Pulmonary Embolism Management – Adult – Ambulatory – Emergency Department Clinical Practice Guideline (CPG)

Cover Sheet

Target Population: Adult patients diagnosed with pulmonary embolism in the Emergency Department

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Review Individuals/Bodies:
Pharmacy and Therapeutics Committee and CKM Council Committee Approvals/Dates: 12/20/2012
Release Date: 12/26/2012
Executive Summary

Guideline Title: Outpatient Pulmonary Embolism Management – Adult – Ambulatory – Emergency Department Clinical Practice Guideline

Guideline Overview
Recommendations for outpatient treatment and management of pulmonary embolism in adult patients in the emergency department.

Practice Recommendations
Eligibility Criteria for Outpatient Pulmonary Embolism management:
- ≥ 18 years of age
- Diagnosis of acute pulmonary embolism
- Able and willing to comply with home care
- Able to obtain necessary medications

If patient meets the eligibility criteria, calculate the PESI score based on table included in the guideline. If PESI score is ≥ 86, hospitalize the patient. If PESI score is ≤ 85, continue to the exclusion criteria:

Exclusion Criteria:
- Intracardiac or central vein thrombus
- Central PE (main pulmonary artery)
- Requires admission for reasons other than acute PE/DVT
- Not appropriate for long term anticoagulation (fall risk, unreliable, or unable to comply with follow up)
- Any stroke in the last 6 weeks
- Brain, spinal, or ophthalmic surgery in the last 6 weeks
- Non-cutaneous surgery in the last 2 weeks
- GI bleed in the last 2 weeks
- Active major bleeding
- History of HIT or heparin “allergy”
- Therapeutic anticoagulation at the time of diagnosis (e.g. INR ≥ 2)
- Thrombocytopenia (< 75,000)
- Other coagulopathy
- Creatinine clearance > 30 mL/min
- Hypoxia (< 90% at any time in the ED)
- Hypotension (SBP < 100mmHg at any time in the ED)
- RV strain on echocardiogram (if obtained)
- Treated with thrombolytics in the ED
- Pregnant
- > 150 kg
- BMI < 18
If no to all exclusion criteria, then the patient may be discharged with proper home care instructions.

**Companion Documents**
ED order set, patient education materials (will hyperlink these once they are created)

**Pertinent UWHC Policies & Procedures**
None identified
Scope
Disease/Condition(s): Pulmonary Embolism (PE)
Clinical Specialty: Emergency Department (ED)
Intended Users: Emergency Department Clinicians

CPG objective(s): To assist clinician by providing a framework for the evaluation and outpatient treatment of adult PE patients.

Target Population: Adult patients diagnosed with PE in the ED.

Major Outcomes Considered: Number of patients with PE admitted versus treated as outpatients. Number of readmissions or complications in the outpatient treatment population.

Methodology
Description of Methods Used to Collect/Select the Evidence:
(1) completing a comprehensive literature search of electronic databases; (2) conducting an in-depth review of relevant abstracts and articles; (3) conducting thoughtful discussion and interpretation of findings; (4) ranking strength of evidence underlying the current recommendations that are made.

Methods Used to Assess the Quality and Strength of the Evidence: Comprehensive review of literature from 1998 to 2011

Rating Scheme for the Strength of the Evidence: A modified Grading of Recommendations Assessment, Development and Evaluation (GRADE) developed by the American Heart Association and American College of Cardiology (Figure 1) has been used to assess the Quality and Strength of the Evidence in this Clinical Practice Guideline.1

Figure 1. Quality of Evidence and Strength of Recommendation Grading Matrix
Definitions:
Pulmonary Embolism: embolism of a pulmonary artery or one of its branches that is produced by foreign matter and most often a blood clot originating in a vein of the leg or pelvis and that is marked by labored breathing, chest pain, fainting, rapid heart rate, cyanosis, shock, and sometimes death.

Introduction
This guideline contains strategies and recommendations designed to assist clinicians in delivering and supporting effective outpatient treatment for pulmonary embolism.

Recommendations

1. Eligibility Criteria for Outpatient Pulmonary Embolism management:
   - ≥ 18 years of age
   - Diagnosis of acute pulmonary embolism
   - Able and willing to comply with home care
   - Able to obtain necessary medications
   (Class IIa, Level of Evidence B)

2. If patient meets the eligibility criteria, calculate the PESI score (Class IIa, Level of Evidence B):

<table>
<thead>
<tr>
<th>Calculate the PESI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age + 1 per year</td>
</tr>
<tr>
<td>Male + 10</td>
</tr>
<tr>
<td>Any history of malignancy* + 30</td>
</tr>
<tr>
<td>Any history of Heart Failure + 10</td>
</tr>
<tr>
<td>Any history of Chronic Lung Disease + 10</td>
</tr>
<tr>
<td>Triage HR &gt; 110 + 20</td>
</tr>
<tr>
<td>Triage SBP &lt; 100 + 30</td>
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<tr>
<td>Triage Temp &lt; 36C + 20</td>
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<tr>
<td>Triage RR &gt; 29 + 20</td>
</tr>
<tr>
<td>Triage Oxygen sat &lt; 90% + 20</td>
</tr>
<tr>
<td>Altered Mental Status + 60</td>
</tr>
</tbody>
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* Any diagnosis of cancer other than basal-cell or squamous-cell carcinoma of the skin, within the prior six months, any treatment for cancer in the previous six months, or recurrent or metastatic cancer

3. If PESI score is ≥ 86, hospitalize the patient
   If PESI score is ≤ 85, continue to the exclusion criteria
   (Class IIa, Level of Evidence B)
4. Exclusion Criteria:
   - Intracardiac or central vein thrombus
   - Central PE (main pulmonary artery)
   - Requires admission for reasons other than acute PE/DVT
   - Not appropriate for long term anticoagulation (fall risk, unreliable, or unable to comply with follow up)
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   - GI bleed in the last 2 weeks
   - Active major bleeding
   - History of HIT or heparin “allergy”
   - Therapeutic anticoagulation at the time of diagnosis (e.g. INR ≥ 2)
   - Thrombocytopenia (< 75,000)
   - Other coagulopathy
   - Creatinine clearance, 30 mL/min
   - Hypoxia (< 90% at any time in the ED)
   - Hypotension (SBP < 100mmHg at any time in the ED)
   - RV strain on echocardiogram (if obtained)
   - Treated with thrombolytics in the ED
   - Pregnant
   - > 150 kg
   - BMI < 18

If no to all exclusion criteria, then the patient may be discharged with proper home care instructions (Class IIa, Level of Evidence B).

Companion/Collateral documents (algorithm, tables, and forms):
### Exclusion criteria

<table>
<thead>
<tr>
<th>Criterion</th>
<th>No</th>
<th>Yes</th>
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<tr>
<td>Pregnant</td>
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<td>Weight &gt; 150 kg</td>
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### Calculate the PESI

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### Consider outpatient management of PE if:

- Diagnosis of acute PE
- Age ≥ 18
- Able and willing to comply with home care
- Able to obtain necessary medications

### If PESI score ≥ 86

- Hospitalize

### If PESI ≤ 85

- If Yes to any of the exclusion criteria, then patient must be hospitalized.
- If No to all of the exclusion criteria, then patient may be discharged.
Pulmonary Embolism Outpatient Treatment Algorithm

Eligible for Outpatient Treatment

Give first dose of LMWH and Warfarin in ED prior to discharge:
- Enoxaparin 1 mg / kg SQ x 1 (round to nearest syringe size)
- Warfarin 5 mg orally x 1

Potential for warfarin sensitivity:
- Baseline INR > 1.5
- Age > 65
- Actual body weight < 45 kg
- Significant drug interactions
- Current antiplatelet therapy
- Chronic diarrhea
- Alcohol abuse history
- Decompensated heart failure
- Malnourished or NPO > 3 days

Outpatient anticoagulation treatment: (*select one from each category*)
- Warfarin 5 mg Take as Directed per INR
- Warfarin 2.5 mg Take as Directed per INR (sensitive patients)*

AND
- Enoxaparin 1 mg/kg SQ every 12 hours for 10 days
  (enoxaparin once daily is not recommended)
- Dalteparin 100 units/kg SQ every 12 hours for 10 days

Physicians:
- Contact (via telephone) patient’s PCP or on call provider if after hours to establish outpatient management
- Schedule a follow up INR 2-3 days after ED discharge
  (an INR should not be checked on the weekend)

Provide patient education on the following prior to discharge:
- Pulmonary embolism disease state
- Injection technique
- Warfarin and LMWH
- Follow up/outpatient management plan

Patient should discharge from the ED with:
- First doses of anticoagulation administered
- Prescription for warfarin and LMWH (may be phoned to a pharmacy)
- Understanding of dose, administration, and follow up/outpatient management plan
- Educational material

Pharmacist will contact patient 2-3 days after ED discharge to ensure follow up with PCP has occurred.
References for Supporting Evidence


Benefits/Harms of Implementation

Potential Benefits: cost savings, shorter length of stay, higher patient satisfaction

Potential Harms: recurrent pulmonary embolism, patient non-adherence, possible higher readmission rate

Implementation Strategy

This guideline will be housed on UConnect in a dedicated folder for Clinical Practice Guidelines. Links to this guideline will be created in appropriate Health Link tools.

Implementation Tools/Plan

ED Physician Responsibilities

- Diagnosis of Pulmonary Embolism
- Evaluation of eligibility criteria
- Review of eligibility with pharmacist
- Completion of Outpatient Pulmonary Embolism order set with dosing recommendations from pharmacist
- Identification of responsible party as contact for the following business day
- Ensure patient has PCP follow up plan established

ED Nurse Responsibilities

- Administer first dalteparin or warfarin dose
- Provide preliminary injection teaching
- Supply patient with warfarin patient information sheets
- Reinforce instructions to return the next business day to PCP

ED Pharmacist Responsibilities

- Ensure appropriate baseline labs are drawn
- Review potential for drug interactions with home medications
- Review discharge prescriptions for LMWH and warfarin
- Review patient insurance coverage
• Patient medication teaching for LMWH and warfarin

Disclaimer
Guidelines are designed to assist clinicians by providing a framework for the evaluation and treatment of patients. This guideline outlines the preferred approach for most patients. It is not intended to replace a clinician’s judgment or to establish a protocol for all patients. It is understood that some patients will not fit the clinical condition contemplated by a guideline and that a guideline will rarely establish the only appropriate approach to a problem.