# Pulmonary Hypertension

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**Pulmonary hypertension (PH):** an umbrella term for many different diseases, leading to increased pressure in the pulmonary arteries. Results in a progressive increase in pulmonary vascular resistance (PVR) and right ventricular failure.

**Causes:** left-side heart failure (most common), COPD, valvular heart disease, idiopathic, thyroid disorders, sickle cell disease

**Pathophysiology:**

- Vasoconstriction of the pulmonary artery due to proliferation of smooth muscle cells and endothelial cells
- Loss of potent pulmonary vasodilator substances
- Increased pulmonary procoagulant substances
- Pulmonary vascular narrowing → increased PVR → ventricular overload → right ventricular failure

## Presentation

- Dyspnoea
- Chest pain
- R side abdominal pain
- Exercise-induced nausea and vomiting
- Peripheral oedema
- Palpitations
- Fatigue

## Diagnosis

- Observation - distended jugular vein
- Doppler echocardiography
- CT scan and CXR - enlargement of the pulmonary trunk
- Pulmonary function test: Mild restrictive lung defect
- Auscultation - High-pitched, holosystolic, best heard at the left sternal border - suggests tricuspid regurgitation
- Swan Ganz catheterization - mean PAP of at least 25 mmHg

## Management

Physiotherapy:

- Community-based pulmonary rehabilitation: the patient should be optimised on targeted drug therapy.

Exercises may involve chair and/or bed-based exercises depending on patient's exercise tolerance

- Activity modification: Limit frequent or excessive pushing or lifting and provide advice regarding pacing during ADLs
- Teach pursed-lip breathing: reduces work of breathing and improves tissue oxygenation
- Supervised, sub-maximal cycling or walking regimes with biofeedback
- Provide patient education on the benefits of exercise and dyspnoea management
- Diaphragmatic breathing control exercise
- Teach relaxation techniques

Medical: Long term oxygen therapy including ambulatory oxygen, diuretics to reduce cardiac workload, digoxin to improve cardiac output, oral anticoagulants to reduce risk of thrombosis formation and calcium channel blockers to reduce PVR

**Complications:** severe dysponea during exercise, worsening right heart failure, pneumonia and sudden cardiac death

**Want to learn more?**

With AcePhysio the learning journey doesn't stop here! Take a look at our further reading recommendations below to become an expert in pulmonary hypertension:


1. Keen C, Hashmi-Greenwood M, York J, Armstrong IJ, Sage K, Kiely D. Exploring a physiotherapy well-being review to deliver community-based rehabilitation in patients with pulmonary hypertension. Pulmonary Circulation. October 2019.
2. European Society of Cardiology/European Respiratory Society. 2015 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension. Published in 2015
3. Keen C, Fowler-Davis S, McLean S, Manson J. Physiotherapy practice in pulmonary hypertension: physiotherapist and patient perspectives. Pulm Circ. 2018;8(3)