

Pulmonary Embolus - Assessment and Imaging - Suspected Acute PE - Summary Clinical Guideline

Reference No.: CG-T/2013/051

The cornerstones of initial assessment are:

1. A thorough history, careful clinical examination and appropriate use of initial investigations (such as routine bloods, ECG and chest radiograph - CXR).
2. Triage of patients with suspected pulmonary embolism using the 2 level Wells score into "PE likely" or "PE unlikely" groups.
3. Use of D dimer testing in "PE unlikely" patients to exclude the diagnosis without need for imaging.
4. Appropriate radiological imaging tests for patients with "PE likely", and those with "PE unlikely" in whom D dimer tests are elevated.

Use of radiological imaging in suspected PE

- If there is clinical DVT and leg Doppler examination is positive and 2 level Wells score is "PE likely" PE can be assumed and no further imaging is required.
- **If result of 2 level Wells score is "PE likely" proceed directly to imaging as follows:**
 - **VQ Scan** - Age under 50 and no significant co-morbid cardiorespiratory disease with a normal CXR.
 - VQ SPECT is not available after hours – if patient presents between Friday morning and Sunday evening, VQ imaging within 24 hours cannot be guaranteed.
 - **CTPA** - Age over 50 or significant co-morbid cardiorespiratory disease, or abnormal CXR or timely VQ scan not available.
- **If result of Wells score is "PE unlikely" assess quantitative D-dimer and image according to above if D dimer is positive.**
- **If "PE unlikely" and D Dimer is normal PE is as unlikely as with a negative CTPA or VQ SPECT, and therefore no further thoracic imaging for PE is warranted.**

Interpreting imaging results

- PE is highly unlikely if a patient has a normal VQ scan or a good quality negative CTPA.
- All indeterminate V/Q scans should be followed by further imaging, usually CTPA.
- A small proportion of CTPAs may be indeterminate due to incomplete opacification of pulmonary vessels or due to respiratory motion artefact. If clinical suspicion for PE remains high the scan result should be reviewed by a senior clinician with expertise in pulmonary embolism and/or a thoracic radiologist.
- In patients with suspected massive or submassive PE, CTPA is the preferred imaging modality. See 'additional guidelines' section below.

- An echocardiogram is the bedside test of choice for patients who are too ill to be transferred for imaging. The decision for bedside echocardiography should be made in conjunction with the consultant responsible for the patient's care.

Timing of radiological investigations

- All patients with suspected PE in whom radiological imaging is required should be imaged within 24 hours. Acute PE can resolve in as little as 2 days resulting in negative investigations if delayed.
- Unstable patients should ideally be imaged within 1 hour.
- Stable patients assessed out of normal working hours should be imaged on the first available list the following day unless there is a clinical need to establish the diagnosis urgently – in which case this should be discussed with the radiologist on call.

Use of anticoagulation prior to imaging

- Patients awaiting imaging should receive empiric parenteral anticoagulation (eg. Enoxaparin) or a dose of direct oral anticoagulant (DOAC) unless imaging is available immediately or there is a major contraindication to anticoagulation.

Renal impairment

Please refer to the trust and imaging policy on IV contrast and renal impairment.

<http://flo/EasySiteWeb/getresource.axd?AssetID=2467&type=full&servicetype=Attachment>

- In patients with severe renal dysfunction in whom V/Q scan is not helpful, a positive Doppler ultrasound may avoid the need for CTPA.
- Advanced renal failure is not an absolute contraindication for CTPA, particularly in the acutely unstable patient if a diagnosis is needed, but discussion with the renal team is essential to ensure an appropriate management/escalation plan in the event of worsening renal function post-contrast.

Outpatient echocardiogram

- Do not request outpatient echocardiograms routinely in all patients with diagnosed PE. This test will be arranged in the specialist PE clinic if necessary.

Cardiac Troponins / BNP / NT-proBNP

- The role of Cardiac Troponins / BNP / NT-pro BNP used in isolation in clinical decision making remains unclear. They may allow recognition of a lower risk cohort of PE patients suitable for outpatient management, but only when used in conjunction with an appropriate risk score. See 'additional guidelines' section below.

Pregnancy

- The on-call obstetrics team should always be contacted when pregnant patients present with suspected PE
- In stable patients first choice imaging is VQ scan, however this is not available on weekend days and so CTPA should be requested if unable to wait until Monday for investigation.

Malignancy screening

- Patients with confirmed unprovoked PE or DVT should have the following assessment:
 - Careful history and examination looking for occult malignancy.
 - FBC, UE, LFT, Calcium, Urine dip
 - PSA and digital rectal examination if male and over 50 years
 - Breast examination if female
- Investigations such as CT and endoscopy should be organised only if there are red flag symptoms or signs suggestive of occult malignancy.
- Evidence does not support the routine use of CT abdomen and pelvis in patients with unprovoked PE in the absence of clinical suspicion of malignancy.

Thrombophilia testing

- There is a limited role in the acute setting. Thrombophilia testing can be requested in the outpatient setting in specialist clinics when it may have an impact on length of anticoagulation treatment or further risk stratification.

Additional guidelines

Patients with suspected sub-massive or massive PE: Read this guideline in conjunction with Trust guideline for thrombolysis in PE available on Trust intranet.

Patients who are suitable for outpatient investigation of PE: Read this guideline in conjunction with the Trust guideline for management for patients with VTE or consult the BTS guidelines on ambulatory management of PE (2018).

<https://brit-thoracic.org.uk/standards-of-care/guidelines/bts-guidelines-for-the-outpatient-management-of-pulmonary-embolism/>