



# ESSENTIAL MESSAGES FROM ESC GUIDELINES

Committee for Practice Guidelines

To improve the quality of clinical practice and patient care in Europe



## ACUTE PE

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# ESSENTIAL MESSAGES FROM THE GUIDELINES FOR THE DIAGNOSIS AND MANAGEMENT OF ACUTE PULMONARY EMBOLISM

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# Take home messages

- 1.** Acute pulmonary embolism (PE) is a common disease which may lead to life threatening right ventricular failure. Even an apparently mild episode of PE should be promptly diagnosed and treated to prevent early and potentially life-threatening recurrences.
- 2.** Because of non-specific clinical presentations PE should be always considered in the differential diagnosis of dyspnoea, chest pain, syncope and many other clinical symptoms and signs. Of note, 20-30% patients with PE have no predisposing factors.
- 3.** Only appropriately validated diagnostic strategies should be used to justify specific PE treatment as well as withholding anticoagulation despite clinical suspicion of acute PE.
- 4.** Diagnostic and management strategy should be chosen according to the severity of a (suspected or confirmed) PE episode, understood as the level of risk of early PE-related death.
- 5.** Patients presenting with shock or hypotension are suspected to have “High-risk PE” (early mortality > 15%) and require immediate diagnostic work-up to decide whether or not emergency thrombolysis and/or embolectomy is justified. Spiral computer tomography or echocardiography are most useful tools in such emergency decision making.
- 6.** Remaining patients are suspected to have “Non-high-risk PE”. In this case diagnostic evaluation should be stratified according to the level of clinical probability of PE. It can be assessed with validated scores (Wells or Geneva) or by clinical judgement.
- 7.** Negative D-dimer result obtained with a high sensitive test can help to select patients with low to intermediate clinical probability of PE in whom anticoagulation may be safely withhold without further diagnostic evaluation.
- 8.** In all other patients more extensive diagnostic algorithms should be followed, based on multidetector computed tomography (CT) evaluation. In specific clinical conditions and in cases with discordant results of clinical evaluation and computed tomography angiography alternative validated diagnostic tests/strategies should be used for therapeutic decision-making.
- 9.** Unfractionated i.v. heparin should be used in patients with “High-risk PE”, severe renal dysfunction or at high bleeding risk. In all other cases s.c. low molecular weight heparin (LMWH) or fondaparinux are recommended as initial treatment, and should be followed by long term oral anticoagulation.

# Take home messages

**10.** Thrombolysis or (if contraindicated or failed) embolectomy is recommended in “High-risk PE”.

**11.** “Non-high-risk PE” may be further risk-stratified. The presence of objective signs of right ventricular dysfunction and/or myocardial injury identify “Intermediate-risk PE” in which thrombolysis is not routinely recommended but may be considered in selected patients.

**12.** “Low-risk PE” can be diagnosed if no signs of right ventricular dysfunction or myocardial injury can be detected. If free from pre-existing co-morbidities, such patients may be considered for early discharge and ambulatory treatment.

**13.** Percutaneous interventions, such as thrombus fragmentation/aspiration and venous filter implantations may be considered in selected clinical situations.

**14.** The duration of the long term oral anticoagulant therapy should be decided based on the presence and reversibility of factors predisposing to recurrent venous thromboembolic disease.

# Major gaps in evidence

## Diagnosis

- Whether negative multidetector computed tomography (MDCT) angiography alone permits to withhold anticoagulation treatment despite high clinical probability of pulmonary embolism remains unclear.
- Diagnostic significance of sub-segmental pulmonary clots documented at MDCT angiography is unclear.
- The respective value of three-level versus two-level stratification of clinical probability of PE remains unclear.

## Prognostic assessment

- The optimal cut-off values of echocardiographic, CT and biomarker-derived criteria of right ventricular overload remain to be defined.
- The optimal cut-off levels of troponin and new biomarkers of myocardial injury remain to be defined.
- The prognostic significance of concomitant presence of signs of right ventricular dysfunction and myocardial injury needs to be defined.

## Pharmacological therapy

- Whether (and how identified) a subgroup of patients with “Intermediate-risk PE” would benefit more from thrombolytic treatment than heparin-alone therapy is unclear.
- The safety and efficacy of new generations of oral anticoagulants in initial and long term treatment of PE needs to be defined.

## Intervention

- The safety and efficacy of retrievable venous filters needs further assessment.  
The safety and efficacy of percutaneous interventions (fragmentation/aspiration) in acute PE needs further assessment.



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