**Commissioner’s Guide to the NCEPOD Report - ‘Know the Score’**

**A review of the care received by patients with a new diagnosis of pulmonary embolism**

**Introduction**

Despite advances in the ability to prevent, diagnose and treat acute pulmonary embolism (PE) it remains an important cause of morbidity and mortality. Its association with air travel, hospitalisation, active cancer, pregnancy and some chronic conditions is well recognised and involves all age groups, including the young. Estimates suggest that there are more than 25,000 hospital deaths in the UK each year from venous thromboembolism (VTE) and previous studies have shown that for every diagnosed case of a non-fatal PE there are 2.5 cases of fatal PE that were not diagnosed.

Key steps to effective care for patients includes prevention, prompt diagnosis and treatment:

* Prevention of healthcare-related deep vein thrombosis (DVT) includes the use of anticoagulants or mechanical methods.
* CT Pulmonary Angiography (CTPA) is commonly used to diagnose PE. However, to be effective this service should be available, promptly in all hospitals, especially out-of-hours.
* The standard treatment is anticoagulation. The combined recommendations from NICE guideline 144 and Quality Standard 29 recommends that heparin therapy should be started immediately if the time taken to confirm the diagnosis is likely to be more than one hour
* To aid safe and effective treatment it is possible to estimate the risk of adverse outcomes of PE, following diagnosis, using prediction tools like the Pulmonary Embolism Severity Index (PESI)

**Patient population**

Patients aged 16 years and older who presented to hospital with symptoms of a pulmonary embolism (PE) or who developed PE as an inpatient (using ICD10 codes I26.0 and I26.9) between 1st July 2017 and 31st August 2017 inclusive were included in the study. Ambulatory care/same day emergency patients and patients admitted to hospital were included in the study.

**Clinical issues**

* There was an avoidable delay in commencing treatment in 18.7% patients. More than half of the avoidable delays recorded were because an anticoagulant was not prescribed and/or not administered
* A PE clinical probability score was documented in the notes for only 19.7% cases where the patient presented with symptoms of PE
* The severity of PE was not recorded for over 80% of patients
* In 50.7% of CTPA reports no comment was made on the thrombus burden and in 37.5% no comment was made on the right ventricle
* Half of CTPA reports were considered to be less than good including 9.5% which were graded as poor; most commonly due to the lack of comment on the right ventricle
* 16.2% patients who presented to hospital with clinical suspicion of PE, were cared for on an ambulatory care pathway for all or part of their patient journey
* 22.9% low-risk patients were treated on an ambulatory pathway, suggesting potential missed opportunities for the remaining 77.1% low-risk patients

**Organisational issues**

* Proformas or other structured reporting systems for CTPA were only used in 14.1% of hospitals
* Specific information/education regarding PE was not routinely provide to patients at 32.9% of hospitals
* Outpatient follow-up was not routinely arranged following a PE diagnosis in 17.9% of hospitals.
* Catheter-directed thrombolysis was unavailable on-site or off-site in 35.7% of hospitals. In 51.3% and 36.1% of hospitals, mechanical thrombectomy and surgical embolectomy were not treatment options

**Key features of a service**

1. Give an interim dose of anticoagulant to patients suspected of having an acute pulmonary embolism (unless contraindicated) when confirmation of the diagnosis is expected to be delayed by more than one hour. The anticoagulant selected, and its dose, should be personalised to the patient. This timing is in line with NICE QS29 2013.

2. Document the severity of acute pulmonary embolism immediately after the confirmation of diagnosis. Severity should be assessed using a validated standardized tool, such as ‘PESI’ or ‘sPESI’. This score should then be considered when deciding on the level of inpatient or ambulatory care.

3. Standardise CT pulmonary angiogram reporting. The proforma should include the presence or absence of right ventricular strain. The completion of these proformas should be audited locally to monitor compliance and drive quality improvement.

Look for indicators of massive (high-risk) or sub-massive (intermediate-risk) pulmonary embolism, in addition to calculating the severity of acute pulmonary embolism in the form of:

1. Haemodynamic instability (clinical)
2. Right heart strain (imaging)
3. Elevated troponin or BNP (biochemical).

Escalate promptly based on local guidance and document in the case notes.

4.Provide every patient with an acute pulmonary embolism with a follow-up plan, patient information leaflet and, at discharge, a discharge letter which should include:

1. The likely cause of the pulmonary embolism
2. Whether it was provoked or unprovoked
3. Details of follow-up appointment(s)
4. Any further investigations required
5. Details of anticoagulant prescribed and its duration, in line with NICE CG144

5. Formalise pulmonary embolism treatment networks for access to catheter-directed thrombolysis, surgical embolectomy or mechanical thrombectomy for the treatment of patients with pulmonary embolism who either fail to improve or have absolute contraindications to systemic thrombolysis.

**Supporting national guidance and reports**

* Venous Thromboembolism Prevention A Guide for Delivering the CQUIN Goal. 2010. [http://www.kingsthrombosiscentre.org.uk/kings/Delivering%20the%20CQUIN%20Goal\_2ndEdition\_LR.pdf 5](http://www.kingsthrombosiscentre.org.uk/kings/Delivering%20the%20CQUIN%20Goal_2ndEdition_LR.pdf%205)
* National Institute for Health and Care Excellence (NICE) guidance. NICE Clinical Guidance CG144. Venous thromboembolic diseases: diagnosis, management and thrombophilia testing. 2012. [https://www.nice.org.uk/ guidance/cg144/resources/venous-thromboembolicdiseases-diagnosis-management-and-thrombophiliatesting-pdf-35109570835141](https://www.nice.org.uk/%20guidance/cg144/resources/venous-thromboembolicdiseases-diagnosis-management-and-thrombophiliatesting-pdf-35109570835141)
* Howard LSGE, Barden S, Condliffe R, et al. British Thoracic Society Guideline for the initial outpatient management of pulmonary embolism (PE). Thorax 2018;73:ii1-ii29
* National Institute for Health and Care Excellence (NICE) Quality Standard. NICE QS29 for the diagnosis and management of venous thromboembolism. 2013 [https://www.nice.org.uk/guidance/qs29/resources/ venous-thromboembolism-in-adults-diagnosis-andmanagement-pdf-2098554175429](https://www.nice.org.uk/guidance/qs29/resources/%20venous-thromboembolism-in-adults-diagnosis-andmanagement-pdf-2098554175429)
* Scottish Intercollegiate Guidelines Network. SIGN 122. Prevention and management of venous thromboembolism. A national clinical guideline. 2010. <https://www.sign.ac.uk/assets/sign122.pdf>
* Konstantinides SV, Torbicki A, Agnelli G et al. European Society of Cardiology Guidelines on the diagnosis and management of acute pulmonary embolism. European Heart Journal 2014; 35: 3033–3080 https://academic. oup.com/eurheartj/article/35/43/3033/503581
* National Institute for Health and Care Excellence (NICE) guidance. NICE Clinical Guidance CG92 ‘Venous Thromboembolism: reducing the risk for patients in hospital’ (2010 with update in 2015) https://www.nice. org.uk/guidance/CG92
* National Institute for Health and Care Excellence (NICE) guidance, NICE Guidance 89. Venous thromboembolism in over 16s: reducing the risk of hospital acquired deep venous thrombosis or pulmonary embolism. 2018 [https://www.nice.org.uk/guidance/ng89/resources/ venous-thromboembolism-in-over-16s-reducing-the-riskof-hospitalacquired-deep-vein-thrombosis-or-pulmonaryembolism-pdf-1837703092165](https://www.nice.org.uk/guidance/ng89/resources/%20venous-thromboembolism-in-over-16s-reducing-the-riskof-hospitalacquired-deep-vein-thrombosis-or-pulmonaryembolism-pdf-1837703092165)