

Coagulation Guidelines for Invasive Procedures University of Wisconsin Department of Radiology Abdominal Imaging Division

Critical coagulation Values:	INR	Platelets
FNA/ core of solid organ (Targeted or random)	<2.0	>25,000
FNA/ core of deep or intraperitoneal structures	<3.0	>25,000
FNA/ core of superficial structures (e.g. thyroid, lymph node)	N/A	N/A
Paracentesis	<3.0	>25,000
Paracentesis on Warfarin	<2.0	>25,000
Thoracentesis	<2.0	>25,000
Lung Biopsy	<2.0	>25,000

Inpatients: INR and Platelet count within 1 week. INR day of procedure if on warfarin
Outpatients: INR and Platelets within 6 months if previously normal. Repeat INR and platelet count if previously abnormal. INR the day of procedure if on warfarin

Note that these time limits are somewhat arbitrary and can be changed at the discretion of the attending radiologist.

Management of patients on anticoagulation:

Medication	Duration	Recommendation
Aspirin	7-10 days	Do not stop /may stop if enough time before biopsy do not delay or reschedule biopsy due to ASA. If possible have patient stop 1 week ahead of time.
NSAIDs	24 hours to 2 days	Do not stop
Plavix (clopidogrel) Ticagrelor (Brilinta) Prasugrel (Effient)	7-10 days	Stop 5 days before. Restart within 24-48 hours after procedure.
Dipyridamole (persantine)	<u>half life 10 hours</u>	Stop 1-2 days prior to procedure
Cilostazol (pletal)	<u>half life 11-13 hours</u>	Restart 24 hours post procedure.
Warfarin (Coumadin, Jantoven)	3-5 days	Permission from patient's primary care provider regulating warfarin dosing and monitoring will be required before any cessation can occur. INR needs to be <2.0 day of procedure. Notify radiologist if INR is <2.0 and patient had

		Warfarin within last 24 hours.
Heparin IV	1-2 hours	Stop 1-2 hours before, Restart 2-4 hours post procedure.
Heparin sub Q	Peaks at 2-4 hours	Stop 6-8 hours before procedure Restart 6-8 hours post procedure
Low Molecular Weight Heparin (LMWH) : (Enoxaparin, (Lovenox), Dalteparin, (Fragmin), Tinzaparin	24 hours	Stop 12 hours prior to procedure Restart 12-24 hours post procedure or 48-72 hours for high risk for bleed procedures
Fondaparinux (Arixtra)	72 hours (half life 17-21 hours)	Stop 72 hours prior to procedure. Restart 24 hours post procedure or 48-72 hours for high risk bleed procedures.
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Dabigatran (Pradaxa)	Creatinine Clearance >50ml/min.	Stop 1-2 days prior to procedure for standard bleeding risk if high bleeding risk stop 2-4 days
	<50mL/min	Stop 3-5 days before procedure for standard risk procedures. For high bleeding risk stop > 5 days before procedure. Resume Dabigatran 24 hours post procedure or 48 hours if high risk for bleeding.
Rivaroxaban (Xarelto)	>30mL/min.	Stop 24 hours before standard risk procedure. 48 hours if high risk procedure
	<30mL/min	Stop 48 hours prior to standard risk procedure and 72 hours before high bleeding risk procedure. Resume Rivaroxaban 24 hours post procedure or 48 hours if high risk for bleeding

Apixaban (Eliquis)	Serum Creat. <1.5mg/dl >1.5mg/dL	Stop apixaban 24 hours before standard risk procedure and 48 hours for high risk procedure. Stop apixaban 48 hours before a standard bleeding risk procedure and 72 hours before high bleeding risk procedure Restart Apixaban 24 hours post procedure or 48-72 hours if high risk for bleeding.
Iib/IIIa antagonists Aggrastat (Tirofiban) Abciximab (Reopro) Eptifibatide (Integrelin) Lamifiban Direct thrombin inhibitors Argatroban Lepirudin (refludan) Desrudin Bivalirudin (angiomax)	Half life is 1.8 hours Half life 30min. Half life 1-2.5 hours Half life 2 hours Half life 40 min. Half life 80 min. Half life 2 hours Half life 25 min.	Procedures to be performed on patients on these drugs need to be discussed on a case by case basis. Higher risk for post procedure bleeding when restarted. The patient population will be ICU and IMC level.
High risk procedures involve all solid organ biopsies, deep lesions, and those next to large blood vessels. All Ablation cases. Please use high risk protocol for all of these cases.		

Management of abnormal coagulation parameters:

<u>Therapy</u>	<u>Use</u>	<u>Risks</u>
Fresh Frozen Plasma	Provides clotting factors Consider dose No benefit in mildly elevated INR	TRALI (1 in 8,000 to 60,000 units) Volume overload (1 in 356 units) Allergic reaction Infection Hemolysis This should be on a case by case basis. Consult with PCP and attending radiologist for direction.

Platelets	Provides platelets	TRALI (1 in 432 to 88,000 units) Volume overload Allergic reaction Hemolysis Decreased response with multiple doses. This should be on a case by case basis. Consult with PCP and attending radiologist for direction.
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Special Considerations:

- High risk of cardiac event and death if clopidogrel and aspirin d/c in these patients. **Never stop aspirin in these patient and only stop clopidogrel if beyond the following time windows. 2-4 weeks for dilation w/o stent. 1 month for bare metal stent and >12 months for a drug for a drug eluting stent.**
- **Do not** stop heparin, aspirin, plavix or any other anticoagulant drug on a Neuroendovascular patient for any procedure, either in-patient, or out-patient, without discussing it first with the Neuroendovascular attendings (Dr. Aagaard-Kienitz or Dr. Niemann).
- High risk patients that need to stay on anticoagulant therapy must be approved by attending radiologist before procedure can be scheduled.
- **Please consult with attending radiologist with any anticoagulant that can't be stopped according to guidelines to receive permission to schedule biopsy.**

Reviewed and revised by Peggy Baker RN 4/1/13

Reviewed and approved by Dr. Fred Lee, Dr. Ann McBride, and Anne Rose PhD 4/1/13.