

Management of Acute Pulmonary Embolism Clinical Practice Guidelines (2019)

European Cardiology Society (ECS)

This is a quick summary of the guidelines without analysis or commentary. For more information, go directly to the guidelines by clicking the link in the reference.

October 01, 2019

The updated guidelines on management of acute pulmonary embolism (PE) were released on August 31, 2019, by the European Cardiology Society (ECS).^[1]

Acute-Phase Treatment of High-Risk Pulmonary Embolism

Initiation of anticoagulation with unfractionated heparin (UFH), including a weight-adjusted bolus injection, without delay is recommended.

Systemic thrombolytic therapy is recommended.

When thrombolysis is contraindicated or has failed, surgical pulmonary embolectomy is recommended; percutaneous catheter-directed treatment should be considered.

Norepinephrine and/or dobutamine should be considered.

Extracorporeal membrane oxygenation (ECMO) may be considered, along with surgical embolectomy or catheter-directed treatment, in patients with refractory circulatory collapse or cardiac arrest.

Acute-Phase Treatment of Intermediate- or Low-Risk Pulmonary Embolism

Initiation of anticoagulation is recommended without delay in patients with high or intermediate clinical probability of PE while diagnostic workup is in progress.

If anticoagulation is initiated parenterally, low-molecular-weight heparin (LMWH) or fondaparinux is recommended over UFH for most patients.

When oral anticoagulation is started in a patient who is eligible for a non-vitamin K antagonist (VKA) oral anticoagulant (NOAC; ie, apixaban, dabigatran, edoxaban, or rivaroxaban), an NOAC is recommended in preference to a VKA.

When patients are treated with a VKA, overlapping with parenteral anticoagulation is recommended until an international normalized ratio (INR) of 2.5 (range, 2.0-3.0) is reached.

NOACs are not recommended in patients with severe renal impairment, pregnant or lactating patients, or patients with antiphospholipid antibody syndrome.

Rescue thrombolytic therapy is recommended for patients with hemodynamic deterioration on anticoagulation.

As an alternative to rescue thrombolytic therapy, surgical embolectomy or percutaneous catheter-directed treatment should be considered for patients with hemodynamic deterioration on anticoagulation.

Use of Inferior Vena Cava Filters

Inferior vena cava (IVC) filters should be considered in patients with acute PE and absolute contraindications to anticoagulation, as well as in patients with recurrent PE despite therapeutic anticoagulation.

Routine use of IVC filters is not recommended.

Early Discharge and Home Treatment

Carefully selected patients with low-risk PE should be considered for early discharge and continuation of treatment at home, if proper outpatient care and anticoagulant treatment can be provided.

Regimen and Duration of Anticoagulation After Pulmonary Embolism in Patients Without Cancer

Therapeutic oral anticoagulation for ≥ 3 months is recommended for all patients with PE.

For patients with a first PE/venous thromboembolism (VTE) secondary to a major transient/reversible risk factor, discontinuance of anticoagulation is recommended after 3 months.

Oral anticoagulation of indefinite duration is recommended for patients presenting with recurrent VTE (ie, with at least one previous episode of PE or deep vein thrombosis [DVT]) not related to a major transient/reversible risk factor.

Treatment with a VKA for an indefinite period is recommended for patients with antiphospholipid antibody syndrome.

Extended oral anticoagulation of indefinite duration should be considered for (1) patients with a first episode of PE and no identifiable risk factor, (2) patients with a first episode of PE associated with a persistent risk factor other than antiphospholipid antibody syndrome, and (3) patients with a first episode of PE associated with a minor transient or reversible risk factor.

If extended oral anticoagulation after PE is decided on in a patient without cancer, a reduced dose of apixaban (2.5 mg twice daily) or rivaroxaban (10 mg once daily) should be considered after 6 months of anticoagulation.

In patients who refuse to take or cannot tolerate any oral anticoagulants, aspirin or sulodexide may be considered for extended VTE prophylaxis.

In patients who receive extended anticoagulation, drug tolerance and adherence, hepatic and renal function, and bleeding risk should be reassessed at regular intervals.

Regimen and Duration of Anticoagulation After Pulmonary Embolism in Patients With Active Cancer

Weight-adjusted subcutaneous LMWH should be considered for the first 6 months over VKAs.

Edoxaban or rivaroxaban should be considered as an alternative to weight-adjusted subcutaneous LMWH in patients without gastrointestinal (GI) cancer.

Extended anticoagulation (beyond the first 6 months) should be considered for an indefinite period or until the cancer is cured.

Management of incidental PE in the same manner as symptomatic PE should be considered if it involves segmental or more proximal branches, multiple subsegmental vessels, or a single subsegmental vessel in association with proven DVT.

Pulmonary Embolism in Pregnancy

A therapeutic fixed dose of LMWH based on early pregnancy body weight is recommended for PE in the majority of pregnant women without hemodynamic instability.

Thrombolysis or surgical embolectomy should be considered for pregnant women with high-risk PE.

Insertion of a spinal or epidural needle is not recommended, unless ≥ 24 hours has passed since the last therapeutic dose of LMWH. Administration of LMWH is not recommended within 4 hours of removal of an epidural catheter.

NOACs are not recommended during pregnancy or lactation.

Amniotic fluid embolism should be considered in a pregnant or postpartum woman with otherwise unexplained cardiac arrest, sustained hypotension, or respiratory deterioration, especially if accompanied by disseminated intravascular coagulation (DIC).

Follow-up After Acute Pulmonary Embolism

Routine clinical evaluation of patients 36 months after the acute PE episode is recommended.

An integrated model of patient care is recommended to ensure optimal transition from hospital to community care.

In symptomatic patients with mismatched perfusion defects persisting on ventilation/perfusion (V/Q) scan beyond 3 months after acute PE, referral to a pulmonary hypertension (PH)/chronic thromboembolic pulmonary hypertension (CTEPH) expert center is recommended.

Further diagnostic evaluation should be considered in patients with persistent or new-onset dyspnea/exercise limitation after PE and may be considered in asymptomatic patients with risk factors for CTEPH.

For more information, please go to [Pulmonary Embolism \(PE\)](#).

For more Clinical Practice Guidelines, please go to [Guidelines](#).

References

1. Konstantinides SV, Meyer G, Becattini C, Bueno H, Geersing GJ, Harjola VP, et al. 2019 ESC Guidelines for the diagnosis and management of acute pulmonary embolism developed in collaboration with the European Respiratory Society (ERS): The Task Force for the diagnosis and management of acute pulmonary embolism of the European Society of Cardiology (ESC). *Eur Respir J*. 2019 Aug 31. Available at: <https://academic.oup.com/eurheartj/advance-article/doi/10.1093/eurheartj/ehz405/5556136>.

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