NCLEX Study Pack — Heart Failure

Priority nursing actions & key medications • Next-Gen style questions with full rationales
Every fact cited to the student's source: OpenStax Medical-Surgical Nursing, §12.3 (book pp. 429–435)

Topic: Heart Failure — priority nursing actions & key medications

Built from one source document: *Medical-Surgical Nursing* (OpenStax, Rice University, 2024), Chapter 12, Section 12.3 "Heart Failure," book pp. 429–435.

How to read the citations: every rationale ends with a source citation in the format **[Source: PDF p. NNN (book p. MMM)]** — the PDF page first, then the printed textbook page. Every fact in this pack was checked against that page of the source. Nothing was added from general knowledge.

Scope note: this pack covers only what the source section covers. Where the source is silent (e.g., it gives no digoxin therapeutic range), the pack says so instead of inventing content — see the digoxin footnote.

Part 1 — High-Yield Summary

What HF is. Congestive heart failure (CHF) is a chronic condition that reduces perfusion to the body because the heart is working inefficiently. As HF progresses, valves become incompetent and create backflow of blood into the pulmonary and hepatic systems. [Source: PDF p. 447 (book p. 429)]

Left-sided HF. The left ventricle muscle is damaged and weak and can no longer pump enough blood through the body. It divides into:

- **Systolic failure** — the diseased ventricle is unable to eject blood forward, creating backward flow.
- **Diastolic failure** — the ventricle is stiff and thick and cannot fully relax, so inadequate filling occurs.

[Source: PDF p. 447 (book p. 429)]

Right-sided HF. Blood congests the right side of the heart and backs up into the body's venous/hepatic systems. Source-supported right-sided findings: hepatic congestion with elevated liver function tests, ascites, and hepatosplenomegaly (liver and spleen enlargement). [Source: PDF p. 450 (book p. 432); PDF p. 451 (book p. 433)]

Classic manifestations. Lower-extremity edema (graded 0 to 4+ pitting), weight gain, cough and sputum production; weight gain of **three pounds in a day or five pounds in a week** is suggestive of HF. Pulmonary signs include dyspnea, orthopnea (needing more than two pillows or sleeping upright in a recliner), frothy pink sputum, crackles in the lung bases, and oxygen saturation less than 92 percent as fluid backs up into the pulmonary system. Reduced cardiac output also causes fatigue, dizziness, palpitations, and syncope from tachycardic dysrhythmias. [Source: PDF p. 448 (book p. 430); PDF p. 449 (book p. 431)]

Diagnostics.

- **Echocardiogram is the gold standard** for detecting HF (valve competency, filling pressures, ventricular thickness and compliance). [Source: PDF p. 449 (book p. 431)]
- **Ejection fraction:** healthy left ventricle = **55 to 60 percent**; greater than 70 percent is hyperdynamic and correlates with diastolic dysfunction; **less than 40 percent** carries a higher risk of serious dysrhythmias. [Source: PDF p. 449 (book p. 431)]
- **BNP:** the sensitive and specific blood test for an acute HF exacerbation; it rises with increased myocardial stretch. **Normal is less than 100 pg/mL.** [Source: PDF p. 450 (book p. 432)]
- **Chest X-ray** in an acute exacerbation identifies pulmonary edema or cardiomegaly. Supporting labs: electrolyte panel (baseline potassium, creatinine), hemoglobin A1C, liver enzymes, TSH. [Source: PDF p. 449 (book p. 431); PDF p. 450 (book p. 432)]

Key medications (with the monitoring the source assigns to the nurse).

- **Diuretics** — preload reducers; furosemide works on the loop of Henle and increases fluid excretion. Monitor strict intake and output, **serial potassium**, BUN/creatinine, and daily weights. Give **IV push furosemide slowly to avoid ototoxicity**. [Source: PDF p. 452 (book p. 434)]
- **Beta-blockers** — reduce myocardial oxygen demand, vasodilate, and reduce heart rate. Metoprolol is cardio-selective (beta-1); carvedilol is nonselective (beta-1 and beta-2) and must be used cautiously in asthma/bronchoconstrictive disease because it may trigger bronchospasm. [Source: PDF p. 452 (book p. 434)]
- **ACE inhibitors / ARBs** — Class 1 recommendation for patients with reduced ejection fraction (e.g., lisinopril; valsartan). Monitor for **hyperkalemia** and blood pressure response; a **new-onset cough** is a common ACE-inhibitor complaint, and common practice is to switch to an ARB. [Source: PDF p. 453 (book p. 435)]
- **Nitrates** — preload reduction and potent coronary vasodilation (patch, oral, sublingual, spray). Monitor blood pressure for orthostatic hypotension; caregivers applying patches should wear gloves to avoid passive absorption. [Source: PDF p. 453 (book p. 435)]

Nursing priorities.

1. **Oxygenation is the top priority.** Place the dyspneic patient in high Fowler's and give ordered supplemental oxygen to maintain saturations greater than 92 percent. [Source: PDF p. 451 (book p. 433)]
2. Monitor the response to diuretic therapy with **daily weights and strict intake and output**; severe HF may require fluid restriction. [Source: PDF p. 451 (book p. 433)]
3. Monitor the patient's response to every medication, including side effects, and use clinical judgment to question holding a medication — **for example, if a pulse is less than 60 bpm**. [Source: PDF p. 450 (book p. 432)]
4. Discharge education: sodium intake **less than two grams a day** (water follows sodium into the vascular space), smoking cessation (nicotine is a vasoconstrictor), reduced alcohol, and immunization against pneumococcal pneumonia, COVID-19, and influenza, because infection can strain a failing heart. [Source: PDF p. 451 (book p. 433)]
5. Evaluate against measurable outcomes: oxygen saturation ≥ 92%, edema reduced to 2+ or less, stable weight, and a medication regimen that reconciles with the provider's orders. [Source: PDF p. 452 (book p. 434)]

Footnote — digoxin range (general note, NOT from the source text, no page citation): *Classic textbooks list the digoxin therapeutic range as 0.5–2.0 ng/mL, while newer heart-failure guidance often cites a lower target of 0.5–0.9 ng/mL. The OpenStax source used for this pack does **not** state a digoxin range or discuss digoxin toxicity: it mentions digoxin only as a first-line rate-control therapy for dysrhythmias [Source: PDF p. 444 (book p. 426)] and as a medication that can cause sinus bradycardia [Source: PDF p. 439 (book p. 421)]. The range figures above are therefore presented as an uncited general note.*

Part 2 — Flashcards

#	Front	Back
1	What is the gold standard diagnostic test for detecting heart failure?	Echocardiogram — ultrasound visualization of valve competency, filling pressures, ventricular thickness, and compliance
2	What is a healthy left ventricular ejection fraction?	55 to 60 percent
3	A patient with an ejection fraction below 40% is at higher risk for what?	Serious dysrhythmias
4	What is the normal BNP level, and why does BNP rise in HF?	Normal is less than 100 pg/mL; BNP rises because increased myocardial stretch raises pressure gradients in the atria and ventricles
5	How much weight gain is suggestive of heart failure fluid retention?	Three pounds in a day, or five pounds in a week
6	How is pitting edema graded?	From 0 (no edema) to 4+ (pitting edema), by the depth of residual finger marks after palpation
7	What is the nurse's top priority for a patient with HF, and what SpO2 target applies?	Oxygenation — place the patient in high Fowler's and maintain oxygen saturation greater than 92 percent
8	What daily sodium limit is taught to patients with HF, and why?	Less than two grams a day — water molecules follow sodium into the vascular space and can leak into interstitial tissue, creating edema
9	Where does furosemide act, and what does it do?	The loop of Henle; it is a preload reducer that increases fluid excretion via the renal system
10	Why must IV push furosemide be administered slowly?	To avoid ototoxicity; also monitor serial potassium, BUN/creatinine, strict I&O, and daily weights
11	Metoprolol vs. carvedilol — what is the difference that matters for a patient with asthma?	Metoprolol is cardio-selective (beta-1 only); carvedilol is nonselective (beta-1 and beta-2) and may trigger bronchospasm, so use cautiously in asthma
12	A patient on lisinopril develops a new cough. What else must the nurse monitor, and what is the common practice for the cough?	Monitor for hyperkalemia and blood pressure response; common practice is to switch from the ACE inhibitor to an ARB

All flashcard content is drawn from OpenStax Medical-Surgical Nursing §12.3, book pp. 429–435 (PDF pp. 447–453); see the question rationales in Part 3 for the page-level citation of each fact.

Part 3 — Practice Questions (Next-Gen style, full rationales)

Q1 — Priority / ABCs

A 68-year-old patient with heart failure arrives in the emergency department with severe dyspnea. Assessment: SpO2 89% on room air, crackles in both lung bases, and a cough producing pink, frothy sputum. Which action should the nurse take **first**?

A. Obtain a baseline weight before giving any treatment

B. Place the patient in high Fowler's position and administer supplemental oxygen

C. Encourage oral fluids to help thin the pulmonary secretions

D. Administer the scheduled oral furosemide dose and reassess in 2 hours

Correct answer: B

Rationale — every option analyzed:

- **A is incorrect.** Daily weights are a core monitoring tool in HF, but they are a *monitoring* action, not a rescue action. This patient is hypoxemic now; weighing first delays the priority intervention.
- **B is correct.** The source names oxygenation as the nurse's top priority in HF care: placing the patient in high Fowler's alleviates dyspnea, and supplemental oxygen is given to maintain oxygen saturations greater than 92 percent. Pink frothy sputum, crackles, and SpO2 below 92 percent are the source's listed signs of fluid backing up into the pulmonary system, so airway/breathing comes before all monitoring tasks.
- **C is incorrect.** Added oral fluid works against this patient's problem — excess volume. In severe HF, compliance with fluid *restrictions* may be required; encouraging fluids can worsen pulmonary congestion.
- **D is incorrect as the *first* action.** Diuretics are part of circulatory support in HF, but the source sequences care with oxygenation first. A 2-hour reassessment window also leaves a patient with an SpO2 of 89% untreated in the priority system.

[Source: PDF p. 451 (book p. 433); PDF p. 448 (book p. 430)]

Q2 — SATA (Select All That Apply) — Discharge teaching

The nurse is providing discharge teaching for a patient hospitalized with heart failure. Which statements by the patient indicate correct understanding of the teaching? **Select all that apply.**

1. "I will keep my sodium intake to less than two grams a day."
2. "I will weigh myself every day and keep a record of my weight."
3. "I should stay up to date on my flu, COVID-19, and pneumonia vaccines."
4. "Once my breathing feels normal again, I can stop taking my metoprolol."
5. "Drinking extra water each day will help my kidneys flush out the fluid."
6. "Quitting smoking will take some of the stress off my heart."

Correct answers: 1, 2, 3, 6

Rationale — every option analyzed:

- **1 is correct.** The American Heart Association strongly encourages patients with HF to reduce sodium intake, and the source's teaching target is less than two grams a day, because water follows sodium into the vascular space and leaks into interstitial tissue as edema.
- **2 is correct.** The response to diuretic therapy is monitored by daily weights (with strict intake and output), and stable weight is one of the source's formal evaluation criteria for HF care.
- **3 is correct.** Primary prevention with immunization for pneumococcal pneumonia, COVID-19, and influenza is recommended to minimize HF recurrences, because infection can strain a failing heart.
- **4 is incorrect.** Patients should be educated on *compliance* with beta-blocker therapy and told to contact their provider if there is a reason to stop or hold the medication — stopping on their own when symptoms improve is exactly the behavior the teaching is meant to prevent.
- **5 is incorrect.** This reverses the physiology in the source: HF involves sodium and water retention, and in severe cases fluid restriction — not extra fluid — is required.
- **6 is correct.** Smoking cessation is part of modifiable-risk-factor education because nicotine is a vasoconstrictor and applies undue stress on the heart.

[Source: PDF p. 451 (book p. 433); PDF p. 452 (book p. 434)]

Q3 — Application — Interpreting BNP

A patient is admitted with dyspnea, lower-extremity edema, and weight gain. The serum BNP result is 850 pg/mL. How should the nurse interpret this result?

A. It is within normal limits and rules out heart failure

B. It is elevated and consistent with the increased myocardial stretch seen in heart failure

C. It is diagnostic of an acute myocardial infarction

D. It indicates that hypothyroidism is the cause of the patient's symptoms

Correct answer: B

Rationale — every option analyzed:

- **A is incorrect.** Normal BNP levels should be less than 100 pg/mL. A value of 850 pg/mL is far above normal (levels may rise slightly with age, but not to this degree).
- **B is correct.** BNP is described in the source as a sensitive and specific blood test to identify an acute exacerbation of HF; with increased myocardial stretch in HF, the protein levels rise as pressure gradients rise in the atria and ventricles. The value fits this patient's presentation.
- **C is incorrect.** In the source's workup, myocardial infarction injury is detected on the electrocardiogram tracings; BNP is the heart-failure test, not the MI test.
- **D is incorrect.** Thyroid function in the HF workup is assessed with thyroid-stimulating hormone (TSH), a separate test; hypothyroidism is listed as a possible *trigger* of an HF event, not something a BNP value diagnoses.

[Source: PDF p. 450 (book p. 432); PDF p. 449 (book p. 431)]

Q4 — SATA — Right-sided heart failure

Which assessment findings should the nurse associate with **right-sided** heart failure? **Select all that apply.**

1. Ascites
2. Hepatosplenomegaly (enlarged liver and spleen)
3. Elevated liver enzyme levels
4. Pink, frothy sputum
5. Crackles auscultated in the lung bases

Correct answers: 1, 2, 3

Rationale — every option analyzed:

- **1 is correct.** A gastrointestinal assessment may reveal fluid accumulation in the abdomen, noted as ascites, from right-sided heart failure.
- **2 is correct.** The same assessment passage attributes hepatosplenomegaly — enlargement of the liver and spleen — to right-sided heart failure, reflecting systemic venous congestion.
- **3 is correct.** The source states that with hepatic congestion from right-sided heart failure, liver function tests may be elevated; this is why liver enzymes are part of the HF laboratory workup.
- **4 is incorrect.** Frothy pink sputum is a *pulmonary* finding — it appears in the source's assessment of fluid backing up into the pulmonary system, i.e., left-sided failure physiology.
- **5 is incorrect.** Crackles in the pulmonary bases are likewise a lung finding from pulmonary fluid backup, not a systemic/right-sided finding.

[Source: PDF p. 451 (book p. 433); PDF p. 450 (book p. 432); PDF p. 448 (book p. 430)]

Q5 — Application — Ejection fraction

An echocardiogram report for a patient with heart failure shows a left ventricular ejection fraction of 32%. Which statement reflects correct understanding of this finding?

A. This is a normal ejection fraction for a healthy heart

B. This hyperdynamic result is strongly correlated with diastolic dysfunction

C. This reduced ejection fraction places the patient at higher risk for serious dysrhythmias

D. Ejection fraction is calculated from the patient's BNP blood sample

Correct answer: C

Rationale — every option analyzed:

- **A is incorrect.** In a healthy heart, the left ventricle's ejection fraction is 55 to 60 percent; 32% is well below that range.
- **B is incorrect.** A *hyperdynamic* ejection fraction is one **exceeding 70 percent** — the opposite end of the scale from 32%. That high value is the one the source correlates with diastolic dysfunction and an overcompensating ventricle.
- **C is correct.** The source states directly that patients with ejection fractions less than 40 percent have a higher risk for developing serious dysrhythmias — a key reason this patient's rhythm must be monitored.
- **D is incorrect.** The ejection fraction is a measurement obtained through an ultrasound of the heart (echocardiogram); BNP is a separate blood test.

[Source: PDF p. 449 (book p. 431); PDF p. 450 (book p. 432)]

Q6 — Medication safety — IV furosemide

A patient with an acute HF exacerbation is receiving intravenous furosemide. Which nursing action is **essential** during this therapy?

A. Administer the IV push dose rapidly so diuresis begins sooner

B. Monitor serum potassium along with BUN and creatinine

C. Discontinue daily weights once the patient's edema begins to decrease

D. Interpret new weight gain as a sign the furosemide is working

Correct answer: B

Rationale — every option analyzed:

- **A is incorrect and unsafe.** Intravenous push furosemide must be administered **slowly** to avoid ototoxicity; speed of the push is a safety issue, not an efficiency choice.
- **B is correct.** With intravenous diuretics, electrolyte monitoring of serum potassium and blood tests for BUN and creatinine are necessary, because potassium wasting is increased and there is a risk of acute kidney injury.
- **C is incorrect.** Daily weight monitoring is part of the nursing assessment for diuretic therapy (along with strict intake and output and serial potassium); it continues while therapy is evaluated — improvement is judged partly *by* the weights.
- **D is incorrect.** The therapeutic response to a diuretic is the opposite: reduction of weight gain and edema, and increased ease of breathing. New weight gain signals fluid retention, not drug effect.

[Source: PDF p. 452 (book p. 434)]

Q7 — SATA — Monitoring new cardiac medications

A patient with heart failure is newly prescribed metoprolol and lisinopril. Which findings or situations require the nurse to act (hold/question the medication, notify the provider, or intervene)? **Select all that apply.**

1. Apical pulse of 54 bpm assessed just before the scheduled metoprolol dose
2. A new-onset cough reported two weeks after starting lisinopril
3. A serum potassium result above the normal range in a patient taking lisinopril
4. New wheezing in a patient with asthma whose beta-blocker was changed to carvedilol
5. A patient who plans to stop lisinopril on his own if a cough develops, without contacting the provider

Correct answers: 1, 2, 3, 4

Rationale — every option analyzed:

- **1 is correct.** The nurse must monitor the patient's response to medication and use clinical judgment to question whether a medication should be held — the source's own example is a pulse of less than 60 bpm, which matters for a rate-slowing beta-blocker.
- **2 is correct.** A new onset of cough is a common complaint with ACE inhibitors; it is a recognized side effect the nurse monitors for, and common practice is to switch to an ARB — a provider decision the nurse triggers by reporting it.
- **3 is correct.** Nursing assessments for ACE inhibitors/ARBs include monitoring for hyperkalemia (and blood pressure response); an elevated potassium must be acted on.
- **4 is correct.** Carvedilol is a nonselective beta-blocker acting on beta-1 and beta-2 sites; non-cardio-selective beta-blockers may trigger bronchospasm and are problematic in patients with asthma or bronchoconstrictive disease, so new wheezing is an intervention-level finding.
- **5 is incorrect.** This describes unsafe self-management, not a nursing action. The source directs nurses to educate patients on side effects and self-monitoring and to involve the provider in changes — the correct nursing response is to correct this plan, not to endorse it.

[Source: PDF p. 450 (book p. 432); PDF p. 453 (book p. 435); PDF p. 452 (book p. 434)]

Q8 — Priority — Telephone triage / recognizing decompensation

A patient with chronic heart failure calls the clinic and reports: "I gained four pounds since yesterday, and my shoes feel tight." What is the nurse's best action?

A. Reassure the patient that day-to-day weight changes of this size are normal variation

B. Recognize possible fluid retention suggesting worsening HF and notify the provider promptly

C. Advise the patient to double the next furosemide dose and call back in a week

D. Advise the patient to stop drinking all fluids and recheck the weight in one week

Correct answer: B

Rationale — every option analyzed:

- **A is incorrect.** The source gives a specific threshold: weight gain of three pounds in a day (or five pounds in a week) is suggestive of HF. Four pounds in one day exceeds that threshold and, with tight shoes (edema), is a cue of fluid retention — not normal variation.
- **B is correct.** New changes or deviations from the prior assessment cue the nurse to consider worsening disease, and the source directs nurses to share the frequency/severity of symptoms with the provider because it suggests the severity of the disease. This report needs prompt provider notification, not watchful waiting.
- **C is incorrect.** Dose changes are provider decisions: the patient's medication regimen must reconcile with the provider's orders, and the nurse's role in the source is monitoring response and questioning orders — not independently doubling a diuretic. The one-week callback also ignores a decompensation cue.
- **D is incorrect.** Fluid restriction in the source applies to severe cases as part of an ordered plan; total self-imposed fluid cessation plus a one-week delay leaves a worsening patient unassessed and risks dehydration.

[Source: PDF p. 448 (book p. 430); PDF p. 451 (book p. 433); PDF p. 449 (book p. 431)]

Case Study (Q9–Q10) — Unfolding case

Scenario. Mr. J., a 74-year-old, is admitted with acute left-sided heart failure. The emergency department nurse reviews his laboratory results over the last 16 hours while he awaits a telemetry bed:

Time	0800	1700	2300
BNP	500 pg/mL	750 pg/mL	1500 pg/mL

Additional 2300 results: ALT 230 units/L (normal 7–56), AST 60 units/L (normal 10–40), LDH 362 units/L (normal 140–280).

(This case mirrors the "Read the Electronic Health Record" exercise in the source itself.) [Source: PDF p. 450 (book p. 432)]

Q9 — Case study, part 1

What best explains the trend in Mr. J.'s BNP values?

A. The rising BNP shows his heart failure is improving in response to treatment

B. BNP rises as myocardial stretch increases with rising pressure gradients in the atria and ventricles, indicating worsening heart failure

C. BNP is released by the congested liver, so the trend tracks his liver injury

D. BNP normally rises to about 1500 pg/mL with aging, so this trend is expected

Correct answer: B

Rationale — every option analyzed:

- **A is incorrect.** BNP is used, along with the clinical presentation, to evaluate the patient's *response to treatment* — a tripling value signals the opposite of improvement.
- **B is correct.** The source states that with increased myocardial stretch in HF, BNP protein levels rise when the pressure gradients rise in the atria and ventricles. A climb from 500 to 1500 pg/mL over 16 hours reflects escalating stretch — worsening failure.
- **C is incorrect.** BNP is a cardiac hormone from a family of proteins acting on blood vessels; its rise is driven by myocardial stretch, not by the liver. (His liver enzymes are a separate finding — see Q10.)
- **D is incorrect.** BNP may increase *slightly* due to age, but normal levels should be less than 100 pg/mL; 1500 pg/mL cannot be attributed to aging.

[Source: PDF p. 450 (book p. 432)]

Q10 — Case study, part 2

Considering Mr. J.'s elevated ALT and AST, which interpretation and expected findings are most consistent with the source?

A. The enzymes suggest hepatic congestion from right-sided heart failure; the nurse would expect findings such as ascites and hepatosplenomegaly

B. The enzymes indicate an unrelated primary liver disease, so no additional HF findings are expected

C. The enzymes indicate thyroid dysfunction, which is the likely trigger of this HF event

D. The elevated enzymes confirm that a myocardial infarction caused this admission

Correct answer: A

Rationale — every option analyzed:

- **A is correct.** The source states that with hepatic congestion from right-sided heart failure, liver function tests may be elevated — which is occurring here alongside the left-sided picture (HF is often biventricular as it progresses). The expected abdominal findings of right-sided failure in the source are fluid accumulation noted as ascites and hepatosplenomegaly.
- **B is incorrect.** The source explicitly links elevated liver enzymes to hepatic congestion from right-sided HF, so dismissing them as unrelated ignores a stated mechanism — and right-sided findings *are* expected.
- **C is incorrect.** Thyroid status in the HF workup is assessed by thyroid-stimulating hormone (TSH); ALT/AST are liver enzymes, not thyroid tests.
- **D is incorrect.** In the source's workup, evidence of myocardial infarction injury is detected on electrocardiogram tracings; elevated liver enzymes point to hepatic congestion instead.

[Source: PDF p. 450 (book p. 432); PDF p. 451 (book p. 433); PDF p. 449 (book p. 431)]

Source

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