**Echocardiogram (echo) in acute presentation and in follow-up of patients with pulmonary embolus (PE)**

**Background:**

Echocardiogram (echo) is not a useful test in most patients with acute PE or in their follow-up [1]. In selected patients, echo PE patients helps to stratify risks, guide management, monitor response to therapy, and give prognostic information for patients with risk adverse event.

When vetting echo tests, we have noted a significant number of unnecessary requests which has added to the already large burden of echo requests in the Trust.

With the agreement of the Trust’s Chief Medical Officer and the Cardiology Management, we are tasked to identify patients with PE who would benefit from echo.

**Recommendations:**

**Please also refer to the Trust’s Guidelines for Pulmonary Emboli** [2]

**For acute PE:**

In the acute phase, echo should be considered in

1. Haemodynamically unstable patients (low Systolic BP below 90 mmHg or bradycardia <40 Beats per minute). If you plan to offer thrombolysis, do not wait for the results of echo.
2. Haemodynamically stable patients with elevated cardiac biomarkers (NT pro BNP), persistent tachycardia or ECG markers of right ventricular strain.
3. CTPA features that suggest right ventricular strain (widened pulmonary artery diameter compared to the adjacent aorta and right ventricular enlargement, deviated septum to the left side and right atrial enlargement).

**For follow-up of patients with PE:**

Most patients with PE are followed up after 3-6 months from the acute phase. The main aims of follow up are to rule out chronic thromboembolic pulmonary hypertension (CTEPH) and to guide continuation of anti-coagulation.

CTEPH occurs in around 3-5% of those with PE [2]. Risk factors for CTEPH are not clearly known, and an aggressive management of acute PE (by thrombolytic therapy) does not appear to reduce the risk of CTEPH. Half of patients with CTEPH do not have a history of treated PE.

CTPA and Perfusion scan are more sensitive and helpful than echocardiogram in suggesting PE. Therefore, our suggestion here is pragmatic.

We suggest that for patients who had follow-up for PE, echo is done in patients with symptoms of breathlessness, chest discomfort and palpitation that are felt to point to pulmonary hypertension.

Consider echocardiogram in the following groups:

1. Patients with hypoxia (oxygen saturation of < 90%) and/or tachycardia (heart rate of >100 BpM).
2. ECG markers of right ventricular strain (new right bundle branch block, tachycardia and right axis deviation).
3. Patients with high volume emboli or with markers of right ventricular strain on the initial CTPA.
4. Patient with massive and sub-massive PE who needed thrombolysis.

If CTEPH is suspected, CTPA or ventilation perfusion should be done. If these point to CTEPH, we would suggest referral to the Trust’s cardiologists for right sided catheter or to the reginal pulmonary hypertension service at the Royal United Hospital Bath.

We would like to encourage referring patients needing follow-up to the VTE clinic run by Dr Abrar Almulla’ through acute medicine secretaries. [ghn-tr.acutemedsecretaries@nhs.net](mailto:ghn-tr.acutemedsecretaries@nhs.net)

**References:**

1. Hritani R, Al-Rifai A, Soud M, Moussa H, Alries C. Which patient with pulmonary embolism need echocardiography? ***Cleveland Clinic Journal of Medicine; 2018: volume 85:11: PP: 826-828.***
2. Trust Guidelines – Pulmonary Embolism. ***Available on the Trust intranet.***
3. Kim NH, Delcoix M, Jais X et al. Chronic thromboembolic pulmonary hypertension (worl symposium on pulmonary hypertension). ***European Respiratory Journal 2019; 53: 1801915.***