

LMWH Reversal

Enoxaparin (Lovenox)
T_{1/2}: 4 - 7 hours
1 mg = 100 anti-Xa units

Last dose < 8 hrs ago?

No

Yes or Unknown

Last dose within 8 - 12 hours?

Yes

No

Protamine 0.5 mg/for each 1 mg Enoxaparin (max 50 mg)

Last dose > 12 hours AND Renal insufficiency?

Yes

Consider reversal beyond 12 hours

No

Reversal is not indicated

Protamine 1 mg/for each 1 mg Enoxaparin (max 50 mg)
If bleeding continues, repeat Protamine 0.5 mg/for each 1 mg Enoxaparin (Protamine T_{1/2}: 7 min)

Direct Thrombin Inhibitor Reversal

Dabigatran (Pradaxa)
T_{1/2}: 12 - 17 hrs

Argatroban
T_{1/2}: 39 - 51 min
Bivalirudin (Angiomax)
T_{1/2}: 25 min

Last dose ≤ 2 hours?

No

Consider activated charcoal 50 g

Dose administered within 48 hours or unknown time or TT > 30 sec

Yes

Idarucizumab (Praxbind) 5 g IV push

No reversal agent available. Use supportive measures to control bleeding

Supportive care

Factor Xa Inhibitor Reversal

Apixaban (Eliquis): T_{1/2}: 8 - 12 hours
Rivaroxaban (Xarelto): T_{1/2}: 5 - 9 hours
Edoxaban (Savaysa): T_{1/2}: 10 - 14 hours
Betrixaban (Bevyxxa): T_{1/2}: 19 - 27 hours

Level 1

Level 3

Level 2

PCC (Kcentra) 50 units/kg (max 5000 units)

Consider PCC (Kcentra) 1500 units

Consider PCC (Kcentra) 2000 units

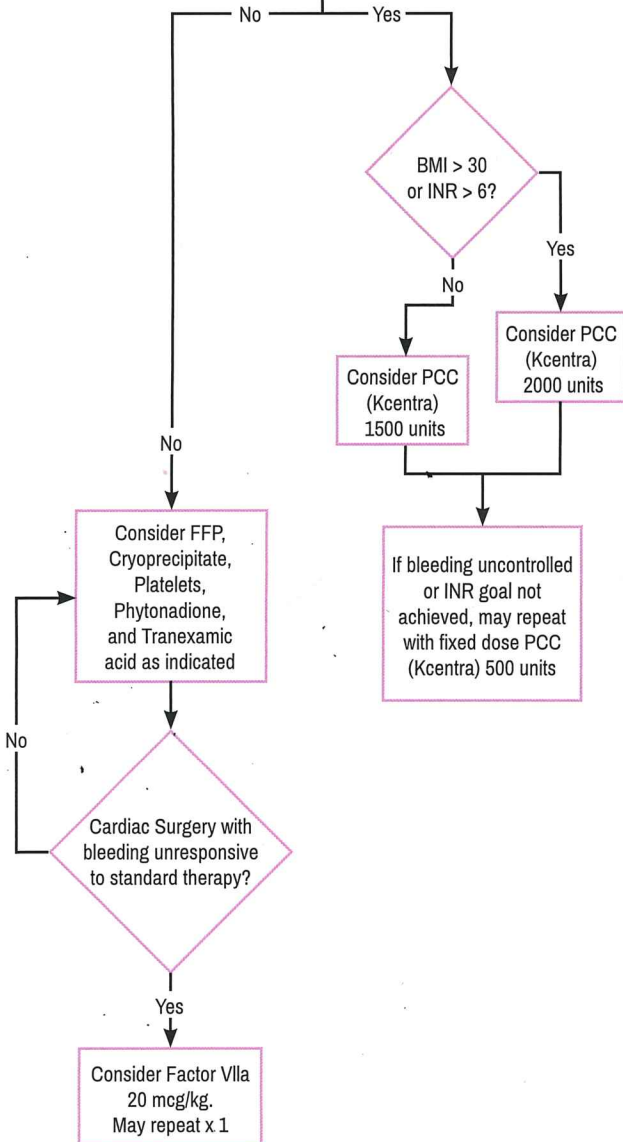
CHOOSE ONE:
Andexanet alfa (EPIC guided dosing available *must have attending physician approval). If bleeding uncontrolled after infusion complete, redosing with Andexanet alfa or combination with PCC is not recommended
OR
PCC (Kcentra) 50 units/kg (maximum 5000 units). If bleeding uncontrolled, may repeat with fixed dose PCC (Kcentra) 500 units

If bleeding uncontrolled may repeat with fixed dose PCC (Kcentra) 500 units

No Anticoagulant Use

PCC (Kcentra) is not recommended for coagulopathy secondary to liver failure or DIC

Emergent Surgical Procedure AND Goal INR < 1.5



Heparin Reversal

Heparin T 1/2: 1 - 2 hours

Protamine 1 mg/100 units administered in the last 2 hours (max dose 50 mg)

Life-threatening Bleeding Definitions:

Level 1

Must have all of the following:

- Anticoagulation Use
- Warfarin: INR required
- Direct Thrombin Inhibitor: TT >30 sec (if available) or dose within 24 hours
- Xa-Inhibitor [Apixaban/rivaroxaban]: dose within 24 hours
- Age >18 years old
- Immediate condition considered survivable/withdrawal of care not anticipated
- Life expectancy prior to immediate condition > 6 months

AND at least one of the following

- Level 1 or 2 Trauma
- Emergent surgical intervention required in next 60 minutes
- Intracranial hemorrhage with GCS >4 (Consider level 1 if ICH with spot sign on CTA and normal coagulation test)
- GI bleed with massive transfusion protocol and hemodynamically unstable (on vasopressors)
- Clinically significant spinal hematoma
- Postpartum hemorrhage
- Bleeding into a small space with devastating consequences such as ophthalmologic bleed
- Heart transplant procedure (please refer to specific recommendations)

Level 2

Must have all of the following

- Anticoagulation use -
- Warfarin: INR required
- Direct Thrombin Inhibitor: TT >30 sec (if available) or dose within 48 hours
- Xa-Inhibitor [Edoxaban/Apixaban/Rivaroxaban]: dose within 48 hours
- Withdrawal of care not anticipated
- Age >18 years old
- Expected life expectancy prior to hemorrhage > 6 months

AND at least one of the following

- Level 1-4 Trauma without immediate life-threatening condition
- Emergent surgical intervention anticipated
- GI bleed with impending hemodynamically instability (not on vasopressors)
- Any condition, in the opinion of the physician, that may deteriorate unless bleeding controlled

Level 3

At least one of the following

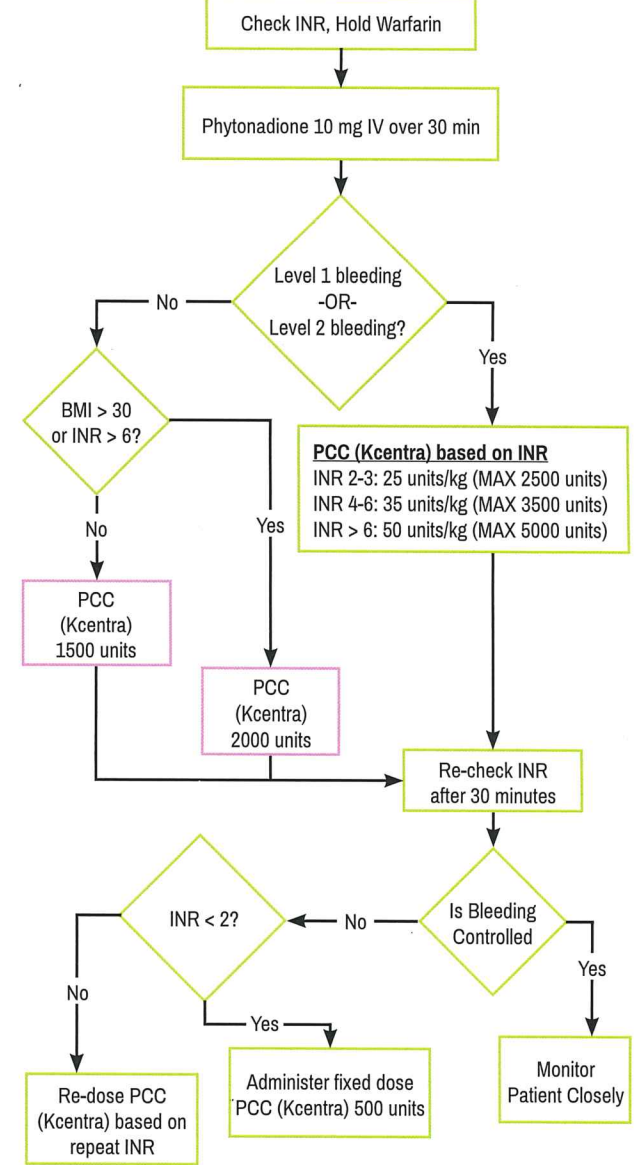
- Significant GI bleeding
- Trauma and hemodynamically unstable

Additional information

- PCC contains heparin and should be avoided in patients with diagnosed HIT within the last 100 days.
- More than one dose of PCC may increase risk of thrombosis
- Andexanet alfa may interfere with the anticoagulant effect of Heparin - Additional monitoring and/or Heparin may be required.

Warfarin Reversal

For non-emergent reversal, refer to the Warfarin Reversal Algorithm in Dorsata and EPIC



For patients requiring large volume resuscitation, consider addition of FFP 15 - 20 mL/kg