Bile-Acid Sequestrants (BAS)

Cholestyramine · Colestipol · Colesevelam

💊 Antilipemic Agent | ❤️ Cardiovascular System | 📘 NCLEX-RN 2026 | 🎯 Pharmacology High-Yield

▼ Expand All | ▲ Collapse All | 1·Overview | 2·MOA | 3·Therapeutic | 4·Side Effects | 5·Nursing | 6·Labs | 7·Admin | 8·Education | 9·NCLEX Traps | 10·Memory | 🏆 Drugs | 🧠 Snapshot

1 Drug Overview

PRIMARY INDICATIONS

- **Primary hypercholesterolemia** — lowers LDL ~15–30%
- **Adjunct to statins** for severe / refractory hyperlipidemia
- **Pruritus from partial biliary obstruction** (cholestyramine — classic board question)
- **Diarrhea** from bile-acid malabsorption (e.g., post-ileal resection, Crohn's)
- **Type 2 Diabetes glycemic control** — *colesevelam only* (FDA-approved)

🎯 **High-Yield Clinical Use:** BAS are **NOT absorbed systemically** — safest lipid-lowering drug in pregnancy/lactation. Remain in the GI tract and are excreted in feces.

2 Mechanism of Action (Simplified)

→ BAS binds **bile acids** in the intestinal lumen

→ Bile acid–drug complex **excreted in feces** (not reabsorbed)

→ Liver must use **cholesterol** to synthesize new bile acids

→ Hepatic cholesterol stores ↓ → **LDL receptors ↑** on hepatocytes

→ Increased **clearance of LDL** from bloodstream

RESULT: ↓ LDL · slight ↑ HDL · may ↑ Triglycerides ⚠️

🔑 **Key concept:** BAS work *inside the gut* — they never enter the bloodstream. This is why GI side effects dominate and systemic effects are rare.

3 Therapeutic Effects

✓ **LDL ↓ 15–30%** within 4–7 days; maximum effect in ~1 month

✓ **HDL ↑ slightly** (3–5%)

✓ **Pruritus relief** in cholestatic liver disease (cholestyramine binds accumulated bile salts)

✓ **Decreased diarrhea** from bile-acid malabsorption

✓ **HbA1c ↓** in type 2 DM (colesevelam) — ~0.5% reduction

WHAT TELLS YOU IT'S WORKING?

→ Repeat lipid panel shows **LDL dropping** in 4–6 weeks

→ Patient reports **less itching** (biliary disease)

→ Stool pattern normalizes (bile-acid diarrhea)

4 Side Effects & Adverse Reactions

COMMON (GI-DOMINANT)

- **Constipation** — the #1 side effect (up to 28%)
- Bloating, flatulence, abdominal pain
- Nausea, dyspepsia, heartburn
- Unpleasant gritty taste (powder forms)
- Steatorrhea (fatty, foul-smelling stools)

SERIOUS / LIFE-THREATENING 🚨

- 🚨 **Fecal impaction / bowel obstruction** — may require hospitalization
- 🚨 **Hypertriglyceridemia** — can precipitate **acute pancreatitis** if TG > 500 mg/dL
- 🚨 **Fat-soluble vitamin deficiency (A, D, E, K)** — chronic use
- 🚨 **Bleeding** — ↓ Vitamin K absorption → ↑ PT/INR (⚠️ especially with warfarin)
- 🚨 **Hyperchloremic metabolic acidosis** — rare; pediatrics more susceptible
- 🚨 **GI perforation** in patients with preexisting bowel pathology

⚠️ **Toxicity Red Flags:** Severe abdominal pain · absent bowel sounds · black tarry stools · unusual bleeding/bruising · epigastric pain radiating to back (pancreatitis).

5 Priority Nursing Considerations

ASSESS / MONITOR

→ **Assess** bowel pattern BEFORE each dose — baseline stool history

→ **Monitor** lipid panel q 4–6 weeks until stable, then q 3–6 months

→ **Monitor** triglycerides at baseline and ongoing (contraindicated if elevated)

→ **Monitor** PT/INR if on warfarin — vitamin K absorption affected

→ **Assess** for abdominal distension, rigidity, absent bowel sounds

→ **Notify** provider for severe constipation, bleeding, or epigastric pain

🛑 HOLD / CONTRAINDICATED

- **Complete biliary obstruction** (no bile to bind)
- **Bowel obstruction** or severe constipation
- **TG > 500 mg/dL** (cholestyramine/colestipol) — pancreatitis risk
- **Dysphagia** (colesevelam tablets — can swell/obstruct esophagus)
- Phenylketonuria (PKU) — some powders contain aspartame

✅ GIVE / SAFE TO ADMINISTER

- Patient with **adequate bowel function** + good hydration
- LDL elevated, TG < 300 mg/dL
- Pregnancy / lactation (safer than statins — not absorbed)
- Pediatric familial hypercholesterolemia
- All meds properly time-separated

💊 KEY DRUG INTERACTIONS (BAS BINDS MANY DRUGS!)

⚠ **Warfarin** — ↓ absorption → subtherapeutic INR; but ↓ vitamin K can also ↑ INR. **Monitor closely**.

⚠ **Digoxin** — ↓ levels → loss of efficacy

⚠ **Levothyroxine** — ↓ absorption → hypothyroid return

⚠ **Thiazides, loop diuretics** — ↓ absorption

⚠ **Oral contraceptives** — ↓ absorption → contraceptive failure

⚠ **Statins, ezetimibe, fibrates** — space timing

⚠ **Fat-soluble vitamins (ADEK)** — ↓ absorption

⏰ **THE GOLDEN RULE:** Give all other medications **1 hour BEFORE** or **4–6 hours AFTER** bile-acid sequestrants. This is one of the most

tested BAS concepts on the NCLEX.

6 Labs & Diagnostics

KEY LABS TO MONITOR

- **LDL-C** — Goal: < 100 mg/dL (< 70 high-risk ASCVD)
- **HDL-C** — Goal: > 40 (M) / > 50 (F) mg/dL
- **Triglycerides** — Goal: < 150 mg/dL
- **Total cholesterol** — Goal: < 200 mg/dL
- **PT/INR** — especially if on warfarin (therapeutic 2–3)
- **LFTs** — AST, ALT baseline and periodic
- **Electrolytes** — chloride, bicarbonate (acidosis risk)
- **Fat-soluble vitamin levels** (A, D, E, K) if long-term

CRITICAL VALUES — ACT NOW:

- **TG > 500 mg/dL** → HOLD drug, notify provider (pancreatitis risk)
- **INR > 4 (on warfarin)** → bleeding risk, notify provider
- **LFTs > 3× ULN** → consider hepatic involvement
- **HCO_3^- < 22 mEq/L** → metabolic acidosis workup

7 Administration & Safety

ROUTE & TIMING

- **Route:** PO only (powder, granules, or tablet)
- **Powder formulations** (cholestyramine, colestipol): mix in 4–6 oz of **water, juice, or non-carbonated beverage**
- **Let stand 1–2 minutes** to fully hydrate — improves palatability, reduces esophageal irritation
- **Administer with meals** (bile acids released during digestion)
- **Colesevelam:** tablet form, take with 8 oz water + meal

🚨 HIGH-ALERT / NEVER-EVENTS

🚨 **NEVER give dry** — powder must always be mixed (aspiration/esophageal impaction risk)

🚨 **NEVER mix with carbonated beverages** — foaming/frothing → expulsion

🚨 **NEVER give with other oral meds simultaneously** — binds and inactivates them

🚨 **NEVER crush colesevelam** tablets — swallow whole

🚨 **Avoid in bowel obstruction** — can worsen impaction

> 💡 **Tip for palatability:** Refrigerate the mixed slurry, use pulpy juice (orange), or let sit longer. Follow with additional fluids to prevent esophageal irritation.

8 Patient Education

TEACH THE PATIENT

- ✓ **Always mix powder with fluid** — never swallow dry
- ✓ **Time other medications:** 1 hour before OR 4–6 hours after BAS
- ✓ **Increase fiber and fluids** — prevent constipation (25–35 g fiber/day; 2–3 L water)

- ✓ **Continue diet & exercise** — BAS is adjunct, not replacement
- ✓ **Take fat-soluble vitamin supplements** (ADEK) if on long-term therapy
- ✓ **Follow-up lipid panels** as scheduled
- ✓ **Women on OCPs:** use backup contraception — absorption may decrease

🚨 WHEN TO SEEK HELP

- ⚠ Severe constipation > 3 days or no bowel movement
- ⚠ Black, tarry stools (melena) or bloody stools
- ⚠ Unusual bleeding or bruising (↓ vitamin K)
- ⚠ Severe abdominal pain, especially radiating to the back (pancreatitis)
- ⚠ Persistent nausea, vomiting, or inability to keep fluids down
- ⚠ Yellow skin/eyes (jaundice — biliary issue)

9 NCLEX Test Traps ⚠️

COMMON CONFUSIONS

- ⚠ **BAS ≠ Statins.** Statins inhibit HMG-CoA reductase (liver). BAS bind bile in the gut. Different MOA, different monitoring. Don't confuse myopathy/rhabdomyolysis (statins) with constipation (BAS).
- ⚠ **"Take at bedtime"** applies to *statins*, NOT BAS. BAS is taken **with meals**.
- ⚠ **Triglycerides:** BAS can ↑ TG. If baseline TG > 500 → contraindicated (cholestyramine/colestipol). **Colesevelam** is slightly safer but still cautioned.
- ⚠ **Powder preparation:** Test writers love the detail of "mix with fluid" — never give dry, never with carbonated drinks.
- ⚠ **Drug timing:** "1 hour before OR 4–6 hours after" — if the question shows BAS being given with digoxin/warfarin/levothyroxine at the same time, that's the WRONG answer.

⚠ **Warfarin + BAS:** trap is that bleeding can go BOTH ways (↓ warfarin absorption OR ↓ vitamin K). The answer is always **monitor INR closely**.

⚠ **Pregnancy:** BAS is the *preferred* lipid agent in pregnancy (not absorbed) — statins are contraindicated (Category X).

PRIORITY VS NON-PRIORITY

→ **PRIORITY:** Bowel obstruction, pancreatitis (TG spike), bleeding (INR change)

→ **Important but not life-threatening:** constipation, nausea, vitamin deficiency

→ **Expected / teach:** gritty taste, bloating, need to time other meds

10 Memory Boosters 🧠

📌 **"BAS BINDS BILE"**

- **B**owel problems (constipation)
- **A**bsorption ↓ of ADEK vitamins + other drugs
- **S**eparate other meds by 1 hr before / 4–6 hr after
- **B**ile acids bound in gut → excreted
- **I**ncreased LDL receptors on liver
- **N**ever give dry powder
- **D**iet + fluids = prevent constipation
- **S**afe in pregnancy (not absorbed)

📌 **The "-AMINE / -IPOL / -SEVELAM" Pattern**

- Cholestyr**amine** — original, strongest binder, worst taste
- Colest**ipol** — similar to cholestyramine

- Colesevelam — newest, best tolerated, tablet form, FDA-approved for T2DM

📌 "4 Cs" of BAS Priority Problems

- Constipation (most common)
- Cholesterol (↓ LDL — goal)
- Clotting (vitamin K ↓ → bleeding)
- Clashing drugs (bind other meds)

📌 Lipid Drug Class Pattern (quick recall across classes)

- Statins = "-statin" → liver; myopathy, ↑ LFTs
- BAS = "-amine/-ipol/-sevelam" → gut; constipation
- Fibrates = "-fibrate" → ↓ TG; gallstones, myopathy
- Ezetimibe = "Zetia" → brush border; ↓ cholesterol absorption
- PCSK9i = "-ocumab" → injection; powerful LDL ↓
- Niacin = vitamin B3 → flushing (give ASA pre-dose)

🏆 Most Tested Drugs in This Class

DRUG	FORM	KEY POINTS	UNIQUE NCLEX PEARL
Cholestyramine Questran · Prevalite	Powder (mix w/ fluid)	• Oldest, most-tested BAS • Strong LDL ↓ • Worst taste / grittiness • Most drug interactions	**Classic Rx for pruritus of biliary obstruction.** Contraindicated if TG > 500.

DRUG	FORM	KEY POINTS	UNIQUE NCLEX PEARL
Colestipol Colestid	Powder or tablet	• Similar efficacy to cholestyramine • Slightly better tolerated • Tablet must be swallowed whole	Tablet formulation may be preferred for palatability concerns.
Colesevelam Welchol	Tablet or oral suspension	• Newest, best-tolerated • Fewer drug interactions • FDA-approved: LDL + Type 2 DM • Less impact on TG	**Only BAS also approved for glycemic control (↓HbA1c).** Caution: dysphagia risk — swallow with full glass of water.

🎯 **Key Differentiator for the NCLEX:** If the question emphasizes **pruritus + jaundice** → think **cholestyramine**. If the question emphasizes **Type 2 DM + hyperlipidemia** → think **colesevelam**. If the question mentions **"gritty taste" or "mixing with juice"** → powder forms (cholestyramine, colestipol).

🧠 Clinical Judgment Snapshot

❶ #1 PRIORITY RISK

Severe constipation → fecal impaction → bowel obstruction. Secondary: hypertriglyceridemia-induced acute pancreatitis (TG > 500).

❷ WHAT WILL HARM THE PATIENT FIRST?

Drug–drug interaction: BAS binds warfarin, digoxin, levothyroxine, and OCPs in the gut. Subtherapeutic levels → clotting, cardiac events, hypothyroidism, or bleeding (from ↓ vitamin K) can happen within days.

❸ FIRST NURSING ACTION IN A SCENARIO

ASSESS bowel function & current medication list BEFORE administration. Verify timing separation (1 hr before / 4–6 hr after other meds), confirm the powder is fully mixed in fluid, and check baseline lipid panel (especially triglycerides).

HOLD the drug and notify provider if bowel obstruction, TG > 500 mg/dL, or complete biliary obstruction.

⚡ 60-SECOND EXAM-DAY RECAP

BAS = binds bile in gut → liver pulls cholesterol → LDL ↓. Not absorbed → safe in pregnancy but tons of GI effects. Constipation is #1. Mix powder with fluid, never dry. Space other meds 1 hr before or 4–6 hr after. Watch triglycerides, INR, vitamin K. Colesevelam also treats T2DM.

📘 Aligned with NCLEX-RN 2026 Test Plan · NGN format · NCJMM clinical judgment framework
Study resource for Student · Pharmacology: Cardiovascular Module