



Australian
National
University

Association of time-to-scan with result in CT pulmonary angiography

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Background

- CT Pulmonary Angiogram (CTPA) is definitive test for Pulmonary Embolism
- A wide range of positive test rates is described in Emergency Medicine
 - USA usually 8-10%
 - British College Radiologists 15.4-37.4%
 - RESPECT-ED reported 14.6% [13.8-15.4]
 - Of 14 sites, 4 below, 1 above 15.3% target

RESEARCH ARTICLE

RESPECT-ED: Rates of Pulmonary Emboli (PE) and Sub-Segmental PE with Modern Computed Tomographic Pulmonary Angiograms in Emergency Departments: A Multi-Center Observational Study Finds Significant Yield Variation, Uncorrelated with Use or Small PE Rates



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Data Availability Statement: These human patient data accumulated via access to multiple hospital institutional data sets. Ethics committees have required that this data are not for consideration release but that requests for use or review of the data will be forwarded to an independent data custodian. Data are available from the University of Western Australia Institutional Data Access

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Abstract

Introduction

Overuse of CT Pulmonary Angiograms (CTPA) for diagnosing pulmonary embolism (PE), particularly in Emergency Departments (ED), is considered problematic. Marked variations

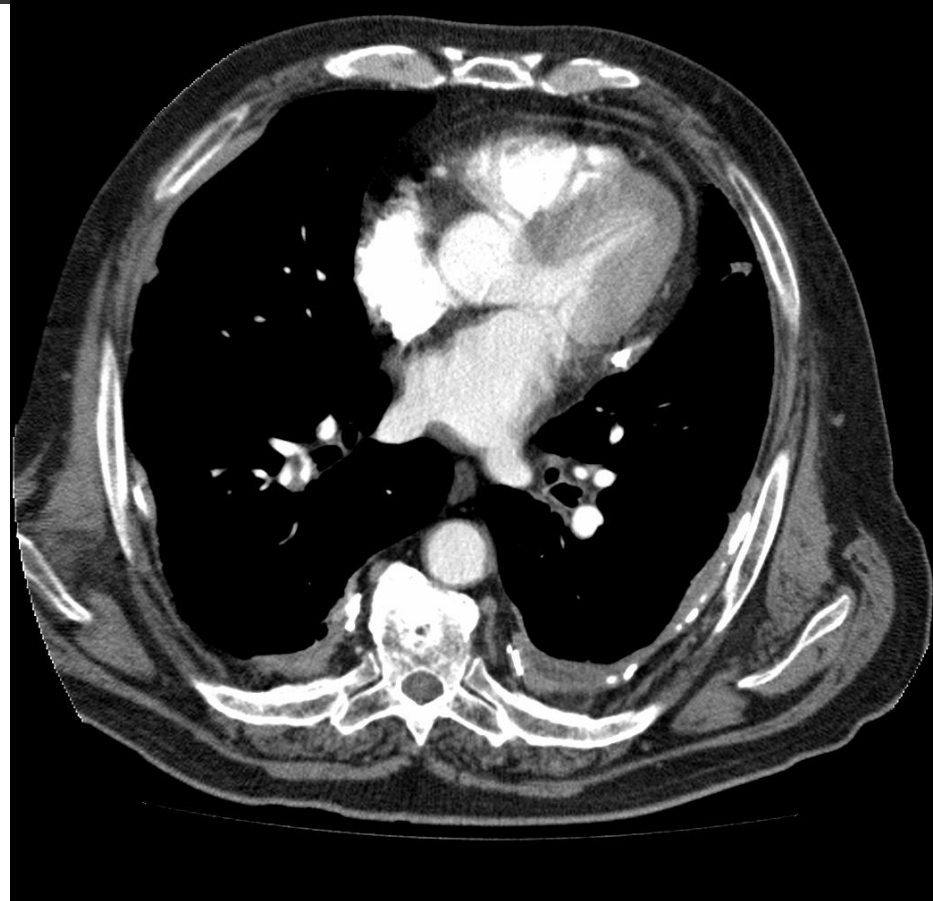
Background

- Mixed Tertiary ED at Canberra Hospitals and Health Services (CHHS) not part of RESPECT-ED
- Anecdotally low yield of CTPA ordered by inpatient teams prior to transfer to the ward



Aim

- To establish the positive CTPA rate in CCHS ED by RESPECT-ED criteria
- To determine the relationship between the time taken to obtain the CTPA and the result



Methods

- Retrospective chart review of all CTPA undertaken for acute PE in the ED of CHHS in 2017
- Of CTPA on the hospital record system, those with an episode number not originating in ED were excluded
- The remainder were included if the time scan performed fell during the time in ED or EMU (observation unit)
- On chart review, progress scans for known PE were excluded

Methods

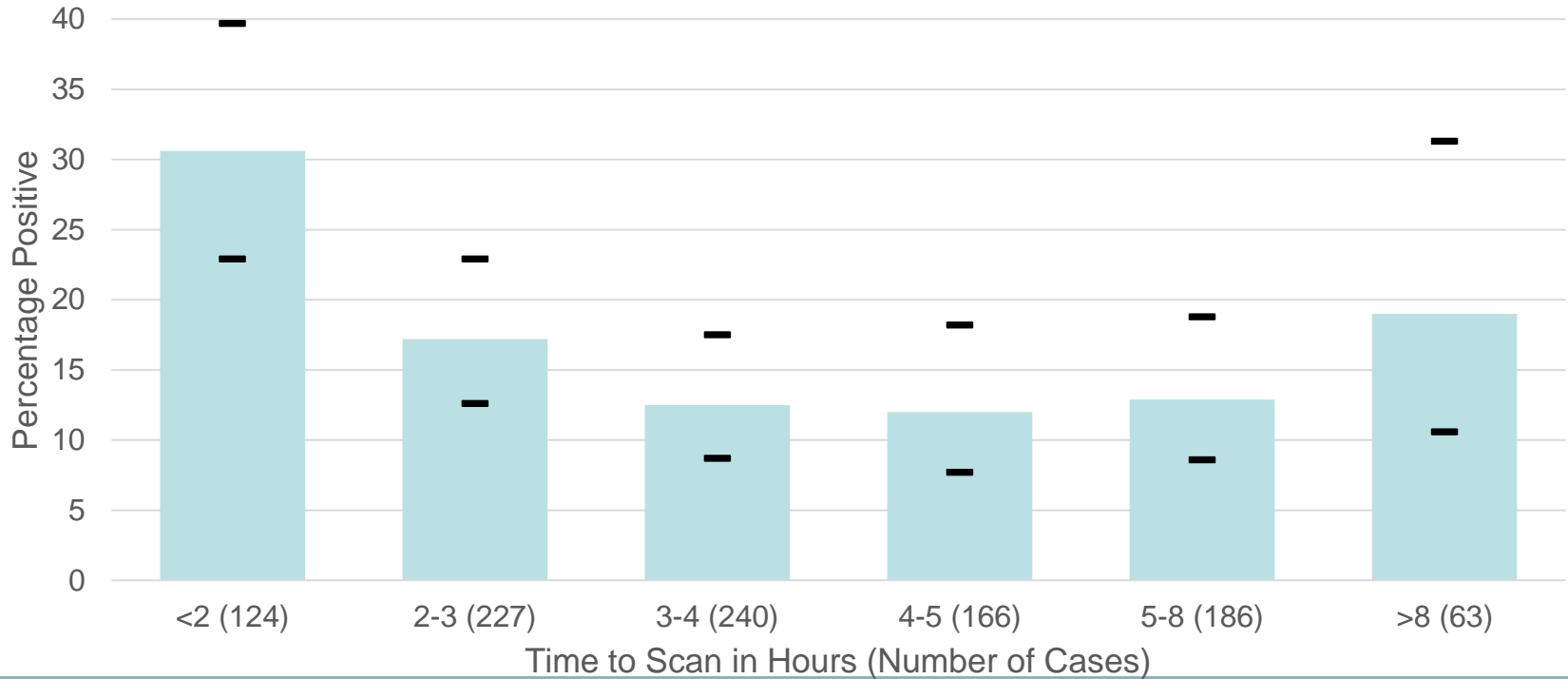
- Time-to-scan was defined as the difference between Time seen by Doctor on ED information system and Time Scan Performed on Radiology Information System
- Scan reports were classified as positive or negative by the previously established criteria (RESPECT-ED)

Results

- 1006 scans of 1414 met inclusion criteria in one year
 - 607 scans were performed from ED
 - 399 from the short stay unit (EMU)
- Overall 163 = 16.2% (95% CI 14.0-18.7) were positive

Results

Positive CTPA by Time to Scan



Discussion

- CHHS ED appears to be normal for Australia in CTPA
 - 16.3% not far from the RESPECT-ED average (14.6%)
 - Confidence intervals within the range of the target (15.3%)
- Falling positive rate with time to scan is a new finding
 - Early fall probably due to high/low risk dichotomy with further test
 - But still only 31% positive in the highest risk group
- Possible increase rate >8 hr might be EMU senior review
- Anecdotal “late scans always negative” disproven

Limitations

- Single site retrospective study
- Time to scan is a proxy for time to scan ordered
 - Data exists but much harder to obtain
- Ideal to know who ordered the scan but this would require a PhD in interpreting doctor's writing (or thoughts)

Conclusions

- Positive CTPA rate in CHHS ED normal for Australia
- New finding of decreasing positive rate with time in ED
- Further research is required to find if this effect is due to
 - faster scans in the critically ill
 - delays for other tests in low risk patients
 - influence of inpatient units on ordering of scans
- Positive rate does not fall to zero even after 8 hours

