Coronary artery disease and ACS

Stable angina vs ACS, ECG and troponin, first actions, nitroglycerin, catheterization

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★ high yield

CARDIOVASCULAR

1 AT A GLANCE

Chest pain is one of the most important things a client can report: the nurse's first minutes often decide how much heart muscle survives.

Coronary artery disease (CAD)

- Plaque narrows the arteries that feed the heart, partly or completely blocking blood flow.
- Risks you can change: high blood pressure and cholesterol, smoking, obesity, inactivity; a diet high in saturated fat, salt and sugar; chronic stress; heavy drinking.
- Risks you can't change: age (men over 45, women over 55) and a family history, especially of early heart disease.
- Angina is chest pain from ischemia: the muscle isn't getting enough oxygen, often during exertion.
- Many people never feel angina: for them, the first sign is a heart attack. Over time, CAD can lead to heart failure.

Heart attack symptoms

- Chest heaviness, pressure or squeezing, like something sitting on the chest; shortness of breath.
- A cold sweat, weakness, lightheadedness, nausea or indigestion; pain in the jaw, arms or shoulder.
- ★ **Don't dismiss vague symptoms**: women may feel only tiredness or indigestion.

> **Words:** Acute coronary syndrome (ACS) is an umbrella term for unstable angina and heart attacks, all from a sudden drop in blood flow.

Stable angina or acute coronary syndrome?

	Stable angina	Acute coronary syndrome
Trigger	Exercise or emotional stress	Can strike at rest, with little or no trigger
Pattern	Predictable	Unpredictable; episodes come more often over time
★ **Relief**	Eases within **about 5 minutes** of rest or nitroglycerin	Lasts longer; **not fully relieved**
Other symptoms	Pressure, tightness	Breathlessness, nausea, vomiting, sweating, dizziness, palpitations; women may feel only fatigue or indigestion
★ **What it means**	Rarely becomes a heart attack; managed for years with lifestyle changes and medicines	May already be a heart attack, or warn of one: **needs immediate care**

ECG and troponin

Finding	What it means
ST depression	Can suggest ischemia, though it has other causes. Ischemic muscle can recover if blood flow returns quickly
★ **ST elevation**	Injury happening now: getting blood flow back quickly matters most
Pathologic Q wave	Can suggest a previous infarction, but not every Q wave means dead tissue
★ **Troponin**	Released when heart muscle dies. Repeated over hours: **one early normal value doesn't rule a heart attack out**
Other tests	Echocardiogram, exercise stress test, scans; cardiac catheterization is the gold standard

Sublingual nitroglycerin

- ★ **One tablet at onset, then every 5 minutes, no more than 3 in 15 minutes**, with the client sitting.
- ★ Check the pressure first. **Never give it with very low pressure, riociguat, or sildenafil-type drugs for any reason.**
- Expect headache and dizziness.
- Open RN reports heart association advice: call emergency services if pain isn't better, or worsens, 5 minutes after the first tablet.
- Keep tablets in the original glass bottle, away from heat and light.

Immediate care: possible ACS

- ★ **Act at once**: notify the provider or call for emergency help. Chest pain that's new, different from usual, or persistent: activate emergency help promptly.
- ★ Get a **stat ECG**. Give oxygen for a **saturation under 90%**, or per protocol; routine oxygen at 90% or above doesn't help.
- Give nitroglycerin and aspirin as ordered: nitroglycerin widens the arteries; aspirin helps stop the clot from growing.
- Morphine is no longer first-line, because it's linked with worse outcomes, though it may be prescribed for pain.
- Antiplatelets like clopidogrel reduce clotting. Beta blockers lower the heart's oxygen demand by slowing the rate and lowering the pressure.
- Many clients need the artery reopened: a catheter and stent, or bypass surgery. A clot-dissolving drug may be ordered for some heart attacks; it's withheld with active bleeding, a recent stroke, or severe uncontrolled blood pressure.
- Reassess the pain, vital signs and rhythm after each step, and stay with the client. Staying calm with the client helps.

Educational use only. Not a substitute for clinical judgment, your facility's policy or the provider's orders. Where practice varies, follow facility policy and state law. No patient information.

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1 AT A GLANCE, CONTINUED

Cardiac catheterization

	What to do
★ Before	Confirm consent; take baseline vital signs; **ask about any prior contrast reaction: which agent, and what happened**. Check kidney function (the dye can harm the kidneys); review blood thinners and antiplatelets; tell the provider about metformin, which may be paused. Fast as ordered, IV access, site prepped
★ After	Pressure is held until bleeding stops; the client keeps the limb still for the set time. **Bleeding again: press firmly at once.** Check the pulse, color, warmth and feeling below the site, and compare with the other side. Monitor vital signs, rhythm and urine output; report any chest pain. Extra fluids help clear the dye, as ordered
At home	A small bruise is normal. Call for bleeding that pressure won't stop, swelling, discharge, or a limb that turns numb, cold or blue. Call emergency services for any heart attack or stroke symptoms

Watch: Iodine isn't an allergen; a shellfish or povidone-iodine allergy doesn't predict a contrast reaction.

Long-term care and teaching

- Medicines: antiplatelets, statins, blood pressure drugs like beta blockers and ACE inhibitors, antianginals like isosorbide. On antiplatelets, teach bleeding precautions and give aspirin with food; on a statin, report unexplained muscle pain.
- A heart-healthy diet low in saturated fat and salt, a healthy weight, and stopping smoking. Alcohol: no more than 2 drinks a day for men, 1 for women. 150 minutes of moderate exercise a week, like brisk walking.
- Track blood pressure at home; keep up with cholesterol checks. Stress, depression and anxiety affect the heart: raise them with the provider. Cardiac rehab helps prevent another heart attack.

2 PRIORITY AND SAFETY CALLS

★ Pain at rest for 20 minutes, not relieved by nitroglycerin: **treat it as acute coronary syndrome, an emergency**.

★ After a femoral cath, a soaked dressing and a cool, pale foot: **apply firm pressure to the site and call for help**.

★ A client on sildenafil: no nitroglycerin; blood pressure can drop severely.

Chest pain at rest with a saturation of 90%: get a stat ECG; routine oxygen isn't needed at this saturation.

A woman with fatigue and indigestion for two hours: don't dismiss vague symptoms.

After a radial cath, a cool, numb hand: report it at once.

3 EXAM ANCHORS

1. Stable angina: with exertion, predictable, relieved within 5 minutes.
2. Acute coronary syndrome: at rest, unrelieved, an emergency.
3. Act fast: ECG, oxygen if low, nitroglycerin, aspirin, and call.
4. ST elevation suggests injury happening now.
5. After catheterization: the site, the limb below it, the rhythm and the urine.
6. Traps: waiting for troponin before acting, morphine as first-line, and dismissing vague symptoms in women.

4 SELF-QUIZ

1. Stable angina eases within about _____ minutes of rest or nitroglycerin.
2. In possible ACS, give oxygen for a saturation under _____ %, or per protocol.
3. Sublingual nitroglycerin: no more than _____ tablets in 15 minutes.
4. ST _____ suggests injury that's happening now.
5. Don't give nitroglycerin with sildenafil or _____.
6. CAD age risk: men over 45, and women over _____.
7. Store nitroglycerin in its original _____ bottle.

ANSWER KEY 1. 5 · 2. 90 · 3. 3 · 4. elevation · 5. riociguat · 6. 55 · 7. glass

5 SOURCES

1. Open RN, Nursing: Health Alterations, 5.7 Coronary Artery Disease. wtcs.pressbooks.pub/healthalts/chapter/5-7-coronary-art…
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4. Open RN, Nursing Pharmacology 2e, 6.8 Antianginal Nitrates. wtcs.pressbooks.pub/pharmacology/chapter/6-8-antiangina…
5. DailyMed, Nitrostat (nitroglycerin) label. dailymed.nlm.nih.gov/dailymed/druglnfo.cfm
6. NHLBI, Cardiac Catheterization: Recovery. nhlbi.nih.gov/health/cardiac-catheterization/reco…
7. ACR Manual on Contrast Media. acr.org/clinical-resources/clinical-tools-a…

Built from RN PocketPal course lessons: Coronary artery disease and acute coronary syndrome (c08-l02). Every line on this sheet comes from those lesson scripts.

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