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Editorial

A Paradigm Shift of Acute Pulmonary Embolism Management From an Old Classification System to a Novel A–E Approach From 2026 American Heart Association Guideline

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1. Introduction

Acute pulmonary embolism (PE) is the third leading cause of cardiovascular mortality after acute myocardial infarction and stroke. The incidence and prevalence of PE vary significantly across different geographical regions. Data from 73 countries show that mortality has declined over the past two decades, from 3.49 per 100,000 population in 2001 to 2.42 per 100,000 population in 2023. Although the mortality is low in the developed countries, they remain higher in the low- and moderate-income countries [1].

The majority of the guidelines, including the National Institute for Health and Care Excellence (NICE) and European Society of Cardiology (ESC) use the Wells and Geneva scores as a pretest probability for PE, contrarily, this new guideline has included other strategies, such as the YEARS algorithm, pulmonary embolism rule out criteria (PERC), and different D-dimer values along with Wells and Geneva scores. This guideline also incorporates biomarkers and imaging modalities into both diagnostic and prognostic assessments. Most importantly, this guideline introduces a novel A–E classification system, shifting away from the old low-, moderate-, or high-risk stratification. This new model enables a more individualised patient-centred care, spanning the clinical spectrum from asymptomatic pulmonary embolism to cardiopulmonary failure [2].

2. Risk Stratification and Multidisciplinary Management of Adult Pulmonary Embolism

The 2026 American Heart Association/American College of Cardiology (AHA/ACC) uses the risk factors from Kearon et al. [3], which is a simplified risk assessment approach in clinical practice. Following the diagnosis of PE, the traditional guidelines recommend calculating the pulmonary embolism severity index (PESI) score. In contrast, the AHA/ACC has broadened the risk stratification model by including simplified PESI (sPESI), Bova, Hestia, Composite Pulmonary Embolism Shock (CPES), Shock index, and National Early Warning Score (NEWS), within the framework of the novel A–E classification. According to the ESC, inpatient 30-day mortality depends on haemodynamic instability, PESI classification, right ventricular (RV) dysfunction on transthoracic echocardiography (TTE)/computed tomography pulmonary angiography (CTPA), and troponin. On the other hand, the AHA/ACC recommends a novel team-based approach called pulmonary embolism response team (PERT), which integrates hemodynamic assessment, biomarkers, and RV imaging to identify the best treatment modality, such as pharmacotherapy, interventions, including catheter-directed thrombolysis (CDT), mechanical thrombectomy, surgical embolectomy, and extracorporeal membrane oxygenation (ECMO) [4].

3. Patient Centric Management Based on Clinical Category

This part of the guideline replaced the old classification with a novel A–E category approach [2]. Category A includes asymptomatic PE, B includes symptomatic low severity PE, C includes symptomatic patients with elevated clinical severity score with or without respiratory modifier (O_2 <90%, respiratory rate [RR] ≥30, need for supplemental oxygen), D includes incipient cardiorespiratory failure with or without respiratory modifier (>6 L nasal cannula or use of a non-rebreather mask) and E includes cardiopulmonary failure with or without respiratory modifier (hypoxaemic respiratory failure or ventilatory failure).

However, the ESC and NICE are still using the old classification system. The ESC and NICE recommend the treatment based on haemodynamic instability, whereas AHA/ACC recommends the treatment based on the A-E category. ESC recommends only the calculation of PESI after the diagnosis of acute PE; in contrast, AHA recommends the use of Hestia, PESI, and/or simplified PESI for A and B categories. However, it does not recommend any scoring system for haemodynamically stable patients of categories C and D, though AHA recommends the use of NEWS/NEWS2 in some special circumstances [5].

4. American Heart Association Based Risk Stratification for Adverse Prognosis

Risk stratification for adverse outcomes based specifically on three parameters such as haemodynamic assessment, biomarkers and right ventricular imaging according to the 2026 AHA/ACC guideline. In patients with category C with no hypotension, either troponin or brain natriuretic peptide is strongly recommended, whereas in category C–E, lactate is indicated alongside the above biomarkers. The RV assessment with specific dimensions is strongly recommended with the strongest evidence for category C–D, and transthoracic echocardiography is the preferred modality over computed tomography. In patients with acute PE with category A–C, quantification of angiographic thrombus does not add any benefit and is not indicated [6,7].

5. The Role of Biomarkers and Cardiac Imaging

Cardiac biomarkers play a pivotal role in risk stratification for short-term morbidity and mortality. High lactate has particular importance in normotensive patients, serving as a marker of subclinical end-organ hypoperfusion. The role of cardiac biomarkers and measurement of lactate has been established by large randomised trials and meta-analyses. Cardiac imaging not only guides the treatment but also changes the trajectory of interventions and outcomes. Therefore, right ventricular assessment should be thorough and specific. The 2026 AHA/ACC recommends measuring RV dimension, RV/left ventricular (LV) ratio in apical or subcostal view, measurement of tricuspid annular plane systolic excursion (TAPSE), Doppler evidence of pulmonary hypertension, and tricuspid systolic velocity in apical 4 chamber or subcostal view. This is because RV dysfunction has superior prognostic performance for the prediction of clinical decompensation and is an independent adverse risk factor for sudden deterioration [7].

6. Holistic Management and Pulmonary Embolism Response Team

Management of acute PE should be individualised based on the clinical severity and patient-specific factors. Patients within categories A and B are suitable for outpatient treatment, provided there are no other indications for hospital admission. Conversely, patients with haemodynamic instability require intensive care unit (ICU) or an intermediate level of care setting. A key integration from 2026 AHA/ACC guideline is that patients within categories C–E must be assessed by the pulmonary embolism response team (PERT). The benefits of PERT are diverse insights from various specialties, selection of appropriate therapies, improved risk stratification, and implementation of evidence-based medicine. Therefore, this new A–E approach is more holistic for patient care and brings better outcomes by placing the patients into outpatient, inpatient, and ICU based treatment depending on their categorical diagnosis.

7. Medical Management

Anticoagulation is the mainstay of treatment for acute confirmed PE. The 2026 AHA/ACC discusses the treatment strategies thoroughly across different spectra of acute PE, whereas ESC/NICE describe more generally. Direct oral anticoagulant (DOAC) is preferred in categories A and B, whereas categories C–E usually require parenteral anticoagulation. Generally, low-molecular-weight heparin (LMWH) and DOAC are preferred over unfractionated heparin and vitamin K antagonists (VKAs). In patients with body mass index (BMI) >30 kg/m^2, DOACs are preferred, but when BMI is >40 kg/m^2, LMWH must be considered. In antiphospholipid syndrome, VKAs are preferred over DOACs. In primary brain cancer, DOAC may be considered over LMWH to reduce the risk of intracerebral haemorrhage (ICH). In chronic kidney disease (CKD), DOACs are recommended over VKA. In pregnancy, DOACs/VKAs are harmful, and in breastfeeding, LMWH/unfractionated heparin (UFH) /VKA are recommended. In chronic liver disease, DOAC should be considered instead of VKA to reduce bleeding, except in Child-Pugh class C. In patients who are undergoing catheter-directed thrombolysis (CDT), concomitant LMWH/UFH are recommended over no anticoagulation to prevent recurrent PE. In patients who require LMWH monitoring, the peak anti-Xa level should be checked 3 to 5 hours after the last LMWH dose once a steady state is reached after 3 doses. In CKD with creatinine clearance <30 mL/min, LMWH is preferred to allow monitoring of anti-Xa levels to guide dose adjustment to reduce bleeding risk. For patients with acute PE with cardiogenic shock categories D2–E2, the use of vasopressors and/or inotropes is recommended to improve cardiac output and systemic perfusion. Sedation with ventilatory strategies, mechanical circulatory support, inferior vena cava filters, and advanced management of PE are beyond the scope of this editorial [8].

8. Implications in Clinical Practice

The 2026 AHA/ACC guideline has outlined a paradigm shift in the management of acute PE. It reshapes the clinical classification, risk stratification, the introduction of multiple risk models, continuous reassessment and a new operational approach termed the pulmonary embolism response team (PERT).

9. Challenges in the Real World

Though many comprehensive and structured framework proposed by the 2026 AHA/ACC guideline, the real-world implementation is still challenging, mainly due to limited resources. There are also no clear instructions for acute pulmonary embolism management in the primary care

setting, secondary care, or district general hospitals. There is also no specific data on how thrombus burden and RV enlargement adversely affect the outcomes. We need specific policies regarding travelling thrombi and the algorithm of advanced treatment. Management of long-term complications, personalised treatment, artificial intelligence, and innovation are additional challenges of the near future.

10. Conclusion

The 2026 AHA/ACC guideline outlines newer advances in almost all aspects of acute PE management. The A–E classification-based treatment strategies make the guideline an easy framework for both inpatient and outpatient treatment. For clinical practice, physicians will face challenges in multidisciplinary collaboration in resource-limited areas.

Key Points

• The 2026 AHA/ACC guideline introduces a dynamic A–E classification approach for acute PE management.

• The outcome of acute PE depends on haemodynamic parameters, clinical severity, biomarkers, and RV dysfunction.

• Pulmonary embolism response team (PERT) is key to implementing advanced treatment for acute PE to reduce morbidity and mortality.

Availability of Data and Materials

Not applicable.

Author Contributions

KA was responsible for conceptualizing the editorial, drafting the original manuscript, critically analysing, overseeing the project, and supervising the overall work. MSE and JMA contributed to the conception and interpretation of the work and drafting. All authors contributed to revising the manuscript critically for important intellectual content. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

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Conflicts of Interest

The authors declare no conflicts of interest.

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