Emergency Department Pulmonary Embolism (PE) Adult Orders

Please select orders by placing a ‘✓’ in the associated box.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Allergies</th>
<th>Up to date in Electronic System</th>
<th>Date (yyyy-Mon-dd)</th>
<th>Time (hh:mm)</th>
<th>Goals of Care Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Patient has updated Goals of Care in green sleeve</td>
</tr>
</tbody>
</table>

**Pulmonary Embolism Rule-Out Criteria (PERC)**

<table>
<thead>
<tr>
<th>Clinical Characteristic</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age greater than or equal to 50</td>
<td>yes/no</td>
</tr>
<tr>
<td>Heart rate greater than or equal to 100</td>
<td>yes/no</td>
</tr>
<tr>
<td>O₂ sat on room air less than 95%</td>
<td>yes/no</td>
</tr>
<tr>
<td>Prior history of venous thromboembolism</td>
<td>yes/no</td>
</tr>
<tr>
<td>Trauma or surgery within 4 weeks</td>
<td>yes/no</td>
</tr>
<tr>
<td>Hemoptysis</td>
<td>yes/no</td>
</tr>
<tr>
<td>Exogenous estrogen</td>
<td>yes/no</td>
</tr>
<tr>
<td>Unilateral leg swelling</td>
<td>yes/no</td>
</tr>
</tbody>
</table>

*Generally rules out PE if no criteria are present and low pre-test probability of PE*

**Two-level Modified PE Wells Score**

<table>
<thead>
<tr>
<th>Clinical Characteristic</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous PE or DVT</td>
<td>1.5</td>
</tr>
<tr>
<td>Heart rate greater than or equal to 100 bpm</td>
<td>1.5</td>
</tr>
<tr>
<td>Surgery or immobilization within the past four weeks</td>
<td>1.5</td>
</tr>
<tr>
<td>Hemoptysis</td>
<td>1</td>
</tr>
<tr>
<td>Active cancer</td>
<td>1</td>
</tr>
<tr>
<td>Clinical signs of DVT</td>
<td>3</td>
</tr>
<tr>
<td>Alternative diagnosis less likely than PE</td>
<td>3</td>
</tr>
</tbody>
</table>

**Clinical Probability**

<table>
<thead>
<tr>
<th>PE unlikely</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE likely</td>
<td>more than 4 points</td>
</tr>
</tbody>
</table>

*The pretest probability of PE in the ‘PE Unlikely’ category is 10% and in the ‘PE Likely’ category is greater than 30%.*

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### Intravenous Orders
- **Intravenous Cannula - Insert**
- Saline lock IV, flush with 2 to 5 mL 0.9% sodium chloride every 12 hours
- IV Bolus: 0.9% NaCl ______ mL over ______ hour(s)
- IV Bolus (other): ____________ mL over ______ hour(s)
- IV Maintenance: 0.9% NaCl infusion ______ mL/hour, reassess after 4 hours
- IV Fluids (other): ____________ at ____________ mL/hr

### Laboratory Investigations
#### Hematology
- Complete Blood Count (CBC)
- D-Dimer

#### Chemistry
- Electrolytes (Na, K, Cl, CO2)
- Creatinine
- BNP / NT-proBNP

#### Blood Gases
- Blood Gas Venous
- Blood Gas Arterial

#### Urine Tests
- Urinalysis
- Pregnancy Test, Urine - POCT

#### Other Labs *(based on presentation needs of the patient)*:
- ____________
- ____________
- ____________
- ____________

### Diagnostic Investigations
- Chest X-Ray 2 projections (posterior-anterior & lateral)
- Chest X-Ray 1 projection: Portable (posterior-anterior)
- CT Chest for Pulmonary Embolus
- Ventilation-Perfusion Scan
- US Venous Doppler, LOWER Extremity; specify extremity: ___________________________
- Echocardiogram: Transthoracic / Transesophageal
- Electrocardiogram - 12 Lead (ECG)

### Low Molecular Weight Heparin
*Absolute contraindications to anticoagulation include: active bleeding, recent intracerebral hemorrhage (less than 14 days), uncontrolled severe hypertension, or platelet count less than 50 x10⁹. In these circumstances consult Hematology for advice.*

- enoxaparin 1.5 mg/kg SUBCUTANEOUSLY daily *(reduce dose if GFR less than 30 mL/min)*
- dalteparin 200 international units/kg SUBCUTANEOUSLY daily *(reduce dose if GFR less than 30 mL/min)*
- tinzaparin 175 units/kg SUBCUTANEOUSLY daily *(reduce dose if GFR less than 30 mL/min)*

*OR* enoxaparin 1 mg/kg SUBCUTANEOUSLY BID *(preferred for cancer patients or extensive clot burden and consider dosage reduction for GFR less than 30 mL/min)*
**Direct Oral Anticoagulants**
- □ rivaroxaban 15 mg PO once *(preferred agent for patients over the age of 80 and a GFR of greater than 30 mL/min)*
- □ apixaban 10 mg PO once *(preferred agent for patients with GFR less than 30 mL/min but greater than 15 mL/min and for patients over the age of 80)*

**Warfarin**
- □ warfarin 5 mg PO once
- □ warfarin ______ mg PO once

**Heparin Infusion**
- □ administer heparin infusion as per heparin nomogram

**Thrombolysis**
- □ alteplase 10 mg IV bolus and then alteplase 90 mg IV over 2 hours *(in consultation with Critical Care +/- Hematology)*

**Analgesia**

*Non-opiate Analgesia*
- □ acetaminophen 500 mg to 1000 mg PO q4h PRN for pain *(maximum 3000 mg/day)*
- □ acetaminophen _____ mg PO ______________________

*Opiate Analgesia*
"For “susceptible patients” defined as elderly, frail, low body mass, systemically unwell, or on medications known to cause sedation or lower blood pressure we recommend decreasing narcotic dosing by 50%.
- □ Contact physician or nurse practitioner for reassessment if pain not controlled after administration of maximum dosage.

*Oral*
- □ acetaminophen 325 mg/caffeine 15 mg/codeine 30 mg 2 tabs PO once
- □ acetaminophen 325 mg/caffeine 15 mg/codeine 30 mg 1 to 2 tabs PO q4h PRN for pain
- □ acetaminophen 325 mg/caffeine 15 mg/codeine 30 mg _____ tabs PO ______________________
- □ oxyCODONE 5 mg/acetaminophen 325 mg 2 tabs PO once
- □ oxyCODONE 5 mg/acetaminophen 325 mg 1 to 2 tabs PO q4h PRN for pain
- □ oxyCODONE 5 mg/acetaminophen 325 mg _____ tabs PO ______________________
- □ HYDROMorphone 1 mg PO once
- □ HYDROMorphone 1 to 2 mg PO q4h PRN for pain
- □ HYDROMorphone _____ mg PO ______________________

*Parenteral*
- □ HYDROMorphone 1 mg IV once
- □ HYDROMorphone 0.5 to 1 mg q10mins PRN for pain *(maximum 3 mg total)*
- □ HYDROMorphone _____ mg IV ______________________
- □ morphine 5 mg IV once
- □ morphine 2.5 to 5 mg IV q10mins PRN for pain *(maximum 15 mg total)*
- □ morphine _____ mg IV ______________________
- □ fentaNYL 50 mcg IV once
- □ fentaNYL 25 to 50 mcg IV q5mins PRN for pain *(maximum 200 mcg total)*
- □ fentaNYL _____ mcg IV ______________________
### Antiemetics

**Avoid dimenhydrinate in patients 65 years or older due to increased risk of side effects including delirium**

- dimenhydrinate 50 mg PO q4h PRN for nausea/vomiting
- dimenhydrinate _____ mg PO ________________

- metoclopramide 10 mg IVPB once
- metoclopramide 5 to 10 mg IVPB q6h PRN for nausea/vomiting *(use 5 mg dose if CrCl less than 40 mL/min)*
- metoclopramide _____ mg IVPB ________________

- ondansetron 4 mg IV once
- ondansetron 4 mg IV to be repeated once 30 minutes after first dose PRN for nausea/vomiting
- ondansetron 4 mg IV q8h PRN for nausea/vomiting
- ondansetron _____ mg IV ________________

**Due to high cost, recommend reserving ondansetron DISINTEGRATING tab for actively vomiting patients without an IV**

- ondansetron DISINTEGRATING tab 8 mg PO q8h PRN for nausea/vomiting
- ondansetron DISINTEGRATING tab _____ mg PO ________________

### Monitoring

- Vital Signs (respiratory rate, pulse, blood pressure, temperature, oxygen saturation)
  - as per provincial guideline
  - every _____ hour(s)
  - every _____ minutes

- Extremity Exam (pulses and color, sensation, movement, temperature)
  - as per local standards
  - every _____ hour(s)

### Respiratory Care

- O2 Therapy at _____ LPM via ________________ *(specify device)* to maintain O2 sat greater than or equal to 90%

- Notify physician if O2 flow required to be increased by greater than 2 L to maintain the same level of oxygenation or if there is a progressive increase in the work of breathing

### Activity

- Bedrest
- Activity as Tolerated
- Other Activity: ________________

### Diet / Nutrition

- NPO
- NPO: May Take Meds
- Regular Diet
- Other Diet: ________________

### Other Orders

- Consult Internal Medicine
- Consult Hematology
- Consult Vascular Surgery
  

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January 2017
Consider a proximal leg vein ultrasound scan

Refer to DVT Guidelines

Advise the patient it is not likely they have a PE. Discuss with them the signs and symptoms of PE, when to seek follow up, and consideration alternative diagnosis

Is DVT suspected?

YES

NO

Diagnose PE and treat

Order CTPA (or V/Q scan)

Was the CTPA (or V/Q scan) positive?

YES

NO

Apply Modified 2-level Wells PE Score

Patient with Modified Wells score of more than 4 points (PE Likely)

PERC rule positive OR not applied

Is a CTPA suitable and available immediately?

YES

NO

Immediate interim parenteral anticoagulation therapy
