

1. The Heart Is a Pump

Heart failure (HF) basics



What is heart failure (HF)?

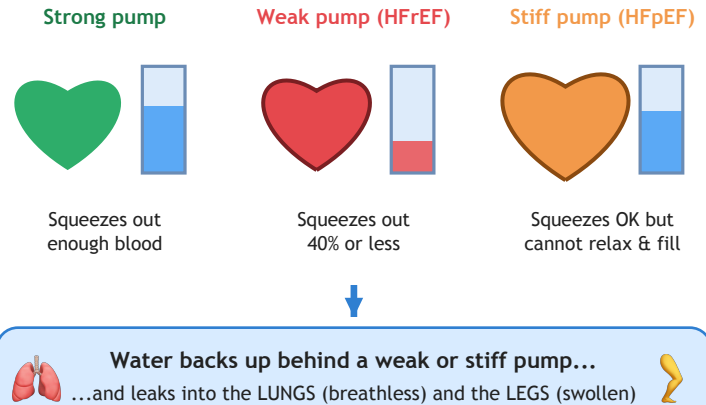
HF means the heart **cannot pump enough blood** for the body, or it can only do it with **very high pressure** inside.

Picture a **water pump in a garden** 🌱:

- **Weak pump (HFrEF)**: water backs up in the hose.
- **Stiff pump (HFpEF)**: the muscle cannot relax and fill, so pressure builds up behind it.
- A **diuretic** is the **drain** 🚰: it lowers the water level (swelling, breathlessness).
- **ARNI, beta-blocker, MRA, SGLT2 inhibitor** protect the pump muscle from wearing out over the years.
- HF is long-term. Most people take several medicines **for life**.

💡 **Memory trick**: EF = **E**jection **F**raction: the share of blood the left ventricle **ejects** (pushes out) with each beat. Think of squeezing a ketchup bottle 🍅.

Pump pictures



Signs the pump is struggling

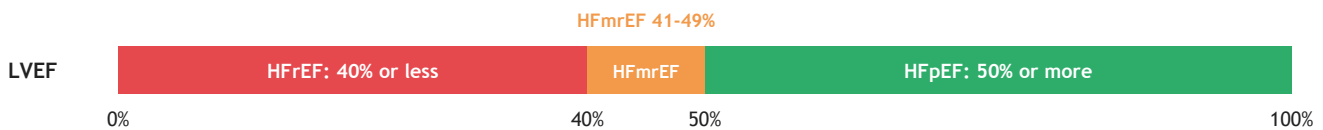
- 😊 **Short of breath** - with less effort, lying flat (orthopnea), or waking at night (PND).
- 💡 **Swelling** of ankles, feet, legs or belly. 🤔 **Tired and weak**. 📏 **Weight gain**.
- Cough or wheeze, poor appetite, racing heartbeat (palpitations).
- 😊 In older adults, **confusion** can be the only sign.
- Doctor sees: lung crackles, big neck veins (raised JVP), leg edema, S3 heart sound, fast pulse, big heart on x-ray.

What causes it?

- ❤️ **Heart attack damage** (coronary artery disease)
- 🩸 **High blood pressure** (thick heart muscle)
- Valve disease, fast irregular rhythms, congenital heart disease
- 🍷 **Alcohol, cocaine, amphetamines**, some cancer drugs, radiation
- 🤰 **Pregnancy-related** (peripartum cardiomyopathy, pre-eclampsia)
- 🦋 **Thyroid disease, diabetes, obesity, infection** of the heart muscle

Types of HF: by ejection fraction (EF)

LVEF = percent of blood the left ventricle pushes out with each beat.



CCS 2025 joins these two into one group: HFmrEF = "non-reduced" = LVEF above 40%

- **Why join them?** Outcomes and treatment responses are similar when LVEF is above 40%. The 2021 CCS guide says HFmrEF (mid-range) and US guides say HFmrEF (mildly reduced); HFpEF means 50% or more. **Know both sets of words.**
- **HFimpEF** (US word) = EF was 40% or less before and is now above 40%.

★ Must remember for the exam

- HF = the pump cannot meet the body's needs. **HFrEF = LVEF 40% or less.**
- **Canada (CCS 2025)**: HFmrEF = LVEF **above 40%** (HFmrEF + HFpEF together). Canada wins on the PEBC exam.
- **Diuretics** = the drain for symptoms. The other four drug classes protect the heart over time.

2. Stages and Tests

How sick? How do we know?



Stages (ACC/AHA) - how the disease develops

Stage A

At risk

High BP, diabetes, family history. No symptoms.

Stage B

Pre-HF

No symptoms, but heart damage or high BNP.

Stage C

HF

Heart disease plus HF symptoms, now or before.

Stage D

Advanced

Symptoms and hospital stays keep coming back.

Stages describe how the disease develops, from A to D.

NYHA class - how you feel TODAY

NYHA I No limit in daily life

NYHA II Symptoms with ordinary activity

NYHA III Symptoms with LESS than ordinary activity

NYHA IV Symptoms at rest

NYHA = New York Heart Association. It can go up and down. Drug labels use it (for example ARNI and ivabradine: II-III).

Memory trick: Higher number = sicker. Class IV is so bad that even sitting on the couch makes you breathless.

Tests to find HF

• **First look:** history, weight, BP, chest x-ray, ECG, blood tests (CBC, electrolytes, kidney, sugar, thyroid).

• **BNP or NT-proBNP** blood test, then an echocardiogram (it gives the EF).

• **Clinic cut-offs ("HF likely"):** NT-proBNP above 125 pg/mL, or BNP above 50 pg/mL, then do an echo.

• Normal EF on a routine echo does **not** rule out HF.

Memory trick: Clinic numbers only: BNP is the shorter name and has the smaller number: **BNP 50, NT-proBNP 125.** (The emergency numbers below are different.)

Emergency numbers (acute HF only, pg/mL)

Emergency room (acute HF)	HF unlikely	Grey zone	HF likely
BNP	below 100	100 - 400	above 400
NT-proBNP, age 50-75	below 300	300 - 900	above 900
NT-proBNP, age over 75	below 300	300 - 1800	above 1800

These numbers are for **sudden (acute) HF**, not for stable HF in the clinic.

Diagnosing HFnrEF (LVEF above 40%): all 3 needed

1) Symptoms or signs of HF. 2) LVEF above 40% on a dedicated scan (echo, cardiac MRI or MUGA). 3) Proof of high filling pressure: raised BNP/NT-proBNP, or structural heart disease / diastolic dysfunction on imaging, or measured pressures.

Labs the pharmacist should know about

- **Potassium, creatinine/eGFR, sodium:** after starting or changing MRA, ARNI, ACEi/ARB, SGLT2i.
- **Magnesium:** with diuretics and digoxin.
- **BP, heart rate and weight** at every visit.

How often to see the patient

- **High risk** (NYHA IIIB-IV, recent hospital stay, dose-raising time): every **1-4 weeks**.
- **Medium risk:** every **1-6 months**.
- **Low risk:** every **6-12 months**.

★ Must remember for the exam

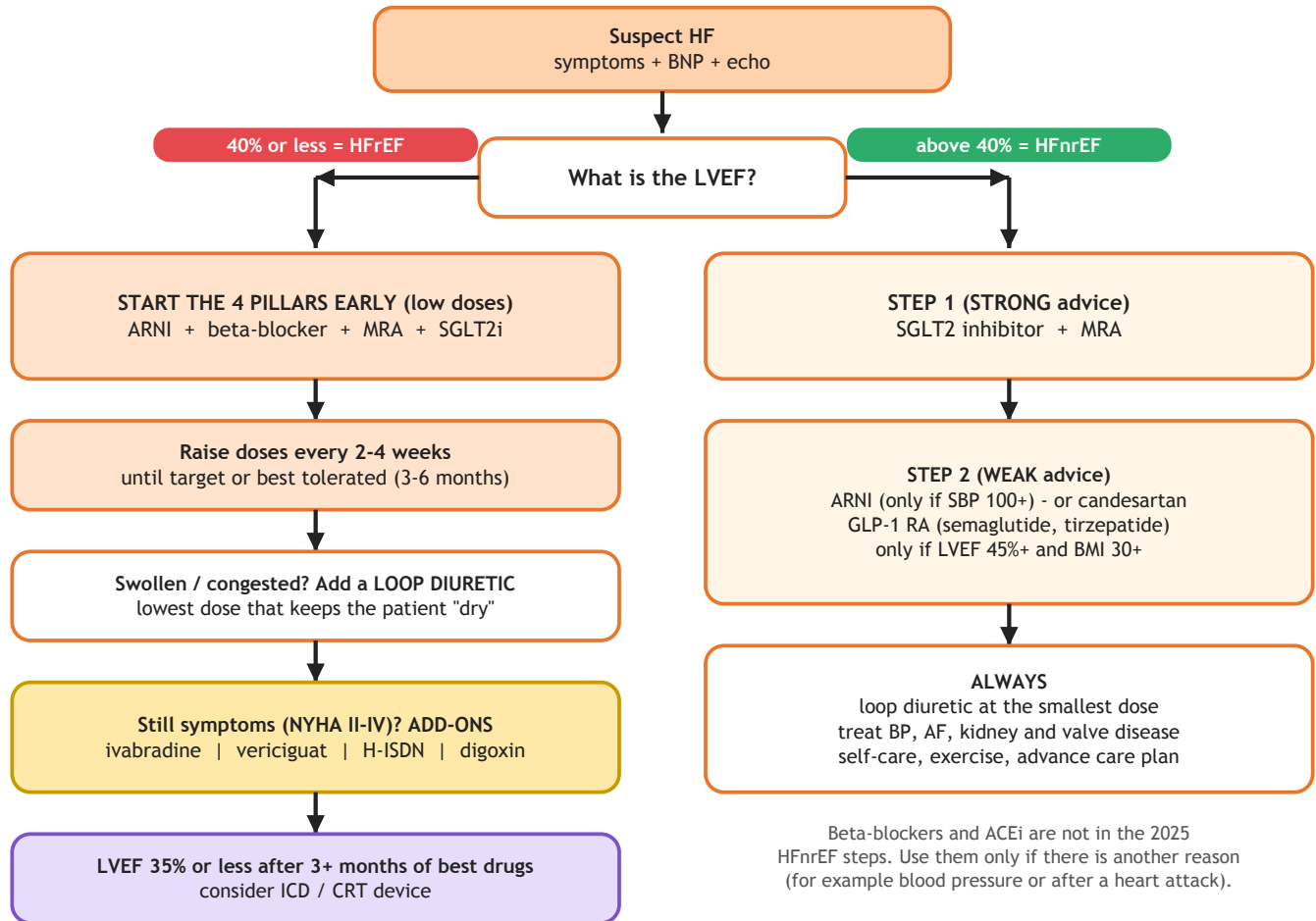
- Stage = disease path (A-D). NYHA = how you feel today (I-IV).
- Clinic: **NT-proBNP above 125 or BNP above 50** means HF is likely; then do an echo.
- Acute HF numbers are higher: BNP above 400 = likely; below 100 = unlikely.

3. Treatment Roadmap

Which drugs, in which order



Flowchart: from diagnosis to treatment



Doses for the pillars (CCS charts and Health Canada labels)

Pillar drug	Start	Target
Sacubitril/valsartan (ARNI)	49/51 mg twice a day*	97/103 mg twice a day
Carvedilol	3.125 mg twice a day	25 mg twice a day (50 mg if over 85 kg)
Bisoprolol	1.25 mg daily	10 mg daily
Metoprolol succinate (CR/XL)	12.5-25 mg daily	200 mg daily
Spironolactone	12.5 mg daily	25-50 mg daily
Eplerenone	25 mg daily (with eGFR 30-49: see page 8)	50 mg daily (see page 8)
Dapagliflozin / empagliflozin	10 mg daily	10 mg daily

*Start 24/26 mg twice a day if age 75+, low SBP, low-dose ACEi/ARB or moderate liver problems. CCS chart says carvedilol 50 mg twice a day if over 85 kg; the Health Canada label maximum is 25 mg twice a day (Canada label wins). ACE inhibitors and ARBs (enalapril, ramipril, candesartan...) are used if an ARNI is not possible.

★ Must remember for the exam

- **Start low, go slow:** raise doses every 2-4 weeks. Start the pillars early - do not wait.
- HFrEF = **4 pillars**. HFmrEF = **SGLT2i + MRA first (strong)**, then ARNI or GLP-1 RA (weak).
- Add-ons only after the pillars: ivabradine, vericiguat, H-ISDN, digoxin. Device when LVEF is 35% or less after 3+ months of drugs.

4. The 4 Pillars

How each drug helps



ARNI (sacubitril/valsartan)



Relaxes vessels, protects the heart

- **ARNI = Angiotensin Receptor-Neprilysin Inhibitor** (Entresto). Valsartan blocks angiotensin; sacubitril blocks neprilysin, so helpful natriuretic peptides last longer. HFrEF, NYHA II-III.
- **Wait 36 hours** after the last ACE inhibitor (angioedema risk). From an ARB: no wait.
- **Never** with an ACEi, or aliskiren if diabetes or eGFR under 60. Not in pregnancy. Not with a past angioedema.
- Check K, creatinine and BP at **1 week**. Raise every 2-4 weeks if SBP is 100+. Cut or stop if creatinine up over 30%, K over 5.4, or low BP.

💡 **Memory trick:** 36 hours = a day and a half. Last ACEi Monday 6 pm, first ARNI Wednesday 6 am 🕒.

Beta-blockers



Slows and calms the heart

- **Carvedilol, bisoprolol, metoprolol succinate** are the HF choices in the CCS table.
- **Start low, go slow.** Raise every 2-4 weeks. Do not raise while HF symptoms or dizziness are not settled.
- **Carvedilol (Canadian label):** patient stable for 4 weeks first. Take **with food**. Dizziness can come within 2 hours, mostly at the start.
- **Do not use** in decompensated HF needing IV inotropes, asthma, 2nd/3rd degree AV block, severe slow pulse or shock.

💡 **Memory trick:** **Slow the horses:** start with a walk, not a gallop 🐾. Take carvedilol with a snack.

MRAs (spironolactone, eplerenone)



Gentle water pill - keeps K IN

- **MRA = Mineralocorticoid Receptor Antagonist** (blocks aldosterone). **Labs 1 week** after start and after every dose change, then about every 3 months.
- **K over 5.4:** think of cutting the dose. **K 6.0 or more:** stop. Creatinine up over 30%: reduce or stop.
- No K supplements, **no salt substitutes**, go easy on bananas, orange juice, prunes, raisins.
- Eplerenone: not with strong CYP3A4 inhibitors (clarithromycin, ketoconazole, ritonavir). Spironolactone: breast swelling - report it.

💡 **Memory trick:** "Over five-four, ease more. Six-oh, say no." CCS rule for spironolactone and eplerenone.

SGLT2 inhibitors (dapagliflozin, empagliflozin)



Gentle diuretic, protects heart + kidney

- **10 mg once daily**, with or without diabetes. Not for emergency treatment of acute HF.
- **Ketoacidosis warning:** nausea, vomiting, belly pain, confusion, unusual tiredness - blood sugar may not look very high. (Labels differ for people without diabetes: page 8.)
- Genital yeast infections are common. Very rare: Fournier gangrene (pain or redness in the genital area).
- **Stop at least 3 days before major surgery.** Careful with loop diuretics (dehydration). Dapagliflozin: not on dialysis, not started if eGFR under 25.

💡 **Memory trick:** **SGLT2 = Sodium-GLucose co-Transporter 2.** It pulls sugar and salt back into the body. The drug blocks it, so they leave in the urine 🚽.

ACE inhibitors and ARBs (when an ARNI is not possible)

- **ACEi** (enalapril, ramipril...): dry cough is common; rare but serious **angioedema**. **ARB** (candesartan, valsartan): when an ACEi is not tolerated. ARNI + ARB: never. Both: **not in pregnancy**; check K, creatinine and BP after changes.

★ Must remember for the exam

- **ARNI:** 36 hours after an ACE inhibitor. Never together. Labs at 1 week.
- **Beta-blocker:** start low, go slow; carvedilol with food. **MRA:** K over 5.4 ease, 6.0 stop; no salt substitutes.
- **SGLT2i:** ketoacidosis can hide behind a not-very-high sugar. Stop 3 days before big surgery.

5. Add-ons and Diuretics

Extra help for the pump



Loop diuretics - the drain

- They relieve **swelling and breathlessness**. They are the "drain", not the "protector".
- Use the **smallest dose that keeps the patient dry** (dry weight).
- In hospital: IV furosemide 20-80 mg push, or 5-20 mg/h drip. Poor response: add metolazone or hydrochlorothiazide (careful).
- Watch **K, Mg, Na, creatinine, BP and weight**. Low K or Mg makes digoxin toxicity more likely.

 **Memory trick:** Diuretic = the drain. Open it only as much as the water needs.

Ivabradine (think "Ivy Brakes")

- Slows the **sinus node** (the natural pacemaker) with little BP drop.
 - **Canadian label:** LVEF 35% or less, NYHA II-III, **sinus rhythm**, resting HR **77 or more**, on standard therapy.
 - Start 5 mg twice a day (2.5 mg if age 75+). After 2 weeks: HR over 60 raise; 50-60 keep; under 50 lower. Max 7.5 mg twice a day.
 - **Not with** verapamil, diltiazem or strong CYP3A4 blockers. HR under 70 before start: no. Not in AF, pregnancy, SBP under 90/50.
 - Side effects: slow pulse, **visual flashes** (phosphenes). Avoid grapefruit and St John's wort.
-  **Memory trick:** Ivy Brakes the sinus. Needs a fast pulse (77+) first .

Vericiguat (think "Very recent hospital stay")

- For HF with reduced EF after a **recent hospital stay or IV diuretics**, on standard therapy. **Approved in Canada (April 2023)**.
- **2.5 mg daily with food**, double about every 2 weeks to 10 mg.
- Do not start if SBP under 100. Lower or pause if symptomatic low BP or SBP under 90.
- **Never with riociguat**. PDE-5 inhibitors (sildenafil) not recommended. CCS: no nitrates.
- Not in pregnancy. Not recommended if eGFR under 15 or on dialysis.

H-ISDN (hydralazine + isosorbide dinitrate)

- Use when an ARNI/ACEi/ARB cannot be used (kidney problems or high K).
 - Or add for **Black patients** with a high symptom burden on best therapy.
 - Side effects: low BP. Hydralazine can cause a **lupus-like** reaction.
 - Each drug alone has not shown HF outcome benefit - they work as a **pair**.
-  **Memory trick:** Hydralazine + Isosorbide dinitrate (H-ISDN) = a **team**. One alone is not enough.

Digoxin

- Use for **AF with poor rate control**, or symptoms despite other drugs. Eases symptoms and hospital stays; **does not** improve survival.
- **Narrow safe range**. Toxicity: nausea, vomiting, slow or blocked heartbeat, dangerous rhythms.
- **Low K, low Mg or high calcium** make toxicity more likely. Smaller doses in kidney disease (CCS: generally not in severe kidney impairment).
- Levels rise with **quinidine, verapamil, amiodarone, propafenone, erythromycin, clarithromycin**.

Devices, GLP-1 and acute HF

- **ICD / CRT:** LVEF 35% or less after 3+ months of best drugs and NYHA II-IV.
- **GLP-1 RA** (semaglutide, tirzepatide) in HFnrEF (weak advice), only if LVEF 45%+ and BMI 30+. Never with medullary thyroid cancer / MEN2, type 1 diabetes, pancreatitis or pregnancy. With diabetes and A1c 8% or less: consider lowering the insulin secretagogue (like a sulfonylurea) or cutting insulin 10-20%.
- **Acute HF:** oxygen to keep saturation at 92%+, IV furosemide. Do not start sacubitril/valsartan during acute HF. Ivabradine and vericiguat are for stable patients.

★ **Must remember for the exam**

- **Ivabradine:** sinus rhythm, HR 77+, LVEF 35% or less. Never with verapamil or diltiazem.
- **Vericiguat:** after a recent HF hospital stay. Never with riociguat. SBP 100+ to start.
- **Digoxin:** narrow window; low K or Mg makes toxicity more likely. Diuretics treat symptoms, not survival.

6. Danger Zone

Drugs to avoid and safety checks



Drugs to AVOID or use with great care in HF

Drug	Why it is a problem	Source
NSAIDs (ibuprofen, naproxen, COX-2)	Hold salt and water, weaken diuretics, make HF worse	US guide: harm
Pioglitazone	Fluid retention. Contraindicated in NYHA I-IV (Actos label)	Canada label
Dronedarone	Contraindicated with any HF history or LV systolic dysfunction	Canada label
Diltiazem, verapamil	Weaken the heart in HFrEF (US source). Never with ivabradine (Canada label)	US + Canada label
Flecainide, disopyramide	Class I antiarrhythmics: weaken the pump	US review
Sotalol	Class III antiarrhythmic: can cause new or worse HF	US review
ACEi + sacubitril/valsartan	Angioedema. Also aliskiren + ACEi/ARB in diabetes or eGFR under 60	Canada label
K supplements, salt substitutes, K-sparing diuretics	High potassium with MRA or ARNI	Canada label
Riociguat with vericiguat	Contraindicated	Canada label
Lithium with SGLT2i, ACEi, diuretics	Lithium levels change	Canada label

 **Memory trick:** Ibuprofen = pounds of fluid go up: ibuprofen and other NSAIDs make you hold water 💧.

Pregnancy: do NOT use

- **ACEi, ARNI:** can injure or kill the baby. Boxed warning for ARNI.
- **Spironolactone, dapagliflozin, ivabradine, vericiguat:** not in pregnancy. Rule out pregnancy first.
- **Finerenone and GLP-1 RA:** not in pregnancy or breastfeeding.
- **Carvedilol:** no studies; may slow the baby's heart and lower baby's sugar.
- **Positive test:** call the prescriber the same day.

Kidney limits (eGFR)

- **Sacubitril/valsartan:** under 30 not recommended (Canada).
- **Spironolactone:** under 30 contraindicated. **Eplerenone:** under 30 no.
- **Finerenone and dapagliflozin:** do not start under 25. Dapagliflozin: not on dialysis.
- **Empagliflozin 10 mg:** usable at any eGFR; not started on dialysis.
- **Vericiguat:** fine at 15 or more. **Ivabradine:** no change.

Low blood pressure: the numbers

- **ARNI** raise only if SBP 100+. **MRA** raise only if SBP above 95.
- **Vericiguat:** do not start under 100; lower if under 90. **Ivabradine:** never under 90/50.
- Dizzy on carvedilol? Sit down, take it with food, and ask about spacing it from the ACEi.

Call the prescriber if...

- Heart rate under 50, or SBP under 90
- Potassium 5.5 or more; creatinine up over 30%
- Signs of ketoacidosis on an SGLT2 inhibitor
- **Angioedema** (lip, tongue or throat swelling): emergency
- Any NSAID, diltiazem/verapamil, pioglitazone or dronedarone on the list

★ Must remember for the exam

- **Avoid:** NSAIDs, pioglitazone, dronedarone, diltiazem/verapamil (HFrEF), ACEi with ARNI.
- **Pregnancy:** ACEi, ARNI and most HF drugs are out. Call the same day.
- **Potassium watch:** MRA + ARNI + ACEi/ARB + salt substitutes = high K.

7. Daily Life and Quiz

Self-care, your job, and 10 questions



Self-care for patients

- **Weigh every morning** after the toilet, before breakfast, same scale. Gain of **more than 2 kg in 2 days** = call.
- **Sodium 2-3 g a day** is reasonable (CCS). Skip canned soup, deli meat, chips.
- **Exercise** (stable NYHA I-III): start 2-3 days a week, 10-15 minutes; aim for 5 days and 30 minutes, moderate effort. Light weights 2-3 days a week.
- **Flu shot every year**. Pneumococcal vaccine (NACI Nov 2024: adults 65+ and under 65 with chronic HF).
- **Stop smoking**. Control BP and diabetes. Most HF pills are for life.

Report right away

- More breathless with less effort, or lying flat
- More swelling in belly or legs
- Weight up more than 2 kg in 2 days
- Dizzy, faint, long palpitations, confusion
- **Breathless at rest or chest pain that does not settle: urgent!**

Pharmacist checklist

1. Scan the list for NSAIDs, diltiazem/verapamil, pioglitazone, dronedarone, K products, ACEi + ARNI, aliskiren, lithium. 2. Check the **36-hour gap**. 3. Ask for K, creatinine/eGFR and Na results; remind about the **1-week blood test**. 4. Teach daily weights, sodium, vaccines and the action plan.

★ Must remember for the exam

- **Daily weight:** up more than 2 kg in 2 days = call. **Sodium:** 2-3 g a day.
- Pharmacist: check interactions, the 36-hour gap and the 1-week labs. Flu + pneumococcal vaccines.

? Quick quiz: 10 questions (answers on the last page)

1. Switching from enalapril to sacubitril/valsartan: how long after the last enalapril dose?
A) 12 hours B) 24 hours C) 36 hours D) 7 days
2. K is 5.6 one week after starting spironolactone. Best step?
A) Call the prescriber; reduce or hold, recheck B) Raise the dose and recheck next month C) Add a potassium supplement to balance it D) Recheck in 3 months and keep the same dose for now
3. Which drug is a poor choice in HF (contraindicated in NYHA I-IV)?
A) Bisoprolol B) Empagliflozin C) Spironolactone D) Pioglitazone
4. A patient starts dapagliflozin. Which advice is best?
A) Check blood sugar four times a day for low sugar B) Stay hydrated; report dizziness or genital pain C) Take it only on days when the legs look swollen D) Double the dose whenever his weight goes up
5. Which patient fits ivabradine?
A) LVEF 55%, HR 80, in sinus rhythm B) Permanent AF, LVEF 30%, NYHA III, HR 90 on a beta-blocker C) LVEF 30%, NYHA II, sinus rhythm, HR 66 on treatment D) LVEF 30%, NYHA II, sinus rhythm, HR 82, on therapy
6. Which pair must never be taken together?
A) Entresto + enalapril B) Carvedilol + furosemide C) Empagliflozin + bisoprolol D) Dapagliflozin + furosemide
7. Weight up 2.5 kg in 2 days, more ankle swelling. Best advice?
A) Wait a week to see if it settles B) Call the care team the same day C) Stop all pills until it settles D) Drink more water to flush it out
8. Vericiguat must NOT be combined with:
A) A beta-blocker B) Digoxin C) Riociguat D) Spironolactone
9. How should carvedilol be taken to lower dizziness?
A) On an empty stomach B) At bedtime only C) With food D) Only when swollen
10. Which are the 4 pillars of HFrEF treatment?
A) Diuretic, digoxin, nitrate, aspirin B) ARNI, beta-blocker, MRA, SGLT2 inhibitor C) ACEi, ARB, ARNI, ivabradine D) Loop diuretic, thiazide, digoxin, vericiguat

8. Label vs Guideline

Where they disagree



Label vs guideline: both are shown, no silent pick

For the exam, the Health Canada label is the safer answer for dose and contraindication questions. For a real patient, talk to the prescriber. These points are not used in the quiz.

Topic	Health Canada label	CCS guideline
Eplerenone, eGFR 30-49	Start 25 mg every other day; maximum 25 mg daily	HFnrEF table (2025): start 12.5 mg daily if eGFR 30-59; target 50 mg daily
ARNI, eGFR under 30	Not recommended (not enough data)	HFnrEF table (2025): 24/26 mg twice a day
SGLT2 ketoacidosis, no diabetes	Forxiga: described in type 2 diabetes. Jardiance: also reported without diabetes	CCS texts used here do not say
Carvedilol maximum	25 mg twice a day	50 mg twice a day if over 85 kg (2021)
ARNI when LVEF above 40%	Label covers HFrEF only	Weak advice to consider an ARNI (2025)

Canada vs US: when they differ, Canada wins on the PEBC

Topic	Canada (the exam answer)	US
EF names	HFrEF 40% or less; HFnrEF above 40% (CCS 2025)	HFrEF, HFimpEF, HFmrEF 41-49%, HFpEF 50%+
SGLT2i when EF above 40%	Strong advice (2025)	Class 2a (2022)
MRA when EF above 40%	Strong advice	Weaker (2b)
ARNI and eGFR under 30	Not recommended (label); CCS table: 24/26 mg	Start at half dose
Finerenone in HF	LVEF 40%+ (label 2026)	LVEF 40%+ (July 2025)
Sodium	2-3 g a day is reasonable	Avoid excess sodium is reasonable

Memory tricks in one place

- **EF = Ejection Fraction** - the share of blood pushed out each beat. **BNP 50, NT-proBNP 125** - clinic numbers only.
- **Higher NYHA number = sicker. Diuretic = the drain. SGLT2 (Sodium-GLucose co-Transporter 2) blocked = sugar leaves in urine.**
- **36 hours = a day and a half** (ACEi Monday 6 pm, ARNI Wednesday 6 am). **Slow the horses** - start beta-blockers low.
- **"Over five-four, ease more. Six-oh, say no."** - potassium with MRAs. **Ivy Brakes the sinus** - HR 77+.
- **Vericiguat = think Very recent hospital stay. Hydralazine + Isosorbide dinitrate = a team.**
- **Ibuprofen = pounds of fluid go up** - NSAIDs hold water. **"2-2-call"** - 2 kg in 2 days: call.

9. Answers and Sources

Check yourself



✓ Answers (blueprint area 1A Clinical Care)

1. **C** - 36 hours. Too short a gap raises the angioedema risk. From an ARB no wait is needed.
2. **A** - K over 5.4: consider reducing or stopping. K 6.0 or more: stop. Never add K.
3. **D** - Pioglitazone: Canadian label says contraindicated in NYHA I-IV HF.
4. **B** - SGLT2 inhibitors act like a gentle diuretic: stay hydrated and report dizziness or genital itching or pain.
5. **D** - Ivabradine: sinus rhythm, LVEF 35% or less, NYHA II-III, HR 77 or more (Canadian label; the CCS 2021 chart says 70 or more). Not in AF.
6. **A** - Entresto (an ARNI) plus an ACE inhibitor: angioedema. (Dapagliflozin + furosemide is allowed but needs care: dehydration.)
7. **B** - More than 2 kg in 2 days with swelling: call the same day.
8. **C** - Riociguat is contraindicated with vericiguat (both stimulate soluble guanylate cyclase, sGC).
9. **C** - With food: slower absorption, less dizziness.
10. **B** - Four pillars: ARNI (or ACEi/ARB), beta-blocker, MRA, SGLT2 inhibitor.

Sources and what is not confirmed

Canada first: CCS/CHFS 2025 guide on HF with non-reduced EF (Can J Cardiol 2025;41(10):1857-1874); CCS 2021 HF pocket guide; Health Canada product monographs, newest versions found in October 2026 (sacubitril/valsartan, vericiguat, ivabradine, finerenone, dapagliflozin, empagliflozin, spironolactone, eplerenone, carvedilol, bisoprolol, ramipril, digoxin, dronedarone, pioglitazone); NACI statements (pneumococcal Nov 2024, influenza). **US second:** ACC/AHA/HFSA 2022 (through secondary summaries), FDA labels.

Not confirmed or older: ACC/AHA stage and NYHA wording came from secondary US pages. The CCS 2021 chart is older (it says vericiguat is not approved in Canada and uses HR above 70 for ivabradine; Health Canada says 77). ARNI use above LVEF 40% is guideline use beyond the label. Not found in sources: oral loop-diuretic doses, nebivolol, metoprolol start dose (printed as a possible typo), canagliflozin HF label, vaccines other than flu and pneumococcal, hyperkalemia emergency treatment, treatment of peripartum cardiomyopathy. Teaching comments, not source wording: sick-day and dehydration advice, "call the same day", the call-the-prescriber limits (heart rate under 50, SBP under 90), and using beta-blockers or ACEi outside the HFnrEF steps for another reason. Two September 2026 author corrections to the CCS 2025 guideline could not be read. US class wording for avoid-list drugs is from secondary reviews. Doses are for exam study only, not for real patients. Not affiliated with or endorsed by PEBC. **Study aid, not medical advice. Check official sources before any patient decision.**
Found an error? Email maplerxprep@proton.me with the file name, version and page.