HEART FAILURE

The heart cannot pump blood forward effectively, leading to backward congestion and decreased tissue perfusion.

RISK FACTORS:

- Coronary artery disease
- Previous myocardial infarction
- Hypertension
- Cardiomyopathy
- COPD
- Smoking
- Excessive alcohol intake
- High-sodium, high-fat diet
- Physical inactivity
- Poor adherence to medication

DIAGNOSTIC PROCEDURES:

Echocardiogram

Shows:

- Ejection fraction
- Ventricular size
- Wall motion
- Valve function
- Overall cardiac function

Ejection Fraction (EF)

EF = percentage of blood ejected from the ventricle with each contraction.

- Normal: approximately 50–70%

> Remember: Echocardiography is a key test for evaluating HF and EF.

B-type natriuretic peptide (BNP)

Released when the ventricles are stretched.

↑ B-type natriuretic peptide (BNP)

- Supports diagnosis of HF
- Indicates increased ventricular pressure/volume

Normal <100 pg/mL; higher supports HF.

> Remember: BNP (B-type natriuretic peptide) can also increase with renal dysfunction, older age, and other conditions.

Chest X-ray

May show:

- Cardiomegaly
- Pulmonary vascular congestion
- Pulmonary edema
- Pleural effusion

ECG

Assesses:

- Dysrhythmias
- Ischemia
- Previous MI
- Conduction abnormalities
- Ventricular hypertrophy

Cardiac Biomarkers

Troponin

- Helps identify myocardial injury
- Important when acute coronary syndrome is suspected as a cause of HF exacerbation

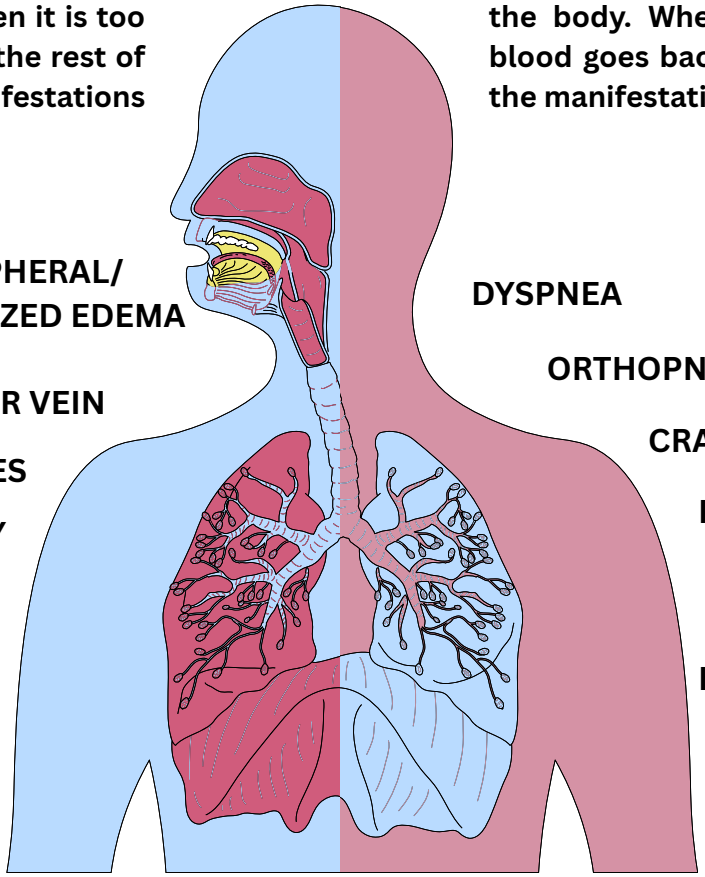
REMEMBER: In Heart Failure, the heart is TOO WEAK to effectively pump blood out of the heart. Hence, the blood GOES BACK TO WHERE IT CAME FROM.

RIGHT-SIDED VS. LEFT-SIDED HEART FAILURE

RIGHT for REST of the body; LEFT for LUNGS

The right side of the heart receives blood from the entire body and pumps it to the lungs. When it is too weak, blood goes back to the rest of the body. Hence, the manifestations are systemic (peripheral).

The left side of the heart receives blood from the lungs and pumps it to the body. When it is too weak, the blood goes back to the lungs. Hence, the manifestations are pulmonary.



PERIPHERAL/ GENERALIZED EDEMA

DISTENDED JUGULAR VEIN

ASCITES

HEPATOMEGALY

WEIGHT GAIN (>1kg or 2.2 lbs/ day)

BOUNDING PULSES

DYSPNEA

ORTHOPNEA

CRACKLES

PULMONARY EDEMA

PULMONARY HYPERTENSION

Remember: Left-sided heart failure is one of the leading causes of right-sided heart failure

How the Body Responds

- **Fast Heartbeat (SNS):** The body speeds up the heart to push more blood, which strains the heart over time.
- **Fluid Retention (RAAS & ADH):** Kidneys hold onto water and salt to boost blood volume, creating extra work for the heart.
- **Heart Reshaping (Remodeling):** Over time, extra strain causes the heart walls to stretch or thicken, making it even harder to pump.
- **Natural Relief (BNP):** Stretched heart muscles release BNP, a hormone that promotes diuresis and vasodilation to lower pressure.

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NURSING INTERVENTIONS

Assess Cardiopulmonary Status

Monitor: Vital signs, SpO2, Lung sounds, Heart sounds, JVD, Peripheral edema, Level of consciousness, Skin temperature/color

Remember: Watch for acute deterioration in oxygenation and perfusion.

Monitor Fluid Status

Daily Weight: Same scale, Same time, Similar clothing, Preferably after voiding and before breakfast

> Remember: Report significant rapid weight gain according to the client's prescribed plan. 1 kg (2.2 lbs) weight gain= 1 L fluid retention.

Positioning: Dyspneic HF client= sit upright.

Oxygen Therapy: Administer oxygen as prescribed for hypoxemia.

Sodium Management

Teach:

Reduce sodium intake (<2 g/day)

Avoid highly processed foods

Use caution with cough drugs, antacids, laxatives that contain sodium.

> Remember: Sodium causes water retention, worsening congestion.

Fluid Management: Fluid restriction (1.5-2L/day) for clients with significant congestion or hyponatremia.

Monitor Electrolytes: K^+, Na^+, Mg^{2+}

> Remember: Pay particular attention to potassium in clients receiving diuretics or RAAS-modifying medications.

Activity

During acute decompensation: Rest and Limit strenuous activity

When stable: Gradual activity, Avoid sudden excessive exertion

Medication Adherence

Teach: Take medications exactly as prescribed. Do not abruptly stop.

Smoking / Alcohol: Stop smoking. Avoid or limit alcohol according to provider recommendations

Symptoms to Report

Contact the healthcare provider for:

- Increasing dyspnea, fatigue, edema
- New/worsening orthopnea
- Rapid weight gain >3lb in 2 days/ 5lb in a week
- Pink, frothy sputum

PHARMACOLOGICAL MANAGEMENT

ACE INHIBITORS

- Captopril, Enalapril, Lisinopril

Effects:

- ↓ Afterload
- ↓ Cardiac workload
- ↓ Remodeling

Monitor for:

- Hypotension
- Hyperkalemia
- Dry cough
- Angioedema

Remember: ACE inhibitors + pregnancy = contraindicated.

ARBs

- Losartan, Valsartan, Candesartan

Used when an ACE inhibitor is not tolerated in appropriate clients.

Same effects and monitoring as ACE, but less likely to cause dry cough. Also contraindicated in pregnancy.

BETA-BLOCKERS

- Carvedilol, Metoprolol succinate, Bisoprolol
- Effects: ↓ HR (monitor BP and HR)

DIURETICS

- Loop Diuretics: Furosemide, Bumetanide, Torsemide. Relieve fluid overload and congestion.

- Monitor for: Hypokalemia, Hyponatremia, Hypotension, Dehydration, Renal dysfunction,Ototoxicity with excessive/rapid IV dosing

DIGOXIN

- Effects

• Positive inotropic effect (stronger contraction)
• Slows AV conduction (lowers heart rate)

Toxicity Signs (GI + VISUAL DISTURBANCES)

- NAUSEA
- ANOREXIA
- VOMITING
- DIARRHEA
- YELLOW/GREEN VISION
- DYSRHYTHMIAS/BRADYCARDIA

Remember: Hypokalemia increases the risk of digoxin toxicity.

HOLD DIGOXIN AND NOTIFY PROVIDER IF:
APICAL PULSE < 60 BPM
HYPOKALEMIA
DECREASED RENAL FUNCTION. Count the apical pulse for a full minute; therapeutic range 0.5–2.0 ng/mL

MEDICAL AND SURGICAL MANAGEMENT

- ICD (Implantable Cardioverter-Defibrillator)

Detects and treats life-threatening ventricular arrhythmias.
Helps prevent sudden cardiac death.

- CRT (Cardiac Resynchronization Therapy)

Coordinates ventricular contractions.
Improves pumping efficiency in selected clients.

- VAD/LVAD

Mechanical device that assists ventricular pumping.
May be used as a bridge to heart transplant or as long-term therapy.

- Heart Transplantation

Considered for selected clients with end-stage HF despite optimal treatment.

- Coronary Revascularization

PCI or CABG may be performed when significant coronary artery disease contributes to HF.

- Valve Repair/Replacement

Used when severe valvular disease is contributing to heart failure.

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