

## **The Transition from Acute Pulmonary Embolism to Chronic Thromboembolic Pulmonary Hypertension: Pathophysiology, Clinical Course, and Implications for Patient Management and Follow-up**

### **Professor Dr Stavros Constantinides**

*Professor for Clinical Trials and Medical Director of the multidisciplinary Center for Thrombosis and Haemostasis (CTH) at the University of Mainz, Germany.*

Acute pulmonary embolism (PE) is a frequent cause of death and serious disability. The risk of PE-associated mortality and morbidity extends far beyond the acute phase of the disease. In earlier follow-up studies, as many as 30% of the patients died during a follow-up period of up to 3 years, and up to 50% of patients continued to complain of dyspnea and/or poor physical performance 6 months to 3 years after the index event. The most feared 'late sequela' of PE is chronic thromboembolic pulmonary hypertension (CTEPH), the true incidence of which remains obscure due to the large margin of error in the rates reported by mostly small, single-center studies. Moreover, the functional and hemodynamic changes corresponding to early, possibly reversible stages of CTEPH, have not been systematically investigated. Thus prospective clinical studies are urgently needed in this field. FOCUS, an ongoing prospective multicenter cohort study on the follow-up after acute pulmonary embolism, is prospectively enrolling and systematically following, over a 2-year period and with a standardized comprehensive program of clinical, echocardiographic, functional and laboratory testing, a large multicenter prospective cohort of 1,000 unselected patients (all-comers) with acute symptomatic PE. FOCUS will possess adequate power to provide answers to relevant remaining questions regarding the patients' long-term morbidity and mortality, and the temporal pattern of post-PE abnormalities. These data will hopefully provide evidence for future guideline recommendations regarding the selection of patients for long-term follow-up after PE, the modalities which this follow-up should include, and the findings that should be interpreted as indicating progressive functional and hemodynamic post-PE impairment, or the development of CTEPH.