



Interpretation Of Coronary Computed Tomography Angiography: Agreement of On-call Radiology Residents and Cardiothoracic Radiology Faculty

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Coronary CTA in the Emergency Department

- Coronary computed tomography angiography (CCTA) has been shown to improve efficiency of care in the emergency department (ED) for patients with symptoms concerning for acute coronary syndrome



Implementation of 24-Hour CCTA

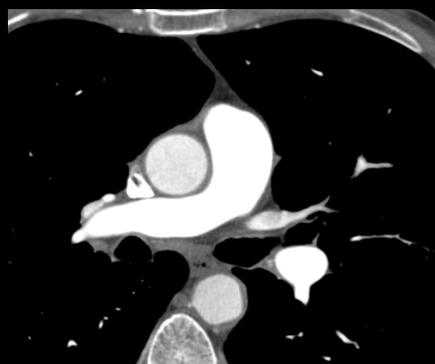
- We recently implemented availability of 24-hour CCTA interpretation in the ED
- Cardiothoracic radiology faculty were available to review CCTA studies at all hours
- We aimed to evaluate the feasibility of on-call radiology resident interpretation of CCTA through creation of a dedicated CCTA curriculum for residents and subsequent assessment of agreement between on-call radiology residents and cardiothoracic radiology faculty interpretations

ED CCTA Study Components

Calcium Score



CCTA



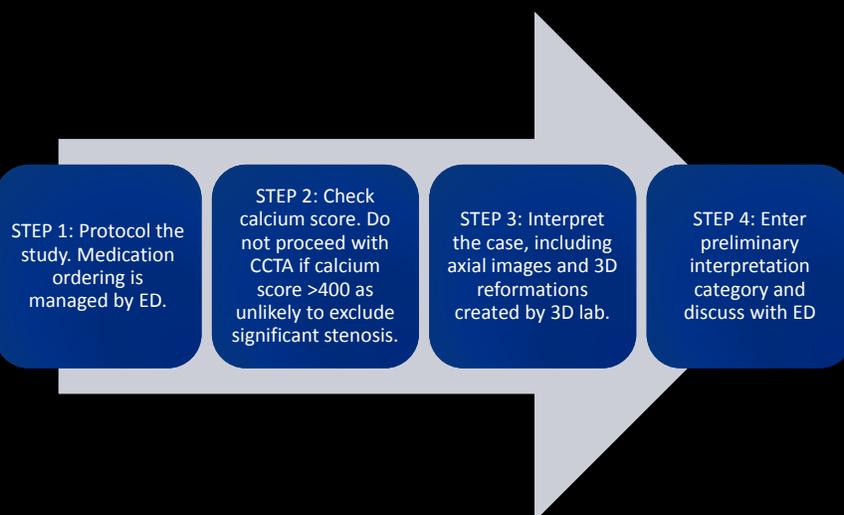
CCTA Curriculum

- Curriculum on performance/interpretation of CCTA was created including both lectures and small group sessions taught by cardiothoracic radiology faculty
- Curriculum included:
 - Three 45-minute group lectures on core concepts
 - Two case-based group lectures reviewing 15 CCTA
 - Faculty-led small group sessions with review of 20 additional CCTA examinations at the PACS workstation
- Total exposure to 50 CCTA cases with faculty-guided review

Resident Workflow

- Only senior radiology residents (PGY-4 and PGY-5) were responsible for CCTA interpretation on-call, all of which had also completed a required one-month cardiac radiology rotation including exposure to CCTA examinations
- A dedicated resident workflow was created to outline the role of the on-call resident at each stage of the CCTA scan protocol

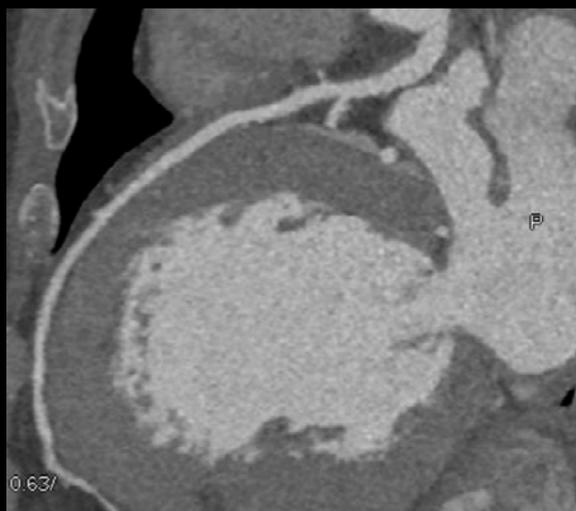
Resident Duties for CCTA from the ED



Simplified Scoring System for CCTA

- CCTAs were classified by the on-call resident into 5 categories:
 1. Normal
 2. Coronary Stenosis <50%
 3. Coronary Stenosis ≥50%
 4. Calcium Score >400
 5. Non-Diagnostic (motion or other artifacts)

Category 1 - Normal



Category 2 – < 50% Stenosis



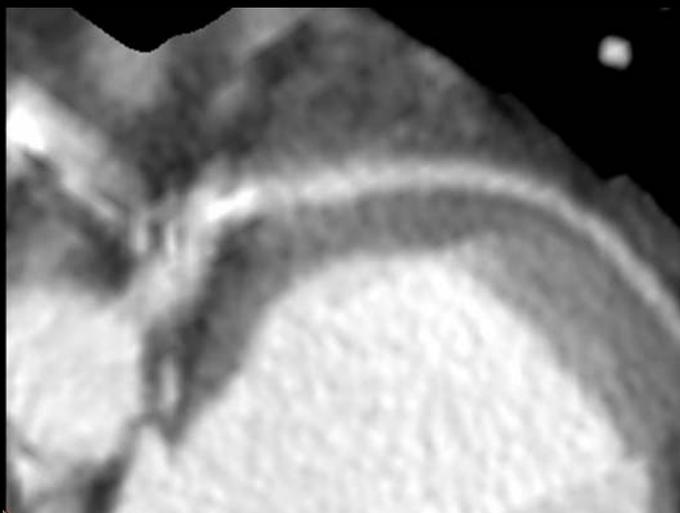
Category 3 – $\geq 50\%$ Stenosis



Category 4 – Calcium Score > 400



Category 5 – Non-Diagnostic



Steps Toward Faculty Interpretation

Residents record preliminary CCTA impression category into online module that permanently saves their choice

Residents contact on-call cardiothoracic radiology faculty member for final interpretation

Faculty review the case and enter their final CCTA category into online module

Methods

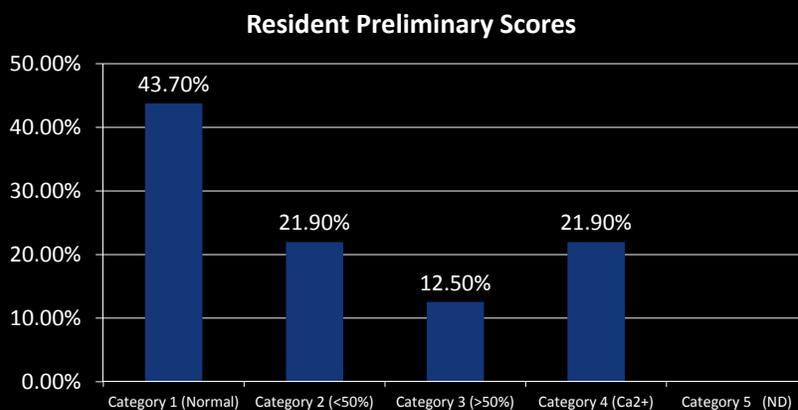
- We collected 6 months of preliminary resident scores and final faculty interpretation from July 2015 to January 2016
- Agreement between the on-call resident and faculty CCTA score was tabulated
- Historical data on resident interpretation was not available, as previously on-call residents did not routinely and irreversibly record a preliminary interpretations before contacting a faculty member

Acquiring Resident Feedback

- Feedback was obtained from the on-call residents anonymously through the chief radiology residents
 - Successes of the program
 - Areas of concern

Results

- 32 CCTAs were performed in the ED during our 6-month evaluation period



Faculty/Resident Agreement

- There was agreement between the on-call resident preliminary category and faculty category in 32/32 cases

Resident Feedback

- Chief residents indicated that the ongoing primary concern of on-call residents throughout the study period was not the interpretation of the studies but rather comfort and familiarity with the workflow including coordination with nursing, technologists, and the 3D lab staff

Conclusions

- On-call radiology resident categorization of CCTA examinations performed in the ED displayed **excellent** agreement with cardiothoracic radiology faculty interpretation
- These results suggest that on-call radiology resident interpretation of CCTA using a **simplified scoring system** is feasible following **dedicated CCTA training**
- Utilization of on-call resident interpretation may allow institutions to increase **after-hour availability of CCTA**

Next Steps

- Further data collection will be needed:
 - To assess for long-term stability of resident-faculty agreement
 - To evaluate whether residents develop increased familiarity with the workflow over time

QUESTIONS OR COMMENTS?

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