Peri-Procedural Management of Antithrombotic Therapy

Balancing Risks of Bleeding and Thrombosis in Patients on Chronic Antithrombotic Therapy Who Are Undergoing Elective Procedures

Determine Bleeding Risk (confirm with surgeon)

Procedures with HIGH Risk of Bleeding:

Any surgery > 45 min	Organ Biopsy/Resection	Eyes: retinal, intraorbital procedures
Cardiac surgery	TURP/TURBT, Lithotripsy	Neuraxial/intracranial procedures
Vascular surgery	GI sphincterotomy, polypectomy	Cancer surgery
Head and neck surgery	PEG placement	Endoscopic fine needle aspiration

Procedures with MINIMAL Risk of Bleeding:

1-2 Simple Dental Extractions, implant positioning, incision of abscess
Minor Derm Procedures: incision of abscess, small excisions
Cataract or glaucoma surgery
Central venous catheter removal
Endoscopy WITHOUT plan for biopsy

Typically, antithrombotic therapy is NOT stopped for these procedures

A HAS-BLED Score ≥3 Predicts Risk of Major Bleeding

Risk Factor	Score
Uncontrolled Hypertension	1
Severely abnormal liver or renal function	1 each
History of stroke	1
Bleeding history or predisposition	1
Labile INR	1
Age > 65	1
Drugs that increase bleeding risk (antiplatelet agents, NSAIDs, corticosteroids) or heavy alcohol use	1 each

Start Here

In complicated cases or if there is any doubt, include the surgeon, cardiologist, anesthesiologist and patient in your decision to stop, continue, or bridge antithrombotic therapy

Determine Thrombosis Risk

High Risk Conditions Include:

Stroke/TIA or systemic embolic event within past 12 weeks	MI and/or Percutaneous Coronary Intervention within past 12 weeks
Previous thromboembolism during interruption of chronic anticoagulant therapy	Severe thrombophilia (deficiency of Protein C, Protein S, antithrombin deficiency, antiphospholipid antibody syndrome)
Presence of drug-eluting stents	Presence of any mechanical heart valve
Active malignancy	Trauma surgery, hip fracture surgery, knee or hip replacement, spinal surgery
Cardiac surgery (bypass/valve)	Carotid endarterectomy
Rheumatic heart disease	Atrial fibrillation with CHA_2DS_2-VASc Score ≥ 7

CHA_2DS_2VASc Score

Risk Factor	Score	Risk Factor	Score
CHF	1	History of ischemic stroke of TIA	2
Hypertension	1	History of vascular disease	1
Age ≥ 75	2	Age 65 – 74	1
Diabetes Mellitus	1	Female sex	1

Stopping and Resuming Different Antithrombotic Agents: Some Guidelines

Need a quick question answered, or would you like your patient to get in-person help? Call AAMC Anticoagulation Services at 443 481 5826

Patients on ASPIRIN ALONE

It depends on why they are taking it:

PRIMARY PREVENTION: If patient has no h/o stroke/TIA/MI, okay to stop aspirin 5-7 days before a procedure with more than minimal bleeding risk. Resume when hemostasis obtained.

SECONDARY PREVENTION: If patient has h/o stroke/TIA/MI, ***DO NOT STOP*** aspirin without talking with cardiologist and surgeon

Patients on Dual Antiplatelet Therapy (DAPT)

DAPT is aspirin PLUS another* antiplatelet agent and is commonly used after acute coronary syndrome and/or percutaneous coronary intervention.

DAPT must be continued for AT LEAST 6 months after placement of drug-eluting stents and 1 month after placement of bare stents.

GENERALLY SPEAKING, aspirin should NEVER be discontinued in patients on DAPT. As for the second agent, ALWAYS CONSULT WITH THE CARDIOLOGIST and SURGEON. There are many nuances and insufficient firm evidence to make general recommendations. Each case should be considered individually.

* For example: clopidogrel (Plavix), prasugrel (Effient), ticagrelor (Brilinta)

Patients on DOACs

Direct oral anticoagulants have short half-lives and quick onset of action. The amount of time they are withheld before surgery depends on the patient's renal function and procedure bleed risk. **No bridging is necessary**.

Drug	Renal Function	Low Bleed Risk	High Bleed Risk	Neuraxial anesthesia
Dabigatran	**CrCl > 50 mL/min**	Last dose: 2 days before (skip 1 day)	Last dose: 3 days before (skip 2 days)	Last dose: 5 days before (skip 4 day)
	CrCl 30–50 mL/min	Last dose: 3 days before (skip 2 days)	Last dose: 5 days before (skip 4 day)	Last dose: 6 days before (skip 5 day)
Rivaroxaban **Apixaban** **Edoxaban**	**CrCl > 30 mL/min**	Last dose: 2 days before (skip 1 day)	Last dose: 3 days before (skip 2 days)	Last dose: 4 days before procedure (skip 3 day)
	CrCl 15–30 mL/min	Last dose: 2-3 days before (skip 1-2 days)	Last dose: 3-4 days before (skip 2-3 days)	

RESUME DOACs 24 hours after low bleed risk or neuraxial anesthesia and 48-72 hours after high bleed risk procedures (consult surgeon & HAS-BLED score)

Guide for Patients on WARFARIN

	Patient Condition of HIGH Thromboembolic Risk	Patient Condition of LOW Thromboembolic Risk
HIGH and LOW Bleed Risk Procedure	Hold warfarin 5 days prior BRIDGE (see below) Resume immediately postop	Hold warfarin 5 days prior DO NOT BRIDGE Resume immediately postop
MINIMAL Bleed Risk Procedure	DO NOT STOP WARFARIN	DO NOT STOP WARFARIN

How to Bridge Warfarin

Before the Procedure:

1. Stop warfarin 5 days prior to high bleed risk surgery.
2. When INR falls below therapeutic range, begin enoxaparin (Lovenox) at a therapeutic dose. See below:
   a. For mechanical heart valves, give 1 mg/kg body weight every 12 hours. ***ADJUST DOSE to ONCE daily if creatinine clearance is <30 mL/min***
   b. For patients with atrial fib or venous thromboembolism, give 1.5 mg/kg body weight ONCE daily OR 1 mg/kg every 12 hrs. ***ADJUST DOSE to 1 mg/kg ONCE DAILY if creatinine clearance is <30 mL/min***
3. Time the FINAL dose of enoxaparin to be given 24 hours before the procedure and ***just give ½ the once daily dose***
4. Check the INR the morning of the procedure

After the Procedure:

1. Resume warfarin once hemostasis is secure.
2. Resume enoxaparin (or start heparin) WITHOUT bolus in 24-48 hours (72 if patient has undergone endoscopic sphincterotomy or has a HAS-BLED score ≥3) ***Consult surgeon about timing.***
3. Discontinue enoxaparin (or heparin) when INR is in therapeutic range, usually about five days later.