

Experience in the use of ACR Appropriateness Criteria for pulmonary embolism CT utilization by the Emergency Room in a community teaching hospital

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Disclosure

- None

Purpose

- Providing evidence-based guidelines to collaborate with the ER physicians to guide appropriate imaging for patients with suspected PE.

Materials/Methods

- The guidelines are based on American College of Radiology Appropriateness criteria, and American College of Emergency Physicians Choosing Wisely Initiative point 7.
- We utilized evidence-based ACR appropriateness criteria to evaluate the rate of appropriate vs inappropriate exams being ordered for CT Chest Pulmonary Embolism protocol study.
- The data presented to the ER physicians as an educational format.

Materials/Methods

- A retrospective study was performed which included a total 110 consecutive CT chest pulmonary protocol studies ordered by the ER between 6/1/2015 and 8/6/2015 at Saint Vincent Hospital.
- Medical records were reviewed with special attention to the clinical presentation, suspicion of PE, D- dimer testing, and differential diagnosis documented.
- Modified Wells score for pulmonary embolism used to evaluate each case.

Materials/Methods

- According to ACR appropriateness criteria:
 - 1) CT chest PE protocol is given 9 points (usually appropriate) with high clinical suspicion of PE (Wells score >4) or with positive D-dimer even with low clinical suspicion of PE (Wells ≤ 4).
 - 2) CT chest PE protocol is given 3 points (usually NOT appropriate) with low clinical suspicion (Wells ≤ 4).
 - 3) CT chest PE protocol is given 1 point (usually NOT appropriate) with low clinical suspicion (Wells ≤ 4) and negative D-dimer.

Results

- Total of 110 PE CT chest studies reviewed.
- Clinical suspicion for PE was appropriately documented in 59 cases (54%, considered appropriate)
- No appropriate differential diagnosis with clinical suspicion for PE documented in 34 cases (31%), however benefit of doubt provided that PE is being considered by chart data.

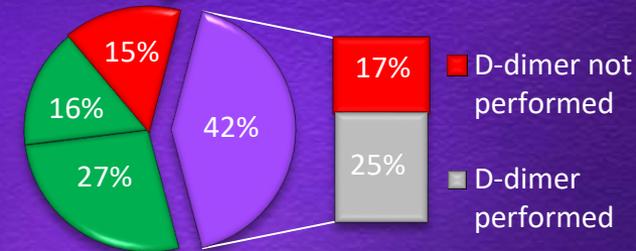
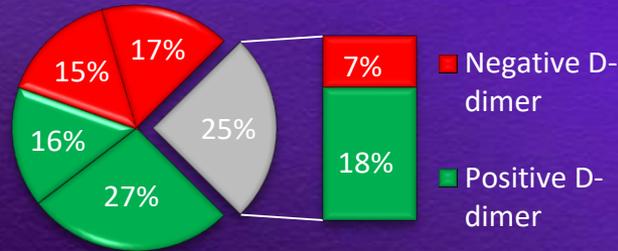
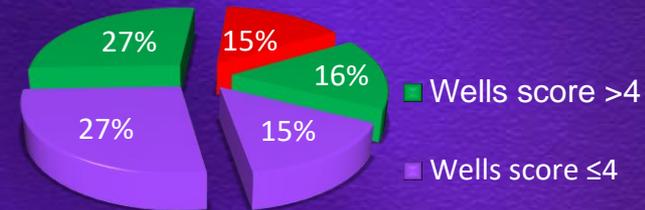
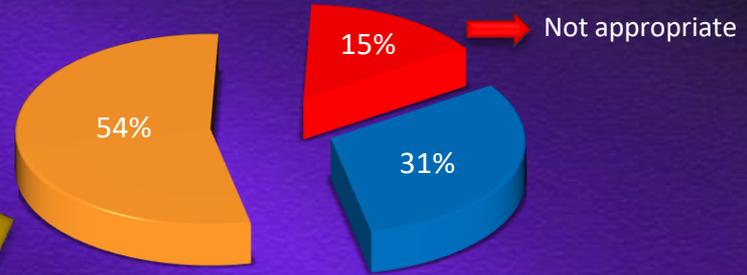
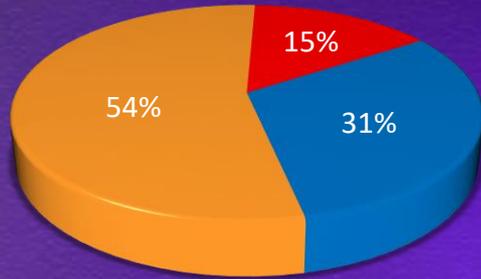
Results

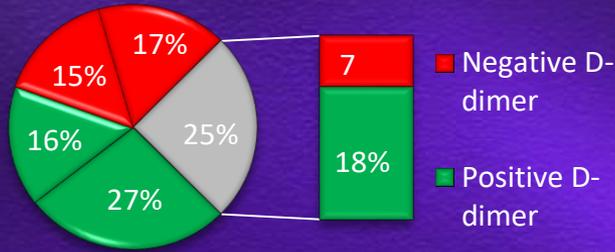
- There was no clinical suspicion for PE in the differential diagnosis in 17 cases (15% considered inappropriate).
- 19 cases with low clinical suspicion who should have had a D-dimer, however it was not performed. These represent 17% of potentially avoidable studies.

Results

- D-dimer was positive in 44 cases (40 %), negative in 16 cases (15%), and not performed in 50 cases (45%).
- Cases with positive D-dimer (40%) are considered appropriate regardless of the clinical suspicion, which was not always clear.
- Cases with negative D-dimer and low suspicion are considered not appropriate.
- Out of the 50 cases with no D-dimer, 31 cases have appropriate clinical suspicion documented.

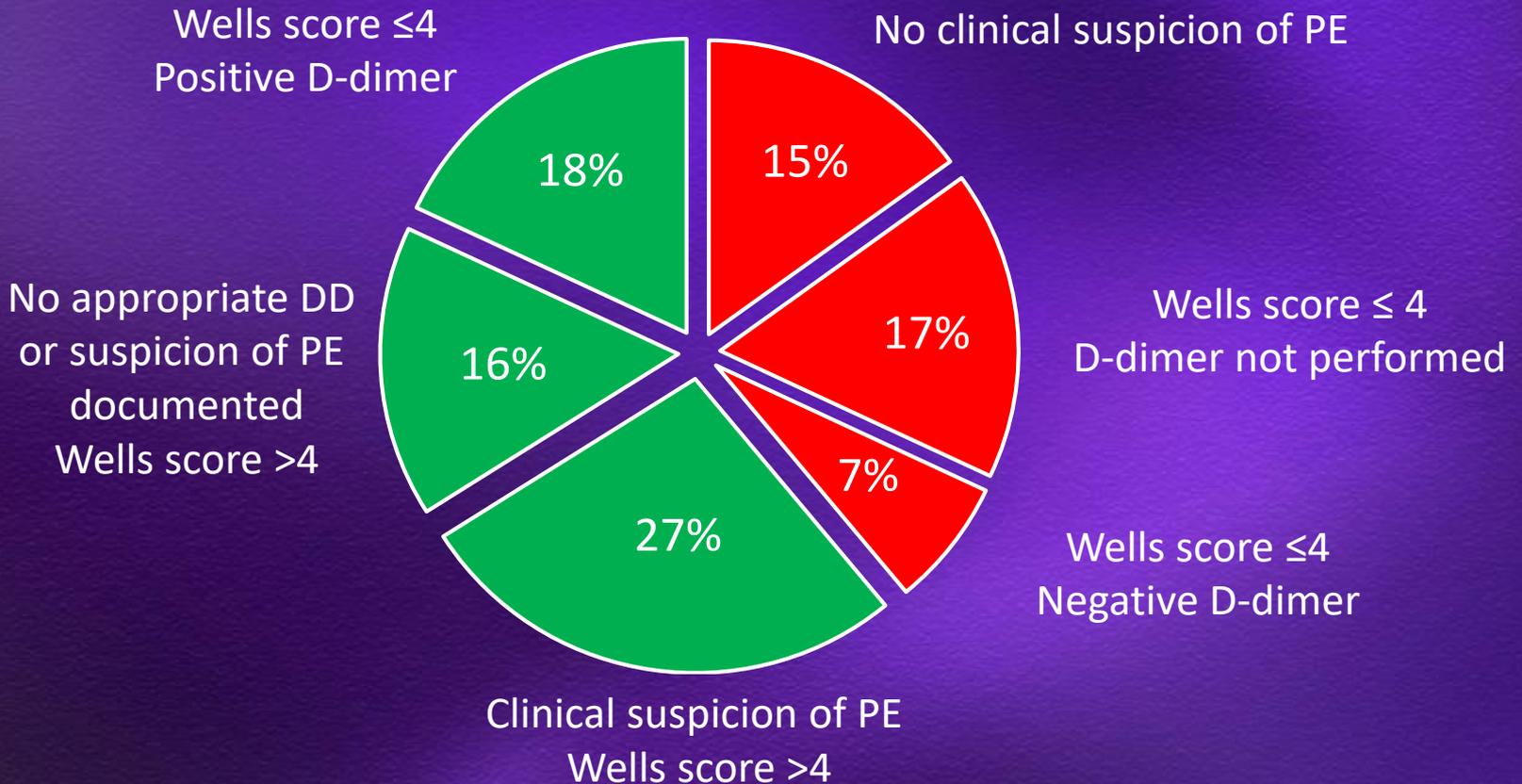
- Clinical suspicion for PE appropriately documented
- No clinical suspicion of PE
- No appropriate differential diagnosis or suspicion for PE (benefit of doubt given that PE is considered)





Appropriate

Not appropriate



Conclusion

- Based on ACR appropriateness criteria and ACEP Choose Wisely Initiative, a simplified algorithm was proposed to assist ER physician in ordering appropriate studies in patients with suspected pulmonary embolism with multiple areas of potential improvement in the existing practice, including:
 - 1) Proper documentation of clinical suspicion of PE and alternative diagnoses.
 - 2) Emphasizing the use of scoring criteria (Wells score) to guide appropriate imaging ordering.

Conclusion

- 3) Using D dimer to help guiding appropriate imaging ordering, , especially in patients with low Wells score ≤ 4 .
- 4) Encouraging the use of alternative imaging such as CT chest without contrast, or contrast enhanced CT chest, particularly when alternative diagnosis is a consideration.

Signs and Symptoms suggestive of PE

Document the Clinical Suspicion of PE

List Alternative Diagnosis if applicable

Modified Wells
(Please document in the patient's chart)

$MW \leq 4$

$MW > 4$

D dimer

CT PE Protocol

Negative

Positive

Negative

Positive

Consider alternative
diagnosis & imaging
(C-/C+ CT Chest)

Stop

Risk
Evaluation