

**OHSU Hospital and Clinics  
Department of Pharmacy Services**

**Pharmacy and Therapeutics Committee  
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**ANTICOAGULANTS: THE GUIDE TO REVERSAL**

**Definition of Bleeding:**

Minor bleeding – Any clinically overt sign of hemorrhage (including imaging) that is associated with a  $<5$  g/dl decrease in the hemoglobin concentration or  $< 15\%$  decrease in the hematocrit felt by the clinician to be related to anticoagulation

Major bleeding – Intracranial hemorrhage or a  $\geq 5$  g/dl decrease in the hemoglobin concentration or a  $\geq 15\%$  absolute decrease in the hematocrit resulting in hemodynamic compromise or compression of a vital structure and felt by the clinician to be related to anticoagulation

**ANTIPLATELET AGENTS**

**Aspirin**

Minor – desmopressin 0.3 mcg/kg x 1

Major – platelet transfusion

**Clopidogrel (Plavix®)**

Minor – desmopressin 0.3 mcg/kg x 1

Major – platelet transfusion – consider two units if life or brain threatening bleeding

**Prasugrel (Effient®)**

Minor – desmopressin 0.3 mcg/kg x 1

Major – platelet transfusion – consider two units if life or brain threatening bleeding

**Ticagrelor (Brilinta®)**

Minor – desmopressin 0.3 mcg/kg x 1

Major – platelet transfusion – consider two units if life or brain threatening bleeding

**Sustained Release Aspirin/Dipyridamole (Aggrenox®)**

Minor – desmopressin 0.3 mcg/kg x 1

Major – platelet transfusion

**Abciximab (Reopro®)**

Major – platelet transfusion

**Eptifibatide (Integrilin®)**

Minor – desmopressin 0.3 mcg/kg x 1

Major Bleeding Reversal: platelet transfusions plus infusion of 10 units of cryoprecipitate

**Tirofiban (Aggrastat®)**

Minor – desmopressin 0.3 mcg/kg x 1

Major bleeding Reversal: platelet transfusions plus infusion of 10 units of cryoprecipitate

## HEPARIN AND HEPARIN LIKE AGENTS

### Standard Heparin

Time since last heparin dose	Dose of Protamine
< 30 minutes	1 unit/100 units of heparin
30-60 minutes	0.5 - 0.75 units/100 units of heparin
60-120 minutes	0.375 - 0.5 units/100 units of heparin
> 120 minutes	0.25 - 0.375 units/100 units of heparin

Infusion rate should not exceed 5 mg/min. Maximum dose is 50 mg per dose

### Low Molecular Weight Heparin

Reversal of Bleeding: Protamine (works just as well with LMWH as heparin) – if with-in 4 hours of dose: 1 mg of protamine for each 1 mg of enoxaparin or 100 units of dalteparin and tinzaparin. Repeat one-half dose of protamine in 4 hours. If 4-8 hours after dose: give 0.5 mg for each 1 mg of enoxaparin or 100 units of dalteparin and tinzaparin.

### Fondaparinux (Arixtra®)

Major Bleeding Reversal – Protamine ineffective – rVIIa (90 mcg/kg) may be of use

### Dabigatran (Pradaxa®)

Reverse if patient shows signs of bleeding and had an elevated aPTT > 40 seconds

1. Profilnine (Factor IX complex) 4000 units (50 units/kg for patients under 80 kg) plus 1 mg of rFVIIa

### Rivaroxaban (Xarelto®)

Reverse if patient shows signs of bleeding and has an INR > 1.5

1. Profilnine (Factor IX complex) 4000 units (50 units/kg for patients under 80 kg) plus 1 mg of rFVIIa

## THROMBOLYTIC THERAPY

Reversal: Immediate infusions of equivalent of 6-8 units of platelets (or one platelet pheresis product), 2 units of plasma, and 10 units of cryoprecipitate. No value in infusing anti-fibrinolytic agents

## WARFARIN

### Not Bleeding: Goal is INR in 2–3 range

INR	Action
3–4.5	Hold dose until INR decreased
4.5–10	1.25 mg Vitamin K PO
> 10	2.5 – 5 mg Vitamin K PO

Should see INR back in therapeutic range in 24–48 hours

### Bleeding: Goal is INR under 2

INR	Action
2–4.5	2.5 mg Vitamin K ± FFP (15 ml/kg)
4.5–10	5 mg Vitamin K ± FFP (15 ml/kg)
> 10	5–10 mg Vitamin K ± FFP (15 ml/kg)

FFP: Fresh Frozen Plasma

Life or Brain Threatening: Prothrombin 4000 units + 1 mg rVIIa

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