FCHC Perioperative Anticoagulant & Antiplatelet Guidelines

Procedure Bleed Risk Stratification

Minimal Bleed Risk Procedures
(30-day risk of major bleed = 0%)

- Minor dermatologic procedures
  (i.e. excision of basal and squamous cell skin cancers, actinic keratoses, and premalignant or cancerous skin nevi)
- Minor dental procedures
  (i.e. extractions, restorations, prosthetics, endodontics, dental cleanings, fillings)
- Ophthalmologic procedures
  (i.e. cataracts)
- Pacemaker or cardioverter-defibrillator device implantation or battery change

Low to Moderate Bleed Risk Procedures
(30-day risk of major bleed = 0-2%)

- Arthroscopy
- Foot or hand surgery
- Coronary angiography
- GI endoscopy
  (with or without biopsy)
- Colonoscopy
  (with or without biopsy)
- Abdominal hysterectomy
- Laparoscopic cholecystectomy
- Abdominal hernia repair
- Hemorrhoidal surgery
- Bronchoscopy (with or without biopsy)
- Thoracentesis
- Paracentesis
- Lumbar puncture
- Tube thoracostomy
- Catheter exchanges
  (i.e. gastrostomy, biliary, nephrostomy, abscess)
- Diagnostic arteriography
- Arterial interventions: peripheral, sheath < 6 F, embolotherapy
- Diagnostic venography & select venous interventions: pelvis, extremities
- Dialysis access interventions
- Facet joint injections
- Medial branch nerve blocks
- IVC filter placement and removal
  (except complex removal)
- Nontunneled venous access/removal
  (including PICC placement)
- Tunneled venous catheter placement/removal
  (including ports)
- Nontunneled chest tube placement for pleural effusion
- Peripheral nerve blocks
- Peripheral joint & musculoskeletal injections
- Sacroiliac joint injection & sacral lateral branch blocks
- Superficial abscess drainage or biopsy
  (i.e. palpable lesion, lymph node, soft tissue, breast, thyroid, superficial bone – extremities, bone marrow aspiration)
- Transjugular liver biopsy
- Trigger point injections including piriformis
- Tunneled drainage catheter placement
- Interlaminar & transforaminal epidural steroid injection (ESI)
- Radiofrequency ablation of spine

High Bleed Risk Procedures
(30-day risk of major bleed ≥ 2%)

- Major surgery with extensive tissue injury
- Surgery duration >45 minutes
- Cancer surgery, especially with solid tumor resection
- Major orthopedic surgery
  (i.e. arthroplasty, fracture repair)
- Reconstructive surgery
- Major thoracic surgery
- Urologic surgery
  (i.e. nephrostomy tube placement, ureteral dilation, stone removal, anastomosis surgery)
- Transurethral prostate or bladder resection, or tumor ablation
- Major abdominal surgery
  (i.e. bowel resection, colonic polyp resection, anastomosis)
- Percutaneous endoscopic gastrostomy (PEG) placement
- Endoscopic retrograde cholangiopancreatography (ERCP)
- Surgery in highly vascular organs (kidney, liver, spleen)
- Cardiac, intracranial, or spinal surgery
- Neuraxial anesthesia or intervention
- Epidural injections
- Ablations: solid organs, bone, soft tissue, lung
- Arterial interventions: sheath > 7 F, aortic, pelvic, mesenteric, CNS
- Biliary interventions (including cholecystostomy tube placement)
- Cather directed thrombolysis (DVT, PE, portal vein)
- Deep abscess drainage
  (i.e. lung parenchyma, abdominal, pelvic, retroperitoneal)
- Deep nonorgan biopsies
  (i.e. spine, soft tissue in intraabdominal, retroperitoneal, pelvic compartments)
- Gastrostomy/gastrojejunostomy placement
- Complex IVC filter removal
- Portal vein interventions
- Solid organ biopsies
- Spine procedures with risk of spinal or epidural hematoma
  (i.e. kyphoplasty, vertebroplasty, epidural injections, facet blocks cervical spine)
- Transjugular intrahepatic portosystemic shunt
- Venous interventions: intrathoracic & CNS interventions

Periprocedural Management of Anticoagulants

	Anticoagulant	Procedure Bleed Risk*	Pre-Procedure: Day -5	Pre-Procedure: Day -4	Pre-Procedure: Day -3	Pre-Procedure: Day -2	Pre-Procedure: Day -1	Day of Procedure (Day 0)	Post-Procedure: Day +1	Post-Procedure: Day +2	Post-Procedure: Day +3
Direct Oral Anticoagulant (DOAC)	Apixaban (Eliquis) Edoxaban (Savaysa) Rivaroxaban (Xarelto) **[CrCl ≥30mL/min]**	Low/Mod					HOLD 1 day prior to procedure		Resume ≥24 hours after procedure	-	-
		High				HOLD 2 days prior to procedure				Resume ≥48-72 hours after procedure	
	Apixaban (Eliquis) Edoxaban (Savaysa) Rivaroxaban (Xarelto) **[CrCl <30mL/min]**	Low/Mod				HOLD 2 days prior to procedure			Resume ≥24 hours after procedure	-	-
		High			HOLD 3 days prior to procedure					Resume ≥48-72 hours after procedure	
	Dabigatran (Pradaxa) **[CrCl ≥50mL/min]**	Low/Mod					HOLD 1 day prior to procedure		Resume ≥24 hours after procedure	-	-
		High				HOLD 2 days prior to procedure				Resume ≥48-72 hours after procedure	
	Dabigatran (Pradaxa) **[CrCl <50mL/min]**	Low/Mod				HOLD 2 days prior to procedure			Resume ≥24 hours after procedure	-	-
		High		HOLD 4 days prior to procedure						Resume ≥48-72 hours after procedure	
Vitamin K Antagonist	Warfarin (Coumadin)	Low/Mod **TE Risk**	HOLD 5 days prior to procedure, DO NOT BRIDGE						Resume **warfarin** night of procedure at previous maintenance dose	**Low/Mod Bleed Risk Procedure:** Resume **LMWH** ≥24 hours after procedure	
		High **TE Risk**	HOLD 5 days prior to procedure + LMWH Bridge							**High Bleed Risk Procedure:** Resume **LMWH** ≥48-72 hours after procedure	
LMWH	Enoxaparin (Lovenox) Dalteparin (Fragmin)	Low/Mod					LAST dose approximately 24 hours prior to procedure		Resume ≥24 hours after procedure	-	-
		High					LAST dose approximately 24 hours prior to procedure			Resume ≥48-72 hours after procedure	

*For minimal bleed risk procedures, continue anticoagulant without interruption. TE=thromboembolism, LMWH=low molecular weight heparin, BID=twice daily
Recommended LMWH dose: Enoxaparin 1mg/kg BID or Dalteparin 100 IU/kg BID.

DISCLAIMER: These evidence-based guidelines intend to support clinical decision-making and should not replace a clinician's independent knowledge or clinical judgement.

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Periprocedural Management Pearls

Periprocedural management of anticoagulant and antiplatelet therapy is a common and important aspect of clinical care. Development of an appropriate periprocedural management plan should incorporate the bleeding risk associated with the planned procedure, as well as the individual patient's risks for bleeding and thrombosis.

DO	• **Utilize an evidence-based approach** that incorporates procedural bleeding risk, thromboembolic risk, and patient-specific factors to guide periprocedural management • **Employ an individualized, patient-centered approach** to periprocedural management that incorporates shared decision-making • **Risk-benefit discussions** between proceduralists and prescribing providers are strongly encouraged to support informed, patient-centered decision-making. • **Document the care plan in the medical record and communicate it to the primary and surgical teams**. Clearly outline instructions to support safe transitions of care. • **Provide patients and caregivers with clear verbal and written instructions** to ensure understanding of the care plan and follow-up requirements.
DON'T	• **DON'T bridge DOACs** • **Do not use bridging therapy** for patients with atrial fibrillation (AF) unless there is a recent history of cerebrovascular accident (CVA) or transient ischemic attack (TIA) within the past 3 months, or a history of prior perioperative CVA. ○ **Note:** Current CHEST and ACC/AHA/ACCP/HRS atrial fibrillation guidelines provide differing recommendations regarding bridging in patients with elevated CHA_2DS_2-VASc or $CHADS_2$ scores.

CONSIDER	• **If minimal periprocedural bleeding risk is anticipated**, interruption of the anticoagulant may not be required.
	• **For patients with a recent thromboembolic (TE) event (< 3 months)**, consider delaying non-urgent or elective procedures when clinically appropriate.
	• **If a procedure must be delayed for a short duration (e.g., several days)**, consider initiation of a short-acting parenteral anticoagulant or low-molecular-weight heparin (LMWH) in patients at high thrombotic risk.
	• **Consider patient-specific factors that may delay drug elimination**, including clinically significant drug interactions. In addition:
	  ○ Patients with renal impairment, particularly severe renal insufficiency (CKD stage V), may require an extended anticoagulant hold period.
	  ○ Patients on warfarin who are of advanced age and receiving low daily doses may require a longer hold period to achieve an INR within the acceptable procedural range.

CAUTION	• **Timing of post-procedure DOAC resumption** should be based on achievement of adequate hemostasis. If resumption is delayed due to bleeding risk, consider initiating prophylactic-dose low-molecular-weight heparin (LMWH) until hemostasis is established. • **Neuraxial procedures** may require extended pre-procedure anticoagulant hold times. • **Recommendations within empiric risk stratification tables** should not replace clinical judgment. Individual patient factors and procedure-specific risks must be considered in decision-making. • **For complex cases**, consider multidisciplinary discussion and coordinated planning. In rare situations involving very high thrombotic risk, bridging therapy may be appropriate.

Patient Thrombotic Risk Stratification

Thrombotic Risk	Mechanical Valves	Atrial Fibrillation (AF)	Venous Thromboembolism (VTE)
Low (<4%/yr risk of ATE or <2%/mo risk of VTE)	• Bileaflet Aortic Valve **without** major risk factors for stroke[o]	• $CHA_2DS_2VASc \leq 4$ or $CHADS_2 = 0\text{-}2$ **and** NO history of TIA/stroke	• Single VTE > 12 months ago **and** NO other risk factors
Moderate (4-10%/yr risk of ATE or 4-10%/mo risk of VTE)	• Mitral Valve **without** major risk factors for stroke[o] • Bileaflet Aortic Valve **with** major risk factors for stroke[o]	• $CHA_2DS_2VASc = 5\text{-}6$ or $CHADS_2 = 3\text{-}4$ • History of TIA/stroke > 3 months ago	• VTE within the past 3-12 months • Recurrent VTE • Single non-severe thrombophilia (Heterozygous FVL or prothrombin gene G20210A mutation) • Active or recent history of cancer
High (>10%/yr risk of ATE or >10%/mo risk of VTE)	• Mitral Valve **with** major risk factors for stroke[o] • Any caged-ball or tilting disc valve • Stroke, TIA or systemic embolism within 3 months	• $CHA_2DS_2VASc = 7\text{-}9$ or $CHADS_2 = 5\text{-}6$ • Stroke, TIA or systemic embolism within 3 months • Rheumatic valvular heart disease • History of stroke during prior interruption	• VTE within 3 months (especially <1 month) • Active cancer with a high VTE risk[Δ] • Severe thrombophilia **and** history of unprovoked VTE (i.e. Protein C or Protein S deficiency, ATIII deficiency, APS, Prothrombin G20210A mutation or multiple abnormalities)

ATE=arterial thromboembolism, VTE=venous thromboembolism, AF=atrial fibrillation, FVL=Factor V Leiden, APS=Antiphospholipid Antibody Syndrome

[o]Major risk factors for stroke: AF, prior stroke/TIA during interruption of anticoagulation or other prior stroke/TIA, prior valve thrombosis, rheumatic heart disease, HTN, DM, CHF, age≥75 years

[Δ]High risk factors for VTE: pancreatic cancer, myeloproliferative disorders, primary brain cancer, gastric cancer, esophageal cancer

Periprocedural Management of Antiplatelets

Antiplatelet	Pre-Procedure							Day of Procedure (Day 0)	Post-Procedure
	Day -7	Day -6	Day -5	Day -4	Day -3	Day -2	Day -1		Day +1
Aspirin	CONTINUATION recommended over interruption in elective, non-cardiac surgery HOLD ≤7 days prior IF INTERRUPTION REQUIRED								Resume ≤24 hours after procedure
Clopidogrel (Plavix)			HOLD 5 days prior						Resume ≤24 hours after procedure
Prasugrel (Effient)	HOLD 7 days prior								Resume ≤24 hours after procedure
Ticagrelor (Brilinta)			HOLD 3-5 days prior	HOLD 3-5 days prior	HOLD 3-5 days prior				Resume ≤24 hours after procedure
Cilostazol (Pletal)*						HOLD 1-2 days prior	HOLD 1-2 days prior		Resume ≤24 hours after procedure
Dipyridamole (Persantine)*						HOLD 1-2 days prior	HOLD 1-2 days prior		Resume ≤24 hours after procedure
Pentoxifylline (Trental)*						HOLD 1-2 days prior	HOLD 1-2 days prior		Resume ≤24 hours after procedure

*Formal guidelines are not available for holding cilostazol, dipyridamole, or pentoxifylline.

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