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CONTEMPORARY APPROACHES TO THE DIAGNOSIS AND MANAGEMENT OF PULMONARY EMBOLISM

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Background: Pulmonary embolism (PE) is an acute cardiovascular condition with frequently nonspecific clinical manifestations that requires rapid, structured diagnostic and therapeutic decision-making. The 2026 multisociety AHA/ACC/ACCP/ACEP/CHEST guideline introduces a new A–E clinical classification of acute PE integrating symptoms, hemodynamic status, right ventricular dysfunction, and biomarkers to support more precise risk stratification and treatment selection.

Objective: To systematize contemporary evidence-based approaches to the diagnosis and management of PE and to develop effective educational strategies for their practical implementation.

Educational Strategy: The educational program is based on a stepwise clinical algorithm: (1) assessment of clinical suspicion and use of validated clinical prediction tools; (2) rational use of D-dimer according to pretest probability; (3) diagnostic confirmation with CT pulmonary angiography (CTPA), with ventilation/perfusion scanning in appropriate cases; (4) assessment of PE severity and early risk based on hemodynamic status, right ventricular function, and biomarkers; and (5) selection of indications for anticoagulation and reperfusion therapy. Teaching methods include case-based learning, clinical decision algorithms, simulation scenarios, and multidisciplinary discussion.

Key Issues: Contemporary diagnosis emphasizes pretest clinical risk assessment before diagnostic testing. Patients with a high clinical probability or a positive D-dimer require imaging, with CTPA serving as the principal imaging modality when confirmation is required. Anticoagulation remains the cornerstone of treatment. The 2026 guideline recommends low-molecular-weight heparin over unfractionated heparin when initial parenteral anticoagulation is required and favors direct oral anticoagulants (DOACs) over vitamin K antagonists in eligible patients without contraindications. After the initial 3–6 months, continuation of anticoagulation should be

individualized according to recurrence risk, provoking factors, and bleeding risk. In hemodynamically unstable patients, rapid reperfusion strategies—including systemic thrombolysis, catheter-based interventions, mechanical thrombectomy, or surgical embolectomy—may be considered according to clinical characteristics and bleeding risk. Pulmonary embolism response teams (PERTs) may facilitate timely multidisciplinary decision-making.

Conclusion: Contemporary PE management requires not only knowledge of diagnostic and therapeutic recommendations but also the ability to apply them systematically. Effective educational strategies should integrate clinical probability assessment, appropriate D-dimer use, CTPA-based diagnosis, dynamic risk stratification, and individualized selection of anticoagulant or reperfusion therapy. Case-based learning and simulation-based algorithms can support rapid and safe decision-making, particularly in high-risk PE. Structured follow-up is also important for timely recognition of persistent symptoms, functional limitation, and possible chronic thromboembolic disease.

Keywords: pulmonary embolism; risk stratification; anticoagulation; thrombolysis; educational strategy