King's College Hospital
NHS Foundation Trust

Clinical Guideline
Diagnosis and Management
of Suspected and Proven Non-Massive Pulmonary Embolism

Document Information			
Version Number	10	**Please complete all fields**	
Is this a new guideline?		No	
If no, please state the title of superseded guideline		Diagnosis and Management of suspected and proven non-massive pulmonary embolism	
Guidance type Clinical Guideline, Protocol, Care Pathway, PIL other.		Clinical Guideline	
Summary This is a couple of sentences to help people assess whether the document is the guidance they need. Description text viewable on search.		Diagnosis and Management of suspected and proven non-massive pulmonary embolism	
Review date needs to be reviewed by. All local guidelines need to have a full review at least every 3 years.		January 2021	
Any drugs-related information included? Guidelines that include any kind of medication need to be reviewed and approved by a specialty Lead Pharmacist. Specialty Lead Pharmacists may judge that the guideline needs to be approved at Drugs & Therapeutics Committee.	Yes	**Name of specialty Lead Pharmacist consulted**	Rachna Patel – Anticoagulation PRUH
Lead Specialty responsible for reviewing and ratifying the document		Acute Medicine	
Principal author responsible for the document's authorship, update and governance. Please state full Name and Job Title.		Lara Roberts – Consultant Haematologist Philip Kelly – Consultant Physician	
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Specialties/staff groups affected for the latest version only. All staff affected by this document need to be consulted. Please include full Name, Job Title, e-signature (if available)		All Specialities except paediatric and intensive care. Victoria Bray – Acute Medicine Lead Pharmacist Rosalind Byrne – Anticoagulation Lead Pharmacist DH	
ED / acute medical pathway included? If the document includes a pathway that starts from ED, please liaise with the relevant ED liaison clinician.	Yes	**Name of ED Liaison clinician consulted**	Simon Calvert
Approved for use at which sites Please state which site(s) this guideline applies to making sure all relevant groups have ratified this document before uploading on to KCGS (King's Clinical Guidelines System) or contacting the Patient Outcomes Team.		NB: Guidelines need to be written for use across all KCH sites unless there is a specific reason not to. Please ensure the guideline has been approved by the appropriate Committee for all relevant sites.	
		Trust-wide	
Approval Committee(s) name For the latest version only. E.g. Drugs & Therapeutics Committee, Care Group Risk & Governance Committee, Infection Prevention & Control Committee.		**Please list ALL Committees that have ratified this document.**	**Approval date**
		Acute Medicine	2015
How will the document be disseminated? E.g. department/ward based education, training, email, team briefings.		Departments, Ward based and team briefings	
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Key words these help intranet users to find the guideline they need.		Pulmonary Embolism; VTE; thrombolysis; LMWH; heparin; anticoagulation; ambulatory; admission; echocardiography; CTPE; VQ; scintigraphy; ventilation perfusion imaging; d-dimer; Wells' score; DVT	
Guidance conflict Does the submitted document conflict with any NICE, Royal Marsden Guidance, Trust policies or other local guidelines?		No	

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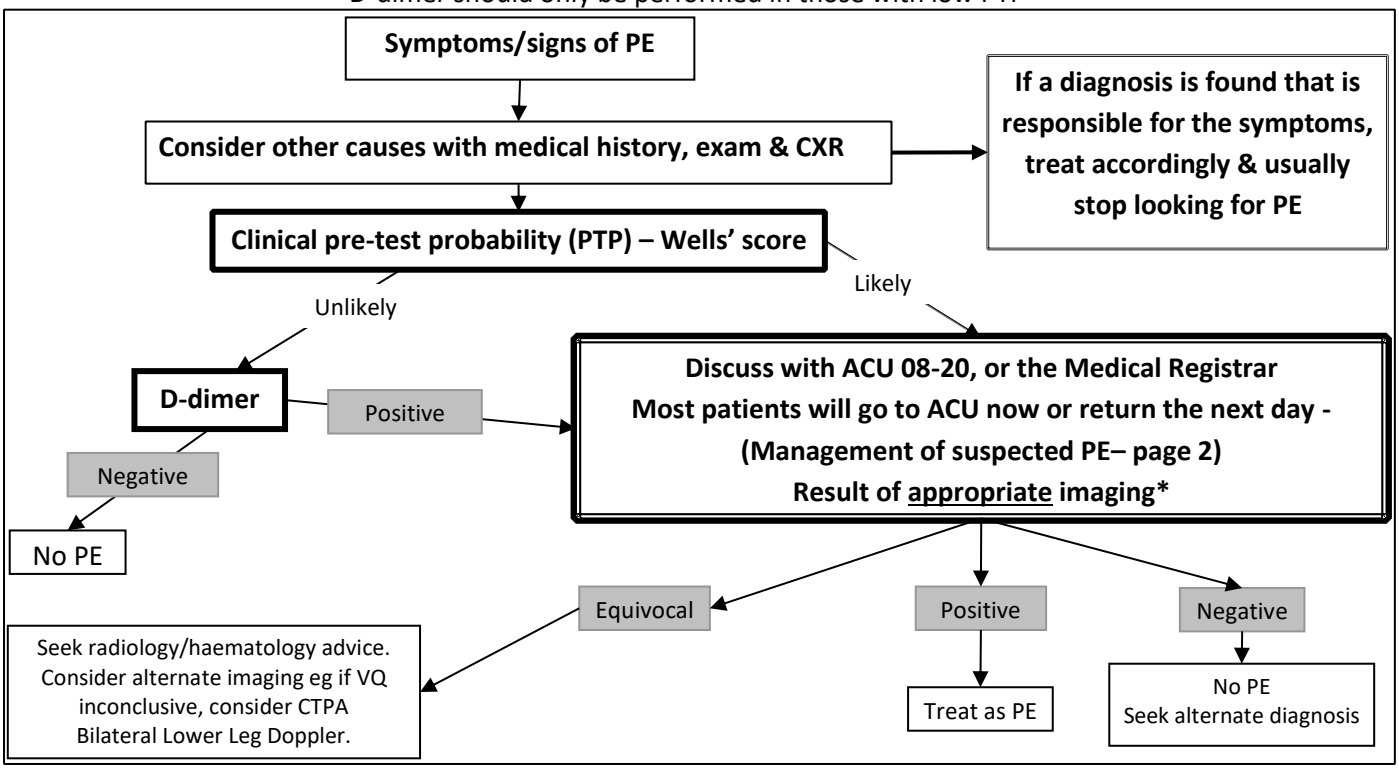
January 2020

Diagnosis & Management Of Suspected Non-Massive Pulmonary Embolism

(see separate protocol for: management of massive PE)
All pregnant patients ≥ 24 weeks gestation are excluded from this protocol and must be referred to the Labour Ward for investigation and management decisions.)

PE diagnostic algorithm

All patients must be assessed with history, examination and CXR; only proceed to clinical pre-test probability (PTP – the Wells' Score) if there is no other diagnosis to explain clinical presentation. D-dimer should only be performed in those with low PTP



*V/Q scan is preferred for patients allergic to contrast, with renal impairment, unable to tolerate CT, or another reason to avoid contrast CT, and for young patients with normal CXR and no cardiorespiratory disease (when available). Please note this is only a guide to diagnosis and clinical suspicion of PE should direct investigation as appropriate.

This algorithm is **NOT** suitable for use in pregnancy. In females of reproductive age, check βHCG & if positive refer to King's '*Prevention and management of antenatal and postnatal* thromboembolism', available on KCGS. **All women 24+ weeks pregnant should be referred to Labour ward for further assessment and management.**

Clinical PTP (Wells' et al, NEJM 2003). Document PTP in notes (use sticker at PRUH).

Clinical feature	**Points**
Clinical symptoms/signs of DVT (i.e. leg swelling and pain on palpation of deep veins)	3
Alternative diagnosis less likely than PE	3
HR > 100bpm	1.5
Immobilisation (>3 days) or surgery in past 4 weeks	1.5
Previous DVT/PE	1.5
Haemoptysis	1
Malignancy (on treatment, treated in last 6 m or palliative)	1
Clinical PTP	
PE likely	>4 points
PE unlikely	≤4 points

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Management of suspected PE

1. **Commence interim therapeutic anticoagulation** unless lung imaging can be arranged within the hour, as per the Anticoagulation Quick Reference Guide (under 'Tools' on EPR) and available on Anticoagulation kwiki page. This would usually be therapeutic dose of LMWH if creatinine clearance is above 30ml/min. Discontinue if diagnosis excluded.
2. **Assess suitability for transfer to ambulatory care unit** (<85y, suitable for personal/ public/ hospital transport), not acutely confused, NEWS<4, not discharged within last 30 days) refer 0800 - 2000, or speak to either your or the Medical Registrar for treat and return in the morning (below).
3. **Assess suitability for ambulatory management** (must meet **ALL** of criteria below). **NB** All patients must be assessed by a senior doctor to be sent home from ED or Ambulatory Care before imaging

Pulse <110/min	No new evidence of right heart strain on ECG
Haemodynamically stable	Parenteral analgesia not required
Respiratory rate <30/min	No contraindication to enoxaparin
$Sa0_2$ >90% on air	Low bleeding risk
Oxygen supplementation not required	No anticipated compliance issues
&/or NEWS <3	No alteration in mental state
No significant comorbidity requiring admission	Has fixed abode and telephone
No or mild cardiac failure (NYHA class I/II only)	Able to attend outpatients
No or mild chronic lung disease (stage I/II Gold classification only)	

Patients suitable for ambulatory management
(advice sheets are available on http://kweb/kwiki/anticoagulation_guidelines)

Denmark Hill
Complete an 'Ambulatory Care Unit Referral – DH' on EPR, provide patients with a 'OP **suspected** PE advice sheet - DH' and instruct them to return to Ambulatory Care Unit (via ED entrance) between 0800 - 1000 on the next day.

PRUH
Refer to the Ambulatory Unit Consultant (x63023 09-17 who will usually see the patient the same day, or out of hours, complete the EPR 'ED out of hours referral to medical ambulatory unit at PRUH'). If out of hours give the patient 'OP **suspected** PE advice sheet – PRUH'.
Leave their notes and ambulatory referral form in the ambulatory box at reception. Tell patient that ambulatory care will call them to arrange the time to attend the following day.

Patients not suitable for ambulatory management
Refer to Medical Registrar on call - DH bleep 101; PRUH bleep 603

Confirmed PE

1. **Review and document presence/absence of provoking factors**

Surgery within previous 3 months
Hospital admission with medical illness within previous 3 months
Pregnancy or <3 months post-partum
Oestrogen-containing OCP or HRT
Significant immobility (>2 days)
Long distance travel (>4h) in previous 4 weeks
Active cancer or cancer therapy
Intravenous drug use

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If age >40 years with recent travel as isolated provoking factor or in the absence of any provoking factor,

- History and guided examination for occult malignancy
- Review reported CXR/CTPA
- Urinalysis

The thrombosis clinic will consider further investigation as appropriate.

2. **Assess suitability for early discharge** by senior medical clinician

(must meet **ALL** of criteria below)

Haemodynamically stable	No significant comorbidity requiring admission
EWS<3	No contraindication to enoxaparin/rivaroxaban
Oxygen supplementation not required	Low bleeding risk
Parenteral analgesia not required	Able to attend outpatients

Reconsider discharge if above criteria not met. Continue inpatient anticoagulation.

If suitable for early discharge:

Denmark Hill

- Mon-Fri (9am to 4pm): Complete 'Anticoagulation Discharge Referral' on EPR and liaise with Anticoagulation Team (x35553) for anticoagulation dosing and follow up.
- If the patient has not been seen by the Anticoagulation Team and commenced on secure oral anticoagulation, ensure patient/carer able to administer enoxaparin or arrange @home service until anticoagulation therapeutic. Provide sharps bin for disposal.
- If also discharging on warfarin, provide warfarin counselling and NPSA booklet.
- Provide 'Confirmed PE Outpatient Management patient' DH advice sheet available on KWIKI.
- After hours discharge: treating Consultant/Registrar to assess options. If safe for discharge, complete 'Anticoagulation Discharge Referral' order on EPR, provide patient details including contact phone number/next of kin details. The Anticoagulation Clinic will contact the patient to arrange review. For weekend discharges: if patient unable to self-inject, document arrangements for daily enoxaparin injection (usually @home or attend ACU daily) on EPR and provide the patient advice sheet.

PRUH

- Provide 'Confirmed PE outpatient management patient advice sheet- PRUH' available on KWIKI.
- Mon-Fri (9am to 4pm): For patients on enoxaparin or warfarin, complete 'Anticoagulation Discharge Referral' order on EPR and liaise with Anticoagulation Team (x64263 or x63833) for anticoagulation dosing and follow up. For patients on rivaroxaban, complete 'Rivaroxaban screening tool for VTE' on KWIKI, and the 'Anticoagulation Discharge Referral' order on EPR.
- After hours discharge: Treating Consultant/Registrar to assess discharge options. If safe for discharge, complete appropriate document as above and provide patient details including contact phone number/next of kin details. The Anticoagulation Clinic will contact the patient to arrange follow-up.
- If unsuitable for rivaroxaban, ensure patient/carer able to self-administer enoxaparin or make arrangements for administration until next working day. Provide sharps bin for disposal.
- If discharging on warfarin, provide warfarin counselling and NPSA booklet.

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