

Title: CT Pulmonary Angiography Audit

Background:

- The mean attenuation of acute and chronic thrombus in the pulmonary arterial system is 33 Hounsfield Units (HU) and 87HU respectively
- To detect 99.75% of all thrombi, attenuation of thrombi can be equal to the mean +3 standard deviations, as such:
- Published theoretical minimum attenuation of blood in the pulmonary arterial (PA) system required to identify nearly all acute and chronic PE are of 93HU and 211HU respectively (Wittram, 2007); hence a minimum of 211HU
- Prior research suggest up to 10.8% of all CT PAs maybe suboptimal/indeterminate due to multiple causes, with motion artifact and bolus enhancement being the most frequent cited reasons for indeterminism (Jones *et al*, 2005)

Target: No more than 10.8% CT PAs have less than 211 HU enhancement of main pulmonary outflow tract (MPOT).

Methods: All CT PA were identified by their respective title searches in PACS over a 20-day period.

Variable collected:

- Patient Demographics (Patient ID, age, gender)
- Main pulmonary outflow tract (MPOT) enhancement. A circular region of interest was measured in the largest axial image of the main pulmonary artery with a diameter of approximately 50% of the vessel.
- Result: +/- for PE.
- Comment on other quality variables: Motion artifact, body habitus, opacification of distal vessels, timing of contrast
- Evaluate CT protocol(s)

Result analysis/Implement change and re-audit:

How many of the total studies had suboptimal opacification of the MPOT as a cause for indeterminism? Review other variables affecting quality of the studies that did not meet enhancement criteria. Review the CT protocol(s) and devise a plan to implement changes. Perform a re-audit in order to ensure that the changes that have been implemented are in an optimal way to decrease the number of indeterminate studies.

References:

- Wittram C. How I do it: CT pulmonary angiography. *AJR* 2007; 188:1255-1261
- Jones SE, Wittram C. The indeterminate CT pulmonary angiogram: imaging characteristics and patient clinical outcome. *Radiology* 2005; 237: 329-337.
- Wittram C, Maher MM, Halpern E, Shepard JO. Hounsfield unit values of acute and chronic pulmonary emboli. *Radiology* 2005; 235; 1050-1054.

Supplement:
Table for data collection

	PATIENT IDENTIFIER (Patient ID/Acct #/Req #)	Patient age	Gender (M/F)	Hounsfield Units of MPOT	Quality Comment	PE Diagnosis (+/-)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						