

FPIN's Clinical Inquiries

What Clinical Findings Can Be Used to Diagnose Deep Venous Thrombosis?

Clinical Inquiries provide answers to questions submitted by practicing family physicians to the Family Practice Inquiries Network (FPIN). Members of the network select questions based on their relevance to family medicine. Answers are drawn from an approved set of evidence-based resources and undergo peer review. The strength of recommendations and the level of evidence for individual studies are rated using criteria developed by the Evidence-Based Medicine Working Group (http://www.cebm.net/levels_of_evidence.asp).

This series of Clinical Inquiries is coordinated for American Family Physician by John Epling, M.D., State University of New York Upstate Medical University, Syracuse, N.Y. The complete database of evidence-based questions and answers is copyrighted by FPIN. If you are interested in submitting questions to be answered or writing answers for this series, go to <http://www.fpin.org> or contact CI2Editor@fpin.org.

Searchable Question

What clinical findings can be used to diagnose deep venous thrombosis (DVT)?

Evidence-Based Answer

No single clinical finding can accurately diagnose DVT. [Strength of recommendation: A, based on a systematic review of homogeneous validating cohort studies with good reference standards] However, when organized into clinical decision rules (CDRs), clinical findings can reliably differentiate patients into categories of low, moderate, or high probability of having DVT. [Strength of recommendation: A, based on numerous studies of CDRs from different clinical centers]

Evidence Summary

A 1998 systematic review¹ concluded that individual signs and symptoms cannot reliably diagnose DVT. [Evidence level 1A] Combining specific risk factors, symptoms, and physical signs into a CDR increases diagnostic accuracy. The best-studied CDR is the Wells model (see accompanying table). The Agency for Healthcare Research and Quality (AHRQ) reported that the Wells CDR accurately classified patients per probability of DVT-low (zero to 13 percent chance), moderate (13 to 30 percent chance) or high (49 to 81 percent chance)-in 11 of 12 studies.² [Evidence level 1A] The AHRQ report was limited in that all of the reviewed studies

were published in the English language, most excluded patients with a history of DVT, and some had methodologic flaws.

Wells Clinical Decision Rule

Clinical characteristic	Score
Active cancer (treatment ongoing or within previous six months or palliative)	1
Paralysis, paresis, or recent plaster immobilization of the lower extremities	1
Recently bedridden for more than three days or major surgery within 12 weeks requiring general or regional anesthesia	1
Localized tenderness along the distribution of the deep venous system	1
Entire leg swollen	1
Calf swelling 3 cm larger than asymptomatic side (circumference measured 10 cm below tibial tuberosity)	1
Pitting edema confined to the symptomatic leg	1
Collateral superficial veins (nonvaricose)	1
Previously documented DVT	1
Alternative diagnosis at least as likely as DVT	-2

NOTE: To determine the probability of DVT, calculate the score and place the patient in one of the following categories: a score of zero = low (zero to 13 percent probability); 1 to 2 = moderate (13 to 30 percent probability); ≥ 3 = high (49 to 81 percent probability). In patients with symptoms in both legs, the more symptomatic leg is used. An additional characteristic, "previously documented DVT," was added in 2003, but the new rule has not been extensively tested.

DVT = deep venous thrombosis.

Information from references 1 and 2.

The results of four recently published studies³⁻⁶ of the Wells CDR are consistent with the AHRQ findings. [References 3 through 6-Evidence level 1B] It is important to note that, when using only the Wells CDR, DVT cannot be ruled out completely in patients with a low probability score or confirmed in patients with a high probability score. However, use of such a CDR can help inform interpretation of subsequent diagnostic tests and reduce the need for invasive testing.

The Wells CDR is more accurate than the Kahn and St. André CDRs and is comparable to the Ambulatory CDR.⁶ Two studies^{3,7} have shown that empirically assigning patients to low-, moderate-, or high-probability groups based on established clinical criteria is as accurate as formal use of the Wells CDR. [Reference 7-Evidence level 1B]

Recommendations from Others

The Finnish Medical Society recommends using a CDR that is similar to the Wells CDR during the initial evaluation of patients suspected of having DVT.⁸ The most recent American Thoracic Society guideline (published in 1999, before most of the studies evaluating CDRs for DVT were

available), states that the clinical evaluation cannot be relied on to confirm or exclude the diagnosis of DVT.⁹

Clinical Commentary

Physicians should use this evidence to decide how aggressively to pursue the diagnosis of suspected DVT. For example, a patient with a low clinical probability of DVT and a normal initial noninvasive diagnostic test (D-dimer or ultrasonography) may require only observation, whereas a patient with a high clinical probability and a normal initial noninvasive diagnostic test may require serial ultrasonography or venography.

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