

## Validated algorithm for suspected pulmonary embolism

Perrier A, Roy PM, Sanchez O, et al. Multidetector-row computed tomography in suspected pulmonary embolism. *N Engl J Med* 2005; 352:1760–1768.

### ■ Clinical Question

What is the best work-up for suspected pulmonary embolism?

### ■ Bottom Line

An algorithm that includes a careful, structured clinical assessment—D-dimer, lower extremity ultrasound, and multiple detector-row computed tomography (CT) depending on risk status, and other testing as needed based on this initial assessment—provides a safe, and presumably cost-effective, evaluation for patients with suspected pulmonary embolism (PE). The authors argue that omitting the lower-extremity ultrasound is a reasonable option given its low yield in this study, although further evaluation of that step is needed in subsequent studies. (LOE=1a)

### Study Design

Decision rule (validation)

### Setting

Emergency department

### Synopsis

Helical CT initially used a single row of detectors; newer technology uses multiple rows. It is hoped that this will improve the sensitivity for detection of PE, since with single detector-row CT approximately

30% of PEs are missed. With improved sensitivity it may be possible to forego the lower-extremity ultrasound now recommended as an adjunct to single detector-row helical CT.

In this study, 1014 consecutive patients who presented with suspected PE to an emergency department at 1 of 3 European hospitals were considered for inclusion; 756 met the criteria. The patients' clinical probability of PE was assessed using the Geneva score (see Clinical Rules and Calculators in InfoRetriever for this clinical rule). It includes signs, symptoms, chest radiograph findings, and blood gas results. Patients were classified as low, intermediate, or high probability, but the physicians could override the score if necessary. This is sensible—these scores are intended as decision supports, not decision replacements.

Patients with a low or intermediate probability had a D-dimer test; if negative, PE was ruled out. If the results were positive, these patients underwent multiple detector-row helical CT and venous compression ultrasound of the lower extremities. Patients with a high clinical probability went directly to helical CT and venous ultrasound; if either result was positive, PE was diagnosed. If both results were negative in patients with high clinical probability they underwent pulmonary angiography. Patients with an inconclusive CT result were referred for either ventilation perfusion scanning or pulmonary angiography.

Patients were followed-up for 3 months, and only 4 were lost to follow-up. The investigators used a rapid ELISA assay, the Vidas DD Exclusion from BioMerieux. Of 82 patients with a high clinical probability of PE, 79 had a PE; 78 of those were detected with the helical CT. Of 674 with a low or intermediate probability of PE, 115 (17%) had a PE.

C O N T I N U E D

### FAST TRACK

**D-dimer, lower-extremity ultrasound, and multiple detector-row CT, plus other tests as needed, provide a safe evaluation for suspected PE**

The algorithm performed well; for example, of the 232 low/intermediate probability patients with a D-dimer <500 mg/L, none had a deep vein thrombosis, PE, or death during follow-up. Similarly, of 318 patients with a low/intermediate probability, D-dimer >500 mg/L, and negative CT and venous ultrasound results, there were 3 non-fatal thromboembolic events and 2 possible deaths from PE (1.7%; 95% CI, 0.7–3.9). This is similar to the 3-month mortality of 1% to 2% seen in patients with suspected PE sent home after a normal pulmonary angiogram. It was rare that a clot was detected on lower extremity ultrasound in a patient with a normal CT result (3 of 324, 0.9%).

Copyright © 1995–2005 InfoPOEM, Inc. All rights reserved.  
www.infopoems.com.

## Negative CT scan to rule out PE equal to angiography

Quiroz R, Kucher N, Zou KH, et al. Clinical validity of a negative computed tomography scan in patients with suspected pulmonary embolism. A systematic review. *JAMA* 2005; 293:2012–2017.

### ■ Clinical Question

Can clinicians rely on a negative computed tomography scan to rule out suspected pulmonary embolism?

### ■ Bottom Line

A negative computed tomography (CT) scan is as accurate as pulmonary angiography in ruling out suspected pulmonary embolism (PE). Clinicians should strongly consider using clinical decision rules to accurately assess the pretest probability of PE in an individual patient, and then interpret diagnostic tests in light of this probability. For example, a negative CT in a low-risk patient rules out PE, while a negative CT in a high-risk patient may require further confirmation. (LOE=2a–)

### Study Design

Systematic review

### Setting

Various (meta-analysis)

### Synopsis

Previous studies question the value of CT scanning alone to rule out suspected PE. These investigators searched many databases—including Medline, the Cochrane Registry of Controlled Trials, and Science Citation Index—and relevant journals for English-language articles meeting selection criteria. Included studies used contrast-enhanced CT as the initial triage test to rule out the diagnosis of acute PE, had an appropriate clinical follow-up of at least 3 months, and employed a prospective design.

The gold standard to establish the validity of testing to rule out PE was the rate of subsequent venous thromboembolic events (VTE) after anticoagulation therapy was withheld. Two reviewers independently abstracted data and a third party arbitrated discrepancies. From the initial search that found 22 studies, 15 studies evaluating a total of 3500 patients met the minimal inclusion criteria. Seven of these 15 met the criteria for level 1 diagnostic studies. Three CT modalities were evaluated, including single-slice CT, multiple detector-row (helical) CT, and electron-beam CT. Patient follow-up ranged from 3 to 12 months.

The overall negative likelihood ratio of a VTE after a negative CT scan for PE was 0.07 (95% CI, 0.05–0.11). There was no significant difference in the risk of a subsequent VTE based on the type of CT modality used. Compared with studies that used chest CT imaging only, the risk of subsequent VTEs in studies using additional imaging tests prior to chest CT was not significantly reduced. The reported negative likelihood ratio in this analysis compares favorably with that reported for pulmonary angiography (Henry JW et al, *Chest* 1995; 107:1375–1378). A formal analysis found no evidence for significant publication bias, but there was some minimal heterogeneity among the results of the various trials.

Copyright © 1995–2005 InfoPOEM, Inc. All rights reserved.  
www.infopoems.com.

### FAST TRACK

**A negative CT in a low-risk patient rules out PE, while a negative CT in a high-risk patient may require further confirmation**

## Calcium/vitamin D not effective for secondary prevention of fracture

Grant AM, Avenell A, Campbell MK, et al, for the RECORD Trial Group. Oral vitamin D3 and calcium for secondary prevention of low-trauma fractures in elderly people (Randomised Evaluation Of Calcium OR vitamin D, RECORD): a randomised placebo-controlled trial. *Lancet* 2005; 365:1621–1628.

Porthouse J, Cockayne S, King C, et al. Randomised controlled trial of supplementation with calcium and cholecalciferol (vitamin D3) for prevention of fractures in primary care. *BMJ* 2005; 330:1003–1006.

### ■ Clinical Question

In older people who have already experienced an osteoporosis-related fracture, does vitamin D, calcium, or the combination prevent secondary fractures?

### ■ Bottom Line

The combination of calcium 1000 mg and vitamin D3 800 IU was ineffective in preventing fractures in 2 studies enrolling a total of more than 8500 participants, almost all of whom were female and aged at least 70 years who either had a previous osteoporotic fracture or were at high risk. The dose of calcium is lower than the 1500 mg commonly recommended and used. These results conflict with a meta-analysis that found that the combination therapy reduced fracture rate, including hip fracture, in older patients who have not had a previous hip or nonvertebral fracture (*JAMA* 2005; 293:2257–2264). (LOE=1b)

### Study Design

Randomized controlled trial (double-blinded)

### Allocation

Concealed

### Setting

Population-based

### Synopsis

Two studies, both conducted in the United Kingdom, studied the effect of calcium and vitamin D. In the first study, the researchers recruited 5292 participants following treatment for a fracture. Most (85%) were white women, all were at least 70 years old and ambulatory, and all had a previous osteoporotic fracture, on average 1 month before entering the study. Approximately 20% of the participants were taking a thiazide diuretic, which blocks calcium excretion.

Using concealed allocation to avoid selective enrolling of patients into a specific treatment, the researchers randomly assigned patients to receive 800 IU daily oral vitamin D3, 1000 mg calcium, the combination of both, or placebo. The patients took their assigned treatment for at least 2 years. Overall, new fractures occurred in 13.0% of the participants; hip fracture, the more clinically relevant outcome, occurred in 3.4% of participants.

Compliance was not good in the study; by 2 years only half the patients were still taking their assigned treatment, and the 2 groups taking calcium had significantly higher noncompliance, with only 42% still taking their assigned treatment at 2 years. The results were analyzed using intention-to-treat, which leaves patients in their assigned groups even if they dropped out of the study or were not compliant. Neither calcium supplementation, vitamin D, nor the combination was effective in decreasing the rate of overall fractures or hip fractures. Compliant patients also did not have lower fracture rates, though the number of patients (508) taking both vitamin D and calcium may not have been large enough to find a difference if one existed.

In the second study, the researchers surveyed general practices across England to find women aged 70 years or older who had either a previous fracture or at least 1 risk factor: low body weight, maternal history of fracture, smoking, or poor/fair health. The 3314 women were randomized, using concealed allocation, to receive either placebo or the combination of calci-

### FAST TRACK

These results conflict with a meta-analysis that found that calcium and vitamin D reduced the fracture rate in older patients

A Filtered EBM approach to medicine where clinicians need it most...at the point of care.



- InfoPOEMs® highlight valid, relevant research via daily e-mail synopses Monday through Friday.
- Each InfoPOEM has information that may change the way you practice.
- Monthly, the complete set is compiled and sent for additional summary review.
- Each InfoPOEM is automatically added to the InfoRetriever database, for easy future reference.



- Find answers to clinical questions in under a minute
- Searches the 7 leading medical databases at once
- Can improve your coding efficiency!
- Available for Web, Windows PC, Pocket PC, and Palm OS

For more information, please call 877-MFO-POEM or e-mail info@infopeems.com

[www.InfoPOEMs.com](http://www.InfoPOEMs.com)

**POEMS®**

um 1000 mg and vitamin D3 800 IU. Over a median follow-up of slightly more than 2 years, 4.3% of women experienced a fracture, and 0.7% experienced a hip fracture. Similar to the first study, there was no difference in fracture rates or hip fracture rates with treatment, either overall or in patients who were compliant.

Copyright © 1995–2005 InfoPOEM, Inc. All rights reserved. [www.infopeems.com](http://www.infopeems.com).

## Little evidence either way for diet, sun, cleansing in acne management

Magin P, Pond D, Smith W, Watson A. A systematic review of the evidence for "myths and misconceptions" in acne management: diet, face-washing and sunlight. *Fam Pract* 2005; 22:62–70.

### ■ Clinical Question

Do diet, facial cleansing, and sun exposure have any effect on acne vulgaris?

### ■ Bottom Line

Although the literature on the subject is of poor quality, the benefits of facial cleansing and sun exposure should not be summarily dismissed by physicians. (LOE=1a–)

### Study Design

Systematic review

### Setting

Various (meta-analysis)

### Synopsis

Patients often believe that fatty foods, lack of sun exposure, poor hygiene, and inadequate face cleansing all worsen acne. Although the importance of these factors is often derided by physicians, the actual evidence is unclear. In this systematic review, the authors searched the literature for every study of the above factors for acne vulgaris. Three small and very poorly designed studies found that chocolate has no effect. Studies of facial cleansing and increased ultraviolet ray exposure reveal mixed results, but some randomized trials have shown an objective benefit of these interventions. Well-designed studies with adequate numbers of patients are needed.

Copyright © 1995–2005 InfoPOEM, Inc. All rights reserved. [www.infopeems.com](http://www.infopeems.com).

## Acupuncture effective for chronic back pain

Manheimer E, White A, Berman B, Forsys K, Ernst E. Meta-analysis: Acupuncture for low back pain. *Ann Intern Med* 2005; 142:651-663.

### ■ Clinical Question

Is acupuncture effective in treating acute or chronic low back pain?

### ■ Bottom Line

Acupuncture is an effective treatment for decreasing pain in patients with chronic low back pain. It doesn't seem to be a placebo effect; acupuncture produces a significantly greater effect on pain than sham acupuncture. There is not enough research to allow a conclusion for the treatment of acute low back pain. (LOE=1a)

### Study Design

Meta-analysis (randomized controlled trials)

### Setting

Various (meta-analysis)

### Synopsis

In Western medicine, with many traditionally trained physicians cross-trained in its use. This meta-analysis assembled 22 randomized controlled trials comparing acupuncture with no treatment, sham acupuncture, or another active treatment such as massage or analgesics in the treatment of chronic low back pain. Sham acupuncture is used to convince patients they are receiving acupuncture and consists of inserting acupuncture needles either superficially or at inappropriate sites, or by using the acupuncture needle tube or other blunt device to provide pressure without actual penetration.

The studies (in any language) were identified by searching 7 databases, contacting experts, hand-searching a Japanese acupuncture journal, and using previous review articles. Two authors

independently selected the studies and abstracted the data. Results of sham-controlled studies were homogeneous. One study of the 5 studies that compared acupuncture with no additional therapy produced heterogeneous results favoring no treatment as compared with acupuncture. Publication bias could not be assessed.

For patients with chronic low back pain, lasting at least 3 months, acupuncture was more effective than sham acupuncture, sham transcutaneous nerve stimulation (TENS), and no treatment for short-term pain relief. It was not significantly better or worse than massage, medication therapy, or actual TENS treatment, and was significantly less effective than spinal manipulation. It provided long-term pain relief as compared with sham TENS or no treatment but was not different from sham acupuncture or active TENS.

There is not enough data on the effectiveness of acupuncture for acute back pain to provide a conclusion. Three studies evaluated the use of acupuncture in the treatment of antenatal low back pain; all 3 studies found a benefit, though their results could not be combined. ■

Copyright © 1995-2005 InfoPOEM, Inc. All rights reserved.  
www.infopoems.com.

### FAST TRACK

**Acupuncture was more effective than sham or no treatment; it was not better or worse than massage, medication, or TENS**