

Congestive Heart Failure



Congestive Heart Failure (CHF): a complex clinical syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the ventricle to fill with or eject blood. Failure of both the left and right ventricles is known as biventricular (congestive) heart failure.

Causes:

- Coronary heart disease (most common)
- Hypertension
- Cardiomyopathies (hypertrophic/dilated)
- Acquired or congenital valvular diseases
- Aortic stenosis

Pathophysiology:

- Damaged myocardial tissue → Reduced efficiency of ventricular contraction → Reduced stroke volume (SV) → Reduced cardiac output (CO) → Neuro-hormonal activation
- Reduced CO → Reduced blood pressure which is detected by baroreceptors
Increased sympathetic drive - increased heart rate (HR) + peripheral resistance
Increased afterload (stress on the ventricular wall during systole) and therefore increased cardiac work
- Simultaneously, reduced blood pressure → Activation of renin-angiotensin-aldosterone pathway → Increases circulating blood volume and thus blood pressure due to Na⁺ and water retention → Increased afterload and preload (stretch of ventricular myocardium before systole) and therefore increased cardiac work

Presentation

- Pulmonary oedema
- Dyspnoea + orthopnoea
- Exercise intolerance
- Paroxysmal nocturnal dyspnoea (PND)
- Basilar crackles upon auscultation
- Jugular venous distension
- Peripheral oedema
- Hepatomegaly

Management

Rehabilitation:

- **Respiratory muscle training** in patients with impaired respiratory function - induces diaphragm hypertrophy + reduction in perceived breathlessness and exertion
- Education on **smoking cessation** - smoking increases sympathetic activity, causing increased cardiac load
- **Cardiac rehabilitation** - involves a circuit of aerobic and resistance training stations. Also includes pre- and post-exercise vital signs monitoring, a warm-up & cool-down. Normally completed bi-weekly and exercise is combined with education on physical activity, food intake, self-efficacy, and health literacy
- Teach **Active Cycle of Breathing Technique** - breathing control may alleviate episodes of dyspnoea - thoracic expansion exercises enhances the recruitment of alveoli

Medical: Angiotensin Converting Enzyme inhibitor or angiotensin II receptor blocker, beta blocker, mineralocorticoid receptor antagonist, implanted defibrillator, biventricular pacemaker, heart transplant.



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 Congestive Heart Failure:

1. Zwisler AD, Soja AM, Rasmussen S, et al. Hospital-based comprehensive cardiac rehabilitation versus usual care among patients with congestive heart failure, ischemic heart disease, or high risk of ischemic heart disease: 12-month results of a randomized clinical trial. *Am Heart J.* 2008 Jun;155(6):1106-13.
2. Papatheanasiou JV, Petrov I, Tokmakova MP, et al. Group-based cardiac rehabilitation interventions. A challenge for physical and rehabilitation medicine physicians: a randomized controlled trial. *Eur J Phys Rehabil Med.* 2020 Aug;56(4):479-488.