

Arrhythmias

- ▶ Cardiac arrhythmias are common in COPD and *vice versa*.⁽¹⁴⁵⁰⁾ Atrial fibrillation is frequent and associated with a lower FEV1.⁽¹⁴⁵¹⁾ The risk of hospitalization for atrial fibrillation in the first 30 days after an exacerbation of COPD is increased when the exacerbation is severe (hospitalized).⁽¹⁴⁵²⁾
- ▶ In COPD patients presenting with severe worsening dyspnea, associated atrial fibrillation is frequently documented, and it may be either a trigger or a consequence of an acute exacerbation episode.⁽¹⁴⁵³⁾
- ▶ The presence of atrial fibrillation does not alter the treatment of COPD. Bronchodilators have been previously described as potentially pro-arrhythmic agents;^(1454,1455) however, available evidence suggests an overall acceptable safety profile for long-acting beta₂-agonists,⁽¹⁴⁵⁶⁾ anticholinergic drugs (and ICS).^(889,932,968,1457-1461) Nevertheless, caution is advised when using short-acting beta₂-agonists^(1456,1462) and theophylline, which may precipitate atrial fibrillation and make control of the ventricular response rate difficult.⁽¹⁴⁶³⁻¹⁴⁶⁵⁾

Pulmonary hypertension

- ▶ Pulmonary hypertension (PH) is defined by an elevated mean pulmonary arterial pressure (mPAP) >20 mmHg, as assessed by right heart catheterization.^(1466,1467) PH is classified in five distinct groups, based on their different pathophysiological mechanisms, clinical presentation and therapeutic management: pulmonary arterial hypertension (PAH, group 1), PH associated with left heart disease (group 2), PH associated with lung diseases and/or hypoxia (group 3), chronic thromboembolic PH (CTEPH, group 4) and PH associated with unclear and/or multifactorial mechanisms (group 5). All groups of PH can be diagnosed in patients with COPD.⁽³²²⁾ Indeed, COPD is a common disease occurring in patients with multiple comorbidities and exposures, which may contribute to pulmonary vascular disease.
- ▶ Therefore, a diagnosis of PH in a COPD patient requires a careful analysis of the possible mechanisms leading to elevated mPAP. This is critical in order to identify treatable traits of PH-COPD. For example, CTEPH, a treatable cause of PH occurring more frequently in patients above the age of 40 years, can be detected in patients with COPD.⁽¹⁴⁶⁸⁾
- ▶ Mild PH is frequent in patients with COPD, based on epidemiological estimations 25-30% of all COPD patients present with elevated mPAP.^(1466,1467,1469) Most of these patients are classified as “group 3 PH” or “group 2 PH”, if significant left heart disease is present. The presence of PH in COPD is clinically relevant, as it is associated with increased health-care resource utilization, more hospitalizations and a poor prognosis.⁽³²⁴⁾
- ▶ A subgroup of PH-COPD patients has severe PH, which is of special clinical importance because PH may represent a major limiting factor in these patients. The 2022 ESC/ERS PH guidelines define severe PH-COPD by an increased PVR > 5 WU.^(1466,1467,1470) Severe PH-COPD is rare, affecting around 5 % of COPD patients.^(1466,1467,1471) The severity of PH is an independent predictor of prognosis⁽³²⁴⁾ and patients with severe PH-COPD frequently present with mild-to-moderate airflow limitation, no or very mild hypercapnia, a low DLco <45% predicted and a circulatory exercise limitation. For this phenotype of COPD patients the term “pulmonary vascular phenotype” has been suggested.⁽³²²⁾
- ▶ Echocardiography is the best non-invasive tool to estimate the probability and severity of PH.^(324,1466,1467) In addition, elevated NT-proBNP and increased ratio of the diameter of the pulmonary artery and the aorta (PA:Ao ratio) on HR-CT are associated with the presence of PH-COPD. Of note, the diameter of the pulmonary artery has also been associated with the risk of COPD exacerbations.⁽³²⁵⁾
- ▶ Patients with PH-COPD should be referred to a PH center with experience in respiratory diseases where they will undergo right heart catheterization and multidisciplinary assessment to guide treatment decision (**Figure 5.1**). Long-term oxygen therapy is recommended in hypoxemic patients.