

# Abstract

CTPA scans are the most readily available and most utilised of all specialist radiological imaging techniques in the investigation of PE. Given the non-specific presentation of patients, the yield values are relatively low. Studies found a variation in yields from 10% to 20% in some imaging centres. CTPA examinations are time-consuming and incur a high dose of ionising radiation to patients, as well as the administration of a potentially nephrotoxic contrast.

Literature notes that the utilisation of CDS is more beneficial than no CDS by providing vital information and reducing the requisition of inappropriate examinations. Ideally, a CDS system will incorporate patient-specific data from a central patient record without requiring the ordering physician to fetch the data themselves. The system should encourage best practice and provide feedback and targeted education to system users.

As the frequency of radiology ordering increases, the requirement to limit inappropriate ordering is critical. The study will evaluate the potential of CDS systems in reducing inappropriate ordering of radiology examinations, in particular, CTPA studies

The main objective of the study is to answer the research question *'Has the use of CDS improved the appropriateness of radiology ordering of CTPA examinations for the diagnosis of PE?'* The results will primarily focus on the yield.

An evaluation of 860 individual CTPA examinations was performed over the course of 10 selected months pre and post-CDS. The selected study months span 48 months surrounding the date of CDS implementation – November 2013. The presence of PE was assessed for each individual CTPA examination included in the study. This allowed for the calculation of yield as well as Z-scores to determine a statistical significance value. The findings were sub-divided into all patients, all IP locations, all

ED patient locations as well as regular intervals around November 2013 for a thorough evaluation of findings.

The results provided displayed an overall tortuous variance of yield values over the course of the study. Overall, the yield values were found to decline from 18.09% (n=72) pre-CDS to 16.67% (n=77) post-CDS. This represents a statistically insignificant decrease of 1.42% post-CDS,

Overall, the study provided a thorough knowledge of CDS systems, including their successes, faults and areas for improvement. Recommendations are made and further system evaluations are required to understand fully the potential of CDS system usage. Whilst the findings of the CDS implementation were not found to be statistically significant in this case, it did allow for the inclusion of critical information on CTPA orders at the time of ordering. This allows for a real-time evaluation of requests to determine their suitability based on the pertinent information provided. This high quality data is imperative to patient care.