



The Prepared Minds

GUIDELINES FOR JOURNAL CLUB REVIEWERS

BACKGROUND

- Briefly describe why this study is being done (and why it should be done). What are the authors trying to do, and did they accomplish it?
- Is this important (new, useful, or practical) information?
- How persuasive is the writing?

METHODS

- Briefly comment on the study's design:
 - Are inclusion/exclusion criteria clearly defined?
 - Are diagnostic criteria and endpoints defined in an unambiguous, reproducible, non-circular, prospective manner? Are there any potential biases? Are investigators blinded? Should they have been?
- Is there a control group? Is a control group necessary?
 - Do the authors state or imply a primary hypothesis? Secondary hypothesis?
 - Are the statistical methods appropriate for the data? Is there evidence that a power calculation was performed to determine the required sample size? (Is there any statistical validation?)
- How could you do it better?

RESULTS

- Briefly comment on major findings of the study. It is not necessary to review the results in detail since Journal club participants have already thoroughly read the study; it is only necessary to highlight the key points.

DISCUSSION AND CONCLUSION

- This is the most important part of the presentation! The following questions should be answered:
 - What conclusions do the authors draw from the data? Are these conclusions the same as the primary/secondary hypotheses or has there been post hoc analysis? Are their conclusions justified?
 - What conclusions do you draw from the data?
 - How should the results of this study be applied clinically? (Should we change our practice?)
 - Does this work suggest the need for further research? If so, describe what form this should take.



Journal Selection for June 2016

Diagnostic Yield of Triple-Rule-Out CT in an Emergency Setting.

Wnorowski AM, Halpern EJ

AJR Am J Roentgenol. 2016 May 17;W1-W7.

OBJECTIVE:

The objective of the present study is to quantify the diagnostic yield of triple-rule-out (TRO) CT for the evaluation of acute chest pain in emergency department patients.

MATERIALS AND METHODS:

All TRO CT studies performed at our institution from 2006 to 2015 were reviewed. Scans were performed on a 256-MDCT scanner, with the use of ECG gating and a biphasic contrast injection. Radiology reports were reviewed to identify diagnoses that could explain chest pain, including coronary and noncoronary diagnoses, and significant incidental findings that did not account for the patient's presentation. The total numbers of coronary and noncoronary diagnoses and incidental findings were calculated.

RESULTS:

Four of 1196 total cases that were identified were excluded from the study because of inadequate image quality. A total of 970 patients (81.4%) had a negative study result without a significant coronary or noncoronary diagnosis. A total of 139 patients (11.7%) had significant coronary artery disease (50% stenosis or greater). One hundred six patients (8.9%) had a noncoronary diagnosis that could explain chest pain ($p < 0.02$), most commonly pulmonary embolism (28 patients [2.3%]), aortic aneurysm (24 patients [2.0%]), or pneumonia (20 patients [1.7%]). Thirty cases (27.3%) of pulmonary embolism and aortic pathologic findings would not have been detected with coronary CT angiography because of unopacified right-side circulation or limited z-axis coverage. A total of 528 incidental findings not considered to explain chest pain were noted in 418 patients (35.1%).

CONCLUSION:

In 8.9% of patients, TRO CT detected a significant noncoronary diagnosis that could explain acute chest pain, including pathologic findings that would not be identified on dedicated coronary CT angiography.

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<http://www.thepreparedminds.com/8926>

Questions and Topics for Discussion

SUMMARY:

- Coronary CTA has been shown to have a negative predictive value of nearly 100% for detection of obstructive coronary disease. CT pulmonary angiography (CTPA) and CT angiography of the aorta are similar in their abilities to detect pulmonary embolism and aortic dissection, respectively. The triple rule out (TRO) CTA attempts to detect all three diagnoses (as well as other causes of chest pain) in one scan.
- The authors retrospectively review 1196 consecutive TRO CTAs performed at their institution during a 10-year period. All studies were performed in the emergency department at the discretion of the ordering physician (physicians could also order dedicated coronary CTA, CTPA, or dissection CTA and there is no mention of how the decision was made to order TRO versus other exams).
- All TRO were performed on a 256-detector (Phillips Brilliance iCT) with ECG-gating and rate control for heart beat of 65 bpm or less. There was a very low exclusion rate (only 4 patients were excluded due to inadequate contrast bolus, motion, or clinical decompensation). The radiation dose varied substantially throughout the study and decreased over time, with mean effective doses initially 18.0 +/- 5.6 mSv, decreasing to 8.75 +/- 2.64 mSv after introduction of dose modulation (no discussion of how many patients were in each group).
- 970 (81.4%) of the studies were considered negative. Of the 222 patients with findings that could potentially explain chest pain, 139 patients had coronary stenosis (>50% considered positive), and 110 had other diagnoses. There were many other diagnoses that constituted the 8.9% of patients with “other” causes of chest pain. Pulmonary embolism (28) was the most common, followed by aortic aneurysm (24), pneumonia (20), other cardiac (16), other aortic excluding dissection (6), bone (6), other lung (5), aortic dissection (4), and pancreatitis (1).

- The conclusions from this study are limited. There are no outcomes data, or follow-up to confirm diagnoses from the TRO exams. The number of dedicated coronary CTA, CTPA and aortic CTA are not reported. The diagnostic accuracy of the TRO CTA was not assessed.

QUESTIONS:

- The authors' objective was to quantify the diagnostic yield for TRO CTA for evaluation of chest pain in the emergency department. Did they meet this objective? Does the data justify the use of TRO CTA?
- Do you think that the reported 8.9% rate of non-coronary diagnoses for chest pain would influence you to use TRO CTA instead of dedicated imaging exams (e.g. coronary CTA, CTPA, CTA)? What are the downsides to TRO CTA? How often are alternative explanations for symptoms discovered on these other dedicated exams?
- How would you design a prospective, randomized study to test the effectiveness of TRO CTA? What are some important data to measure?
- If you offer TRO CTA at your institution, how does the protocol differ from the specific exams (i.e. coronary CTA, CTPA, aorta CTA)? Specific issues to consider include: difference in contrast dose/injection rate; z-axis coverage and pitch; need for ECG-gating and rate control.

PLEASE SHARE YOUR THOUGHTS WITH OUR READERS.

Submitting the opinions and conclusions reached at your Journal Club meeting after reviewing the article couldn't be easier:

- » By e-mail to: kirschj@thepreparedminds.com
- » By fax to: (954) 689-5115 | C/O Jacobo Kirsch, MD
- » By using the 'Contact Us' form in the website

Prepared by Editors from ThePreparedMinds.com

Travis Henry, MD
UCSF Department of
Radiology and Biomedical
Imaging
San Francisco, CA

Juan Battle, MD
Radiology Associates of
Florida
Miami, FL

Daniel Vargas, MD
University of Colorado
Denver, CO

Jeremy D Collins, MD
Northwestern University
Feinberg School of
Medicine
Chicago, IL

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