Post-procedure Orders - ICU
Thrombolytic Infusion via EKOS Catheter for Submassive Pulmonary Embolism
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<table>
<thead>
<tr>
<th>Do Not Use Abbreviations</th>
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<tbody>
<tr>
<td><strong>DO NOT USE</strong></td>
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<tr>
<td>Q.D., QD</td>
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<tr>
<td>Q.O.D., QOD</td>
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<tr>
<td>U</td>
</tr>
<tr>
<td>No Trailing Zero</td>
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<tr>
<td>Lack of Leading Zero</td>
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<tr>
<td>MS</td>
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<tr>
<td>MSO₄</td>
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<td>MgSO₄</td>
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**STATUS INPATIENT:** See Initial Order Set - Patient Status already completed by MD
- [ ] Transfer to CICU
- [ ] Transfer to CVICU

**Diagnosis:**

**Allergies:**

**Nursing:**
- [ ] Vital Signs with continuous pulse oximetry Q 15 min X 4, Q 30 min X 2, then Q 1 hour
- [ ] Call MD for:
  - SBP < (90) _______ or > (180) _______; DBP < (40) _______ or > (100) _______; 
  - HR < (50) _______ or > (120) _______; RR > (30) _______; Temp > (101) _______; 
  - O₂ sats < (90%) _______; Urine Output < (30cc/hr x 2) _______; 
  - Hgb < (10) _______ g/dL; Platelets < (150,000) _______ mm3 OR if drops > 50% from baseline 
  - Fibrinogen < (150) _______ mg/dL
- [ ] Bedrest with HOB elevated (max 30°) with [ ] Rt leg [ ] Lt leg [ ] both legs extended, no groin flexion
- [ ] Strict I & O: [ ] Foley Catheter drainage to gravity **Indication:** accurate urine output measurement in critically ill patient
- [ ] Neuro Checks Q (4) ______ hr; notify MD for all changes in neuro exam
- [ ] Delirium Assessment Q shift
- [ ] Vascular Checks of LE w/sheath Q 15 min X 4, Q 30 min X 2, Q 1 hr X 4 , then Q (4) ______ hr; 
- [ ] Do not remove dressing from insertion site; if bleeding/oozing occurs, reinforce dressing
- [ ] Notify MD for bleeding (blood in urine, stool or emesis) and/or swelling or hematoma at insertion site
- [ ] Place sign over the HOB and on door to alert that the patient is receiving or has received (within the past 8 hours) thrombolytic therapy.
- [ ] No IM injections

**Nutrition / Diet:**
- [ ] Regular [ ] Clear liquids [ ] Full liquid [ ] NPO [ ] NPO except medications
- [ ] 2 gm Na [ ] 60 gm Consistent Carb
- [ ] Ice chips only [ ]

**Glucose Management:**
- [ ] Initiate “ICU Blood Glucose Treatment Protocol”
- [ ] Initiate Hypoglycemia protocol if BG < 70 and notify MD

**Labs:** **May draw labs from sheath**
- [ ] CBC now and q6h
- [ ] BMP now and q12h
- [ ] Fibrinogen now and q12h
- [ ] PTT-heparin 6 hours after arrival to ICU, then per Heparin protocol on pg 2
- [ ] Type and Crossmatch 3 units PRBC and HOLD **EXCEPTION: IF BLOODLESS MEDICINE PATIENT**
  - Obtain ABORh if agreed to any alternative treatment on the Blood Transfusion Liability Release.

**IV Fluids**
- [ ] 0.9% sodium chloride at _________ mL/hr
- [ ] 5% dextrose/0.45% sodium chloride at _________ mL/hr
- [ ] 5% dextrose/0.45% sodium chloride + 20 mEq KCl per liter at _________ mL/hr

**Oxygen Supplement:**
- [ ] Nasal Cannula or [ ] Face Mask at _____ L/min or _____ FiO₂.

**MD Signature:** [ ]  Date: [ ]  Time: [ ]

**RN Signature:** [ ]  Date: [ ]  Time: [ ]

[Patient Identifier]
### Diagnostic:
- **CXR Portable daily in AM while tPA infusing**
  - **Indication:**
- **12 lead ECG**
  - **Indication:**
- **2D echocardiogram**
  - **Indication:**
- **LE venous duplex**
- **Other:**

### Indication:

### Medications: Choose either Single OR Dual Catheter Protocol

#### Single catheter protocol
- tPA (alteplase) 12.5 mg/ 125 mL 0.9% NaCl (0.1 mg/mL)
- Infuse via EKOS catheter in the PA at 1 mg/hr (10 mL/hr) x 5 hr, then decrease to 0.5 mg/hr (5 mL/hr) x 10 hr, then stop.
  - (Start time of infusion = ______ am/pm)

#### Dual catheter protocol
- tPA (alteplase) 12.5 mg/ 125 mL 0.9% NaCl (0.1 mg/mL) x 2 bags
- Infuse via EKOS catheter in the **right** PA at 1 mg/hr (10 mL/hr) x 5 hr, then decrease to 0.5 mg/hr (5 mL/hr) x 10 hr, then stop.
  - (Start time of infusion = _____ am/pm)
- Infuse via EKOS catheter in the **left** PA at 1 mg/hr (10 mL/hr) x 5 hr, then decrease to 0.5 mg/hr (5 mL/hr) x 10 hr, then stop.
  - (Start time of infusion = _____ am/pm)

- Discontinue tPA if SBP > 210 or DBP > 120 and notify MD
- Room temperature 0.9% NaCl to infuse via EKOS “Coolant Port” at 35 mL/hr

#### Heparin 25,000 units/250 mL D5W (100 units/mL)
- Infuse via **MS04**
- **Heparin Infusion Protocols; High Dose Protocol**
  - Do not administer Initial Bolus (Step 1 of protocol), unless otherwise ordered.
  - Start infusion at most recent rate that resulted in a PTT of 50 – 75
  - If PTT never ≥ 50 during infusion, begin at most recent rate and continue titration according to protocol.

### Miscellaneous Orders:
- Return patient to **Cardiac Cath Lab** at _________ am/pm for follow-up arteriogram.
  - NPO after midnight or at ____________ for recheck in the AM

### Signatures:
- MD Signature: ____________ Date: ____________ Time: ____________
- RN Signature: ____________ Date: ____________ Time: ____________

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**Originated:** 2/13  
**Revised:** 10/13, 10/14; 2/15; 2/15a, 5/15
Inclusion Criteria for thrombolytic therapy for submassive PE

1. Pulmonary Embolism
2. No systemic arterial hypotension (defined as SBP < 90 x 15 min or requiring inotropic support)
3. Evidence of moderate to severe RV injury and/or circulatory or respiratory insufficiency

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<th>Circulatory or respiratory insufficiency (one or more of the following)</th>
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<td>Troponin I &gt; 0.4</td>
<td>Any episode of hypotension</td>
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<td>RV enlargement on CT (RV/LV &gt; 0.9)</td>
<td>Persistent Shock Index &lt; 1 (HR/SBP)</td>
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<tr>
<td>RV hypokinesis on echo</td>
<td>Pulse oximetry &lt; 95% on room air</td>
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<tr>
<td>Estimated RVSP &gt; 40 on echo</td>
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<td>McConnell’s Sign on echo</td>
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Contraindications to Thrombolysis

**Absolute Contraindications**

1. Any prior intracranial hemorrhage
2. Structural intracranial cerebrovascular disease (eg, AVM)
3. Known malignant intracranial neoplasm
4. Ischemic stroke within 3 months
5. Suspected aortic dissection
6. Active bleeding or bleeding diathesis
7. Recent surgery encroaching on the spinal canal or brain
8. Recent significant closed-head or facial trauma with radiographic evidence of bony fracture or brain injury

**Relative Contraindications**

1. Age > 75 years
2. Current use of anticoagulation
3. Pregnancy
4. Noncompressible vascular punctures
5. Traumatic or prolonged CPR (> 10 minutes)
6. Recent internal bleeding (within 2-4 weeks)
7. History of chronic, severe, poorly controlled HTN
8. Severe uncontrolled hypertension on presentation (SBP > 180 or DBP > 110)
9. Dementia
10. Remote (> 3 months) ischemic stroke
11. Major surgery within 3 weeks


Fibrinogen

200-400 mg/dL is normal, Bleeding risk increases at < 100 mg/dL

- Cryoprecipitate is treatment of choice for bleeding associated with low fibrinogen.
  - Each unit of cryoprecipitate raises plasma fibrinogen by 7-10 mg/dL. Half-life is 2-4 days.
  - Minor bleeding, dose is 1 unit/10 kg of body weight; more serious circumstances may require 1 unit/5 kg.

Consider hematology consult if bleeding or high-risk of bleeding and fibrinogen <100 mg/dL

Treatment Algorithms for Pulmonary Embolus
