/ MATERNITY

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Vaginal Exam in the Patient with *Ruptured Membranes*

Confirming ROM • Laboratory testing & interpretation • Minimizing infection risk • Recognizing cord prolapse and chorioamnionitis

System: OB / Maternity | Cluster: Intrapartum | NCJMM Aligned ✓ | Print-Ready ✓

📚 **SOURCE TRANSPARENCY**

This topic is not present in Diane's uploaded personal flashcard notes. Content has been compiled from standard NCLEX and clinical references: *ACOG Practice Bulletin No. 217 — Prelabor Rupture of Membranes*, *AWHONN Perinatal Nursing (5th ed.)*, *Lowdermilk's Maternity & Women's Health Care (12th ed., 2024)*, *Ladewig's Contemporary Maternal-Newborn Nursing Care (10th ed.)*, *Davidson's Maternal-Newborn Nursing & Women's Health (4th ed.)*, *Saunders Comprehensive Review for the NCLEX-RN 2026*, and *ATI Maternal Newborn Nursing Edition 12*.

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DEFINITION & OVERVIEW

What is Rupture of Membranes (ROM)?

Rupture of membranes = breakage of the amniotic sac (chorion + amnion) with release of amniotic fluid through the vagina. Once membranes are ruptured, the sterile intrauterine environment is breached — every digital vaginal exam after this point increases infection risk.

TYPES OF ROM

- **SROM** — Spontaneous ROM during labor (normal)
- **PROM** — Prelabor ROM at term (≥37 wks) before labor onset
- **PPROM** — Preterm Prelabor ROM (<37 wks) — high-risk
- **AROM** — Artificial ROM (amniotomy by provider)
- **PROLONGED ROM** — Ruptured >18–24 hours before delivery

WHY IT MATTERS ON NCLEX

- ROM is a sterile-field breach → **infection risk rises with every exam**
- **Cord prolapse** is an immediate fetal emergency after ROM
- Latent ROM (>18 hr) triggers **GBS prophylaxis**
- PPROM requires **antibiotics + corticosteroids** for fetal lung maturity

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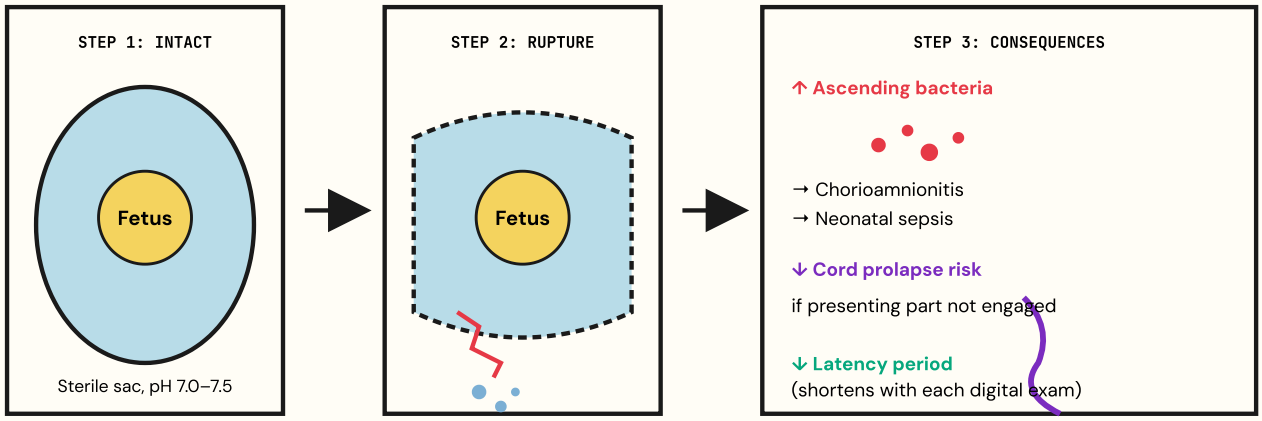
PATHOPHYSIOLOGY

Mechanism of ROM & Infection Risk

Amniotic fluid is alkaline (pH 7.0–7.5) and produced largely by fetal urine + lung secretions. The amniotic sac protects the fetus from ascending vaginal/cervical flora. Once the sac ruptures, a direct pathway is created from the vaginal canal → uterus → fetus.



RISK FACTORS FOR ROM

- Prior PROM or preterm birth
- Genitourinary infection (BV, STI, UTI)
- Cervical insufficiency / short cervix
- Multiple gestation, polyhydramnios
- Smoking, low socioeconomic status
- Trauma, amniocentesis

COMPLICATIONS POST-ROM

- **Chorioamnionitis** (intraamniotic infection)
- **Umbilical cord prolapse** ← emergency
- Placental abruption
- Preterm labor / prematurity (PPROM)
- Oligohydramnios → cord compression, pulmonary hypoplasia
- Neonatal sepsis

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SIGNS & SYMPTOMS — CONFIRMING ROM

How ROM Presents Clinically

Patient classically reports a **sudden gush** or **continuous trickle** of fluid from the vagina. Always differentiate from urinary incontinence (very common in late pregnancy) and increased leukorrhea.

MATERNAL REPORT

- Sudden gush of warm fluid → ongoing leak
- Wet undergarments, sensation of dampness
- Cannot stop the flow (vs. urinary urge)
- May or may not have contractions

CLINICAL FINDINGS

- Visible fluid pooling in posterior fornix
- Positive nitrazine (blue) & ferning
- Decreased amniotic fluid on US (low AFI)
- Engaged presenting part may now feel lower

Amniotic Fluid Assessment — Remember C-O-A-T

ELEMENT	NORMAL	ABNORMAL — CONCERNING FINDINGS
Color	Clear to slightly straw, may have flecks of vernix	**Green/brown** = meconium (fetal distress) • **Yellow** = old meconium or infection • **Port-wine** = abruption • **Cloudy/purulent** = infection
Odor	Mild, bleach-like (almost odorless)	**Foul / putrid** = chorioamnionitis
Amount	500–1000 mL near term; AFI 8–18 cm	Excessive gush (polyhydramnios) or scant/trickle with low AFI <5 (oligohydramnios)
Time	Document exact time of rupture	ROM >18 hours = prolonged → GBS prophylaxis + infection surveillance

RED FLAG

Immediate red flags after ROM: meconium-stained fluid • foul-smelling fluid • maternal fever ≥100.4°F (38°C) • fetal tachycardia >160 • visible or palpable cord at introitus • sudden variable decelerations or prolonged bradycardia.

VAGINAL EXAMINATION

4 Indications, Contraindications & Technique

GUIDING PRINCIPLE: After ROM, every digital exam carries infection risk. **Minimize the number of exams.** When confirming ROM is the goal, a **sterile speculum exam** is preferred over digital exam.

✅ INDICATIONS

- **Confirm ROM** (sterile speculum first — visualize pooling, collect samples for nitrazine/ferning/PAMG-1)
- **Rule out cord prolapse** after ROM, especially if FHR shows variable decels or unengaged presenting part
- Assess cervical dilation, effacement, station before induction/augmentation
- Determine fetal presentation/position (cephalic vs. breech)
- Before initiating oxytocin or amniotomy
- Evaluate progress in active labor (per protocol, q2–4h)
- Suspected advanced labor (urge to push, bloody show, perineal bulging)

⛔ CONTRAINDICATIONS / CAUTIONS

- **Placenta previa** — ABSOLUTE contraindication for digital exam (catastrophic hemorrhage risk)
- **Active painless vaginal bleeding** of unknown cause — US first
- **PPROM** not yet in labor — avoid digital exam; sterile speculum only (every exam shortens latency & ↑ infection)
- No clear clinical purpose — do not exam "just to check"
- Patient declines (informed refusal)

🩺 Sterile Speculum Exam — Technique

1. Explain procedure; obtain consent; ensure privacy.
2. Have patient empty bladder; position supine with knees flexed (lithotomy).
3. Perform hand hygiene; don sterile gloves.
4. Use **sterile** speculum with sterile lubricant or warm sterile water only (no antiseptics — they cause false-positive nitrazine).
5. Visualize cervix and posterior fornix for **pooling of clear fluid**.
6. If no pooling visible, ask patient to **cough or perform Valsalva** to express fluid through the cervical os.
7. Collect fluid samples on a sterile swab for: **nitrazine, ferning, PAMG-1/AmniSure, GBS culture**.
8. Inspect cervix visually (dilation/effacement may be estimated without digital exam in PPROM).
9. Document findings; perform/return FHR check.

👆 Digital Vaginal Exam — Technique

1. Confirm no contraindication (review for previa, recent bleeding).
2. Place patient supine with knees flexed; drape for privacy.
3. Hand hygiene → **sterile glove on examining hand**; sterile lubricant.
4. Insert index + middle finger gently; assess:
    - **Dilation** (0–10 cm)
    - **Effacement** (0–100%)
    - **Station** (-5 to +5 relative to ischial spines)
    - **Presentation** & position (sutures, fontanels)
    - **Membrane status** (intact vs. ruptured) — only if not already known
    - **Palpate for cord** if FHR concerning
5. Auscultate FHR immediately after exam (vagal response possible).
6. Document time, findings, and examiner.

LABORATORY EXAMS — INDICATIONS & INTERPRETATION

5 Confirming ROM & Surveillance for Infection

When ROM is suspected, three "bedside" tests + ultrasound are the workhorses. Newer immunoassays are used when results are equivocal. Once ROM is confirmed, infection surveillance labs become priority.

TEST	INDICATION	PROCEDURE	INTERPRETATION
Nitrazine Paper (pH)	Quick bedside confirmation of ROM	Touch nitrazine strip to fluid from posterior fornix (via sterile speculum)	**POSITIVE = paper turns BLUE** (pH 6.5–7.5, alkaline = amniotic fluid). Negative = yellow/orange (acidic vaginal secretions, pH 4.5–5.5). *False positives:* blood, semen, BV, cervical mucus, antiseptics, lubricants.
Fern Test (Microscopy)	Confirm ROM when nitrazine equivocal — more specific	Smear fluid on slide → air dry → examine under microscope (low power)	**POSITIVE = fern-leaf crystal pattern** (NaCl + proteins crystallize as fluid dries). More specific than nitrazine. *False neg:* heavy blood; *False pos:* cervical mucus, semen, fingerprints.
Pooling (Speculum)	Most reliable clinical sign of ROM	Visualize clear fluid collecting in posterior vaginal fornix; ↑ with cough/Valsalva	Visible pooling = strong evidence of ROM. Absent pooling does not rule out ROM if leak is intermittent.
PAMG-1 (AmniSure®) / IGFBP-1 (ROM Plus®)	Equivocal speculum/nitrazine/ferning; suspected ROM with normal speculum exam	Sterile vaginal swab → immunoassay strip; result in ~5–10 min	Detects amniotic-fluid–specific proteins. **Sensitivity & specificity >95%.** Positive = ROM confirmed. Not affected by blood, semen, or infection as much as nitrazine/fern.
Ultrasound — AFI / Single Deepest Pocket	Adjunct when ROM unclear; baseline for PPROM management	Transabdominal US measurement of amniotic fluid volume	**Oligohydramnios** (AFI <5 cm or SDP <2 cm) supports ROM diagnosis. Normal AFI does not rule out ROM. Also evaluates fetal presentation, growth, placenta location.
GBS Culture (vagino-rectal swab)	Determine GBS status if unknown; ROM >18 hr	Swab lower vagina → rectum; sent for culture (24–72 hr) or rapid PCR	If **positive** or unknown with risk factors (ROM >18 hr, fever, preterm, prior GBS infant) → IV

TEST	INDICATION	PROCEDURE	INTERPRETATION
			penicillin/ampicillin prophylaxis at least 4 hr before delivery.
CBC with Differential	Baseline + serial monitoring for chorioamnionitis	Venous blood draw; often q6–12h with prolonged ROM	Normal pregnancy WBC ≤15,000/mm³. **WBC >15,000–18,000** with **left shift** (↑ bands/neutrophils) suggests infection. Hgb baseline before delivery.
C-Reactive Protein (CRP)	Adjunct marker for chorioamnionitis (not stand-alone)	Venous blood; trended	Elevated & **rising CRP** supports intraamniotic infection. Less specific than clinical signs.
Amniocentesis (selected PPROM)	Suspected subclinical chorioamnionitis or fetal lung maturity assessment	US-guided needle aspiration of amniotic fluid	Gram stain + WBC + glucose + culture. **Low glucose (<14 mg/dL)**, **positive Gram stain**, or WBC >30 = infection. L/S ratio ≥2:1 or PG present = lung maturity.
Wet Mount / Vaginal Cultures	Rule out BV, candida, trichomonas, STI as cause of leukorrhea	Vaginal swab	Clue cells = BV (also produces false-positive nitrazine). Treat infections appropriately.
Urinalysis & UA Culture	Rule out UTI (mimics infection signs; also a risk factor for PROM/PPROM)	Clean-catch urine	WBCs, nitrites, bacteria → treat UTI. Important differential because urinary incontinence is the most common "fake-ROM" presentation.
Maternal Vital Signs & Fetal Monitoring	Continuous surveillance after confirmed ROM	Maternal T q1–4h; HR, BP; continuous EFM or intermittent auscultation per protocol	Maternal T ≥100.4°F (38°C), HR >100, fetal HR >160 baseline, or category II/III tracing = act on infection or fetal compromise.

RED FLAG

Classic NCLEX cue: nitrazine strip **turns blue** AND microscope shows **fern pattern** = ROM confirmed. If only one is positive and the clinical picture is unclear → use AmniSure or repeat speculum exam.

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PRIORITY NURSING INTERVENTIONS — ABCS & SAFETY

What the Nurse Does After ROM is Confirmed

A AIRWAY / B BREATHING (FETAL OXYGENATION)

- **Auscultate FHR immediately** after ROM & with every contraction × first 15–30 min, then continuous EFM per protocol
- Watch for **variable decelerations** → cord compression
- If non-reassuring FHR: reposition (left lateral, knee-chest), O_2 10 L NRB, IV bolus, stop oxytocin, notify provider

C CIRCULATION (CORD PROLAPSE CHECK)

- **Perform vaginal exam to rule out cord prolapse** if presenting part unengaged or FHR concerning
- If cord palpated or visible: **elevate presenting part with gloved hand and DO NOT REMOVE**; place patient in knee-chest or Trendelenburg; call for emergency C-section
- Establish/maintain IV access (18-gauge), draw labs

Safety & Infection Prevention

- **Minimize digital vaginal exams** — every exam ↑ chorioamnionitis risk & shortens latency
- Document **exact time of ROM**; track total hours ruptured (the "ROM clock")
- Temperature q1–2h after ROM; vital signs per protocol
- Assess amniotic fluid using **COAT** (Color, Odor, Amount, Time) with each pad change
- Strict perineal hygiene; clean pads frequently; sterile gloves for exams
- Initiate **GBS prophylaxis** (IV penicillin G or ampicillin) if positive/unknown status or ROM >18 hr
- Anticipate **induction with oxytocin** for term PROM not in spontaneous labor within ~12–24 hr (per ACOG)
- For **PPROM**: anticipate corticosteroids (betamethasone), latency antibiotics (ampicillin + erythromycin/azithromycin), magnesium sulfate if <32 wks for neuroprotection

RED FLAG

Emergency drill — Suspected cord prolapse:

1. Call for help; stay with patient.
2. Insert sterile gloved hand into vagina & **lift the presenting part off the cord** — hold until C-section.
3. Place patient in **knee-chest, Trendelenburg, or modified Sims**.
4. Administer O_2 10 L NRB; start IV bolus; stop oxytocin.
5. If cord is visible outside introitus: cover with sterile saline-soaked gauze — **do not push back in**.
6. Prepare for stat C-section.

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PHARMACOLOGY

Medications Commonly Used After ROM

DRUG / CLASS	INDICATION	MECHANISM / DOSE	KEY NURSING CONSIDERATIONS
Penicillin G (or Ampicillin if PCN unavailable)	GBS prophylaxis (positive/unknown GBS, ROM >18 hr, fever, preterm)	5 million units IV load → 2.5–3 million units IV q4h until delivery	Need **≥4 hr** before birth for adequate prophylaxis. If PCN-allergic: cefazolin (low risk) or clindamycin/vancomycin (high risk).
Ampicillin + Erythromycin/Azithromycin	Latency antibiotics for PPROM <34 wks	Ampicillin IV 48 hr → amoxicillin PO 5 days + erythromycin/azithromycin	Extends latency, reduces chorioamnionitis & neonatal sepsis. Monitor for hypersensitivity.
Betamethasone (corticosteroid)	Fetal lung maturity in PPROM 24–34 wks (consider up to 36+6)	12 mg IM q24h × 2 doses	Maternal hyperglycemia (esp. GDM) — monitor BG; benefits >> risks. Counts even if delivery occurs before second dose.
Magnesium Sulfate	Fetal neuroprotection if PPROM <32 wks & imminent delivery	4–6 g IV load over 20–30 min → 1–2 g/hr	Monitor: **RR >12, DTRs present, UO >30 mL/hr, LOC**. Antidote: **calcium gluconate**. Toxicity: ↓DTRs → respiratory depression → cardiac arrest.
Oxytocin (Pitocin)	Induction/augmentation when delivery indicated	IV piggyback titrated to contraction pattern	Monitor for **tachysystole** (>5 contractions/10 min), uterine rupture, FHR changes, water intoxication. Stop infusion for category III tracing.
Broad-spectrum Antibiotics (ampicillin + gentamicin ± clindamycin)	Suspected/confirmed chorioamnionitis	IV until delivery + per institutional protocol postpartum	Delivery is the definitive treatment. Monitor renal function with gentamicin (peak/trough).

DRUG / CLASS	INDICATION	MECHANISM / DOSE	KEY NURSING CONSIDERATIONS
Tocolytics (e.g., nifedipine, indomethacin)	Selected PPROM cases — short-term to allow steroid course or transfer	Nifedipine PO; indomethacin PO/PR (avoid >32 wks — premature ductus closure)	Use is limited & controversial after ROM. Monitor BP (nifedipine), watch for oligohydramnios worsening (indomethacin).

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NCLEX TEST TRAPS

Common Mistakes & Priority Confusions

✕ WRONG ACTION	✅ RIGHT ACTION
Perform a digital vaginal exam first to confirm ROM in PPROM patient.	**Sterile speculum exam first** — visualize pooling and collect nitrazine/fern/PAMG-1. Digital exam in PPROM accelerates infection and shortens latency.
Push a prolapsed cord back into the vagina to relieve pressure.	**Never push the cord back.** Lift the presenting part OFF the cord with gloved hand, position knee-chest/Trendelenburg, cover any visible cord with sterile saline-soaked gauze, and prepare for stat C-section.
Send the patient home because nitrazine is negative and ROM "is ruled out."	Nitrazine has **false negatives** (intermittent leak, dry sample) and false positives (blood, BV, semen). Confirm with **ferning, pooling, and/or PAMG-1**. If clinical suspicion remains, observe.
Treat increased clear vaginal fluid as ROM in a 36-week patient without testing.	Differential = urinary incontinence (very common), increased leukorrhea, BV. Always **confirm with objective test** before initiating ROM management (admission, antibiotics, induction).
Auscultate FHR every 30 minutes immediately after ROM as "routine."	**Auscultate FHR IMMEDIATELY after ROM** and during the next contraction — sudden variable decels or bradycardia could mean cord prolapse. Continuous EFM thereafter.
Wait for fever to start GBS prophylaxis when ROM >18 hr.	Start **IV penicillin/ampicillin once the criteria are met** (ROM >18 hr, fever, GBS positive/unknown). Need ≥4 hours before delivery for adequate neonatal protection.

❌ WRONG ACTION	✅ RIGHT ACTION
Perform a digital vaginal exam in a patient with painless bright red bleeding.	**NEVER do a digital exam until placenta previa is ruled out** (ultrasound first). Painless vaginal bleeding in late pregnancy = previa until proven otherwise.

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PATIENT & FAMILY EDUCATION

What to Teach & When to Call

TEACH PATIENT TO RECOGNIZE ROM

- Sudden gush or continuous, uncontrollable trickle of fluid
- Different from urine — can't stop the flow, doesn't smell like urine
- Note the time, color, and odor of fluid
- Bring the pad/garment in for assessment if uncertain

CALL PROVIDER / GO TO L&D IMMEDIATELY IF…

- Sudden gush or steady leak of fluid (any time)
- Fluid is **green, brown, yellow, or foul-smelling**
- Decreased fetal movement
- Bright red vaginal bleeding
- Fever, chills, abdominal tenderness
- Feels something in the vagina (possible cord)

🚿 Infection-Prevention Self-Care After ROM

- **NOTHING in the vagina** after ROM — no tampons, no douching, no intercourse, no tub baths
- Showers only; wipe front to back
- Change pads frequently; note color/amount of fluid
- Take temperature q2–4h at home if managed expectantly (PPROM); report ≥100.4°F
- Monitor fetal movement counts (kick counts — 10 movements in 2 hours)
- Attend all scheduled visits/NSTs/BPPs as ordered
- Know your **ROM clock** — delivery is usually expected within 24 hr at term

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MEMORY BOOSTERS

Mnemonics & Quick Associations

C • O • A • T

Assess amniotic fluid every time you see it

Color — clear vs. meconium / blood / cloudy	**O**dor — mild vs. foul (infection)	**A**mount — gush vs. trickle, AFI	**T**ime — exact time of rupture (the "ROM clock")

T • A • C • O

Confirming ROM at the bedside

Test — Nitrazine turns blue	**A**mniSure / PAMG-1 if equivocal	**C**rystals — Ferning under microscope	**O**verflow — Pooling visible on speculum

"BLUE = TRUE"

Nitrazine turning BLUE = membranes are TRUEly ruptured (amniotic fluid is alkaline, pH 7.0–7.5).

"FERN = FIRM"

A positive FERNing pattern = FIRM evidence of ROM. Fern is more specific than nitrazine.

"LIFT — don't push"

For cord prolapse, LIFT the presenting part off the cord with a sterile gloved hand. Never push the cord back inside.

"18 + 4 = GBS"

ROM > 18 hours = give GBS antibiotics. Antibiotic must be in for ≥4 hours before delivery for full prophylaxis.

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NCJMM SIX-STEP CLINICAL JUDGMENT

Apply It — Patient Case

Case: A 27-year-old G2P1 at 34+2 weeks gestation presents to L&D reporting a "warm gush" of fluid 2 hours ago, followed by ongoing trickle. She denies contractions and bleeding. Vitals: T 99.4°F, HR 92, BP 118/72, RR 18. FHR baseline 145 with moderate variability and accelerations. GBS status: *unknown*. Sterile speculum exam shows pooling of clear fluid in the posterior fornix; nitrazine turns blue; ferning is positive. AFI on bedside US = 4.2 cm.

STEP 1 — RECOGNIZE CUES

What information matters?

Gush + trickle of fluid; **34+2 weeks (preterm)**; pooling + positive nitrazine + positive ferning = ROM confirmed → diagnosis is **PPROM**. GBS unknown. Oligohydramnios (AFI 4.2). Maternal afebrile but T 99.4 (low-grade — monitor). Reassuring FHR currently.

STEP 2 — ANALYZE CUES

What do the cues mean together?

PPROM at 34+2 weeks → expectant management OR delivery (gray zone 34–36+6 wks). High risk for: **chorioamnionitis, cord prolapse, preterm labor, neonatal RDS/sepsis**. Unknown GBS + preterm = treat as positive. Oligohydramnios = risk for cord compression with any contractions.

STEP 3 — PRIORITIZE HYPOTHESES

What's the biggest immediate threat?

Highest priority: cord prolapse (FHR change) → fetal compromise. **Next:** ascending infection / chorioamnionitis. **Then:** preterm delivery readiness / fetal lung maturity. Maternal hemodynamics currently stable.

STEP 4 — GENERATE SOLUTIONS

What interventions are indicated?

- Admit, place on continuous EFM & toco
- Avoid further digital vaginal exams
- IV access (18-g), draw **CBC, CRP, type & screen, GBS culture**
- Start **latency antibiotics** (ampicillin IV + erythromycin/azithromycin)
- Start **GBS prophylaxis** (penicillin G) — unknown status + preterm
- Administer **betamethasone 12 mg IM** × 2 doses 24 hr apart for fetal lung maturity

- Consider **magnesium sulfate** for neuroprotection if delivery imminent and <32 wks (this patient is 34+2 — not routinely indicated)
- Monitor T q2h; assess COAT with each pad change
- Educate patient: nothing per vagina, knee-chest if "feels something"

STEP 5 — TAKE ACTION

Order of nursing actions, right now

1. Continuous FHR/toco; verify reassuring baseline.
2. Start IV; draw labs (CBC, CRP, GBS, type & screen).
3. Administer first dose of **ampicillin IV** (GBS + latency).
4. Give **betamethasone 12 mg IM** per order.
5. Patient education + bedrest with bathroom privileges.
6. Document time of ROM and ongoing fluid assessment.

STEP 6 — EVALUATE OUTCOMES

How will you know it's working?

Maternal T <100.4°F, HR <100, no foul-smelling fluid, WBC trending down, FHR reassuring (110–160 with moderate variability, no recurrent decels), no contractions or labor progression, patient verbalizes red-flag findings. Document each finding and re-prioritize if any of these change.

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Topic: Vaginal Examination in the Patient with Ruptured Membranes — Indications, Lab Tests & Interpretation

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