

SYSTEMIC THROMBOLYTIC THERAPY using Alteplase

* Hematology consult and PICU Admission required*

PREPARATION OF PATIENT FOR ALTEPLASE INFUSION

- Baseline CBC, INR, aPTT, fibrinogen and D dimers, group and screen
- Ensure that platelet count is $> 100 \times 10^9/L$ and fibrinogen is $> 1 \text{ g/L}$
- For children < 1 year of age, give plasma (15 mL/kg) prior to alteplase to replace naturally low plasminogen
- Notify blood bank of alteplase infusion so they are aware that blood products may be needed
- Ensure good venous access for blood sampling
- Have compresses and topical thrombin available in case of localized bleeding
- Consider sedation depending on the child and circumstances
- An "Alteplase Infusion" sign should be posted on patient's bed

CONTRAINDICATIONS

- Active bleeding or significant potential for local bleeding (e.g. tumor surrounding vessel with clot), GI bleed, head injury, uncontrolled hypertension
- General surgery or lumbar puncture within previous 10 days
- Neurosurgery within previous 3 weeks, stroke, AV malformations, TIA
- Brain tumor

Alteplase (tissue plasminogen activator, tPA)

- No loading dose
- Infuse IV at 0.5 mg/kg/h x 6 hours

HEPARIN addition during alteplase infusion

- Concurrent heparin infusion recommended to prevent thrombin generation. Run at 10 units/kg/h during alteplase infusion (do not give a heparin loading dose). Start as soon as possible, if possible start prior to starting alteplase
- If patient is already on therapeutic heparin, reduce the infusion rate to 10 units/kg/h 30 minutes prior to starting alteplase
- Re-evaluate with objective testing (radiographically or return of pulses and BP for arterial thrombi) following 6 hours of infusion
- 30 – 60 minutes after alteplase infusion is finished, start titrating heparin infusion up toward therapeutic aPTT
- If no response, consider giving plasma at 15 mL/kg every 8 hours
- A repeat alteplase infusion can be considered 12-24 hours after completing initial course

Monitoring

- At 4 hours and Q6-8H thereafter: CBC, INR, aPTT, fibrinogen, D dimer
- Expect fibrinogen to decrease and d-dimer to increase with thrombolysis
- Maintain fibrinogen $> 1 \text{ g/L}$ with cryoprecipitate infusions (1 unit/5 kg) as needed
- If no response to alteplase, consider administration of plasma (15 mL/kg) Q8H
- Maintain platelets $\geq 100 \times 10^9/L$

PRECAUTIONS:

- Minimal patient manipulation
- No intramuscular injections, arterial punctures, urinary catheterization, rectal temperature
- Avoid concurrent antiplatelet agents such as ASA, NSAIDs or dipyridamole

- Reverse warfarin as needed
- Blood sampling from superficial veins or indwelling venous catheter
- Monitor for bleeding in previous puncture sites (e.g. for cardiac catheter)

Bleeding complications:

- Major bleeding occurs in 10-30% of children
- Management depends on severity
- Consider:
 - stopping alteplase and heparin
 - local hemostatic measure
 - cryoprecipitate (to reverse alteplase)
 - protamine sulfate (to reverse unfractionated heparin)
 - for life-threatening bleeding consider rFVIIa