

111.2 SUSPECTED PULMONARY EMBOLISM (PE) - INVESTIGATION PATHWAY FOR THE EMERGENCY DEPARTMENT (ED)

Target Audience: Stoke Mandeville ED – Consultant/Registrars/Nurses/Acute Medical Team

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Scope of the guideline

To provide a safe algorithm for ED clinicians to follow with patients who are suspected to have a PE in the ED at Stoke Mandeville, with a view to identifying those patients who can be safely discharged on low molecular weight heparin (LMWH) pending their definitive investigation, i.e. computed tomography pulmonary angiogram (CTPA). This will enable the patient to be diverted to an ambulatory care pathway, thereby avoiding admission where possible.

Introduction

Patients with suspected PE have traditionally been admitted with therapeutic LMWH pending their diagnostic investigation. For patients presenting out of hours (night/evening/weekend), the time to CTPA can exceed 48 hours. Of these patients, at least 50% end up with a negative test result. Developments and research around the ambulatory management of deep vein thrombosis (DVT) and advent of new LMWHs have led to a similar treatment option for suspected PE patients. Research and trials conducted into risk stratification of patients with diagnosed PE have provided validated scoring systems like the Pulmonary Embolism Severity Index (PESI) to help stratify which patients with confirmed PE can be treated safely in the outpatient setting. By incorporating the 3 risk stratification modalities into this guideline, a safe strategy is provided enabling low risk patients to be placed on the ambulatory care pathway thereby avoiding hospital admission and providing a smooth acceptable course for the patient.

Requirements for doctors using the guideline (see [Pathway](#) on page 3)

Identify the patient with a potential PE who will often attend the ED with one or more symptoms, such as shortness of breath (SOB)/pleuritic chest pain/tachypnoea/haemoptysis.

Perform baseline investigations: FBC, U&E, CRP, CXR and ECG (these will help to rule out other differential diagnoses as well).

Wells score for PE will be calculated to assess the probability of the patient actually having a PE. The high-risk patient will require a treatment dose of dalteparin and an inpatient CTPA. The low and moderate risk patients will have a D-DIMER check and, based on the result, will have dalteparin treatment and PESI scoring to see if they qualify for ambulatory care. Troponin and B-type natriuretic peptide (BNP) need to be checked to ascertain right ventricular strain. These must be normal before patient can be considered for ambulatory care. Only the patient that fulfills the criteria will go on to have CTPA within 24 hours and be discharged with information and training regarding administration of dalteparin and an advice leaflet. They will return to Ambulatory Emergency Care Unit (AECU) or the ED (when seen out of hours).

It is clearly stipulated that any haemodynamically unstable patient will require immediate referral to the medical team and urgent CTPA. Likewise, the pregnant patient will need to be discussed with the Obs & Gynae registrar.

Any deviation from the pathway will need to be discussed with the medical/ED consultant on-call.

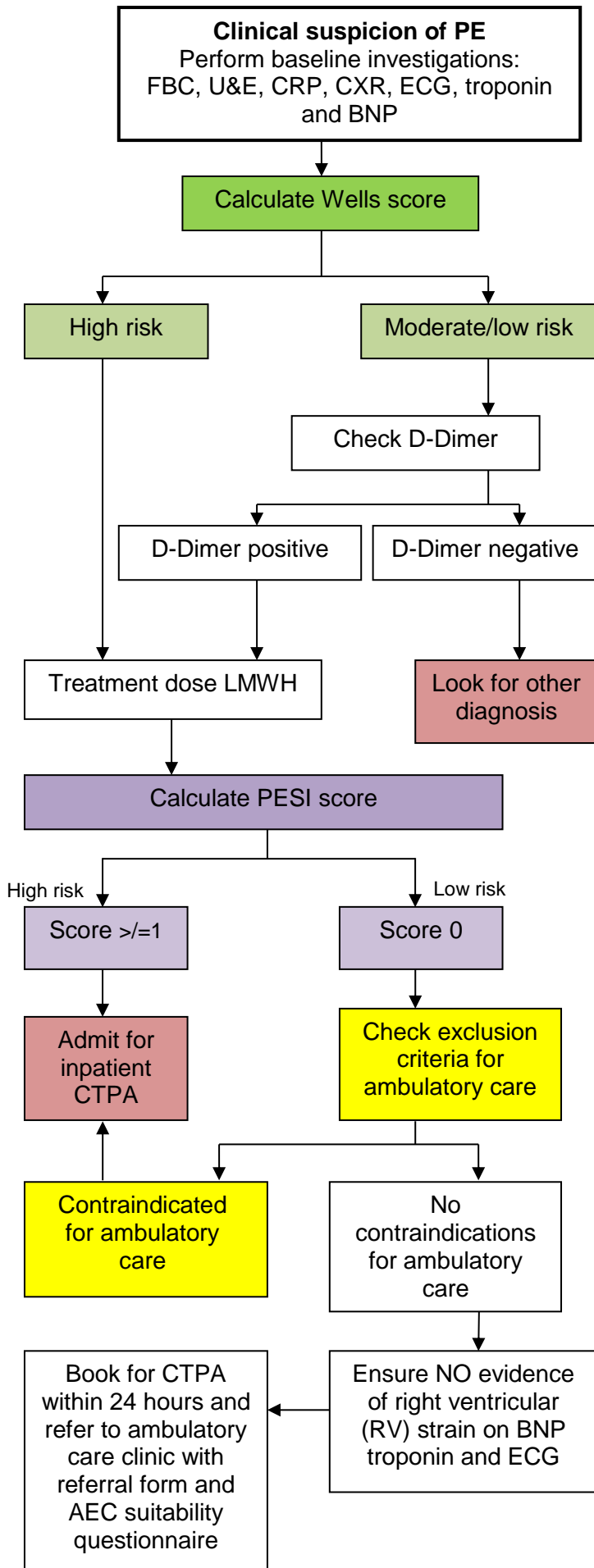
Contraindications to ambulatory care, i.e. ambulatory care exclusion criteria

Co-existing major DVT or pneumonia
PE whilst on anticoagulation
Presenting with syncopal episode
Active malignancy
Prior cardiac or respiratory disease
Pregnant
Reaction to warfarin or heparin/dalteparin
Active bleeding
INR >1.5 or PLT <50 x 10 ⁹ /l
GI/GU bleed within last 2 weeks
Intracranial bleed ever in the past
Known or suspected alcohol dependence
Poor compliance suspected
Cognitive impairment
Severe renal dysfunction (eGFR <30 ml/min/1.73 m ²)
Uncontrolled pain on oral analgesia

LMWH dosing schedule

See [Guideline 238 Anticoagulant Treatment for Adult Patients with Venous Thromboembolism](#).

Suspected Pulmonary Embolus - Investigation Pathway



Wells Score (PE)	
Clinical Feature	Points
Clinical signs and symptoms of DVT	3
No other diagnosis more likely	3
HR >100	1.5
Immobility (>3/7) or surgery (4/52)	1.5
Previous PE/DVT	1.5
Haemoptysis	1
Malignancy (active or within 6/12)	1
HIGH risk	>6 points
MODERATE risk	2 - 6 points
LOW risk	<2 points

Simplified PESI Score (Prognostic)	
Clinical Feature	Points
Age >80	1
History of cancer	1
History of heart failure/lung disease	1
HR >= 110/min	1
Systolic BP <100 mmHg	1
SpO ₂ <90%	1
HIGH risk	>=1
LOW risk	0

Exclusion Criteria for Ambulatory Care
Co-existing major DVT or pneumonia
PE whilst on anticoagulation
Presenting with syncopal episode
Active malignancy
Prior cardiac or respiratory disease
Pregnant
Reaction to warfarin or heparin/dalteparin
Active bleeding
INR >1.5 or PLT <50 x 10 ⁹ /l
GI/GU bleed within last 2 weeks
Intracranial bleed ever in the past
Known or suspected alcohol dependence
Poor compliance suspected
Cognitive impairment
Severe renal dysfunction (eGFR <30 ml/min/1.73 m ²)
Uncontrolled pain on oral analgesia

- Haemodynamically unstable patients require immediate referral and urgent CTPA
- Pregnant women should be discussed with the Obs & Gynae registrar (CTPA versus ventilation/perfusion (VQ) scan)
- LMWH dosing can be found in [guideline 238](#)

References:

1. Aujesky D, Obrosky DS, Stone RA et al.
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2. Hogg K; Dawson D; Mackway-Jones K.
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Emergency Medicine Journal, February 2006, vol./is. 23/2(123-7), 1472-0205;1472-0213
3. Cameron A; Ogilvie C; Teckchandani S; McKay G.
Outpatient imaging for pulmonary embolism may only be suitable for a minority.
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4. Howard LSGE, et al. Thorax 2018;73:ii1-ii29. Doi:10.1134/thoraxjnl-2018-211539

See also:

[Guideline 9AFM Algorithm for Suspected Acute Non-massive Pulmonary Embolus](#)
[Guideline 9BFM Guideline for Massive Pulmonary Embolus](#)
[Guideline 238 Anticoagulant Treatment for Adult Patients with Venous Thromboembolism](#)

Title of Guideline	Suspected Pulmonary Embolism (PE) - Investigation Pathway for the Emergency Department (ED)
Guideline Number	111
Version	2
Effective Date	February 2019
Review Date	February 2022
Original Version Published	April 2015
<i>Approvals:</i>	
Clinical Guidelines Subgroup	13 th February 2019
Original Authors	Dr Maria Fernando, Dr Charlotte Campbell and Dr Tina O'Hara Updated by Dr Maria Fernando
SDU(s)/Department(s) responsible for updating the guideline	Emergency Medicine
Uploaded to Intranet	27 th February 2019
Buckinghamshire Healthcare NHS Trust	