The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust

Poole Hospital NHS Foundation Trust

Guideline for the Diagnosis and Management of Haemodynamically Unstable Pulmonary Embolus (PE)

"Massive PE"

Approval Committee	Version	Issue Date	Review Date	Document Author(s)
Thrombosis Committee & D&TC (Jan 2020)	1	November 2019	November 2021	Dr Craig Prescott and Dr David Morgan

Version Control

Version	Date	Author	Section	Principal Amendment Changes

Contents

Contents 2
1.0 Introduction 2
2.0 Objective / Policy Statement 2
3.0 Procedures.....3
4.0 Training.....7
5.0 Process for Monitoring Compliance with the Policy 7
6.0 Approval, Implementation & Review 7
7.0 References.....7
8.0 Associated Policies 7
9.0 Consultation.....7

1.0 Introduction

Pulmonary Embolus (PE) is a common medical emergency. These guidelines are to help in the diagnosis and management of PE where there is evidence of haemodynamic instability. These patients have a high mortality and the management is different to patients who are haemodynamically stable.

If there is no clinical evidence of haemodynamic compromise please refer to “Guideline for Diagnosis and Management of Haemodynamically Stable Pulmonary Emboli”

Definitions:

Haemodynamically unstable PE (also referred to as massive PE)
This group of patients are defined by a systolic blood pressure of less than 90 mmHg or a drop in blood pressure of ≥ 40mmHg for >15 minutes.
Clinical judgment is needed to determine the severity of a PE for patients who have had a collapse prior to admission, but where the blood pressure was not recorded.

Haemodynamically stable PE
This group includes patients who are haemodynamically stable with and without evidence of heart strain.

2.0 Objective / Policy Statement

The purpose of this guideline is to provide a framework for clinicians managing adult patients (aged 16 years and over) with possible and confirmed pulmonary embolus (PE) with evidence of haemodynamic compromise. Patients may be managed in the emergency department or as an inpatient ideally in a high dependency area.

The goal is to provide a safe and timely service for urgent assessment, investigation and diagnosis or exclusion of PE for patients with haemodynamic instability.
The guideline covers diagnosis, acute treatment and immediate ongoing care.

3.0 Procedures

3.1 Initial Assessment and Investigation

Assess the patient using an ABCDE approach as with any critically ill patient. Offer supplemental oxygen to all patients with SaO2<94% (<88% if patient has COPD). Consider early escalation to ITU if organ support is required either in parallel with or while waiting for reperfusion therapy.

If PE is considered -

- Treat as massive PE if systolic blood pressure is less than 90mmHg or 40mmHg less than baseline for more than 15 minutes. Escalate the care of the patient to a senior clinician (ideally consultant if available).
- Assess for presence of shock (hypotensive, clammy, reduced capillary refill) and symptoms of syncope or pre-syncope. Escalate the care of the patient to a senior clinician (ideally consultant if available).

Give an intravenous bolus of 5000 units of heparin and commence unfractionated heparin as per policy while deciding on further investigation.

If patient is stable for CT scanning, and there are no other contraindications, then arrange urgent (within 1 hour) CTPA by direct discussion with consultant Radiologist (see below).

If peri-arrest or too unstable for CT scan, then contact on call Cardiologist (at RBCH) or Acute/General Physician (at PHFT) for advice including echocardiographic assessment. Whilst an echo cannot diagnose a pulmonary embolus, it can give indirect support and exclude most other causes of cardiovascular shock. If urgent echo is not available or patient is too unwell to wait for further investigation then a consultant may make a decision to thrombolyse on clinical grounds (see below).

In all cases, the decision for Thrombolysis should be on the advice of a Consultant physician or intensivist.

Cardiovascularly stable patients should be investigated in line with the guidelines for haemodynamically stable PE. If the patient develops symptoms or signs of cardiovascular compromise, then these tests will need to be upgraded to urgent by direct discussion with a radiologist and the patient care should be escalated to a senior clinician (ideally consultant if available).

3.2 CTPA when massive PE suspected.

Within working hours a CTPA should be requested by direct discussion with the CT Department to ensure this is done as soon as possible.

Outside of normal working hours, decision for CT should be discussed with the Consultant Physician on call prior to contacting the Consultant Radiologist.

All patients should have an eGFR >30 and be fit enough to transfer to CT (protected airway and stablised BP). They will need a pink cannula in situ for IV contrast and must be able to lie flat for the scan.

In life-threatening cases, where immediate diagnosis is imperative, it may be possible to give contrast while awaiting renal function. These cases must be discussed with a consultant physician.

Patients with contrast allergy should be considered for urgent echocardiography and if this is not available, decision to thrombolyse may be undertaken by a consultant on a clinical basis.

3.3 Thrombolysis

Patients requiring thrombolysis should be transferred to a critical care area such as the high dependency unit (HDU) or coronary care unit (CCU) depending on bed availability and clinical state of the patient.

Active bleeding is a contraindication but the contraindications usually applied for MI patients are less applicable in acute haemodynamically unstable PE patients. These should however be considered and weighed up in any final decision to thrombolyse. They should be included in the informed consent with the patient.

The risk of major bleeding is 5-13% with 2% fatal haemorrhage. This should be discussed as part of informed consent which should be written and documented in the patient's notes.

Treatment is most effective in the first 48h after onset of symptoms.

Treatment should be with Alteplase (recombinant tissue Plasminogen activator)

- 10mg by intravenous injection over 1–2 minutes
- Followed by intravenous infusion of 90mg over 2 hours. If the patient weighs less than 65kg the total dose should be limited to 1.5mg/kg.

Alteplase can be obtained from ED or CCU out of hours and replacement obtained from out of hours pharmacy if there is none remaining in that location's stock.

Intravenous (IV) heparin infusion should be commenced after the Alteplase, and continued for 24 hours. After 24 hours the team can continue IV heparin or switch to Low Molecular Weight Heparin depending on the patients clinical progress.

Discuss with interventional radiology (IR) (based at RBCH) if thrombolysis contraindicated or the patient fails to improve. Consider discussion with thoracic surgery at Southampton Hospital for consideration of embolectomy if IR intervention not appropriate

3.4 Subsequent Care

When stabilised, the patient should be transferred to the care of a Respiratory physician, ideally on a respiratory ward, for ongoing care and further investigation if needed.

Further investigation and management is outlined in management of haemodynamically stable PE.

3.5 Special Circumstances

3.5.1 Pregnancy

Management of pregnant women with suspected massive PE should be coordinated by a team including a consultant physician, the consultant obstetrician on call and a consultant radiologist.

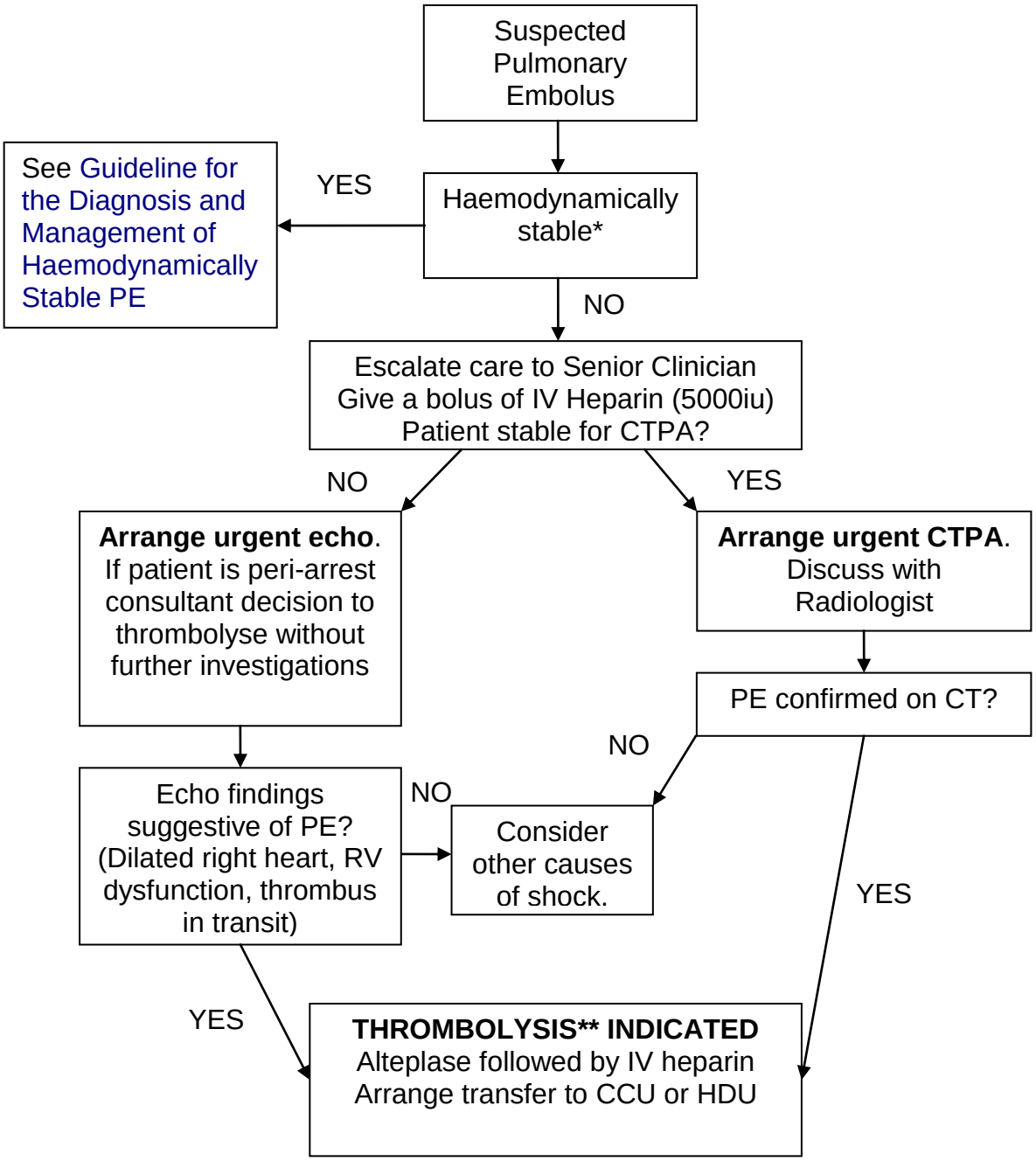
Pregnant women with massive PE should be considered for all investigations and treatment, including thrombolysis, as per non-pregnant patients.

3.5.2 Cardiac Arrest

Acute PE is part of the differential diagnosis of cardiac arrest. Current ALS Guidelines should be followed. Decision to treat for PE in cardiac arrest with thrombolytic therapy should be taken early while a good outcome is still possible. Cardiopulmonary Resuscitation should be continued for 60-90 minutes post thrombolysis in this scenario before termination of resuscitation.

Thrombolysis in cardiac arrest can be given as IV Alteplase 0.6 mg/kg over 15 min (maximum dose 50 mg) rather than the dosage described above over 2 hours.

Management of Haemodynamically Unstable PE



*****Haemodynamically unstable PE*** *is also referred to as massive PE. This group of patients are defined by a systolic blood pressure of less than 90 mmHg or a drop in blood pressure of ≥ 40mmHg for >15 mins*

*****Thrombolysis Protocol*
CIs and Informed Consent with patient Alteplase 10mg over 1-2mins followed by 90mg over 2hrs. If wt<65kg total dose limited to 1.5mg/kg. IV heparin as per protocol for 24 hrs after tPA

4.0 Training

Only clinicians who have undergone appropriate training will independently assess patients with possible PE.

5.0 Process for Monitoring Compliance with the Policy

Compliance with this policy will be audited as part of the medicine clinical governance processes

6.0 Approval, Implementation & Review

This Policy was approved by the Thrombosis Committee

7.0 References

NICE CG144: Venous thromboembolic diseases: the management of venous thromboembolic diseases and the role of thrombophilia testing - Jun 2012
http://www.nice.org.uk/nicemedia/pdf/ip/IPG144guidance.pdf

2019 ESC Guidelines on the diagnosis and management of acute pulmonary embolism.

RCOG Green-top Guideline No.37b: Thromboembolic Disease in Pregnancy and the Puerperium: Acute Management – April 2015
https://www.rcog.org.uk/globalassets/documents/guidelines/gtg-37b.pdf

Adult Advanced Life Support Guideline 2015 https://www.resus.org.uk/resuscitation-guidelines/adult-advanced-life-support/

http://www.dorsetformulary.nhs.uk

8.0 Associated Policies

Anticoagulation Guidelines
Guideline for the Diagnosis and Management of Haemodynamically Stable PE

9.0 Consultation

Version	Date	Author	Consultation Process
1.0	November 2019	Dr Craig Prescott, Consultant Acute Physician (PGH) and Dr David Morgan, Consultant Respiratory Physician (RBH)	Acute Physicians PGH &RBH Dr Jason Mainwaring, Consultant Haematologist (RBH) Dr Chris Davies, Consultant Respiratory Physician (PGH) Dr JP Carpenter, Consultant Cardiologist (PGH) Mr Rob Sawdy, Consultant Obstetrician (PGH) Hayley Flavell, Anticoagulation Nurse Consultant (RBH)

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