

Angina



- Anginal pain is a result of an imbalance between myocardial oxygen supply and demand.
- Pharmacological management is aimed at prevention of myocardial ischemia and pain as well as prevention of myocardial infarction and death.

- Anginal pain is managed with organic nitrates, beta adrenergic blocking agents, calcium channel blockers, and ranolazine.
- In addition, clients with chronic stable angina should concurrently take an antiplatelet agent, such as aspirin or clopidogrel (Plavix), a cholesterol-lowering agent, and an ACE inhibitor to prevent myocardial infarction and death.

Organic Nitrates

Select Prototype Medication:

- **Nitroglycerin**
 - Sublingual tablet: Nitrostat
 - Translingual spray: Nitrolingual
 - Topical ointment: Nitro-Bid
 - Transderm patch: Nitro-Dur
 - Intravenous: Nitro-Bid IV

Other Medications:

- Sublingual: isosorbide dinitrate (Isordil)
- Oral: isosorbide mononitrate (Imdur)

Expected Pharmacological Action

- In chronic stable exertional angina, nitroglycerin (NTG) dilates veins and decreases venous return (preload), which decreases cardiac oxygen demand.
- In variant (Prinzmetal's or vasospastic) angina, nitroglycerin prevents or reduces coronary artery spasm, thus increasing oxygen supply.

Therapeutic Uses

- Treatment of acute angina attack
- Prophylaxis of chronic stable angina or variant angina

Side/Adverse Effects

SIDE/ADVERSE EFFECTS	NURSING INTERVENTIONS/CLIENT EDUCATION
Headache	<ul style="list-style-type: none">• Instruct clients to use aspirin or acetaminophen to relieve pain.• Clients should notify the provider if symptoms do not resolve in a few weeks. Dosage may need to be reduced.
Orthostatic hypotension	<ul style="list-style-type: none">• Advise clients to sit or lie down if experiencing dizziness or faintness.• Clients should avoid sudden changes of position and rise slowly.
Reflex tachycardia	<ul style="list-style-type: none">• Monitor the client's vital signs.• Administer a beta-blocker such as metoprolol (Lopressor) if symptoms occur.
Tolerance	<ul style="list-style-type: none">• Use lowest dose needed to achieve effect.• All long-acting forms of nitroglycerin should be taken with a medication-free period each day (usually 8 hr).

Contraindications/Precautions

- Nitroglycerin is Pregnancy Risk Category C.
- This medication is contraindicated in clients with hypersensitivity to nitrates.
- Nitroglycerin is contraindicated in clients with traumatic head injury because the medication can increase intracranial pressure.
- Use cautiously in clients taking antihypertensive medications and clients who have renal or liver dysfunction.

Interactions

MEDICATION/FOOD INTERACTIONS	NURSING INTERVENTIONS/CLIENT EDUCATION
Use of alcohol can contribute to the hypotensive effect of nitroglycerin.	<ul style="list-style-type: none">• Advise clients to avoid use of alcohol.
Antihypertensive medications, such as beta-blockers, calcium channel blockers, and diuretics can contribute to hypotensive effect.	<ul style="list-style-type: none">• Use nitroglycerin cautiously in clients receiving these medications.
Use of sildenafil (Viagra) and nitroglycerin can result in life-threatening hypotension.	<ul style="list-style-type: none">• Instruct clients not to take sildenafil if prescribed nitroglycerin.

Nursing Administration

ROUTE	USE	NURSING INTERVENTIONS/CLIENT EDUCATION
<p>Sublingual tablet and translingual spray</p> <ul style="list-style-type: none">• Rapid onset• Short duration	<ul style="list-style-type: none">• Treat acute attack• Prophylaxis of acute attack	<ul style="list-style-type: none">• Use this rapid-acting nitrate at the first sign of chest pain. Do not wait until pain is severe.• Use prior to activity that is known to cause chest pain, such as climbing a flight of stairs.• For sublingual tablet:<ul style="list-style-type: none">○ Place the tablet under the tongue and allow it to dissolve.○ Tablets should be stored in original bottles, and in a cool, dark place.○ Discard tablets after 24 months unless indicated on the package.• Translingual spray should be sprayed against oral mucosa and not inhaled.

Transmucosal

- Rapid onset
- Long duration

- Treat acute attack
- Prophylaxis of acute attack
- Long-term prophylaxis against anginal attacks

- Use this rapid-acting nitrate at the first sign of chest pain. Do not wait until pain is severe.
- Use prior to activity that is known to cause chest pain, such as climbing a flight of stairs.
- Do not chew the tablet, but place the tablet between the upper lip and gum, or between the cheek and gum to be dissolved.

Sustained-release
oral capsules

- Slow onset
- Long duration

- Long-term
prophylaxis
against anginal
attacks

- Swallow capsules without crushing or
chewing.

<p>Transdermal</p> <ul style="list-style-type: none">• Slow onset• Long duration	<ul style="list-style-type: none">• Long-term prophylaxis against anginal attacks	<ul style="list-style-type: none">• To ensure appropriate dose, patches should not be cut.• Place the patch on a hairless area of skin (chest, back, or abdomen) and rotate sites to prevent skin irritation.• Wash skin with soap and water and dry thoroughly before applying new patch.• Remove the patch at night to reduce the risk of developing tolerance to nitroglycerin. Be medication-free a minimum of 8 hr each day.
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ROUTE	USE	NURSING INTERVENTIONS/CLIENT EDUCATION
Topical ointment <ul style="list-style-type: none"> • Slow onset • Long duration 	<ul style="list-style-type: none"> • Long-term prophylaxis against anginal attacks 	<ul style="list-style-type: none"> • Remove the prior dose before a new dose is applied. Measure specific dose with applicator paper and spread over 2.5 to 3.5 inches of the paper. • Apply to a clean, hairless area of the body, and cover with clear plastic wrap. • Follow same guidelines for site selection as for transdermal patch. • Avoid touching ointment with the hands.
Intravenous	<ul style="list-style-type: none"> • Control of angina not responding to other medications • Control of BP or induced hypotension during surgery • Heart failure resulting from acute MI 	<ul style="list-style-type: none"> • Administer with IV tubing supplied by manufacturer using a glass IV bottle. • Administer continuously due to short duration of action. • Start at a slow rate, usually 5 mcg/min, and titrate gradually until desired response is achieved. • Provide continuous cardiac monitoring during administration.

Treatment of Anginal Attack

- Instruct the client to stop activity.
- The client should take a dose of rapid-acting nitroglycerin immediately.
- If pain is unrelieved in 5 min, the client should call 9-1-1 or be driven to an emergency department.
- The client can take up to two more doses at 5 min intervals.

- Advise clients not to stop taking long-acting nitroglycerin abruptly and follow the provider's instructions.
- Advise clients who have angina to record pain frequency, intensity, duration, and location. The provider should be notified if attacks increase in frequency, intensity, and/or duration.

Nursing Evaluation of Medication Effectiveness

Depending on therapeutic intent, effectiveness may be evidenced by:

- Prevention of acute anginal attacks
- Long-term management of stable angina
- Control of perioperative blood pressure
- Control of heart failure following acute MI

Antianginal Agent

Select Prototype Medication:

- Ranolazine (Ranexa)

Expected Pharmacological Action

- Lowers cardiac oxygen demand and thereby improves exercise tolerance and decreases pain

Therapeutic Uses

- Chronic stable angina in combination with amlodipine (Norvasc), a beta adrenergic blocker or an organic nitrate.

Side/Adverse Effects

SIDE/ADVERSE EFFECTS	NURSING INTERVENTIONS/CLIENT EDUCATION
QT prolongation	Monitor ECG
Elevated blood pressure	Monitor blood pressure

Contraindications/Precautions

- Ranolazine is contraindicated in clients who have QT prolongation or in clients taking other medications that can result in QT prolongation.
- This medication is contraindicated in clients who have liver dysfunction.
- Use cautiously in older adult clients.

Interactions

MEDICATION/FOOD INTERACTIONS	NURSING INTERVENTIONS/CLIENT EDUCATION
Inhibitors of CYP3A4 can increase levels of ranolazine and lead to torsades de pointes. Agents include grapefruit juice, HIV protease inhibitors, macrolide antibiotics, azole antifungals and verapamil.	<ul style="list-style-type: none">• Avoid concurrent use.
Quinidine and sotalol (Betapace) can further increase QT interval	<ul style="list-style-type: none">• Avoid concurrent use.
Concurrent use of digoxin (Lanoxin) and simvastatin (Zocor) increases serum levels of digoxin and simvastatin.	<ul style="list-style-type: none">• Monitor digoxin level.• Instruct client to report muscle weakness.

Nursing Administration

- Administer as an extended release oral tablet, twice daily.
- Obtain baseline and monitor ECG for QT prolongation.
- Obtain baseline and monitor digoxin level with concurrent use.

Nursing Evaluation of Medication Effectiveness

Depending on therapeutic intent, effectiveness may be evidenced by:

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- Long-term management of stable angina