NCLEX · STUDY SERIES
VOLUME XIV · CARDIOVASCULAR DISORDERS
NGN · 2026 TEST PLAN

HIGH-YIELD CARDIAC REVIEW

Aortic Aneurysm & Cardiomyopathy

Two silent killers of the cardiovascular system — one a ticking vessel, the other a failing pump. Mastering both means recognizing the whisper before the scream.

CARDIOVASCULAR | PRIORITY CONDITION | PHYSIOLOGICAL ADAPTATION | PHARMACOLOGICAL THERAPIES

PART ONE

01 Aortic Aneurysm

A ballooning weakness in the largest artery — silent until it ruptures.

◆ VASCULAR ◆ EMERGENCY POTENTIAL ◆ DO NOT PALPATE

§ 01 Definition & Overview CONCEPT

An ***aortic aneurysm*** is a localized **outpouching or dilation** of the aortic wall — typically **≥ 1.5× the normal diameter** — caused by weakening of the vessel's middle layer (tunica media).

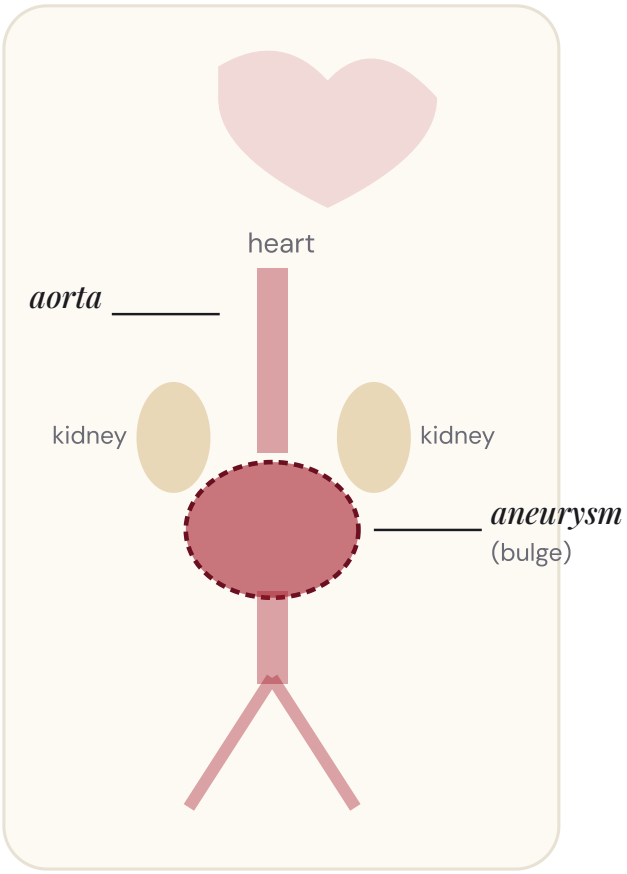
Over time, blood pressure against the weakened wall causes progressive ballooning. Aneurysms are often **asymptomatic until rupture**, which is almost always catastrophic. Early detection and controlled blood pressure are the two levers that save lives.

≥1.5×	5.5 cm	>80%	M > F
NORMAL DIAMETER	SURGICAL THRESHOLD (AAA)	MORTALITY IF RUPTURED	AGE > 65 · SMOKERS

§ 02 Classifications TYPES

TYPE	LOCATION & KEY FEATURES
Abdominal MOST COMMON	Located **below the renal arteries**. Pulsatile mass near umbilicus. Most are discovered incidentally on imaging.
Thoracic	In the chest cavity. May press on structures → hoarseness, dysphagia, cough, SOB. Often linked to hypertension and Marfan syndrome.
Thoracoabdominal	Spans both cavities. More complex surgical repair; higher risk of spinal cord ischemia.
Dissecting EMERGENCY	Tear in the intima allows blood to split the vessel wall layers. **Sudden, "tearing" or "ripping"** chest/back pain. Surgical emergency.

Abdominal Aortic Aneurysm — Anatomy



Most AAAs occur below the renal arteries — palpation can rupture the wall.

§ 03 Pathophysiology MECHANISM

STEP 01	→	STEP 02	→	STEP 03	→	STEP 04	→	STEP 05
Injury to tunica media (HTN, atherosclerosis, connective tissue dz)		Wall weakens & loses elasticity		Arterial pressure pushes outward → dilation		Ballooning expands · turbulent flow · clot risk		Dissection or rupture → hemorrhagic shock

Non-Modifiable

Modifiable

Other Triggers

- Age > 65
- Male sex
- Family history
- Marfan / Ehlers-Danlos syndrome

- **Smoking** (strongest modifiable risk)
- Hypertension
- Hyperlipidemia / atherosclerosis
- Obesity

- Trauma (blunt/penetrating)
- Infection (syphilis, mycotic)
- Vasculitis
- Cocaine use (dissection)

§ 04 Signs & Symptoms ASSESSMENT

E Early / Intact Aneurysm

- **Often asymptomatic** — found incidentally
- Pulsatile abdominal mass (AAA)
- Bruit over abdomen on auscultation
- Steady, gnawing abdominal or low-back pain
- Thoracic: hoarseness, dysphagia, cough
- "Feeling a heartbeat" in the abdomen

L Rupture / Dissection

- **Sudden, severe "tearing" or "ripping"** pain
- Hypotension · Tachycardia · Pallor
- Diaphoresis · Syncope · Altered LOC
- Absent or diminished peripheral pulses
- Flank / back bruising (Grey Turner's sign)
- Hematemesis if aortic-duodenal fistula

RED FLAG · RUPTURE TRIAD

Sudden *tearing pain* + *hypotension* + *pulsatile mass* = impending or active rupture. Large-bore IV access, type & crossmatch, emergent surgical consult.

§ 05 Priority Nursing Interventions ABCS · SAFETY

1 *Assess*
Airway, breathing, circulation
Continuous cardiac monitoring. Compare BP &

2 *Control*
Blood pressure aggressively
Target SBP **100–120 mmHg**. Beta blockers first, then

3 *Avoid*
Palpating the abdomen
Never repeatedly palpate a known or suspected AAA — pressure may trigger rupture.

4 *Monitor*
Peripheral pulses & perfusion
Mark pedal pulses with a pen. Note temperature, color, cap

pulses in **both arms** and all extremities.

vasodilators. Avoid BP spikes.

refill. Any loss = call immediately.

5 *Prevent*
Valsalva & BP-raising activities
Stool softeners, no heavy lifting, no straining, manage cough. Keep HOB calm & environment quiet.

6 *Prepare*
Emergent surgical repair
Open repair or EVAR (endovascular). NPO, 2 large-bore IVs, T&C for ≥ 6 units PRBCs, consent.

7 *Evaluate*
Post-op perfusion & kidney function
Watch urine output (>30 mL/hr), BUN/Cr, lower-extremity pulses, abdominal girth, graft-site bleeding.

8 *Assess*
Neuro checks post-op
Especially thoracoabdominal repairs — risk of spinal cord ischemia → lower-extremity paralysis.

§ 06 Pharmacology MEDS

Metoprolol · Labetalol · Esmolol
BETA BLOCKERS — FIRST-LINE

ACTION	Lower HR & BP → reduce shear stress on aortic wall
SIDE FX	Bradycardia, hypotension, bronchospasm, fatigue
NURSING	Hold if HR < 60 or SBP < 100. Do **not** stop abruptly (rebound HTN).

Lisinopril · Enalapril · Losartan
ACE INHIBITORS / ARBS

ACTION	Vasodilation, lower BP, reduce vessel wall stress
SIDE FX	Dry cough (ACEI), hyperkalemia, angioedema, ↑ Cr
NURSING	Monitor K^+, BUN/Cr. Teach: no salt substitutes (K^+).

Atorvastatin · Rosuvastatin
HMG-COA REDUCTASE INHIBITORS

ACTION	↓ LDL & slow atherosclerotic progression
SIDE FX	Myopathy, rhabdomyolysis, ↑ liver enzymes
NURSING	Report muscle pain. Monitor LFTs. Give at bedtime.

Morphine Sulfate
OPIOID · PAIN CONTROL

ACTION	Relieves pain & anxiety → lowers catecholamine surge → lowers BP
SIDE FX	Respiratory depression, hypotension, constipation
NURSING	Monitor RR & LOC. Naloxone at bedside. Never delay treating pain.

§ 07 NCLEX Test Traps THINK AGAIN

TRAP 01

"Palpate the abdominal mass to confirm pulsation."

TRAP 02

"Give the patient something to push through the pain."

Wrong. Never palpate a suspected AAA — it can rupture. Just inspect & auscultate for a bruit.

Wrong. Pain = wall stress = catastrophe. Treat pain **aggressively** — pain raises BP & can trigger rupture.

TRAP 03

"Increase fluids rapidly for BP of 80/50 post-rupture."

Careful. Target is **permissive hypotension** (SBP ~90) until repair — aggressive fluid boluses can dislodge the clot.

TRAP 04

"Ambulate the patient early to prevent DVT."

Not yet. Pre-op = bed rest, calm environment, no straining. Prevent Valsalva & BP spikes first.

TRAP 05

"Post-op, 25 mL/hr urine output is acceptable."

No. Must be **> 30 mL/hr**. Low output = possible graft occlusion of renal arteries — call surgeon.

TRAP 06

"Patient reports new lower-extremity numbness post-op — document and recheck."

Don't delay. This is spinal cord ischemia or graft occlusion — **notify provider immediately.**

§ 08 Patient Education TEACH-BACK

Lifestyle Modifications

- Stop smoking — #1 modifiable risk factor
- Low-sodium, heart-healthy diet (DASH)
- Moderate activity; **no heavy lifting** (> 10 lbs)
- Maintain healthy weight, manage stress

Daily BP Management

- Check BP daily; keep a log
- Take all meds exactly as prescribed — **never skip BP meds**
- Avoid OTC decongestants (raise BP)
- Rise slowly (orthostatic hypotension)

Report Immediately · 911

- Sudden severe abdominal, back, or chest pain
- Feeling a new "pulsing" lump
- Fainting, dizziness, cold/numb legs
- Bloody or black stools

Post-Surgical Care

- Keep follow-up CT scans (monitor graft)
- Incision care — report redness, drainage, fever
- Antibiotic prophylaxis before dental work
- No heavy lifting for 6–12 weeks

§ 09 NCJMM · Clinical Judgment

NGN FRAMEWORK

Next-Gen Clinical Judgment Measurement Model

SIX-STEP PROCESS

1	2	3	4	5	6
RECOGNIZE CUES	ANALYZE CUES	PRIORITIZE HYPO.	GENERATE SOLUTIONS	TAKE ACTION	EVALUATE
Pulsatile mass, bruit, sudden tearing pain	Pain + hypotension + mass = rupture	Hemorrhagic shock risk over routine pain	Large-bore IV, T&C, BP control, OR prep	Notify surgeon, initiate beta-blocker drip	SBP 100–120, pulses intact, stable LOC

§ 10 Memory Boosters

MNEMONICS

CLASSIC MNEMONIC

PULSE

- **P** — **Pulsatile** abdominal mass — key finding
- **U** — **Ultrasound** / CT confirms diagnosis
- **L** — **Lower** the blood pressure (target SBP 100–120)
- **S** — **Stop** smoking — #1 modifiable risk
- **E** — **Emergency** if ruptured — tearing pain + hypotension

RUPTURE TRIAD

3 P's

- **P** — **Pain** — sudden, tearing, ripping (abdomen / back / chest)
- **P** — **Pulsating** — palpable mass or absent distal pulses
- **P** — **Pressure drop** — hypotension, shock, pallor

"If it pulses, don't press. If it tears, don't wait."

PART TWO

02 Cardiomyopathy

A sick heart muscle — the pump is structurally compromised, long before symptoms appear.

◆ CARDIAC ◆ CHRONIC + PROGRESSIVE ◆ HF PRECURSOR

§ 01 Definition & Overview CONCEPT

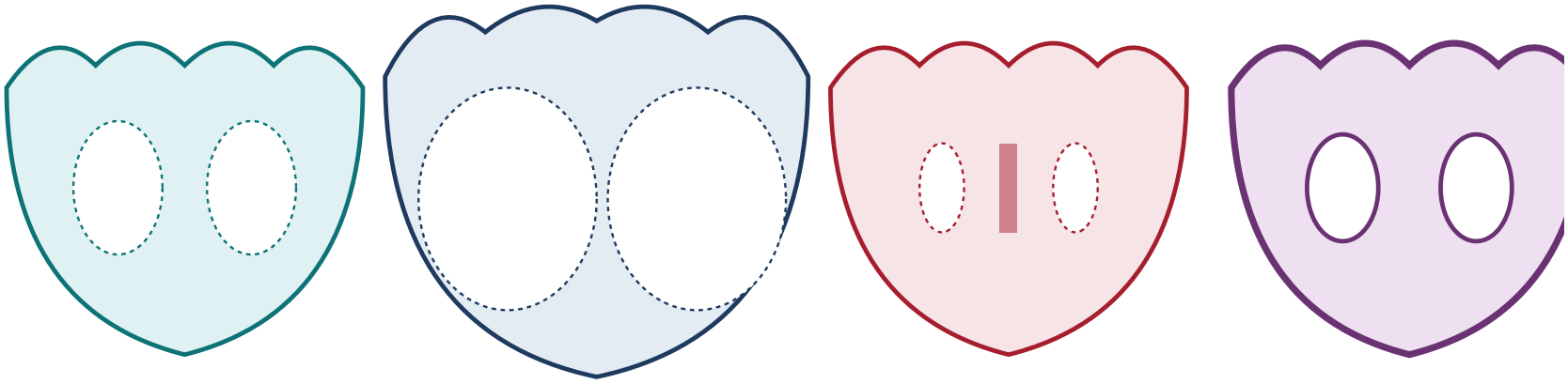
Cardiomyopathy is a **structural and functional disease of the myocardium** — the heart muscle itself is diseased, independent of coronary artery, valve, or pericardial disease.

The heart's ability to fill (diastole) or pump (systole) is impaired. Over time it progresses to **heart failure**, **arrhythmias**, **sudden cardiac death**, or **thromboembolism**. Management is largely supportive — the definitive treatment for end-stage disease is heart transplant.

3	DCM	HCM	~50%
MAIN TYPES	MOST COMMON	#1 CAUSE SCD IN ATHLETES	HCM IS GENETIC

§ 02 The Three Types CLASSIFICATION

Normal Heart vs. Cardiomyopathy Types



Each type damages the heart differently — the location of the problem predicts the symptoms & the treatment.

TYPE	PROBLEM	HALLMARK	KEY RISK
Dilated (DCM) MOST COMMON	Ventricles **stretch & thin** → weak **systolic** contraction (↓ EF)	Low EF, global hypokinesis, S3 gallop	Heart failure, A-fib, mural thrombi → stroke
Hypertrophic (HCM) SCD RISK	Muscle **thickens abnormally** (esp. septum) → ↓ chamber size, **diastolic** filling problem	Syncope on exertion, systolic murmur, S4	**Sudden cardiac death** in young athletes
Restrictive RARE	Walls become **rigid & non-compliant** → poor **diastolic** filling (preserved EF)	Right-HF signs, JVD, ascites, hepatomegaly	Amyloidosis, sarcoidosis, radiation

§ 03 Pathophysiology MECHANISM

STEP 01
Genetic, toxic, infectious, or idiopathic insult to myocardium

→

STEP 02
Muscle fibers remodel (dilate / thicken / stiffen)

→

STEP 03
Impaired filling & / or contraction → ↓ CO

→

STEP 04
Compensatory neurohormonal activation (RAAS, SNS) worsens damage

→

STEP 05
Heart failure · Arrhythmia · Thromboembolism · Death

DCM Causes

HCM Causes

Restrictive Causes

- **Idiopathic** (most common)
- Alcohol / cocaine abuse
- Chemo (Doxorubicin · Adriamycin)
- Viral myocarditis · postpartum
- Genetic

- **Autosomal dominant** gene mutation
- ~50% have a family history
- Young athletes at highest SCD risk
- Screen first-degree relatives

- Amyloidosis (most common)
- Sarcoidosis · hemochromatosis
- Radiation therapy
- Endomyocardial fibrosis

§ 04 Signs & Symptoms ASSESSMENT

M Mild / Early Disease

- Fatigue, decreased exercise tolerance
- Mild dyspnea on exertion (DOE)
- Palpitations
- Occasional dizziness
- Atypical chest discomfort
- **Many patients are asymptomatic** — found on family screening or exam murmur

S Severe / Advanced (HF)

- Orthopnea, PND, nocturnal cough
- Crackles, S3 gallop (DCM), S4 (HCM)
- Peripheral edema, JVD, ascites
- **Exertional syncope** (classic HCM)
- Arrhythmias (A-fib, V-tach, V-fib)
- Sudden cardiac death (HCM)

RED FLAG · YOUNG ATHLETE

A young athlete with *syncope* during exercise, *family history of sudden death*, or a new *systolic murmur* that intensifies with Valsalva = screen for *HCM*. This is an NCLEX priority scenario.

§ 05 Priority Nursing Interventions ABCS · SAFETY

1 *Assess*
Heart failure status

2 *Monitor*
Daily weights & I/Os

3 *Restrict*
Sodium & fluids

4 *Restrict*

Lung sounds, JVD, edema, weight. Continuous telemetry for arrhythmias.

Same time, same scale, same clothes. **Weight gain > 2 lbs / 24 hrs or 5 lbs / week = report.**

Low-sodium diet (< 2 g/day). Fluid limit often 1.5–2 L/day depending on severity.

Strenuous activity — especially HCM

Intense exercise & competitive sports are **contraindicated in HCM** → risk of SCD.

5 *Administer*

Medications safely

Hold digoxin if HR < 60 (apical 1 min). Check BP before all antihypertensives. Monitor K^+.

6 *Prevent*

Thromboembolism

Monitor for A-fib. Anticoagulant therapy often needed. Watch for new stroke symptoms.

7 *Refer*

Genetic counseling (HCM)

First-degree relatives need echocardiogram screening. Offer emotional support.

8 *Prepare*

Advanced therapies

ICD placement for SCD risk, biventricular pacing, LVAD, or heart transplant evaluation.

§ 06 Pharmacology

MEDS · TYPE-SPECIFIC

Lisinopril · Enalapril · Losartan

ACEI / ARB — CORE HF THERAPY

ACTION	Vasodilate · block RAAS · reduce preload & afterload
SIDE FX	Dry cough (ACEI), hyperkalemia, angioedema, ↑ Cr
NURSING	Monitor K^+, BUN/Cr. Avoid salt substitutes.

Metoprolol · Carvedilol · Bisoprolol

BETA BLOCKERS — ALL TYPES

ACTION	Slow HR → more filling time, ↓ O_2 demand, ↓ remodeling
SIDE FX	Bradycardia, hypotension, fatigue, bronchospasm
NURSING	Hold if HR < 60 or SBP < 100. Never stop abruptly.

Furosemide · Bumetanide

LOOP DIURETICS — VOLUME CONTROL

ACTION	↓ Preload by excreting Na^+ & H_2O
SIDE FX	**Hypokalemia**, ototoxicity, dehydration, ↑ glucose
NURSING	Monitor K^+ & digoxin level (low K = dig tox). Give AM.

Spironolactone · Eplerenone

ALDOSTERONE ANTAGONISTS

ACTION	Block aldosterone · reduce remodeling · K^+ sparing
SIDE FX	**Hyperkalemia**, gynecomastia (spiro)
NURSING	Monitor K^+ closely. Give with meals.

Digoxin

CARDIAC GLYCOSIDE — DCM ONLY

Warfarin · Apixaban · Rivaroxaban

ANTICOAGULANTS — A-FIB / LOW EF

ACTION	+ Inotrope · - chronotrope. Strengthens weak pump.
SIDE FX	Tox > 2.0 ng/dL: N/V, yellow-green halos, bradycardia
NURSING	Apical HR × 1 min; hold if < 60. **Contraindicated in HCM.**

ACTION	Prevent mural thrombi & embolic stroke
SIDE FX	Bleeding — gums, hematuria, melena, bruising
NURSING	Monitor INR (warfarin, 2–3). Teach bleeding precautions.

MAJOR PHARMACOLOGY TRAP

Digoxin, ACE inhibitors, nitrates & diuretics **are** ***contraindicated or used cautiously*** **in** ***HCM*****. They reduce preload or increase contractility — both worsen left ventricular outflow obstruction.**

§ 07 NCLEX Test Traps

THINK AGAIN

TRAP 01

"HCM patient reports palpitations — encourage jogging for 'heart health.'"

Dangerous. Strenuous activity is **contraindicated** in HCM — risk of SCD. Teach moderate, low-intensity activity only.

TRAP 02

"Give digoxin to boost contractility in HCM."

Wrong. HCM already has a forceful, thick ventricle — digoxin worsens obstruction. Digoxin is for **DCM**, not HCM.

TRAP 03

"Administer a diuretic before a HCM patient's stress test."

No. Diuretics reduce preload → worsen outflow obstruction → syncope. HCM patients need **adequate filling.**

TRAP 04

"The patient's EF is 60%, so heart failure is ruled out."

Not so fast. Restrictive & HCM can have **preserved EF** but impaired filling (HFpEF). Look at symptoms, not just EF.

TRAP 05

"Young athlete collapsed — probably dehydration."

Think HCM first. Exertional syncope in a young, fit person = screen for hypertrophic cardiomyopathy until proven otherwise.

TRAP 06

"Patient gained 3 lbs in one day — offer fluids."

No. Rapid weight gain = fluid overload. **Notify HCP**, restrict fluids, anticipate diuretic & reinforce teaching.

§ 08 Patient Education

TEACH-BACK

Daily Self-Management

Activity & Safety (HCM)

- Weigh daily — same time/scale/clothing
- Record all meds, doses, times
- Limit sodium < 2 g/day · read labels
- Restrict fluids as prescribed
- Quit alcohol & all recreational drugs

- **No competitive or strenuous sports**
- Avoid dehydration & overheating
- Rise slowly — orthostatic risk
- Know symptoms of pre-syncope
- Wear a medical ID bracelet

Call Provider If...

- Weight ↑ > 2 lbs/day or 5 lbs/week
- New SOB at rest or when lying flat
- Edema worsens; shoes/rings tight
- Chest pain, palpitations, syncope
- Signs of bleeding (on anticoagulants)

Family & Genetic Teaching

- HCM is often autosomal dominant
- All **first-degree relatives** need echo screening
- Genetic counseling is recommended
- Discuss advance directives & goals of care

§ 09 NCJMM · Clinical Judgment

NGN FRAMEWORK

Applied to HCM — Young Athlete Scenario

SIX-STEP PROCESS

1	2	3	4	5	6
RECOGNIZE CUES	**ANALYZE CUES**	**PRIORITIZE HYPO.**	**GENERATE SOLUTIONS**	**TAKE ACTION**	**EVALUATE**
Exertional syncope + systolic murmur + family hx	Cluster = outflow obstruction pattern	HCM with SCD risk outranks dehydration	Echo, telemetry, activity restrictions, BB	Hold strenuous exercise, initiate BB, ICD discussion	No syncope, stable rhythm, family screened

§ 10 Memory Boosters

MNEMONICS

THREE TYPES — D-H-R

DHR

HEART FAILURE WARNING

FACES

D **Dilated** — big & baggy · systolic failure · give digoxin

H **Hypertrophic** — thick & muscular · diastolic · NO dig

R **Restrictive** — rigid & ridged · diastolic · rare

F **Fatigue** — can't do what they used to do

A **Activity** limitation — DOE, PND

C **Congestion** — cough, crackles, wet lungs

E **Edema** — ankles, weight gain, JVD

S **SOB** — shortness of breath, orthopnea

Quick Differentiation

- ✓ **DCM:** thin walls, low EF, S3 gallop → give standard HF drugs (+ digoxin)
- ✓ **HCM:** thick septum, syncope on exertion, S4 → beta blockers only, NO dig / nitrates / diuretics
- ✓ **Restrictive:** stiff walls, right-HF signs, JVD → treat underlying cause

"HCM" = Hard, Can't Move

- ✗ **H**eavy muscle · **C**an't fill · **M**ovement restricted
- ✗ No competitive sports
- ✗ No digoxin, nitrates, or aggressive diuretics
- ✗ Screen the family

"Dilated fails to squeeze · Hypertrophic fails to fill · Restrictive fails to stretch."

SIDE-BY-SIDE REVIEW

§ Aortic Aneurysm vs. Cardiomyopathy AT-A-GLANCE

FEATURE	AORTIC ANEURYSM	CARDIOMYOPATHY
Organ / Tissue	Aorta (blood vessel wall)	Myocardium (heart muscle)
Core Problem	Weakened, dilated vessel wall at risk of **rupture**	Structural disease affecting **pumping or filling**

FEATURE	AORTIC ANEURYSM	CARDIOMYOPATHY
Classic Sign	Pulsatile abdominal mass; tearing pain if ruptured	HF symptoms; HCM = syncope in young athlete
Priority Assessment	BP, pulses in all extremities, abdominal inspection	Daily weight, lung sounds, telemetry, JVD, edema
Key "DON'T"	**Don't palpate** the mass	**Don't give digoxin** in HCM; don't exercise
Pharm Overlap	Beta blockers, ACEI, statins, pain control	Beta blockers, ACEI, diuretics, anticoagulants
Definitive Tx	Surgical repair (open or EVAR) if > 5.5 cm	Heart transplant for end-stage disease
Biggest NCLEX Miss	Palpating a pulsatile mass / fluid-boluing a rupture	Giving digoxin or strenuous activity advice in HCM