Clinical Policy: Suspected Acute Venous Thromboembolic Disease
Presenters

Stephen J. Wolf, MD
Clinical Policy: Critical Issues in the Evaluation and Management of Adult Patients Presenting to the Emergency Department With Suspected Acute Venous Thromboembolic Disease

From the American College of Emergency Physicians Clinical Policies Subcommittee (Writing Committee) on Thromboembolic Disease:

Stephen J. Wolf, MD (Subcommittee Chair; Committee Co-Chair)
Sigrid A. Hahn, MD, MPH
Lauren M. Nentwich, MD
Ali S. Raja, MD, MBA, MPH
Scott M. Silvers, MD
Michael D. Brown, MD, MSc (Committee Co-Chair)
Hierarchy of Evidence

MAs
SRs
RCTs
Cohort studies
Case control studies
Cross sectional surveys
Case studies
Ideas, expert opinion, editorials
Anecdotal

Quality of Information

Value Judgment
Value-Based Evidence

- MAs
- SRs
- RCTs
- Cohort studies
- Case control studies
- Cross sectional surveys
- Case studies
- Ideas, expert opinion, editorials
- Anecdotal

Clinical Practice Guidelines

Value Judgment

Quality of Information
Clinical Policies Committee
IOM Standards for Trustworthiness

- Establishing Transparency
- Management of Conflicts of Interest
- Group Composition
- Systematic Review Intersection
- Evidence Foundations for and Rating Strength of Recommendations
- Articulation of Recommendations
- External Review
- Updating
ACEP’s Process

Topic selection
Subcommittee appointed
Critical questions developed
Literature search & grading
Subcommittee writing
Oversight committee input
Expert review & open comment
Board approval & dissemination
STUDY DESIGN
Based on the type of study (e.g., Design 1, Design 2, or Design 3)

GRADE OF EVIDENCE
Based on the flaws & biases of the study (e.g., Class I, Class II, Class III, or X)

LEVEL OF RECOMENDATION
Based on the systematic review and value judgments (e.g., Level A, Level B, or Level C)

Getting from Point A to B
How trustworthy are ACEP Clinical Policies for imaging recommendations?
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Critical Questions: VTE

Diagnostic Questions

• In adult patients with suspected acute PE, can a clinical prediction rule be used to identify a group of patients at very low risk for the diagnosis of PE for whom no additional diagnostic workup is required?

• In adult patients with low to intermediate pretest probability for acute PE, does a negative age adjusted D-dimer result identify a group of patients at very low risk for the diagnosis of PE for whom no additional diagnostic workup is required?
Critical Questions: VTE

Management Questions

• In adult patients with subsegmental PE, is it safe to withhold anticoagulation?

• In adult patients diagnosed with acute PE, is initiation of anticoagulation and discharge from the ED safe?

• In adult patients diagnosed with acute lower-extremity DVT who are discharged from the ED, is treatment with a NOAC safe and effective compared with treatment with LMWH and VKA?
EMB & Stewardship

Diagnostic Likelihood

- It is not worth to test
- More tests needed to make diagnosis and start treatment
- Diagnosis completed. Start treatment

0%  Test threshold  Treatment threshold  100%  

Testing Threshold for VTE

In consideration of the cost of evaluation, the risk of false positives, and the risk of complications related to testing, studies have supported using a predefined posttest probability threshold of less than 2.0% to exclude the diagnosis of VTE.
Why 2%? My colleagues always say they want to miss the bad stuff less than 1% of the time
Pretest Probability (PTP) × Negative LR

Post-Test Probability (Goal < 2%)
Critical Question

In adult patients with suspected acute PE, can a clinical prediction rule be used to identify a group of patients at very low risk for the diagnosis of PE for whom no additional diagnostic workup is required?

47 identified > 19 graded
4 Class II, 4 Class III, 11 Class X
Pulmonary Embolism Rule-out Criteria (PERC)

1. Age < 50 year
2. Pulse Rate < 100 beats/min
3. SaO2 > 94% (at sea level)
4. No Recent Trauma or Surgery
5. No Unilateral Leg Swelling
6. No Previous PE or DVT
7. No Hormone Use
8. No Hemoptysis
# PERC Performance

## Clinical Policy

## Table 1. PERC performance.

<table>
<thead>
<tr>
<th>Study Cohorts</th>
<th>Class</th>
<th>Probability</th>
<th>N</th>
<th>PE (%)</th>
<th>Pretest Probability</th>
<th>PERC Determination</th>
<th>Sensitivity (95% CI), %</th>
<th>Specificity (95% CI), %</th>
<th>Negative LR (95% CI)</th>
<th>Posttest VTE (%) (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low-Risk Cohorts</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Kline et al&lt;sup&gt;24&lt;/sup&gt;</td>
<td>II</td>
<td>Low</td>
<td>1,427</td>
<td>114 (8)</td>
<td>Prospective</td>
<td>96 (90-99)</td>
<td>27 (25-30)</td>
<td>0.16 (0.07-0.38)</td>
<td>1.4 (0.4-3.2)</td>
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<tr>
<td>Kline et al&lt;sup&gt;26&lt;/sup&gt;</td>
<td>II</td>
<td>Low</td>
<td>5,425</td>
<td>163 (3)</td>
<td>Prospective</td>
<td>97 (96-99)</td>
<td>22 (21-23)</td>
<td>0.12 (0.07-1.19)</td>
<td>1.3 (0.8-1.9)</td>
<td></td>
</tr>
<tr>
<td>Hugli et al&lt;sup&gt;27&lt;/sup&gt;</td>
<td>II</td>
<td>Low</td>
<td>587</td>
<td>57 (10)</td>
<td>Retrospective</td>
<td>79 (67-88)</td>
<td>33 (29-37)</td>
<td>0.63 (0.04-1.06)</td>
<td>6.4 (3.7-6.8)</td>
<td></td>
</tr>
<tr>
<td>Wolf et al&lt;sup&gt;31&lt;/sup&gt;</td>
<td>III</td>
<td>Low</td>
<td>60</td>
<td>1 (2)</td>
<td>Retrospective</td>
<td>100 (25-100)</td>
<td>22 (12-35)</td>
<td>0 (*)</td>
<td>0 (0-24.7)</td>
<td></td>
</tr>
<tr>
<td>Penaloza et al&lt;sup&gt;30&lt;/sup&gt;</td>
<td>III</td>
<td>Low</td>
<td>399</td>
<td>26 (7)</td>
<td>Retrospective</td>
<td>100 (99-100)</td>
<td>9 (6-11)</td>
<td>0 (*)</td>
<td>0 (0-5)</td>
<td></td>
</tr>
<tr>
<td><strong>Undifferentiated-Risk Cohorts</strong></td>
<td></td>
<td></td>
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<tr>
<td>Kline et al&lt;sup&gt;26&lt;/sup&gt;</td>
<td>II</td>
<td>All</td>
<td>8,138</td>
<td>561 (7)</td>
<td>Prospective</td>
<td>96 (94-97)</td>
<td>25 (24-26)</td>
<td>0.17 (0.11-0.25)</td>
<td>1.0 (0.6-1.6)</td>
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<td>Hugli et al&lt;sup&gt;27&lt;/sup&gt;</td>
<td>II</td>
<td>All</td>
<td>1,675</td>
<td>357 (21)</td>
<td>Retrospective</td>
<td>97 (94-98)</td>
<td>16 (14-18)</td>
<td>0.21 (0.12-0.37)</td>
<td>5.4 (3.1-9.3)</td>
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<tr>
<td>Wolf et al&lt;sup&gt;31&lt;/sup&gt;</td>
<td>III</td>
<td>All</td>
<td>120</td>
<td>16 (12)</td>
<td>Retrospective</td>
<td>100 (79-100)</td>
<td>16 (10-24)</td>
<td>0 (*)</td>
<td>0 (0-17.6)</td>
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<tr>
<td>Crichlow et al&lt;sup&gt;29&lt;/sup&gt;</td>
<td>III</td>
<td>All</td>
<td>152</td>
<td>18 (12)</td>
<td>Prospective</td>
<td>100 (78-100)</td>
<td>10 (6-17)</td>
<td>0 (*)</td>
<td>0 (0-23.2)</td>
<td></td>
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<tr>
<td>Penaloza et al&lt;sup&gt;30&lt;/sup&gt;</td>
<td>III</td>
<td>All</td>
<td>959</td>
<td>286 (30)</td>
<td>Retrospective</td>
<td>99 (97-100)</td>
<td>10 (8-13)</td>
<td>0.13 (0.05-0.36)</td>
<td>5.4 (1.7-12.5)</td>
<td></td>
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<tr>
<td>Bozarth et al&lt;sup&gt;28&lt;/sup&gt;</td>
<td>III</td>
<td>All</td>
<td>719</td>
<td>32 (5)</td>
<td>Retrospective</td>
<td>97 (94-100)</td>
<td>12 (10-15)</td>
<td>0.26 (0.04-1.82)</td>
<td>1.2 (0-6.5)</td>
<td></td>
</tr>
</tbody>
</table>

CI, confidence interval; LR, likelihood ratio; PE, pulmonary embolism; PERC, pulmonary embolism rule-out criteria; VTE, venous thromboembolism; *Undefined given 100% sensitivity
Critical Question

In adult patients with suspected acute PE, can a clinical prediction rule be used to identify a group of patients at very low risk for the diagnosis of PE for whom no additional diagnostic workup is required?

Level B Recommendation

For patients who are at low risk for acute PE, use the PERC to exclude the diagnosis without further diagnostic testing.
Clinical prediction rules are easy to misapply – where do you see cracks in the evidence translation?
Critical Question

In adult patients with low to intermediate pretest probability for acute PE, does a negative age-adjusted D-dimer result identify a group of patients at very low risk for the diagnosis of PE for whom no additional diagnostic workup is required?

59 identified > 42 graded
3 Class II, 7 Class III, 32 Class X
Age-Adjusted D-Dimer Goal

Improve diagnostic efficiency
Reduce unnecessary testing
Reduce test-related complications
Steward health care resources
Age-Adjusted D-Dimer

Important note
D-dimer assays are reported as either the concentration of DDU or as FEU, depending on the calibration for the assay. The 2 numeric values are easily convertible because the mass of one FEU equals approximately half of one DDU (ie, 1 FEU = 2DDU).

Strategies:
Fixed age-adjusted cutoff
Incremental age-adjusted cutoff
Table 2. D-dimer performance in VTE patients older than 50 years using a CDD versus AADD.

<table>
<thead>
<tr>
<th>Study</th>
<th>Class</th>
<th>CPR</th>
<th>PTP</th>
<th>AADD cutoff (µg/L)</th>
<th>CDD Sensitivity (%; 95% CI)</th>
<th>AADD Sensitivity (%; 95% CI)</th>
<th>AADD Miss Rate (1%; 95% CI)</th>
<th>AADD Miss Rate (1%; 95% CI)</th>
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<td>Righini et al&lt;sup&gt;43&lt;/sup&gt;</td>
<td>II</td>
<td>sRGS or Wells</td>
<td>Non-high or unlikely</td>
<td>Age × 10&lt;sup&gt;†&lt;/sup&gt;</td>
<td>NR</td>
<td>NR</td>
<td>1/810 (0.1; 0.7)</td>
<td>2/1,141 (0.2; 0.6)</td>
<td>28 (27-30)</td>
<td>40 (38-42)</td>
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<td>Flores et al&lt;sup&gt;45&lt;/sup&gt;</td>
<td>II</td>
<td>Wells</td>
<td>Non-high</td>
<td>Age × 10&lt;sup&gt;†&lt;/sup&gt;</td>
<td>100 (94-100)</td>
<td>100 (94-100)</td>
<td>0/92 (0; 3.9)</td>
<td>0/121 (0; 3.0)</td>
<td>28 (23-33)</td>
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<td>Gupta et al&lt;sup&gt;49&lt;/sup&gt;</td>
<td>II</td>
<td>Wells</td>
<td>Any</td>
<td>Age × 10&lt;sup&gt;†&lt;/sup&gt;</td>
<td>100 (94-100)</td>
<td>97 (90-100)</td>
<td>0/72 (0; 5.0)</td>
<td>2/165 (1.2; 0.1-4.3)</td>
<td>7 (4.1-14)</td>
<td>16 (4.1-19)</td>
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<td>Friz et al&lt;sup&gt;50&lt;/sup&gt;</td>
<td>II</td>
<td>Wells</td>
<td>Any</td>
<td>Age × 10&lt;sup&gt;†&lt;/sup&gt;</td>
<td>100 (97-100)</td>
<td>98 (94-100)</td>
<td>0/8 (0; 0.3-6.9)</td>
<td>2/28 (7.1; 0.9-23.5)</td>
<td>2 (1.3)</td>
<td>6 (1.3)</td>
</tr>
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<td>Jaconelli et al&lt;sup&gt;52&lt;/sup&gt;</td>
<td>II</td>
<td>Wells</td>
<td>Unlikely</td>
<td>Age × 5&lt;sup&gt;†&lt;/sup&gt;</td>
<td>95 (86-99)</td>
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<td>3/859 (0.3; 1.0-1.0)</td>
<td>3/989 (0.3; 0.1-0.9)</td>
<td>65 (62-68)</td>
<td>75 (62-77)</td>
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<td>Sharp et al&lt;sup&gt;48&lt;/sup&gt;</td>
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<td>Age × 10&lt;sup&gt;†&lt;/sup&gt;</td>
<td>98 (96-99)</td>
<td>93 (90-95)</td>
<td>10/16,660 (0.1; 0.1)</td>
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<td>54 (53-54)</td>
<td>63 (62-64)</td>
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<td>II</td>
<td>Wells</td>
<td>Unlikely</td>
<td>Age × 10&lt;sup&gt;†&lt;/sup&gt;</td>
<td>NR</td>
<td>NR</td>
<td>2/983 (0.2; 0.1-0.7)</td>
<td>7/1,093 (0.6; 0.3-1.3)</td>
<td>46 (43-48)</td>
<td>51 (49-53)</td>
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<td>Douma et al&lt;sup&gt;56&lt;/sup&gt;</td>
<td>II</td>
<td>RGS</td>
<td>Non-high</td>
<td>Age × 10&lt;sup&gt;†&lt;/sup&gt;</td>
<td>NR</td>
<td>NR</td>
<td>0/561 (0; 0.0-0.7)</td>
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<td>NR</td>
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<td>1,000&lt;sup&gt;†&lt;/sup&gt;</td>
<td>98 (96-99)</td>
<td>84 (81-87)</td>
<td>10/16,660 (0.1; 0.0-0.1)</td>
<td>80/23,146 (0.3; 0.3-0.4)</td>
<td>54 (53-54)</td>
<td>74 (74-75)</td>
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<td>Friz et al&lt;sup&gt;50&lt;/sup&gt;</td>
<td>III</td>
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<td>1,000&lt;sup&gt;†&lt;/sup&gt;</td>
<td>100 (97-100)</td>
<td>96 (91-99)</td>
<td>0/8 (0; 0.3-6.9)</td>
<td>4/61 (6.6; 1.8-15.9)</td>
<td>2 (1.3)</td>
<td>13 (10-16)</td>
</tr>
<tr>
<td>Kline et al&lt;sup&gt;44&lt;/sup&gt;</td>
<td>II</td>
<td>sRGS or Wells</td>
<td>Any</td>
<td>1,000&lt;sup&gt;†&lt;/sup&gt;</td>
<td>94 (88-97)</td>
<td>92 (86-96)</td>
<td>8/152 (5.3; 2.10-1)</td>
<td>10/185 (5.4; 2.6-9.7)</td>
<td>22 (19-26)</td>
<td>27 (24-31)</td>
</tr>
</tbody>
</table>

AADD, age-adjusted D-dimer; CDD, conventional D-dimer; CI, confidence interval; CPR, clinical prediction rule; NR, not reported; PTP, pretest probability; RGS, revised Geneva score; sRGS, simplified revised Geneva score.

*Multiple CPRs were used; for simplicity, only results for Wells are presented.

<sup>†</sup>D-dimer value reported in FEUs.

<sup>‡</sup>D-dimer value reported in DDUs.

<sup>§</sup>Applied AADD to patients older than 70 years.
Table 2. D-dimer performance in VTE patients older than 50 years using a CDD versus AADD.

| Study          | Class       | CPR          | PTP          | AADD cutoff (μg/L) | CDD Sensitivity (% 95% CI) | CDD Miss Rate (% 95% CI) | AADD Sensitivity (% 95% CI) | AADD Miss Rate (% 95% CI) | % Cohort With Negative CDD (% 95% CI) | % Cohort With Negative AADD (% 95% CI) |
|----------------|-------------|--------------|--------------|-------------------|---------------------------|--------------------------|---------------------------|---------------------------|--------------------------------*******|--------------------------------*******|
| Righini et al[^4,6] | II          | sRGS or Wells | Non-high or unlikely | Age x 10[^†] | NR  | NR | 2/1,141 (0.2; 0.6-0.6) | 28 (27-30) | 40 (38-42) |
| Flores et al[^45] | II          | Wells | Non-high | Age x 10[^†] | 100 (94-100) | 0/92 (0; 3.9) | 0/121 (0; 3.0) | 28 (23-33) | 37 (32-42) |
| van Es et al[^44] | II          | Wells | Unlikely | Age x 10[^†] | 99 (99-100) | 13/2,035 (0.7; 0.4-1.1) | 22/2,369 (0.9; 0.6-1.5) | 28 | 33 (25-42) |
| van Es et al[^47,48] | III         | Wells | Unlikely | Age x 10[^†] | NR  | NR | 1/60 (1.7; 0.8-9) | 2/92 (2.2; 0.7-6) | 15 (11-18) | 22 (18-26) |
| Gupta et al[^49] | III         | NR | Any | Age x 10[^†] | 100 (94-100) | 0/72 (0; 0.5-0) | 2/165 (1.2; 0.1-1.3) | 7 | 16 (14-19) |
| Friz et al[^50] | III         | NR | Any | Age x 10[^†] | 100 (97-100) | 0/8 (0; 0.36-9) | 2/28 (7.1; 0.9-23.5) | 2 | 6 (4-8) |
| Jaconelli et al[^52] | III         | Wells | Unlikely | Age x 5[^†] | 95 (86-99) | 3/859 (0.3; 0.1-1.0) | 3/989 (0.3; 0.1-0.9) | 65 | 75 (72-77) |
| Sharp et al[^48] | III         | NR | Any | Age x 10[^†] | 98 (96-99) | 10/16,660 (0.1; 0.0-1) | 36/19,584 (0.2; 0.1-0.3) | 54 | 63 (62-64) |
| Douma et al[^46] | III         | Wells | Unlikely | Age x 10[^†] | NR  | NR | 2/983 (0.2; 0.1-0.7) | 7/1,093 (0.6; 0.3-1.3) | 46 (43-48) | 51 (49-53) |
| Douma et al[^46] | III         | RGS | Non-high | Age x 10[^†] | NR  | NR | 0/561 (0; 0.0-0.7) | 2/663 (0.3; 0.1-1.1) | 34 (32-37) | 40 (38-43) |

AADD, age-adjusted D-dimer; CDD, conventional D-dimer; CI, confidence interval; CPR, clinical prediction rule; NR, not reported; PTP, pretest probability; RGS, revised Geneva score; sRGS, simplified revised Geneva score.

[^†]: Multiple CPRs were used; for simplicity, only results for Wells are presented.

[^1]: D-dimer value reported in FELs.

[^2]: D-dimer value reported in DDUs.

[^3]: Applied AADD to patients older than 70 years.
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<th>Study</th>
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<td>Righini et al(^{43a})</td>
<td>II</td>
<td>sRGS or Wells</td>
<td>Non-high or unlikely</td>
<td>Age (\times 10^1)</td>
<td>NR</td>
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<td>Unlikely</td>
<td>Age (\times 10^1)</td>
<td>NR</td>
<td>NR</td>
<td>1/60 (1.7; 8.9)</td>
<td>2/92 (2.2; 0.7-6)</td>
<td>15 (11-18)</td>
<td>22 (18-26)</td>
</tr>
<tr>
<td>Gupta et al(^{49})</td>
<td>III</td>
<td>NR</td>
<td>Any</td>
<td>Age (\times 10^1)</td>
<td>100 (94-100)</td>
<td>97 (90-100)</td>
<td>0/72 (0; 0.5)</td>
<td>2/165 (1.2; 0.1-4.3)</td>
<td>7 (4-19)</td>
<td>16 (14-19)</td>
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<tr>
<td>Friz et al(^{50})</td>
<td>III</td>
<td>NR</td>
<td>Any</td>
<td>Age (\times 10^1)</td>
<td>100 (97-100)</td>
<td>98 (94-100)</td>
<td>0/8 (0; 0.3-6.9)</td>
<td>2/28 (7.1; 0.9-23.5)</td>
<td>2 (1.3)</td>
<td>6 (1-4)</td>
</tr>
<tr>
<td>Jaconelli et al(^{52})</td>
<td>III</td>
<td>Wells</td>
<td>Unlikely</td>
<td>Age (\times 5^1)</td>
<td>95 (86-99)</td>
<td>95 (86-99)</td>
<td>3/859 (0.3; 0.1-1.0)</td>
<td>3/989 (0.3; 0.1-0.9)</td>
<td>65 (62-68)</td>
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</tr>
<tr>
<td>Sharp et al(^{48})</td>
<td>III</td>
<td>NR</td>
<td>Any</td>
<td>Age (\times 10^1)</td>
<td>98 (96-99)</td>
<td>93 (90-95)</td>
<td>10/16,660 (0.1; 0.0-1)</td>
<td>36/19,584 (0.2; 0.1-0.3)</td>
<td>54 (53-54)</td>
<td>63 (62-64)</td>
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<tr>
<td>Douma et al(^{46})</td>
<td>III</td>
<td>Wells</td>
<td>Unlikely</td>
<td>Age (\times 10^1)</td>
<td>NR</td>
<td>NR</td>
<td>2/983 (0.2; 0.1-0.7)</td>
<td>7/1,093 (0.6; 0.3-1.3)</td>
<td>46 (43-48)</td>
<td>51 (49-53)</td>
</tr>
<tr>
<td>Douma et al(^{46})</td>
<td>III</td>
<td>RGS</td>
<td>Non-high</td>
<td>Age (\times 10^1)</td>
<td>NR</td>
<td>NR</td>
<td>0/561 (0; 0.0-0.7)</td>
<td>2/663 (0.3; 0.1-1.1)</td>
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<td>54 (53-54)</td>
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<td>Friz et al(^{50})</td>
<td>III</td>
<td>NR</td>
<td>Any</td>
<td>1,000 (^{1})</td>
<td>100 (97-100)</td>
<td>96 (91-99)</td>
<td>0/8 (0; 0.3-6.9)</td>
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<td>2 (1-3)</td>
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</tr>
<tr>
<td>Kline et al(^{54+a})</td>
<td>III</td>
<td>sRGS or Wells</td>
<td>Any</td>
<td>1,000 (^{1})</td>
<td>94 (88-97)</td>
<td>92 (86-96)</td>
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</tbody>
</table>

AADD, age-adjusted D-dimer; CDD, conventional D-dimer; CI, confidence interval; CPR, clinical prediction rule; NR, not reported; PTP, pretest probability; RGS, revised Geneva score; sRGS, simplified revised Geneva score.

*Multiple CPRs were used; for simplicity, only results for Wells are presented.

\(^{1}\)D-dimer value reported in FELs.

\(^{2}\)D-dimer value reported in DDIUs.

\(^{3}\)Applied AADD to patients older than 70 years.
<table>
<thead>
<tr>
<th>Study</th>
<th>Class</th>
<th>CPR</th>
<th>PTP</th>
<th>AADD cutoff (μg/L)</th>
<th>AADD Sensitivity (95% CI)</th>
<th>CDD Sensitivity (95% CI)</th>
<th>CDD Miss Rate (95% CI)</th>
<th>AADD Miss Rate (95% CI)</th>
<th>% Cohort With Negative CDD (95% CI)</th>
<th>% Cohort With Negative AADD (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Righini et al&lt;sup&gt;43&lt;/sup&gt;</td>
<td>II</td>
<td>sRGS or Wells</td>
<td>Non-high or unlikely</td>
<td>Age × 10&lt;sup&gt;1&lt;/sup&gt;</td>
<td>NR</td>
<td>NR</td>
<td>1/810 (0.1; 0.7)</td>
<td>2/1,141 (0.2; 0.6)</td>
<td>28 (27-30)</td>
<td>40 (38-42)</td>
</tr>
<tr>
<td>Flores et al&lt;sup&gt;45&lt;/sup&gt;</td>
<td>II</td>
<td>Wells</td>
<td>Non-high</td>
<td>Age × 10&lt;sup&gt;1&lt;/sup&gt;</td>
<td>100 (94-100)</td>
<td>100 (94-100)</td>
<td>0/92 (0; 0-3.9)</td>
<td>0/121 (0; 0.3-0)</td>
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<td>37 (32-42)</td>
</tr>
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<td>II</td>
<td>Wells</td>
<td>Unlikely</td>
<td>Age × 10&lt;sup&gt;1&lt;/sup&gt;</td>
<td>99 (99-100)</td>
<td>99 (98-99)</td>
<td>13/2,035 (0.7; 0.4-1.1)</td>
<td>22/2,369 (0.9; 0.6-1.5)</td>
<td>28 (21-37)</td>
<td>33 (25-42)</td>
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*Multiple CPRs were used; for simplicity, only results for Wells are presented.

<sup>1</sup>D-dimer value reported in FEIs.

<sup>2</sup>D-dimer value reported in DDUs.

<sup>3</sup>Applied AADD to patients older than 70 years.
Critical Question

In adult patients with low to intermediate pretest probability for acute PE, does a negative age adjusted D-dimer result identify a group of patients at very low risk for the diagnosis of PE for whom no additional diagnostic workup is required?

Level B Recommendation

In patients older than 50 years deemed to be low or intermediate risk for acute PE, clinicians may use a negative age-adjusted D-dimer result to exclude the diagnosis of PE.
In your opinion, does the research suggest D-Dimer testing increases or decreases CT imaging use?
Clinical Policy: Critical Issues in the Evaluation and Management of Adult Patients Presenting to the Emergency Department With Suspected Acute Venous Thromboembolic Disease

From the American College of Emergency Physicians Clinical Policies Subcommittee (Writing Committee) on Thromboembolic Disease:
Stephen J. Wolf, MD (Subcommittee Chair; Committee Co-Chair)
Sigrid A. Hahn, MD, MPH
Lauren M. Nentwich, MD
Ali S. Raja, MD, MBA, MPH
Scott M. Silvers, MD
Michael D. Brown, MD, MSc (Committee Co-Chair)
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