MATERNAL-NEWBORN AND PEDIATRIC NURSING · STUDY GUIDE

Exam 2 Study Guide

This guide covers the antepartum period. First the normal: how pregnancy is confirmed and dated, how every body system adapts in ways that look like disease, and the schedule of visits and screens that turns those changes into surveillance. Then the high-risk pregnancy: reading fetal tests, sorting bleeding, treating severe blood pressure, keeping magnesium safe, managing diabetes and preterm labor, and doing weight-based dose math with a ceiling. Work one chapter at a time. Read the "what to know" paragraphs, study the tables, then try each worked case with the steps covered. Finish each chapter with its ten self-test items. The cram sheet at the end puts the numbers in one place.

WHAT THIS GUIDE COVERS

- Chapter 3 · presumptive, probable and positive signs, Naegele's rule and GTPAL, the first visit and its labs, cardiovascular, respiratory, renal, GI, endocrine and skin changes with their look-alikes, the visit schedule, fundal height and Leopold maneuvers, screening windows, glucose testing, kick counts, NST and BPP, weight gain by BMI, energy and micronutrients, food safety, discomforts, medications and vaccines, danger signs, SBAR and the first actions in emergencies.
- Chapter 4 · risk as a moving target, NST, BPP, CST, AFI and Doppler, early, variable and late decelerations and intrauterine resuscitation, early loss and ectopic pregnancy, molar pregnancy, previa, abruption, vasa previa and rupture, hemorrhage response, hypertensive categories and severe features, severe-range treatment, eclampsia, magnesium sulfate, HELLP, diabetes, weight-based dosing with a ceiling, hyperemesis, anemia, cholestasis, infection and GBS, Rh alloimmunization, preterm labor, steroids, PPROM and trauma.

CHAPTER 3

The Antepartum Period: Adaptation and Prenatal Care

Read it in full: **Chapter 3 in the textbook**. Practice it in the lab: **Confirm It, Date It, Record It** and **Every Adaptation Has a Look-Alike**.

What to know

Pregnancy is confirmed in tiers. **Presumptive signs** are what the person notices: missed period, nausea, breast changes, frequency, fatigue and quickening. **Probable signs** are what the examiner finds: Goodell (cervical softening, about 6 weeks), Chadwick (blue-violet cervix, 6 to 8 weeks), Hegar (soft lower segment, 6 to 12 weeks), ballottement and a positive hCG test. A hormone test is only probable because a molar pregnancy also makes hCG. Only three signs are **positive**, and all come from the fetus: seeing it on ultrasound, hearing the fetal heart, and an examiner feeling it move.

The fetal heart rate baseline is 110 to 160. If the rate you hear matches the patient's radial pulse, you are hearing the uterine souffle; feel the radial pulse every time you listen. Doppler hears the heart at 10 to 12 weeks, a fetoscope at 18 to 20.

Naegele's rule: LMP minus 3 months, plus 7 days, plus 1 year. The 7 days is the step most often dropped. A first-trimester crown-rump length is accurate to 5 to 7 days and wins when the two disagree by more. Accuracy falls to 1 to 2 weeks in the second trimester and 2 to 3 weeks in the third. **GTPAL**: Gravida counts all pregnancies including this one (twins count once); Term births at 37 0/7 or later; Preterm births from 20 0/7 through 36 6/7; Abortions are all losses before 20 weeks; Living is children alive now. Parity counts births, not babies.

The first visit, ideally before 10 weeks, includes blood type, Rh and antibody screen, CBC, rubella and varicella immunity, hepatitis B and C, syphilis, HIV (opt-out), urine culture and chlamydia and gonorrhea. **Asymptomatic bacteriuria is treated in pregnancy** because relaxed, dilated ureters let infection climb to the kidney. A negative rubella titer means the vaccine waits until after birth, because it is live.

Blood volume rises 40 to 50 percent by about 32 weeks, but plasma rises about 50 percent while red cells rise only 20 to 30 percent. The result is the **physiologic anemia** of pregnancy. True anemia is hemoglobin below 11 g/dL in the first and third trimesters and below 10.5 in the second. Cardiac output rises 30 to 50 percent and heart rate rises 10 to 20. Vascular resistance falls, so diastolic pressure dips 5 to 15 mm Hg to a low point at 24 to 28 weeks. A soft systolic murmur is common; a diastolic murmur is never normal.

After about 20 weeks, lying flat lets the uterus press on the vena cava: **supine hypotensive syndrome**. Turn the patient to the left side or wedge the right hip. Pregnancy is hypercoagulable (fibrinogen up about 50 percent), so clot risk rises four to five fold. One swollen, painful calf is a clot until proven otherwise.

Progesterone raises tidal volume 30 to 50 percent, giving a compensated respiratory alkalosis with arterial CO2 of 27 to 32. The diaphragm rises about 4 cm, so a pregnant patient desaturates fast during apnea. GFR rises 40 to 50 percent, so normal creatinine is 0.4 to 0.8 mg/dL and **1.0 is abnormal in pregnancy**. Trace glucose in urine is expected; protein of 1+ or more after 20 weeks is not. Progesterone slows the gut: reflux, constipation and gallstones. Hyperemesis is vomiting with weight loss over 5 percent, ketonuria and electrolyte changes, and needs IV fluids, not crackers.

Human placental lactogen makes the body resist insulin so glucose reaches the fetus. Insulin needs fall in the first trimester (hypoglycemia risk in type 1) and climb in the second half. Relaxin loosens joints, adding lordosis, waddling and fall risk. Skin shows linea nigra, melasma and striae. **Dependent ankle edema is expected; sudden swelling of the face and hands is not** and belongs with headache, visual change and epigastric pain.

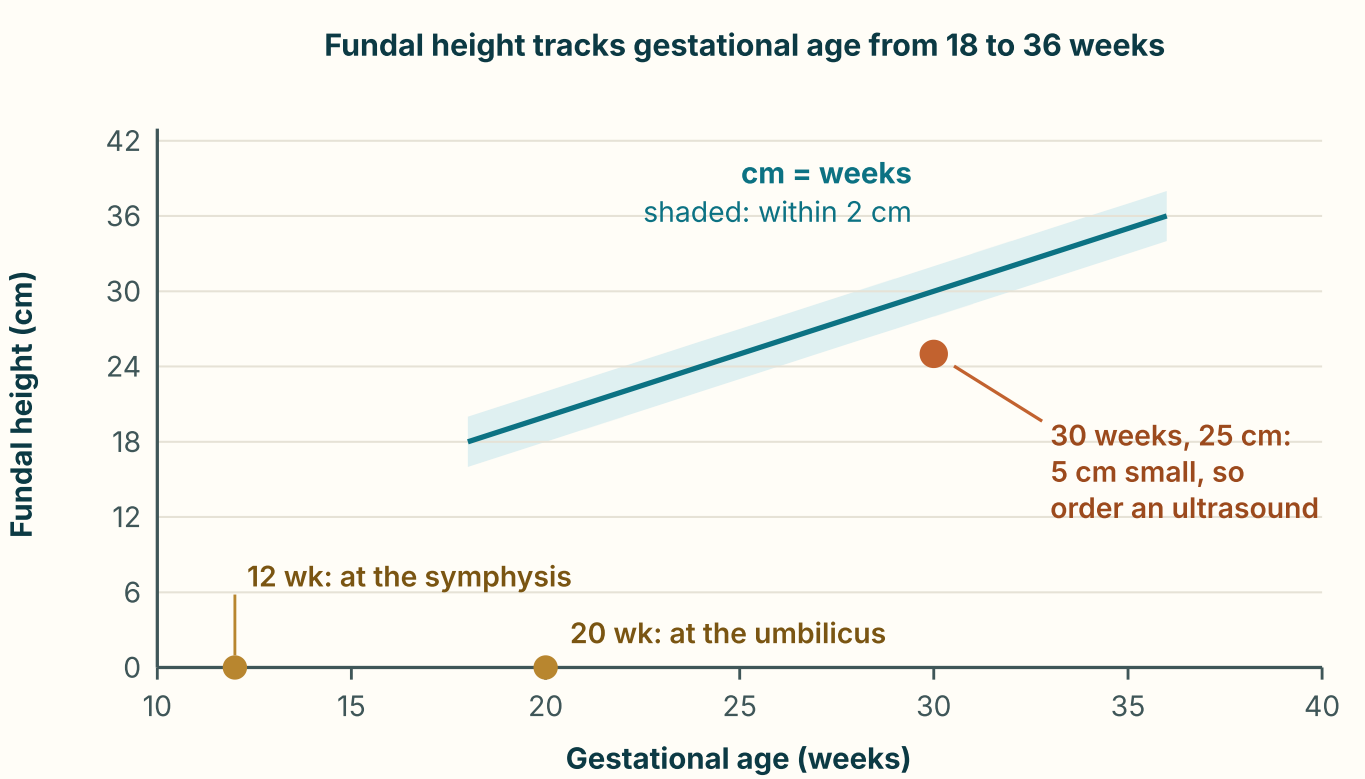
Visits come every 4 weeks to 28 weeks, every 2 weeks to 36, then weekly. Every visit checks blood pressure, weight, urine for protein and glucose and the fetal heart rate; from about 18 to 20 weeks add **fundal height**. The fundus is at the symphysis at about 12 weeks and the umbilicus at about 20. From 18 to 36 weeks the height in centimeters equals the weeks within about 2 cm; a gap over 2 to 3 cm calls for ultrasound.

Screening windows: cell-free DNA from 10 weeks, anatomy scan 18 to 22, glucose screen 24 to 28, **Rh immune globulin 300 micrograms at 28 weeks** if Rh negative and antibody negative, Tdap 27 to 36 weeks every pregnancy, and the GBS culture at 36 0/7 to 37 6/7 weeks. Low-dose aspirin 81 mg starts at 12 to 28 weeks (ideally before 16) for those at raised pre-eclampsia risk. Gestational diabetes: the two-step test diagnoses with two or more abnormal values on the 100 g test (95, 180, 155, 140); the one-step 75 g test diagnoses with any one value (92, 180, 153).

From about 28 weeks, teach movement counting: **10 movements within 2 hours** is reassuring, and a definite drop from the baby's own pattern means assessment that day. The NST is reactive at 32 weeks or more with two accelerations of 15 beats for 15 seconds in 20 minutes (10 by 10 before 32 weeks). The BPP scores five items 0 or 2; 8 to 10 is reassuring, 6 equivocal, 4 or less concerning. Always monitor in a left lateral tilt.

Weight gain depends on pre-pregnancy BMI: underweight 12.5 to 18 kg, normal 11.5 to 16 kg, overweight 7 to 11.5 kg, obese 5 to 9 kg. Extra energy is about **340 kcal a day in the second trimester and 452 in the third**; protein about 71 g. Folic acid 400 to 800 micrograms, or 4 mg after a prior neural tube defect. Iron 27 mg; calcium 1000 mg (1300 at 18 or younger); iodine 220 micrograms. Avoid listeria foods and high-mercury fish, eat 8 to 12 ounces of low-mercury fish a week, keep caffeine under 200 mg, and no alcohol.

Teach danger signs as "call today": bleeding, leaking fluid, severe headache, visual change, epigastric pain, sudden facial or hand swelling, vomiting with no fluids kept down, fever of 38 °C or more, painful urination, contractions before 37 weeks, decreased movement and any abdominal trauma. In emergencies **the hands move first**: massage the fundus, lift the presenting part off a prolapsed cord, hyperflex the thighs (McRoberts) for shoulder dystocia, stop the magnesium. The RN never delegates assessment, first teaching, evaluation or the unstable patient. Screen for intimate partner violence alone, every trimester.



Centimeters match weeks. From 18 to 36 weeks the fundal height in centimeters equals the weeks within about 2 cm. A gap of more than 2 to 3 cm, like 25 cm at 30 weeks, calls for an ultrasound.

LOCK THESE IN

- Positive signs only: ultrasound visualization, heard fetal heart, examiner-felt movement.
- GTPAL: term 37 0/7 or later; preterm 20 0/7 to 36 6/7; abortions before 20 weeks; parity counts births, not babies.
- True anemia: hemoglobin below 11 (first and third trimesters) or below 10.5 (second).
- Creatinine 1.0 mg/dL is abnormal in pregnancy; normal is 0.4 to 0.8.
- Fundus at the symphysis at 12 weeks, the umbilicus at 20; centimeters equal weeks from 18 to 36 within 2 cm.
- Windows: cfDNA from 10, anatomy 18 to 22, glucose 24 to 28, RhIG 28, Tdap 27 to 36, GBS 36 to 37 6/7.
- Extra energy: about 340 kcal in the second trimester and 452 in the third.
- Left lateral for supine hypotension; mechanical first actions in emergencies.

Expected change and its look-alike

System	Expected	Investigate
Blood	Hemoglobin 11 to 12; dilutional fall	Below 11 (first, third) or 10.5 (second)
Blood pressure	Diastolic dips 5 to 15, low at 24 to 28 weeks	140/90 or more twice, 4 h apart, after 20 weeks
Heart	Soft systolic murmur; rate up 10 to 20	Any diastolic murmur; rate over 110; chest pain
Lungs	Mild, gradual dyspnea; CO_2 27 to 32	Sudden dyspnea, orthopnea, SpO_2 below 95%
Kidney	Creatinine 0.4 to 0.8; trace glycosuria	Creatinine 1.0 or more; protein 1+ after 20 weeks
Urine	Frequency without dysuria	Positive culture; flank pain with fever
Clotting and swelling	Ankle edema; WBC 5,000 to 15,000	One painful calf; sudden face or hand edema
Glucose	Rising insulin needs after 20 weeks	Fasting 92 or more; abnormal screen at 24 to 28 weeks

Weight gain by pre-pregnancy BMI (singleton)

BMI	Total gain	Weekly rate in 2nd and 3rd trimesters
Underweight, below 18.5	12.5 to 18 kg (28 to 40 lb)	About 0.5 kg (1 lb)
Normal, 18.5 to 24.9	11.5 to 16 kg (25 to 35 lb)	About 0.4 to 0.5 kg (1 lb)
Overweight, 25.0 to 29.9	7 to 11.5 kg (15 to 25 lb)	About 0.3 kg (0.6 lb)
Obese, 30.0 or higher	5 to 9 kg (11 to 20 lb)	About 0.2 kg (0.5 lb)

Worked cases

WORKED CASE 1 · WRITE THE GTPAL

A patient is pregnant now. She had a son at 38 weeks, twins at 33 weeks, and a miscarriage at 8 weeks. All three children are alive.

STEP 1 · GRAVIDA

Count every pregnancy including this one: the son, the twins (one pregnancy), the miscarriage and the current one. G = **4**.

STEP 2 · TERM

Births at 37 0/7 or later: the son. T = **1**.

STEP 3 · PRETERM

Births from 20 0/7 to 36 6/7: the twin birth counts once. P = **1**.

STEP 4 · ABORTIONS

Losses before 20 weeks: the miscarriage. A = **1**.

STEP 5 · LIVING

Children alive now: the son and both twins. L = **3**. Record G4 T1 P1 A1 L3.

WORKED CASE 2 · SET THE WEIGHT-GAIN GOAL

A patient weighed 92 kg before pregnancy and is 1.70 m tall. She asks how much she should gain.

STEP 1 · FIND THE BMI

BMI = weight in kg divided by height in meters squared: 92 ÷ (1.70 × 1.70) = 92 ÷ 2.89 = **31.8**.

STEP 2 · PLACE THE CATEGORY

31.8 is 30.0 or higher, the obese category.

STEP 3 · READ THE GOAL

Total gain 5 to 9 kg (11 to 20 lb), at about 0.2 kg (0.5 lb) a week in the second and third trimesters.

STEP 4 · FRAME IT

Talk about the baby's growth and health, never as a moral matter. Weight talk is a common reason people drop out of care.

WORKED CASE 3 · THE FUNDAL HEIGHT THAT DOES NOT FIT

At a visit dated by early ultrasound at 30 weeks, the fundal height is 25 cm.

STEP 1 · COMPARE

From 18 to 36 weeks, centimeters should equal weeks within about 2 cm. Expected is about 30 cm.

STEP 2 · MEASURE THE GAP

30 minus 25 = 5 cm, which is more than 2 to 3 cm.

STEP 3 · LIST CAUSES OF SMALL

Growth restriction, oligohydramnios or a dating error. Here dating is from an early scan, so it is less likely.

STEP 4 · ACT

Arrange an ultrasound for growth and fluid, and report the finding.

WORKED CASE 4 · DIZZY ON THE EXAM TABLE

At 32 weeks a patient lying flat for a monitoring strip becomes pale, clammy and nauseated, and her blood pressure falls.

STEP 1 · NAME IT

Supine hypotensive syndrome: the uterus is compressing the inferior vena cava and cutting venous return.

STEP 2 · FIRST ACTION

Turn her to the left side or wedge the right hip. This is mechanical and works in moments.

STEP 3 · RECHECK

Repeat the blood pressure and look at the fetal tracing again. A nonreactive strip caused by the position is an artifact of positioning.

STEP 4 · PREVENT

Use a left lateral tilt for any prolonged monitoring.

TRAPS PEOPLE FALL INTO

- **Calling a positive hCG test a positive sign.** It is probable. Only ultrasound, a heard fetal heart and examiner-felt movement are positive.
- **Counting twins as two pregnancies or two births.** Twins count once in gravida and once in parity, but two in living.
- **Treating a falling hemoglobin as disease by default.** Plasma outgrows red cells. Use the pregnancy thresholds: 11, or 10.5 in the second trimester.
- **Calling creatinine 1.0 normal.** In pregnancy normal is 0.4 to 0.8, so 1.0 signals kidney impairment.
- **Giving the rubella vaccine during pregnancy.** It is live. Vaccinate after birth; breastfeeding is not a reason to wait.
- **Telling a patient with less fetal movement to wait until tomorrow.** Assess the same day.

Chapter 3 self-test · ten items

1. At 11 weeks, which finding confirms that a fetus is present?

A. Nausea with breast tenderness each day
B. Fetal heart tones heard by Doppler
C. A positive serum hCG level today
D. Chadwick sign seen on speculum exam

B. Fetal heart tones heard by Doppler Positive signs come directly from the fetus. A hormone test is probable and quickening is presumptive.

2. A nurse hears a heart rate of 84 with the Doppler. The patient's radial pulse is 84. What is the nurse most likely hearing?

A. Fetal bradycardia
B. The fetal heart rate
C. The uterine souffle
D. The umbilical cord souffle

C. The uterine souffle A rate that matches the maternal pulse is the maternal vessels. Feel the radial pulse each time you listen.

3. A patient is pregnant now and had twins at 35 weeks, both living. What is her GTPAL?

A. G2 T0 P1 A0 L2
B. G3 T0 P2 A0 L2
C. G2 T0 P2 A0 L2
D. G2 T1 P0 A0 L2

A. G2 T0 P1 A0 L2 Twins count once in gravida and once as a preterm birth, but two in living.

4. At 22 weeks, which hemoglobin meets the definition of anemia?

A. 11.6 g/dL
B. 11.2 g/dL
C. 10.8 g/dL
D. 10.2 g/dL

D. 10.2 g/dL The second trimester cutoff is below 10.5 g/dL.

5. Which pregnancy finding needs follow-up?

A. Diastolic pressure lower than at booking
B. A serum creatinine of 1.1 mg/dL
C. Trace glucose on the urine dipstick
D. A soft systolic ejection murmur

B. A serum creatinine of 1.1 mg/dL Normal pregnancy creatinine is 0.4 to 0.8; the other findings are expected.

6. At about how many weeks is the fundus at the umbilicus?

A. 20 weeks
B. 16 weeks
C. 28 weeks
D. 12 weeks

A. 20 weeks The fundus is at the symphysis at about 12 weeks and the umbilicus at about 20.

7. An Rh-negative patient with a negative antibody screen is 28 weeks. What is due?

A. Low-dose aspirin started today
B. The rectovaginal GBS culture
C. A live rubella vaccine dose
D. Rh immune globulin 300 micrograms

D. Rh immune globulin 300 micrograms RhIG is given at 28 weeks and again within 72 hours of birth if the newborn is Rh positive.

8. A patient in her third trimester asks how much more to eat each day. What is the best answer?

A. No extra energy is needed
B. About twice her usual intake
C. About 452 extra kcal a day
D. About 1,000 extra kcal a day

C. About 452 extra kcal a day Needs rise about 340 kcal in the second trimester and 452 in the third.

9. Which NST at 34 weeks is reactive?

A. No accelerations with steady moderate variability
B. One acceleration of 15 beats for 15 seconds in 20 minutes
C. Two accelerations of 10 beats for 10 seconds in 20 minutes
D. Two accelerations of 15 beats for 15 seconds in 20 minutes

D. Two accelerations of 15 beats for 15 seconds in 20 minutes At 32 weeks or more the criterion is two 15 by 15 accelerations within 20 minutes.

10. Which task is appropriate to delegate to assistive personnel on an antepartum unit?

A. Weighing a stable patient and reporting it
B. Admitting a patient with a BP of 166/112
C. Teaching danger signs for the first time
D. Interpreting a fetal heart tracing

A. Weighing a stable patient and reporting it Weights on a stable patient are delegable. First teaching, interpretation and the unstable patient stay with the RN.

CHAPTER 4

High-Risk Pregnancy and Antepartum Complications

Read it in full: **Chapter 4 in the textbook**. Practice it in the lab: **Sorting the Bleeding** and **Magnesium Sulfate and the Order of Toxicity**.

What to know

A high-risk pregnancy is an ordinary pregnancy carrying a named threat. Risk comes from pre-existing conditions, obstetric history, problems arising now, and the social conditions that decide whether a person can reach care. **Risk is dynamic**: reassess at every contact. When a pregnant person says something is wrong, that report is data. Document it in her words and escalate.

Fetal tests infer oxygen from behavior. Hypoxia switches off reactivity and breathing first, then movement, then tone; low amniotic fluid signals chronic compromise. The **NST** is reactive at 32 weeks or more with two 15 by 15 accelerations in 20 minutes; a nonreactive test is usually a sleeping fetus, so extend to 40 minutes. The **BPP** scores five items: 8 to 10 reassuring, 6 equivocal, 4 or less deliver. The **CST** is negative (good) when there are no late decelerations. Absent or reversed end-diastolic flow on umbilical artery Doppler needs urgent review. These tests reassure well when normal and are poor at predicting harm when abnormal.

Three decelerations: **early** mirrors the contraction (head compression, benign); **variable** is abrupt and V-shaped (cord compression); **late** starts after the contraction begins and recovers after it ends

(uteroplacental insufficiency, most ominous). Recurrent late or variable decelerations or a prolonged deceleration trigger intrauterine resuscitation in order: reposition to the side, stop oxytocin, IV bolus, oxygen 10 L/min by non-rebreather, notify, reassess and prepare for birth.

Bleeding before 20 weeks: threatened (closed os, viable), inevitable (open os), incomplete (some tissue passed, os open), complete (all passed, os closed), missed (retained demise) and septic. **Ectopic pregnancy** gives 6 to 8 weeks of amenorrhea, one-sided pain and light spotting; rupture brings shock and shoulder pain (Kehr sign). A stable unruptured ectopic may get methotrexate; teach no folic acid, NSAIDs or alcohol. A molar pregnancy shows a large uterus, very high hCG, severe vomiting and pre-eclampsia before 20 weeks; follow hCG to zero with reliable contraception. Say "miscarriage," not "spontaneous abortion," at the bedside.

Bleeding after 20 weeks is hemorrhage until proven otherwise. **Placenta previa**: painless bright red bleeding, soft uterus, normal fetal heart rate, and **nothing in the vagina**. **Abruption**: painful dark bleeding, rigid board-like tender uterus, fetal distress, and about one in five is concealed, so shock can exceed visible loss; watch for DIC. **Vasa previa**: painless bleeding at membrane rupture with immediate fetal bradycardia; the blood is fetal and a term fetus has only about 250 to 350 mL, so this is an immediate cesarean. Accreta risk rises with a prior cesarean plus a current previa.

Pregnancy hides blood loss: a person can lose 1,000 to 1,500 mL before pressure falls. Tachycardia, narrowing pulse pressure, restlessness and urine under 30 mL/h come first. The response: call for help, two large-bore IVs, warmed crystalloid, type and crossmatch with coagulation studies and fibrinogen, oxygen, left lateral, a catheter, continuous fetal monitoring and **weighed (quantified) blood loss**. Pregnant fibrinogen runs 400 to 600, so a value near 200 is a red flag.

Pre-eclampsia starts with poor spiral artery remodeling and ends as endothelial injury everywhere. Categories: **chronic** hypertension (before 20 weeks or beyond 12 weeks postpartum), **gestational** (new at 20 weeks or later, no proteinuria or severe features), **pre-eclampsia** (new hypertension plus proteinuria, or any severe feature without it), and superimposed pre-eclampsia. Proteinuria is 300 mg per 24 hours, a ratio of 0.3 or more, or dipstick 2+, but it is **not required**. Severe features: 160 systolic or 110 diastolic, platelets under 100,000, liver enzymes twice normal or severe RUQ

pain, creatinine over 1.1, pulmonary edema, new headache or visual symptoms. Aspirin 81 mg from 12 to 28 weeks prevents it in high-risk patients.

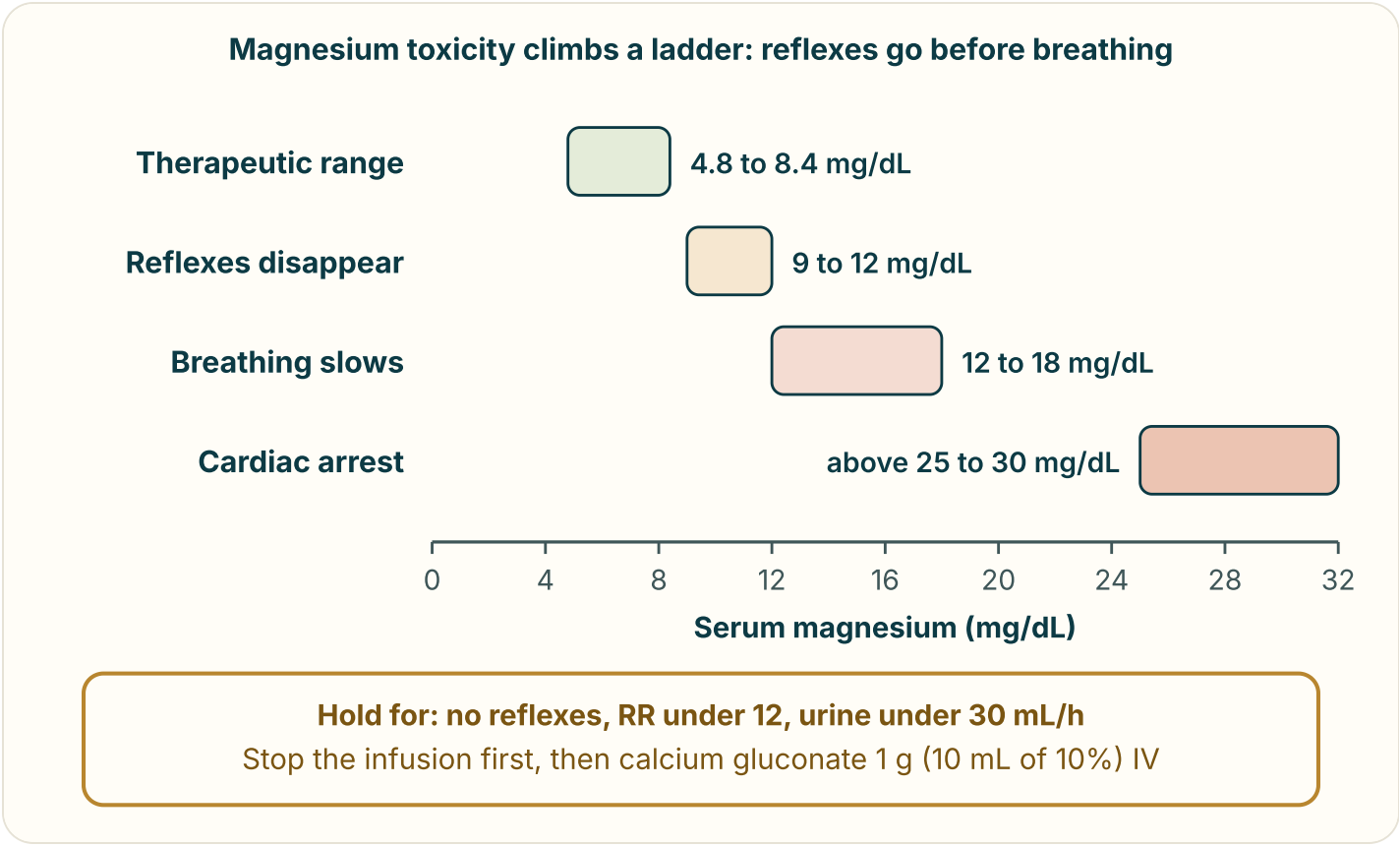
A confirmed severe-range pressure is treated **within 30 to 60 minutes** with IV labetalol, IV hydralazine or oral immediate-release nifedipine. The goal is 140 to 150 over 90 to 100, not normal. In an eclamptic seizure: stay, call for help, turn to the side, protect the head, nothing in the mouth, no restraints; afterward suction, oxygen, access and the magnesium bolus. A third to a half of eclamptic seizures happen after birth, and postpartum pre-eclampsia can appear up to six weeks out.

Magnesium sulfate prevents seizures; it does not lower pressure. It runs on a dedicated pump with an independent double check. Therapeutic range 4 to 7 mEq/L (about 4.8 to 8.4 mg/dL). Toxicity comes in order: reflexes lost at 9 to 12 mg/dL, breathing slows at 12 to 18, cardiac arrest above 25 to 30. Hold for RR under 12, absent reflexes, urine under 30 mL/h or a change in consciousness. Then: **stop the infusion first**, give calcium gluconate 1 g (10 mL of 10 percent) IV over about 3 minutes, support ventilation and send a level. Flushing and warmth are expected effects. **HELLP** (hemolysis, elevated liver enzymes, low platelets) often presents as epigastric pain and nausea with only modest hypertension; add bleeding precautions.

Placental hormones cause insulin resistance. Glucose crosses the placenta; insulin does not, so the fetus makes its own insulin, causing macrosomia, shoulder dystocia, newborn hypoglycemia, delayed surfactant and jaundice. Pre-gestational diabetes raises anomaly risk (target HbA1c below 6.5 before conception); gestational diabetes does not, but it carries about a 50 percent lifetime risk of type 2 diabetes, so test at 4 to 12 weeks postpartum. Targets: fasting under 95, one hour under 140, two hours under 120. **Insulin is first line** because it does not cross. Insulin needs crash after the placenta is delivered.

Every weight-based dose is calculated **per kilogram and then checked against the adult maximum**; the smaller number wins. Therapeutic enoxaparin is 1 mg/kg every 12 hours. Vancomycin is 20 mg/kg every 8 hours with a 2 g cap. Use a current documented weight in kilograms. Hyperemesis needs **thiamine before dextrose** to prevent Wernicke encephalopathy. Cholestasis gives itching of palms and soles at night without a rash; bile acids of 10 or more confirm it and 100 or more is severe.

Asymptomatic bacteriuria is treated; pyelonephritis is an admission. **GBS**: culture at 36 0/7 to 37 6/7 weeks, intrapartum IV penicillin, adequate once given at least 4 hours before birth. **Rh**: an Rh-negative person exposed to Rh-positive fetal cells makes anti-D, which harms the next fetus. RhIG 300 micrograms at 28 weeks, within 72 hours of birth and after any sensitizing event; one dose covers about 30 mL of fetal whole blood, and a Kleihauer-Betke test measures larger bleeds. RhIG is useless once the indirect Coombs is positive. Preterm labor: tocolytics buy about 48 hours for **antenatal steroids** (betamethasone 12 mg IM, two doses 24 hours apart) and transfer. PPROM: sterile speculum, no digital exam, watch temperature and fetal tachycardia over 160, and check the fetal heart immediately after any rupture. Bed rest is not a treatment.



The reflex is the early warning. Reflexes disappear at a lower level than breathing slows, so an hourly reflex check catches toxicity while there is still time. Stop the drip before giving the antidote.

LOCK THESE IN

- NST reassures when reactive; nonreactive usually means a sleeping fetus, so extend the test.
- Early = head, variable = cord, late = placenta. Resuscitate: reposition, stop oxytocin, bolus, oxygen, notify.
- Previa: painless, bright, soft uterus, nothing in the vagina. Abruption: painful, dark, rigid, may be concealed.
- Vasa previa: bleeding at rupture plus fetal bradycardia means immediate cesarean.
- Severe range is 160 or 110; treat within 30 to 60 minutes; goal 140 to 150 over 90 to 100.
- Magnesium: reflexes go before breathing. Stop the drip, then calcium gluconate 1 g IV.
- Insulin is first line in pregnancy because it does not cross the placenta.
- Weight-based dose, then compare with the adult maximum; the smaller wins.

Late-pregnancy bleeding at a glance

Feature	Previa	Abruption	Vasa previa
Pain	Painless	Painful, constant	Painless
Blood	Bright red, maternal	Dark red; about 20% concealed	Small volume, fetal, at rupture
Uterus	Soft, relaxed	Rigid, board-like, tender	Normal
Fetal heart rate	Usually normal at first	Late decelerations, bradycardia	Abrupt bradycardia or sinusoidal
First action	Nothing in the vagina; IV, type and cross, monitor	Two large IVs, oxygen, left lateral, labs, prepare for cesarean	Call for immediate cesarean

Magnesium sulfate by the numbers

Item	Value	Action
Therapeutic level	4 to 7 mEq/L (about 4.8 to 8.4 mg/dL)	Assess hourly
Reflexes lost	About 9 to 12 mg/dL	Earliest bedside warning
Respiratory depression	About 12 to 18 mg/dL	Hold for RR under 12
Cardiac arrest	Above about 25 to 30 mg/dL	Prevent by acting early
Urine output	At least 30 mL/h (100 mL over 4 h)	Oliguria lets the level climb
Antidote	Calcium gluconate 1 g = 10 mL of 10%	After stopping the infusion; over about 3 min

Worked cases

WORKED CASE 1 · DOSE WITH A CEILING

A patient who weighs 110 kg needs vancomycin for GBS prophylaxis because of a severe penicillin allergy. The order is 20 mg/kg every 8 hours, maximum 2 g per dose.

STEP 1 · CONFIRM THE WEIGHT

Use a current documented weight in kilograms: 110 kg.

STEP 2 · MULTIPLY

20 mg/kg × 110 kg = **2,200 mg**.

STEP 3 · COMPARE WITH THE CAP

2,200 mg is more than the 2,000 mg (2 g) maximum.

STEP 4 · GIVE THE SMALLER

The dose given is **2 g**. The calculated number never outranks the ceiling.

WORKED CASE 2 · THE ADOLESCENT AND THE ADULT MAXIMUM

Acetaminophen 15 mg/kg per dose is ordered for a 72 kg adolescent. The adult single dose maximum is 1,000 mg.

STEP 1 · MULTIPLY

15 mg/kg × 72 kg = 1,080 mg.

STEP 2 · COMPARE

1,080 mg is above the 1,000 mg adult single dose.

STEP 3 · CHOOSE

Give **1,000 mg**. A large adolescent never gets more than an adult dose because the multiplication says so.

STEP 4 · CONTRAST

For a 24 kg child the same order gives 15 × 24 = 360 mg, well under the cap, so 360 mg is given.

WORKED CASE 3 · SEVERE PRESSURE AT 33 WEEKS

At 33 weeks, a patient's blood pressure is 168/112, repeated four minutes later. She has a headache that acetaminophen did not help, reflexes of 3+, and urine output of 25 mL in the last hour.

STEP 1 · NAME IT

Severe-range pressure with a cerebral symptom: pre-eclampsia with severe features.

STEP 2 · START THE CLOCK

Antihypertensive treatment is due within 30 to 60 minutes of confirmation; goal 140 to 150 over 90 to 100.

STEP 3 · SEIZURE PREVENTION

Magnesium sulfate is the seizure prophylaxis. Note the low urine output: magnesium is cleared by the kidney, so it can accumulate.

STEP 4 · ESCALATE WITH SBAR

Give the numbers, name the concern, request labetalol and magnesium orders, and ask the provider to come now.

WORKED CASE 4 · TWO BLEEDING PATIENTS, TWO DIFFERENT RULES

Patient A at 34 weeks has painless bright red bleeding and a soft uterus. Patient B at 35 weeks has hypertension, constant pain, a rigid uterus and only a small amount of dark blood, but her pulse is 124.

STEP 1 · SORT A

Painless, bright red, soft uterus: placenta previa. No digital exam and nothing in the vagina.

STEP 2 · SORT B

Painful, rigid uterus, dark blood with hypertension: abruption.

STEP 3 · READ THE MISMATCH

B's pulse is high for the visible loss, which points to concealed bleeding behind the placenta.

STEP 4 · ACT

Two large-bore IVs, type and crossmatch with coagulation studies and fibrinogen, oxygen, left lateral, continuous fetal monitoring, and prepare for birth.

TRAPS PEOPLE FALL INTO

- **Reading a nonreactive NST as fetal distress.** Most are sleeping fetuses. Extend to 40 minutes and use stimulation before escalating.
- **Doing a cervical check for painless bleeding.** Previa forbids anything in the vagina until ultrasound clears it.
- **Trusting visible blood in abruption.** About one in five is concealed; trust the pulse and perfusion.
- **Waiting for proteinuria to call it pre-eclampsia.** Any severe feature makes the diagnosis without proteinuria.
- **Giving calcium gluconate while magnesium keeps running.** Stop the infusion first.
- **Giving dextrose fluids first in long-standing hyperemesis.** Give thiamine before dextrose to prevent Wernicke encephalopathy.

Chapter 4 self-test · ten items

1. A deceleration begins after the contraction starts and returns to baseline after it ends. What does it reflect?

A. Fetal head compression
B. Umbilical cord compression
C. Uteroplacental insufficiency
D. A normal fetal sleep cycle

C. Uteroplacental insufficiency A late deceleration means the placenta cannot meet oxygen demand during contractions.

2. Recurrent late decelerations appear during an oxytocin infusion. What is the first action?

A. Increase the oxytocin infusion rate
B. Reposition the patient to her side
C. Perform a sterile cervical exam
D. Document it and recheck in an hour

B. Reposition the patient to her side Intrauterine resuscitation starts with lateral positioning, then stopping oxytocin, a bolus, oxygen and notifying.

3. A patient at 32 weeks has painless bright red bleeding and a soft uterus. Which order should the nurse question?

A. Draw type and crossmatch
B. Begin continuous fetal monitoring
C. Insert a large-bore IV
D. Perform a digital cervical exam

D. Perform a digital cervical exam This picture suggests previa; a digital exam can cause catastrophic bleeding.

4. Membranes rupture with a small gush of blood and the fetal heart rate drops to 70 at once. What is most likely?

A. Ruptured vasa previa
B. Placenta previa
C. Bloody show of labor
D. Marginal abruption

A. Ruptured vasa previa Painless bleeding at rupture with immediate fetal bradycardia means torn fetal vessels.

5. Which finding is a severe feature of pre-eclampsia?

A. Blood pressure of 146/94
B. Platelets of 92,000
C. Dipstick protein of 2+
D. Ankle edema at day's end

B. Platelets of 92,000 Platelets below 100,000 are a severe feature; proteinuria alone is not.

6. A patient on magnesium has a respiratory rate of 10 and absent reflexes. Which action comes first?

A. Stop the magnesium infusion
B. Call the provider for orders
C. Draw a serum magnesium level
D. Give calcium gluconate IV

A. Stop the magnesium infusion Stop the source first; then give the antidote, support ventilation and notify.

7. Why is insulin first line for diabetes in pregnancy?

A. It is taken by mouth
B. It never causes hypoglycemia
C. It does not cross the placenta
D. It lowers placental lactogen

C. It does not cross the placenta Insulin stays on the maternal side, while metformin and glyburide cross.

8. A 120 kg patient has therapeutic enoxaparin ordered at 1 mg/kg every 12 hours. What is each dose?

A. 240 mg
B. 40 mg
C. 60 mg
D. 120 mg

D. 120 mg 1 mg/kg times 120 kg is 120 mg every 12 hours; 40 mg is the prophylactic dose.

9. An Rh-negative patient has a positive indirect Coombs test. What does this mean?

A. The newborn will have hemolytic disease
B. She needs a double dose of RhIG this week
C. The fetus is certainly Rh negative too
D. She is sensitized, so RhIG will not help

D. She is sensitized, so RhIG will not help RhIG prevents sensitization; once antibody is present the window has closed and fetal surveillance begins.

10. A patient with PPROM at 30 weeks has a fetal heart rate of 168. What does this suggest?

A. Possible early chorioamnionitis
B. An occult umbilical cord prolapse
C. Normal fetal reactivity at 30 weeks
D. An expected effect of bed rest

A. Possible early chorioamnionitis Fetal tachycardia above 160 is an early sign of intra-amniotic infection.

Cram sheet

Everything from chapters 3 and 4 in one place. Cover the right column and see if you can rebuild each row.

Normal pregnancy numbers

Item	Value	Note
Fetal heart baseline	110 to 160	Check the maternal pulse
Anemia	Below 11 (1st, 3rd); below 10.5 (2nd)	Physiologic dilution otherwise
Creatinine	0.4 to 0.8 mg/dL	1.0 is abnormal
Fundal height	12 wk symphysis; 20 wk umbilicus	cm = weeks within 2 from 18 to 36
Visits	Every 4 wk to 28; every 2 wk to 36; weekly	BP, weight, urine, FHR every time
Kick counts	10 movements in 2 hours	Less than usual: assess today
Extra energy	340 kcal (2nd); 452 kcal (3rd)	Protein about 71 g
Caffeine	Under 200 mg a day	No alcohol

High-risk rules

Item	Rule	Note
NST reactive	2 accelerations 15 by 15 in 20 min	10 by 10 before 32 weeks
BPP	8 to 10 reassuring; 4 or less deliver	6 is equivocal
Severe range	160 systolic or 110 diastolic	Treat within 30 to 60 minutes
Magnesium hold	RR under 12, no reflexes, urine under 30 mL/h	Stop, then calcium gluconate 1 g
GDM targets	Fasting under 95; 1 h under 140; 2 h under 120	Insulin first line
Dose rule	mg/kg, then adult maximum	Smaller number wins
RhIG	300 micrograms at 28 wk and within 72 h of birth	Covers about 30 mL fetal whole blood
Steroids	Betamethasone 12 mg IM, 2 doses 24 h apart	24 0/7 to 33 6/7 weeks

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