Heart Failure: Signs and Treatment Guidelines

Heart failure (HF) is a clinical syndrome where the heart is unable to pump sufficient blood to meet the metabolic needs of body tissues despite adequate venous return. It results in impaired perfusion and/or systemic or pulmonary congestion.

Causes of Heart Failure

Heart failure may arise from structural, functional, or systemic abnormalities that compromise cardiac performance.

Common causes include:

- Hypertension (chronic pressure overload)
- Ischemic heart disease (e.g., myocardial infarction)
- Valvular heart diseases (e.g., aortic stenosis, mitral regurgitation)
- Dilated or restrictive cardiomyopathies
- Arrhythmias (e.g., atrial fibrillation)
- Congenital heart defects
- High-output states (e.g., anemia, thyrotoxicosis, AV fistula)
- Pulmonary thromboembolism (leading to RV failure)

Clinical Features of Heart Failure

General signs and symptoms:

- Tachycardia
- Gallop rhythm (S3 or S4)
- Raised Jugular Venous Pressure (JVP)
- Dependent (pitting) edema
- Tender hepatomegaly
- Orthopnea and paroxysmal nocturnal dyspnea
- Fatigue, weakness
- Exercise intolerance
- Basal lung crackles (crepitations)
- Cyanosis (in severe cases)

Precipitating Factors for Decompensation

Heart failure may worsen due to acute triggers. Identifying and correcting them is essential.

Precipitants include:

- Poor adherence to medications or diet
- Increased metabolic demand (e.g., anemia, pregnancy, fever)
- Myocardial ischemia or infarction

- Uncontrolled hypertension
- Tachyarrhythmias or bradyarrhythmias
- Pulmonary embolism
- Infection (e.g., pneumonia, infective endocarditis)
- Excessive fluid or salt intake
- Use of negative inotropic drugs (e.g., non-dihydropyridine calcium channel blockers)

Diagnostic Investigations

Initial work-up includes:

- **Chest X-ray:** Cardiomegaly, pulmonary venous congestion, interstitial edema
- **ECG:** Assess rhythm, ischemia, LV hypertrophy
- **Echocardiography:** Most important for assessing EF, chamber size, wall motion, and valves
- **Full blood count:** Rule out anemia, infection
- **Urea and electrolytes:** Assess renal function, sodium, potassium
- **BNP or NT-proBNP:** Elevated in HF, helps confirm diagnosis
- **Thyroid function tests:** Especially in new-onset or refractory HF

General Management of Heart Failure

- **Rest:** Limit physical activity during acute decompensation; semi-Fowler's position for dyspnea
- **Oxygen therapy:** For hypoxic patients
- **Daily weight monitoring**
- **Fluid and sodium restriction:** <2 L/day fluids, <2 g/day sodium
- **Monitor urine output:** Especially in hospitalized or oliguric patients

Pharmacological Management

1. Diuretics (for symptomatic fluid overload):

- **Furosemide (Frusemide):** 20–160 mg PO/IV daily; titrate based on response
- Monitor electrolytes and volume status

2. Digoxin:

- **Maintenance:** 0.125–0.25 mg PO daily (used in HFrEF with atrial fibrillation)
- **Loading (optional):** 0.25–0.5 mg PO Q6h up to 1–1.5 mg total over 24 hours

3. Potassium supplements:

- Use with loop diuretics unless contraindicated
- Dietary sources: bananas, oranges, spinach

4. Anticoagulation:

- **Heparin 2,500–5,000 IU SC BD** for immobile patients or those at thromboembolic risk

5. ACE Inhibitors (for HFrEF):

- **Captopril:** Start 6.25 mg TDS, titrate to 25–50 mg TDS
- **Enalapril:** Start 2.5 mg BD, titrate to 10–20 mg BD
- Reduce afterload and improve survival

6. Beta-blockers (e.g., bisoprolol, carvedilol):

- Initiate when stable, start low and titrate
- Avoid in acute decompensated HF

7. Treat underlying cause:

- Control hypertension
- Revascularization in ischemic heart disease
- Manage arrhythmias
- Treat infections or anemia

Note: SGLT2 inhibitors and ARNI (e.g., sacubitril/valsartan) are now part of guideline-directed therapy in HFrEF but may not be widely available in all settings.