

SUMMARY OF GUIDELINE

Effective Date: October 1, 2010

Warfarin Therapy - Management during Invasive Procedures and Surgery

For full Guideline please go to website: www.BCGuidelines.ca

Always consult with the surgeon and anesthesiologist about risk of bleeding and goal INR

Considerations for Perioperative Anticoagulation	
INR	<ul style="list-style-type: none"> Discuss goal for pre-op INR with surgeon and anesthesiologist; check baseline INR. INR < 1.5 is acceptable except with neurosurgery, ocular surgery, spinal anesthesia, and epidural analgesia.
Bleeding risk	<ul style="list-style-type: none"> Type of procedure determines bleeding risk and how long to withhold anticoagulation post-op. <i>When to discontinue warfarin:</i> body cavity is entered; percutaneous needle procedures in non-compressible sites including organ biopsies; prostatic surgery; sites where minor bleeding can cause significant morbidity, e.g., CNS and intraocular procedures; and major arthroplasty surgery, e.g., hip and knee replacements. <i>When discontinuation of warfarin is not usually necessary:</i> percutaneous needle procedures in readily compressible sites, skin procedures, routine dental procedures, and endoscopy without biopsy.
Bridging therapy	<p>Lower thrombosis risk</p> <ul style="list-style-type: none"> Newer model mechanical aortic valve prostheses and any tissue valves. Atrial fibrillation without additional risk factors for stroke. DVT / PE > 3 months ago. Hypercoagulable state <u>without</u> recent thrombotic episode, recurrent thrombosis, or history of life-threatening thrombosis.
	<p>Higher thrombosis risk</p> <ul style="list-style-type: none"> Mechanical mitral valve and old model aortic prosthesis. Atrial fibrillation plus history of stroke / TIA, or 2 or more additional risk factors for cardioembolic events (recent cardiac failure, hypertension, age > 75 years, DM). Patients with DVT / PE in past 3 months or patients with active cancer. Hypercoagulable state <u>with</u> recent thrombotic episode, recurrent thrombosis or history of life-threatening thrombosis.
Management	<p>Lower thrombosis risk</p> <ul style="list-style-type: none"> Discontinue warfarin 5 days pre-surgery, i.e., give last dose on day -6. Check INR the day before the procedure to ensure it is lower than the goal INR (< 1.5 for most procedures). If INR is higher than goal INR, discuss with physician performing procedure. Restart warfarin at pre-op dose once hemostasis is assured and epidural catheters are removed. Recheck INR within 1 week and resume regular monitoring.
	<p>Higher thrombosis risk</p> <ul style="list-style-type: none"> Discontinue warfarin ≥ 5 days pre- surgery; 6 days if target INR is 3.0 (range 2.5 to 3.5). If indicated, start therapeutic LMWH dose on day -3 in consultation with local expert. Last LMWH dose should be given ≥ 24 hours pre-op. Check INR the day before procedure to ensure it is below goal INR (< 1.5 for most). Start LMWH 12-24 hours post-op if there is no procedure-specific thromboprophylactic regimen. Restart warfarin at pre-op dose once hemostasis is assured and epidural catheters are removed. Continue LMWH until the INR is in therapeutic range for 2 consecutive days.
Procedure timing	<ul style="list-style-type: none"> If chronically anticoagulated, surgery should be elective if possible; for fixed duration warfarin therapy, e.g., 3 months duration, delay until post-therapy: <ul style="list-style-type: none"> Patient should be 5 or 6 days warfarin-free prior to surgery, depending on therapeutic INR range. Consider need for LMWH bridging therapy. Check INR on the day of surgery (or 1 day prior), especially with high risk bleeding procedures. Urgent or emergency surgery / procedure: <ul style="list-style-type: none"> <i>Within next 24 hours:</i> Discontinue warfarin and administer vitamin K; if surgery is within 6 hours, Octaplex® is recommended (if not available, then give frozen plasma [FP]), check INR immediately after infusion / pre-surgery; if INR not corrected, consider repeat administration of Octaplex® or FP in consultation with specialist. <i>Within 24-96 hours:</i> Discontinue warfarin and administer IV or PO vitamin K, check INR in 24 hours; if not corrected, repeat IV vitamin K and recheck INR in 12 hours; if still not corrected, consider conditions that elevate INR, e.g., DIC, liver disease; check INR immediately before surgery to document the correction.
Anesthesia	<ul style="list-style-type: none"> Local and general anesthesia can be safely administered to a patient on warfarin. Neuraxial blocks should not be performed, e.g. epidural analgesia, spinal anesthesia, and retrobulbar blocks. If central venous access is needed, a compressible site is preferred. In patients with epidural catheters in place: a prophylactic LMWH dose is okay but do not give a therapeutic LMWH dose; do not remove catheter within 12 hours after LMWH dose; do not start warfarin until epidural catheter is removed; and do not give LMWH until 2 hours after catheter removal.

Therapeutic Measures for Reversal of Warfarin Therapy

Vitamin K	<ul style="list-style-type: none"> • IV is the fastest and most reliable route of delivery but PO is equally good if the procedure is in > 24 hours; avoid IM injection. • Excessive dose can lead to difficulty with re-anticoagulation. • Effect on INR is observed after 8-12 hours, depending on route of administration. • Dosing: Oral 1-2 mg; IV 5 mg in 50cc normal saline infused over 30 minutes.
Octaplex® (virally inactivated plasma-derived concentrate containing factors II, VII, IX, X and Protein C and Protein S)	<ul style="list-style-type: none"> • Preferred product for rapid reversal of warfarin when available. • Duration of action is ~6 hours, typically only one dose is needed. • Must be used in conjunction with IV vitamin K • Indicated for immediate INR reversal for surgery within next 6 hours. • Contraindicated in patients with heparin induced thrombocytopenia and liver insufficiency. • May be associated with clinically important thrombosis • Use only in consultation with specialist.
Frozen plasma	<ul style="list-style-type: none"> • Short duration of action (~4hours). • Indicated for rapid reversal when Octaplex® is not available. • Slight risk of infectious agent transmission. • Available in large centres; rural centres can arrange rapid shipping.

Management of Warfarin Therapy During Invasive Procedures and Surgery for a Desired Reversal INR of 1.5 or Lower (review sections 1, 2, 3 in text)

