Clinical Guideline

INVESTIGATION AND MANAGEMENT OF PULMONARY EMBOLISM

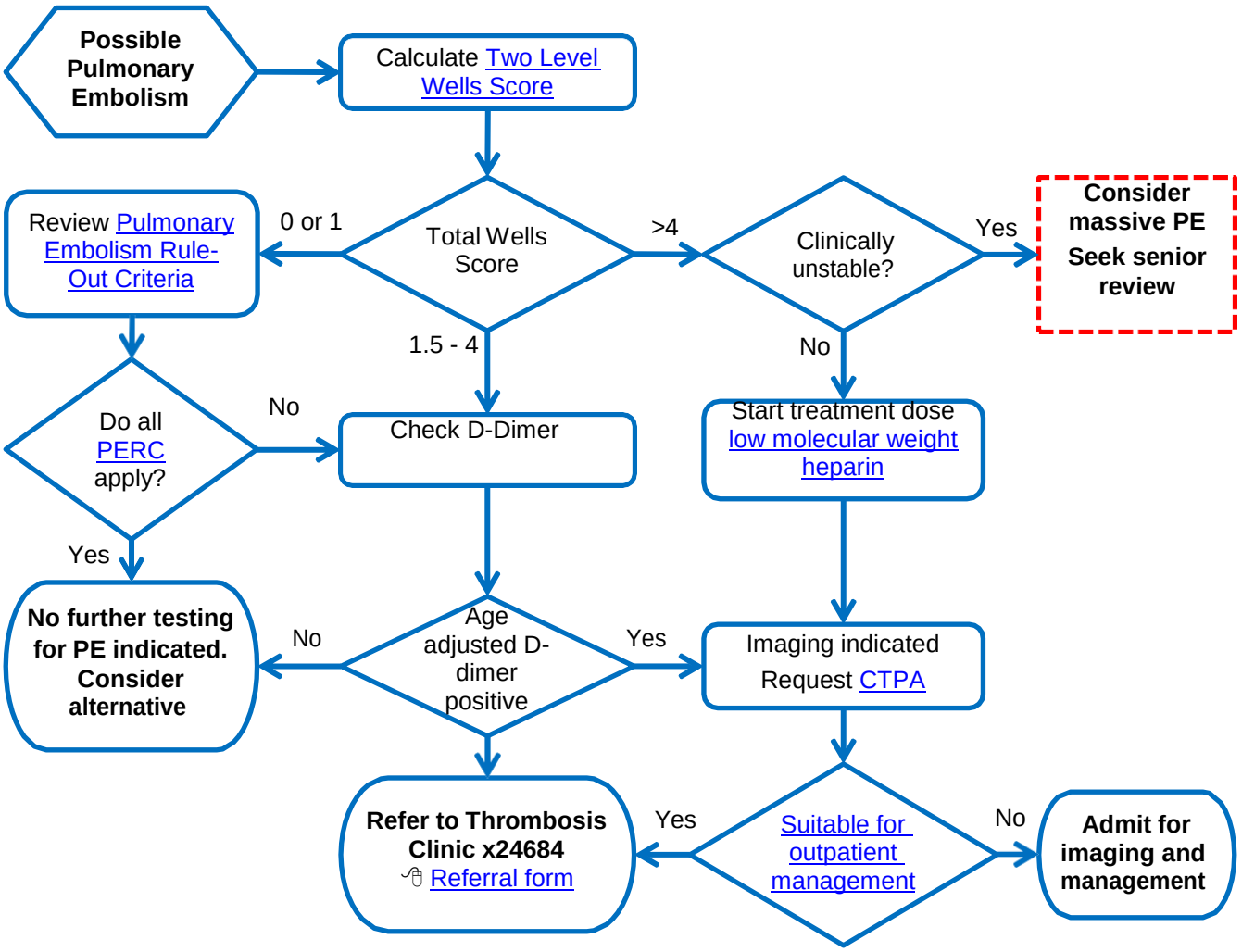
SETTING	Trustwide
FOR STAFF	Medical and nursing staff
PATIENTS	Adult patients with suspected or confirmed pulmonary embolism Excludes pregnancy and puerperium (see http://nww.avon.nhs.uk/dms/download.aspx?did=11244)

This guideline consists of three sections: Investigations for suspected PE; immediate management of confirmed PE; continuining management of confirmed PE.

Clinical judgement should always be used when deciding on management for individual patients.

1. Investigations for suspected PE

(Underlined text links to explanatory paragraphs below)



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Two Level Wells Score

Criterion	Score
Clinical signs of deep vein thrombosis (leg swelling or pain on palpation)	3
Pulmonary embolism is more likely than alternative diagnoses	3
Heart rate > 100 beats per minute	1.5
Immobilisation for more than 3 days or surgery in the previous 30 days	1.5
Previous deep vein thrombosis or pulmonary embolism	1.5
Haemoptysis	1
Malignancy (on treatment, treated within the last 6 months)	1

Interpretation of Two Level Wells Score:

Total score	Probability of PE	Interpretation
≤ 4.0	3%	PE unlikely (if score 0 or 1.0 see below for rule out criteria)
>4.0	28%	PE likely

Pulmonary Embolism Rule Out Criteria (PERC)

If Wells score is 0 or 1.0 and all of the following apply the patient is at ultra-low risk of pulmonary embolism:

- Age < 50 year old
- Heart rate < 100 beats/min
- SpO2 > 94%
- No unilateral leg swelling
- No haemoptysis
- No surgery or trauma within last 4 weeks
- No previous deep vein thrombosis or pulmonary embolism
- No current oral hormone use

No further investigations (including D-dimer) are indicated. Consider an alternative diagnosis to PE.

Outpatient management not suitable if any of the following:

- Haemodynamic instability: HR >110, systolic BP <100mmHg, requirement for inotropes, critical care, thrombolysis or embolectomy
- Sats <94% or need for supplementary oxygen
- Active bleeding or risk of major bleeding (e.g. recent GI bleed or surgery, previous intracranial bleeding, uncontrolled hypertension)
- On anticoagulation at the time of the PE
- Severe pain (e.g. requiring opiates)
- Other medical co-morbidities requiring hospital admission
- Chronic kidney disease (CKD) stages 4 or 5 (eGFR<30ml/min) or severe liver disease
- Heparin induced thrombocytopenia (HIT) previously (if LMWH is to be used as the out-patient treatment)
- Social reasons which may include inability to return home, inadequate care at home, lack of telephone communication, concerns over compliance, etc.
- New or unexplained troponin > 14ng/l
- ECG showing right heart strain

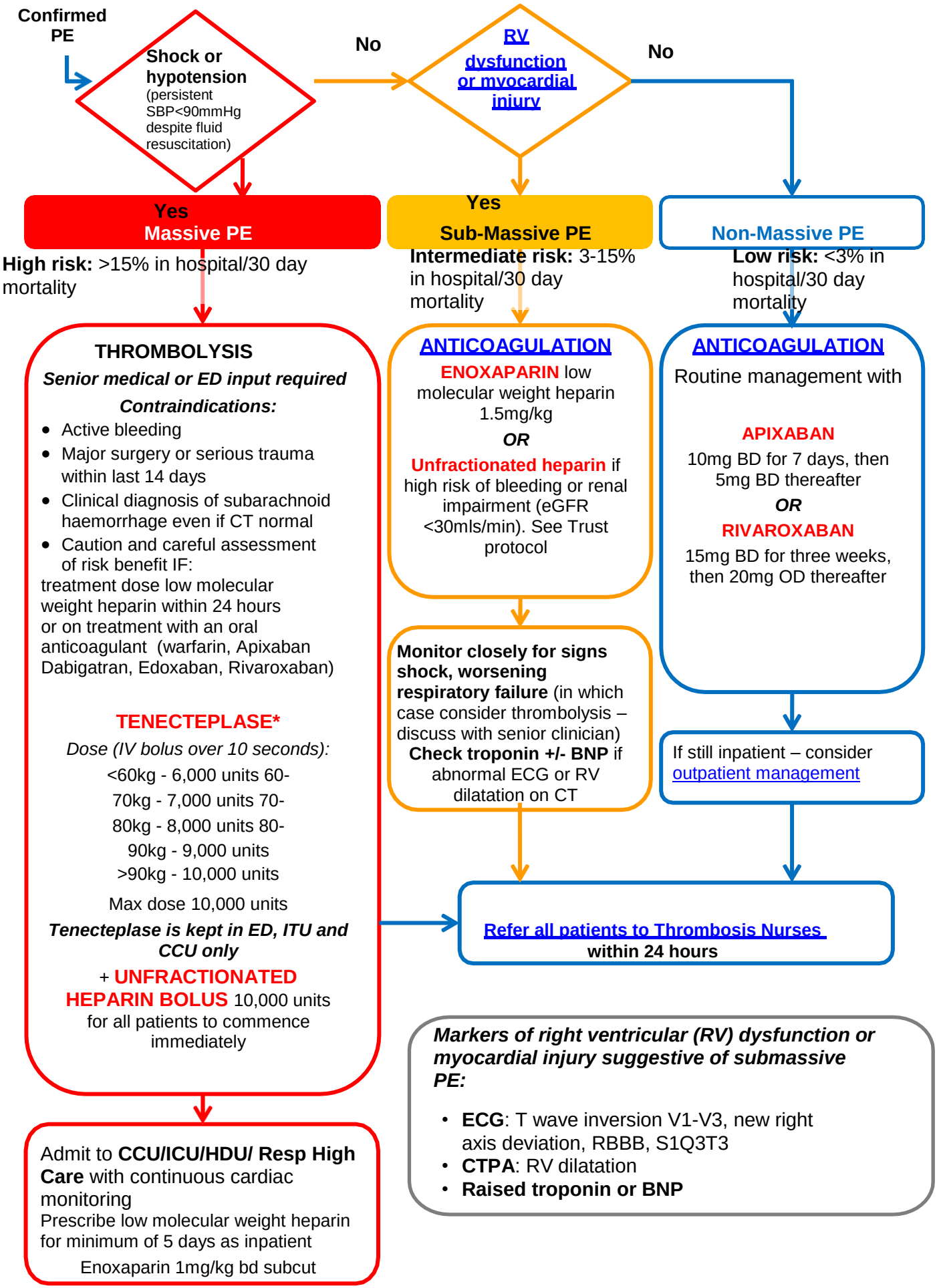
Patients with a confirmed diagnosis of pulmonary embolism who are thought suitable to be discharged should be assessed by a senior clinician (ST3 or above) prior to discharge. They should be given clear instructions on what to do if their condition deteriorates.

Imaging

- Clinical probability +/- D-dimer result required on scan request
- CTPA first line investigation
- V/Q scan recommended for women of childbearing age but do not delay scanning if unavailable
    - If leg symptoms present can request Doppler ultrasound to make diagnosis, if leg scan positive for VTE chest imaging not indicated
- All women of childbearing potential require a pregnancy test
- If delay in imaging and PE likely by Wells score will need treatment dose anticoagulation

2. Immediate management of confirmed PE

(Underlined text links to explanatory paragraphs below)



3. Continuing management of confirmed PE

Refer to Thrombosis Specialist Nurses within 24h of diagnosis

➔ Provide counselling for anticoagulation decisions

➔ Facilitate discharge and provide initial follow up

Phone extension 24684: Mon-Fri 9am- 5pm & Sat-Sun 9am-12pm

Complete referral from on http://nww.avon.nhs.uk/dms/download.aspx?did=12441

Anticoagulant Choice

Apixaban 10mg BD PO for 7 days, then 5mg BD thereafter
OR
Rivaroxaban 15mg BD PO for 21 days, then 20mg OD thereafter
OR
Enoxaparin 1mg/kg BD SC for a minimum of 5 days with conversion to **Warfarin**

NB if using Enoxaparin recommended dose in symptomatic PE or where there are risk factors eg malignancy is now 1mg/Kg bd initially

Duration of anticoagulation

➔ Provoked PE (i.e. secondary to **major** temporary risk factor): 3 months
➔ Unprovoked PE: minimum 3 months but consider longterm
➔ Pulmonary hypertension at 3 months: longterm anticoagulation

Special circumstances:

- IVDUs – Rivaroxaban is a good choice
- Pregnancy – Enoxaparin 1.0mg/kg SC BD
- Known active malignancy – Enoxaparin 1mg/kg SC BD initially with potential to reduce to 1.5mg/kg if symptoms improve
    - Initial period of anticoagulation 3-6 months; reassess need for further anticoagulation at 6mo
      Check platelet count at 7-10 days

Investigation for underlying malignancy (to be arranged by the admitting medical team)

In up to 5% of patients presenting with an apparently unprovoked pulmonary embolism occult malignancy is found

➔ Thorough history and physical examination (incl. rectal and breast exam)
➔ FBC, LFTs, Calcium, PSA
➔ Urinalysis
➔ Consider CT abdomen/pelvis and mammogram especially in patients over 40 where there is clinical suspicion based on history clinical examination and abnormal blood tests:
Choice of investigation should be guided by clinical presentation

Echocardiogram

Not indicated in the acute setting unless suspected massive PE and CTPA inappropriate or contraindicated.
Even if CT suggests right heart strain an ECHO at this stage does not change management

If persistent dyspnoea at 3 months → consider transthoracic echocardiogram
→ refer to respiratory: type '*goto/chest*' into the intranet / bleep 6059

Discharge Planning

Patients admitted to hospital: Recommended admission minimum 48hrs

- Prior to discharge they should be reviewed by a senior clinician (ST3 or above)

Consider the following parameters to be safe for discharge (taking into consideration their pre-morbid condition)
RR ≤ 20, BP > 100 systolic, HR <100, $Sa0_2$ ≥ 94% on air (i.e. not requiring oxygen), no undue dyspnoea on walking.

Follow up

Haematology clinic → unprovoked PE in patients who are otherwise well at discharge
Primarily for discussion of longterm anticoagulation
Also consider for young patients with >1 first degree relative with VTE and
Post-partum follow up of all patients with PE during pregnancy

Respiratory clinic → patients with sub-massive PE, evidence of pulmonary hypertension, abnormal echo, or underlying lung disease

GP follow up only → provoked PE in patients who are otherwise well. The GP needs to assess for ongoing breathlessness at 3mo (and subsequent respiratory referral); this must be made clear in the discharge paperwork.

REFERENCES	1. British Thoracic Society Guidelines Full reference needed. 2. Venous thromboembolic diseases: the management of venous thromboembolic diseases and the role of thrombophilia testing NICE Clinical guideline 144 2012
AUTHORISING BODY	Clinical Effectiveness Group
QUERIES	Thrombosis Nurses (ext 24684)