Clinical Practice Committee
Prophylaxis for Venous Thromboembolism Following Knee and Hip Orthopedic Surgery

Original Date: 05/15/06
Last Updated: 06/07/07

Clinical Question
Are any of the currently available anti-thrombotic strategies superior in the prevention of thromboembolic complications of major lower extremity orthopedic surgery?

Data Source

Bottom Line
For the prevention of venous thromboembolism following:
Elective total hip replacement (THR) and total knee arthroplasty (TKA) the following strategies have a grade 1A recommendation*:
1. LMWH (low molecular weight heparin) at full dose started 12-24 hours post-op.
2. Warfarin with a goal INR 2-3 started the evening before or the day of surgery.

Hip Fracture Surgery (HFS):
1. Fondaparinux 2.5mg SQ q24H started 8 hours post-operatively (Grade 1A)
2. LMWH at full dose started 12-24 hours post-operatively (Grade 1C)
3. Warfarin therapy with a goal INR of 2-3 (Grade 2B)
The use of aspirin alone for THR, TKA, and HFS is a Grade 1A recommendation against.
The optimal duration of prophylaxis is at least 10 days for TKA and 28-35 days with THR and HFS.

Synopsis
In the past 15 years the routine use of thromboembolic prophylaxis in major orthopedic surgery has reduced the incidence of fatal pulmonary embolism (PE) to 1% or less and symptomatic venous thrombosis to 10% or less. No effective strategies have been identified that risk stratify this patient population and therefore thromboprophylaxis is recommended for all patients. Because of the low frequency of PE most studies are inadequately powered to measure an effect on the rate of this complication and therefore measure the endpoint of proximal deep venous thrombosis (DVT), which represents a clinically important endpoint as well as a surrogate for PE. The incidence of proximal DVT reported in clinical trials of patients undergoing major hip and knee surgery who did not receive prophylaxis was up to 36% for hip and 22% for knees. In THR warfarin resulted in a proximal DVT rate of 4.8% and LMWH of 3.4%. In TKA the proximal DVT rate was 10.4% for warfarin and 7.1% for LMWH. Studies examining the effect of prophylaxis in patients with hip fracture included smaller patient numbers (thus the reason for a lower grade of recommendation) but have demonstrated proximal DVT rates of 9% with warfarin, 3.4% with LMWH, 1% with Fondaparinux (a pentasaccharide...
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A fragment of heparin that selectively binds factor Xa without directly inhibiting thrombin. The incidence of major bleeding for these regimens was approximately 1%.

Studies of aspirin therapy have yielded inconsistent results. A metaanalysis has shown aspirin to be superior to placebo but inferior to the other prophylactic regimens. For that reason, this consensus group recommends against the use of aspirin alone as prophylaxis against VTE for any patient group (Grade 1A).

In patients who have an epidural catheter left in place post-operatively anticoagulation poses a potential significant risk, namely an epidural hematoma. For that reason anticoagulation should be delayed until 4 hours after the removal of the epidural catheter.

LMWHs are cleared by the kidney and patients with significant renal insufficiency are at increased risk of bleeding due to accumulation of this agent. Thus, in patients with creatinine clearance below 30mg/min an adjustment in the dose of the LMWH should be considered.

*Grade/Strength of Recommendations used by the ACCP:
Grade 1A: Strong recommendation that the benefits outweigh the risks and burdens based on high quality evidence.
Grade 1C: Strong recommendation that the benefits outweigh the risks and burdens based on low quality evidence.
Grade 2B: Weak recommendation that the benefits are closely balanced with the risks and burdens based on moderate quality evidence.