PHARMACOLOGY · PSYCHIATRIC · ANTIDEPRESSANTS

Monoamine Oxidase Inhibitors (MAOIs)

High-risk antidepressants requiring strict dietary & drug-interaction surveillance

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TOPIC 67 · PSYCH PHARM SERIES

SOURCE DISCLOSURE

This topic was not present in Diane's uploaded personal notes. Content compiled from standard NCLEX references: Saunders Comprehensive Review for the NCLEX-RN (2026), ATI RN Pharmacology Made Easy 4.0, Lippincott Illustrated Reviews: Pharmacology (8th ed.), Davis's Drug Guide, and FDA prescribing information for phenelzine, tranylcypromine, isocarboxazid, and selegiline.

SECTION 01

1 Definition & Overview

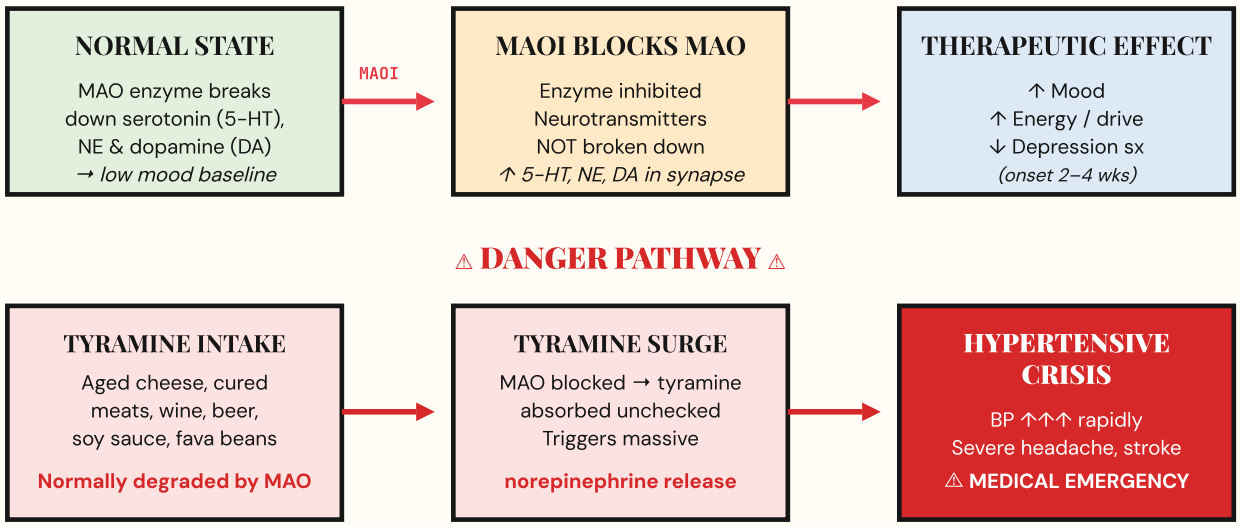
- **MAOIs** are one of the **oldest classes of antidepressants**, reserved for **atypical or treatment-resistant depression** when SSRIs and SNRIs have failed.
- They work by **blocking monoamine oxidase** (MAO), the enzyme that breaks down serotonin, norepinephrine, and dopamine — boosting all three at the synapse.
- High therapeutic value but **high-risk profile** due to potential for **hypertensive crisis** (with tyramine foods) and **serotonin syndrome** (with other antidepressants).

NCLEX Pearl: If a client on an MAOI develops a severe occipital headache, stiff neck, and palpitations — assume **hypertensive crisis** until proven otherwise. This is the #1 emergency tested.

SECTION 02

2 Pathophysiology & Mechanism

Monoamine oxidase exists in two forms: **MAO-A** (breaks down serotonin, norepinephrine, dopamine, & tyramine in the gut/liver) and **MAO-B** (breaks down primarily dopamine). MAOIs block these enzymes — non-selectively or selectively — allowing neurotransmitters to accumulate.



Why this matters: Tyramine is a sympathomimetic that normally never reaches systemic circulation because gut MAO inactivates it. Block MAO → tyramine floods the bloodstream → norepinephrine dumps from nerve terminals → catastrophic BP spike.

SECTION 03

3 Side Effects vs. Adverse Effects

COMMON Side Effects

- **Orthostatic hypotension** (most common)
- Dizziness, lightheadedness
- Insomnia / sleep disturbance
- Weight gain
- Dry mouth
- Constipation
- Sexual dysfunction
- Peripheral edema
- Blurred vision

RED FLAG Adverse / Crisis

- **Hypertensive crisis** (tyramine)
- **Serotonin syndrome** (drug interaction)
- Severe occipital headache
- Stiff/sore neck
- Palpitations, tachycardia, chest pain
- Diaphoresis, flushing
- Nausea/vomiting, photophobia
- Dilated pupils
- Suicidal ideation (black-box warning)

Hypertensive Crisis vs. Serotonin Syndrome — Don't Confuse Them:
• **HTN crisis** = food trigger (tyramine) → severe headache, stiff neck, BP ↑↑, NO hyperreflexia.
• **Serotonin syndrome** = drug trigger (SSRI/SNRI/Demerol) → hyperthermia, agitation, *hyperreflexia, clonus, tremor*, diarrhea.

SECTION 04

4 Priority Nursing Interventions (ABCs)

A Airway

- Assess for **stridor/laryngeal edema** in serotonin syndrome.
- Have suction & airway equipment ready in crisis.

B Breathing

- Monitor RR & SpO_2 — serotonin syndrome causes tachypnea.
- Auscultate lungs if chest pain reported.

C Circulation

- **BP every visit** — both sitting & standing for orthostasis.
- Hold dose & notify HCP if BP ≥ 180/120 or severe HA.
- Have **phentolamine** ready for crisis.

Ongoing Safety & Assessment

- **Suicide screen** at every visit — energy returns BEFORE mood lifts in weeks 2–4, putting clients at **increased suicide risk**.
- **Onset is delayed 2–4 weeks** — teach client not to stop early thinking "it doesn't work."
- Reconcile all meds (Rx, OTC, herbal) at every encounter — drug interactions can be fatal.
- Tapering required — never stop abruptly (discontinuation syndrome).
- **Washout periods**: 14 days off MAOI before starting other antidepressants; 14 days off SSRI before MAOI (5 weeks for fluoxetine due to long half-life).
- Educate on tyramine diet & have client carry **medical alert ID**.

If hypertensive crisis suspected: Stop medication → assess BP & symptoms → notify HCP/Rapid Response → administer ordered **phentolamine IV** (alpha-adrenergic blocker, drug of choice) → continuous cardiac monitoring → reduce environmental stimuli.

SECTION 05

5 MAOI Drug Comparison Table

DRUG (BRAND)	SELECTIVITY	INDICATION	KEY SIDE EFFECTS / ADVERSE	NURSING & TEACHING PEARLS
Phenelzine *(Nardil)*	Non-selective, irreversible (MAO-A & B)	Atypical & treatment-resistant depression, anxiety, social phobia	Orthostatic hypotension, insomnia, weight gain, sexual dysfunction, edema. **Highest tyramine risk.**	Strict tyramine-free diet. BP at each visit. Take in AM to ↓ insomnia. Avoid OTC decongestants. 14-day washout.
Tranylcypromine *(Parnate)*	Non-selective, irreversible	Major depression (especially atypical)	Same as phenelzine + amphetamine-like stimulation (more insomnia, agitation)	Most stimulating MAOI — give early in day. Same diet & interaction precautions. Watch BP closely.
Isocarboxazid *(Marplan)*	Non-selective, irreversible	Major depression	Hepatotoxicity, orthostasis, weight gain, dizziness	Monitor LFTs. Same diet rules. Less commonly used. Caution with hepatic disease.
Selegiline (oral) *(Eldepryl, Zelapar)*	Selective MAO-B at low dose; non-selective at high dose	Parkinson's disease (low dose)	Nausea, dizziness, dyskinesia, insomnia. Diet restrictions *not* needed at low PD doses.	Used as adjunct to levodopa. Take with breakfast/lunch to ↓ insomnia. Diet restrictions DO apply at antidepressant doses.
Selegiline (transdermal) *(EMSAM patch)*	Selective MAO-B at lowest dose only	Major depression	Application site reaction, insomnia, headache, orthostasis	**No dietary restrictions at 6 mg/24 hr patch only;** higher patch strengths require tyramine-free diet. Rotate sites. Avoid heat (↑ absorption).
Rasagiline *(Azilect)*	Selective MAO-B, irreversible	Parkinson's disease	Headache, joint pain, dyspepsia, orthostasis	Same interaction concerns as other MAOIs. Avoid with SSRIs, meperidine, sympathomimetics.

Memory hook: The "classic three" oral antidepressant MAOIs all end in **-zid, -zine, or -mine** → *Phenelzine, Tranylcypromine, Isocarboxazid*. All require strict diet teaching.

SECTION 06

6 NCLEX Test Traps ⚠️

TRAP #1 · **Confusing hypertensive crisis with serotonin syndrome.**
✗ **Wrong:** Treating any agitation in a client on an MAOI as serotonin syndrome.
✓ **Right:** Look at the trigger and exam — food = HTN crisis (severe HA, stiff neck, BP↑); drug interaction = serotonin syndrome (hyperthermia, hyperreflexia, clonus).

TRAP #2 · **Picking "stop the medication" as the first action in hypertensive crisis.**
✗ **Wrong:** Hold the next dose and reassess in 1 hour.
✓ **Right:** Acute crisis = ABC priority → **monitor BP, notify HCP, administer phentolamine**. Holding the dose is a step but not the immediate priority.

TRAP #3 · **Forgetting the washout period when switching antidepressants.**
✗ **Wrong:** Starting an SSRI the day after stopping an MAOI.
✓ **Right:** Wait **14 days** between MAOIs and most other antidepressants (5 weeks if coming off fluoxetine).

TRAP #4 · **Allowing "just a little" cheese or wine.**
✗ **Wrong:** Telling the client small portions of aged cheese are okay.
✓ **Right:** Zero tolerance. Even small amounts of aged/fermented foods can trigger crisis with non-selective MAOIs.

TRAP #5 · **Missing Demerol (meperidine) as a fatal interaction.**
✗ **Wrong:** Administering meperidine for postop pain in a client on phenelzine.
✓ **Right:** **Meperidine + MAOI = potentially fatal serotonin syndrome.** Use morphine or other non-serotonergic opioid instead.

TRAP #6 · **"The medication isn't working" at week 1.**
✗ **Wrong:** Recommending dose increase after one week.
✓ **Right:** Full therapeutic effect takes **2–4 weeks**; reassure and continue. Energy returns before mood — monitor closely for suicide risk.

SECTION 07

7 Patient Education — Tyramine & Beyond

The cornerstone of MAOI teaching is the **tyramine-free diet**. Tyramine forms when proteins are *aged, fermented, pickled, smoked, or spoiled*. Teach the client to read every label and ask about food preparation when dining out.

🚫 AVOID — High Tyramine

- **Aged cheeses** — cheddar, blue, brie, camembert, parmesan, gorgonzola, swiss, feta
- **Cured/smoked/aged meats** — salami, pepperoni, summer sausage, prosciutto, smoked fish, herring
- **Fermented foods** — sauerkraut, kimchi, miso, tofu, tempeh
- **Soy products** — soy sauce, teriyaki sauce, fish sauce
- **Yeast extracts** — Marmite, Vegemite, brewer's yeast
- **Alcohol** — red wine, vermouth, tap beer, sherry, liqueurs
- **Overripe / spoiled** — bananas, avocados, figs
- **Fava beans** (broad beans), snow peas
- **Caffeine / chocolate** in large amounts

✅ GENERALLY SAFE

- Fresh meats, poultry, fish (cooked & eaten same day)
- Fresh fruits & vegetables (except those listed)
- Eggs, milk, cottage cheese, cream cheese, ricotta
- Breads & cereals (without yeast extract)
- Pasta, rice, potatoes
- Decaffeinated coffee/tea (moderate amounts)
- Water, juices

*When in doubt — leave it out. Continue diet for **2 weeks after stopping** the MAOI.*

Additional Teaching Points

- **OTC medications:** AVOID cold remedies, decongestants (pseudoephedrine, phenylephrine), cough suppressants with dextromethorphan, weight-loss products, stimulants, and St. John's Wort. *Always check with pharmacist before any OTC.*
- **Anesthesia & surgery:** Notify all providers — including dentist — that you are on an MAOI. Avoid **meperidine (Demerol)**.
- **Medical alert ID:** Wear at all times listing the MAOI name.
- **Rise slowly** from sitting/lying to prevent falls (orthostasis).
- **Onset 2–4 weeks** for full effect — don't stop early; don't double dose if missed.
- **Suicide watch:** Report worsening mood, hopelessness, or thoughts of self-harm — especially in first 4–6 weeks.
- **Sign of crisis = ER NOW:** sudden severe headache (especially back of head), stiff/sore neck, palpitations, sweating, chest pain, vision changes.
- **Continue diet 2 weeks after discontinuation** — enzyme regeneration takes that long.

SECTION 08

8 Memory Boosters & Mnemonics

M·A·O·I

Monitor BP · **A**void Tyramine · **O**TCs are off-limits · **I**nteractions kill (Demerol, SSRIs)

S·A·V·E·D

Foods to skip: **S**moked / aged meats & fish · **A**ged cheese · **V**ino (red wine) & tap beer · **E**xtracts (yeast, soy sauce) · **D**ried/overripe fruit & fava beans

"3 H's"

Hypertensive Crisis warning: **H**eadache (severe occipital) · **H**eart racing (palpitations) · **H**ot & sweaty (diaphoresis, flushing).
Add stiff neck = call 911.

Quick Associations

- **Phenelzine** → Phenelzine = "Phen**e**lzine forbids **e**verything" (most diet restrictions)
- **EMSAM patch** → low-dose only = no diet (but rip-and-eat-cheese is still risky if patient increases dose)
- **Demerol + MAOI = Death** (alliteration helps lock it in)
- "**T**ired? **T**ry **MAOI**" — used when SSRIs fail, especially in atypical depression

Pattern Recognition

- If exam stem mentions *aged, fermented, smoked, pickled, or "leftover"* food + antidepressant → think MAOI + tyramine.
- Severe occipital headache + stiff neck + recent meal = **hypertensive crisis**.
- Hyperreflexia + clonus + agitation + recent drug change = **serotonin syndrome**.
- "Postop pain, on phenelzine" stem → choose **morphine** over meperidine.

SECTION 09

9 NCJMM Clinical Judgment Scenario

Scenario: *A 52-year-old client with treatment-resistant depression has been on phenelzine 45 mg/day for 3 weeks. She presents to the ED 2 hours after attending a wine-and-cheese reception, reporting a sudden, severe, throbbing headache at the base of her skull, stiff neck, palpitations, and "feeling hot all over."*
Vital signs: *BP 218/124, HR 122, RR 22, T 99.4°F, SpO_2 97% RA. Pupils dilated; skin flushed and diaphoretic. Alert and oriented ×3.*

1 Recognize Cues

Severe occipital headache · stiff neck · BP 218/124 (hypertensive emergency range) · tachycardia · diaphoresis · flushing · dilated pupils · recent tyramine exposure (aged cheese + wine) · on phenelzine 3 weeks. *Relevant negative:* no clonus, no hyperreflexia, no diarrhea (helps rule out serotonin syndrome).

2 Analyze Cues

The pattern — tyramine-rich meal + non-selective MAOI + sudden severe headache with BP >180/120 — fits **hypertensive crisis**. Tyramine bypassed inhibited MAO, triggering massive norepinephrine release. End-organ risk: stroke, MI, intracranial hemorrhage, hypertensive encephalopathy. Differentiated from serotonin syndrome by absence of neuromuscular hyperactivity and hyperthermia.

3 Prioritize Hypotheses

Highest priority: Hypertensive crisis with tyramine reaction → risk for stroke/MI. **Lower priority differentials:** Migraine, primary HTN urgency, pheochromocytoma, serotonin syndrome (less likely without hyperreflexia). Act on the highest-acuity hypothesis first.

4 Generate Solutions

- Establish IV access; continuous cardiac & BP monitoring (q5 min initially).
- Hold MAOI; notify HCP and Rapid Response.
- Anticipate orders for **phentolamine 5 mg IV** (alpha-blocker, drug of choice) or IV nicardipine/labetalol per protocol.
- Reduce stimuli (quiet, dim room); semi-Fowler's position.
- Neuro checks q15 min for signs of stroke.
- Obtain 12-lead ECG, troponin, BMP, CT head if neuro changes.
- Educate after stabilization on tyramine avoidance.

5 Take Action

Nurse holds the next phenelzine dose, places client on continuous monitoring, starts IV NS at KVO, administers phentolamine 5 mg IV as ordered, repeats BP q5 min, documents neuro status, and notifies HCP of trends. Maintains a calm, low-stimulus environment.

6 Evaluate Outcomes

Expected: BP decreases gradually (avoid rapid drop >25% in first hour — risk of cerebral hypoperfusion) toward 160/100 within 1–2 hours, HR <100, headache resolving, no neuro deficits, no chest pain. **Unexpected (escalate):** continued BP rise,

focal neuro deficits, chest pain, altered LOC, or hyperreflexia/clonus emerging → re-evaluate for stroke or serotonin syndrome.

SECTION 10

10 Quick Reference — One-Page Recall

⚙️ Mechanism

Block MAO enzyme → ↑ serotonin, norepinephrine, dopamine in synapse → improved mood.

🎯 Used For

Atypical depression, treatment-resistant depression, anxiety; selegiline/rasagiline for Parkinson's.

⏱️ Onset

Therapeutic effect at **2–4 weeks**. Energy returns before mood — watch for suicide risk.

🩺 Monitor

BP (sitting & standing), mood/suicide screen, LFTs (isocarboxazid), med reconciliation.

🚫 Avoid

Tyramine foods · OTC decongestants · SSRIs/SNRIs/TCAs · St. John's Wort · **Meperidine**.

🆘 Antidote (HTN crisis)

Phentolamine IV (alpha-blocker) — drug of choice.

⏳ Washout

14 days between MAOI and other antidepressants (**5 weeks** if from fluoxetine).

🍽️ Diet Continues

Tyramine-free diet for **2 weeks after** stopping the MAOI (enzyme regeneration).