# Age-adjusted D-dimer cut-off levels to rule out pulmonary embolism: a prospective outcome study.

No registrations found.

| | |
|---|---|
| **Ethical review** | Not applicable |
| **Status** | Pending |
| **Health condition type** | - |
| **Study type** | Interventional |

## Summary

### ID

NL-OMON27990

**Source**
NTR

**Health condition**

pulmonary embolism, D-dimer test, diagnosis, efficacy, elderly

### Sponsors and support

**Primary sponsor:** Academic Medical Center in collaboration with centers in The Netherlands, France, Switzerland and Belgium

### Intervention

### Outcome measures

**Primary outcome**

The number of thromboembolic events in the 3-month follow-up period in patients not anticoagulated on the basis of:

1. A non high clinical probability (simplified revised Geneva score) and a normal new age adjusted D-dimer cut-off, or;

2. A PE considered as "unlikely" (simplified wells score) and a normal new age adjusted D-dimer cut-off.

**Secondary outcome**

N/A

# Study description

**Background summary**

Background:

In older patients, the D-Dimer (DD) test has a lower specificity and is therefore less applicable to rule out pulmonary embolism (PE). We retrospectively derived and validated the safety and efficacy of an age-dependent DD cut-off combined with clinical probability assessment for the exclusion of PE (BMJ, in press). In three large management studies consisting of 5132 consecutive (out-)patients with clinically suspected PE, we used a new DD cut-off defined as patient's age x 10 mcg/L in patients >50 years. In 1331 patients with a 'non-high' clinical probability for PE, the disease could be excluded in 42% with the new cut-off compared to 36% using the old cut-off (<500 mcg/L), p<0.0001. In two validation sets, the increase in the proportion of patients with a DD below the new cut-off compared to the old cut-off was 5% and 6% for validation set 1 and 2, respectively. This absolute increase was largest among patients >70 years, from 11% to 24%, and from 16% to 31% in the two validation cohorts. The 3 month VTE failure rates using the new cut-off (all ages) were 0.2% (95%CI 0.0 to 1.0), 0.6% (0.3 to1.3%) and 0.3% (0.1 to1.1%), for the three cohorts, respectively. This analysis showed that an age-adjusted DD cut-off combined with clinical probability increases the proportion of elderly patients in whom PE can be non-invasively excluded, without reducing safety. Since these data were collected retrospectively, a prospective validation of this new age-adjusted D-dimer cut-off is necessary for implementation in clinical practice.

Objective:

To assess the efficacy and safety of an age-adjusted D-dimer cut-off to rule out pulmonary embolism in patients older than 50 years.

Primary outcome:

The number of thromboembolic events in the 3-month follow-up period in patients not anticoagulated on the basis of a) a non high clinical probability (simplified revised Geneva score) and a normal new age adjusted D-dimer cut-off or b) a PE considered as "unlikely"

(simplified wells score) and a normal new age adjusted D-dimer cut-off.

Methods/design:

Multicenter international prospective outcome study in patients with suspected pulmonary embolism. In 2400 patients >50 years, a clinical probability assessment by the simplified revised Geneva clinical score or the simplified Wells score in combination with a D-dimer measurement will be assessed. Patients with a D-dimer value above the age-adjusted threshold will undergo multi-slice CT-scanning (MSCT), and will be treated according to MSCT results. All patients will be followed during 3 months from inclusion to evaluate recurrent thromboembolic events or haemorrhagic complications.

Expected results:

Based on our large retrospective analysis, we expect an increase in the number of patients above 50 years in whom pulmonary embolism can be safely ruled on the basis of the new age-adjusted D-Dimer cut-off, but without additional imaging. Especially patients >70 years will benefit from the new strategy. Considering the growing elderly population, this improvement of the diagnostic strategy is urgently needed.

### Study objective

Based on our large retrospective analysis, we expect an increase in the number of patients above 50 years in whom pulmonary embolism can be safely ruled on the basis of the new age-adjusted D-Dimer cut-off, but without additional imaging. Especially patients >70 years will benefit from the new strategy. Considering the growing elderly population, this improvement of the diagnostic strategy is urgently needed.

### Study design

3-months follow-up.

### Intervention

Based on an age-adjusted D-dimer level, in combination with an unlikely or low/moderate clinical decision rule, pulmonary embolism will be excluded without further testing

## Contacts

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# Eligibility criteria

## Inclusion criteria

All outpatients >50 years admitted to the emergency ward for suspected pulmonary embolism defined as acute onset of new or worsening shortness of breath or chest pain without another obvious etiology will be included in the study, provided they have signed an informed consent form.

## Exclusion criteria

1. PE suspicion raised more than 24 hours after admission to the hospital;

2. Absence of informed consent;

3. Life expectancy less than 3 months;

4. Geographic inaccessibility for follow-up;

5. Pregnancy;

6. Patients anticoagulated for a disease other than venous thromboembolism (for instance, atrial fibrillation);

7. Patients allergic to contrast medium;

8. Impaired renal function (creatine clearance less than 30 ml/min as calculated by the Cockroft formula).

# Study design

### Design

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|---|---|
| Study type: | Interventional |
| Intervention model: | Parallel |
| Allocation: | Non controlled trial |
| Masking: | Open (masking not used) |
| Control: | N/A , unknown |

### Recruitment

NL

| | |
|---|---|
| Recruitment status: | Pending |
| Start date (anticipated): | 01-04-2010 |
| Enrollment: | 2400 |
| Type: | Anticipated |

## Ethics review

Not applicable

| | |
|---|---|
| Application type: | Not applicable |

## Study registrations

### Followed up by the following (possibly more current) registration

No registrations found.

### Other (possibly less up-to-date) registrations in this register

No registrations found.

### In other registers

| Register | ID |
|---|---|
| NTR-new | NL2046 |
| NTR-old | NTR2163 |

| Register | ID |
|---|---|
| Other | METC AMC : 10/109 |
| ISRCTN | ISRCTN wordt niet meer aangevraagd. |

# Study results

**Summary results**

1. Douma RA, le Gal G, Söhne M, Righini M, Kamphuisen PW, Perrier A, Kruip MJHA, Bounameaux H, Büller HR, Roy PM. Age-adjusted D-dimer cut-off levels increase the ability to safely rule out pulmonary embolism in older patients: a retrospective analysis of three large management study cohorts. BMJ, in press<br>
2. van Belle A, Büller HR, Huisman MV, Huisman PM, Kaasjager K, Kamphuisen PW, Kramer MH, Kruip MJ, Kwakkel-van Erp JM, Leebeek FW, Nijkeuter M, Prins MH, Sohne M, Tick LW. Effectiveness of managing suspected pulmonary embolism using an algorithm combining clinical probability, D-dimer testing, and computed tomography. JAMA 2006;295:172-9.<br>
3. Djurabi RK, Klok FA, Nijkeuter M, Kaasjager K, Kamphuisen PW, Kramer MH, Kruip MJ, Leebeek FW, Büller HR, Huisman MV. Comparison of the clinical usefulness of two quantitative D-Dimer tests in patients with a low clinical probability of pulmonary embolism. Thromb Res 2009;123:771-4.<br>
4. Huisman MV, Klok FA. Diagnostic management of clinically suspected acute pulmonary embolism. J Thromb Haemost 2009;7 Suppl 1:312-7.<br>
5. Klok FA, Mos IC, Nijkeuter M, Righini M, Perrier A, Le Gal G, Huisman MV. Simplification of the revised Geneva score for assessing clinical probability of pulmonary embolism. Arch Intern Med 2008;168:2131-6.