

Preventing VTE in hospitalized patients

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- How do we determine risk of venous thromboembolism (VTE) in patients scheduled for surgery?

- Do all surgical patients require VTE prevention?

- Is aspirin adequate to prevent VTE in low-risk hospitalized patients?

- Which anticoagulant is appropriate for a patient scheduled for total knee replacement?

These important questions are answered in a guideline developed by a committee of the American College of Chest Physicians, which considered the following prophylaxis recommendations: early ambulation, aspirin, graduated compression stockings, intermittent pneumatic compression, low-dose unfractionated heparin, low-molecular-weight heparin, or oral antithrombotic agents.

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The committee categorized recommendations by type of surgical procedure and risk status. *In this summary, the recommendations are reorganized by strength of recommendation.*

Three outcomes were regarded:

1. Efficacy of various prophylactic strategies
2. Rates and relative risk of venous thromboembolism outcomes—ie, fatal pulmonary embolism, symptomatic deep vein thrombosis, pulmonary embolism, or asymptomatic proximal deep vein thrombosis
3. Cost-effectiveness of prophylaxis.

The committee used a rating scheme that accounted for both the risk/benefit ratio (clear or unclear) and the strength of the supporting recommendation (**A**, **B**, **C**). The grades of evidence were altered to correspond to the grades of recommendation of the Oxford Centre for Evidence-Based Medicine. (For an explanation of these grades, see page 32.)

■ RELEVANT RECOMMENDATIONS

This guideline is clinically relevant because of the high mortality associated with pulmonary embolus complicating VTE.

It offers a practical, tabulated guide, listed by surgical procedure performed. It is pertinent to hospitalized patients under the care of family physicians. The rationale for each

PRACTICE RECOMMENDATIONS

Determining surgical risk

Surgery +	Patient age (yr) +	Risk factors =	Level of risk
Minor	< 40	No	Low
Minor	Any	Yes*	Moderate
	40–60	No	
Major	< 40	No	
Minor	> 60	No	High
	> 60	Yes*	
Major	> 40	No	
	> 40	Yes*	
Major	> 40	Prior VTE, cancer, hypercoagulable states, hip/knee arthroplasty, hip fracture, major trauma, spinal injury	Very high

total knee replacement surgery; continue for longer periods in higher-risk patients. Adjusted-dose intravenous heparin is an acceptable alternative, but more difficult to manage

- Aspirin alone is not acceptable for hip fracture patients
- IPC with GCS for intracranial surgery; LDUH or postoperative LMWH are acceptable alternatives
- LMWH or intravenous heparin for the acute myocardial infarction patient (for the VTE prevention indication)
- LDUH or LMWH for immobilized stroke patient. GCS if anticoagulation is contraindicated
- LDUH or LMWH for medical patients with cancer, bedrest, congestive heart failure, or severe lung disease

Grade B Recommendations

- LDUH, GCF, IPC, or LMWH for open urologic procedures
- IPC for total knee replacement
- LMWH or warfarin for hip fracture; an alternative is IPC
- LMWH for acute spinal cord injury. Alternative GCS or IPC in combination with LMWH or LDUH, if LMWH is contraindicated

Grade C Recommendations

- Early ambulation (with no antithrombotic agents) for low-risk surgery patients or uncomplicated gynecologic procedures
- LDUH, LMWH, or IPC for higher-risk surgery patients
- For very-high-risk surgery patients, LDUH or LMWH combined with GCS or IPC. Some patients may benefit from post-hospital LMWH or warfarin
- Daily LDUH or IPC for major gynecologic procedures for benign disease
- LDUH plus GCS or LMWH for gynecologic surgery for malignancy
- Early ambulation for low risk urologic and gynecologic procedures
- High-risk urologic procedures GCS plus with LDUH or LMWH
- GCS or IPC added to antithrombotic drugs for total hip replacement

***Additional risk factors:** immobility, stroke, paralysis, trauma, obesity, varicose veins, cardiac dysfunction, indwelling central venous catheter, inflammatory bowel disease, nephrotic syndrome, pregnancy, estrogen use, congenital thrombophilic abnormalities

- For all risk groups of patients, aspirin is not recommended for prophylaxis (strength of recommendation [SOR]: **A**)
- Every hospital should have an appropriate thromboembolic event prevention strategy, determined by proper risk assessment (SOR: **D**)
- Antithrombotics should be used with caution before invasive spinal or epidural procedures (SOR: **C**)

Grade A Recommendations

- Low-dose unfractionated heparin (LDUH), low-molecular-weight heparin (LMWH), graduated compression stockings (GCS), or intermittent pneumatic compression (IPC) for moderate-risk surgery patients
- LDUH, LMWH, or IPC for higher-risk general surgery
- Twice-daily LDUH for major gynecological surgery for benign disease
- Three-times-daily dose LDUH for gynecological surgery for malignancy
- LMWH or warfarin for 7–10 days for total hip or

The rationale for each recommendation is clear and well supported by the referenced literature. The objectives of the guideline were met and the outcome measures were appropriate.

The guideline is weakened by the lack of cost-effectiveness considerations.

■ GUIDELINE DEVELOPMENT AND EVIDENCE REVIEW

Literature searches were performed for each patient group. Criteria for inclusion included relevant patient group, sample size of at least 10 patients per group, verified deep vein thrombosis, and patients with adequate outcome assessments.

In considering baseline risk of thrombosis, only either prospective cohort studies or control groups of randomized trials were considered. For prophylaxis efficacy recommendations, only randomized trials were considered. The consensus group analyzed data from 630 sources before making these recommendations.

■ SOURCES FOR THIS GUIDELINE

Sixth ACCP Consensus Conference on Antithrombotic Therapy

The Consensus Conference guidelines can be found at:

Geerts WH, et al. Prevention of thromboembolism. *Chest* 2001; 119:132S–175S. Available at: www.chestjournal.org/content/vol119/1_suppl/index.shtml. Accessed on December 16, 2003.

Tables illustrating these guideline, organized by type of surgical procedure can be accessed at: chestnet.safeserver.com/guidelines/antithrombotic/p8.php

In the same issue of this journal, there were reports on the mechanism of action for oral anticoagulants, managing oral anticoagulant therapy, platelet active drugs, mechanisms of action of heparin and low molecular weight heparin, hem-

orrhagic complications of anticoagulation, use of antithrombotic medications during pregnancy, antithrombotic therapy for heart disease and peripheral vascular disease, use of these for stroke, and their role in treating children.

■ OTHER GUIDELINES ON PREVENTION OF VTE

- Deep venous thrombosis. Finnish Medical Society Duodecim. Helsinki, Finland: Duodecim Publications Ltd; 2002. Available at: www.ngc.gov/guidelines/FTNGC-2610.html. Accessed on December 16, 2003.
- Practice parameters for the prevention of venous thromboembolism. The Standards Task Force of the Society of Colon and Rectal Surgeons. *Dis Colon Rectum* 2000; 43:1037–47. [54 references.] Available at: www.fascrs.org/ascrspp-pvt.html. Accessed on December 16, 2003.

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