September 2018

YEARS Criteria May Decrease Need for Imaging to Rule out Pulmonary Embolism

DES PLAINES, IL — It may be possible to safely rule out pulmonary embolism (PE) in patients with low pretest probability (PTP) using a D-dimer adjustment based on the YEARS criteria. That is the finding of a study published in the August 2018 issue of Academic Emergency Medicine (AEM), a journal of the Society for Academic Emergency Medicine (SAEM).

The lead author of the study is Christopher Kabrhel, MD, MPH, an associate professor of surgery at Harvard Medical School and an attending physician in the Department of Emergency Medicine at Massachusetts General Hospital.

In a multicenter study in the Netherlands, the YEARS criteria, which include three questions from the Wells PE score to identify low-PTP patients and a variable D-dimer threshold, was shown to decrease the need for imaging to rule out PE by 14%, with some increase in “missed pulmonary embolism” but no decrease in NPV or negative likelihood ratio in this low-prevalence population.

D-dimer adjustment based on the YEARS criteria appear valid and safe. However, Kabrhel, et al suggest that a simpler model with D-dimer adjustment based on the presence or absence of an alternative diagnosis more likely than pulmonary embolism performs similarly.

Menno Huisman, MD, PhD, professor of medicine in the department of Thrombosis and Hemostasis, Leiden University Medical Center (LUMC), Leiden, The Netherlands, commented:

“The YEARS algorithm may work well in hospitals across the USA, based on this careful study in selected patients presenting with suspected PE, with a very low prevalence of PE, very good negative predictive value, and an absolute reduction in need for CTPA imaging of 14%, thus equaling the percentage seen in the original YEARS study.”

Dr. Huisman’s research at the Department of Thrombosis and Hemostasis, LUMC, is focused on the clinical aspects of venous and arterial thromboembolic disorders, with special interest on the diagnosis and treatment of pulmonary embolism and deep-vein thrombosis.
**About Academic Emergency Medicine**

Academic Emergency Medicine, the monthly journal of Society for Academic Emergency Medicine, features the best in peer-reviewed, cutting-edge original research relevant to the practice and investigation of emergency care. The above study is published open access and can be downloaded by following the DOI link: [https://doi.org/10.1111/acem.13417](https://doi.org/10.1111/acem.13417). Journalists wishing to interview the authors may contact Stacey Roseen at sroseen@saem.org.

**About the Society for Academic Emergency Medicine**

SAEM is a 501(c)(3) not-for-profit organization dedicated to the improvement of care of the acutely ill and injured patient by leading the advancement of academic emergency medicine through education and research, advocacy, and professional development. To learn more, visit saem.org.

**IMAGE: YEARS CRITERIA IN POTENTIAL PE**

CREDIT: KIRSTY CHALLEN, B.SC., MBCHB, MRES, PH.D., LANCASHIRE TEACHING HOSPITALS, UNITED KINGDOM.

### YEARS criteria in potential PE

15-site prospective observational cohort, 1789 patients

Patients >17y with potential PE undergoing objective testing & eligible for d-dimer

Excl: clinical exclusion of PE eg PERC, high pretest probability eg Wells>6, pregnancy, anticoagulation

<table>
<thead>
<tr>
<th>Wells&lt;6 D-dimer&lt;500</th>
<th>YEARS criteria</th>
<th>Alt diag more likely</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="2 PE" /> 940 -ve</td>
<td><img src="image" alt="6 PE" /> Variable D-dimer 1204 -ve 585 +ve</td>
<td><img src="image" alt="6 PE" /> 1237 -ve 552 +ve</td>
</tr>
<tr>
<td>849 +ve 80 PE</td>
<td><img src="image" alt="6 PE" /> Variable D-dimer 1204 -ve 585 +ve</td>
<td><img src="image" alt="6 PE" /> 1237 -ve 552 +ve</td>
</tr>
</tbody>
</table>

**99.8%**

NPV 99.8% (99.2-100)
Sens 97.6 (91.7-99.7)
Spec 55 (52.6-57.4)
PPV 9.7 (7.8-11.8)

**99.5%**

NPV 99.5 (98.9-99.8)
Sens 92.9 (85.1-97.3)
Spec 70.3 (68.7-2.4)
PPV 13.3 (10.7-16.4)

**99.5%**

NPV 99.5 (98.9-99.8)
Sens 92.9 (85.1-97.3)
Spec 72.2 (70-74.3)
PPV 14.1 (11.3-17.3)

YEARS criteria: Clinical signs/symptoms of DVT, haemoptysis, alternative diagnoses less likely than PE
D-dimer threshold: 500mg/dL if YEARS +ve; 1000mg/dL if YEARS -ve

Kabrhel doi 10.1111/acem.13417