Final Exam Study Guide

This final guide puts the whole course in one place. Each chapter gets a short summary, the points to lock in, its diagram, one table, two worked cases, the most common traps and six new self-test items. The worked cases and tables come from the exam guides, so use those for the full version of any chapter that feels weak. Where two chapters give slightly different numbers for the same idea, each chapter keeps its own, just as the book does. Work the self-tests first; any miss tells you which chapter to reread.

WHAT THIS GUIDE COVERS

- Exam 1 · Chapters 1 and 2: Family-Centered Care, Reproductive Health, Equity and Accountability; Conception, Fetal Development and Genetics.
- Exam 2 · Chapters 3 and 4: The Antepartum Period: Adaptation and Prenatal Care; High-Risk Pregnancy and Antepartum Complications.
- Exam 3 · Chapters 5 and 6: Labor and Birth; Intrapartum Complications and Obstetric Emergencies.
- Exam 4 · Chapters 7 and 8: The Postpartum Period; Postpartum Complications.
- Exam 5 · Chapters 9 and 10: The Newborn: Transition, Assessment and Care; The High-Risk Newborn.
- Exam 6 · Chapters 11 and 12: Pediatric Growth, Development and Health Promotion; Pediatric Respiratory and Cardiovascular Conditions.
- Exam 7 · Chapters 13 and 14: Pediatric Systemic and Chronic Conditions; The Child in Crisis: Emergencies, Safeguarding and the Family.

CHAPTER 1

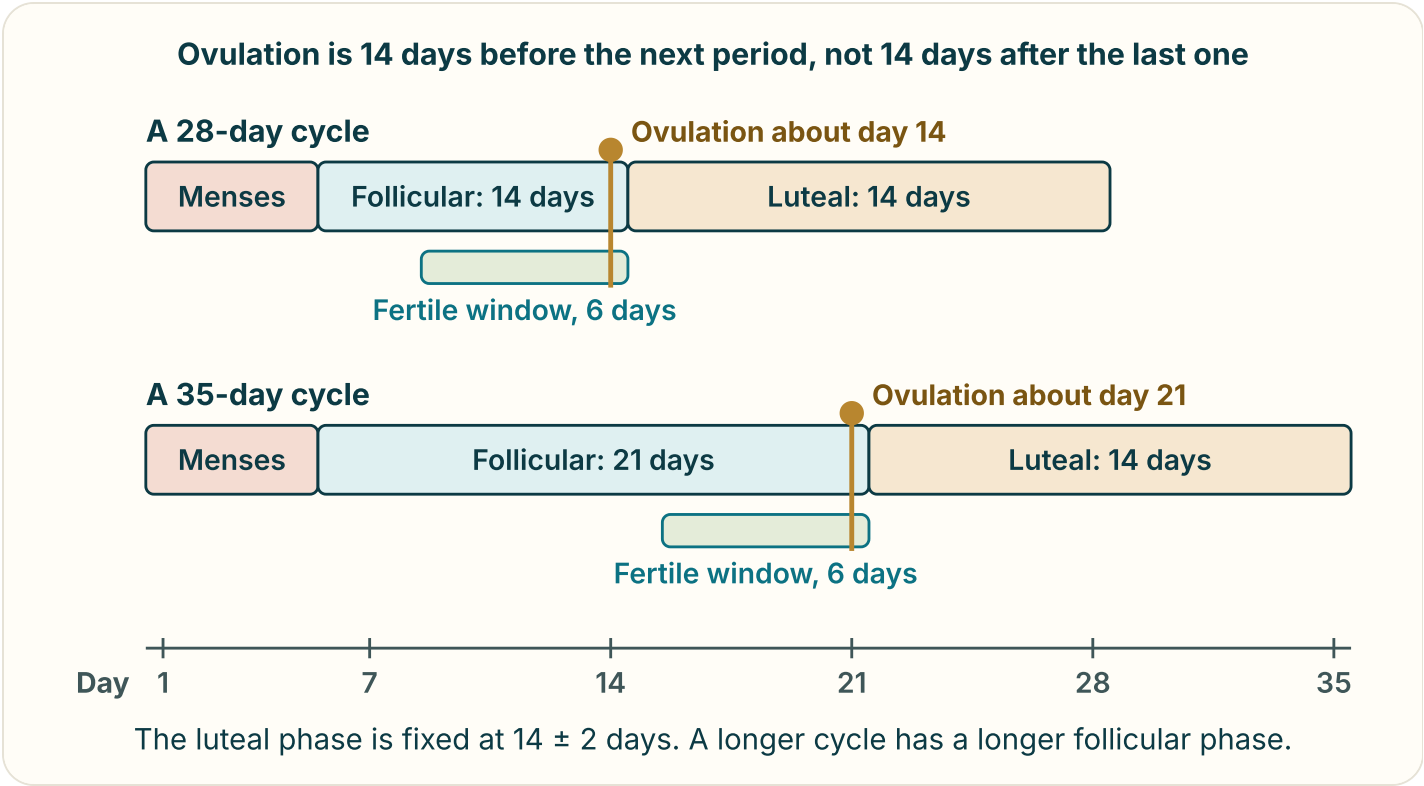
Family-Centered Care, Reproductive Health, Equity and Accountability

Read it in full: **Chapter 1 in the textbook**. Practice it in the lab: **Do You Sign It? The Consent Bench**.

What to know

The family is the unit of care, built on dignity and respect, information sharing, participation and collaboration. Atraumatic care and descriptive, non-blaming language are interventions. The RN keeps assessment, teaching, evaluation and the unstable patient, and checks the five rights of delegation every time. Assent comes from about age 7; emancipated minors consent for themselves; emergencies imply consent.

Ovulation is 14 days before the next period because the luteal phase is fixed; Naegele's rule is LMP minus 3 months plus 7 days plus 1 year, and early ultrasound wins when they disagree. Counsel contraception by tier and screen every estrogen method against its contraindications. Folic acid 400 micrograms starts before conception. Use trained interpreters, take a patient's report of something wrong as data, and remember that disparities come from structural racism and unequal access. The clinician obtains consent; the nurse witnesses identity, voluntariness and apparent capacity; a patient with capacity may refuse; mandatory reporting is personal.



The luteal phase is the fixed part. Only the follicular phase changes length, so ovulation sits 14 days before the next period. A 35-day cycle ovulates near day 21, which is why Naegele's rule runs early for that patient.

LOCK THESE IN

- Four pillars: dignity and respect, information sharing, participation, collaboration.
- The RN keeps assessment, teaching, evaluation and the unstable patient. Delegation is checked against the five rights every time.
- Assent from about age 7; emancipated minors consent for themselves; emergencies imply consent.
- Ovulation is 14 days before the next period; the luteal phase is fixed at 14 ± 2 days.
- Naegele's rule: LMP minus 3 months plus 7 days plus 1 year. Early ultrasound wins when they disagree.
- No estrogen with smoking at 35 or older, migraine with aura, prior VTE, BP 160/100 or higher, or the first 21 days postpartum.

Who may do what, and who decides

Item	Rule	Note
Assessment, teaching, evaluation	RN only	Includes the unstable patient and first 24 hours fundal checks
Titrating oxytocin or magnesium	RN only	Also reading fetal heart rate patterns
Vital signs, I and O, weights	UAP or LPN on a stable patient	Not on a patient whose status is changing
Reinforcing teaching	LPN/LVN	Only teaching the RN already gave; RN evaluates
Child below age of consent	Parent or guardian decides	Seek the child's assent from about age 7

Worked cases

CASE 1.1 · DATE THE PREGNANCY AND SPOT THE LIMIT

A patient's last menstrual period began on 25 January 2026. Her cycles are a regular 35 days. Find the estimated date of birth by Naegele's rule and say how her cycle changes the estimate.

STEP 1 · SUBTRACT THREE MONTHS

25 January 2026 minus three months is 25 October 2025.

STEP 2 · ADD SEVEN DAYS

25 October plus 7 days is 1 November 2025. Watch the month change: October has 31 days.

STEP 3 · ADD ONE YEAR

1 November 2025 becomes **1 November 2026**.

STEP 4 · CHECK THE ASSUMPTION

The rule assumes a 28-day cycle with ovulation on day 14. Her luteal phase is still about 14 days, so she ovulates near day 35 minus 14, which is day 21.

STEP 5 · APPLY IT

She ovulated about 7 days later than the rule assumes, so the estimate is about a week early. A first-trimester crown-rump length overrides the date if the two disagree by more than about 5 to 7 days.

CASE 1.2 · SCREEN A CONTRACEPTION REQUEST

A 36-year-old who smokes a pack a day asks for the combined pill. She has migraines that start with flashing lights.

STEP 1 · CHECK AGE AND SMOKING

Age 35 or older with 15 or more cigarettes a day is an absolute contraindication to estrogen.

STEP 2 · CHECK THE HEADACHE

Migraine with aura is a contraindication at any age. Both risks are arterial: stroke and heart attack.

STEP 3 · OFFER WHAT FITS

Offer methods without estrogen that are as or more effective: the implant, a levonorgestrel or copper IUD, the depot injection or the progestin-only pill.

STEP 4 · ADD SUPPORT

Offer smoking cessation help as a separate, non-judging conversation.

TRAPS PEOPLE FALL INTO

- **Ovulation on day 14 for everyone.** Ovulation is 14 days before the next period. A 35-day cycle ovulates near day 21.
- **Using a family member to interpret.** Relatives edit and children are harmed by the task. Use a trained interpreter for the whole encounter.
- **Thinking the witness confirms understanding.** The clinician obtains consent. The nurse witnesses identity, voluntariness and apparent capacity, and stops the signing if the patient cannot explain the plan.

Chapter 1 self-test · six items

1. A nurse explains a child's low hemoglobin in plain words and checks that the parents understood. Which pillar is this?

A. Collaboration with family
B. Information sharing
C. Dignity and respect
D. Family participation

B. Information sharing Complete, timely information in usable words is information sharing.

2. A patient has regular 30-day cycles. On about which day does she ovulate?

A. Day 16
B. Day 12
C. Day 20
D. Day 14

A. Day 16 The luteal phase is about 14 days, so 30 minus 14 is day 16.

3. Which person can usually consent to their own care without a parent?

A. A 12-year-old on a school trip
B. A 15-year-old with a sore throat
C. A 16-year-old married parent
D. A 10-year-old with a broken arm

C. A 16-year-old married parent Marriage is one basis for emancipated-minor status.

4. Which patient should not be started on a combined pill?

A. A 28-year-old after a miscarriage
B. A 30-year-old with acne
C. A 24-year-old nonsmoker
D. Day 10 after giving birth

D. Day 10 after giving birth Combined hormonal methods are contraindicated in the first 21 days postpartum.

5. A woman with a previous pregnancy affected by a neural tube defect plans to conceive. What daily folic acid dose is advised?

A. 4 mg as a single-ingredient tablet
B. 400 micrograms in a multivitamin
C. Ten prenatal vitamins a day
D. No supplement until pregnant

A. 4 mg as a single-ingredient tablet A prior NTD calls for 4 mg; ten prenatal vitamins would give excess vitamin A.

6. A patient who was given an opioid 15 minutes ago cannot say what surgery is planned. What does the nurse do?

A. Ask her partner to sign the form instead
B. Stop the signing; call the clinician back
C. Explain the surgery to her herself
D. Witness the signature as she was asked

B. Stop the signing; call the clinician back The disclosure has not happened; the clinician who will perform the procedure obtains consent.

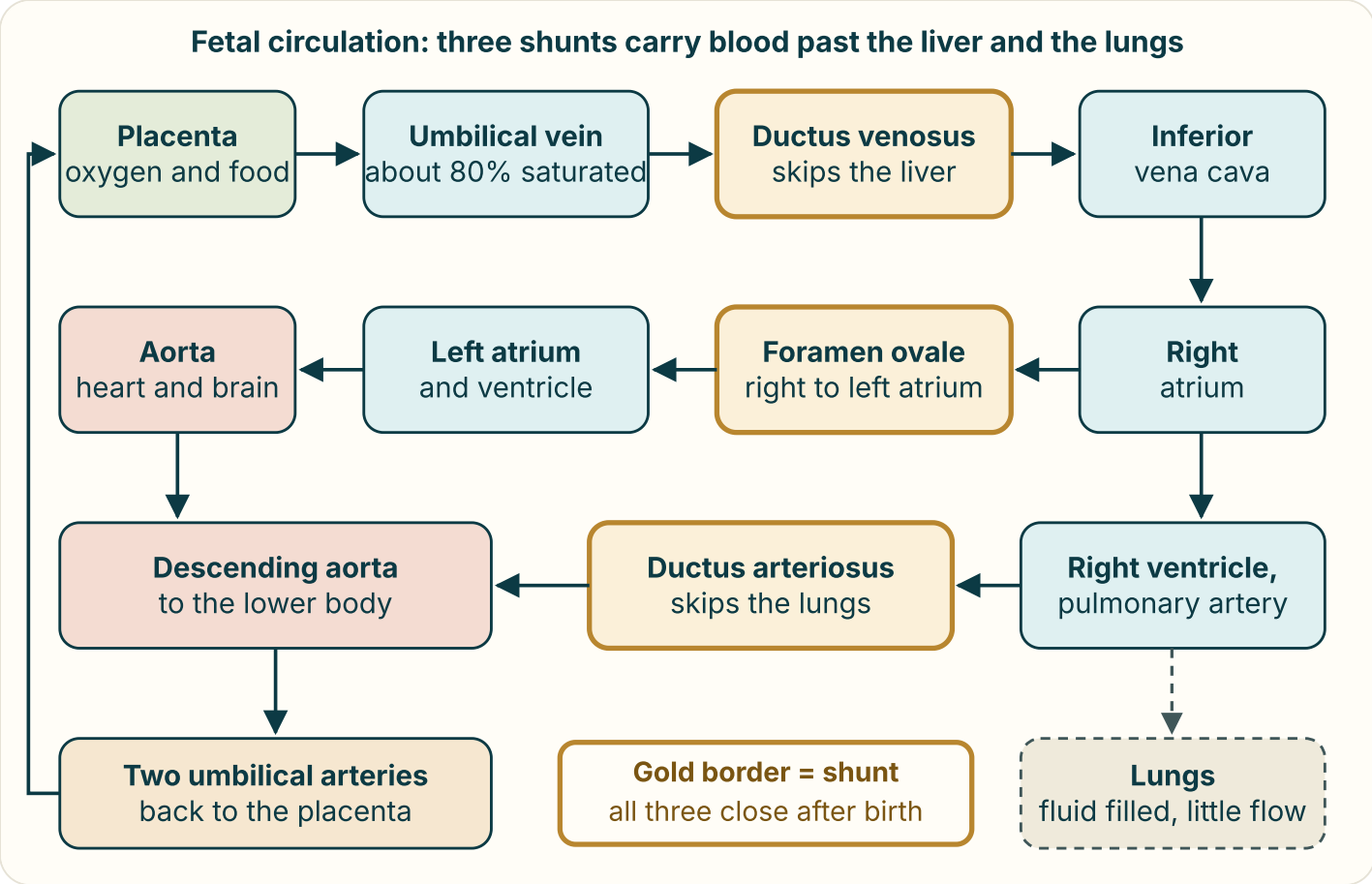
Conception, Fetal Development and Genetics

Read it in full: **Chapter 2 in the textbook**. Practice it in the lab: **A Screen Returns a Probability: The Prenatal Testing Bench**.

What to know

Fertilization happens in the ampulla, the blastocyst implants on days 6 to 10 and hCG rescues the corpus luteum. Gestational age is about two weeks more than fertilization age. Weeks 3 to 8 after conception build the organs and are the peak teratogen window; the neural tube closes by day 28. The placenta is a selective filter: IgG crosses, IgM does not, and hPL drives insulin resistance.

The cord has two arteries and one vein, and three shunts (ductus venosus, foramen ovale, ductus arteriosus) close after the first breath. In emergencies the first action decides the outcome: lift the presenting part off a prolapsed cord, stop magnesium before calcium gluconate, massage the fundus. Dominant risk is 50 percent, recessive 25 percent every pregnancy, X-linked recessive has no father-to-son transmission. A screen gives a probability; CVS and amniocentesis diagnose.



Three shunts, three bypasses. The ductus venosus skips the liver; the foramen ovale and the ductus arteriosus skip the lungs. At the first breath lung resistance falls, the cord is clamped, and all three begin to close.

LOCK THESE IN

- Fertilization in the ampulla; blastocyst by day 5; implantation days 6 to 10; hCG rescues the corpus luteum.
- Gestational age is about two weeks more than fertilization age.
- Weeks 3 to 8 after conception build the organs and are the peak teratogen window. The neural tube closes by day 28.
- Maternal IgG crosses the placenta; IgM does not.
- Cord: two arteries, one vein. The vein carries oxygenated blood to the fetus.
- First actions: lift the presenting part, stop the magnesium, massage the fundus.

Fetal shunts and what they become

Structure	Before birth	Closure and remnant
Ductus venosus	Umbilical vein blood bypasses the liver	Days after clamping; ligamentum venosum
Foramen ovale	Right atrium to left atrium	Functional at first breaths; fossa ovalis
Ductus arteriosus	Pulmonary artery to aorta	Functional 12 to 24 h, usually by 72 h; ligamentum arteriosum
Umbilical vein	Oxygenated blood to the fetus	Ligamentum teres
Umbilical arteries	Deoxygenated blood to the placenta	Medial umbilical ligaments

Worked cases

CASE 2.1 · TEN TIMES THE DOSE, ONE SAFE TABLET

A patient took valproate in a prior pregnancy that was affected by a neural tube defect. She plans another pregnancy and asks how much folic acid to take and whether she can just take more prenatal vitamins.

STEP 1 · PICK THE DOSE

A prior neural tube defect (or valproate or carbamazepine use) calls for 4 mg daily. The standard dose is 400 micrograms, which is 0.4 mg.

STEP 2 · SHOW THE MATH

4 mg divided by 0.4 mg equals **10**. Her dose is ten times the standard dose.

STEP 3 · SPOT THE HAZARD

Ten prenatal vitamins would also give ten times the vitamin A. Preformed vitamin A above roughly 10,000 IU a day is itself teratogenic.

STEP 4 · TEACH

She takes a single-ingredient folic acid tablet, starting at least one month before conception and through the first trimester.

CASE 2.2 · TWO CARRIER PARENTS AND THE COIN WITH NO MEMORY

Two parents who both carry the cystic fibrosis allele have one affected child. They believe the next three children will be fine because "the one in four has happened."

STEP 1 · DRAW THE SQUARE

Each parent passes the typical allele or the altered allele. The four equal outcomes are one affected, two carriers and one with two typical copies.

STEP 2 · STATE THE RISK

Each pregnancy carries a 25 percent chance of an affected child, 50 percent carrier and 25 percent unaffected noncarrier.

STEP 3 · CORRECT THE BELIEF

Each conception is independent. The chance resets every time.

STEP 4 · SAY IT KINDLY

"The chance is one in four each time, and it starts fresh with each pregnancy." Then offer genetic counseling and respect what the family decides.

TRAPS PEOPLE FALL INTO

- **Counting weeks from conception on the chart.** Charts use gestational age from the LMP, about two weeks more than fertilization age.
- **Thinking the umbilical arteries carry oxygen to the fetus.** The single vein carries oxygenated blood to the fetus; the two arteries return it to the placenta.
- **Expecting the risk to "use up."** A 25 percent recessive risk applies to every pregnancy.

Chapter 2 self-test · six items

1. When does the blastocyst usually implant?

A. Days 6 to 10 after fertilization

B. At about 8 weeks of gestation

C. Days 14 to 21 after fertilization

D. Days 1 to 3 after fertilization

A. Days 6 to 10 after fertilization The blastocyst hatches on day 5 or 6 and implants between days 6 and 10.

2. A patient took a drug 10 days after conception, before she knew she was pregnant. What is the usual pattern of effect at this stage?

A. A specific organ malformation
B. All or none: loss or full recovery
C. Fetal growth restriction only
D. Effects seen only in the third trimester

B. All or none: loss or full recovery In the first two weeks injury tends to cause loss or full recovery.

3. Which vessel carries oxygen-rich blood to the fetus?

A. The pulmonary artery
B. The umbilical arteries
C. The umbilical vein
D. The ductus arteriosus

C. The umbilical vein The single vein carries oxygenated blood from the placenta.

4. Which shunt lets fetal blood bypass the liver?

A. Umbilical artery
B. Foramen ovale
C. Ductus arteriosus
D. Ductus venosus

D. Ductus venosus The ductus venosus carries umbilical vein blood past the liver into the IVC.

5. A father has an autosomal dominant condition and the mother is unaffected. What is the chance for each child?

A. 75 percent
B. 25 percent
C. 50 percent
D. 100 percent

C. 50 percent One altered copy is enough, passed to half of the children on average.

6. Which test can diagnose a chromosome condition at 11 weeks?

A. Cell-free DNA screening
B. Chorionic villus sampling
C. The first-trimester combined screen
D. Maternal serum AFP

B. Chorionic villus sampling CVS is diagnostic from 10 0/7 weeks; the others are screens.

CHAPTER 3

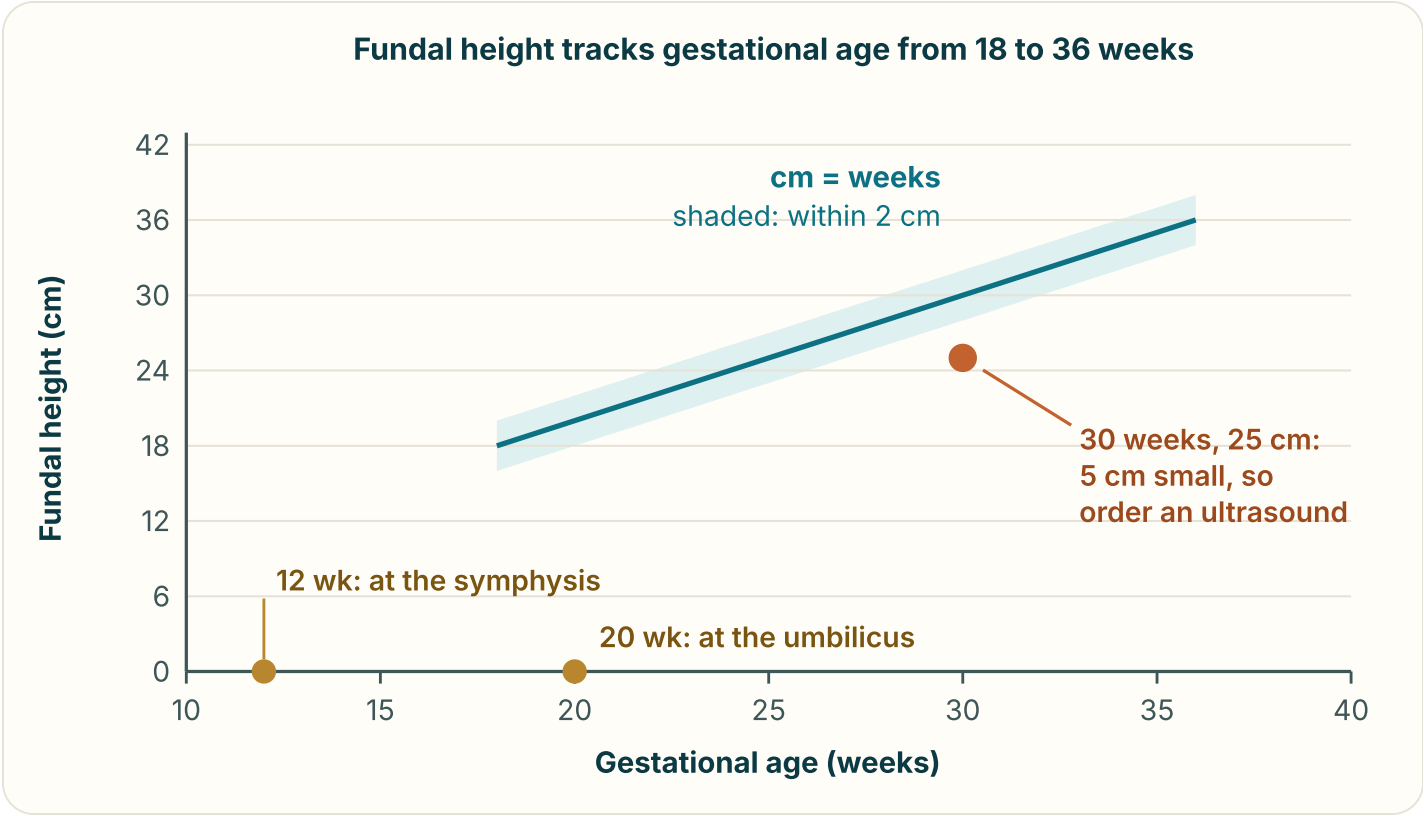
The Antepartum Period: Adaptation and Prenatal Care

Read it in full: **Chapter 3 in the textbook**. Practice it in the lab: **The Windows, the Tape Measure and the Tracing**.

What to know

Only ultrasound, a heard fetal heart and examiner-felt movement confirm pregnancy. GTPAL counts pregnancies and births, not babies. Nearly every adaptation has a look-alike: physiologic anemia (true anemia under 11, or 10.5 in the second trimester), a diastolic dip that bottoms at 24 to 28 weeks, a creatinine of 0.4 to 0.8 so that 1.0 is abnormal, and supine hypotension fixed by the left side.

Visits check BP, weight, urine and FHR every time, and fundal height from about 20 weeks (centimeters equal weeks from 18 to 36). Screening windows: cfDNA from 10 weeks, anatomy 18 to 22, glucose 24 to 28, RhIG at 28, Tdap 27 to 36, GBS 36 to 37 6/7. Gain depends on BMI; energy rises about 340 then 452 kcal. Teach danger signs as "call today," and in emergencies the hands move first.



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.

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; CO2 27 to 32	Sudden dyspnea, orthopnea, SpO2 below 95%
Kidney	Creatinine 0.4 to 0.8; trace glycosuria	Creatinine 1.0 or more; protein 1+ after 20 weeks

Worked cases

CASE 3.1 · 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.

CASE 3.2 · 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.

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.

Chapter 3 self-test · six items

1. Which is a probable sign of pregnancy?

A. Hegar sign on bimanual exam
B. Movement felt by the examiner
C. Fetal parts seen on ultrasound
D. Fetal heart tones by Doppler

A. Hegar sign on bimanual exam Hegar sign (soft lower segment) is probable; the others are positive signs.

2. A patient is pregnant now and had one baby at 39 weeks who is alive. What is her GTPAL?

A. G2 T0 P1 A0 L1
B. G1 T1 P0 A0 L1
C. G2 T1 P0 A1 L1
D. G2 T1 P0 A0 L1

D. G2 T1 P0 A0 L1 Two pregnancies, one term birth, one living child.

3. At 26 weeks a patient's diastolic pressure is lower than at booking. What does this reflect?

A. Supine hypotension only
B. Early pre-eclampsia developing
C. Falling vascular resistance
D. Dehydration from vomiting

C. Falling vascular resistance Diastolic pressure normally dips to a low point at 24 to 28 weeks.

4. When is the GBS culture collected?

A. At 40 weeks, only if due
B. 36 0/7 to 37 6/7 weeks
C. At the very first visit
D. 24 to 28 weeks of pregnancy

B. 36 0/7 to 37 6/7 weeks The rectovaginal culture is taken at 36 0/7 to 37 6/7 weeks.

5. A patient with a pre-pregnancy BMI of 22 asks about weight gain. What is the goal?

A. 5 to 9 kg
B. 12.5 to 18 kg
C. 7 to 11.5 kg
D. 11.5 to 16 kg

D. 11.5 to 16 kg A normal BMI calls for 11.5 to 16 kg (25 to 35 lb).

6. Which symptom at 32 weeks should prompt a same-day call?

A. Lower back ache when standing
B. Sudden swelling of the face
C. Ankle swelling at night
D. Mild heartburn after meals

B. Sudden swelling of the face Sudden facial or hand edema belongs with pre-eclampsia warning signs.

CHAPTER 4

High-Risk Pregnancy and Antepartum Complications

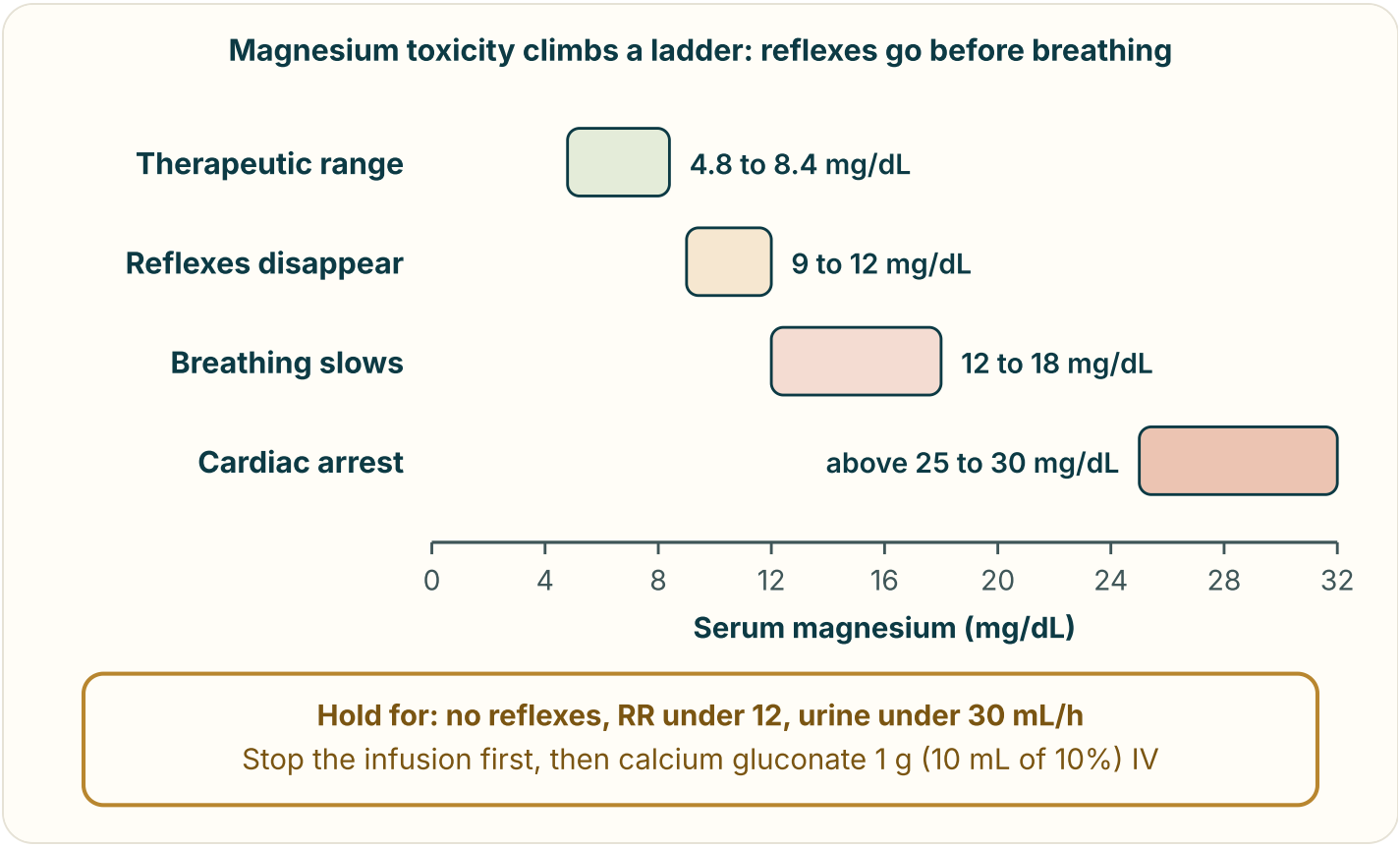
Read it in full: **Chapter 4 in the textbook**. Practice it in the lab: **PPROM, Prophylaxis and the Rhesus Window**.

What to know

Risk is dynamic and fetal tests reassure well but predict harm poorly. Early decelerations are head compression, variables are cord compression and lates are placental insufficiency; intrauterine resuscitation starts with repositioning. Painless bright bleeding with a soft uterus is previa (nothing in the vagina); painful dark bleeding with a rigid uterus is abruption, which may hide its blood; bleeding at rupture with fetal bradycardia is vasa previa.

Pre-eclampsia is endothelial injury and does not need proteinuria if a severe feature is present; treat 160 or 110 within 30 to 60 minutes. Magnesium prevents seizures: reflexes go before

breathing, so stop the infusion and then give calcium gluconate 1 g. Insulin is first line for diabetes because it does not cross the placenta. Every weight-based dose is checked against the adult maximum. RhIG prevents, but cannot reverse, sensitization; steroids are the reason to buy 48 hours in preterm labor.



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.

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

Worked cases

CASE 4.1 · 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.

CASE 4.2 · 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.

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.

Chapter 4 self-test · six items

1. A BPP scores 4 out of 10. What does this indicate?

A. Significant risk; plan for birth

B. Repeat the test in one week

C. A healthy fetus that is asleep

D. A reassuring, normal result

A. Significant risk; plan for birth A score of 4 or less indicates significant risk.

2. Which nursing action is safe for a patient with known placenta previa?

A. Insertion of a tampon for flow
B. A digital cervical exam now
C. Ultrasound to check the placenta
D. A speculum swab by the nurse

C. Ultrasound to check the placenta Nothing goes in the vagina with previa; transvaginal ultrasound is safe.

3. What is the goal when treating severe-range pressure in pre-eclampsia?

A. A systolic pressure under 100
B. Normal pressure, under 120/80
C. Any drop at all of 10 mm Hg
D. About 140 to 150 over 90 to 100

D. About 140 to 150 over 90 to 100 Dropping too far collapses placental perfusion.

4. A patient on magnesium has a urine output of 20 mL/h. Why does this matter?

A. It means she is too dry
B. Magnesium can build up
C. It lowers her seizure risk
D. It is expected from the drug

B. Magnesium can build up Magnesium is cleared by the kidney, so oliguria lets the level rise.

5. What is the fasting glucose target for gestational diabetes?

A. Under 95 mg/dL
B. Under 120 mg/dL
C. Under 180 mg/dL
D. Under 140 mg/dL

A. Under 95 mg/dL Targets are fasting under 95, one hour under 140, two hours under 120.

6. A patient with PPROM is in a triage room. Which exam is avoided?

A. A ferning slide test
B. A nitrazine test of fluid
C. A digital cervical exam
D. A sterile speculum exam

C. A digital cervical exam Digital exams shorten latency and bring in organisms.

CHAPTER 5

Labor and Birth

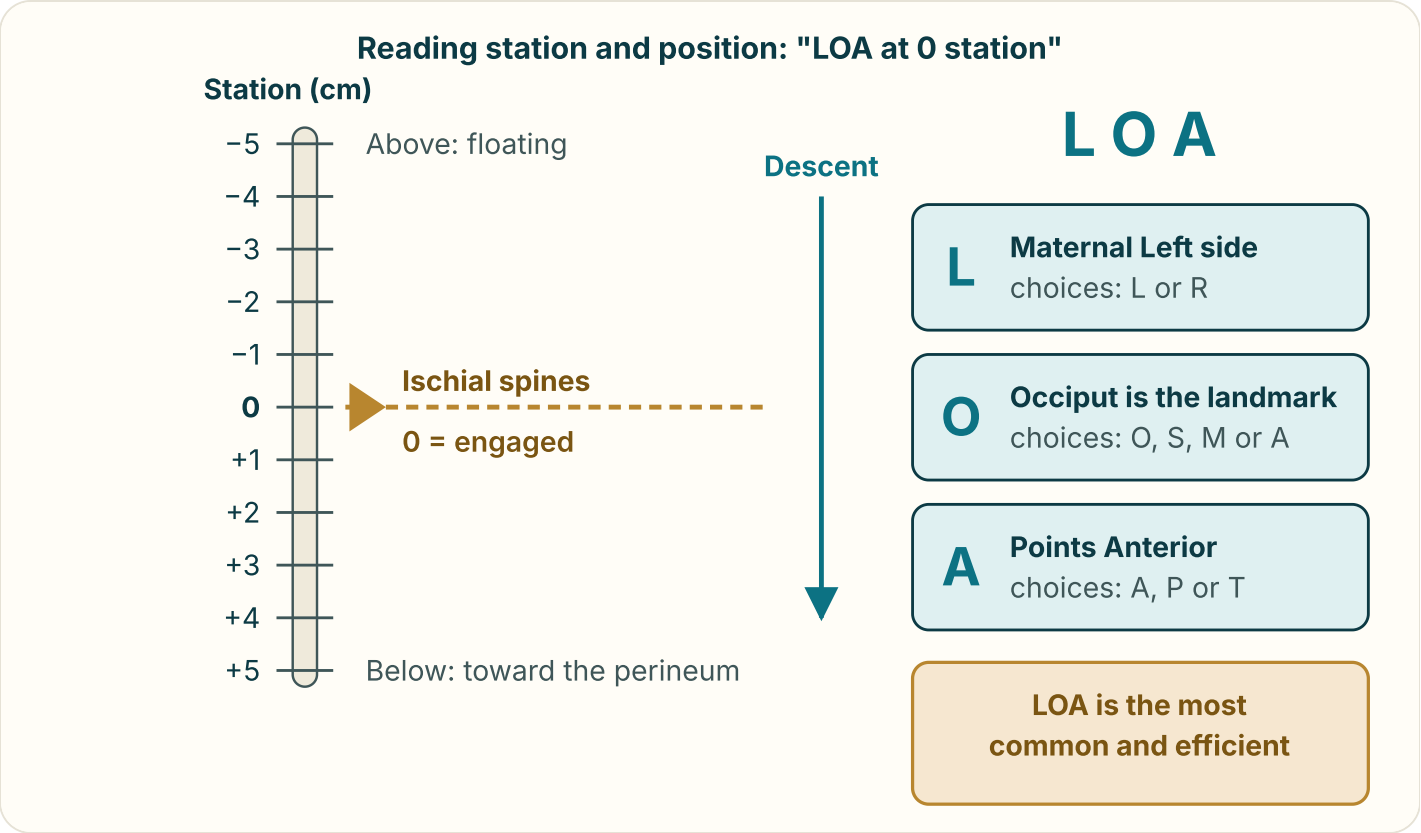
Read it in full: **Chapter 5 in the textbook**. Practice it in the lab: **The First Minutes, and the Order That Saves the Life**.

What to know

Read position as three letters and station against the ischial spines. Only progressive cervical change proves labor, and after any rupture of membranes the first action is a full minute of fetal heart rate. The active phase starts at about 6 cm; the fourth stage carries the greatest hemorrhage risk and is assessed every 15 minutes for the first hour.

Moderate variability is the most reassuring finding on a strip. For a worrying pattern, reposition and stop the oxytocin first. Continuous labor support is the best-evidenced comfort measure;

epidural hypotension is treated first with left uterine displacement. Newborns who are not breathing get ventilation within the first minute, and hemorrhage starts with fundal massage and measured loss.



Station is measured from the ischial spines. Minus numbers are above the spines and plus numbers below; 0 means engagement. The position code gives the maternal side, the fetal landmark and the direction it points.

LOCK THESE IN

- Station 0 is the ischial spines and means engagement; LOA is the most common position.
- Only progressive cervical change proves labor.
- After any rupture of membranes: a full minute of fetal heart rate first.
- Moderate variability is the most reassuring finding on a strip.
- VEAL CHOP: variable cord, early head, acceleration OK, late placenta.
- Epidural hypotension: left uterine displacement first, then fluid, oxygen, vasopressor.

The four stages of labor

Stage	Boundaries	Duration	Nursing priority
First, latent	Onset to about 6 cm	Highly variable, hours	Support, hydration, ambulation
First, active	6 to 10 cm	Faster, wide normal range	FHR, comfort, position change, bladder
Second	Complete to birth	Up to 3 h nullipara, 2 h multipara; add 1 h with epidural	Pushing, perineal support, FHR
Third	Birth to placenta	5 to 30 minutes	Uterotonic, cord traction, inspect placenta
Fourth	First 1 to 4 hours	1 to 4 hours	Fundus, lochia, bladder, vitals; skin-to-skin

Worked cases

CASE 5.1 · ARE THE CONTRACTIONS ADEQUATE?

An intrauterine pressure catheter shows four contractions in 10 minutes with peaks of 60, 55, 65 and 58 mm Hg. The resting baseline is 10 mm Hg.

STEP 1 · FIND EACH AMPLITUDE

Subtract baseline from each peak: 50, 45, 55 and 48 mm Hg.

STEP 2 · ADD THEM

50 + 45 + 55 + 48 = **198 Montevideo units**.

STEP 3 · COMPARE

Adequate is 200 or more, so this is just below adequate.

STEP 4 · USE IT

Document the number. An arrest diagnosis depends on whether contractions were adequate, so this matters before anyone labels the labor.

CASE 5.2 · THE EPIDURAL AND THE FALLING PRESSURE

Ten minutes after an epidural dose, a laboring patient's blood pressure drops from 124/78 to 88/50 and late decelerations appear.

STEP 1 · NAME IT

Post-epidural hypotension: systolic under 100 and a fall of more than 20 percent. The placenta feels it before the patient does.

STEP 2 · FIRST ACTION

Turn her to her side or displace the uterus to the left to relieve aortocaval compression.

STEP 3 · THEN

Open the IV fluid, apply oxygen, and notify anesthesia for an ordered vasopressor such as ephedrine or phenylephrine.

STEP 4 · RECHECK

Blood pressure every 5 minutes and watch the tracing recover.

TRAPS PEOPLE FALL INTO

- **Calling regular contractions labor.** Only progressive cervical change proves labor has begun.
- **Charting fluid color before listening.** After rupture, a full minute of fetal heart rate comes first because of cord prolapse risk.
- **Reaching for oxygen first on a worrying strip.** Reposition and stop the oxytocin; those change uterine blood flow.

Chapter 5 self-test · six items

1. Which fontanelle is diamond shaped?

A. The anterior fontanelle
B. The lambdoid fontanelle
C. The occipital fontanelle
D. The posterior fontanelle

A. The anterior fontanelle The anterior fontanelle is diamond shaped; the posterior is triangular.

2. Which contraction pattern is tachysystole?

A. Three contractions in 10 minutes
B. Contractions every 3 minutes apart
C. Two contractions in every 10 minutes
D. Six in 10 minutes, averaged over 30

D. Six in 10 minutes, averaged over 30 More than five in 10 minutes averaged over 30 minutes is tachysystole.

3. What marks the end of the third stage of labor?

A. Birth of the baby itself
B. Four hours after the birth
C. Delivery of the placenta
D. Complete cervical dilation

C. Delivery of the placenta The third stage runs from birth of the baby to the placenta.

4. A strip shows a baseline of 135, variability of 10 and early decelerations. What category is it?

A. Category II
B. Category I
C. Uninterpretable
D. Category III

B. Category I Normal baseline, moderate variability and only early decelerations meet Category I.

5. Where is second-stage labor pain carried?

A. The pudendal nerve, S2 to S4
B. The femoral nerve, L2 to L4
C. T10 to L1 visceral fibers
D. The phrenic nerve, C3 to C5

A. The pudendal nerve, S2 to S4 Second-stage pain is somatic through the pudendal nerve.

6. A newborn is pink with blue hands and feet. How is color scored on the Apgar?

A. A score of 2
B. Color is skipped
C. A score of 1
D. A score of 0

C. A score of 1 Acrocyanosis scores 1; completely pink scores 2.

CHAPTER 6

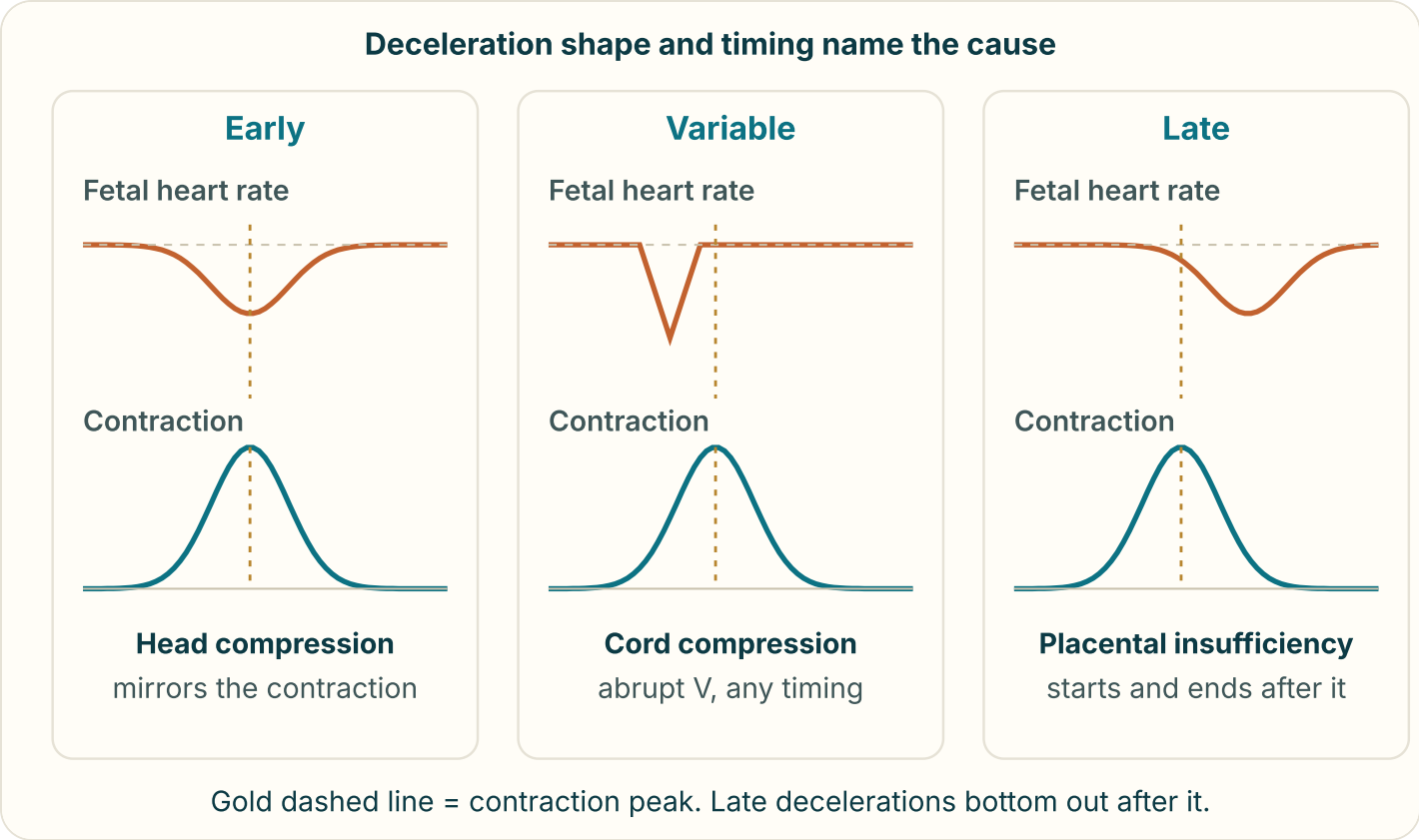
Intrapartum Complications and Obstetric Emergencies

Read it in full: **Chapter 6 in the textbook**. Practice it in the lab: **The 30-Minute Clock and the Magnesium Ladder**.

What to know

The shape and timing of a deceleration name its mechanism, and variability trumps decelerations. Category III means absent variability with recurrent lates, variables or bradycardia, or a sinusoidal pattern. Intrauterine resuscitation removes the cause first: stop the oxytocin, reposition, examine for prolapse, bolus. Describe labor patterns rather than blaming the person; the placenta refills between contractions, so tachysystole is treated by stopping oxytocin.

Cord prolapse: lift the presenting part and keep your hand there. Shoulder dystocia: McRoberts plus suprapubic, never fundal pressure. Uterine rupture shows first as an abnormal fetal heart rate. Treat severe pressure within 30 to 60 minutes; stabilize an eclamptic patient before birth. Magnesium toxicity: stop, then calcium gluconate. Hemorrhage: massage, then check BP before methylergonovine and ask about asthma before carboprost. The Apgar describes the newborn; it never starts resuscitation.



Shape and timing tell you the mechanism. Early dips mirror the contraction, variables are abrupt and V-shaped, and lates lag behind the peak. Lates are never normal and call for intrauterine resuscitation.

LOCK THESE IN

- Variability trumps decelerations.
- Early = head, variable = cord, late = placenta, sinusoidal = severe anemia.
- Category III: absent variability plus recurrent late or variable decels or bradycardia, or sinusoidal.
- Tachysystole is more than 5 contractions in 10 minutes averaged over 30; stop the oxytocin.
- Shoulder dystocia: McRoberts plus suprapubic, never fundal.
- Rupture shows first as an abnormal fetal heart rate.

Decelerations by mechanism

Type	Shape and timing	Mechanism	Response
Early	Gradual; nadir under the contraction peak	Head compression, vagal reflex	None; document
Variable	Abrupt; any timing	Cord compression	Reposition; amnioinfusion if recurrent
Late	Gradual; all phases after the contraction	Uteroplacental insufficiency	Full intrauterine resuscitation
Prolonged	2 to under 10 minutes	Occlusion, hypotension, tachysystole, rupture	Exam for prolapse; full resuscitation
Sinusoidal	Smooth wave, 3 to 5 per minute, 20 min or more	Severe fetal anemia	Category III; prepare for birth

Worked cases

CASE 6.1 · SET THE OXYTOCIN PUMP

Oxytocin 30 units in 500 mL is ordered to start at 2 milliunits per minute.

STEP 1 · FIND THE CONCENTRATION

30 units = 30,000 milliunits. 30,000 ÷ 500 mL = **60 milliunits per mL**.

STEP 2 · DOSE PER HOUR

2 milliunits/min × 60 min = 120 milliunits per hour.

STEP 3 · CONVERT TO ML/H

120 ÷ 60 milliunits/mL = **2 mL/h**. At this concentration, milliunits per minute equals mL per hour.

STEP 4 · TITRATE SAFELY

Increase by 1 to 2 milliunits a minute no more often than every 30 to 60 minutes, to a pattern, not a number.

CASE 6.2 · THE BLEEDING PATIENT AND THE SHOCK INDEX

Twenty minutes after birth, the measured loss is 900 mL and rising. Heart rate 122, BP 96/54, fundus boggy and deviated right.

STEP 1 · SHOCK INDEX

122 ÷ 96 = **1.27**, above the 0.9 level of concern.

STEP 2 · FIRST ACTION

Massage the fundus; it is both the assessment and the treatment for atony.

STEP 3 · NEXT

Empty the bladder (the deviation suggests it is full), call for help, check access, increase oxytocin, send labs and crossmatch.

STEP 4 · CHOOSE THE SECOND DRUG SAFELY

Check BP before methylergonovine; ask about asthma before carboprost. Escalate with SBAR and a specific request.

TRAPS PEOPLE FALL INTO

- **Worrying more about deep variables than about absent variability.** Variability trumps decelerations; absent variability means the reserve is gone.
- **Augmenting a hypertonic latent labor.** It gets worse. Use rest, hydration and analgesia.
- **Using misoprostol in a patient with a uterine scar.** It markedly raises the risk of rupture.

Chapter 6 self-test · six items

1. What does moderate variability most strongly suggest?

A. The fetus is in a sleep cycle
B. The placenta is now failing
C. The fetus is not acidemic now
D. Cord compression is present

C. The fetus is not acidemic now Moderate variability reflects an intact, oxygenated nervous system.

2. A smooth, wavy fetal heart pattern of 3 to 5 cycles a minute lasts 20 minutes. What is suspected?

A. Severe fetal anemia
B. Head compression
C. A normal sleep cycle
D. Maternal fever

A. Severe fetal anemia A sinusoidal pattern suggests severe fetal anemia and is Category III.

3. In this chapter's sequence, what is the first step of intrauterine resuscitation during oxytocin?

A. Apply oxygen by mask
B. Stop the oxytocin
C. Give an IV bolus
D. Start amnioinfusion

B. Stop the oxytocin Remove the cause before treating the effect.

4. Which statement about magnesium sulfate is correct?

A. It is the main antihypertensive
B. It may be given by rapid IV push
C. It is always stopped at birth
D. It prevents seizures but not high BP

D. It prevents seizures but not high BP Magnesium is an anticonvulsant; it continues 24 hours after birth.

5. Which uterotonic is avoided in a patient with asthma?

A. Carboprost
B. Misoprostol
C. Oxytocin
D. Tranexamic acid

A. Carboprost Carboprost can cause bronchospasm.

6. Without return of circulation in a pregnant patient after amniotic fluid embolism, when does perimortem cesarean begin?

A. At 20 minutes
B. At 10 minutes
C. At 30 minutes
D. At 4 minutes

D. At 4 minutes Begin at 4 minutes, aiming for birth by 5 minutes.

CHAPTER 7

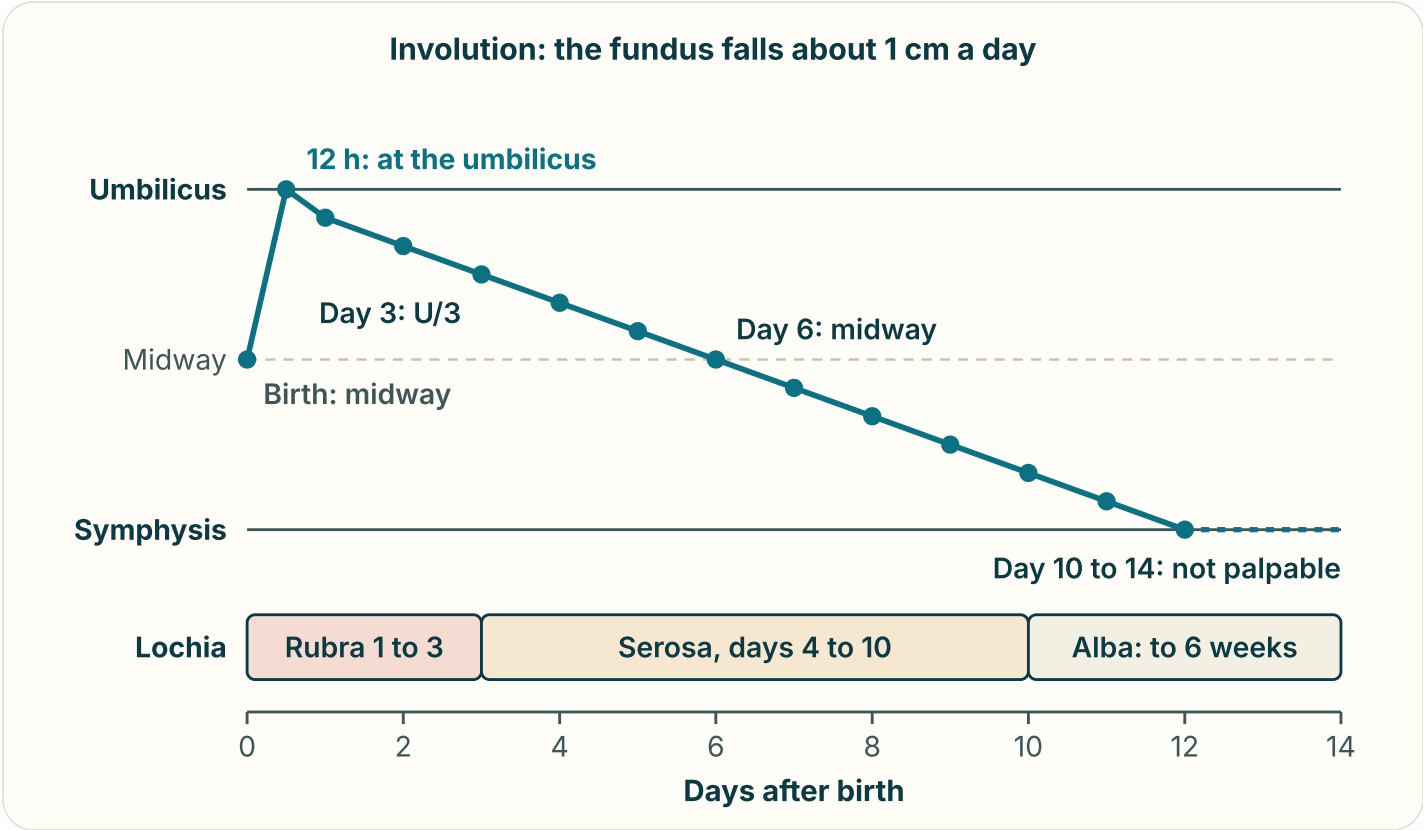
The Postpartum Period

Read it in full: **Chapter 7 in the textbook**. Practice it in the lab: **Feeding, Mood and Going Home: the Fourth Trimester Bench**.

What to know

Involution runs on the living ligature, autolysis and regeneration: the fundus is at the umbilicus by 12 hours and falls about 1 cm a day; lochia moves rubra, serosa, alba. Bradycardia of 40 to 60 and a white count up to 30,000 are normal; tachycardia over 100 is not. A boggy fundus high and to the right means a full bladder. BUBBLE-HE structures the assessment and the Maternal Early Warning Criteria trigger a bedside review.

Hemorrhage: massage first, then help, the bladder, access and uterotonics matched to BP and airway history. Inversion means stop uterotonics. Fever of 38.0 on two of days 1 to 10, after the first 24 hours, is puerperal morbidity. Feed 8 to 12 times a day and keep feeding through mastitis. Blues resolve by two weeks; depression lasts longer; psychosis is an emergency. Teach POST-BIRTH and contraception before discharge.



A centimeter a day. The fundus is at the umbilicus by 12 hours, then falls about one fingerbreadth daily. Lochia moves rubra, serosa, alba; a fundus higher than the day predicts, or lochia going backward, needs assessment.

LOCK THESE IN

- Fundus at the umbilicus by 12 hours, then down about 1 cm a day; not palpable by day 10 to 14.
- Lochia: rubra 1 to 3, serosa 4 to 10, alba 10 to six weeks. Backward flow or foul odor needs assessment.
- Bradycardia 40 to 60 and WBC up to 30,000 are normal; tachycardia over 100 is not.
- Fundus high and to the right: empty the bladder.
- Hemorrhage: massage first, then help, bladder, access, uterotonics. Quantify by weight.
- Inversion: stop uterotonics and leave the placenta.

Maternal Early Warning Criteria (any one triggers a bedside evaluation)

Measure	Trigger	Note
Systolic BP	Under 90 or over 160 mm Hg	Pressure falls late in hemorrhage
Diastolic BP	Over 100 mm Hg	Severe range is 110
Heart rate	Under 50 or over 120	Bradycardia 40 to 60 can be normal, but under 50 still triggers a look
Respiratory rate	Under 10 or over 30	Think magnesium, PE, sepsis
Oxygen saturation	Under 95% on room air	PE, pulmonary edema, cardiomyopathy

Worked cases

CASE 7.1 · WEIGH THE PAD, NOT THE GUESS

A pad weighs 340 g. Its dry weight is 40 g. The patient is 90 minutes postpartum and says she feels "fine."

STEP 1 · SUBTRACT

340 g minus 40 g = 300 g.

STEP 2 · CONVERT

1 g equals 1 mL, so the pad holds **300 mL**.

STEP 3 · TURN HER

Roll the patient to check under the buttocks, where blood pools unseen.

STEP 4 · ACT

Check the fundus and bladder, add this to the cumulative QBL, and notify. Visual estimates miss 30 to 50 percent.

CASE 7.2 · THE NUMBER THAT LOOKS FINE

Two hours after birth: heart rate 108, BP 112/70. She is restless and keeps saying something is wrong.

STEP 1 · SHOCK INDEX

108 ÷ 112 = **0.96**, above 0.9.

STEP 2 · READ THE PATTERN

Postpartum bradycardia is normal; a rate over 100 is not. Restlessness is cerebral hypoperfusion. Pressure falls late because of the expanded plasma volume.

STEP 3 · FIRST ACTION

Check and massage the fundus if boggy, call for help, and quantify the loss.

STEP 4 · ESCALATE

Use SBAR with the numbers, the shock index and her words, and a specific request.

TRAPS PEOPLE FALL INTO

- **Massaging a firm fundus.** It fatigues the muscle and can cause bleeding. Massage only a boggy fundus, with the lower segment supported.
- **Treating a high, right-sided boggy fundus with a drug first.** Empty the bladder; a full bladder blocks contraction.
- **Reading a white count of 25,000 as infection.** It is normal after labor. Look for fever, tachycardia and a source.

Chapter 7 self-test · six items

1. About how much does the uterus weigh six weeks after birth?

A. 300 to 350 g

B. 60 to 80 g

C. 450 to 500 g

D. 900 to 1,000 g

B. 60 to 80 g It falls from about 1,000 g at birth to 60 to 80 g by six weeks.

2. Which postpartum comfort measure fits the first 24 hours?

A. Ice packs to the perineum
B. A warm sitz bath
C. A heating pad to the perineum
D. Hot compresses to the fundus

A. Ice packs to the perineum Ice for the first 24 hours limits edema and hematoma; heat after.

3. What is the expected first void after birth?

A. At least 500 mL within 2 hours
B. Any amount within 24 hours
C. At least 50 mL within 12 hours
D. At least 150 mL within 6 hours

D. At least 150 mL within 6 hours Expect a void within 6 hours of at least 150 mL.

4. Which Rubin phase is best for teaching?

A. Taking-in
B. Binding-in
C. Taking-hold
D. Letting-go

C. Taking-hold Taking-hold, about day 2 to 10, is the teaching window.

5. A rubella non-immune patient is breastfeeding. What is correct about the MMR vaccine?

A. Give it in the next pregnancy
B. Wait until weaning
C. It is contraindicated now
D. Give it before discharge

D. Give it before discharge MMR is compatible with breastfeeding; avoid pregnancy for 28 days.

6. When does lactational amenorrhea work as contraception?

A. Until the first period comes back
B. Any breastfeeding during the first year
C. Only breast milk, no period, under 6 mo
D. Pumping milk once a day after month 2

C. Only breast milk, no period, under 6 mo All three conditions must hold together.

CHAPTER 8

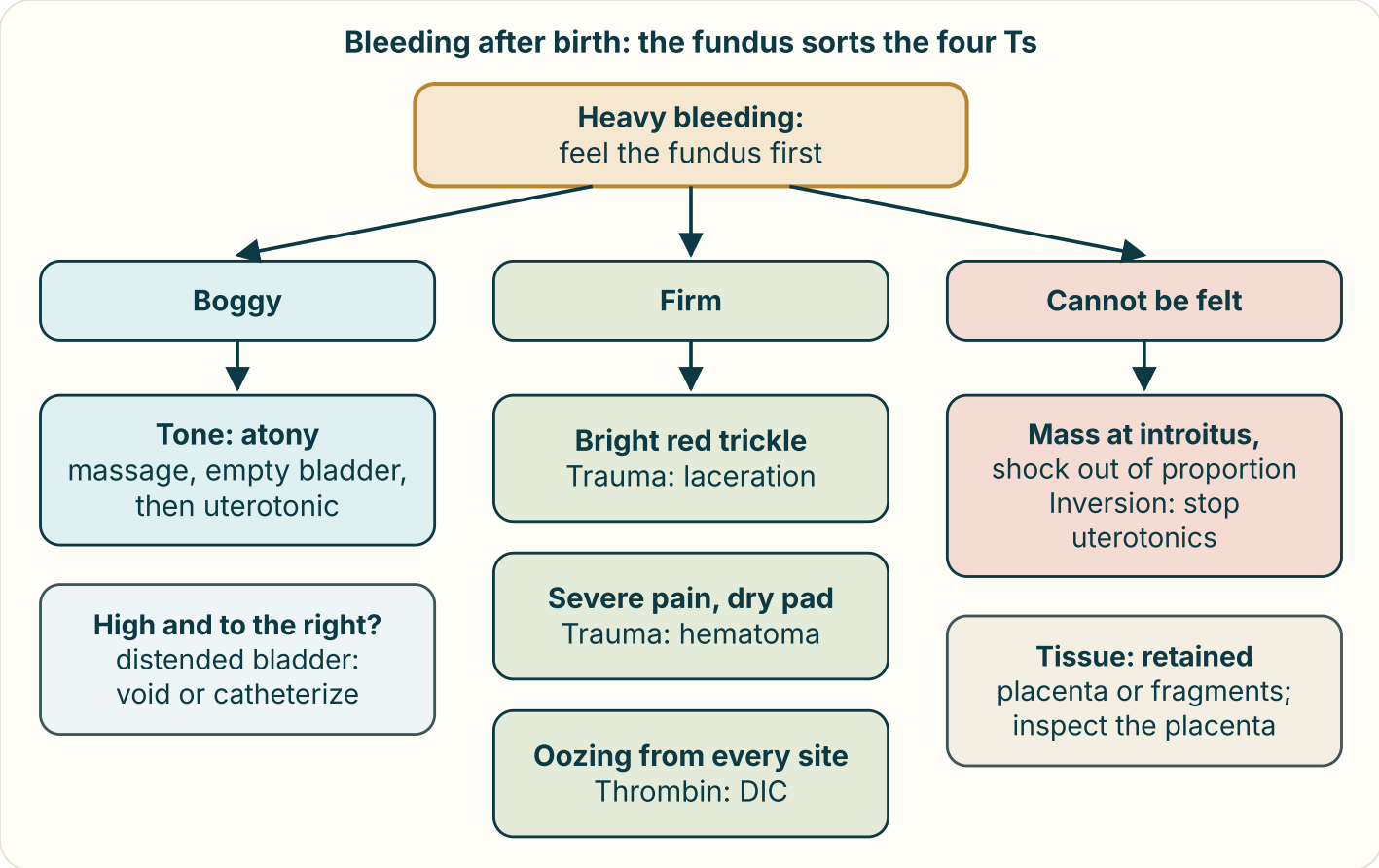
Postpartum Complications

Read it in full: **Chapter 8 in the textbook**. Practice it in the lab: **The Hour That Counts**.

What to know

Hemorrhage is 1000 mL or any loss with hypovolemia; blood pressure falls late, so watch the pulse, the shock index and the patient's words. Tone causes most bleeding: massage with lower-segment support, call for help, oxytocin, empty bladder, access. A firm fundus that keeps bleeding means trauma; severe pain with a dry pad means a hematoma; an absent fundus with disproportionate shock means inversion. Fibrinogen under 200 predicts severe bleeding.

Fever after the first day is infection until disproved; sepsis gets antibiotics within one hour and 30 mL/kg for hypotension or lactate 4 or more, with doses written out and double checked. VTE peaks in the first three weeks; therapeutic enoxaparin is 1 mg/kg every 12 hours. Postpartum pre-eclampsia can appear after discharge. Any positive EPDS item 10 is acted on at once, and a parent with psychosis is never left alone with the infant.



Your hand on the fundus is the first test. A boggy fundus means tone; a firm fundus that keeps bleeding means trauma, a hematoma or a clotting problem; a fundus you cannot feel means inversion, and uterotonics stop.

LOCK THESE IN

- Hemorrhage is 1000 mL or any loss with hypovolemia; blood pressure falls late.
- Shock index 0.9 or more needs a second look.
- Boggy fundus = atony; firm fundus still bleeding = trauma; pain with a dry pad = hematoma.
- Methylergonovine never in hypertension; carboprost never in asthma; TXA within 3 hours.
- Fibrinogen under 200 mg/dL predicts severe hemorrhage.
- Sepsis: antibiotics within one hour; 30 mL/kg fluid for hypotension or lactate 4 or more.

The bedside sort when bleeding continues

Finding	Suggests	Next move
Boggy fundus, dark blood and clots, fundus high	Atony	Massage with lower-segment support, then uterotonic
Firm fundus, steady bright red trickle	Laceration	Notify for inspection and repair; keep quantifying
Firm fundus, little external loss, severe one-sided pain, rising pulse	Hematoma	Inspect, mark borders, notify urgently
Boggy fundus deviated to one side, high	Distended bladder	Void or catheterize, then reassess tone
No palpable fundus, mass at introitus, profound shock	Uterine inversion	Stop uterotonics, call for help, leave the placenta

Worked cases

CASE 8.1 · SEPSIS DOSES FOR AN 80 KG PATIENT

A patient on day 3 after cesarean has a temperature of 38.6 °C, heart rate 124, BP 88/50 and lactate 4.2. She weighs 80 kg. Gentamicin 1.5 mg/kg every 8 hours and a 30 mL/kg crystalloid bolus are ordered.

STEP 1 · RECOGNIZE

Fever, heart rate over 120, systolic under 90 and lactate 4 or more: sepsis.

STEP 2 · ANTIBIOTIC

1.5 mg/kg × 80 kg = **120 mg** every 8 hours, within one hour of recognition, after cultures if they do not cause delay.

STEP 3 · FLUID

30 mL/kg × 80 kg = **2,400 mL** crystalloid.

STEP 4 · CHECK

A second nurse does an independent calculation, and each dose is checked against the maximum before it is given. Find the source: wound, retained tissue, abscess.

CASE 8.2 · PAIN OUT OF PROPORTION, PAD NEARLY DRY

An hour after a repair, a patient reports severe rectal pressure that ice and analgesia do not touch. The fundus is firm and midline, the pad is barely stained, and her pulse has risen from 78 to 104.

STEP 1 · SORT THE T

Firm fundus rules out atony. Pain with little external bleeding points to trauma: a genital tract hematoma.

STEP 2 · LOOK

Inspect for a tense, bulging, bluish mass, often one-sided, and mark its borders.

STEP 3 · ESCALATE

Notify urgently; the rising pulse and a falling hematocrit show concealed loss.

STEP 4 · PREPARE

Larger or expanding hematomas need incision, evacuation and ligation, often with a urinary catheter.

TRAPS PEOPLE FALL INTO

- **Waiting for hypotension to call a hemorrhage.** Pulse, breathing, mental status and the shock index change first.
- **Massaging harder when the fundus is already firm.** A firm fundus with bleeding is trauma; call for inspection.
- **Calling a fibrinogen of 250 normal.** In pregnancy it runs 350 to 650; under 200 predicts severe bleeding.

Chapter 8 self-test · six items

1. What is a normal postpartum shock index?

A. Over 1.4
B. 0.9 to 1.4
C. 1.0 to 1.2
D. 0.5 to 0.7

D. 0.5 to 0.7 0.5 to 0.7 is normal; 0.9 or more needs a second look.

2. Why is a fibrinogen of 250 mg/dL worrying in a bleeding postpartum patient?

A. It predicts a blood clot
B. Pregnant levels run 350 to 650
C. It means the lab made an error
D. It is above the normal range

B. Pregnant levels run 350 to 650 In pregnancy 250 is low; under 200 predicts severe hemorrhage.

3. Which sign suggests necrotizing fasciitis at a wound?

A. Pain far beyond what the wound shows
B. A small amount of yellow exudate
C. Mild redness at the incision edge
D. Itching along the healing incision

A. Pain far beyond what the wound shows Severe pain with rapid spread and dusky skin is a surgical emergency.

4. An 82 kg patient needs enoxaparin 1 mg/kg every 12 hours from 100 mg/mL stock. What volume is given?

A. 0.41 mL
B. 8.2 mL
C. 0.82 mL
D. 0.8 mL

C. 0.82 mL 82 mg divided by 100 mg/mL is 0.82 mL.

5. A parent on day 4 is suddenly sleepless, confused and believes the baby is possessed. What comes first?

A. Give a sleep aid and then observe her
B. Never leave her alone with the baby
C. Reassure her that this is the blues
D. Schedule a routine two-week follow-up

B. Never leave her alone with the baby This is postpartum psychosis, an emergency with infant and suicide risk.

6. When is the risk of postpartum VTE highest?

A. The first three weeks after birth
B. The second trimester
C. The first hour after birth only
D. Six to twelve months after birth

A. The first three weeks after birth Risk peaks in the first three weeks and stays raised to about twelve.

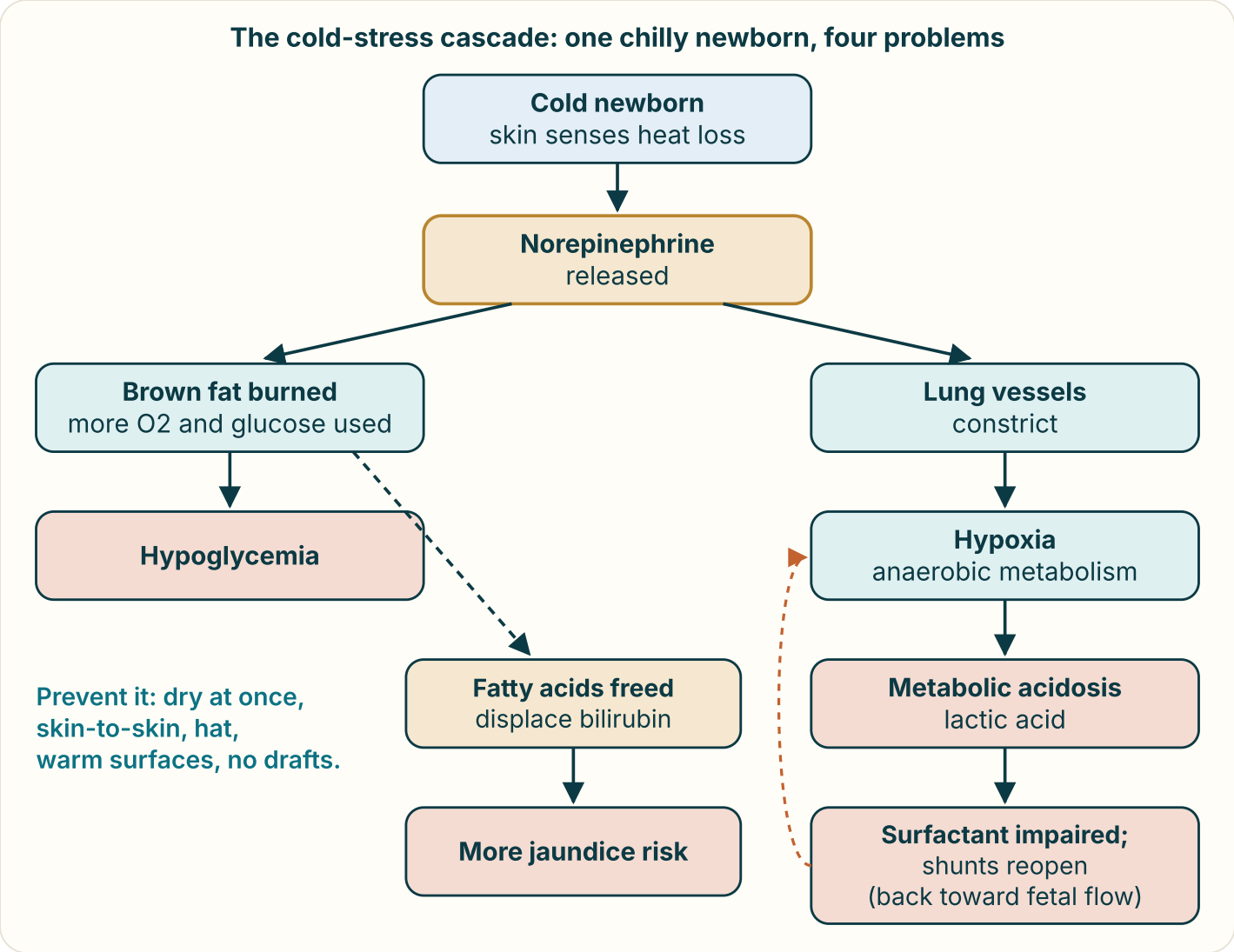
The Newborn: Transition, Assessment and Care

Read it in full: **Chapter 9 in the textbook**. Practice it in the lab: **Scoring the First Five Minutes**.

What to know

Labor primes lung fluid clearance, and the first breath drops pulmonary resistance so the shunts close; hypoxia, acidosis and cold can reopen them. Ventilation within 60 seconds is the key resuscitation step; the Apgar describes the transition. Caput crosses sutures, cephalhematoma does not, and subgaleal hemorrhage crosses sutures, spreads and can cause shock.

Cold stress burns brown fat, oxygen and glucose and cascades into hypoglycemia, acidosis and jaundice. Treat low glucose by hour-of-life thresholds with gel 0.5 mL/kg or D10W 2 mL/kg. Jaundice in the first 24 hours, a rise over 0.2 mg/dL per hour or a direct fraction over 1 is pathologic. Give vitamin K, eye ointment and hepatitis B vaccine; screen CCHD at 24 hours; dose per kilogram with the adult ceiling; teach safe sleep.



Cold is a metabolic emergency. Making heat burns brown fat, oxygen and glucose, so a cold baby becomes hypoglycemic, hypoxic, acidotic and more jaundiced. Drying and warming are also the metabolic treatment.

LOCK THESE IN

- Ventilation within the first 60 seconds is the most effective resuscitation step.
- The duct closes functionally by 12 to 24 hours; hypoxia, acidosis and cold can reopen it.
- Apgar at 1 and 5 minutes describes; it never delays care.
- Caput crosses sutures and fades in days; cephalhematoma does not cross; subgaleal crosses, spreads and can cause shock.
- Cold stress leads to hypoglycemia, acidosis, reopened shunts and worse jaundice.
- Dextrose gel 0.5 mL/kg; D10W 2 mL/kg; GIR 5 to 8 mg/kg/min.

Newborn hypoglycemia thresholds

Hour of life	Treat IV if	Feed and recheck in 1 h if
First 4 hours	Under 25 mg/dL after a feed, or symptomatic	25 to 40 mg/dL
4 to 24 hours	Under 35 mg/dL after a feed, or symptomatic	35 to 45 mg/dL
Any age, symptomatic	Under 40 mg/dL: treat now	Do not rely on oral feeding alone
Beyond 48 hours	Persistently under 50 to 60 mg/dL	Investigate hyperinsulinism

Worked cases

CASE 9.1 · TREAT THE LOW GLUCOSE BY WEIGHT

A 3.6 kg infant of a parent with diabetes is jittery at 2 hours with a plasma glucose of 22 mg/dL.

STEP 1 · CLASSIFY

Under 25 mg/dL in the first 4 hours, and symptomatic: intravenous dextrose. Treat first, confirm with the lab second.

STEP 2 · BOLUS

D10W 2 mL/kg × 3.6 kg = **7.2 mL** IV over about 5 minutes.

STEP 3 · COMPARE THE GEL

For an asymptomatic low, gel 0.5 mL/kg × 3.6 kg = 1.8 mL buccally before a feed.

STEP 4 · FOLLOW

Start a continuous infusion so the glucose does not rebound, and recheck 30 minutes after the intervention.

CASE 9.2 · IS THIS JAUNDICE PATHOLOGIC?

A term newborn had a bilirubin of 6.0 mg/dL at 24 hours and 10.8 mg/dL at 40 hours.

STEP 1 · FIND THE CHANGE

10.8 minus 6.0 = 4.8 mg/dL.

STEP 2 · FIND THE TIME

40 minus 24 = 16 hours.

STEP 3 · RATE

4.8 ÷ 16 = **0.3 mg/dL per hour**.

STEP 4 · JUDGE

Over 0.2 mg/dL per hour is pathologic. Escalate for type and Rh, direct Coombs, hematocrit and reticulocytes, and plot against the hour-specific nomogram.

TRAPS PEOPLE FALL INTO

- **Waiting for the 1-minute Apgar before ventilating.** The score describes; ventilation starts within 60 seconds if needed.
- **Giving naloxone to a depressed newborn.** Ventilate. Naloxone can cause seizures in a newborn of an opioid-dependent parent.
- **Calling a swelling that crosses sutures a cephalhematoma.** Cephalhematoma stops at the sutures; a spreading one after vacuum birth may be subgaleal.

Chapter 9 self-test · six items

1. Why does a scheduled cesarean without labor raise the risk of TTN?

A. Labor hormones help clear lung fluid

B. Cesarean surgery injures the lungs

C. Surfactant is destroyed at surgery

D. The baby is always born preterm

A. Labor hormones help clear lung fluid Labor catecholamines switch lung cells to absorb sodium and fluid.

2. A newborn's swelling after vacuum birth crosses sutures and is spreading toward the ears. What is suspected?

A. Normal skull moulding
B. A cephalhematoma
C. Subgaleal hemorrhage
D. Caput succedaneum

C. Subgaleal hemorrhage Subgaleal bleeding crosses sutures, spreads and can cause shock.

3. Where is the radiant warmer servo probe placed?

A. Under the infant's back
B. Between the shoulder blades
C. On the bony forehead
D. The abdomen over the liver

D. The abdomen over the liver Avoid brown fat, bony prominences and the surface under the baby.

4. A 3.4 kg infant needs D10W at 2 mL/kg. What is the bolus volume?

A. 34 mL
B. 6.8 mL
C. 3.4 mL
D. 1.7 mL

B. 6.8 mL 2 mL/kg times 3.4 kg is 6.8 mL.

5. Which jaundice pattern needs no change except continued feeding?

A. Visible jaundice at 12 hours of age
B. A rise of 0.4 mg/dL every hour
C. A direct bilirubin of 2.5 mg/dL
D. Breast-milk jaundice, thriving baby

D. Breast-milk jaundice, thriving baby Breast-milk jaundice starts around day 5 to 7 in a well, gaining infant.

6. When is the newborn metabolic heel stick collected?

A. At the 2-week visit, not before
B. After at least 24 hours of feeding
C. Before the very first feed
D. In the first hour after birth

B. After at least 24 hours of feeding Several analytes need protein intake to become abnormal.

CHAPTER 10

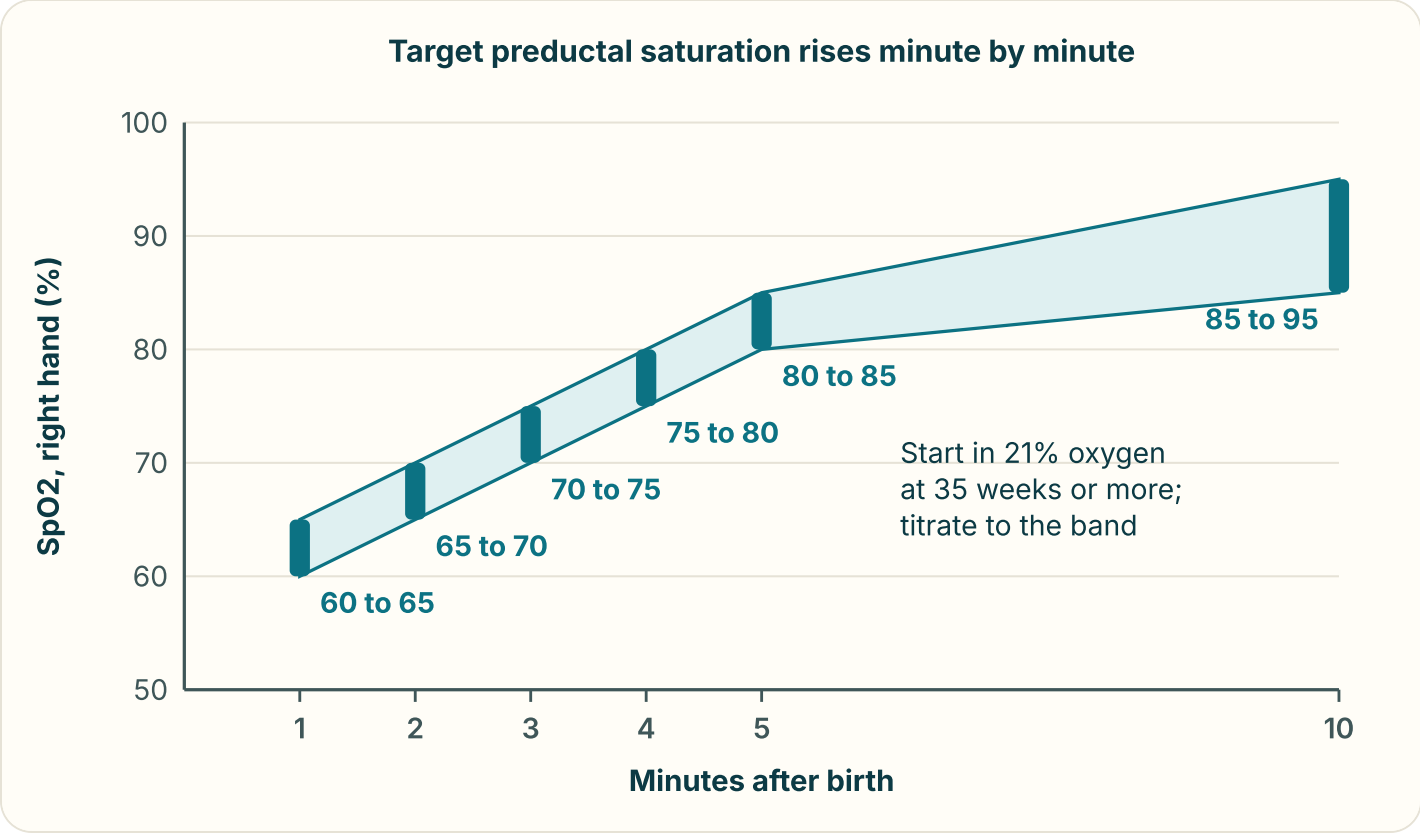
The High-Risk Newborn

Read it in full: **Chapter 10 in the textbook**. Practice it in the lab: **One Correct First Action: Injury, Anomaly, Withdrawal and the Family**.

What to know

Gestational age, birth weight and birth events are separate risk axes; the late preterm baby looks term but is not. In resuscitation, fix ventilation with MR SOPA before compressions; compress at 3:1 for a rate under 60 after effective ventilation; epinephrine 0.02 mg/kg IV. Titrate oxygen to minute-by-minute preductal targets. Tell RDS, TTN, meconium aspiration and PPHN apart by history and film.

Warmth, glucose and fluid form one system; GIR = (dextrose percent times mL/h) divided by (kg times 6). NEC needs feeds stopped and the stomach decompressed. Early and late sepsis both look like a baby who is not right. Cooling for HIE starts within 6 hours. Each anomaly has one counterintuitive first action, such as intubating, never bag-masking, a diaphragmatic hernia. Withdrawal care starts with Eat, Sleep, Console.



A corridor, not a ceiling. Healthy newborns start near 60 percent and climb over ten minutes. Titrate oxygen to the band on the right hand; too much oxygen harms preterm eyes and lungs.

LOCK THESE IN

- Late preterm 34 0/7 to 36 6/7: treat as a surveillance patient.
- Golden Minute: PPV within 60 seconds; fix it with MR SOPA before compressions.
- Compressions 3:1 if under 60 after 30 seconds of effective ventilation; epinephrine 0.02 mg/kg IV.
- Preductal targets: 60 to 65 at 1 minute up to 85 to 95 at 10.
- PPHN: pre to post gap over 10%; handle minimally.
- GIR = dextrose % times mL/h, divided by kg times 6; target 5 to 8.

Respiratory syndromes of the newborn

Condition	Typical newborn	Radiograph	Core management
RDS	Preterm; worse with diabetes or asphyxia	Ground glass, air bronchograms, low volume	CPAP 5 to 6, surfactant, wean oxygen
TTN	Term or late preterm, cesarean without labor	Fluid in fissures, perihilar streaks	Warmth, oxygen if needed; 24 to 72 h
Meconium aspiration	Post-term or growth restricted	Patchy infiltrates, hyperinflation	Ventilation; watch air leak and PPHN
PPHN	Term, after asphyxia, MAS or sepsis	Often clearer than the hypoxemia	Oxygen, gentle ventilation, iNO, ECMO

Worked cases

CASE 10.1 · TWO ROUTES, TWO EPINEPHRINE DOSES

A 2.5 kg newborn still has a heart rate under 60 after 60 seconds of compressions with ventilation. The 0.1 mg/mL concentration is used.

STEP 1 · IV DOSE

0.02 mg/kg × 2.5 kg = **0.05 mg**.

STEP 2 · IV VOLUME

0.05 mg ÷ 0.1 mg/mL = **0.5 mL** by umbilical venous catheter.

STEP 3 · ENDOTRACHEAL DOSE

Only while access is obtained: 0.1 mg/kg × 2.5 kg = 0.25 mg, which is 2.5 mL.

STEP 4 · CHECK

Say both numbers aloud with a second nurse; the routes are never interchangeable.

CASE 10.2 · IS THIS SATURATION ACCEPTABLE?

At 3 minutes of life a term newborn receiving PPV in 21 percent oxygen has a right-hand saturation of 72 percent and a rising heart rate.

STEP 1 · READ THE TARGET

At 3 minutes the preductal target is 70 to 75 percent.

STEP 2 · COMPARE

72 percent is inside the range.

STEP 3 · ACT

Do not raise the oxygen. Continue effective ventilation and keep titrating to the minute-by-minute target.

STEP 4 · WHY

Hyperoxia harms; a pink baby at 1 minute is not the goal.

TRAPS PEOPLE FALL INTO

- **Treating a 35-week baby as a well term baby.** Late preterm infants need glucose, temperature, feeding and bilirubin surveillance.
- **Starting compressions when the heart rate will not rise.** Fix the ventilation with MR SOPA first.
- **Pushing oxygen until the baby is pink at 1 minute.** Follow the minute-by-minute targets; hyperoxia harms.

Chapter 10 self-test · six items

1. What is the most reliable early sign that PPV is working?

A. Chest rise by itself
B. A rising heart rate
C. A higher Apgar score
D. A pink chest wall

B. A rising heart rate A rising heart rate is the first and best sign; chest rise is second.

2. What is the endotracheal epinephrine dose compared with the IV dose?

A. Five times larger
B. The same dose
C. Ten times smaller
D. Half the dose

A. Five times larger ET is 0.1 mg/kg versus 0.02 mg/kg IV because absorption is unreliable.

3. Which film pattern fits respiratory distress syndrome?

A. Patchy infiltrates with hyperinflation
B. A clear film with hypoxemia
C. Fluid in the fissures
D. Ground glass with air bronchograms

D. Ground glass with air bronchograms RDS shows a reticulogranular ground-glass pattern with low volumes.

4. A newborn has a scaphoid abdomen and bowel sounds in the left chest. What is avoided?

A. Intubation
B. An orogastric tube
C. Bag-mask ventilation
D. Positioning on the affected side

C. Bag-mask ventilation In CDH, bag-mask fills the herniated bowel with gas.

5. A myelomeningocele is present at birth. Which care is correct?

A. Supine with a dry gauze cover on it
B. A snug diaper fastened over the sac
C. Routine latex gloves for all handling
D. Prone, moist sterile dressing, no latex

D. Prone, moist sterile dressing, no latex Keep pressure off the sac, keep it moist and avoid latex.

6. How are vaccines timed for a baby born at 30 weeks?

A. By corrected age, not the calendar
B. By chronological age at full dose
C. Only after discharge from the unit
D. At half doses until the baby is 2 kg

B. By chronological age at full dose Preterm infants are vaccinated on the calendar.

CHAPTER 11

Pediatric Growth, Development and Health Promotion

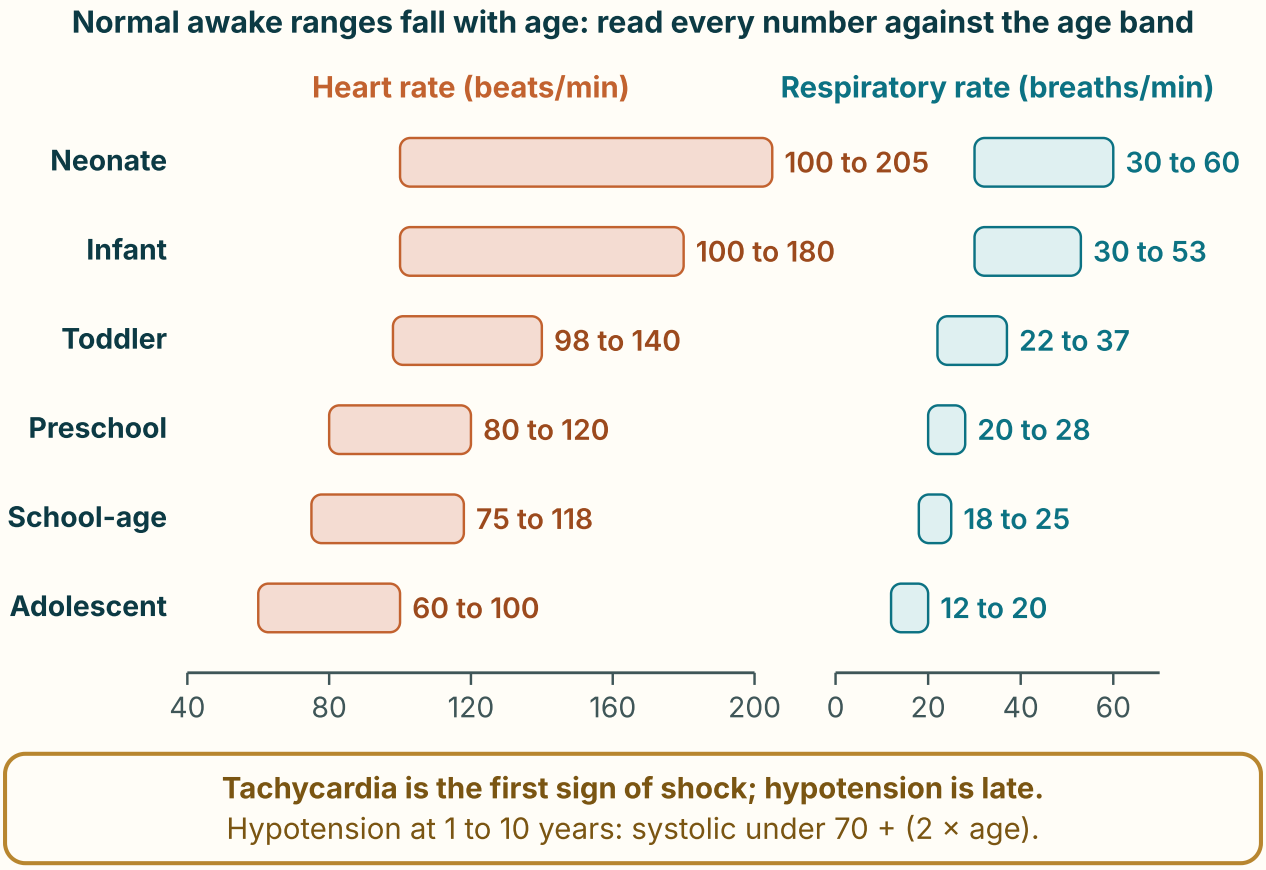
Read it in full: **Chapter 11 in the textbook**. Practice it in the lab: **The Growth Chart: Trajectory, Correction and the Two-Line Rule**.

What to know

Growth is head to toe and center outward, in a fixed sequence at an individual pace, and only a plotted trajectory diagnoses faltering. Use corrected age for preterm growth, never for vaccines. Erikson and Piaget tell you how to approach each age. Loss of an acquired skill is an urgent referral, and hearing is checked first when language lags.

Health promotion is a short list: supine sleep, vitamin D for breastfed infants, iron, no honey or cow's milk before one year, fluoride from the first tooth, vaccines on time and injury advice ahead

of each new skill. Every dose is per kilogram and capped at the adult maximum; maintenance follows 4-2-1 and a shock bolus is 20 mL/kg. Tachycardia is the first sign of shock; hypotension is late.



No single pediatric normal. Heart and breathing rates fall as children grow, so a value is only normal or abnormal for an age band. A rising heart rate is the early warning; a falling pressure is late.

LOCK THESE IN

- The sequence of development is fixed; the rate is individual.
- Two major percentile lines crossed downward = growth faltering. Use corrected age for preterm growth, never for vaccines.
- Loss of an acquired skill is an urgent referral; check hearing first for language delay.
- No honey, cow's milk or juice before 12 months; vitamin D 400 IU for breastfed infants.
- Dose = mg/kg times weight, then the smaller of that and the adult maximum.
- 4-2-1 for maintenance; 20 mL/kg bolus for shock (10 mL/kg in special cases).

Milestones at a glance

Age	Gross motor	Fine motor	Language and social
2 months	Lifts head prone	Hands fisted; follows to midline	Coos; social smile
4 months	Steady head; rolls front to back	Hands together; grasps rattle	Laughs; babbles
6 months	Tripod sits; rolls both ways	Transfers; ulnar rake	Consonant babble; stranger awareness
9 months	Sits alone; crawls; pulls to stand	Crude pincer	Mama/dada nonspecific; object permanence
12 months	Cruises; may walk	Neat pincer	1 to 3 words; waves

Worked cases

CASE 11.1 · DOSE, VOLUME AND THE DAILY CEILING

A 16 kg child is ordered acetaminophen 15 mg/kg per dose. The suspension is 160 mg per 5 mL. Maximum is 75 mg/kg/day and five doses a day.

STEP 1 · DOSE

15 mg/kg × 16 kg = **240 mg**.

STEP 2 · VOLUME

240 ÷ 160 × 5 mL = **7.5 mL** by oral syringe.

STEP 3 · DAILY CHECK

75 × 16 = 1,200 mg a day. Five doses of 240 mg = 1,200 mg, exactly at the ceiling, so no sixth dose and no hidden acetaminophen in cold medicines.

STEP 4 · TEACH

Show the parent the 7.5 mL mark and have them draw it up; never a teaspoon.

CASE 11.2 · IS THIS BLOOD PRESSURE LOW?

A 5-year-old with vomiting has a heart rate of 160, capillary refill of 4 seconds, mottled knees and a systolic BP of 84.

STEP 1 · THRESHOLD

For ages 1 to 10, hypotension is under 70 + (2 × age): 70 + 10 = **80 mm Hg**.

STEP 2 · COMPARE

84 is above 80, so the pressure is not yet low.

STEP 3 · READ THE REST

Heart rate 160 is above the preschool range of 80 to 120, refill is delayed and the skin is mottled: compensated shock.

STEP 4 · ACT

Access and a 20 mL/kg bolus now, glucose check, and SBAR escalation. Do not wait for the pressure to fall.

TRAPS PEOPLE FALL INTO

- **Plotting a former preterm infant by chronological age.** Use corrected age for growth and development until about 2 to 3 years.
- **Delaying vaccines for prematurity or a cold.** Vaccinate by chronological age at full dose; mild illness is not a contraindication.
- **"Watch and wait" for a lost skill.** Regression at any age is an urgent referral.

Chapter 11 self-test · six items

1. Which milestone is expected at 4 months?

A. Saying two or three clear words
B. Sitting alone without any support
C. A neat thumb and finger pincer grasp
D. Steady head control; rolls front to back

D. Steady head control; rolls front to back Head control and rolling front to back arrive around 4 months.

2. Which phrase best fits a preschooler's literal thinking?

A. "I will take your blood pressure."
B. "I will check your blood pressure."
C. "This medicine kills the germs."
D. "We will put you to sleep now."

B. "I will check your blood pressure." Preschoolers take words literally; "take" and "kill" frighten them.

3. A parent asks when to start solid food. What is the best answer?

A. At 12 months, starting with cow's milk
B. At 2 months, with cereal in a bottle
C. At about 6 months, iron-rich foods first
D. At 3 months, starting with fruit juice

C. At about 6 months, iron-rich foods first Complementary foods start around 6 months, iron-rich first.

4. A 9 kg infant needs maintenance fluid. What is the hourly rate by 4-2-1?

A. 36 mL/h
B. 18 mL/h
C. 90 mL/h
D. 45 mL/h

A. 36 mL/h All 9 kg fall in the first band: 9 times 4 is 36 mL/h.

5. Which pain tool fits a 2-year-old?

A. A numeric 0 to 10 scale
B. The FLACC behavioral scale
C. An adult verbal rating scale
D. A visual analog line

B. The FLACC behavioral scale FLACC is used from about 2 months to 7 years.

6. Which finding means compensated shock in a toddler?

A. BP 80 with a heart rate of 60
B. HR 110 with refill of 1 second
C. HR 170, refill 4 s, normal BP
D. Normal vital signs while asleep

C. HR 170, refill 4 s, normal BP Tachycardia and delayed refill with a normal pressure is compensated shock.

CHAPTER 12

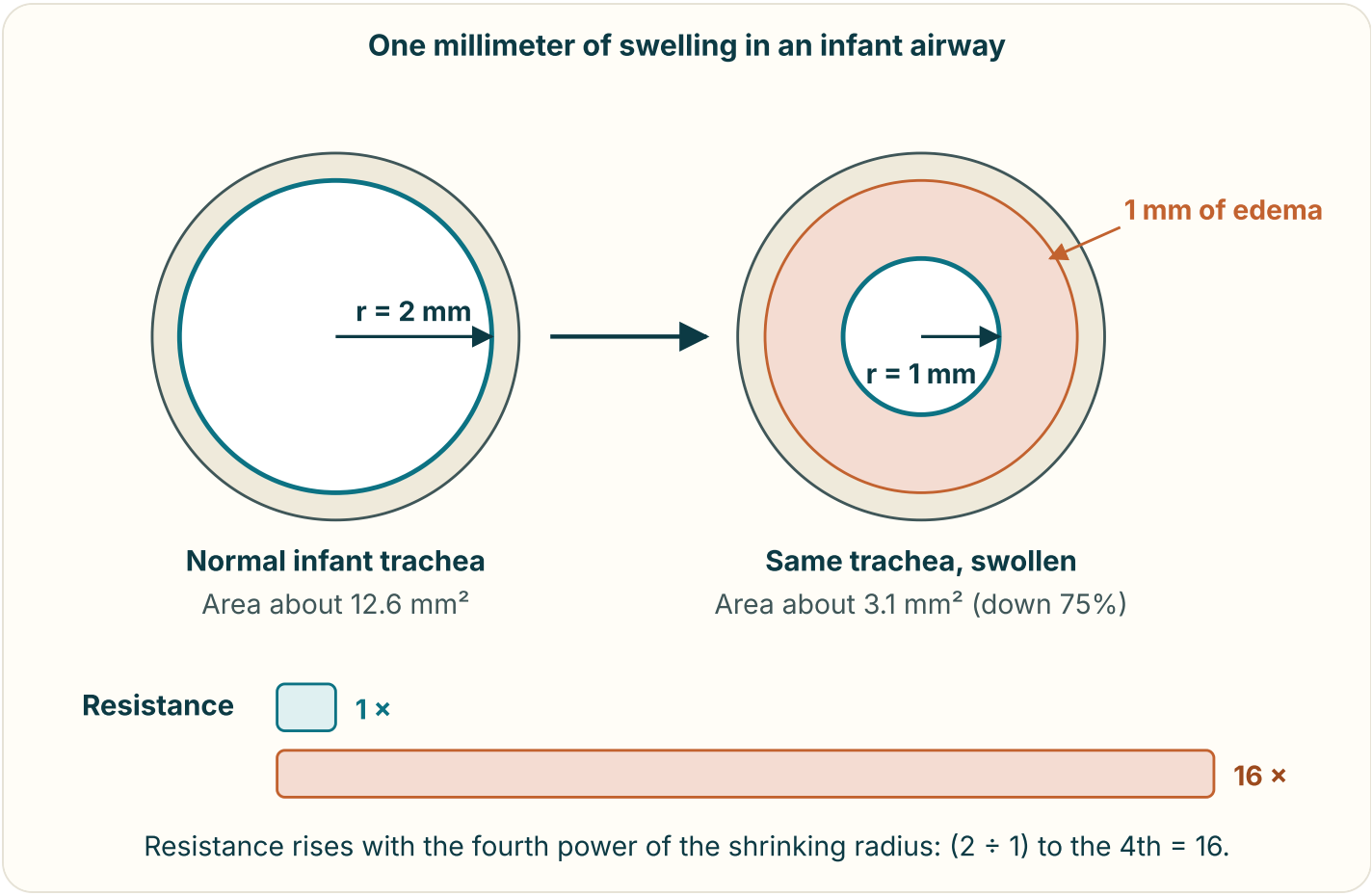
Pediatric Respiratory and Cardiovascular Conditions

Read it in full: **Chapter 12 in the textbook**. Practice it in the lab: **The Order Round: What Bronchiolitis, Asthma, Pneumonia and Cystic Fibrosis Actually Need**.

What to know

A narrow airway turns a millimeter of swelling into sixteen times the resistance, and cardiac output in a child depends on rate, so tachycardia is early and bradycardia is pre-arrest. Croup gets a calm child and dexamethasone; epiglottitis gets hands off the throat and the airway team. Bronchiolitis is supportive; asthma needs early systemic steroid; tachypnea is the most sensitive sign of pneumonia.

Classify heart lesions by flow: increased (VSD, ASD, PDA), obstructed (coarctation) or cyanotic (tetralogy, transposition). Prostaglandin E1 keeps a ductal-dependent lesion alive. A tet spell starts with knee-chest. Kawasaki disease needs IVIG within 10 days to protect the coronaries. SVT gets vagal maneuvers then adenosine; compressions start at a heart rate under 60 with poor perfusion.



Small swelling, big resistance. Halving the radius cuts the area to a quarter and raises resistance sixteen fold. That is why croup gives a toddler stridor at rest while the same swelling only makes an adult hoarse.

LOCK THESE IN

- Half the radius, sixteen times the resistance.
- Croup: calm child, dexamethasone 0.6 mg/kg. Epiglottitis: hands off the throat, call the airway team.
- Bronchiolitis: suction, hydration, oxygen; no routine bronchodilators or steroids.
- Asthma: early systemic steroid; a silent chest or rising PaCO2 means failure.
- Tachypnea is the most sensitive sign of pneumonia.
- Tet spell: knee-chest first, then calm, oxygen, morphine, fluid.

Croup versus epiglottitis

Feature	Croup	Epiglottitis
Onset	Gradual, after 1 to 3 days of cold symptoms	Abrupt, over hours
Age	6 months to 3 years	2 to 7 years
Cough	Barking, seal-like	Absent
Voice	Hoarse	Muffled, minimal speech
Drooling	No	Yes

Worked cases

CASE 12.1 · CROUP BY THE KILOGRAM

A 12 kg toddler has a barking cough and stridor at rest with mild retractions. Dexamethasone 0.6 mg/kg is ordered, usual maximum 16 mg.

STEP 1 · GRADE IT

Stridor at rest with retractions and an interactive child: moderate croup.

STEP 2 · DOSE

0.6 mg/kg × 12 kg = **7.2 mg**, under the 16 mg maximum, so 7.2 mg is given.

STEP 3 · ADD EPINEPHRINE

Stridor at rest adds nebulized epinephrine, which acts within 10 to 30 minutes.

STEP 4 · OBSERVE

Watch 3 to 4 hours for rebound obstruction before discharge, with the child calm on the caregiver's lap.

CASE 12.2 · SVT IN A 7 KG INFANT

An infant has a fixed heart rate of 260, no visible P waves, pallor and poor feeding but a normal blood pressure and alert state.

STEP 1 · NAME IT

A fixed rate over 220 with no P waves that does not change with comfort: SVT. The infant is stable.

STEP 2 · FIRST

Vagal maneuver: a bag of iced water on the forehead and nose bridge for 15 to 30 seconds. Never ocular pressure or carotid massage.

STEP 3 · ADENOSINE

0.1 mg/kg × 7 kg = **0.7 mg** by rapid push with an immediate saline flush through a proximal line; second dose 0.2 mg/kg = 1.4 mg.

STEP 4 · IF UNSTABLE

Synchronized cardioversion at 0.5 to 1 J/kg, escalating to 2 J/kg.

TRAPS PEOPLE FALL INTO

- **Looking in the throat of a drooling, tripod-positioned child.** Suspected epiglottitis: nothing in the mouth, no lying down, no IV until the airway team is there.
- **Calling softer stridor or a silent chest an improvement.** Less noise can mean less air moving.
- **Giving albuterol and steroids for bronchiolitis.** Supportive care only: suction, hydration, oxygen.

Chapter 12 self-test · six items

1. Why is bradycardia in a sick child an emergency?

A. It shows that the child is now calm

B. It usually signals hypoxia before arrest

C. It means that the fever has broken

D. It is a normal heart rate during sleep

B. It usually signals hypoxia before arrest Output depends on rate; bradycardia signals hypoxia and pre-arrest.

2. Which croup severity calls for nebulized epinephrine?

A. Barking cough only
B. A mild runny nose
C. Stridor at rest
D. A low-grade fever

C. Stridor at rest Stridor at rest adds nebulized epinephrine to dexamethasone.

3. Which is a reliable early sign of bleeding after tonsillectomy?

A. Bad breath on day 5
B. Ear pain on day 3
C. A low-grade fever
D. Frequent swallowing

D. Frequent swallowing Children swallow the blood, so frequent swallowing is an early sign.

4. A child with CF should take pancreatic enzymes when?

A. With every meal and snack
B. Only after an episode of vomiting
C. Only with the evening meal
D. Once a day at bedtime

A. With every meal and snack Enzymes go with every meal and snack, not crushed or chewed.

5. A newborn has weak femoral pulses and higher arm pressures. What is suspected?

A. Tetralogy of Fallot
B. Coarctation of the aorta
C. Patent ductus arteriosus
D. Atrial septal defect

B. Coarctation of the aorta An arm-to-leg pressure gap with weak femorals suggests coarctation.

6. A child received IVIG for Kawasaki disease. When can MMR be given?

A. After 2 weeks
B. At the next visit
C. After 1 month
D. After 11 months

D. After 11 months Passive antibody blunts the live vaccine response for 11 months.

CHAPTER 13

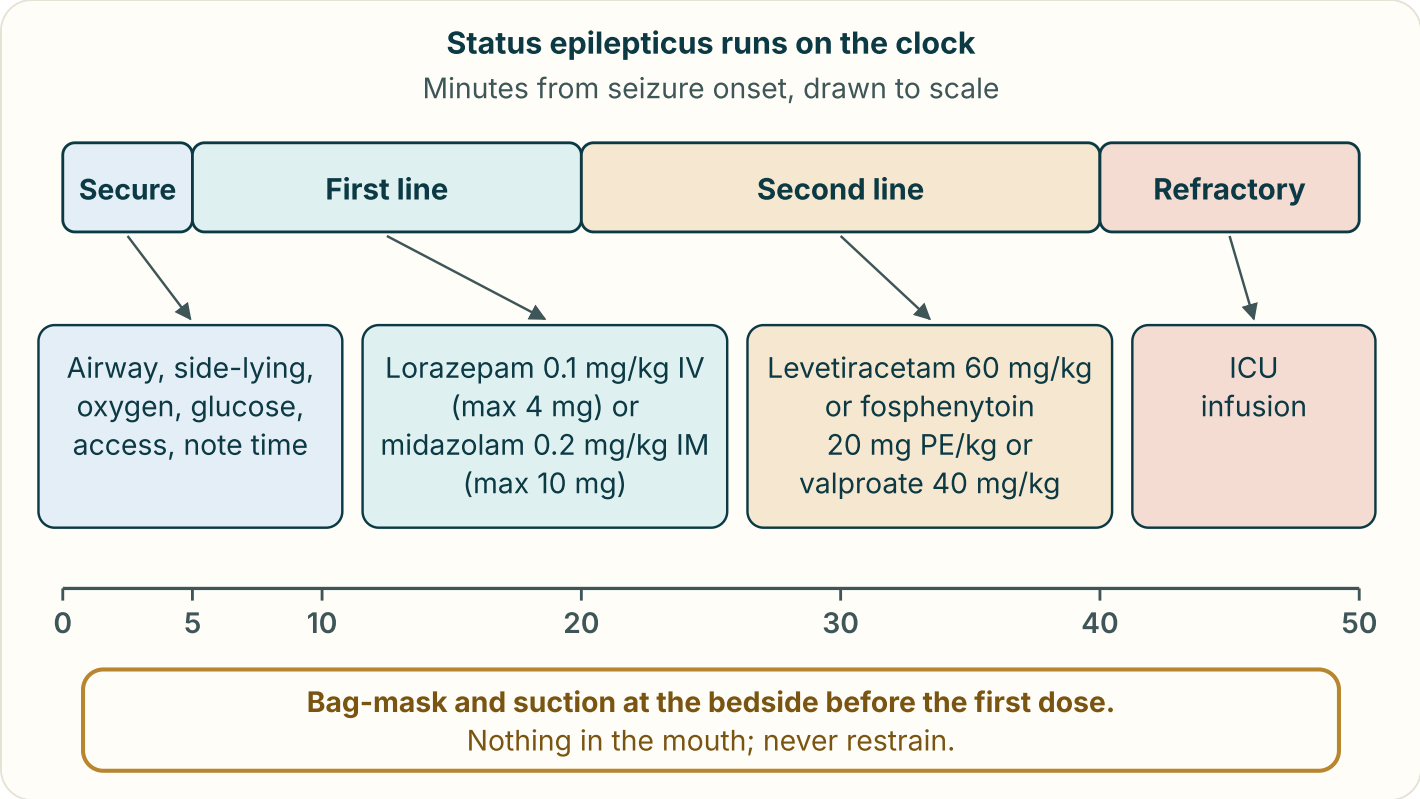
Pediatric Systemic and Chronic Conditions

Read it in full: **Chapter 13 in the textbook**. Practice it in the lab: **The Five-Minute Clock, the Rising Pressure and the Limb That Hurts Too Much**.

What to know

Children lose extracellular water fast; grade dehydration by weight lost, give ORS for mild and moderate loss and a 20 mL/kg isotonic bolus for severe. Pyloric stenosis is fixed medically before surgery. Nephrotic syndrome and glomerulonephritis are separated by blood pressure and urine color. In DKA, fluids come before an insulin infusion with no bolus, and headache with bradycardia means cerebral edema.

Sickle cell crises need fluids, scheduled analgesia and oxygen only when hypoxic; acute chest and sequestration are emergencies. Hemophilia head injury: factor first. Febrile neutropenia: antibiotics within 60 minutes. Anaphylaxis: IM epinephrine first. Status epilepticus: a weight-based benzodiazepine at 5 minutes. Compartment syndrome shows as pain on passive stretch. Every order is checked against the safe range and the adult maximum.



The clock drives the drugs. A seizure still running at 5 minutes rarely stops on its own and gets harder to stop over time. Stabilize first, give a weight-based benzodiazepine at 5 minutes, and move to a second-line agent at 20.

LOCK THESE IN

- 1 kg of acute weight loss = 1 L of deficit.
- ORS 50 mL/kg (mild) or 100 mL/kg (moderate) over 4 hours; 20 mL/kg IV bolus for severe.
- Nephrotic: protein and edema, normal BP. Glomerulonephritis: cola urine and hypertension.
- DKA: fluids first, insulin infusion without a bolus; headache with bradycardia = cerebral edema.
- Sickle cell: oxygen only if hypoxic; acute chest and sequestration are emergencies.
- Febrile neutropenia (ANC under 500): cultures and antibiotics within 60 minutes.

Nephrotic syndrome versus glomerulonephritis

Feature	Nephrotic (minimal change)	Post-streptococcal GN
Age	2 to 6 years	5 to 12 years
Trigger	Often none; may follow a virus	Strep throat 1 to 2 weeks or impetigo 3 to 6 weeks before
Urine	Massive protein, little blood	Cola or tea colored, mild protein
Blood pressure	Normal or low	High: the hallmark
Albumin	Low, under 2.5 g/dL	Normal or mildly low

Worked cases

CASE 13.1 · IS THIS CHILD NEUTROPENIC?

A 4-year-old on chemotherapy has a temperature of 38.4 °C. WBC is 1,800/mm³ with 15 percent segs and 5 percent bands.

STEP 1 · ADD THE NEUTROPHILS

15 + 5 = 20 percent.

STEP 2 · CALCULATE

ANC = 1,800 × 20 ÷ 100 = **360/mm³**.

STEP 3 · CLASSIFY

Under 500 is severe neutropenia; a single temperature of 38.3 or more qualifies as febrile neutropenia.

STEP 4 · ACT

Blood cultures and the first broad-spectrum IV antibiotic within 60 minutes. No rectal temperature.

CASE 13.2 · DKA IN A 24 KG CHILD: THE ORDER OF THINGS

A 24 kg child has glucose 540 mg/dL, pH 7.12 and ketones, with deep rapid breathing.

STEP 1 · FLUID FIRST

10 mL/kg × 24 kg = **240 mL** isotonic bolus over the first hour.

STEP 2 · INSULIN SECOND

One to two hours after fluids start: 0.1 units/kg/h × 24 = **2.4 units/h** by infusion. No bolus.

STEP 3 · POTASSIUM

Add once the level is under 5.5 and the child is voiding; it will fall as insulin works.

STEP 4 · WATCH THE BRAIN

Hourly neuro checks for 4 to 12 hours: headache with bradycardia and rising BP means cerebral edema.

TRAPS PEOPLE FALL INTO

- **Giving juice or sports drinks for diarrhea.** Use oral rehydration solution; the others worsen diarrhea and lower sodium.
- **Rushing a pyloric stenosis infant to surgery.** Correct the alkalosis and potassium first.
- **Calling sudden relief of appendix pain improvement.** It suggests perforation.

Chapter 13 self-test · six items

1. A child has vomited twice and had three diarrheal stools during ORS. How are losses replaced?

A. Give a 20 mL/kg IV bolus for each
B. Switch to apple juice for flavor
C. 10 mL/kg per stool, 2 mL/kg per vomit
D. Stop the ORS until things settle

C. 10 mL/kg per stool, 2 mL/kg per vomit Ongoing losses are replaced in addition to the deficit.

2. Which infant is most likely to have intussusception?

A. An 8-month-old with screaming spells
B. A 4-week-old with projectile vomiting
C. A newborn who has passed no meconium
D. A 10-year-old with a sore swollen ankle

A. An 8-month-old with screaming spells Peak age is 5 to 10 months with colicky pain and drawn-up knees.

3. A child with nephrotic syndrome is on prednisone. What teaching is key?

A. Expect a low appetite
B. Never stop it suddenly
C. Live vaccines are fine now
D. Stop if the face rounds

B. Never stop it suddenly Steroids are tapered; the child is immunosuppressed.

4. A 30 kg child with diabetes is unconscious from hypoglycemia. What glucagon dose is given?

A. 2 mg IM
B. 0.5 mg IM
C. 0.1 mg IM
D. 1 mg IM

D. 1 mg IM 0.5 mg under 25 kg, 1 mg at 25 kg or more; then turn to the side.

5. A child with sickle cell disease has an enlarging spleen and falling hemoglobin. What is this?

A. Acute chest syndrome
B. Aplastic crisis
C. Splenic sequestration
D. A vaso-occlusive crisis

C. Splenic sequestration Sequestration pools blood in the spleen and can cause shock.

6. Which sign of raised intracranial pressure is late?

A. Morning headache
B. Irritability
C. A high-pitched cry
D. The Cushing triad

D. The Cushing triad Hypertension with wide pulse pressure, bradycardia and irregular breathing is late.

CHAPTER 14

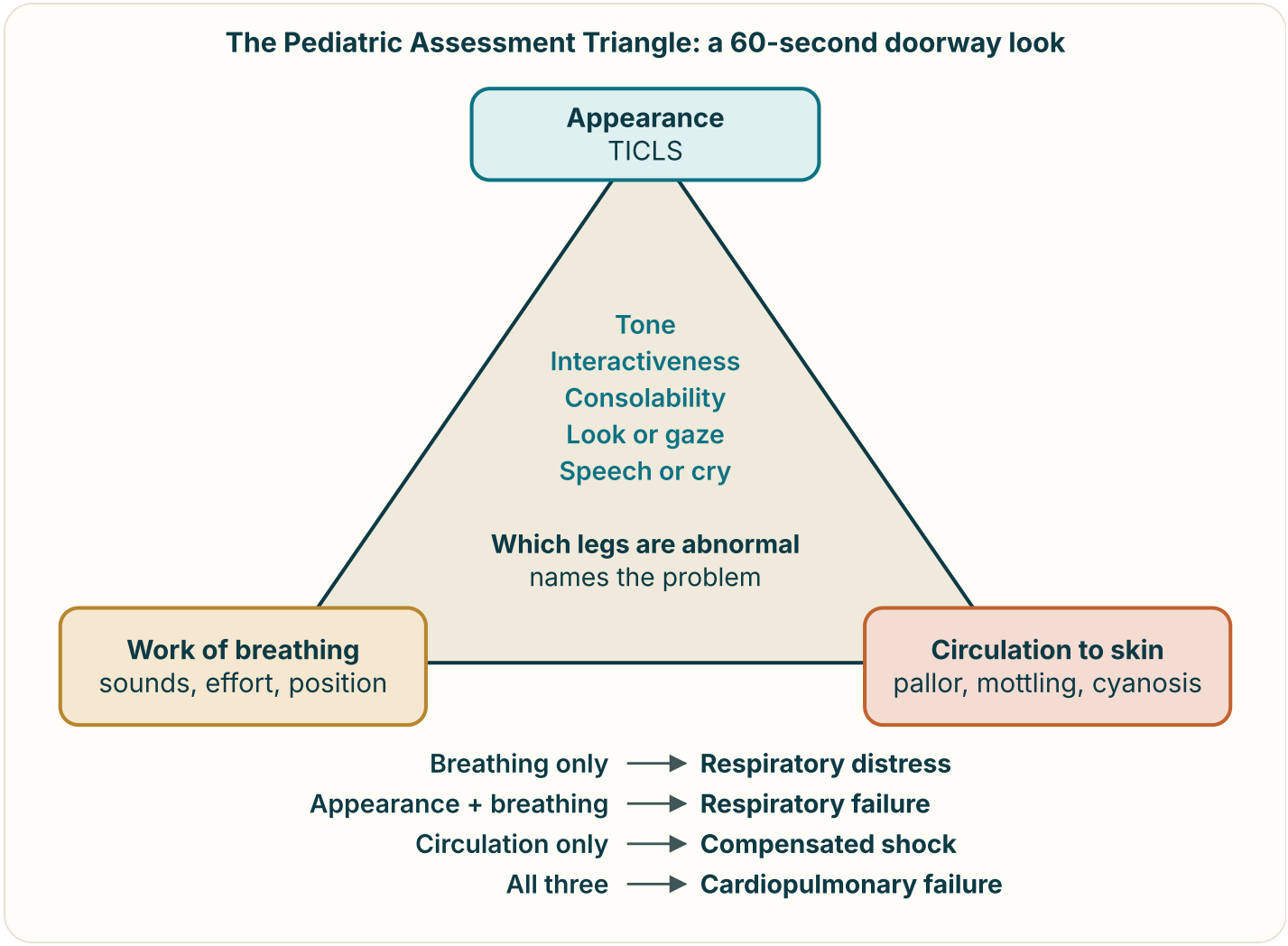
The Child in Crisis: Emergencies, Safeguarding and the Family

Read it in full: **Chapter 14 in the textbook**. Practice it in the lab: **Presence, Bad News and Loss: The Family in Crisis**.

What to know

The Pediatric Assessment Triangle reads appearance, work of breathing and circulation from the doorway, and the pattern names the state. Check glucose in every child with an abnormal appearance. Heart rate and refill change early; blood pressure falls last, and a child 1 to 10 years is hypotensive below 70 plus twice the age. Compress for a rate under 60 with poor perfusion.

Grade dehydration by percentage (each 1 percent is 10 mL/kg), run maintenance by 4-2-1 and resuscitate with 20 mL/kg except in the named cases. The order is the treatment: epinephrine in the thigh first in anaphylaxis, the airway and the clock before the benzodiazepine, perfusion rather than pressure in sepsis, fluid before insulin in DKA, no induced vomiting, and no blind finger sweep. Test injuries against development, report reasonable suspicion yourself, and stay with the family, using the word "died."



Look before you touch. The triangle uses only what you see and hear from the doorway. The pattern of abnormal legs names the physiological state, and the state names the first intervention.

LOCK THESE IN

- PAT: appearance, work of breathing, circulation to skin; the pattern names the state.
- Glucose in every child with an abnormal appearance.
- Compress for heart rate under 60 with poor perfusion; 15:2 with two rescuers; 2 then 4 J/kg.
- Each 1% dehydration = 10 mL/kg; 1 kg lost = 1 L.
- 4-2-1 and the daily rule meet at 35 kg (75 mL/h).
- Anaphylaxis: IM epinephrine in the thigh first; never stand a hypotensive child up.

Reading the Pediatric Assessment Triangle

Appearance	Breathing	Circulation	State	First priority
Normal	Abnormal	Normal	Respiratory distress	Oxygen, position of comfort, calm
Abnormal	Abnormal	Normal	Respiratory failure	Bag-mask ventilation; call now
Normal	Normal	Abnormal	Compensated shock	Access and bolus before BP falls
Abnormal	Normal	Abnormal	Shock reaching the brain	Immediate bolus; escalate
Abnormal	Normal	Normal	Brain or metabolic problem	Glucose; think seizure, poison, sepsis

Worked cases

CASE 14.1 · GRADE THE DEHYDRATION AND SET THE ORS

A 15 kg four-year-old weighed 15.0 kg last week and weighs 14.1 kg today after vomiting and diarrhea. She is drinking.

STEP 1 · WEIGHT LOST

15.0 minus 14.1 = 0.9 kg, about 900 mL.

STEP 2 · PERCENT

0.9 ÷ 15.0 × 100 = **6 percent**.

STEP 3 · GRADE

Six percent falls in the 5 to 10 percent band, so it is moderate.

STEP 4 · ORS

60 mL/kg × 15 kg = **900 mL** over about 4 hours in 5 to 10 mL sips, plus 10 mL/kg for each extra watery stool. It matches the 900 mL weight loss.

CASE 14.2 · IS THIS BLOOD PRESSURE DECOMPENSATED?

A seven-year-old with sepsis has a heart rate of 150, capillary refill of 4 seconds and a systolic BP of 82.

STEP 1 · THRESHOLD

70 + (2 × 7) = **84 mm Hg**.

STEP 2 · COMPARE

82 is below 84: decompensated shock.

STEP 3 · ACT NOW

Oxygen, access (IO if two attempts fail), a fluid bolus titrated to perfusion, antibiotics within the hour, glucose and lactate.

STEP 4 · ESCALATE

SBAR with the words "I need you to come now," and the resuscitation team.

TRAPS PEOPLE FALL INTO

- **Skipping the glucose in a child with an abnormal appearance.** Hypoglycemia mimics sepsis, seizure and poisoning and is fixed in ninety seconds.
- **Waiting for pulselessness to start CPR.** Compress for a heart rate under 60 with poor perfusion despite ventilation.
- **Giving a third benzodiazepine at 25 minutes.** Move to a second-line agent; the third dose buys respiratory depression.

Chapter 14 self-test · six items

1. Which TICLS finding is most worrying in a toddler?

A. Pushes away the cold stethoscope

B. Clings tightly to a parent

C. Cries loudly when being examined

D. No reaction to a stranger nearby

D. No reaction to a stranger nearby Loss of normal protest is a worrying appearance sign.

2. A 6-year-old is moderately dehydrated and can drink. How much oral rehydration solution is given over 4 hours?

A. 60 mL/kg
B. 90 mL/kg
C. 100 mL/kg
D. 30 mL/kg

C. 100 mL/kg Moderate dehydration is 5 to 10 percent; ORS is about 50 mL/kg for mild and 100 mL/kg for moderate over 4 hours.

3. What is the estimated weight of an 8-year-old with no scale or tape?

A. 24 kg
B. 40 kg
C. 31 kg
D. 26 kg

C. 31 kg For ages 6 to 12, (age times 3) plus 7: 24 plus 7 is 31 kg.

4. Which auto-injector strength fits a 20 kg child?

A. 0.5 mg
B. 0.15 mg
C. 0.1 mg
D. 0.3 mg

B. 0.15 mg 0.15 mg covers 15 to under 25 kg.

5. A child is choking but coughing hard and crying. What does the nurse do?

A. Encourage coughing; stay close
B. Give five firm back blows
C. Give five abdominal thrusts
D. Sweep the mouth with a finger

A. Encourage coughing; stay close An effective cough is left alone.

6. A family's newborn died suddenly at home. Which statement is best?

A. "Your baby passed away peacefully."
B. "I am so sorry. Your baby died."
C. "Your baby went to sleep forever."
D. "At least you have other children."

B. "I am so sorry. Your baby died." Say "died"; avoid euphemisms and false comfort.

ONE PAGE

Cram sheet

The whole course on a few pages: the top rows of every exam guide's cram tables. Cover the right column and recite it.

Exam 1: Rules to know

Item	Rule	Note
Family-centered care	Dignity, information, participation, collaboration	Parents' concerns are findings
RN only	Assessment, teaching, evaluation, unstable patient	Five rights every time
Assent	From about age 7	Parent or guardian gives permission
Interpreter	Trained, whole encounter	Never family, never a child
Consent	Provider obtains it	Nurse witnesses identity, voluntariness, capacity
Capacity	Understand, appreciate, reason, communicate	Not lost by refusing

Exam 1: Numbers to know

Item	Value	Note
Ovulation	14 days before next menses	LH surge 24 to 36 h before
Naegele's rule	LMP minus 3 months plus 7 days plus 1 year	Assumes 28-day cycle
Folic acid	0.4 mg; 4 mg after prior NTD	Single-ingredient tablet for 4 mg
Implantation	Days 6 to 10	hCG peaks at 8 to 10 weeks
Neural tube	Closed by day 26 to 28 after conception	About 6 weeks gestational age
AFI	5 to 24 cm	Deepest pocket 2 to 8 cm

Exam 2: 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

Exam 2: 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

Exam 3: Labor numbers

Item	Value	Note
Anterior fontanelle	Diamond, 4 to 5 cm, closes 12 to 18 months	Posterior closes at 2 to 3 months
Adequate contractions	200 or more Montevideo units	Sum of peak minus baseline in 10 min
Tachysystole	More than 5 in 10 min over 30 min	Placenta refills between contractions
Active phase	Starts about 6 cm	Arrest: no change 4 h adequate or 6 h inadequate
Second stage limit	3 h nullipara, 2 h multipara	Add 1 h with an epidural
Third stage	5 to 30 minutes	Inspect the placenta

Exam 3: Sequences that save lives

Event	First action	Never
Rupture of membranes	Full minute of FHR	Chart fluid first
Worrying tracing	Stop oxytocin and reposition	Delay for oxygen mask
Epidural hypotension	Left uterine displacement	Start with vasopressor
Cord prolapse	Lift presenting part and keep hand there	Push cord back
Shoulder dystocia	McRoberts plus suprapubic	Fundal pressure
Magnesium toxicity	Stop infusion, then calcium gluconate 1 g	Antidote with drip running

Exam 4: Postpartum numbers

Item	Value	Note
Uterus weight	1000 g at birth; 500 g at 1 wk; 60 to 80 g at 6 wk	Autolysis
Fundus	Umbilicus by 12 h; down 1 cm a day	Not palpable by day 10 to 14
Lochia	Rubra 1 to 3; serosa 4 to 10; alba to 6 wk	Foul odor = infection
Heart rate	40 to 60 normal for 6 to 10 days	Over 100 is never normal
WBC	20,000 to 30,000 normal	Not diagnostic alone
First void	Within 6 h, at least 150 mL	Residual over 150 = retention

Exam 4: Complication rules

Event	Rule	Never
Hemorrhage	Massage, help, oxytocin, bladder, access	Massage a firm fundus
Inversion	Stop uterotonics; leave the placenta	Massage the inverted fundus
Sepsis	Antibiotics within 1 h; 30 mL/kg	Delay for cultures
PE	Upright, oxygen, rapid response	Rely on Homans
Magnesium toxicity	Stop, then calcium gluconate 1 g	Antidote with drip running
Mastitis	Keep feeding on demand	Stop feeding abruptly

Exam 5: Newborn numbers

Item	Value	Note
Respirations	30 to 60; apnea 20 s or more	Periodic pauses up to 15 s are normal
Heart rate	100 to 205 awake (110 to 160 typical)	Count a full minute
Temperature	36.5 to 37.5 °C axillary	38.0 rectal under 3 months = emergency
Weight loss	Up to 7 to 10%	Over 7% evaluate feeding
Glucose goal	45 mg/dL or more early	60 or more after 48 h
Gel and bolus	Gel 0.5 mL/kg; D10W 2 mL/kg	GIR 5 to 8

Exam 5: High-risk rules

Item	Rule	Note
PPV	Within 60 s at 40 to 60 a minute	Rising heart rate = effective
Compressions	3:1, 120 events a minute	After 30 s of effective PPV under 60
Epinephrine	0.02 mg/kg IV; 0.1 mg/kg ET	0.1 mg/mL concentration
Volume	10 mL/kg newborn; 20 mL/kg older child	Reassess after each bolus
Saturation	60 to 65 at 1 min; 85 to 95 at 10 min	Right hand
Jaundice red flags	First 24 h; over 0.2/h; direct over 1	Not managed by eye

Exam 6: Growth, development and safety numbers

Item	Value	Note
Birth weight	Doubles 4 to 6 mo; triples 12 mo; quadruples 24 mo	Length up 50% in year one
Fontanelles	Posterior 2 to 3 mo; anterior 12 to 18 mo	Assess calm and upright
Teeth	Age in months minus 6	20 primary teeth by 30 months
Vitamin D	400 IU a day	Breastfed infants
Weight estimate	(Age × 2) + 8 kg	Ages 1 to 5, emergencies only
4-2-1	4, 2, 1 mL/kg/h by weight band	Isotonic fluid

Exam 6: Respiratory and cardiac rules

Condition	First action	Never
Croup	Calm; dexamethasone 0.6 mg/kg	Upset the child for tests
Epiglottitis	Upright; airway team	Tongue depressor or supine
Choking infant	5 back blows, 5 chest thrusts	Blind finger sweep
Bronchiolitis	Suction, hydrate, oxygen	Routine bronchodilators
Asthma	Oxygen, albuterol, early steroid	Trust a silent chest
Tet spell	Knee-chest	Oxygen alone

Exam 7: Numbers to know

Item	Value	Note
Urine output	Infant 2, child 1, adolescent 0.5 to 1 mL/kg/h	1 g diaper = 1 mL
Weight loss	1 kg = 1 L deficit	Gold standard
ORS	50 mL/kg mild; 100 mL/kg moderate	Over 4 h; plus 10 mL/kg per stool
Bolus	20 mL/kg; 10 mL/kg special cases	Reassess each time
DKA insulin	0.05 to 0.1 units/kg/h	No bolus; after fluids
ANC	WBC × (segs + bands) ÷ 100	Under 500 severe

Exam 7: Sequences and rules

Situation	Rule	Never
Severe dehydration	Access, 20 mL/kg isotonic bolus	Dextrose bolus
Pyloric stenosis	Fix electrolytes before surgery	Rush to theater
Sickle pain crisis	Fluids, scheduled analgesia, O2 if under 95%	Meperidine
Hemophilia head injury	Factor first, then scan	Delay factor for imaging
Febrile neutropenia	Antibiotics within 60 min	Rectal temperatures
Compartment syndrome	Report; limb at heart level	Elevate above heart

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