

**Anticoagulation Management Guidelines for Patients having *ELECTIVE* Invasive Procedures in Diagnostic Imaging**

**LOW RISK**

**LOW RISK PROCEDURES**

MEDICATION	DISCONTINUE Y/N	STOP RECOMMENDATION	RESUME ANTICOAGULATION
<b>Conventional Agents</b>			
Warfarin (Coumadin)	Yes	Hold 3-5 Days pre <b>recheck INR</b>	Evening of Procedure
<b>LMWH:</b> Fragmin=Dalteparin Lovenox=Enoxaparin Innohep=Tinzaparin	Yes	Hold 12 hrs prior	Evening of Procedure
Heparin (Unfractionated)	Yes	Hold 2 hours prior	2 Hours Post
<b>Antiplatelet Agents</b>			
ASA	No		
Clopidogrel (Plavix)	No		
Prasugrel (Effient)	No		
Triclopidine (Ticlid)	No		
<b>Glycoprotein IIb/IIIa inhibitors</b>			
Abciximab (ReoPro)	Yes	Hold 12-24 hrs pre	Day after Procedure
Eptifibatide (Integrilin)	Yes	Hold immediately pre	
Tirofiban (Aggrastat)	Yes	Hold immediately pre	
<b>Factor Xa Inhibitors</b>			
Rivaroxaban (Xarelto)	Yes	eGFR>30 Hold 24hrs eGFR<30 Hold 48hrs	Day after Procedure
Apixaban (Eliquis)	Yes	eGFR>30 Hold 24hrs eGFR<30 Hold 48hrs	Day after Procedure
Fondaparinux (Arixtra)	No		
<b>Direct Thrombin Inhibitors</b>			
Argatroban	No		
Dabigatran (Pradaxa)	No		
Bivalirudin (Angiomax)	No		
<b>NSAIDS</b>			
<b>Short acting:</b> Ibuprofen, Diclofenac, Ketoprofen, Indomethacin	No		
<b>Intermediate Acting:</b> Naproxen, Sulindac, Diflunisal, Celecoxib	No		
<b>Long Acting:</b> Meloxicam, Nabumetone, Piroxicam	No		

**VASCULAR**

- Dialysis Line exchanges
- Venography
- Central Line Removal
- IVC filter placement
- PICC

**NON-VASCULAR**

- Catheter exchange (Abscess, Biliary, Nephrostomy)
- Thoracentesis
- Paracentesis
- Superficial Drainage

**SUPERFICIAL BIOPSY / ASPIRATION**

- Breast
- Lymph Node
- Extremities
- Thyroid

**THRESHOLDS FOR TREATMENT**

- INR < 1.5
- PTT: No consensus
- PLT: >50,000

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<b>MODERATE RISK</b>				
<b>MODERATE RISK PROCEDURES</b>	<b>MEDICATION</b>	<b>DISCONTINUE Y/N</b>	<b>STOP RECOMMENDATION</b>	<b>RESUME ANTICOAGULATION</b>
<b>VASCULAR</b> <ul style="list-style-type: none"> <li>Angiography (Arterial Intervention up to 7F)</li> <li>Venous Intervention (Plasty, Stent, Thrombolysis)</li> <li>Chemoembolization</li> <li>Uterine Fibroid Embolization</li> <li>Varicocele Embolization</li> <li>Transjugular Liver Biopsy</li> <li>Tunneled CVC/Port/Hickman</li> </ul>	<b>Conventional Agents</b>			
	Warfarin (Coumadin)	Yes	Hold 5 Days pre <b>recheck INR</b>	Day after Procedure
	<b>LMWH:</b> Fragmin=Dalteparin Lovenox=Enoxaparin Innohep=Tinzaparin	Yes	Hold 12 hrs prior	Day after Procedure
	Heparin (Unfractionated)	Yes	Hold 2-4 hours prior	4-6 Hours Post
	<b>Antiplatelet Agents</b>			
	ASA	No		
	Clopidogrel (Plavix)	Yes	Hold 5 days pre	Day after Procedure
	Prasugrel (Effient)	Yes	Hold 5 days pre	Day after Procedure
	Triclopidine (Ticlid)	Yes	Hold 7 days pre	Day after Procedure
	<b>Glycoprotein IIb/IIIa inhibitors</b>			
	Abciximab (ReoPro)	Yes	Hold 24 hrs pre	Day after Procedure
	Eptifibatide (Integrilin)	Yes	Hold 4hrs pre	
	Tirofiban (Aggrastat)	Yes	Hold 4hrs pre	
	<b>Factor Xa Inhibitors</b>			
Rivaroxaban (Xarelto)	Yes	eGFR>30 Hold 48hrs eGFR<30 Hold 4days	Day after Procedure	
Apixaban (Eliquis)	Yes	eGFR>30 Hold 48hrs eGFR<30 Hold 4days	Day after Procedure	
Fondaparinux (Arixtra)	Yes	eGFR>50 Hold 2-3days eGFR <50 Hold 3-5days	Day after Procedure	
<b>Direct Thrombin Inhibitors</b>				
Argatroban	Yes	Hold 4hrs pre	Day after Procedure	
Dabigatran (Pradaxa)	Yes	eGFR >50 Hold 2-4days eGFR 30-50 Hold 4days eGFR <30 Hold for 5days	Day after Procedure	
Bivalirudin (Angiomax)	Yes	Hold 3-5 hrs pre	Day after Procedure	
<b>THRESHOLDS FOR TREATMENT</b>	<b>NSAIDS</b>			
<ul style="list-style-type: none"> <li>INR&lt; 1.5</li> <li>PTT: try for &lt;50s (N=25-35s)</li> <li>PLT: &gt;50,000</li> </ul>	<b>Short acting:</b> Ibuprofen.....	No		
	<b>Intermediate Acting:</b> Naproxen...,	No		
	<b>Long Acting:</b> Meloxicam,.... See above for others	No		
Bloodwork within 30days for outpatient				

**Anticoagulation Management Guidelines for Patients having *ELECTIVE* Invasive Procedures in Diagnostic Imaging**

**HIGH RISK**

**HIGH RISK PROCEDURES**

MEDICATION	DISCONTINUE Y/N	STOP RECOMMENDATION	RESUME ANTICOAGULATION
<b>Conventional Agents</b>			
Warfarin (Coumadin)	Yes	Hold 5 Days pre <b>recheck INR</b>	Day after Procedure
<b>LMWH:</b> Fragmin=Dalteparin Lovenox=Enoxaparin Innohep=Tinzaparin	Yes	Hold 2 doses or 24 hrs pre procedure	Day after Procedure
Heparin (Unfractionated)	Yes	Hold 4 hours prior	12 Hours Post
<b>Antiplatelet Agents</b>			
ASA	Yes	Hold 5 days pre	Day after Procedure
Clopidogrel (Plavix)	Yes	Hold 5 days pre	Day after Procedure
Prasugrel (Effient)	Yes	Hold 5 days pre	Day after Procedure
Triclopidine (Ticlid)	Yes	Hold 7 days pre	Day after Procedure
<b>Glycoprotein IIb/IIIa inhibitors</b>			
Abciximab (ReoPro)	Yes	Hold 24 hrs pre	Day after Procedure
Eptifibatide (Integrilin)	Yes	Hold 4hrs pre	
Tirofiban (Aggrastat)	Yes	Hold 4hrs pre	
<b>Factor Xa Inhibitors</b>			
Rivaroxaban (Xarelto)	Yes	eGFR>30 Hold 48hrs eGFR<30 Hold 4days	2 <sup>nd</sup> Day after Procedure
Apixaban (Eliquis)	Yes	eGFR>30 Hold 48hrs eGFR<30 Hold 4days	2 <sup>nd</sup> Day after Procedure
Fondaparinux (Arixtra)	Yes	eGFR>50 Hold 2-3days eGFR <50 Hold 3-5days	2 <sup>nd</sup> Day after Procedure
<b>Direct Thrombin Inhibitors</b>			
Argatroban	Yes	Hold 4hrs pre	2 <sup>nd</sup> Day after Procedure
Dabigatran (Pradaxa)	Yes	eGFR >50 Hold 2-4days eGFR 30-50 Hold 4days eGFR <30 Hold for 5days	2 <sup>nd</sup> Day after Procedure
Bivalirudin (Angiomax)	Yes	Hold 3-5 hrs pre	2 <sup>nd</sup> Day after Procedure
<b>NSAIDS</b>			
<b>Short acting:</b> Ibuprofen.....	Yes	Hold 24 hrs pre	Day after Procedure
<b>Intermediate Acting:</b> Naproxen....,	Yes	Hold 2-3 days pre	Day after Procedure
<b>Long Acting:</b> Meloxicam,.... See above for others	Yes	Hold 10 days pre	Day after Procedure

**VASCULAR**

- Angiography Arterial Intervention > 7F
- TIPS

**NON-VASCULAR**

- Biliary Interventions (New Tract)
- Nephrostomy Insert
- Renal Biopsy
- RFA: complicated

**THRESHOLDS FOR TREATMENT**

- INR < 1.5
- PTT: try for <43s (N=25-35s)
- PLT: >50,000

Bloodwork within:  
72hrs Inpatients  
14days Outpatients

**HIGH RISK**

**MODERATE RISK**

**LOW RISK**

**Version 2.0 Effective September 1 2015  
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**References:**

- 1. Journal of Vascular And Interventional Radiology 2013; 24:5 641-645. Addendum of Newer Anticoagulants to the SIR Consensus Guideline.**
- 2. Journal of Vascular And Interventional Radiology 2009; 20:S240-S249 – Consensus Guidelines for Periprocedural management of Coagulation Status and Hemostasis Risk in Percutaneous Image-guided Interventions**
- 3. Canadian Journal of Cardiology 2011; 27:S1-S59 – The Use of Antiplatelet Therapy in the Outpatient Setting: Canadian Cardiovascular Society Guidelines**
- 4. O'Connor et al. Coagulation Concepts Update AJR, 2009**