POEMs
Patient-Oriented Evidence that Matters

Each month, the POEMs editorial team reviews more than 80 journals of interest to primary care physicians, identifying articles you need to know about to stay up to date. We call these articles POEMs (Patient-Oriented Evidence that Matters) because they address common primary care problems, report outcomes that matter to patients, and, if valid, require us to change the way we practice. The 8 most important articles are critically appraised here each month. Occasionally, we include articles that confirm an important practice for which there had been only weak evidence previously (POEs – Patient-Oriented Evidence) or research that is focused on intermediate outcomes (DOEs – Disease-Oriented Evidence). We call attention to the latter so improper changes in currently valid practices are prevented. The collected reviews are available online. Additional POEMs and other important evidence-based material are published in a monthly newsletter called *Evidence-Based Practice* (available through subscription—phone: 1-201-782-5726; fax: 1-201-391-2778; Internet: www.infopoems.com).

■ DETERMINING THE RISK OF BLEEDING IN WARFARIN THERAPY

Kuijer PM, Hutten BA, Prins MH, Buller HR. Prediction of the risk of bleeding during anticoagulant treatment for venous thromboembolism. Arch Intern Med 1999; 159:457-60.

Clinical question What is the risk of bleeding with warfarin treatment for venous thromboembolism?

Background Major and minor bleeding complications are relatively common among patients being treated with anticoagulants. Known risk factors include increasing age, female sex, previous episodes of bleeding, and the presence of comorbidities. The goal of this study was to develop and validate an objective score that could be used to determine the risk of bleeding among patients given an anticoagulant.

Population studied The authors studied 1021 consecutive patients with venous thromboembolism who initially received either low-molecular-weight heparin or unfractionated heparin and were then started on warfarin on the first or second day of treatment. Patients were evenly split between men and women, and the mean age was 60 years.

Study design and validity A 5-item bleeding risk prediction score (BRPS) was developed on the basis of a systematic review of the literature. The odds ratio of each variable for the risk of bleeding based on the literature review was used to determine the number of points associated with this variable in the BRPS. The 1021 study patients were then divided into test (241 patients) and validation (780 patients) groups. Patients were followed up for 3 months, and bleeding complications were tabulated. A major bleeding complication was defined as one associated with a decline in hemoglobin of 20 g/L, a need for transfusion of 2 or more units, a retroperitoneal or intracranial bleed, or a situation that otherwise warranted permanent discontinuation of warfarin. The test set was used to develop a simplified 3-item score and to determine the optimal cutoff points to divide patients into low-, moderate-, and high-

risk groups. The final 3-item BRPS was validated using the remaining 780 patients. The equation for generating the score is:

$$BRPS = (1.6 \text{ if } \geq 60 \text{ years}) + (1.3 \text{ if female}) + (2.2 \text{ if a malignancy is present})$$

A BRPS score of 0 is low risk; 1 to 3 points is moderate risk; and more than 3 points is high risk. This is a good example of how to develop a clinical prediction rule. The authors based their rule on a thorough review of the literature; used clinically sensible, easily measured variables; studied a consecutive series of patients with the condition of interest; used clinically important outcomes; kept the rule simple enough to apply at the bedside; and validated the rule using an independent population.

Outcomes measured The primary outcomes were the risk of any bleeding complication and of a major bleeding complication.

Results Patients with a BRPS of 0 (low risk) had a 4% chance of any bleeding complication and a 1% risk of a major bleeding complication. Those with a score between 0 and 3 (moderate risk) had an 8% risk of any bleeding complication and a 2% risk of a major bleeding complication. Patients with a score greater than 3 (high-risk) had a 17% risk of any bleeding complication and a 7% risk of a major bleeding complication.

Recommendations for clinical practice **The bleeding risk prediction score is a well-validated, useful clinical prediction rule that can help physicians and their patients make more rational decisions about the risks and benefits of anticoagulation for venous thromboembolism. It seems reasonable that these findings can be generalized to patients undergoing anticoagulation for other reasons, such as atrial fibrillation or cerebrovascular disease.**

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