

● NCLEX-RN PHARMACOLOGY • 2026 TEST PLAN

★ PROTOTYPE: ETHOSUXIMIDE

Succinimides

Silence the Spike-&-Wave

DRUG CLASS

Anticonvulsant / Antiepileptic (AED)

BODY SYSTEM

Neurological / CNS

FIRST-LINE FOR

Absence (Petit Mal) Seizures

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Drug Overview

WHY WE GIVE IT • HIGH-YIELD USE

- ▶ **Drug of choice** for **absence (petit mal) seizures** — especially in children ages 3–16
- ▶ Treats brief (5–10 sec) "blank stare" episodes with sudden loss of awareness
- ▶ Suppresses the characteristic **3-Hz spike-and-wave pattern** on EEG
- ▶ **NOT effective** for tonic-clonic, partial, or myoclonic seizures
- ▶ Methsuximide (Celontin) used for **refractory** absence seizures
- ▶ Often selected over valproic acid in pediatric patients due to better cognitive side-effect profile

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Mechanism of Action

HOW PHYSIOLOGY CHANGES

- ▶ Blocks **T-type (low-threshold) calcium channels** in **thalamic neurons**
- ▶ Thalamus is the "relay station" that drives abnormal absence-seizure rhythms
- ▶ ↓ Ca^{2+} influx → ↓ thalamocortical oscillations → ↓ 3-Hz spike-and-wave
- ▶ Does NOT affect Na^+ channels (unlike phenytoin) or GABA (unlike benzos/barbiturates)

Ethosuximide → blocks **T-type Ca^{2+} channels** in thalamus

- ↓ calcium entry into thalamic neurons
- ↓ abnormal thalamocortical firing (3-Hz spike-and-wave)
- **Absence seizure suppressed**

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Therapeutic Effects

WHAT TELLS YOU IT'S WORKING

- ▶ ↓ Frequency or complete **elimination of absence seizures**
- ▶ Fewer "daydreaming" or "zoning-out" episodes reported by teachers/parents
- ▶ Improved **school performance, attention,** and engagement
- ▶ **EEG normalization** — resolution of 3-Hz spike-wave pattern
- ▶ Therapeutic serum level achieved: **40–100 mcg/mL**
- ▶ Goal: seizure-free status with minimal side effects



Side Effects & Adverse Reactions

COMMON VS LIFE-THREATENING

Common EXPECTED

- ▶ **GI upset** — nausea, vomiting, abdominal pain, anorexia (MOST COMMON)
- ▶ Drowsiness, dizziness, fatigue, ataxia
- ▶ **Hiccups** — classic, unique hallmark of ethosuximide *
- ▶ Headache, weight loss
- ▶ Mood changes, irritability
- ▶ Gingival hyperplasia (less than phenytoin, but monitor)

Serious / Life-Threatening

- ▶ **Stevens-Johnson Syndrome (SJS) / TEN** — any rash = emergency, STOP drug
- ▶ **Blood dyscrasias** — aplastic anemia, agranulocytosis, thrombocytopenia
- ▶ **SLE-like syndrome** (lupus-like reaction with joint pain, malar rash)
- ▶ **Suicidal ideation** — class warning for ALL AEDs
- ▶ Hepatotoxicity (rare) — jaundice, ↑ LFTs
- ▶ Paradoxical **emergence of tonic-clonic seizures**

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Priority Nursing Considerations

ASSESS • MONITOR • HOLD • NOTIFY

- ▶ **ASSESS** Baseline seizure pattern, frequency, duration, triggers
- ▶ **ASSESS** Skin for any new rash on every shift — could be SJS
- ▶ **MONITOR** CBC with differential (baseline + routine)
- ▶ **MONITOR** LFTs, renal function, serum drug levels
- ▶ **MONITOR** Mood / suicidal ideation at every visit
- ▶ **HOLD** If rash, fever, sore throat, unusual bleeding/bruising, jaundice
- ▶ **HOLD** If suicidal ideation or severe depression emerges
- ▶ **NOTIFY** HCP for any adverse reaction — never stop abruptly
- ▶ **CAUTION** Hepatic/renal impairment, pregnancy (Category C/D — teratogenic)
- ▶ **INTERACT** ↑ levels with valproic acid, isoniazid • additive CNS depression with alcohol/opioids

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Labs & Diagnostics

CRITICAL VALUES • WHAT ABNORMAL MEANS

LAB / TEST	THERAPEUTIC RANGE	CRITICAL / CONCERNING	WHAT IT MEANS
Ethosuximide serum level	40–100 mcg/mL	>100 mcg/mL = toxic	Sedation, ataxia, GI distress, confusion
CBC with differential	WBC 4,500–11,000	WBC <3,500 or ANC <1,500	Bone-marrow suppression • infection risk
Platelets	150,000–400,000	<100,000	Bleeding risk • thrombocytopenia
LFTs (AST / ALT)	Within normal limits	>3× upper limit	Hepatotoxicity — hold & notify
BUN / Creatinine	BUN 7–20 • Cr 0.6–1.2	Rising trend	Renal impairment — dose adjustment
EEG	Resolution of 3-Hz spike-wave	Persistent spike-wave	Inadequate control — titrate dose



Administration & Safety

ROUTE • TIMING • PRECAUTIONS

- ▶ **Route:** PO only — capsules or oral suspension
- ▶ **Take WITH food or milk** to reduce GI upset (MOST COMMON SE)
- ▶ Same time every day — adherence is critical for seizure control
- ▶ **Shake suspension well** before each dose
- ▶ Do NOT crush or chew extended-release capsules
- ▶ Store at room temperature, away from light/moisture
- ▶ **Never stop abruptly** — taper over weeks to prevent **status epilepticus**
- ▶ Seizure precautions: padded side rails, suction/O₂ at bedside, nothing in mouth during seizure
- ▶ Avoid driving/operating machinery until response to drug is established

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Patient Education

WHAT THE PATIENT MUST KNOW

✓ Take It Right

- ▶ Take **EXACTLY** as prescribed — **never skip or double doses**
- ▶ Take **WITH** food to prevent nausea
- ▶ **Never stop suddenly** — causes status epilepticus
- ▶ Keep follow-up appointments for drug levels & CBC

🚨 Call Provider NOW If...

- ▶ **Any rash**, blistering, mouth sores, or fever
- ▶ Sore throat, unusual bruising or bleeding
- ▶ Yellow skin or eyes (jaundice)
- ▶ Thoughts of self-harm or severe depression
- ▶ Seizures worsen or change in pattern

⚠️ Avoid

- ▶ **Alcohol** and other CNS depressants
- ▶ Driving until response is known
- ▶ Pregnancy without consultation (teratogenic)
- ▶ OTC meds without provider approval

⚡ Safety Tips

- ▶ Wear **medical alert bracelet**
- ▶ Keep a **seizure diary** (frequency, triggers, duration)
- ▶ Maintain good oral hygiene — regular dental visits
- ▶ Use effective contraception; plan pregnancy with neurologist

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NCLEX Test Traps !

COMMON STUDENT MISTAKES

TRAP 01 • WRONG SEIZURE TYPE

Ethosuximide does NOT treat tonic-clonic, partial, or myoclonic seizures. Those need phenytoin, carbamazepine, valproate, or levetiracetam. Succinimides = **absence only**.

TRAP 02 • DON'T CONFUSE WITH SUCCINYLCHOLINE

Succinimides (anti-seizure, oral) are COMPLETELY different from **succinylcholine** (IV neuromuscular blocker used in RSI/intubation). Spelling is the only similarity.

TRAP 03 • "SEIZURE-FREE, SO STOP THE DRUG"

Abrupt discontinuation → **status epilepticus**. Always taper slowly over weeks under neurology guidance.

TRAP 04 • "JUST A RASH"

ANY new rash could be **Stevens-Johnson Syndrome**. PRIORITY action = hold the drug & notify provider immediately — do NOT just apply lotion or reassure.

TRAP 05 • MISSING AGRANULOCYTOSIS CUES

Sore throat + fever in a patient on ethosuximide is NOT a simple cold — suspect **bone marrow suppression**. Get a STAT CBC.

TRAP 06 • PRIORITY ORDER

Safety & airway ALWAYS outrank drug levels and education. If an NCLEX question offers "check drug level" vs "protect airway during seizure" → airway wins.

TRAP 07 • HICCUPS ARE BENIGN

Hiccups are an **expected** side effect of ethosuximide — don't escalate or hold the drug for hiccups alone.

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Memory Boosters

MNEMONICS · PATTERNS · QUICK RECALL

"ETH0 = Absence"

Ethosuximide for **A**bsence seizures. The drug name literally starts with the treatment indication.

Think "T"

T-type Ca^{2+} channels · **T**halamus · a**TT**ention lapses (absence).
Three T's link MOA to symptom.

3 H's of Ethosuximide

Hiccups · **H**eadache · **H**eme (blood dyscrasias). The three things to teach and monitor.

Absence seizure signs

Blank stare · **B**rief (5–10 sec) · **N**o aura · **N**o postictal state. Kid "pauses" mid-sentence & resumes.

"Silence the Spike-and-Wave"

Succinimides **S**uppress the 3-Hz **S**pike-and-wave pattern.
Three S's = three hertz.

"ZARONTIN for the Zone-out"

Brand name **Zarontin** → treats the "zoning-out" stare episodes of absence seizures.

SOS for SJS

Stop the drug · **O**btain provider · **S**upport airway. Any rash = SJS until proven otherwise.

AED class rule

All AEDs carry suicidal-ideation warning + require **slow taper**.
Never stop abruptly — this is true for every antiepileptic.



Clinical Judgment *Snapshot*

NGN PRIORITY • NCJMM MODEL • THINK LIKE THE NCLEX

📌 #1 PRIORITY RISK

Stevens-Johnson Syndrome and **blood dyscrasias** (agranulocytosis, aplastic anemia). Either can kill before a seizure does.

☹️ WHAT HARMS FIRST

Severe skin reaction OR bone-marrow suppression → **sepsis / hemorrhage**. Abrupt withdrawal → **status epilepticus**. Toxic serum level > 100 mcg/mL.

⚙️ FIRST NURSING ACTION

Rash + fever + mucosal involvement → **HOLD drug, notify provider, protect airway**. **Active seizure** → turn patient to side, protect head, time it, never restrain.

★ Most Tested Drugs in This Class

KNOW THE PROTOTYPE. RECOGNIZE THE DIFFERENCES.

DRUG (GENERIC • BRAND)	ROLE / INDICATION	KEY PEARL	NCLEX TESTED?
Ethosuximide (Zarontin)	First-line for absence seizures; pediatric preferred	Classic hiccups • GI upset • narrow indication (absence ONLY)	★★★★★ Prototype — know cold
Methsuximide (Celontin)	Refractory absence seizures (when ethosuximide fails)	More potent + more toxicity; higher SJS & blood dyscrasia risk	★★ Low-yield
Phensuximide (Milontin)	Absence seizures (mostly historical)	Least effective; rarely prescribed today	★ Rare

★ NCLEX PHARM INFOGRAPHIC • SUCCINIMIDES • ETHOSUXIMIDE FOCUS
FOR STUDY • NOT MEDICAL ADVICE • VERIFY AGAINST CURRENT REFERENCES