NCLEX · 2026 TEST PLAN — OB / MATERNITY — PHARMACOLOGY

Tocolytics.

The four drugs every nursing student must know to halt preterm labor — indications, toxicity, priority assessments, and the exam traps that cost points.

HIGH-YIELD | PRIORITY | SAFETY | PHARM | ABCS

01 OVERVIEW

What *are* tocolytics?

1

Definition

Medications that **suppress uterine contractions** to delay preterm labor (PTL).

2

Window

Given between **24–34 weeks** gestation when cervical change < 4 cm.

3

Why it matters

Buys **48 hrs** for corticosteroids (betamethasone) to mature fetal lungs.

48h	24–34	4	#1
TARGET DELAY	WEEKS GESTATION	CORE DRUGS	GOAL: LUNG MATURITY

02 PATHOPHYSIOLOGY — SIMPLIFIED

How *preterm labor* unfolds

TRIGGER	CASCADE	CONTRACT	CERVIX	STOP
Infection, stretch, stress <37 wks	Prostaglandins + oxytocin release	Uterine smooth muscle tightens	Dilation + effacement begin	Tocolytics relax muscle & halt

CLINICAL GOAL | Delay birth **48 hours** → administer **betamethasone** (lung maturity) → optionally give **magnesium** for fetal **neuroprotection** < 32 wks → transfer to tertiary NICU center.

03 CLINICAL MANIFESTATIONS

Signs *of* preterm labor & toxicity

Preterm Labor EARLY / MILD

- Regular uterine contractions q10 min or less
- Low dull backache (rhythmic)
- Pelvic pressure / heaviness
- Menstrual-like cramping
- Change in vaginal discharge (watery, mucousy, bloody)
- Cervical dilation < 4 cm

Toxicity & Red Flags SEVERE

- **Mag: RR < 12, absent DTRs, ↓ LOC**
- **Urine output < 30 mL/hr (mag retention)**
- **Terbutaline: maternal HR > 120**
- **Chest pain, SOB → pulmonary edema**
- **BP < 90/50 (nifedipine)**
- **Fetal bradycardia or late decels**

04 PRIORITY NURSING ACTIONS

Interventions *ranked by* ABC + Safety

ABC
AIRWAY · BREATHING · CIRCULATION

ASSESS Respiratory rate **q hour** on mag — hold if RR < 12	CHECK DTRs q 1–2 hr — loss = **1st sign of toxicity**
STOCK **Calcium gluconate** at bedside (mag antidote)	MONITOR Continuous fetal heart tones & contraction pattern
POSITION Left lateral — maximize placental perfusion	TRACK Strict I&O; foley if on mag — UOP ≥ 30 mL/hr
AUSCULT. Lungs q shift — crackles = pulmonary edema	ADMIN **Betamethasone IM** for fetal lung maturity
HOLD Terbutaline if maternal HR > 120 bpm	VERIFY Serum mag level — therapeutic **4–7 mg/dL**

05 THE FOUR DRUGS

Pharmacology *deep-dive*

Magnesium Sulfate $MgSO_4$ ★ 1st Line — CNS DEPRESSANT

MECHANISM

Blocks calcium entry into smooth muscle → **relaxes uterus**. Also protects fetal brain from cerebral palsy < 32 wks.

SIDE EFFECTS

- Flushing, warmth, sweating
- Headache, N/V, blurred vision
- ↓ DTRs, muscle weakness
- Pulmonary edema

NURSING CARE

- Monitor DTRs, RR, LOC, UOP
- Mag level q 4–6 hr
- Foley catheter standard
- Continuous telemetry

Toxicity Absent DTRs · RR < 12 · UOP < 30 mL/hr · ↓ LOC · serum mag > **8 mg/dL**

⚡ ANTIDOTE: CALCIUM GLUCONATE IV — STOP INFUSION FIRST

Terbutaline *Brethine*

BETA-2 AGONIST

MECHANISM

Stimulates β2 receptors → uterine smooth muscle relaxation. Given **SubQ**.

SIDE EFFECTS

- Maternal **tachycardia, tremors**
- Palpitations, chest pain
- Hyperglycemia, hypokalemia
- Fetal tachycardia

Black Box Do **NOT** use > 48–72 hrs · **HOLD if maternal HR > 120** · risk: MI, pulmonary edema

Nifedipine *Procardia*

CALCIUM CHANNEL BLOCKER

MECHANISM

Blocks Ca^{2+} channels → prevents smooth muscle contraction. Given **PO**.

SIDE EFFECTS

- **Hypotension**, dizziness
- Headache, flushing
- Reflex tachycardia
- Peripheral edema

Caution **NEVER combine with magnesium sulfate** → profound hypotension + neuromuscular blockade · hold if BP < 90/50

Indomethacin *Indocin*

NSAID / PROSTAGLANDIN INHIBITOR

MECHANISM

Inhibits prostaglandin synthesis → ↓ uterine contractions. Only < **32 weeks**.

SIDE EFFECTS

- Premature closure of **fetal ductus arteriosus**
- Oligohydramnios
- Maternal GI bleeding
- Platelet dysfunction

Limits Max duration **48 hrs** · only < 32 wks · monitor amniotic fluid index (AFI)

06 EXAM TRAPS

What *trips up* nursing students

⚠ ✗ Giving calcium gluconate while mag still infusing
✓ STOP the mag infusion FIRST → then calcium gluconate

⚠ ✗ Running mag + nifedipine together
✓ Never combine — synergistic hypotension

Always the first priority action in mag toxicity.

Causes cardiovascular collapse & neuromuscular blockade.

⚠ **✗ Continuing terbutaline past 72 hours**
✓ FDA black box — max 48–72 hrs only
Risk of maternal MI, arrhythmias, death.

⚠ **✗ Using indomethacin at 34 weeks**
✓ Only < 32 wks — closes ductus arteriosus
Ductus must stay open until birth.

⚠ **✗ Confusing therapeutic vs toxic mag**
✓ Therapeutic 4–7 mg/dL · Toxic > 8 mg/dL
Normal non-pregnant level is 1.5–2.5 mg/dL.

⚠ **✗ Mag for preeclampsia = Mag for tocolysis**
✓ Same drug, different goal
Preeclampsia = seizure prevention; PTL = uterine relaxation.

⚠ **✗ Stopping tocolytic with any contraction**
✓ Stop only if contraindicated or CI develops
CI: fetal demise, chorioamnionitis, severe abruption, eclampsia.

⚠ **✗ Holding terbutaline at HR 100**
✓ Hold threshold = HR > 120
Expect mild maternal tachycardia as side effect.

07 PATIENT TEACHING

What *to teach* the patient

1. **Report recurring contractions** (4+ in 1 hr), pelvic pressure, or fluid leakage immediately.
2. **Kick counts:** Report < 10 fetal movements in 2 hrs or decreased baseline activity.
3. **Activity modification** — pelvic rest, no intercourse, limit stairs; NOT strict bedrest.
4. **Hydration:** 2–3 L/day unless contraindicated — dehydration triggers contractions.
5. **Side effect awareness:** flushing, headache, palpitations are expected — chest pain is not.
6. **Medication schedule:** take nifedipine on time; never skip doses to "feel better."
7. **Empty bladder** every 2 hrs — full bladder triggers uterine irritability.
8. **Follow-up:** keep weekly OB appointments; know nearest L&D triage number.

08 MEMORY BOOSTERS

Mnemonics *& pattern* recognition

STOP *Labor*

- **S** — Steroids (betamethasone for lungs)
- **T** — Tocolytics (mag, terb, nif, indo)
- **O** — Oxygen & left-lateral position
- **P** — Prevent infection / monitor fetus

MAG *Toxicity*

- **M** — Muscle weakness / ↓ DTRs
- **A** — Absent reflexes = stop!
- **G** — Going under (↓ LOC, ↓ RR)
- ⚡ Give `Calcium gluconate`

4 *Priorities* on Mag

DTRs — deep tendon reflexes

RR — ≥ 12

UOP — ≥ 30 mL/hr

LOC — alert & oriented

Contra*indications*

D — Dead fetus (demise)

I — Infection (chorioamnionitis)

E — Eclampsia / severe PIH

S — Severe bleeding / abruption

✦ PATTERN RECOGNITION — DRUG TO SIDE EFFECT ✦

Magnesium	→	**M**uscles weak · Mom loses reflexes · Monitor respirations
Terbutaline	→	**T**achycardia · Tremors · Ticker (heart) stress
Nifedipine	→	**N**ice pressure drop · Never with mag · Needs BP check
Indomethacin	→	**I**nfant ductus closes · Inhibits platelets · In < 32 wks only