NCLEX-RN PHARMACOLOGY · 2026 TEST PLAN · NGN + NCJMM ALIGNED

Meperidine *(Demerol)*

CLASS
Opioid Analgesic — Synthetic μ-agonist (phenylpiperidine)

SYSTEM
CNS · Pain Management

SCHEDULE
DEA Schedule II

⚠ HIGH-ALERT MEDICATION · NORMEPERIDINE NEUROTOXICITY RISK · MAOI = FATAL ⚠

01 Drug Overview

INDICATIONS

- **Short-term moderate-to-severe acute pain** (use limited to <48 hours)
- **Post-op shivering** (low-dose, unique indication — tested on NCLEX)
- **Pre-op sedation** / procedural pain
- **NOT a first-line opioid** — largely replaced due to toxicity profile
- ❌ *Not for chronic pain, cancer pain, or sickle cell crisis*

> **Why it matters:** *Meperidine looks like "just another opioid" on the NCLEX — but the test writers hide a landmine. It has a toxic metabolite with a LONG half-life (15–20 hrs) that morphine does not.*

02 Mechanism of Action

HOW IT WORKS

STEP 1 → Binds μ-opioid receptors in CNS (brain + spinal cord)

STEP 2 → ↓ Pain perception + altered emotional response to pain

STEP 3 → Also blocks sodium channels (mild local anesthetic effect)

STEP 4 → Anticholinergic/atropine-like structure → **tachycardia + mydriasis**

LIVER → Metabolized to **NORMEPERIDINE** (active, neurotoxic)

KIDNEY → Normeperidine excreted renally — **accumulates in renal impairment**

RESULT → Buildup lowers seizure threshold → **tremors, myoclonus, seizures**

03 Therapeutic Effects

IS IT WORKING?

- **Onset:** IV 5 min · IM/SubQ 10–15 min · PO 15 min
- **Peak:** 30–60 minutes
- **Duration: 2–4 hours** (much shorter than morphine's 4–5 hrs — NCLEX trap)
- **Expected outcome:** Pain score ↓ by 2+ points within 30 minutes
- Patient verbalizes comfort · able to participate in recovery (deep breathing, ambulating)
- Post-op shivering: reduction or cessation within 5–10 min
- Vital signs remain stable: HR regular, RR ≥ 12, SpO_2 ≥ 92%

04 Side Effects & Adverse Reactions

RECOGNIZE EARLY

Common (monitor & support)

- Drowsiness, dizziness, euphoria
- Nausea & vomiting
- Constipation *(less than morphine)*
- Dry mouth · flushing · diaphoresis
- Orthostatic hypotension
- Urinary retention
- **Tachycardia + mydriasis** *(opposite of morphine!)*
- Pruritus (histamine release)

LIFE-THREATENING

Serious (stop & intervene)

- **Respiratory depression** (RR < 12) → coma → death
- **Normeperidine toxicity:** tremors, twitching, myoclonus → **SEIZURES**
- **Serotonin syndrome** (w/ MAOIs, SSRIs, SNRIs, linezolid, tramadol)
- **Hypertensive crisis** (w/ MAOIs within 14 days) — FATAL
- Delirium, hallucinations, psychosis (especially elderly)
- Severe hypotension, bradycardia (late), cardiac arrest
- Physical dependence, tolerance, withdrawal
- Anaphylaxis · histamine-induced bronchospasm

Critical pattern: *Normeperidine neurotoxicity =* **CNS excitation** *(tremors, seizures). This is the OPPOSITE of classic opioid sedation — and* **naloxone will NOT reverse the seizures***. It may even worsen them.*

05 Priority Nursing Considerations

ASSESS · MONITOR · HOLD · NOTIFY

→ ASSESS & MONITOR

- **Respiratory rate** (Q15 min × 1 hr after IV dose)
- Sedation scale (POSS / RASS)
- Pain reassess 30 min after IV / 60 min after PO
- BP, HR, SpO_2, LOC
- Bowel sounds, last BM, urine output
- **Screen for tremors, myoclonus, confusion** (normeperidine)
- Renal function (creatinine, GFR) before & during
- MAOI / SSRI / antidepressant history — **ASK EVERY TIME**

⊘ CONTRAINDICATIONS

- **MAOI use within 14 days** (absolute — fatal)
- Renal impairment / AKI / CKD
- Seizure disorder or ↑ ICP
- Severe hepatic impairment
- **Elderly (Beers Criteria — avoid)**
- Sickle cell crisis (lowers seizure threshold)
- Chronic pain / long-term therapy
- Severe respiratory compromise (COPD, asthma attack, sleep apnea)

✋ HOLD & NOTIFY PROVIDER IF:

- ✋ **RR < 12/min** or SpO_2 < 92%
- ✋ SBP < 90 mmHg or significant drop from baseline
- ✋ Sedation score indicates difficult to arouse
- ✋ **Any tremors, twitching, myoclonic jerks, or seizure activity**
- ✋ Patient reports taking MAOI, SSRI, SNRI, linezolid, or St. John's wort
- ✋ New or worsening confusion / delirium
- ✋ Creatinine rising or UOP < 30 mL/hr
- ✋ Already received max daily dose (< 600 mg/24 hr) or used > 48 hrs

06 Labs & Diagnostics

WATCH THESE NUMBERS

LAB	NORMAL / TARGET	WHY IT MATTERS
Serum Creatinine	0.6–1.2 mg/dL	↑ Cr = normeperidine accumulation → seizure risk
BUN	7–20 mg/dL	Renal function marker — trend with dosing
GFR	> 90 mL/min	< 60 = AVOID meperidine entirely
AST / ALT	10–40 U/L	Hepatic metabolism — impairment ↑ drug levels
SpO_2 / ABG	SpO_2 ≥ 92% · $PaCO_2$ 35–45	Resp depression → ↑ $PaCO_2$ (respiratory acidosis)
Serum Electrolytes	K^+ 3.5–5.0	Baseline — important if seizure workup needed

No therapeutic drug level exists *for meperidine on standard monitoring — toxicity is recognized clinically by neuro symptoms. Trust your assessment.*

07 Administration & Safety

HIGH-ALERT MEDICATION

ROUTES & DOSING

- **IV:** dilute, push **slowly over 1–2 min** (rapid = histamine/hypotension)
- **IM/SubQ:** avoid repeated IM (erratic absorption, tissue damage)
- **PO:** ~25% bioavailability — PO doses higher than parenteral
- **Max:** < 600 mg/24 hr · duration < 48 hrs
- Not recommended for PCA pump

SAFETY RULES

- **Naloxone (Narcan) at bedside** — always
- Two-RN verification per facility policy (controlled substance)
- Count & waste documentation (Schedule II)
- Bed low, call light in reach, fall precautions
- Monitor with continuous SpO_2 / capnography in high-risk patients
- Do NOT mix in same syringe with barbiturates (precipitate)

08 Patient Education

TEACH & DISCHARGE

- **Take only as prescribed** — do not double-dose or crush extended-release
- **NO alcohol, benzodiazepines, sleep aids, or other opioids**
- **Tell every provider** you are on this — especially before starting any antidepressant
- Do NOT take if on or recently stopped an MAOI (phenelzine, selegiline, linezolid)
- Change positions slowly (orthostatic hypotension)
- No driving or operating machinery
- ↑ fluids, fiber, ambulation to prevent constipation; stool softener often prescribed
- **Seek ER care immediately for:** muscle twitching, tremors, confusion, high fever + sweating + agitation (serotonin syndrome), RR < 10, or unresponsiveness
- Store locked away from children, pets, visitors · return unused meds to a take-back program
- Discuss with provider if pain persists beyond expected duration — do NOT self-escalate

09 NCLEX Test Traps ⚠

DON'T FALL FOR THESE

- **TRAP 1:** "Give meperidine for this patient's sickle cell pain." → ❌ Contraindicated — lowers seizure threshold, chronic use. **Correct: morphine or hydromorphone.**
- **TRAP 2:** "Patient on phenelzine needs pain relief." → ❌ NEVER give meperidine. 14-day MAOI washout required. Fatal hypertensive crisis / serotonin syndrome.
- **TRAP 3:** Expecting bradycardia + miosis (like morphine). → Meperidine causes **TACHYCARDIA + MYDRIASIS** (atropine-like structure).
- **TRAP 4:** Giving naloxone for meperidine-induced seizures. → Naloxone reverses respiratory depression, NOT seizures. May worsen them. **Correct: seizure precautions, benzodiazepine per order.**
- **TRAP 5:** "The elderly patient on meperidine is just confused from surgery." → ❌ Assume normeperidine toxicity or delirium. Beers Criteria: AVOID in elderly.
- **TRAP 6:** Scheduling meperidine q3–4h for 5 days post-op. → ❌ Max 48 hrs total. Accumulation = neurotoxicity.
- **TRAP 7:** Renal patient with "just one dose." → Even single doses in renal failure can accumulate. Check creatinine first.
- **TRAP 8:** Priority question: "New-onset muscle twitching in a patient receiving meperidine q3h × 4 days." → This is **normeperidine toxicity**, not anxiety or restlessness. HOLD the drug, notify provider — priority over pain reassessment.

10 Memory Boosters

QUICK RECALL

"The 4 NO's of Meperidine"

NO MAOIs (within 14 days)
NO Renal impairment
NO Older adults (Beers)
NO Chronic pain / > 48 hrs use

"DEMEROL" — what it does wrong

D — Delirium / Dependence
E — Elderly: avoid
M — MAOI = fatal
E — Excreted by kidneys (accumulates)
R — Respiratory depression
O — Only for short-term (< 48 hr)
L — Lowers seizure threshold

Meperidine vs Morphine — opposites

Morphine = bradycardia + **MI**osis (pinpoint pupils)
Meperidine = tachycardia + **MY**driasis (dilated pupils)
"M&M's have MIOSIS — if pupils are big, it's meperidine."

"Normeperidine Twitch Triad"

T remors · **T** witching · **T** onic-clonic activity
→ If you see any T, HOLD the drug. Naloxone won't fix this.

Clinical Judgment Snapshot

NCJMM PRIORITY

#1 PRIORITY RISK

Normeperidine-induced seizures from metabolite accumulation — especially in **renal impairment, elderly, or use > 48 hrs**. Co-equal fatal risk: **serotonin syndrome / hypertensive crisis** with MAOIs.

WHAT HARMS THE PATIENT FIRST

Acutely → **respiratory depression** (minutes after IV dose). With repeated dosing → **CNS excitation: tremors → myoclonus → seizures**. If MAOI present → **hypertensive crisis / hyperthermia within minutes**.

FIRST NURSING ACTION (SCENARIO-BASED)

Before giving: Assess **RR, LOC, and MAOI/antidepressant history**. Check renal function.
If RR < 12: **HOLD → stimulate patient → notify provider → prepare naloxone**.
If tremors/twitching appear: **HOLD drug → seizure precautions → notify provider**. Do NOT give another dose. Do NOT rely on naloxone.
If MAOI history discovered: **DO NOT ADMINISTER** — clarify order with provider immediately.