Basic Facts
*Incidence of pulmonary embolism (PE) is estimated to be approximately one in 1000 patients, with an annual mortality of 300,000.
* Mortality rate of untreated PE is as high as 30%, - with treatment can be reduced to 1%.
*75% of patients who develop thromboembolic disease have at least one established risk factor.
*Sizable and symptoms of PE can be non-specific - thus a high degree of clinical suspicion required.

Imaging Studies in PE Diagnosis
There’s no free lunch:
Potential adverse events of CTA
* Increased risk of cancer secondary to radiation exposure, 
* Contrast induced nephropathy
* Anaphylactic reactions, 
* Identification of small lesion(s) that require further work-up (the so-called incidentaloma); 
* Pregnant woman: both mother and fetus are at risk from exposure to radiation.

Radiation Exposure during CTA
* Radiation exposure during CTA is approximately 7 mGy

CTA Correlation with Wells Score
* Only 1 (one) of 34 patients with low Wells Score had CTA with a high probability for PE.
* Only 13 of 12 patients with intermediate Wells Score had CTA with a high probability for PE.
* 33 of 34 patients with low Wells Score (97%) and 9 of 12 patients with intermediate Wells Score (75%) CTA was not suggestive for PE (p=0.007).

Material and Methods
* Study consisted of retrospective chart review of records from January 1, 2008 to December 31, 2008, however, adequate sample size was achieved with chart review through February 2008.
* Adult patients (18 to 89 years of age) evaluated in the Emergency Department or admitted for less than seven days who were evaluated for possible pulmonary embolism.
* Review of physician documentation of the patient’s probability of having a pulmonary embolism or documentation of factors that can be used to determine pre-test probability on the same date that CTA was ordered.
* Authorization from AMC IRB was obtained, and confidentiality maintained.

Results: Is Wells Score Being Used?
*53 consecutive patients were evaluated in the Emergency Department for suspected embolism.
* In only 2 (3.7%) Wells score was calculated prior to CV angiography.
* CT angiography was requested in: 
  - 21 (40%) patients for chest pain and dyspnea evaluation,
  - 14 (26%) with dyspnea.
* Increased Wells Score was highly predictive of high probability of PE on CTA.
* Positive diagnostic yield of CTA in patients evaluated for PE was 15%.

Determining Pre-test Probability of PE
* Due to the risks, costs, and time burden of spiral CTA, it is important to first determine the patient’s pre-test probability of having a PE.

Calculating Wells Score can have:
* Profound cost savings.
* Excellent negative predictive value.
* May avoid unnecessary radiation exposure.


costs of PE Dx Using CTA With or Without Wells Score (with CTA charges of $2,745.50 per study)

Pulmonary Embolism Diagnosis - Theory and Practice of Pulmonary Embolism Diagnosis At A Large Urban Medical Center
Utilization and Potential Impact of Wells Score Application

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CTA Chest = $2,745.50 + 9.6% NYS surcharge.

CTA C/A/P = $6,119.50 - 9.6% NYS surcharge.

REFERENCE: