PHARMACOLOGY · STUDY GUIDE

Exam 7 Study Guide

This guide covers the last two chapters. Chapter 13 walks the gut from stomach to colon, where timing and food decide whether a drug works. Chapter 14 covers the reproductive drugs, where the science is demanding and the conversation is private, and two drugs are high-alert. Work one chapter at a time. Read the "what to know" paragraphs, copy the tables by hand, then try each worked example with the steps covered. Finish each chapter with its ten self-test items. Any dose or number in a worked example is a practice calculation only, not dosing advice.

WHAT THIS GUIDE COVERS

- Chapter 13 · the parietal cell, PPIs and their timing and long-term risks, H2 blockers, antacid spacing, sucralfate, misoprostol, bismuth, H. pylori regimens, the four roads to vomiting and the antiemetic classes, laxative classes and onsets, antidiarrheals and their contraindications, IBD drugs, pancrelipase, and GI timing, teaching and monitoring.
- Chapter 14 · combined and progestin-only contraception, estrogen clot risk and ACHES, CYP3A4 inducers, menopausal hormone therapy, clomiphene, letrozole and OHSS, oxytocin and tachysystole, uterotonics, tocolytics, magnesium sulfate, betamethasone, testosterone, PDE-5 inhibitors and nitrates, and alpha-1 blockers and 5-alpha reductase inhibitors for BPH.

CHAPTER 13

Gastrointestinal Drugs

Read it in full: **Chapter 13 in the textbook**. Practice it in the lab: **The Parietal Cell** and **Laxatives by Mechanism & Onset**.

What to know

The parietal cell makes acid through the **H+/K+-ATPase** (proton pump), switched on by gastrin, histamine (H2) and acetylcholine (M3). Mucus, bicarbonate, blood flow and prostaglandins

defend the lining. Ulcers come from failed defense, mostly **H. pylori** and **NSAIDs**, so acid suppression heals ulcers but does not cure the cause.

PPIs (omeprazole, pantoprazole, esomeprazole) block the pump irreversibly, so once daily lasts about 24 hours. They are prodrugs activated only in active pumps: give **30 to 60 minutes before the first meal**. Long-term risks: low magnesium, low B12, poor iron absorption, C. difficile, pneumonia, interstitial nephritis and fractures. Taper to avoid rebound acid. Omeprazole and esomeprazole block CYP2C19 and weaken clopidogrel; **pantoprazole** is the partner of choice. Do not crush delayed-release forms.

H2 blockers (famotidine) are faster but weaker, with tolerance; famotidine needs renal dose reduction or causes confusion in older adults; cimetidine inhibits CYP450 and causes gynecomastia. **Antacids** neutralize acid in minutes: magnesium causes diarrhea, aluminum constipation, both accumulate in renal failure. Antacid spacing is drug specific: at least 1 to 2 hours for most drugs, levothyroxine 4 hours, fluoroquinolones 2 hours before or 6 hours after, tetracyclines and iron at least 2 hours.

Sucralfate forms a paste in acid: empty stomach, 1 hour before meals and at bedtime, other drugs 2 hours apart. **Misoprostol** prevents NSAID ulcers and is contraindicated in pregnancy. **Bismuth** blackens stool and tongue harmlessly and is a salicylate. For H. pylori, **bismuth quadruple therapy** (PPI, bismuth, tetracycline, metronidazole for 10 to 14 days) is preferred first-line. Teach finishing every dose and no alcohol with metronidazole; test for cure at least 4 weeks after finishing, with the PPI held 1 to 2 weeks before.

Vomiting has four roads. The **CTZ** (D2, 5-HT3, NK1) senses blood-borne drugs and toxins; the **gut** sends 5-HT3 signals by the vagus; the **vestibular** system uses H1 and muscarinic receptors; the **cortex** drives anticipatory nausea. Match the drug to the road: ondansetron does nothing for motion sickness.

Ondansetron (5-HT3) is first-line for chemotherapy and post-op nausea; watch QT, potassium and magnesium. **Aprepitant** (NK1) covers delayed nausea and weakens oral contraceptives. **Metoclopramide** carries a boxed warning for tardive dyskinesia; limit to 12 weeks. **Promethazine** causes gangrene if it extravasates and is contraindicated under 2; dilute, slow, large

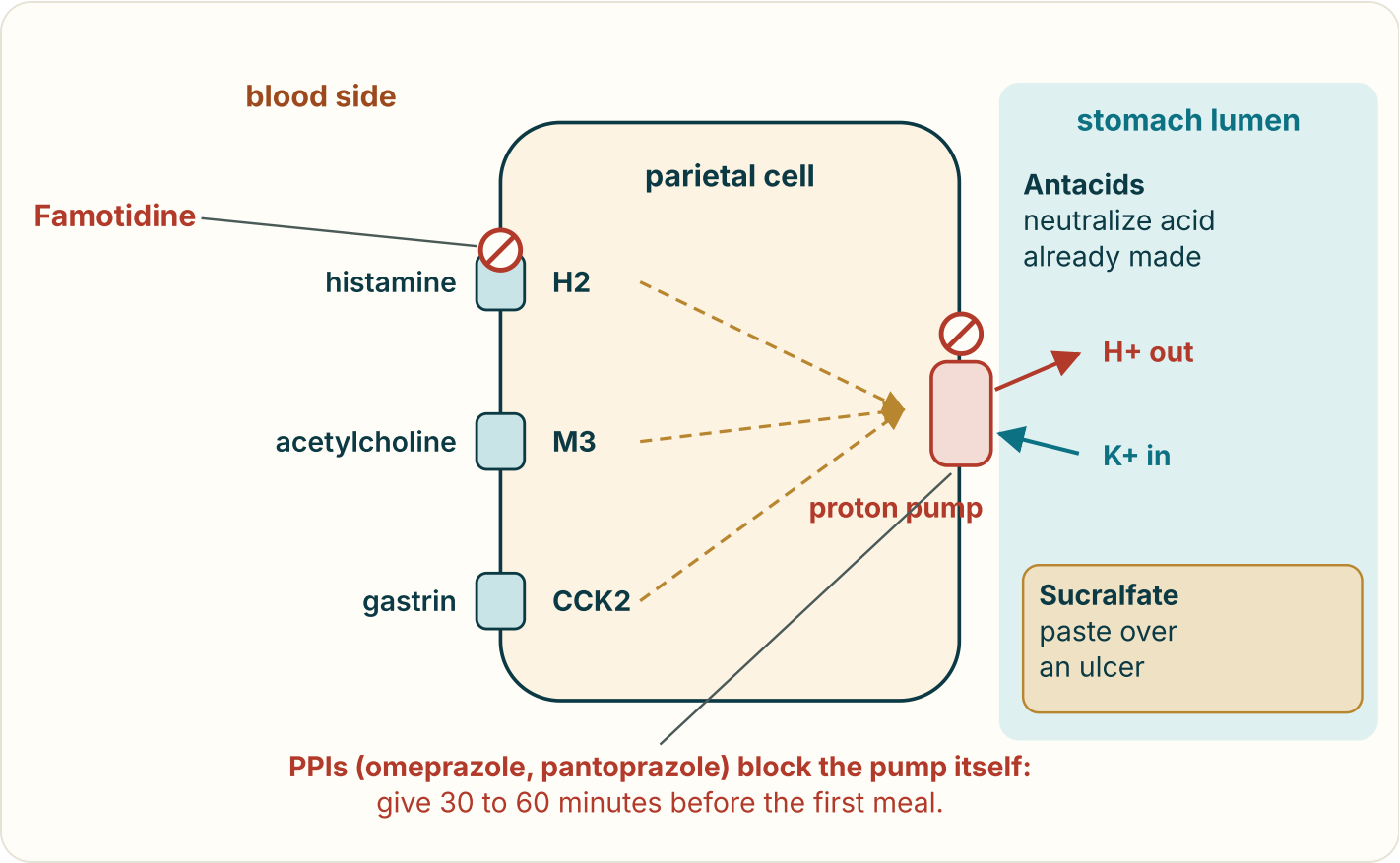
vein, stop for burning. Meclizine and scopolamine treat motion sickness (scopolamine patch 4 hours before travel, every 72 hours, wash hands). Dexamethasone boosts other antiemetics. In pregnancy, doxylamine plus pyridoxine is first-line. Give chemotherapy antiemetics **before** the chemotherapy. Vomiting causes hypokalemic, hypochloremic metabolic alkalosis.

Laxatives. **Bulk-forming** (psyllium): 12 to 72 hours, safest long term, full glass of water or obstruction. **Osmotic**: PEG 3350 first-line for chronic constipation; **lactulose** in hepatic encephalopathy is titrated to 2 to 3 soft stools a day; magnesium salts accumulate in renal failure; sodium phosphate risks nephropathy. **Stimulants** (senna, bisacodyl): 6 to 12 hours oral, 15 to 60 minutes rectal; do not crush bisacodyl or give it within an hour of milk or antacids. Docusate is weak alone. **PAMORAs** treat opioid constipation. Never give a laxative with undiagnosed abdominal pain, suspected obstruction or possible appendicitis.

Loperamide slows the gut; massive doses cause torsades (OTC ceiling 8 mg/day, prescription 16 mg/day). Diphenoxylate with atropine is Schedule V. Oral rehydration solution is the real treatment for most infectious diarrhea. **No antimotility drug** with bloody diarrhea, high fever or suspected C. difficile: toxic megacolon.

IBD: induce with steroids, maintain with something else. Mesalamine (watch kidneys) and sulfasalazine (sulfa allergy, orange-yellow staining of urine and lenses, folic acid). Budesonide acts on the gut with fewer systemic effects. Azathioprine and 6-MP need **TPMT and NUDT15** testing first. Methotrexate is weekly. Anti-TNF biologics need **latent TB and hepatitis B** screening, no live vaccines. Vedolizumab is gut selective; JAK inhibitors carry broad boxed warnings.

Other GI drugs: metoclopramide for gastroparesis; antispasmodics (dicyclomine) are anticholinergic; alosetron is restricted for ischemic colitis. **Pancrelipase** goes with every meal and snack, swallowed whole or sprinkled on acidic food such as applesauce. Orlistat blocks vitamins A, D, E and K. Teach red flags: black tarry stool, coffee-ground vomit, dysphagia, weight loss, new dyspepsia after 60. Raise the head of the bed 6 to 8 inches on blocks, not pillows.



Three switches, one pump. H2 blockers turn off one switch; PPIs shut the pump that all three switches drive.

LOCK THESE IN

- PPI: 30 to 60 min before the first meal; taper; pantoprazole with clopidogrel.
- Antacid spacing: levothyroxine 4 h; fluoroquinolone 2 h before or 6 h after.
- Sucralfate: empty stomach; others 2 h apart. Misoprostol: not in pregnancy.
- H. pylori: bismuth quadruple therapy 10 to 14 days; no alcohol with metronidazole.
- Ondansetron: QT. Metoclopramide: tardive dyskinesia, 12 weeks. Promethazine: gangrene, not under 2.
- Bulk laxatives need water; lactulose to 2 to 3 soft stools; no laxative in an acute abdomen.
- No antimotility drug in bloody, febrile or C. difficile diarrhea.
- TPMT/NUDT15 before azathioprine; TB and hepatitis B before anti-TNF.

Key terms and comparisons: timing is the drug

Drug	When	Why
PPI	30 to 60 min before first meal	Activates only in secreting pumps
H2 blocker	Before the triggering meal; bedtime for night acid	On board before the acid rise
Antacid	1 to 2 h after meals; spaced from other drugs	Chelation; levothyroxine 4 h
Sucralfate	1 h before meals and bedtime	Needs acid; binds other drugs
Pancrelipase	With every meal and snack	Enzymes must meet food
Bulk laxative	Any time with a full glass of water	Obstruction without fluid
Scopolamine patch	4 h before travel; every 72 h	Slow onset; wash hands
Chemo antiemetics	Before the chemotherapy	Prevention beats rescue

Antiemetics and laxatives

Drug	Class	Signature risk or onset
Ondansetron	5-HT3 antagonist	QT prolongation
Aprepitant	NK1 antagonist	Lowers contraceptive efficacy
Metoclopramide	D2 antagonist, prokinetic	Tardive dyskinesia; 12 weeks max
Promethazine	Phenothiazine (mainly H1)	Gangrene; not under 2
Meclizine	H1 antihistamine	Motion sickness; sedation
Psyllium	Bulk-forming	12 to 72 h
PEG 3350	Osmotic	1 to 3 days; first-line chronic
Magnesium citrate	Saline osmotic	30 min to 6 h; not in renal failure
Senna, bisacodyl	Stimulant	6 to 12 h oral
Methylnaltrexone	PAMORA	Opioid constipation; not with obstruction

Worked examples

WORKED EXAMPLE 1 · MOVING THE PPI

Mr. Vance takes omeprazole at bedtime with a snack and says it never helped. Breakfast is at 0730. When should he take it?

STEP 1 · NAME THE PROBLEM

A PPI is a prodrug activated only in actively secreting pumps. At bedtime after a snack, most pumps are quiet.

STEP 2 · APPLY THE WINDOW

30 to 60 minutes before the first meal: 0730 − 60 min = 0630; 0730 − 30 min = 0700. Take it **between 0630 and 0700**.

WHY IT MATTERS

It changes no order and costs nothing, yet it can turn a failing drug into one that works.

WORKED EXAMPLE 2 · SPACING AN ANTACID

A patient takes levothyroxine at 0600 and ciprofloxacin at 0800. She wants an aluminum-magnesium antacid in the morning. When is the earliest safe time?

STEP 1 · LEVOTHYROXINE RULE

At least 4 hours from the antacid: 0600 + 4 h = 1000.

STEP 2 · CIPROFLOXACIN RULE

Cipro must come 2 hours before the antacid: 0800 + 2 h = 1000.

STEP 3 · CHOOSE

Both rules point to **1000 or later**.

IF THE ANTACID CAME FIRST

A fluoroquinolone would then wait 6 hours after it.

WORKED EXAMPLE 3 · TIMING AN H. PYLORI TEST

A 14-day bismuth quadruple regimen starts March 1. When can the confirmatory breath or stool test be done, and what about the PPI?

STEP 1 · LAST DAY OF THERAPY

March 1 plus 13 more days = **March 14**.

STEP 2 · ADD 4 WEEKS

March 14 + 28 days = **April 11** at the earliest.

STEP 3 · HOLD THE PPI

Stop the PPI 1 to 2 weeks before the test, or acid suppression can give a false negative.

WORKED EXAMPLE 4 · DIARRHEA ON ANTIBIOTICS

Ms. Okoro, on day 6 of antibiotics, has new watery diarrhea and a temperature of 101.8°F. She asks for loperamide. What do you do?

STEP 1 · HOLD THE ANTIMOTILITY DRUG

Fever plus new diarrhea on antibiotics suggests C. difficile. Loperamide could trap toxin and cause toxic megacolon.

STEP 2 · ACT

Notify the provider, send a C. difficile test, start contact precautions.

STEP 3 · CLEAN CORRECTLY

Soap and water; alcohol does not kill spores.

STEP 4 · TRACK

Count stools, describe them, and check potassium and creatinine.

TRAPS PEOPLE FALL INTO

- **Giving a PPI with breakfast or at bedtime.** Give it 30 to 60 minutes before the first meal.
- **Stopping a long-term PPI abruptly.** Rebound acid follows; taper.
- **Using one "1 to 2 hours" rule for every antacid interaction.** Levothyroxine needs 4 h; fluoroquinolones 2 h before or 6 h after.
- **Giving ondansetron for motion sickness.** Wrong road. Use meclizine or scopolamine.
- **Pushing promethazine into a hand vein.** Large vein, diluted, slow; stop for burning.
- **Holding lactulose because the patient stooled.** The goal is 2 to 3 soft stools; no stool means rising ammonia.
- **Giving loperamide for C. difficile.** Toxic megacolon risk.

Chapter 13 self-test · ten items

1. Why must a PPI be given before the first meal?

A. It works only when the gut is already full
B. It causes nausea on an empty stomach
C. Food destroys most of it in the stomach
D. It activates only in actively secreting pumps

D. It activates only in actively secreting pumps PPIs are prodrugs that need an active pump. Before breakfast the pumps are about to switch on.

2. A patient on clopidogrel needs a PPI. Which is preferred?

A. Omeprazole
B. Esomeprazole
C. Pantoprazole
D. Cimetidine

C. Pantoprazole Omeprazole and esomeprazole inhibit CYP2C19, which activates clopidogrel. Cimetidine is an H2 blocker with many interactions.

3. Which is a long-term risk of chronic PPI use?

A. Hyperkalemia
B. Hypomagnesemia
C. Hypoglycemia
D. Hypercalcemia

B. Hypomagnesemia Chronic PPIs are linked to low magnesium, low B12, iron malabsorption, C. difficile, pneumonia and fractures.

4. Which drug is contraindicated in pregnancy?

A. Misoprostol
B. Sucralfate
C. Pyridoxine
D. Famotidine

A. Misoprostol Misoprostol stimulates uterine contractions and can cause miscarriage.

5. Which antiemetic carries a boxed warning for tardive dyskinesia?

A. Aprepitant
B. Dimenhydrinate
C. Metoclopramide
D. Ondansetron

C. Metoclopramide Metoclopramide blocks D2 and is limited to 12 weeks because of tardive dyskinesia.

6. When are chemotherapy antiemetics best given?

A. Before the chemotherapy, on a schedule
B. The day after the infusion only
C. After the first episode of vomiting
D. Only as needed for severe nausea

A. Before the chemotherapy, on a schedule Prevention works far better than rescue.

7. What must accompany every dose of psyllium?

A. A small high-fat meal
B. A full glass of water
C. A docusate stool softener
D. A chewable antacid tablet

B. A full glass of water Without enough fluid, bulk laxatives can swell into an obstruction.

8. A patient with cirrhosis on lactulose has had no stool for 24 hours. Why does it matter?

A. Lactulose has caused dehydration
B. Magnesium is building up
C. The liver is now healing
D. Ammonia is not being cleared

D. Ammonia is not being cleared Lactulose traps ammonia for excretion in stool. The goal is 2 to 3 soft stools a day.

9. Which test must precede the first dose of azathioprine?

A. A latent TB screen only
B. TPMT and NUDT15 activity
C. HLA-B*5701 genotyping
D. A G6PD enzyme level

B. TPMT and NUDT15 activity Low enzyme activity leads to profound myelosuppression on a normal dose.

10. How should pancrelipase be taken?

A. With every meal and snack
B. Crushed into warm milk
C. Once daily at bedtime
D. On an empty stomach only

A. With every meal and snack The enzymes must be present with food. If opened, sprinkle on acidic soft food; alkaline food destroys the coating.

Reproductive System Drugs

Read it in full: **Chapter 14 in the textbook**. Practice it in the lab: **Female Hormones & Contraception** and **Fertility & Pregnancy Drugs**.

What to know

Estrogen and progesterone are steroid hormones: they act on DNA inside cells, so effects build and fade over days. Oral estrogen passes the liver, which responds by making more clotting factors. A **combined** contraceptive (ethinyl estradiol plus a progestin) flattens the **LH surge** so ovulation does not occur; the progestin also thickens cervical mucus and thins the endometrium.

Progestin-only methods drop the estrogen. The norethindrone mini-pill has a **3 hour** window (late means backup for 48 hours); drospirenone-only has 24 hours. DMPA every 13 weeks has a boxed warning for **bone loss** and delays return of fertility 10 to 18 months. The implant lasts up to 5 years; the levonorgestrel IUD 3 to 8. The patch gives more estrogen exposure than pills. Emergency contraception delays ovulation and does not end an established pregnancy.

Estrogen raises VTE risk about three to fourfold (still lower than pregnancy itself). Estrogen methods are contraindicated with **smoking at 35 or older**, **migraine with aura**, prior VTE or thrombophilia, uncontrolled hypertension, under 21 days postpartum, active breast cancer, lupus with antiphospholipid antibodies, and diabetic vascular disease. Most get a progestin-only method instead; current breast cancer needs a nonhormonal method. Teach **ACHES**: abdominal pain, chest pain, headache, eye problems, severe leg pain. Most antibiotics do not cause failure; **CYP3A4 inducers** do (rifampin, carbamazepine, phenytoin, St. John's wort).

Menopausal hormone therapy is the most effective treatment for hot flashes. Benefits generally outweigh risks under 60 or within 10 years of menopause. **A uterus requires a progestin**, or endometrial hyperplasia and cancer follow. Boxed warnings: endometrial cancer, stroke and VTE, probable dementia when started late, breast cancer with progestin. Report any postmenopausal bleeding. Low-dose vaginal estrogen for dryness has minimal systemic absorption.

Clomiphene blocks hypothalamic estrogen receptors, so GnRH, FSH and LH rise and ovulation follows; taken commonly days 5 to 9, ovulation about 5 to 10 days after the last tablet. **Visual**

disturbances mean stop and report. Multiples run about 5 to 10%. **Letrozole** is first-line in PCOS. Gonadotropins risk **OHSS**: call for weight gain over about 2 lb a day, distension, pain, low urine output or dyspnea.

Oxytocin is high-alert with no antidote: dilute piggyback on a pump at the port nearest the patient, milliunits per minute, titrated against contractions and fetal heart rate. **Tachysystole** is more than 5 contractions in 10 minutes averaged over 30 minutes. Response: **stop the oxytocin**, left lateral, IV fluid bolus, oxygen if indicated, notify, anticipate terbutaline. Prolonged high doses can cause water intoxication. Postpartum uterotonics: methylergonovine (not with hypertension or preeclampsia), carboprost (not with asthma), misoprostol (not for ripening with a prior cesarean scar).

Tocolytics buy about **48 hours** for betamethasone and transfer. Nifedipine is the usual first-line (hypotension). Terbutaline is short-term only (tachycardia, pulmonary edema, hyperglycemia). Indomethacin is limited to about 48 hours before 32 weeks (ductus constriction, oligohydramnios). **Betamethasone**: two IM doses 24 hours apart. Rho(D) immune globulin at about 28 weeks and within 72 hours of birth of an Rh-positive infant.

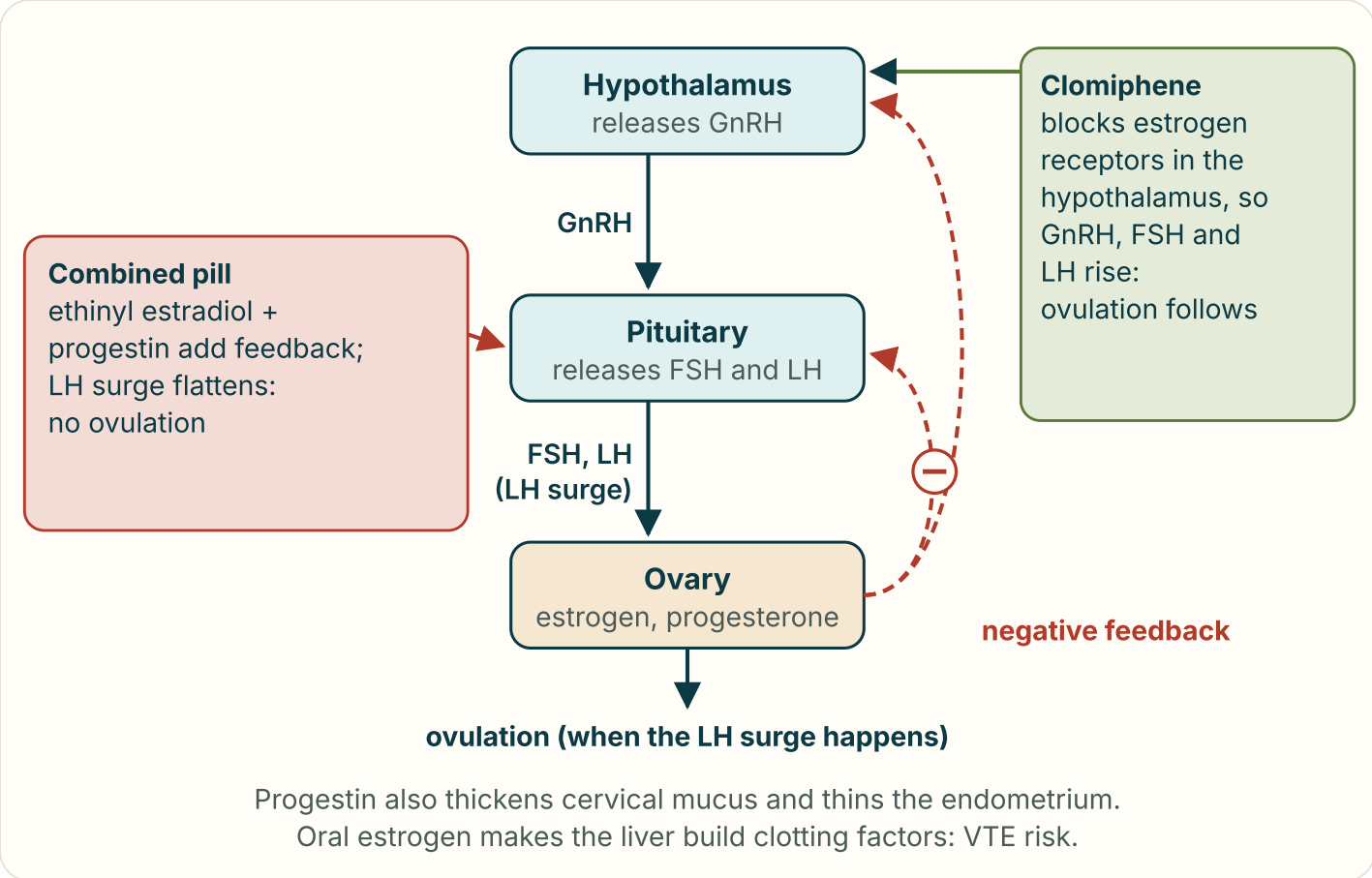
Magnesium sulfate prevents eclamptic seizures and protects the preterm brain. Toxicity ladder: **reflexes lost first**, then respirations fall, then cardiac conduction fails. Monitor DTRs, respiratory rate (at least 12), urine output (at least 30 mL/h) and LOC. Urine under 30 mL/h means the drug is accumulating: stop, notify, check a level. **Calcium gluconate** (1 g IV) is the antidote for respiratory or cardiac toxicity, kept at the bedside.

Testosterone is Schedule III, for confirmed hypogonadism only. Gel has a boxed warning for **transfer**: wash hands, let it dry, cover the site, wash before skin contact. Monitor hematocrit (hold near 54%), PSA, lipids and BP. It causes **infertility** by suppressing LH and FSH. IM undecanoate needs a 30 minute observation.

PDE-5 inhibitors keep cGMP around and need sexual stimulation to work. With **nitrates** (including poppers) they cause refractory, fatal hypotension. Hold nitrates at least **12 h after avanafil**, **24 h after sildenafil or vardenafil**, **48 h after tadalafil**. Ask privately before any

nitroglycerin. Emergencies: erection over 4 hours, sudden vision loss, sudden hearing loss. Add caution with alpha blockers.

BPH has two parts. **Alpha-1 blockers** relax prostate muscle in days: first dose at bedtime (except alfuzosin ER after a meal), rise slowly, retrograde ejaculation is harmless, tell the eye surgeon (floppy iris). **5-alpha reductase inhibitors** (finasteride, dutasteride) shrink the gland 20 to 25% over 3 to 6 months, cut retention and surgery, and **halve the PSA** (double it after 6 months). They are teratogenic: no one pregnant handles broken tablets; never crush; no blood donation for 1 month after finasteride or 6 months after dutasteride. Avoid decongestants and first-generation antihistamines in BPH.



Feedback runs both drugs. The pill strengthens the brake so the LH surge never comes; clomiphene hides estrogen from the hypothalamus so the drive rises.

LOCK THESE IN

- Combined pill: no LH surge; plus thick mucus and thin lining.
- No estrogen: smoker 35+, migraine with aura, VTE, under 21 days postpartum. Teach ACHES.
- Inducers (rifampin, anticonvulsants, St. John's wort) cause pill failure; most antibiotics do not.
- Hormone therapy: uterus means progestin. DMPA: bone loss.
- Clomiphene: visual changes = stop. Gonadotropins: watch for OHSS.
- Tachysystole: more than 5 in 10 min; stop oxytocin first.
- Magnesium: reflexes, RR at least 12, urine at least 30 mL/h; calcium gluconate antidote.
- Nitrates: 12 h avanafil, 24 h sildenafil/vardenafil, 48 h tadalafil. 5-ARIs halve PSA and are teratogenic.

Key terms and comparisons

Drug	Key effect	Nursing alert
Combined oral contraceptive	Blocks LH surge	Clot screening; ACHES
Norethindrone mini-pill	Mucus and endometrium	3 hour window
DMPA	Every 13 weeks	Bone loss boxed warning
Clomiphene	Hypothalamic SERM	Visual change: stop
Oxytocin	Uterine contraction	High-alert; tachysystole: stop
Methylergonovine	Sustained contraction	Not with hypertension
Carboprost	Prostaglandin uterotonic	Not with asthma
Nifedipine	Tocolytic	Hypotension
Magnesium sulfate	Seizure prophylaxis	Reflexes, RR, urine; calcium antidote
Testosterone gel	Androgen replacement	Transfer; hematocrit; infertility
Sildenafil, tadalafil	PDE-5 inhibition	No nitrates 24 h / 48 h
Tamsulosin	Uroselective alpha-1 blocker	Retrograde ejaculation; IFIS
Finasteride, dutasteride	5-alpha reductase inhibitors	Double PSA; teratogenic

Numbers to know

Item	Number	Note
Mini-pill window	3 hours	Backup 48 h if late
DMPA interval	13 weeks	Fertility return 10 to 18 months
Tachysystole	More than 5 in 10 min	Averaged over 30 min
Magnesium safety	RR at least 12; urine at least 30 mL/h	Calcium gluconate 1 g IV
Betamethasone	2 doses 24 h apart	Tocolysis buys 48 h
Testosterone hold	Hematocrit near 54%	Hyperviscosity
Nitrate holds	12 / 24 / 48 h	Avanafil / sildenafil, vardenafil / tadalafil
5-ARI onset	3 to 6 months	PSA halved
Blood donation	1 month finasteride; 6 months dutasteride	Teratogen

Worked examples

WORKED EXAMPLE 1 · SPOTTING TACHYSYSTOLE

During an oxytocin induction you count 7 contractions in the last 10 minutes, with late decelerations. What do you do, in order?

STEP 1 · COMPARE

More than 5 in 10 minutes is tachysystole; with late decelerations it needs action now.

STEP 2 · STOP

Stop the oxytocin. Its half-life is a few minutes, so this works fast and needs no order.

STEP 3 · SUPPORT

Left lateral position, IV fluid bolus, oxygen if indicated.

STEP 4 · ESCALATE

Notify the provider and anticipate terbutaline.

WORKED EXAMPLE 2 · A MAGNESIUM CHECK

Ms. Amari, on magnesium for preeclampsia, has absent patellar reflexes, a respiratory rate of 10 and 20 mL of urine in the last hour. What is happening?

STEP 1 · CLIMB THE LADDER

Reflexes are gone (rung one) and respirations are under 12 (rung two).

STEP 2 · READ THE URINE

20 mL/h is under 30: the renally cleared drug is accumulating. On its own this is stop, notify and check a level.

STEP 3 · ACT

Stop the infusion, notify, give **calcium gluconate** (typically 1 g IV) because breathing is now depressed, and have airway support ready.

WORKED EXAMPLE 3 · NITRATE HOLD TIMES

A man with chest pain took avanafil at 1800 yesterday, or in a second case tadalafil at 1800 yesterday. It is now 0900. Can nitroglycerin be given in each case?

STEP 1 · AVANAFIL

At least 12 hours: 1800 + 12 h = 0600 today. It is 0900, so 15 hours have passed. The hold is met.

STEP 2 · TADALAFIL

At least 48 hours: 1800 yesterday + 48 h = **1800 tomorrow**. Only 15 hours have passed: **no nitrate**.

STEP 3 · ACT

For the tadalafil patient, treat ischemia with non-nitrate agents and document why.

WORKED EXAMPLE 4 · READING A PSA ON FINASTERIDE

Mr. Lindqvist has taken finasteride for 8 months. His PSA is 1.6 ng/mL. How should it be interpreted?

STEP 1 · APPLY THE RULE

5-alpha reductase inhibitors cut PSA roughly in half after 6 to 12 months, so double it.

STEP 2 · CALCULATE

1.6 × 2 = **3.2** as the comparable value.

STEP 3 · ACT

Compare it with his history and investigate any rise from his new baseline. Write the drug next to the lab.

WORKED EXAMPLE 5 · SCHEDULING DMPA

A patient received DMPA on January 6. When is the next injection due?

STEP 1 · ADD 13 WEEKS

13 × 7 = 91 days. January 6 + 91 days = **April 7**.

STEP 2 · TEACH

Calcium, vitamin D and weight-bearing exercise for bone; fertility may take 10 to 18 months to return.

TRAPS PEOPLE FALL INTO

- **Asking "do you get migraines?" and stopping there.** Ask about visual symptoms before the headache: that is the aura.
- **Telling every antibiotic user to add backup.** Inducers such as rifampin matter; most antibiotics do not.
- **Giving estrogen alone to a patient with a uterus.** Unopposed estrogen causes endometrial hyperplasia.
- **Calling for fluids first during tachysystole.** Turn off the oxytocin first.
- **Giving calcium gluconate for low urine output alone.** Stop and check a level; calcium is for respiratory or cardiac toxicity.
- **Giving nitroglycerin without asking about ED drugs.** Ask privately, including about poppers.
- **Crushing finasteride for a feeding tube.** Never crush; teratogenic to anyone pregnant handling it.

Chapter 14 self-test · ten items

1. How does a combined oral contraceptive mainly prevent pregnancy?

A. It blocks both fallopian tubes

B. It ends an already implanted pregnancy

C. It suppresses the mid-cycle LH surge

D. It kills sperm inside the vagina

C. It suppresses the mid-cycle LH surge Steady hormones flatten the LH surge so ovulation does not occur. Mucus and lining changes are backups.

2. A 36-year-old who smokes asks for a combined pill. What is the best response?

A. Start the combined pill at a low dose
B. Start the patch rather than the pill
C. Delay until she cuts down smoking
D. Offer a progestin-only method instead

D. Offer a progestin-only method instead Smoking at 35 or older contraindicates estrogen. The patch gives even more estrogen exposure.

3. Which drug can make oral contraceptives fail?

A. Amoxicillin
B. Rifampin
C. Loratadine
D. Acetaminophen

B. Rifampin Rifampin is a strong CYP3A4 inducer. Most ordinary antibiotics do not lower hormone levels.

4. A patient on clomiphene reports flashes of light and blurred vision. What should she do?

A. Stop the drug and report it
B. Double the dose to finish sooner
C. Take it with food from now on
D. Expect it to pass by next cycle

A. Stop the drug and report it Visual disturbances on clomiphene mean stop and report immediately.

5. What defines tachysystole?

A. Resting tone above zero
B. Any contraction lasting 60 seconds
C. More than 3 contractions in 10 minutes
D. More than 5 contractions in 10 minutes

D. More than 5 contractions in 10 minutes Tachysystole is more than five contractions in 10 minutes averaged over 30 minutes.

6. Which uterotonic is contraindicated in a patient with preeclampsia?

A. Carboprost
B. Methylergonovine
C. Misoprostol
D. Oxytocin (Pitocin)

B. Methylergonovine Methylergonovine causes severe vasoconstriction. Carboprost is avoided in asthma.

7. During magnesium therapy, which sign of toxicity appears first?

A. A sudden cardiac arrest
B. A complete heart block
C. Loss of deep tendon reflexes
D. Slowed, shallow respirations

C. Loss of deep tendon reflexes Reflexes disappear first, then respirations, then cardiac conduction.

8. Which teaching about testosterone gel is correct?

A. Wash hands and cover the site after applying
B. It needs no blood tests once started
C. Apply it to the forearms and leave them bare
D. It improves fertility in most men who use it

A. Wash hands and cover the site after applying Gel transfers by touch. It also suppresses sperm production, and hematocrit and PSA are monitored.

9. A patient took tadalafil 20 hours ago and now has chest pain. What about nitroglycerin?

A. Give it with the patient lying flat
B. Give half the usual dose
C. Give it, since 12 hours have passed
D. Do not give it; 48 hours must pass

D. Do not give it; 48 hours must pass Tadalafil is long acting; nitrates are held at least 48 hours after it.

10. A man has taken finasteride for a year. His PSA reads 2.0. How should it be read?

A. As about 4.0 after doubling
B. As not valid on this drug
C. As about 1.0 after halving
D. As 2.0 with no adjustment

A. As about 4.0 after doubling 5-alpha reductase inhibitors halve the PSA, so the value is doubled and the drug noted next to the lab.

Cram sheet

Everything from chapters 13 and 14 in one place. Cover the right column and see if you can rebuild each row.

Gastrointestinal drugs

Item	Fact	Note
PPI	30 to 60 min before first meal	Taper; Mg, B12, C. diff
PPI + clopidogrel	Pantoprazole	Omeprazole blocks CYP2C19
H2 blocker	Famotidine; renal dosing	Confusion in older adults
Antacid spacing	1 to 2 h; levothyroxine 4 h	Cipro 2 h before or 6 h after
Sucralfate	1 h before meals and bedtime	Others 2 h apart
Misoprostol	Prevents NSAID ulcer	Not in pregnancy
H. pylori	Bismuth quadruple 10 to 14 days	Test 4+ weeks after; hold PPI 1 to 2 weeks
Ondansetron	5-HT3	QT
Metoclopramide	Tardive dyskinesia	12 weeks max
Promethazine	Gangrene	Not under 2
Lactulose	2 to 3 soft stools/day	Hepatic encephalopathy
Loperamide	OTC 8 mg/day; Rx 16	Not in C. diff or bloody diarrhea
IBD	Steroids induce; others maintain	TPMT/NUDT15; TB and HBV screens

Reproductive drugs

Item	Fact	Note
Combined pill	No LH surge	ACHES
Estrogen contraindications	Smoker 35+, aura, VTE, early postpartum	Use progestin-only
Pill failure	CYP3A4 inducers	Not ordinary antibiotics
Hormone therapy	Uterus = progestin	Report postmenopausal bleeding
Clomiphene	Visual change = stop	Multiples 5 to 10%
Oxytocin	Pump, piggyback, nearest port	Tachysystole: stop first
Tocolytics	About 48 hours	Betamethasone 2 doses 24 h apart
Magnesium	Reflexes, RR 12+, urine 30+ mL/h	Calcium gluconate 1 g IV
Testosterone	Schedule III; hematocrit near 54% hold	Gel transfer; infertility
PDE-5 + nitrates	12 / 24 / 48 h holds	Priapism over 4 h: ED
Alpha-1 blockers	Days; bedtime first dose	Retrograde ejaculation; IFIS
5-ARIs	3 to 6 months; PSA halved	Teratogenic; donation 1 / 6 months

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