

Pulmonary Embolism Response Team Protocol at the University Hospital Zurich: Implications for Reperfusion, Acute Management, and Follow-up

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Abstract

Pulmonary Embolism Response Teams (PERTs) facilitate timely risk stratification and multidisciplinary decision-making in acute pulmonary embolism (PE). We describe the organization, activation pathways, and clinical decision-making framework of the PERT at University Hospital Zurich (USZ).

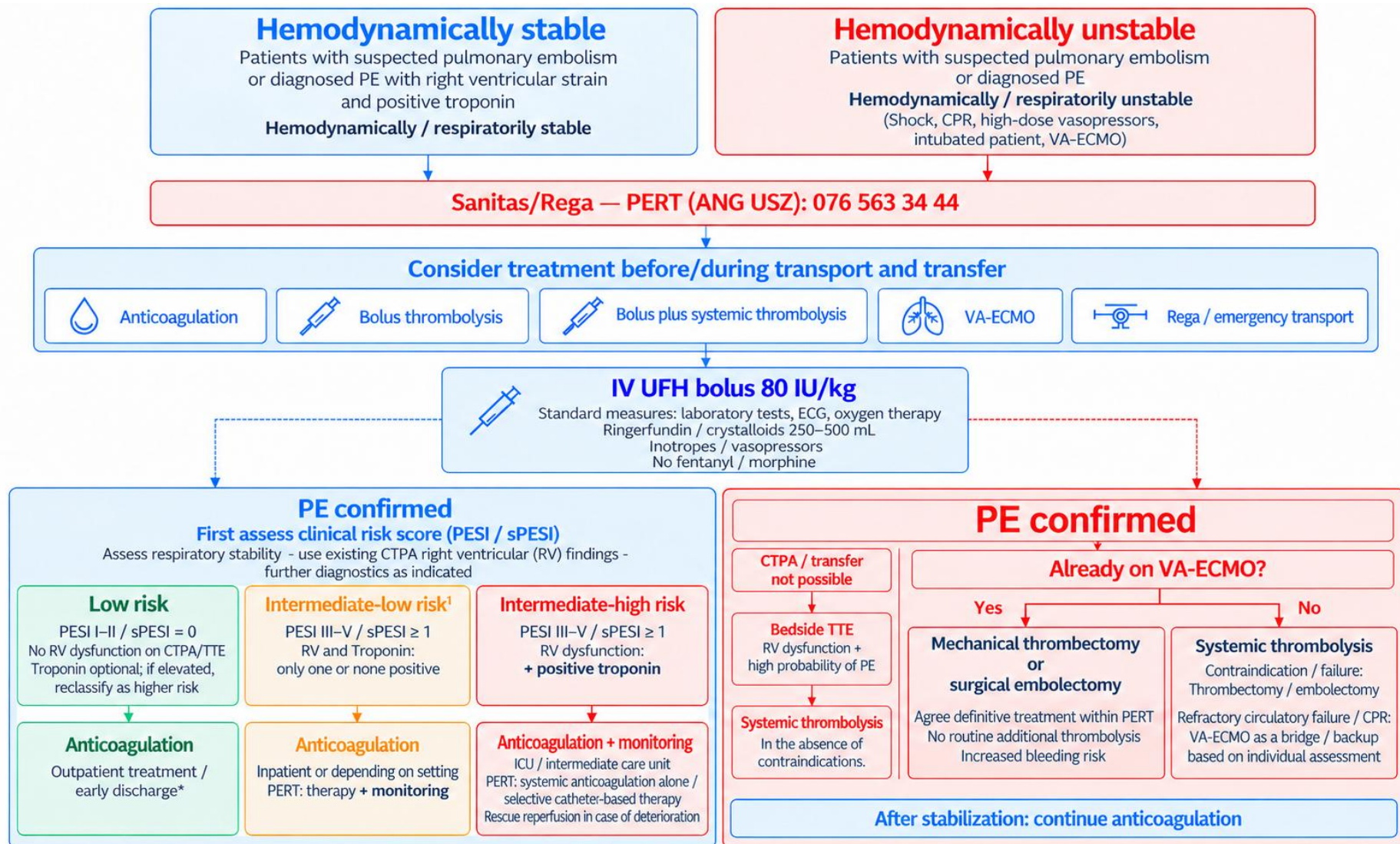
Coordinated by the Department of Angiology, the USZ PERT protocol (version 3.0, September 2024) was developed based on international guidelines and adapted to local expertise and resources. Structured flowcharts guide management throughout the PE care pathway, encompassing diagnostic assessment, risk-adapted treatment, management during pregnancy, evaluation of suspected chronic thromboembolic pulmonary hypertension (CTEPH), and standardized follow-up.

A single regional PERT telephone number, available 24/7 through the Department of Angiology, provides centralized access for both internal consultations and referrals from more than 10 external hospitals for a total of more than 200 consultations (and more than 100 patients transferred) per year. Patients with stable hemodynamic and respiratory status follow the standard, small activation pathway. Patients with shock, ongoing or recent cardiopulmonary resuscitation, high-dose vasopressor requirements, intubation, or venoarterial extracorporeal membrane oxygenation (VA-ECMO) support trigger extended shock-room activation with immediate, large multidisciplinary involvement. For patients referred from external hospitals, the initial management strategy is agreed upon before transfer, including stabilization measures, the intended reperfusion approach, potential VA-ECMO support, transfer urgency, and transport requirements. This coordination enables preparation of the receiving team and the necessary resources before patient arrival (Figure 1).

Treatment selection balances the anticipated benefits and risks of anticoagulation and reperfusion therapies. For high-risk PE, reperfusion options include catheter-based mechanical thrombectomy, surgical embolectomy, and systemic thrombolysis. The choice depends on the patient's hemodynamic status, treatment contraindications, and whether VA-ECMO is already in place or available as backup. For intermediate-high-risk PE, the institutional treatment strategy includes ultrasound-assisted catheter-directed thrombolysis (EKOS) in patients without contraindications to thrombolysis. A research team assists PERT for screening and recruitment of acute PE patients on a 24/7 basis.

The USZ PERT protocol provides a structured framework for multidisciplinary PE management, combining a single regional access point, coordinated treatment planning before transfer, individualized therapeutic decisions, and systematic follow-up.

Figure 1



Legend: ANG, Angiology; CPR, cardiopulmonary resuscitation; CTPA, computed tomography pulmonary angiography; ECG, electrocardiogram; ECMO, extracorporeal membrane oxygenation; ICU, intensive care unit; IU, international units; IV, intravenous; PE, pulmonary embolism; PERT, Pulmonary Embolism Response Team; PESI, Pulmonary Embolism Severity Index; RV, right ventricular; sPESI, simplified Pulmonary Embolism Severity Index; TTE, transthoracic echocardiography; UFH, unfractionated heparin; USZ, University Hospital Zurich; VA-ECMO, venoarterial extracorporeal membrane oxygenation.