WASHINGTON HEALTH SYSTEM

WHS Clinical Practice Guidelines/Recommendations for Anticoagulation and Antiplatelet Discontinuation Prior to Surgery

The following recommendations are collated from available product references, clinical practice guidelines, and available pharmacokinetic data and are meant for informational purposes only. Individual patient risk factors (procedural bleeding risk, peri-procedural thromboembolic risk, etc.) should be considered when decisions are made regarding discontinuation of antithrombotic agents prior to a procedure/surgery.

Bleeding Risk	Surgery/Procedure Type
High	• Left atrial appendage occlusion (Watchman device) • Valve repair/replacement (TAVR or open surgery) • Major elective lower extremity surgery, THA (total hip), TKA (total knee) or revision of either procedure • Spinal surgery • Lumbar Puncture • Corrective jaw or facial surgery • Mastectomy • PEG placement • Prostate procedures • ERCP • Diagnostic Endoscopy/Colonoscopy including mucosal biopsy
Moderate	• PCI • VATS procedure • Bronchoscopy w/biopsy
Low	• Ablation • Right Heart Catheterization • Bronchoscopy w/BAL (Bronchoalveolar lavage) • Thoracentesis • FNA (fine needle aspiration) breast • Breast biopsy (core needle biopsy) • Tunneled hemodialysis catheter exchange/removal • Ureteral stenting • Transurethral instrumentation (cystoscopy, catheter placement) • ICD or pacemaker placement

No Risk to Very Low Risk
 	
***Do not hold anticoagulation/ antiplatelet**
	• Cataract surgery
	• Dental procedures
	  ○ Dental hygiene
	  ○ Simple extractions
	  ○ Restorations
	  ○ Endodontics
	  ○ Prosthetics
	• Cutaneous surgeries

Periprocedural Risk for Thromboembolism

Risk	High: Periprocedural Anticoagulation Advised
Mechanical Heart Valve	• Any mechanical mitral valve • Older mechanical valve model (caged ball or tilting disc) in mitral or aortic position • Recently placed mechanical valve (< 3 months) in mitral or aortic position • Recent Stroke or TIA (within 6 months) with mitral or aortic valve
Atrial Fibrillation	• With mechanical heart valve in mitral or aortic position • With recent stroke or TIA (within 3 months)
Venous Thromboembolism	• VTE within previous 3 months

Anticoagulant Discontinuation Recommendations

Apixaban(Eliquis)		
Renal Function (Est CrCl)	**Apixaban Discontinuation Plan**	
	Low Bleeding Risk	Moderate-High Bleeding Risk
≥30ml/min	Stop 24 hours before surgical procedure	Stop 48 hours before surgical procedure
<30ml/min	Stop 36-48 hours before surgical procedure	Stop 72 hours before surgical procedure
*Neuraxial procedure planned	Hold 72 hours prior to procedure	

Dabigatran (Pradaxa)		
Renal Function (Est CrCl)	**Dabigatran Discontinuation Plan**	
	Low Bleeding Risk	Moderate-High Bleeding Risk
>50ml/min	Stop 24-36 hours before surgical procedure	Stop 48-72 hours before surgical procedure
≤50ml/min	Stop 48-72 hours before surgical procedure	Stop 96-120 hours before surgical procedure
*Neuraxial procedure planned	Est CrCl >= 80 ml/min	72 hrs before procedure
	50-79 ml/min	96 hrs before procedure
	30-49 ml/min	120 hrs before procedure
	<30ml/min	Neuraxial procedure inappropriate

Rivaroxaban (Xarelto)		
Renal Function (Est CrCl)	**Rivaroxaban Discontinuation Plan**	
	Low Bleeding Risk	Moderate-High Bleeding Risk
≥30ml/min	Stop 24 hours before surgical procedure	Stop 48 hours before surgical procedure
<30ml/min	Stop 48 hours before surgical procedure	Stop 72 hours before surgical procedure
*Neuraxial procedure planned	Hold 72 hours prior to procedure	

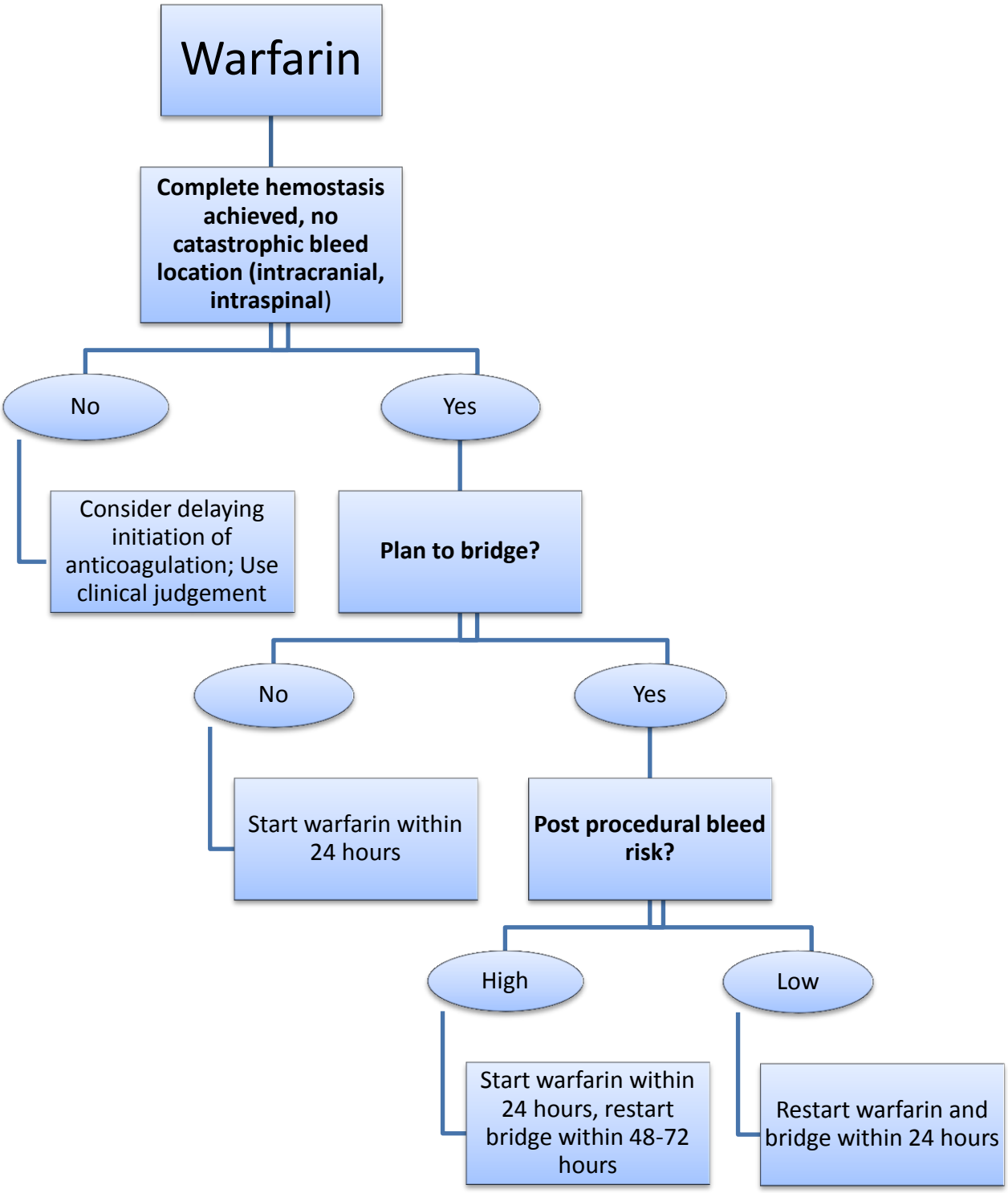
Edoxaban (Savaysa)		
Renal Function (Est CrCl)	**Edoxaban Discontinuation Plan**	
	Low Bleeding Risk	Moderate-High Bleeding Risk
≥30ml/min	Stop 24 hours before surgical procedure	Stop 48 hours before surgical procedure
<30ml/min	Stop 36 -48 hours before surgical procedure	Stop 72 hours before surgical procedure
*Neuraxial procedure planned	Hold 72 hours prior to procedure	

Warfarin	Pre-procedure INR	Pre-Procedure Plan
	2.0-3.0	Stop 5 days before procedure
	3.0-4.5	Stop 6 days before procedure
	>4.5	Stop 6-7 days before procedure Consider rechecking INR after 2-3 days of held doses If indicated consider phytonadione

Enoxaparin (Lovenox)	
	Lovenox Discontinuation Plan
In patients who are receiving bridge	Last preoperative dose approximately 24 hours before surgery
	Lovenox Resumption
	24 hours in patients undergoing low-risk bleeding 48-72 hours in patient undergoing high-bleeding risk surgery

IV Unfractionated Heparin (UFH)	
	IV UFH Discontinuation Plan
In patients who are receiving bridge	4-6 hours before surgery

Resuming Anticoagulation (VKA/Warfarin):



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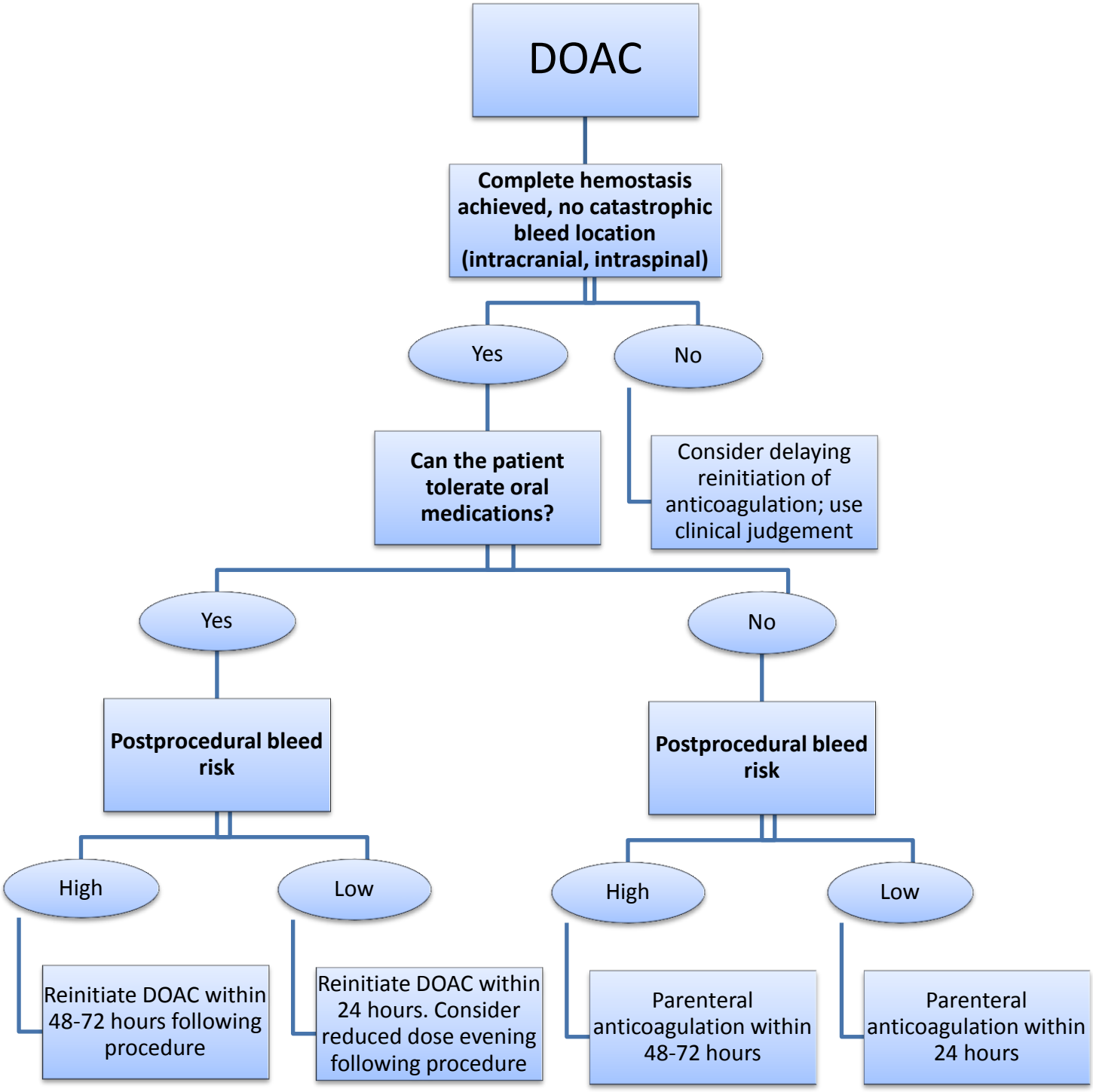
Resuming Anticoagulation (DOAC):



Journal of the American College of Cardiology[1]

Noncardiac Surgery Recommendations for Patients on Dual Antiplatelet Therapy for Percutaneous Intervention

Thrombotic Risk	Hemorrhagic Risk: Low Risk	Hemorrhagic Risk: Intermediate Risk	Hemorrhagic Risk: High Risk
Low Risk	**Continue ASA and discontinue P2Y12 receptor inhibitor; resume within 24-72 hours**	**Continue ASA and discontinue P2Y12 receptor inhibitor; resume within 24-72 hours**	**Continue ASA and discontinue P2Y12 receptor inhibitor; resume within 24-72 hours**
Intermediate Risk	**Continue ASA and discontinue P2Y12 receptor inhibitor; resume within 24-72 hours**	**Continue ASA and discontinue P2Y12 receptor inhibitor; resume within 24-72 hours**	**Continue ASA; discontinue P2Y12 receptor inhibitor; resume within 24–72 hours**
High Risk	**Postpone Elective Surgery** **If surgery cannot be deferred, continue ASA and P2Y12 receptor inhibitor perioperatively.**	**Postpone Elective Surgery** **If surgery nondeferrable: continue ASA; discontinue P2Y12 receptor inhibitor; resume within 24–72 hours**	**Postpone Elective Surgery** **If surgery nondeferrable: continue ASA; discontinue P2Y12 receptor inhibitor; resume within 24–72 hours**

APT = antiplatelet therapy; ASA = aspirin; IV = intravenous

5. Banerjee, S., Angiolillo, D. J., Boden, W. E., Murphy, J. G., Khalili, H., Hasan, A. A., . . . Rao, S. V. (2017). Use of Antiplatelet Therapy/DAPT for Post-PCI Patients Undergoing Noncardiac Surgery. *Journal of the American College of Cardiology, 69*(14), 1861-1870. doi:10.1016/j.jacc.2017.02.012

****When indicated, recommendation is to hold P2Y12 inhibitors:**
Clopidogrel(Plavix): 5-7 days, Prasugrel(Effient): 7-10 days, Ticagrelor(Brillinta): 5-7 days, Ticlodipine(Ticlid): 10 days

Determination of Thrombotic Risk

Low Risk (<1%)*	Intermediate Risk (1-5%)*	High Risk (>5%)*
>4 weeks after PCI with POBA	**>2 weeks and </=4 weeks after PCI with POBA**	**</=2 weeks after PCI with POBA**
>6 months after PCI with BMS	**>1 month and </=6 months after PCI with BMS**	**</=1 month after PCI with BMS**
>12 months after PCI with DES	**>6 months and </=12 months after PCI with DES**	**</=6 months after PCI with DES**
	>12 months after complex PCI with DES (long stents, multiple stents, overlapping, small vessels, bifurcations, left main, last remaining vessel)	**</=12 months after complex PCI with DES** **</=6 months after PCI for MI** **Previous ST**
*30 day ischemic event rates of cardiovascular death and MI BMS = bare metal stent(s), DES = drug eluding sent(s), MI = myocardial infarction, PCI = percutaneous coronary intervention, POBA = plain old balloon angioplasty, ST = stent thrombosis		

5. Banerjee, S., Angiolillo, D. J., Boden, W. E., Murphy, J. G., Khalili, H., Hasan, A. A., . . . Rao, S. V. (2017). Use of Antiplatelet Therapy/DAPT for Post-PCI Patients Undergoing Noncardiac Surgery. *Journal of the American College of Cardiology, 69*(14), 1861-1870. doi:10.1016/j.jacc.2017.02.012

1. Doherty, J. U., Gluckman, T. J., Hucker, W. J., Januzzi, J. L., Ortel, T. L., Saxonhouse, S. J., & Spinler, S. A. (2017). 2017 ACC Expert Consensus Decision Pathway for Periprocedural Management of Anticoagulation in Patients With Nonvalvular Atrial Fibrillation. Journal of the American College of Cardiology, 69(7), 871-898. doi:10.1016/j.jacc.2016.11.024

2. Douketis JD, Spyropoulos AC, Spencer FA, et al. Perioperative management of antithrombotic therapy: Antithrombotic therapy and prevention of thrombosis: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (9th Edition). *CHEST*. 2012;141:e326S-e350S.

3. Wii DM, McCool KH, Dowd MB, et al. Incidence and predictors of bleeding or thrombosis after polypectomy in patients receiving and not receiving anticoagulation therapy. *J Thromb Haemost.* 2009;7(12):1982-9.

4. Bahl V, Hu H, Henke P, et al. A validation study of a retrospective venous thromboembolism risk scoring method. *Ann Surg.* 2010;251:344-350.

5. Banerjee, S., Angiolillo, D. J., Boden, W. E., Murphy, J. G., Khalili, H., Hasan, A. A., . . . Rao, S. V. (2017). Use of Antiplatelet Therapy/DAPT for Post-PCI Patients Undergoing Noncardiac Surgery. *Journal of the American College of Cardiology, 69*(14), 1861-1870. doi:10.1016/j.jacc.2017.02.012

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