are noted.

Methods

Discrepancy Evaluation

- Discrepancies undergo peer review by 2 attending radiologists and a senior radiology resident.
  - Utilizing RADPEER, a RADPEER score is assigned to each case.
  - Limited chart review is performed of the significant discrepancies to evaluate outcome.
  - Using EXCEL the following data is documented:
    - Patient name, MRN, study type, discrepant finding, interpreting resident's name, attending's name and RADPEER score.

Methods

RADPEER scoring language

Score	Meaning	Significance
1	Concur with interpretation	
2	Discrepancy in interpretation/not ordinarily expected to be made (understandable miss)	a. Unlikely to be clinically significant b. Likely to be clinically significant
3	Discrepancy in interpretation/should be made most of the time	a. Unlikely to be clinically significant b. Likely to be clinically significant
4	Discrepancy in interpretation/should be made almost every time—misinterpretation of finding	a. Unlikely to be clinically significant b. Likely to be clinically significant

Methods

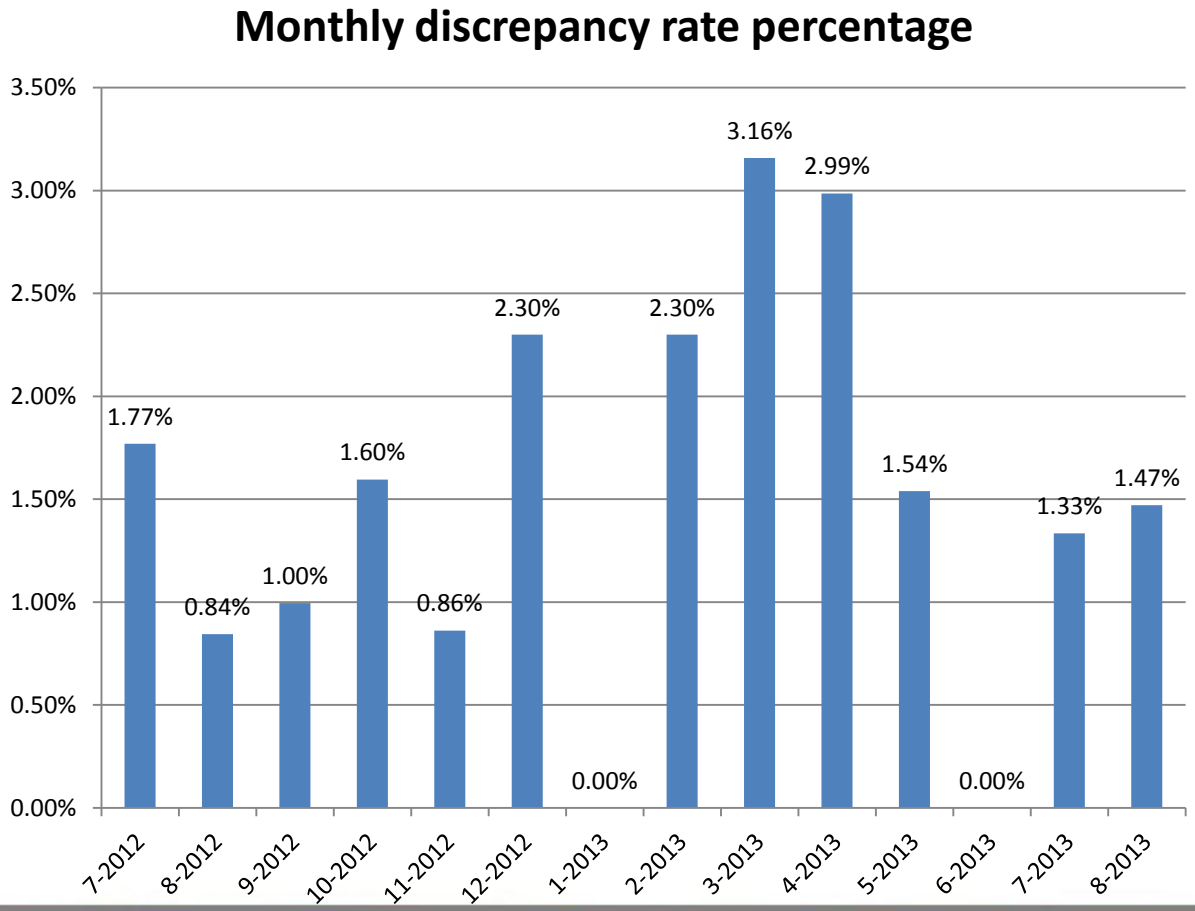
Utilizing the collected data

- Discrepancies are:
  - Discussed individually with the interpreting resident
  - Presented at the monthly hospital trauma committee meeting
  - Presented at our monthly Radiology Intradepartmental QI meeting

Results

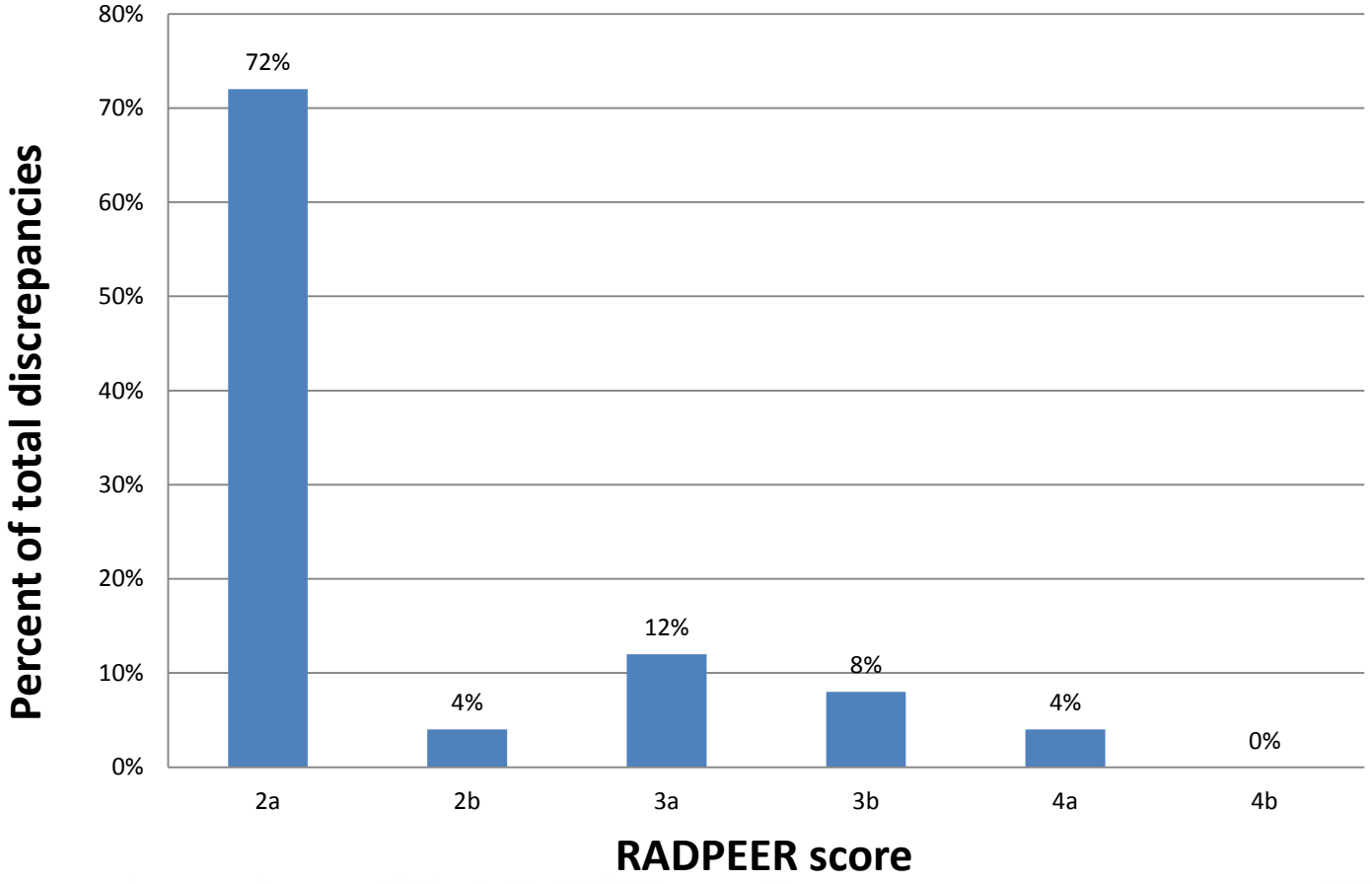
Monthly Discrepancy Rates

Our average overall discrepancy rate: 1.4%



Results

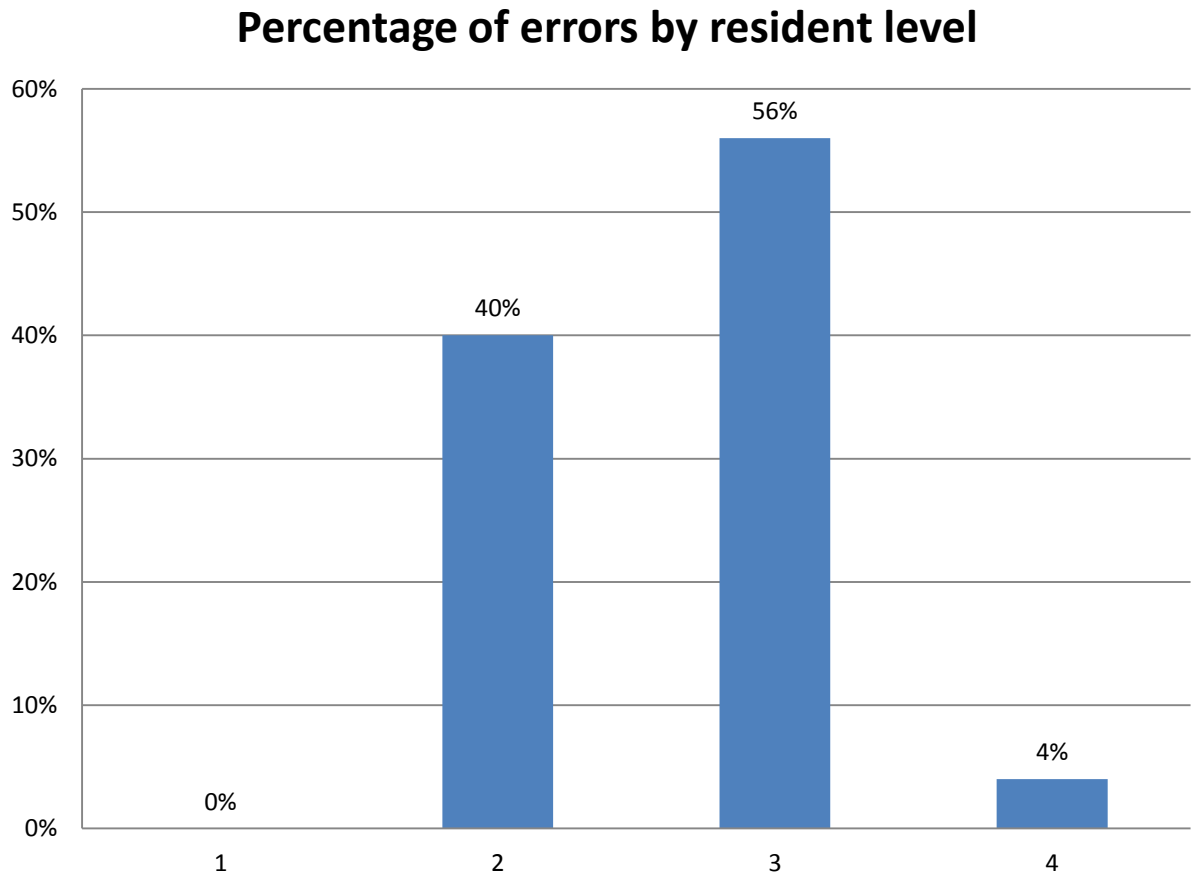
RADPEER score



Results

Resident Discrepancies

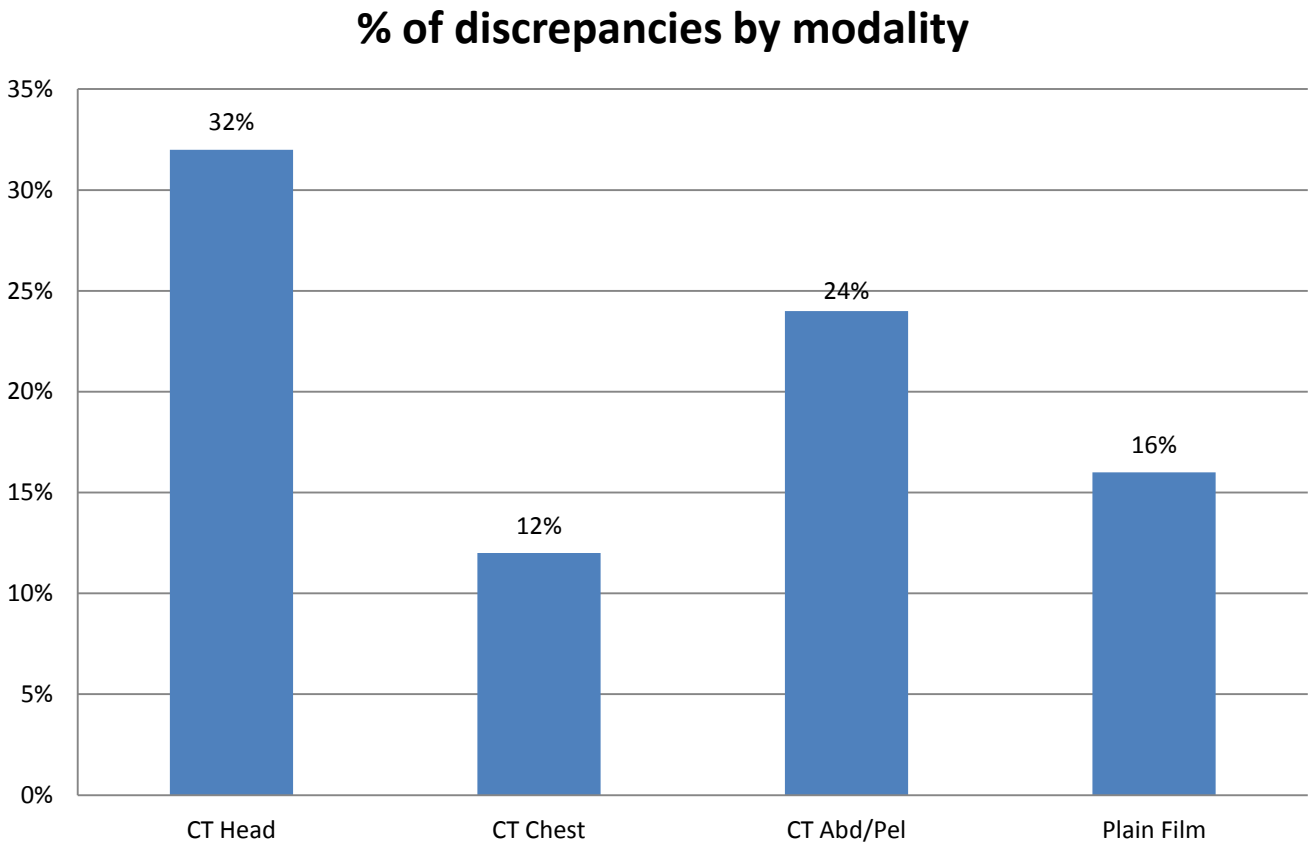
Note: Our trauma interpretations are almost exclusively performed by 2nd-4th year residents.



Results

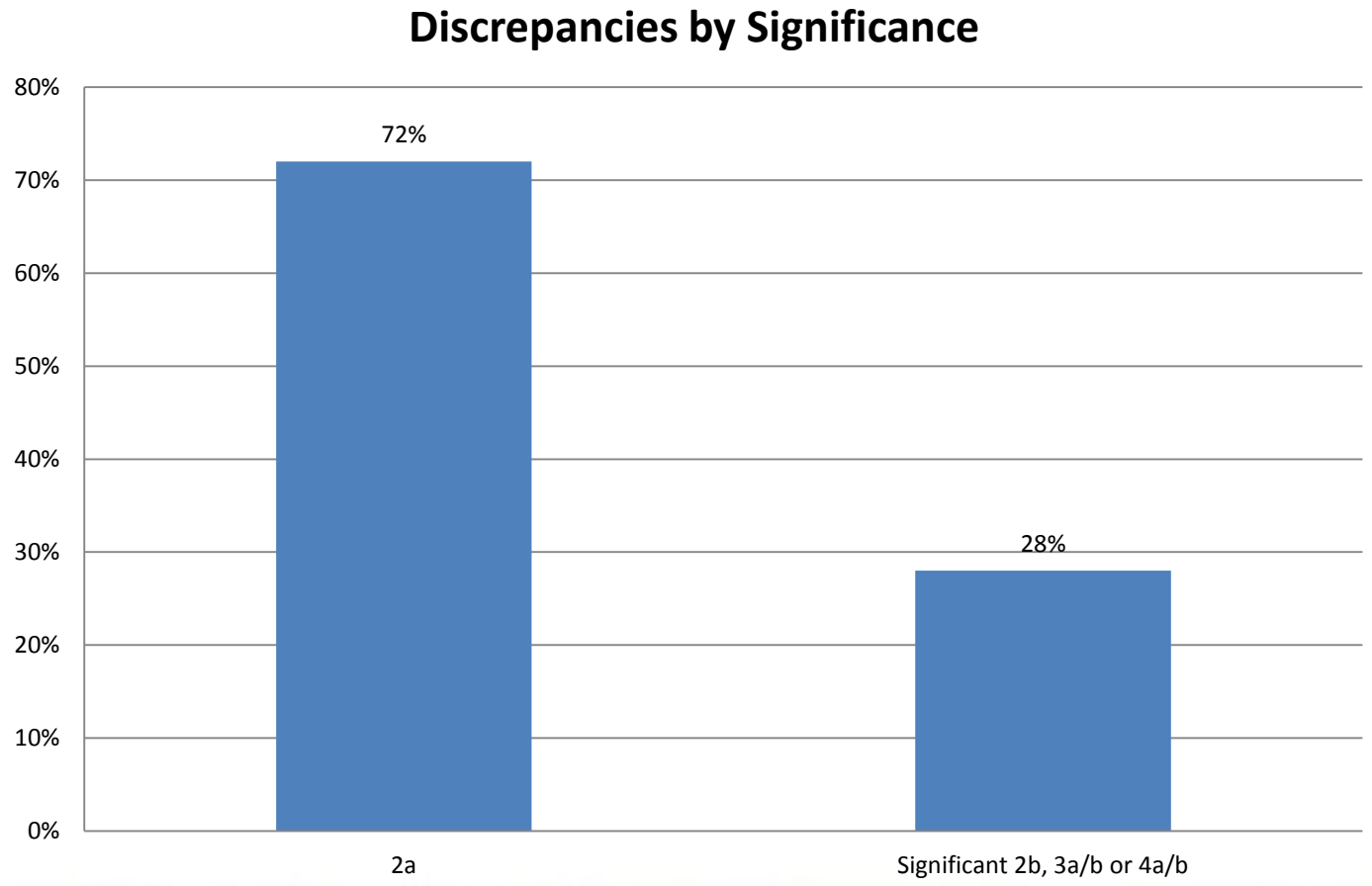
Resident Discrepancies

MRI and US are rarely ordered on trauma patients, hence no significant misses were found.



Results

Resident Discrepancies



Discussion

Why is this important?

- Overnight radiology coverage has been a “hot button” topic recently and will be in the near future.
  - Many academic medical centers utilize residents to provide overnight preliminary reads.
  - Other trends include in house staff coverage 24/7 and tele-radiology services.

Discussion

What is Major?

- Using the RADPEER guidelines scores of 2b, 3, and 4 are considered significant
  - Score of 1 or 2a require no further action except for some random validation
  - Scores of 2b, 3, and 4 require further internal radiology review by the QA committee to substantiate findings.

Discussion

Published major discrepancy rates

- Numerous published discrepancy rates between residents and attendings have been reported:
  - Values range between 0.1% and 10%
  - Majority report a major discrepancy rate between 0.5-2.0%

Discussion

Examples of published resident-attending major discrepancy rates

J Am Coll Radiol. 2012 Apr;9(4):264-9. doi: 10.1016/j.jacr.2011.11.016.

Application of the RADPEER™ scoring language to interpretation discrepancies between diagnostic radiology residents and faculty radiologists.

Maloney E, Lomasney LM, Schomer L.

Department of Radiology, Loyola University Medical Center, Maywood, Illinois 60153, USA. ezmaloney@lumc.edu

1.3%

J Am Coll Radiol. 2011 Sep;8(9):644-8. doi: 10.1016/j.jacr.2011.04.003.

Identifying benchmarks for discrepancy rates in preliminary interpretations provided by radiology trainees at an academic institution.

Ruutiainen AT, Scanlon MH, Itri JN.

Department of Radiology, Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania 19104, USA. alexander.ruutiainen@uphs.upenn.edu

0.9%

J Am Coll Radiol. 2011 Jun;8(6):409-14. doi: 10.1016/j.jacr.2011.01.012.

Cross-sectional examination interpretation discrepancies between on-call diagnostic radiology residents and subspecialty faculty radiologists: analysis by imaging modality and subspecialty.

Ruma J, Klein KA, Chong S, Wesolowski J, Kazerooni EA, Ellis JH, Myles JD.

Department of Radiology, University of Michigan Health System, Ann Arbor, MI, USA.

0.7%

Acad Radiol. 2009 Sep;16(9):1155-60. doi: 10.1016/j.acra.2009.02.017. Epub 2009 May 30.

Overnight resident interpretation of torso CT at a level 1 trauma center an analysis and review of the literature.

Chung JH, Strigel RM, Chew AR, Albrecht E, Gunn ML.

Department of Radiology, University of Washington and Harborview Medical Center, Seattle, WA, USA.

2.0%

Acad Radiol. 2008 Sep;15(9):1198-204. doi: 10.1016/j.acra.2008.02.011.

Radiology resident interpretations of on-call imaging studies: the incidence of major discrepancies.

Cooper VF, Goodhartz LA, Nemcek AA Jr, Ryu RK.

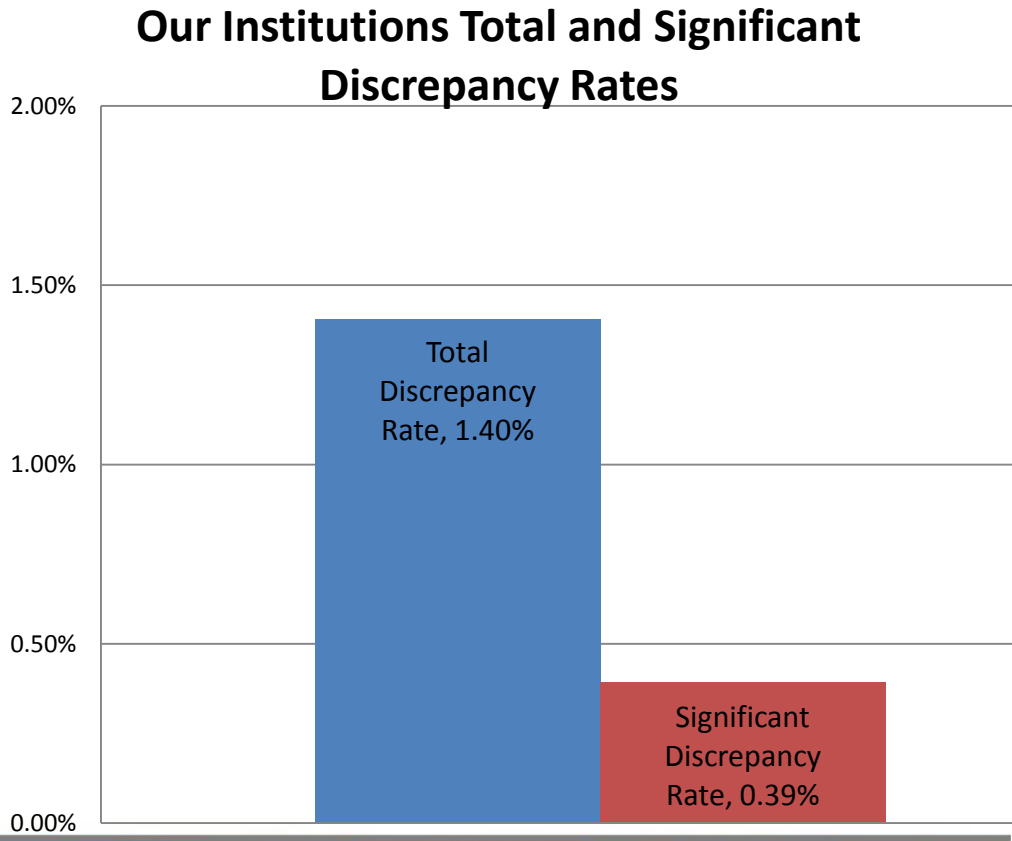
Department of Radiology, Northwestern University Feinberg School of Medicine, 676 North St. Clair Street, Suite 800, Chicago, IL 60611, USA.

1.0%

Discussion

Summary of discrepancy rates

- We evaluated 1781 studies thus far in 14 months.
  - 25 total discrepancies
  - 7 significant discrepancies



Discussion

Summary of discrepancy rates by modality

- The majority of our discrepancies were from CT.
- The discrepancy typically represented a missed finding rather than misinterpretation or overcall.
- Although 0.39% of the misses were deemed significant no death, morbidity or significant management change occurred in these cases.

Discussion

Summary of discrepancy rates by resident level and month

- The majority of our discrepancies were from 2nd and 3rd year residents.
  - This was expected as they interpret the majority of our trauma imaging.
  - No significant difference between 2nd and 3rd years
- No significant spike in monthly discrepancy rate during July-August in 2012 or 2013
  - These findings demonstrate that our residents taking call during the first few months of the academic year have similar discrepancy rates throughout the year

Discussion

Published attending-attending radiologist discrepancy data

Outsourced Teleradiology Imaging Services: An Analysis of Discordant Interpretation in 124,870 Cases

Wilson S. Wong,[a,b], Ivan Roubal, MD[a], David B. Jackson, MD[a], William N. Paik, MD[a], Victor K.J. Wong[a]

→ 1.1%

AJR Am J Roentgenol. 2012 May;198(5):1121-5. doi: 10.2214/AJR.11.6724.

Optimizing peer review: A year of experience after instituting a real-time comment-enhanced program at a children's hospital.

Swanson JO, Thapa MM, Iyer RS, Otto RK, Weinberger E.

Department of Radiology, Seattle Children's Hospital, WA 98105, USA. jonathan.swanson@seattlechildrens.org

→ 3.6%

RADPEER™ Scoring White Paper

Valerie P. Jackson, MD[a], Trudie Cushing, MS[b], Hani H. Abujudeh, MD, MBA[c], James P. Borgstede, MD[d], Kenneth W. Chin, MD[e], Charles K. Grimes, MD[f], David B. Larson, MD[g], Paul A. Larson, MD[h], Robert S. Pyatt Jr, MD[i], William T. Thorwarth Jr, MD[j]

→ 2.9%

Discussion

Improving Resident Education

- How we utilize the data:
  - Focused education, especially call-prep lectures with increased attention to cross-sectional imaging
  - Individual residents are made aware of their misses and appropriate review materials can be made available

Discussion

Satisfying ACGME

- This project satisfies the ACGME requirement that *"Residents must evaluate their personal practice, utilizing scientific evidence, best practice and self-assessment programs with the intent of practice improvement."*
- Helps institutions satisfy ACGME's CLER site visit in 2 of the 6 focus areas:
  - Patient safety and Quality Improvement

Conclusion

Our results

- Discrepancy rates of our radiology residents are similar to recently published resident-attending literature
- Our rates are at or below published attending-attending discrepancy rates
- Majority of our misses are by 2nd-3rd year residents
- Majority of our discrepancies are on CT imaging

Conclusion

Advantages of our project

- Continual data collection on resident-attending discrepancy rates
  - In the future we plan to compare this to our RADPEER attending-attending discrepancy rate data.
- Monthly discrepancy data is available to our ED
- Involvement of our residents in an on-going QI project and helps familiarize our residents with the RADPEER scoring system and CLER site visit requirements

Conclusion

Limitations of the study

- Our data only reflects trauma imaging
- We do not directly evaluate clinical impact, we only estimate it
- Our trauma imaging interpretations are heavily weighted towards 2nd-3rd year residents so evaluation of our 1st and 4th year resident's discrepancy rates is limited
- We evaluate approximately 20% of our monthly trauma activations

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