Adult Anticoagulation Guidelines for ELECTIVE Image Guided Procedures in AHS Diagnostic Imaging

HIGH RISK	MODERATE RISK	LOW RISK

CAUTION Patients with **prosthetic heart valves, venous thromboembolism, atrial fibrillation** (**with prior stroke)** are at risk for a **thrombotic event** and may require consultation for bridging therapy. **Premature discontinuation of antiplatelet drugs i**n patients with **coronary** or **cerebrovascular stents** may precipitate acute stent thrombosis. **Do not stop anticoagulation in these patients without consultation.**
NOTE: Specialized neurovascular procedures such as **carotid stenting** and **intra-cranial embolization** are **excluded** from this guideline. This guideline may not apply to peripheral arterial procedures. **If anticoagulation is discontinued, MRHP must instruct the patient.** This guideline is intended for elective procedures only and is **not applicable for emergency procedures**. Refer to AHS Guideline: *Direct Oral Anticoagulant Agents* for emergency procedures.
For procedures not included in this guideline, reference a similar procedure. *Clinical judgement must always be used*

HIGH RISK PROCEDURES

Target: INR ≤ 1.5 Platelets ≥ 50 Inpatients & Anticoagulated patients or other patient condition warrants (i.e. Liver failure or on chemotherapy): Obtain CBC & INR within 48 hours Outpatients: Obtain CBC & INR within 1 week Anticoagulated patients: repeat blood work after last dose of anticoagulation	**Anticoagulant / Antiplatelet Medications**	**Discontinue Yes/ No**	**Timing of LAST dose BEFORE procedure**	**Timing of FIRST dose AFTER day of procedure**
VASCULAR • TIPS • Arterial interventions >7 Fr access • Transhepatic Vascular Procedure (i.e. percutaneous portal vein access) Note: For Islet cell transplant: follow protocol by transplant team **NON-VASCULAR** **Abdominal Procedures** • Gastrostomy / gastrojejunostomy • Renal core biopsy • PCNL / Nephrostomy • Biliary drainage (PTBD) • Complex thermal ablation – liver, kidney, lung, MSK (SIR) • Lumbar puncture, spinal drain, epidural injection, rhizotomy, Spinal RFA	• Aspirin (ASA), any dose	Yes	5 – 7 days	24 hours
	• Ticagrelor (Brilinta®)	Yes	5 – 7 days	24 hours
	• Clopidogrel (Plavix®)	Yes	5 – 7 days	24 hours
	• Aggrenox® (ASA & Dypridamole)	Yes	5 – 7 days	24 hours
	• Prasugrel (Effient®)	Yes	5 – 7 days	24 hours
	• NSAIDs (long-acting only)	Yes	3 days	24 hours
	• Warfarin (Coumadin®)	Yes	5 days CHECK INR within 24 hrs prior	24 hours
	• LMWH (prophylactic) (i.e.: Enoxaparin, Dalteparin, Tinzaparin)[b] ➢ May require Anti-Xa level (< 0.1)	Yes	12 hours	12 hours
	• LMWH (therapeutic) (i.e.: Enoxaparin, Dalteparin, Tinzaparin)[b] ➢ May require Anti-Xa level (< 0.1)	Yes	24 hours	24 hours
	• (IV) unfractionated heparin (UFH)[c] ➢ May require Anti-Xa level (< 0.1)	Yes	infusion to stop 4 – 6 hours prior to procedure	12 hours with no loading dose
	• Dabigatran (Pradaxa®) ➢ May require Thrombin Time	Yes	[a] GFR ≥ 50: 3 days GFR < 50: 5 days	24 hours; consider prophylactic dose
	• Rivaroxaban(Xarelto®) • Apixaban (Eliquis®) ➢ May require Anti-Xa level (< 0.1)	Yes	3 days	24 hours; consider prophylactic dose
	• Fondaparinux (Arixtra®) (therapeutic)	Yes	[a] GFR ≥ 50: 3 days GFR < 50: 5 days	24 hours; consider prophylactic dose
	• Fondaparinux (Arixtra®) (prophylactic)	Yes	12 hours	12 hours
	• Eptifibatide (Integrilin®)	Yes	4 hours	24 hours; consider prophylactic dose

Created by: EZ DI Nursing LG Subcommittee (Dr. R. Samji, Dr. R, Owen, Dr. C. Plewes, Dr. B. Ritchie, C. Wickens CNE, A. Richmond RN, J. Woo RN). **Reviewed by**: IR LG May 2021 **Version 2 Approved by:** DIPET May 27, 2021
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Alberta Health Services

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MODERATE RISK PROCEDURES

Target: INR ≤ 1.8 Platelets ≥ 50 Inpatients & Anticoagulated patients or other patient condition warrants (i.e. Liver failure or on chemotherapy): Obtain CBC & INR within 72 hours Outpatients: Obtain CBC & INR within 3 months Anticoagulated patients: repeat blood work after last dose of anticoagulation	**Anticoagulant / Antiplatelet Medications**	**Discontinue Yes/ No**	**Timing of LAST dose BEFORE procedure**	**Timing of FIRST dose AFTER day of procedure**
VASCULAR • Angiography / arterial intervention up to 7 Fr access • Uterine fibroid embolization • Transjugular liver biopsy • Tunneled CVC / Port / Hickman **NON-VASCULAR** **Abdominal / Thoracic Procedures** • Intra-abdominal, chest wall, pleural or retroperitoneal abscess drainage, core biopsy • Percutaneous cholecystostomy • Lung biopsy • Prostate biopsy • Transabdominal liver biopsy • Paracentesis / thoracentesis Diagnostic or therapeutic under Ultrasound (9 Fr catheter or larger) **MSK/Spine Procedures** • Nerve root block • Neurolysis (celiac plexus block) • Vertebroplasty / kyphoplasty • Spine biopsy, paraspinal injection • Extremity / MSK core biopsy • Thoracic and lumbar sympathectomy	• Aspirin (ASA), any dose	No	Do not stop	
	• Ticagrelor (Brilinta®)	Yes	5 – 7 days	24 hours
	• Clopidogrel (Plavix®)	Yes	5 – 7 days	24 hours
	• Aggrenox® (ASA & Dypridamole)	Yes	5 – 7 days	24 hours
	• Prasugrel (Effient®)	Yes	5 – 7 days	24 hours
	• NSAIDs	No	Do not stop	
	• Warfarin (Coumadin®)	Yes	5 days CHECK INR within 24 hrs prior	12 hours
	• LMWH (prophylactic) (i.e.: Enoxaparin, Dalteparin, Tinzaparin)[b] ➢ May require Anti-Xa level (<0.3)	No	Do not stop	
	• LMWH (therapeutic) (i.e.: Enoxaparin, Dalteparin, Tinzaparin)[b] ➢ May require Anti-Xa level (<0.3)	Yes	24 hours	24 hours
	• (IV) Unfractionated Heparin (UFH)[c d] ➢ May require Anti-Xa level (<0.3)	Yes	infusion to stop 4 – 6 hours prior to procedure	6 hours after with no loading dose
	• Dabigatran (Pradaxa®) ➢ May require Thrombin Time	Yes	[a] GFR ≥ 50: 2 days GFR < 50: 3 days	24 hours; consider prophylactic dose
	• Rivaroxaban (Xarelto®) • Apixaban (Eliquis®) ➢ May require Anti-Xa level	Yes	2 days	24 hours; consider prophylactic dose
	• Fondaparinux (Arixtra®) (therapeutic)	Yes	[a] GFR ≥ 50: 2 days GFR < 50: 3 days	24 hours; consider prophylactic dose
	• Fondaparinux (Arixtra®) (prophylactic)	No	Do not stop	
	• Eptifibatide (Integrilin®)	Yes	4 hours	24 hours; consider prophylactic dose

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LOW RISK PROCEDURES

No bloodwork required unless patient condition warrants (liver failure or on chemotherapy), or on Warfarin, then **target INR ≤ 2.5** recommended. **If TPA is required CBC & Fibrinogen within 48 hours (i.e. Declotting) NOTE: Most low risk procedures do not require the discontinuation of anticoagulation / antiplatelet therapy.	**Anticoagulant / Antiplatelet Medications**	**Discontinue Yes/ No**	**Timing of LAST dose BEFORE procedure**	**Timing of FIRST dose AFTER day of procedure**
VASCULAR • Dialysis access (including fistulograms, graftograms,) • Declotting** • Peripheral venous interventions • Varicocele embolization • IVC filter placement / removal (Therapeutic INR is recommended) • PICC insertion • Uncomplicated catheter / line exchange / removal • Diagnostic venography **NON-VASCULAR** • Catheter exchange or removal (GU, biliary, abscess) • Superficial abscess drainage • Peripheral joint injection or aspiration • GI tract stenting (colon, esophagus) • Hysterosalpingography • Fallopian tube recanalization • Facet Joint injections • Paracentesis / thoracentesis Diagnostic or therapeutic under Ultrasound (up to 8 Fr catheter) **Superficial Aspiration / Biopsy (FNAB)** • Breast (including core) • Extremities • Lymph nodes • Thyroid	• Aspirin (ASA), any dose	No	Do not stop	
	• Ticagrelor (Brilinta®)	Typically No	5 – 7 days	24 hours
	• Clopidogrel (Plavix®)	Typically No	5 – 7 days	24 hours
	• Aggrenox® (ASA & Dypridamole)	Typically No	2 days	24 hours
	• Prasugrel (Effient®)	Typically No	5 – 7 days	24 hours
	• NSAIDs	No	Do not stop	
	• Warfarin (Coumadin®) ➢ If discontinuing then recommend INR ≤ 2.5	Typically No	5 days CHECK INR within 24 hrs prior	12 hours
	• LMWH (prophylactic) (i.e.: Enoxaparin, Dalteparin, Tinzaparin)[b]	No	Do not stop	
	• LMWH (therapeutic) (i.e.: Enoxaparin, Dalteparin, Tinzaparin)[b]	Typically No	24 hours	24 hours
	• (IV) unfractionated heparin (UFH)[c]	Typically No	If discontinuing stop 4 hours prior	4 hours
	• Dabigatran (Pradaxa®)	Typically No	[a] GFR ≥ 50: 2 days GFR < 50: 3 days	24 hours
	• Rivaroxaban (Xarelto®) • Apixaban (Eliquis®)	Typically No	2 days	24 hours
	• Fondaparinux (Arixtra®) (therapeutic)	Typically No	[a] GFR ≥ 50: 2 days GFR < 50: 3 days	24 hours
	• Fondaparinux (Arixtra®) (prophylactic)	No	Do not stop	
	• Eptifibatide (Integrilin®)	Yes	Immediately prior	24 hours

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[a] GFR / Creatinine Clearance is considered equivalent measurements for the purposes of this document.
[b] If LMWH is given less than 6 hrs before assay then the level may still be rising and the level may be misleading.
[c] For LMWH assays it is important to know where on the PK curve the level was drawn i.e. the level peaks at 4-6 hours post-dose.
[d] For the Anti-Xa levels in UFH, less than 0.3 is the lower end of the therapeutic level, so would be similar to an INR of 1.8-2.0, since we recommend less than 1.8 for moderate risk procedures.

References

1. Alberta Health Services Provincial Guideline, 10 March 2017- Direct Oral Anticoagulation Agents
2. Goodman, B. et al, (2017). Anticoagulant and Antiplatelet Management for Spinal Procedures: A Prospective, Descriptive Study for Interpretation of Guidelines. *Pain Medicine.* 18: 1218-1224
3. Kurup, A. et al, (2015). Bleeding Rate for Ultrasound-Guided Paracentesis in Thrombocytopenic Patients. *J. Ultrasound Med;* 34:1833- 1838.
4. Jaffe, T. et al, (2015). Management of Anticoagulant and Antiplatelet Medications in Adults Undergoing Percutaneous Interventions. *Vascular and Interventional Radiology.* 421-428.
5. Lexi-Comp. (2019). Dalteparin, Enoxaparin, Eptifibatid, Tinzaparin, Retrieved between January - March 2019 from Insite.
6. Narouze, S. et al, (2015). Interventional Spine and Pain Procedures in Patients on Antiplatelet and Anticoagulant Medications. *American Society of Regional Anesthesia and Pain Medicine.* 40: 182-212
7. Pannucci, C., Prazak, A. & Scheefer, M. (2017). Utility of anti-factor Xa monitoring in surgical patients receiving prophylactic doses of enoxaparin for venous thromboembolism prophylaxis. *The American Journal of Surgery.* 213, 1143-1152
8. Patel, I., Davidson J., Nikolic B. et al. (2016). Consensus Guidelines for periprocedural management of coagulation status and hemostasis risk in percutaneous image-guided intervention. *Journal of Vascular Interventional Radiology,* 23: 727-736.
9. Patel et al, (2013). Addendum of Newer Anticoagulants to the SIR Guidelines Consensus Guideline. SIR Journal of Vascular Interventional Radiology, 24: 641-645-
10. Patel et al, (2011). Abnormal preprocedural international normalized ratio and platelet counts are not associated with increased bleeding complications after ultrasound-guided thoracentesis.
11. Rowley, M. (2019). Real-Time Ultrasound-Guided Paracentesis by Radiologists: Near Zero Risk of Hemorrhage Without Correction of Coagulopathy. *Journal of Vascular and Interventional Radiology,* 30 (2): 259-264.
12. Thrombosis Canada, (2018) NOACs / DOACs: Perioperative Management.
13. Thrombosis Canada, (2018) Unfractionated Heparin, Low Molecular Weight Heparin and Fondaparinux.

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