



WILLIAM S. WILKE, MD, EDITOR

HIGHLIGHTS FROM MEDICAL GRAND ROUNDS

DEEP VENOUS THROMBOSIS: LOW-MOLECULAR-WEIGHT HEPARINS IN PERIOPERATIVE PROPHYLAXIS

APPROXIMATELY 11 000 surgical patients die of pulmonary embolism each year, and most of these deaths could be prevented by prophylaxis against deep venous thrombosis (DVT). Theoretically, the low-molecular-weight heparins (LMWHs) have unique advantages over standard heparin. The LMWHs have been only slightly better than standard therapy in preventing DVT in general surgery but are proving to be more effective in orthopedic procedures. The important issue is to give prophylactic therapy: many physicians still do not, in spite of recommendations.

WHO IS AT RISK?

DVT develops in 20% to 25% of untreated general surgical patients because of Virchow's triad of stasis, intimal injury, and hypercoagulability. The risk is higher in certain situations: age over 40, surgery lasting longer than 30 minutes (especially orthopedic or extensive pelvic or abdominal surgery), obesity, varicose veins, immobilization, cancer, estrogen use, or previous DVT or pulmonary embolism. Without prophylaxis, the risk of DVT in total-hip replacement is as high as 50% and an amazing 72% in total-knee replacement. Prophylactic therapy approximately halves the risk.

■ Highlights from Medical Grand Rounds present take-home points from selected Cleveland Clinic Division of Medicine Grand Rounds lectures.

LOW-MOLECULAR-WEIGHT HEPARINS

LMWHs were developed to provide better bioavailability and more specific action than regular heparin does in inhibiting factor Xa (and less against factor IIa, which should result in less bleeding). Further, LMWHs, unlike regular heparin, do not bind to proteins such as histidine-rich glycoprotein, platelet factor 4, fibronectin, and von Willebrand's factor. As a result, the dosage of LMWHs is easier to titrate. Regular heparin also binds to macrophages and endothelial cells, inhibits collagen-induced platelet aggregation and von Willebrand's factor-dependent platelet aggregation, and increases vascular permeability; LMWHs do not.

These features should make LMWHs ideal in orthopedic surgery. However, in controlled clinical trials in patients undergoing total-hip replacement, the incidence of DVT was only slightly lower with LMWHs than with warfarin or heparin. The advantage may be somewhat greater in repair of fractured hips, and LMWH therapy recently has been shown to reduce the incidence of DVT in total-knee replacement surgery.

Current recommendations in total-hip replacement are to give warfarin to maintain the International Normalized Ratio (INR) between 2 and 3, or enoxaparin (an LMWH) 30 mg subcutaneously every 12 hours, or regular heparin in adjusted doses, or to use pneumatic compression sleeves. For hip-fracture repair, patients should receive regular heparin in an adjusted low-dose regimen, warfarin, or compression sleeves. For total-knee replacement, the options are warfarin, enoxaparin 30 mg subcutaneously every 12 hours, or compression sleeves.

SHOULD THERAPY CONTINUE AFTER DISCHARGE?

Even with prophylaxis, 20% to 25% of patients develop DVT after orthopedic surgery—even more after total-knee replacement. Performing venography in all orthopedic patients to detect these DVTs would be prohibitively expensive. Evidence from one study suggests it might be worthwhile to treat all high-risk patients *as if* they had DVT, ie, with warfarin for 12 weeks after discharge. Most orthopedic surgeons are already doing this. Another study is underway.

GENO MERLI, MD
Thomas Jefferson Medical College
Philadelphia, Pa

SUGGESTED READING

Goldhaber S, Morpurgo M. Diagnosis, treatment, and prevention of pulmonary embolism. *JAMA* 1992; 268:1727-1733.

Hirsh J, Levine M. Low molecular weight heparin. *Blood* 1992; 79:1-17.

Nurmohamed M, Rosendaal F, Büller H, et al. Low-molecular-weight heparin versus standard heparin in general and orthopedic surgery: a meta-analysis. *Lancet* 1992; 340:152-156.

COST EFFECTIVE MANAGEMENT OF ARTERIAL HYPERTENSION

This self-instruction program with 22-minute video is available for two hours of Category I CME credit. It provides you with necessary information to correctly classify and manage your hypertensive patient using the new Classification of Blood Pressure for Adults.

Along with the video, physicians will receive:

- A concise, current, and comprehensive monograph including appropriate algorithms.
- The complete *Fifth Report of the National Committee on Detection, Evaluation, and Treatment of High Blood Pressure*.
- Pre- and post-tests along with registration and evaluation materials to help you receive two hours of Category I CME credit.

After viewing this video and reading the accompanying written material, the participant will be able to:

- Categorize blood pressure readings based on the new Classification of Blood Pressure for Adults;
- Identify risk factors predisposing to hypertension;
- Recognize situations warranting patient referral to a specialist;
- Explain the Clinical Practice Guidelines for effectively treating the patient with primary hypertension.

Cost of the program is \$84.95. All major credit cards accepted. Shipping and handling is included. Ohio residents add 7% sales tax. To order the Clinical Practice Guidelines video program, or for more information, please call **1-800-762-8173**.

THE CLEVELAND CLINIC
FOUNDATION

