

DIANE'S NGN NCLEX 2026 VISUAL STUDY LIBRARY · NEUROLOGICAL / PHARMACOLOGY

Cholinergic *Crisis*

A life-threatening overdose state from too much acetylcholine — the dangerous mirror image of myasthenic crisis. High-yield for NCLEX prioritization, antidote recognition, and the SLUDGE-killer-B's pattern.

SYSTEM: NEUROMUSCULAR

BODY SYSTEM: AUTONOMIC

 MEDICAL EMERGENCY

NGN DOMAIN: PHARMACOLOGY & SAFETY



Content sourcing note: Cholinergic Crisis is not yet in Diane's uploaded reference notes. This infographic draws from standard NGN NCLEX 2026 references — *Saunders Comprehensive Review (2025)*, *ATI RN Pharmacology Made Easy*, *Lippincott NCLEX-RN Review*, and *CDC clinical guidelines on organophosphate poisoning*.



Definition & Overview

WHAT IT IS · WHY IT MATTERS

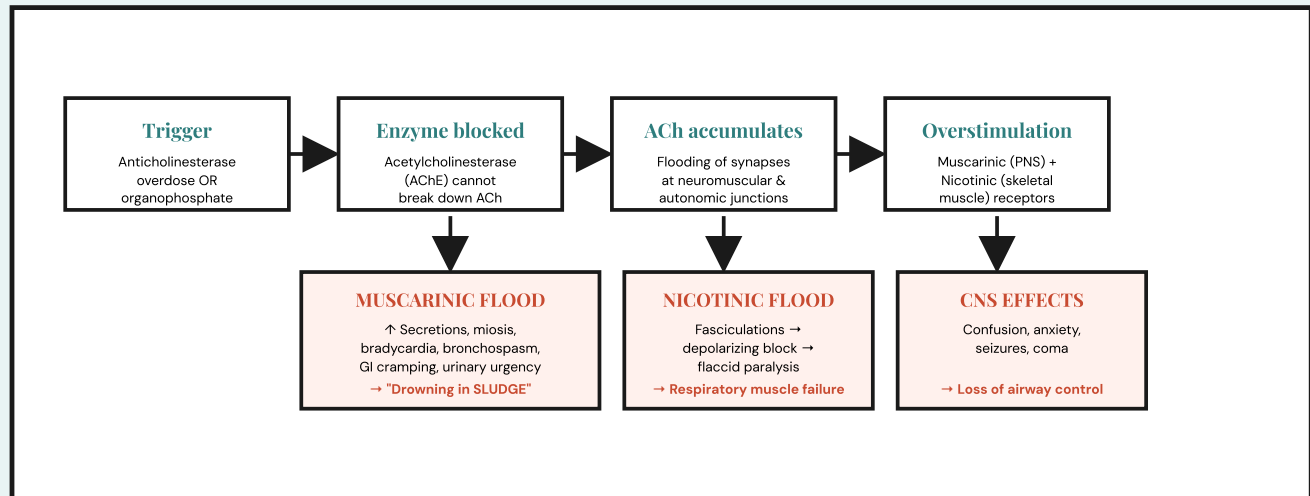
- **Cholinergic crisis** is an acute, life-threatening state of *excess acetylcholine (ACh)* at neuromuscular junctions and parasympathetic synapses, producing flooded secretions, paralysis, and respiratory failure.
- Two classic causes: **(1) Overdose of anticholinesterase drugs** in myasthenia gravis (e.g., pyridostigmine / Mestinon, neostigmine) or Alzheimer's (donepezil, rivastigmine), and **(2) Organophosphate poisoning** — pesticides, insecticides, or nerve agents (sarin, VX).
- It is the *opposite* of myasthenic crisis: cholinergic = **too much** medication; myasthenic = **too little**. Distinguishing them is a top-tier NCLEX skill — the wrong dose can kill.

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Pathophysiology

STEP-BY-STEP MECHANISM

Acetylcholine is normally broken down by the enzyme **acetylcholinesterase (AChE)**. When AChE is inhibited — by drugs or toxins — ACh accumulates and floods both **muscarinic** (parasympathetic) and **nicotinic** (skeletal muscle) receptors.



Bottom line: The patient dies from *respiratory failure* — drowning in secretions + paralyzed diaphragm. Airway is everything.



Signs & Symptoms

EARLY VS. LATE · RED FLAGS

Symptoms appear within minutes of the trigger and escalate rapidly. Use the **SLUDGE-M** or **DUMBBELS** mnemonic to scan for muscarinic features, then add the Killer B's and muscle weakness.

Early / Mild

- ▶ Excessive salivation, drooling
- ▶ Watery eyes (lacrimation)
- ▶ Sweaty, clammy skin (diaphoresis)
- ▶ Nausea, abdominal cramping, diarrhea
- ▶ Increased urinary frequency
- ▶ Mild muscle twitching (fasciculations)
- ▶ Blurred vision, miosis (pinpoint pupils)
- ▶ Restlessness, anxiety

Late / Severe 🚨

- ▶ **Bronchospasm + bronchorrhea** (wet, frothy secretions)
- ▶ **Bradycardia** & hypotension
- ▶ Profound muscle weakness → flaccid paralysis
- ▶ Respiratory muscle paralysis → **apnea**
- ▶ Seizures, loss of consciousness
- ▶ Pinpoint, non-reactive pupils
- ▶ Pulmonary edema (non-cardiogenic)
- ▶ Coma → cardiac arrest



RED FLAG TRIAD — "The Killer B's": Bronchospasm · Bronchorrhea · Bradycardia. Together they signal imminent respiratory arrest.

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Priority Nursing Interventions

ABC FRAMEWORK · ACTION VERBS

The order matters on NGN: **protect airway** → **reverse the toxin** → **support the patient**. Atropine is the antidote you give first.

A

AIRWAY — SECURE IT FIRST

- **Suction** copious oral and pulmonary secretions continuously
- **Position** patient side-lying or with head turned to prevent aspiration
- **Prepare** for emergency endotracheal intubation — keep crash cart at bedside
- **Have** oxygen and bag-valve-mask immediately ready

B

BREATHING — ANTICIPATE FAILURE

- **Administer** 100% oxygen via non-rebreather initially
- **Monitor** SpO₂, respiratory rate, depth, and accessory muscle use
- **Auscultate** for crackles, wheezes, diminished sounds — secretions can sound like fluid overload
- **Prepare** for mechanical ventilation; bronchorrhea defeats most BVM attempts

C

CIRCULATION & ANTIDOTE

- **Administer ATROPINE IV** — the antidote — repeated until secretions dry up and HR > 80
- **Administer Pralidoxime (2-PAM)** if organophosphate poisoning — reactivates AChE if given early
- **HOLD** all cholinergic medications (pyridostigmine, neostigmine, donepezil)
- **Decontaminate** skin/clothes if organophosphate exposure (wear PPE — toxin absorbs through skin)
- **Monitor** continuous ECG (bradydysrhythmias), BP, urine output, and LOC
- **Anticipate** benzodiazepines for seizures

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Pharmacology

CAUSES & ANTIDOTES

Drug / Agent	Class	Mechanism & Use	Key Nursing Considerations
Pyridostigmine (Mestinon)	Anticholinesterase	Inhibits AChE → ↑ ACh; treats myasthenia gravis . Most common cause of cholinergic crisis.	Give on a strict schedule; do not double dose. Hold if SLUDGE symptoms appear.
Neostigmine (Prostigmin)	Anticholinesterase	Same mechanism; also reverses non-depolarizing neuromuscular blockers post-op.	Always co-administered with glycopyrrolate or atropine to blunt muscarinic effects.
Donepezil, Rivastigmine, Galantamine	Central anticholinesterase	Increase ACh in the CNS for Alzheimer's disease .	Risk of cholinergic toxicity in dose increases; monitor for bradycardia and GI symptoms.
Organophosphates (Malathion, parathion, sarin, VX)	Toxin / irreversible AChE inhibitor	Bind irreversibly to AChE. Found in pesticides and nerve agents.	Decontaminate first — toxin is skin-absorbed. Wear full PPE. Antidote: atropine + pralidoxime.
★ ATROPINE SULFATE	Antidote (anticholinergic)	Competes with ACh at muscarinic receptors → dries secretions, ↑ HR, dilates pupils.	Endpoint of dosing: drying of pulmonary secretions (NOT pupil size or HR). Doses are often large and repeated.
★ Pralidoxime (2-PAM Chloride)	Antidote (cholinesterase reactivator)	Used specifically for organophosphate poisoning . Reactivates AChE before irreversible "aging" occurs.	Effective only if given <i>early</i> (within hours). Give with atropine, not as a substitute for it.

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NCLEX Test Traps

WHAT STUDENTS CONFUSE

Cholinergic crisis is engineered to confuse you with myasthenic crisis. Memorize these traps cold — they show up on every test plan.

⚠️ TRAP / WRONG THINKING

"The patient with myasthenia is weak — I'll give the next dose of pyridostigmine."



✓ RIGHT PRIORITY

HOLD the dose and assess for SLUDGE. If salivation, miosis, and cramping are present, this is cholinergic crisis — more drug will kill.

⚠️ TRAP

Choosing **Tensilon (edrophonium)** as the antidote.



✓ RIGHT

ATROPINE is the antidote. Tensilon is a *diagnostic* drug: it *improves* myasthenic crisis but *worsens* cholinergic crisis.

⚠️ TRAP

Treating bradycardia first with chest compressions or pacing.



✓ RIGHT

Bradycardia here is *muscarinic*. **Atropine** fixes both the bradycardia and the secretions at the same time. Airway always comes first.

⚠️ TRAP

Confusing pinpoint pupils with stroke or opioid overdose.



✓ RIGHT

Pinpoint pupils + **wet** secretions + bradycardia = cholinergic. Pinpoint pupils + **dry** + apneic = opioid (give naloxone).

⚠️ TRAP

Decontaminating an organophosphate patient with bare hands.



✓ RIGHT

Don PPE first. Organophosphates absorb through skin — the nurse is at risk of secondary poisoning. Remove clothing, irrigate skin copiously.

Cholinergic Crisis

- ▶ Cause: **TOO MUCH** medication
- ▶ Pupils: **Pinpoint** (miosis)
- ▶ Skin: **Wet** (sweaty, salivating)
- ▶ Secretions: **Excessive**
- ▶ Tensilon test: **Worsens** symptoms
- ▶ Treat with: **Atropine** + hold drug

Myasthenic Crisis

- ▶ Cause: **TOO LITTLE** medication / illness / stress
- ▶ Pupils: **Normal** or dilated
- ▶ Skin: **Dry**
- ▶ Secretions: **Normal / dry mouth**
- ▶ Tensilon test: **Improves** symptoms
- ▶ Treat with: **More** anticholinesterase + ventilatory support

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Patient & Family Education

PREVENTION & SELF-MONITORING



Take medication on a strict schedule

Pyridostigmine works only in narrow blood-level windows. Set alarms; never double up after a missed dose.



Keep a medication and symptom log

Record doses, missed doses, and any SLUDGE-type symptoms. Bring to every appointment.



Wear a medical alert bracelet

Identifies myasthenia gravis or anticholinesterase use — critical if found unconscious.



Recognize early warning signs

Drooling, cramping, sweating, diarrhea, blurred vision, or muscle twitches → call provider *before* the next dose.



Avoid organophosphate exposure

Wear gloves and long sleeves when handling pesticides; store away from food. Decontaminate immediately if exposed.



Tell every prescriber

Some drugs (aminoglycosides, beta-blockers, certain anesthetics) worsen myasthenia and shift the crisis balance.



Time meals around doses

Take pyridostigmine 30–45 minutes before meals to ease chewing and swallowing and prevent aspiration.



Have an emergency plan

Know the nearest ER, keep atropine information accessible, and instruct family on calling 911 for difficulty breathing.

8

Memory Boosters

MNEMONICS & PATTERN RECOGNITION

SLUDGE-M

Muscarinic flood — the classic teaching mnemonic

S Salivation

L Lacrimation

U Urination

D Defecation /
Diarrhea

G GI
cramping

E Emesis

M Miosis /
Muscle
weakness

DUMBBELS

Expanded mnemonic — includes the Killer B's

D Diarrhea

U Urination

M Miosis

B Bradycardia

B Bronchospasm
/ Bronchorrhea

E Emesis

L Lacrimation

S Salivation
/ Sweating

The 3 Killer B's

The fatal triad that drives respiratory failure

B Bronchospasm

B Bronchorrhea

B Bradycardia

Quick Pattern Recognition

When you see these together, think CHOLINERGIC CRISIS

1 Wet
patient +
pinpoint pupils

2 Slow
heart +
flooded lungs

3 Recent
dose increase
of Mestinon

4 Farmer or
pesticide
exposure

5 Improves
with ATROPINE

One-liner to lock it in: "Cholinergic crisis drowns the patient in their own secretions — atropine dries them out."



NCJMM Clinical Judgment Scenario

NEXT GENERATION NCLEX · SIX-STEP MODEL

Case: A 58-year-old woman with a 6-year history of myasthenia gravis is brought to the ED by her husband. She takes pyridostigmine 60 mg PO every 4 hours. The husband reports she has been feeling "weaker than usual" for two days and took two extra doses today. On arrival: drooling, sweaty, tearful eyes, complaining of cramping and blurred vision. **Vitals:** HR 48, BP 96/58, RR 26 (labored, gurgling), SpO₂ 89% on RA, pupils 2 mm bilaterally, diffuse fasciculations of the face and arms.

1

Recognize Cues

Drooling, lacrimation, diaphoresis, miosis (2 mm), bradycardia (48), hypotension (96/58), labored gurgling respirations, SpO₂ 89%, fasciculations, recent **extra dosing** of pyridostigmine. Cluster: muscarinic + nicotinic + respiratory.

2

Analyze Cues

The full SLUDGE picture plus the Killer B's, plus a clear precipitating event (extra doses), points to **cholinergic crisis** — not myasthenic crisis (which would be dry, with no secretions). The patient is in early respiratory failure.

3

Prioritize Hypotheses

Highest priority: **impending respiratory failure** from bronchorrhea + paralysis. Next: bradycardia/hypotension. Rule out myasthenic crisis (dry, would improve with edrophonium) and opioid overdose (dry, no secretions).

4

Generate Solutions

HOLD pyridostigmine immediately. Administer **atropine IV** until secretions dry. Suction airway. Apply 100% O₂ non-rebreather. Prepare intubation supplies and notify ICU. Place on continuous cardiac/SpO₂ monitor. Notify provider.

5

Take Action

Stop the home medication, suction copiously, administer atropine 1 mg IV per order and repeat per protocol, position side-lying, oxygenate, draw labs (ABG, cholinesterase level), stay at bedside, and document the time of last pyridostigmine dose.

6

Evaluate Outcomes

Expected: secretions dry up, HR > 80, SpO₂ > 94%, respirations easier, pupils dilate slightly, fasciculations resolve. **Red flags:** rising EtCO₂, persistent bradycardia, declining LOC → escalate for intubation and ICU transfer.

