CLINICALJUDGE™ · MASTER STUDY GUIDE

PHARMACOLOGY — COMPLETE MASTERY

Every drug class the 2026 NGN NCLEX-RN can test, organized by body system with mechanism, side effects, nursing priorities, antidotes, and the highest-yield facts — followed by a full battery of master reference tables. Built to take you to 100% on Pharmacological & Parenteral Therapies.

2026 NGN BLUEPRINT | 90+ DRUG CLASSES | PHARMACOLOGICAL & PARENTERAL THERAPIES | 12 REFERENCE TABLES | SUFFIXES · ANTIDOTES · LEVELS · FLUIDS

RED	BLUE	GREEN	ORANGE	YELLOW	PURPLE	TEAL
CRITICAL SE / TOXICITY	MECHANISM / ACTION	NURSING CARE	INTERACTIONS	MUST-KNOW FACT	DRUG CLASS	ANTIDOTE / TEACHING

THE MASTERY FRAME FOR EVERY DRUG QUESTION

For each class know: **what it does, what it harms, what to assess/hold before giving, what to teach, and its antidote.** Plus universal safety: 6 Rights, two identifiers, allergies, therapeutic range, and the gating parameter (HR, BP, K^+, level) before high-alert drugs.

01 CARDIOVASCULAR

PRESSURE · RHYTHM · LIPIDS · COAGULATION

BETA-BLOCKERS

"-olol" · metoprolol, propranolol, carvedilol, atenolol

ACTION

Block beta receptors → ↓HR, ↓BP, ↓contractility, ↓O_2 demand. HTN, angina, post-MI, HF, dysrhythmias.

SE

Bradycardia, hypotension, fatigue, bronchospasm (nonselective), masks hypoglycemia, sexual dysfunction.

NURSING

Hold if HR <60 / SBP <90–100; taper (rebound HTN/angina); caution in asthma/diabetes.

KEY

Masks hypoglycemia; never stop abruptly. Selective ("A–M": atenolol, metoprolol) safer in lung disease.

ACE INHIBITORS

"-pril" · lisinopril, enalapril, captopril

ACTION

Block angiotensin I→II → vasodilation, ↓BP, ↓afterload; renal/cardiac protection.

SE

Dry cough | Angioedema | Hyperkalemia first-dose hypotension, ↑creatinine.

NURSING

Monitor K^+ & renal function; avoid K-sparing diuretics/salt substitutes; report facial/throat swelling.

KEY

Teratogenic; angioedema = stop & never rechallenge; cough → switch to ARB.

ARBS

"-sartan" · losartan, valsartan

ACTION

Block angiotensin II receptors → vasodilation, ↓BP. Used for ACE-cough intolerance.

SE

Hyperkalemia, hypotension, dizziness, ↑creatinine; **less cough** than ACE.

KEY

Also **teratogenic**; don't combine ACE + ARB.

CALCIUM CHANNEL BLOCKERS

amlodipine, diltiazem, verapamil, nifedipine

ACTION

Block Ca influx → vasodilation, ↓BP; diltiazem/verapamil ↓HR & rate-control AF.

SE

Peripheral edema, headache, flushing, **constipation** (verapamil), bradycardia.

KEY

Avoid grapefruit; don't combine verapamil + beta-blocker (heart block).

ALPHA-1 BLOCKERS & CENTRAL AGONISTS

"-osin" (doxazosin) · clonidine, methyldopa

ACTION

Alpha-1 block → vasodilation (HTN, BPH). Central alpha-2 agonist → ↓sympathetic outflow.

SE

First-dose orthostatic hypotension/syncope, dizziness; clonidine → rebound HTN if stopped, sedation, dry mouth.

KEY

Take alpha-blocker first dose at bedtime; **don't stop clonidine abruptly** (rebound HTN); methyldopa safe in pregnancy.

DIRECT VASODILATORS

hydralazine, nitroprusside, minoxidil

ACTION

Relax arterial smooth muscle → ↓BP; severe HTN/crisis (IV nitroprusside).

SE

Reflex tachycardia, headache, fluid retention; nitroprusside → **cyanide toxicity** (prolonged/high dose); minoxidil → hair growth.

KEY

Nitroprusside: protect from light, monitor for thiocyanate/cyanide toxicity.

LOOP DIURETICS

furosemide, bumetanide, torsemide

ACTION

Inhibit Na/K/Cl in loop → strong diuresis; edema, HF, pulmonary edema.

SE

Hypokalemia Ototoxicity hyponatremia, dehydration, hypotension, ↑glucose/uric acid.

NURSING

Monitor K^+, I&O, daily weight, BP; give early; push IV slowly; K-rich foods.

KEY

Hypokalemia + digoxin = toxicity.

THIAZIDE / K-SPARING / OSMOTIC DIURETICS

HCTZ · spironolactone · mannitol

SE

Thiazide → **hypo**kalemia, ↑glucose/Ca/uric acid. Spironolactone → **hyper**kalemia, gynecomastia. Mannitol → pulls fluid (↓ICP/IOP), monitor for overload.

KEY

Opposite K: thiazide/loop lower it, spironolactone raises it. Don't pair spironolactone with ACE/ARB/K.

DIGOXIN

cardiac glycoside · HIGH ALERT · narrow index

ACTION

↑Contractility, ↓HR; HF & rate control.

TOXICITY

Anorexia, N/V, **yellow-green halos**, dysrhythmias, confusion; worsened by hypokalemia.

NURSING

Hold if apical HR <60; monitor K^+ & level (0.5–2 ng/mL).

ANTIDOTE

Digoxin immune Fab; correct hypokalemia.

ANTIDYSRHYTHMICS

amiodarone, adenosine, lidocaine, diltiazem

SE

Amiodarone → **pulmonary fibrosis**, thyroid/liver toxicity, blue-gray skin, ↑QT. Adenosine → **brief asystole/flushing** (rapid IV push, very short half-life).

NURSING

Amiodarone: baseline PFTs/TFTs/LFTs/ECG. Adenosine: push fast + flush, warn of transient chest discomfort.

NITRATES

nitroglycerin, isosorbide

ACTION

Vasodilation → ↓preload, ↓O_2 demand; angina.

SE

Headache, hypotension, dizziness, reflex tachycardia, flushing.

NURSING

SL: sit, 1 tab q5 min ×3, call 911 if unrelieved after first; protect from light; rotate patches, nitrate-free interval.

KEY

Never with PDE-5 inhibitors (sildenafil) → severe hypotension.

ANTILIPEMICS

statins · ezetimibe · fibrates · niacin · PCSK9 · bile-acid sequestrants

SE

Statins → **myopathy/rhabdomyolysis** (muscle pain + dark urine), hepatotoxicity. Fibrates → gallstones/myopathy. Niacin → flushing. Sequestrants → constipation, bind other drugs.

NURSING

Statin in evening; monitor LFTs/CK; report muscle pain; avoid grapefruit; ASA before niacin (↓flushing).

KEY

Statins teratogenic; **muscle pain + dark urine = hold & report.**

HEPARIN / LMWH

heparin IV/SubQ · enoxaparin

ACTION

Potentiate antithrombin → inhibit thrombin/Xa; rapid, short-acting.

SE

Bleeding, **HIT** (thrombocytopenia), injection hematoma.

NURSING

Monitor **aPTT** (1.5–2.5×) + platelets; SubQ in abdomen, don't aspirate/massage; bleeding precautions.

ANTIDOTE

Protamine sulfate.

WARFARIN

oral · vitamin K antagonist · narrow index

ACTION

Inhibits vitamin-K factors (II,VII,IX,X); slow onset (days).

NURSING

Monitor **PT/INR** (2–3); consistent vitamin-K intake; many interactions; bleeding precautions.

ANTIDOTE

Vitamin K; FFP/PCC for severe bleed.

KEY

Teratogenic (heparin in pregnancy); keep green-veggie intake steady, not zero.

DOACS & ANTIPLATELETS

apixaban/rivaroxaban/dabigatran · aspirin, clopidogrel

ACTION

DOACs: direct Xa/thrombin inhibitors (no routine monitoring). Antiplatelets: ↓aggregation.

SE

Bleeding; aspirin → GI bleed, tinnitus (salicylism).

ANTIDOTE

Dabigatran → **idarucizumab**; Xa inhibitors → **andexanet alfa**.

THROMBOLYTICS & VASOPRESSORS

"-ase" alteplase · norepinephrine, dopamine, dobutamine

SE

Thrombolytics → **major bleeding** (active bleed/recent surgery/hemorrhagic stroke = contraindicated). Vasopressors → dysrhythmias, **extravasation necrosis**.

NURSING

Thrombolytics: bleeding precautions, time window. Vasopressors: central line, titrate to MAP, watch IV site (extravasation antidote = phentolamine).

02 RESPIRATORY

BRONCHODILATION · INFLAMMATION · ALLERGY · COUGH

BETA-2 AGONISTS (SABA / LABA)
albuterol · salmeterol, formoterol

ACTION
Stimulate beta-2 → bronchodilation. SABA = rescue; LABA = long-term control.

SE
Tachycardia, tremor, nervousness, palpitations, ↑glucose.

KEY
LABA never for acute attack / never monotherapy in asthma; albuterol first if both ordered.

ICS & ANTICHOLINERGICS
fluticasone, budesonide · ipratropium, tiotropium

SE
ICS → **oral thrush**, hoarseness; anticholinergic → dry mouth, urinary retention.

KEY
Rinse mouth after ICS; bronchodilator before steroid inhaler (open airway first).

LEUKOTRIENE MODIFIERS & MAST-CELL STABILIZERS
montelukast · cromolyn

ACTION
↓Inflammation/bronchoconstriction; prophylaxis only.

SE
Montelukast → **neuropsychiatric effects** (mood, suicidal ideation — black box).

KEY
Not for acute attacks — daily prevention; report mood/behavior changes.

THEOPHYLLINE (METHYLXANTHINE)
narrow index

TOXICITY
Tachycardia, dysrhythmias, N/V, restlessness, seizures. Level **10–20 mcg/mL**.

KEY
Caffeine ↑ toxicity; smoking ↓ levels.

ANTIHISTAMINES & DECONGESTANTS
diphenhydramine, loratadine · pseudoephedrine

SE
1st-gen → sedation, anticholinergic (dry mouth, retention, confusion in elderly). Decongestants → ↑BP/HR, insomnia.

KEY
Avoid 1st-gen in elderly (falls); decongestants caution with HTN/cardiac disease.

COUGH & MUCUS AGENTS
dextromethorphan/codeine · guaifenesin · acetylcysteine

ACTION
Antitussives suppress cough; expectorant (guaifenesin) thins/loosens; mucolytic (acetylcysteine) breaks up mucus.

KEY
Guaifenesin: ↑fluids to thin secretions; acetylcysteine smells like rotten eggs & is also the acetaminophen antidote.

03 ENDOCRINE
GLUCOSE · THYROID · STEROIDS · PITUITARY

INSULIN
HIGH ALERT · see profile table

ACTION
Drives glucose into cells; type 1 (required), type 2.

SE
Hypoglycemia, lipohypertrophy, **hypokalemia** (shifts K into cells).

NURSING
Two-RN verify; rotate sites; **clear before cloudy**; only Regular IV; know peaks.

KEY
Hypoglycemia risk greatest at peak; don't delay meal after rapid-acting; glargine/detemir = no peak, never mix.

METFORMIN (BIGUANIDE)
first-line type 2

ACTION
↓Hepatic glucose, ↑insulin sensitivity; no hypoglycemia alone.

SE
GI upset, metallic taste, B12 deficiency; rare **lactic acidosis**.

KEY
Hold 48 h before/after IV contrast; hold with renal impairment.

OTHER ORAL / INJECTABLE ANTIDIABETICS
sulfonylureas · "-gliptin" · "-flozin" · "-glitazone" · GLP-1 "-tide"

SE
Sulfonylureas → **hypoglycemia**, weight gain. SGLT2 ("-flozin") → GU infections, DKA risk. TZDs → fluid retention/HF. GLP-1 → N/V, weight loss, pancreatitis.

KEY
Sulfonylureas + alcohol → disulfiram-like reaction; SGLT2 → watch for euglycemic DKA.

LEVOTHYROXINE
hypothyroidism · lifelong

SE
Over-replacement → hyperthyroid signs (tachycardia, palpitations, weight loss, insomnia).

NURSING
Same time daily, **empty stomach AM**; monitor TSH; separate from calcium/iron/antacids.

KEY
Don't stop when feeling better; report chest pain/palpitations.

ANTITHYROID AGENTS
PTU, methimazole · radioactive iodine

SE

Agranulocytosis (report sore throat/fever), hepatotoxicity.

KEY

PTU preferred 1st-trimester pregnancy; RAI contraindicated in pregnancy.

CORTICOSTEROIDS (SYSTEMIC)
prednisone, methylprednisolone, hydrocortisone

SE

Cushingoid: hyperglycemia, ↑infection, osteoporosis, weight gain/moon face, ↑BP, fluid retention, hypokalemia, peptic ulcer, mood changes, delayed healing.

NURSING

Take with food; monitor glucose/weight/BP; **taper—never stop abruptly;** watch masked infection.

KEY

Abrupt withdrawal → adrenal crisis. Stress dosing during illness.

POSTERIOR PITUITARY AGENTS
desmopressin / vasopressin

ACTION

Synthetic ADH → water retention; treats **diabetes insipidus**, also enuresis.

SE

Water intoxication/hyponatremia, headache.

KEY

Monitor I&O, sodium, daily weight; watch for fluid overload.

BISPHOSPHONATES
alendronate, risedronate · osteoporosis

ACTION

Inhibit bone resorption → ↑bone density.

SE

Esophagitis, **osteonecrosis of the jaw**, atypical fractures.

KEY

Take AM with full water on empty stomach; **stay upright 30 min;** dental exam before starting.

04 GASTROINTESTINAL
ACID · MOTILITY · NAUSEA · BOWEL

PROTON PUMP INHIBITORS
"-prazole" · omeprazole, pantoprazole

ACTION

Block gastric acid pump; GERD, ulcers, prophylaxis.

SE

Long-term → ↓Ca/Mg, B12 deficiency, fracture risk, C. diff, pneumonia.

NURSING

Take before meals; don't crush enteric-coated; short-term preferred.

H2 BLOCKERS, ANTACIDS & PROTECTANTS
famotidine · Ca/Al/Mg antacids · sucralfate, misoprostol

SE

Aluminum → constipation; magnesium → diarrhea; misoprostol → **abortifacient** (avoid pregnancy).

KEY

Separate antacids/sucralfate from other meds by 1–2 h (↓absorption); sucralfate before meals.

ANTIEMETICS
ondansetron, promethazine, metoclopramide, scopolamine

SE

Ondansetron → **QT prolongation**, headache, constipation. Metoclopramide → **EPS/tardive dyskinesia**. Scopolamine → anticholinergic.

KEY

Monitor QT with ondansetron; limit metoclopramide duration (movement disorders).

LAXATIVES & ANTIDIARRHEALS
docusate, psyllium, senna, PEG, lactulose · loperamide

SE

Fluid/electrolyte loss, dependence (stimulant), cramping; loperamide → constipation/ileus.

KEY

Bulk-forming needs **adequate water;** avoid antidiarrheals in infectious/C. diff diarrhea; lactulose lowers ammonia.

05 NEUROLOGIC & PSYCHIATRIC
MOOD · PSYCHOSIS · SEIZURES · MOVEMENT

SSRIS
fluoxetine, sertraline, citalopram, escitalopram

SE

GI upset, insomnia, sexual dysfunction; **serotonin syndrome** (agitation, hyperthermia, clonus, ↑HR).

NURSING

2–6 weeks to work; monitor suicidal ideation early (black box, young adults); taper to stop.

KEY

SSRI + MAOI = serotonin syndrome — separate ≥2 weeks.

SNRIS · TCAS · MAOIS · ATYPICALS
venlafaxine/duloxetine · amitriptyline · phenelzine · bupropion, mirtazapine, trazodone

SE

TCA → anticholinergic + **lethal in OD (cardiotoxic)**. MAOI → **hypertensive crisis with tyramine**. Bupropion → ↓seizure threshold. Trazodone → priapism.

KEY

MAOI + tyramine (aged cheese, cured meats, wine) → crisis; avoid TCA in suicidal clients.

LITHIUM
mood stabilizer · level 0.6–1.2 mEq/L

TOXICITY
Early: N/V, fine tremor, thirst. Toxic: coarse tremor, ataxia, confusion, seizures, dysrhythmia.

NURSING
Consistent **sodium + fluid** intake; monitor level.

KEY
Low Na / dehydration / NSAIDs / thiazides → toxicity. Don't restrict salt/fluid.

ANTIPSYCHOTICS
haloperidol · risperidone, olanzapine, clozapine, quetiapine

SE
EPS (dystonia, akathisia, parkinsonism, tardive dyskinesia), **NMS** (fever, rigidity, ↑CK, AMS), anticholinergic; atypicals → metabolic syndrome; **clozapine → agranulocytosis**.

RX
NMS: stop drug + dantrolene/bromocriptine + cooling. Acute dystonia → benztropine/diphenhydramine. Clozapine → WBC monitoring.

BENZODIAZEPINES & HYPNOTICS
"-pam/-lam" lorazepam, diazepam · zolpidem · barbiturates

SE
Sedation, **respiratory depression** (esp. with opioids/alcohol), dependence, falls; zolpidem → complex sleep behaviors.

ANTIDOTE
Flumazenil (benzos; use cautiously — seizures).

KEY
Don't stop abruptly (withdrawal seizures); avoid with CNS depressants.

ANTIEPILEPTICS
phenytoin, valproate, carbamazepine, levetiracetam, lamotrigine

SE
Phenytoin → **gingival hyperplasia**, ataxia (level 10–20). Valproate/carbamazepine → hepatotoxicity, dyscrasias. Lamotrigine/carbamazepine → **Stevens-Johnson**.

KEY
Many **teratogenic;** report rash (SJS); don't stop abruptly; phenytoin meticulous oral care.

ANTIPARKINSON & COGNITION
levodopa-carbidopa, ropinirole · donepezil, memantine

SE
Levodopa → orthostatic hypotension, dyskinesias, **dark urine/sweat** (harmless), impulse-control issues. Donepezil → bradycardia, GI upset.

KEY
High-protein meals ↓ levodopa absorption; effects take weeks; cholinesterase inhibitors slow Alzheimer progression, not cure.

STIMULANTS, MUSCLE RELAXANTS & TRIPTANS
methylphenidate · cyclobenzaprine, baclofen · sumatriptan

SE
Stimulants → ↓appetite/growth, insomnia, ↑HR/BP. Muscle relaxants → sedation. Triptans → **vasoconstriction** (avoid in CAD); serotonin syndrome with SSRIs.

KEY
Stimulants early in day; monitor child growth; triptans not for hemiplegic migraine/CAD.

06 PAIN, INFLAMMATION & IMMUNE
OPIOIDS · NSAIDS · GOUT · DMARDS

OPIOIDS
morphine, hydromorphone, fentanyl, oxycodone · HIGH ALERT

SE
Respiratory depression (the killer), sedation, **constipation** (no tolerance), N/V, retention, pinpoint pupils, dependence.

NURSING
Assess RR & sedation before/after; hold if RR <12; bowel regimen; naloxone available.

ANTIDOTE
Naloxone — repeat dosing (shorter-acting than opioid).

NSAIDS & ACETAMINOPHEN
ibuprofen, naproxen, ketorolac, aspirin · acetaminophen

SE
NSAIDs → **GI bleed**, renal impairment, ↑BP, ↑CV risk; aspirin → tinnitus, Reye's. Acetaminophen → **hepatotoxicity** (max 4 g/day).

ANTIDOTE
Acetaminophen → **N-acetylcysteine**.

KEY
No aspirin in children with viral illness (Reye's); ketorolac ≤5 days; watch acetaminophen in combo products.

GOUT AGENTS
allopurinol, colchicine, probenecid, febuxostat

SE
Allopurinol → rash (SJS). Colchicine → severe GI/diarrhea.

KEY
Allopurinol prevents, doesn't treat acute; push fluids; limit purines (organ meats, shellfish, alcohol).

DMARDS, BIOLOGICS & IMMUNOSUPPRESSANTS
methotrexate · TNF inhibitors ("-mab") · cyclosporine, tacrolimus

SE
Methotrexate → hepatotoxicity, marrow suppression, **teratogenic** (give folic acid). Biologics/immunosuppressants → **↑infection** (TB reactivation), malignancy risk.

KEY
Screen for TB before biologics; infection precautions; monitor CBC/LFTs; live vaccines contraindicated.

07 ANTI-INFECTIVES
ANTIBIOTIC · ANTIFUNGAL · ANTIVIRAL · TB · HIV

PENICILLINS & CEPHALOSPORINS
"-cillin" · "cef-/ceph-"

SE
Allergy → rash to **anaphylaxis**; GI upset, C. diff; cross-sensitivity penicillin↔cephalosporin.

KEY
Always assess penicillin allergy; some cephalosporins + alcohol → disulfiram reaction; finish full course.

MACROLIDES & FLUOROQUINOLONES
azithromycin · "-floxacin"

SE
Both → **QT prolongation**; fluoroquinolones → **tendon rupture**, photosensitivity, CNS effects (black box).

KEY
Fluoroquinolones: report tendon pain; avoid in children/pregnancy; separate from antacids/dairy/iron.

AMINOGLYCOSIDES & VANCOMYCIN
gentamicin · vancomycin

SE
Nephrotoxicity + ototoxicity; vancomycin → **"Red Man" syndrome** if infused fast.

NURSING
Monitor **peak & trough** + renal/hearing; infuse vancomycin ≥60 min.

KEY
Trough drawn just before next dose; Red Man = slow the rate, not a true allergy.

TETRACYCLINES, SULFONAMIDES & OTHERS
doxycycline · TMP-SMX · metronidazole, clindamycin, linezolid

SE
Tetracycline → **tooth staining** (avoid <8 yo & pregnancy), photosensitivity. Sulfa → rash/SJS, crystalluria. Clindamycin → C. diff. Metronidazole → **disulfiram reaction** with alcohol.

KEY
Tetracyclines: no dairy/antacids/iron; sulfa & metronidazole: no alcohol; push fluids with sulfa.

ANTITUBERCULAR (RIPE)
rifampin, isoniazid, pyrazinamide, ethambutol

SE
Rifampin → orange body fluids (harmless). **Isoniazid → hepatotoxicity + neuropathy** (give B6). Ethambutol → optic neuritis (vision).

KEY
INH neuropathy prevented by B6; rifampin ↓ oral contraceptive effect; adherence is critical.

ANTIFUNGALS, ANTIVIRALS & ANTIRETROVIRALS
fluconazole, amphotericin B · acyclovir, oseltamivir · ART

SE
Amphotericin B → **"shake and bake"** fevers, nephrotoxicity, hypokalemia. Acyclovir → nephrotoxicity (hydrate). Azoles → hepatotoxicity. ART → varied (lactic acidosis, lipodystrophy).

KEY
Amphotericin B "amphoterrible" — premedicate, monitor renal/K^+; ART **adherence** prevents resistance; start antivirals early.

08 RENAL, FLUID & HEMATOLOGIC
ELECTROLYTES · REPLACEMENT · BLOOD

POTASSIUM CHLORIDE
HIGH ALERT replacement

SE
GI irritation (oral); IV → phlebitis; rapid IV → fatal dysrhythmia.

KEY
NEVER IV push KCl — always diluted, slow, via pump; ensure urine output; oral with food/full glass.

PHOSPHATE BINDERS & CALCIUM/MAG
sevelamer, calcium acetate · calcium gluconate · magnesium

ACTION
Binders lower phosphate in CKD; calcium/mag replacement & antidotes.

KEY
Phosphate binders **with meals;** calcium gluconate = antidote for mag toxicity & stabilizes heart in hyperkalemia.

IRON, B12 & FOLATE
ferrous sulfate · cyanocobalamin · folic acid

SE
Iron → constipation, **dark/black stools** (expected), GI upset, teeth staining (liquid).

NURSING
Iron with vitamin C/empty stomach; straw for liquid; **Z-track IM**. B12 IM lifelong for pernicious anemia.

KEY
Dark stools from iron are normal (vs melena); keep iron from children (lethal OD).

HEMATOPOIETIC GROWTH FACTORS
epoetin alfa · filgrastim (G-CSF)

ACTION
Epoetin → ↑RBC (CKD/chemo anemia). Filgrastim → ↑neutrophils after chemo.

SE
Epoetin → HTN, thrombosis; filgrastim → bone pain.

KEY
Monitor H&H/BP with epoetin (don't overshoot Hgb — clot risk).

09 OB & REPRODUCTIVE
UTEROTONICS · TOCOLYTICS · HORMONES

OXYTOCIN
induction · postpartum

SE
Uterine tachysystole/hyperstimulation, fetal distress, water intoxication, hypotension.

NURSING
Continuous fetal monitoring; **stop** if contractions >5/10 min or late decels; titrate.

MAGNESIUM SULFATE
tocolytic · preeclampsia/eclampsia

TOXICITY
Loss of DTRs → resp depression → cardiac arrest; flushing, ↓BP, lethargy. Level 4–7 mEq/L.

NURSING
Monitor DTRs, RR (≥12), urine (≥30 mL/h).

ANTIDOTE
Calcium gluconate.

OTHER OB AGENTS
methylergonovine, carboprost, misoprostol, terbutaline, betamethasone, RhoGAM

KEY POINTS

Methylergonovine → **hold if hypertensive**. Carboprost → **avoid in asthma**. Terbutaline → maternal tachycardia. Betamethasone → fetal lung maturity. RhoGAM → Rh−negative mothers.

KEY

RhoGAM at 28 wks & within 72 h postpartum if baby Rh+.

REPRODUCTIVE / GU AGENTS
contraceptives · PDE-5 (sildenafil) · finasteride, tamsulosin

SE

Estrogen contraceptives → **thromboembolism** (worse with smoking >35). PDE−5 → hypotension (no nitrates). Finasteride → **teratogenic** (pregnant women avoid handling). Tamsulosin → orthostatic hypotension.

KEY

Contraceptive warning signs (ACHES); never PDE−5 with nitrates.

10 ONCOLOGY & MISCELLANEOUS
CHEMO · EYE · IMMUNIZATION SUPPORT

ANTINEOPLASTICS (CHEMO)
alkylating, antimetabolites, vinca alkaloids, taxanes, anthracyclines

SE

Myelosuppression (↓WBC/RBC/platelets), N/V, alopecia, mucositis, fatigue; vesicants → extravasation; anthracyclines → cardiotoxicity; vincristine → neuropathy.

NURSING

Neutropenic + bleeding precautions, antiemetics, oral care, monitor CBC; handle with chemo PPE.

KEY

Fever in neutropenia = emergency; infection is the priority.

HORMONAL & TARGETED CANCER THERAPY
tamoxifen · monoclonal antibodies ("-mab")

SE

Tamoxifen → **thromboembolism, endometrial cancer risk**, hot flashes. mAbs → infusion reactions.

KEY

Tamoxifen: report leg pain/swelling, abnormal bleeding; monitor infusion reactions with mAbs.

OPHTHALMIC / GLAUCOMA
timolol, latanoprost, pilocarpine, acetazolamide

ACTION

Lower intraocular pressure (↓production or ↑outflow).

SE

Timolol drops → systemic beta−blockade (bradycardia/bronchospasm). Latanoprost → iris/eyelash darkening.

KEY

Apply punctal occlusion after drops to limit systemic absorption; wait 5 min between different drops.

IV FLUIDS (OVERVIEW)
see fluid table for detail

ACTION

Isotonic expands intravascular volume; hypotonic hydrates cells; hypertonic pulls fluid into vessels.

KEY

Match fluid to the problem; monitor for overload (crackles, ↑JVD, weight gain) and electrolytes.

★ MASTER REFERENCE TABLES
THE CONSOLIDATED HIGH-YIELD DATA

11 · DRUG SUFFIX / STEM DECODER

STEM / SUFFIX	CLASS	STEM / SUFFIX	CLASS
-olol	Beta−blocker	-pril	ACE inhibitor
-sartan	ARB	-dipine	Calcium channel blocker
-osin	Alpha−1 blocker	-statin	HMG−CoA (statin)
-pam / -lam	Benzodiazepine	-prazole	Proton pump inhibitor
-tidine	H2 blocker	-cillin	Penicillin
cef- / ceph-	Cephalosporin	-floxacin	Fluoroquinolone
-mycin / -micin	Aminoglycoside / macrolide	-cycline	Tetracycline
-azole	Antifungal / PPI	-vir	Antiviral
-ase	Thrombolytic	-parin	LMWH (heparin)
-gliptin	DPP−4 inhibitor	-glitazone	Thiazolidinedione
-flozin	SGLT2 inhibitor	-tide	GLP−1 agonist
-mab	Monoclonal antibody	-prost	Prostaglandin
-triptan	Migraine (serotonin agonist)	-pine (antipsych)	Atypical antipsychotic

12 · HIGH-ALERT MEDICATIONS

DRUG / CLASS	WHY HIGH-ALERT	KEY SAFEGUARD
Insulin	Hypoglycemia, dosing errors	**Two-RN verify; know peaks; only Regular IV**
Heparin / warfarin / DOACs	Bleeding	**Monitor labs; antidotes available; double-check**
Opioids	Respiratory depression	**Assess RR/sedation; naloxone ready**
Potassium chloride IV	Fatal dysrhythmia if pushed	**Never IV push; dilute, slow, pump**
Digoxin	Narrow index, dysrhythmias	**Apical HR, K^+, level**
Chemotherapy	Toxicity, extravasation	**Verify protocol; chemo PPE; two-RN**
Neuromuscular blockers	Paralysis/respiratory arrest	**Ventilation/airway support required**
Concentrated electrolytes	Lethal if misdosed	**Always diluted, independent double-check**

13 · INSULIN ONSET · PEAK · DURATION

INSULIN	TYPE	ONSET	PEAK	DURATION	PEARL
Lispro/Aspart/Glulisine	Rapid	10–30 min	30 min–3 h	3–5 h	**Give with food on tray**
Regular (R)	Short	30 min–1 h	2–4 h	5–8 h	**Only insulin given IV**
NPH (N)	Intermediate	1–2 h	4–12 h	12–18 h	**Cloudy; hypo risk mid-day/night**
Glargine/Detemir/Degludec	Long	1–2 h	No peak	~24 h+	**Never mix; once-daily basal**

MIXING RULE
"Clear before cloudy" — draw up Regular (clear) before NPH (cloudy).

14 · THERAPEUTIC DRUG LEVELS

DRUG	THERAPEUTIC RANGE	TOXICITY SIGNS
Digoxin	0.5–2 ng/mL	**N/V, yellow-green halos, dysrhythmias**
Lithium	0.6–1.2 mEq/L	**Tremor, ataxia, confusion, seizures**
Phenytoin	10–20 mcg/mL	**Nystagmus, ataxia, gingival hyperplasia**
Theophylline	10–20 mcg/mL	**Tachycardia, dysrhythmias, seizures**
Valproic acid	50–100 mcg/mL	**Hepatotoxicity, thrombocytopenia**
Carbamazepine	4–12 mcg/mL	**Diplopia, ataxia, dyscrasias**
Magnesium (OB)	4–7 mEq/L	**Loss of DTRs, RR <12, arrest**
Vancomycin (trough)	10–20 mcg/mL	**Nephro/ototoxicity**
aPTT (heparin)	1.5–2.5× control	**Bleeding**
INR (warfarin)	2.0–3.0	**Bleeding**
Acetaminophen	10–30 mcg/mL	**Hepatotoxicity (use NAC)**

15 · ANTIDOTES & REVERSAL AGENTS

DRUG / TOXIN	ANTIDOTE	DRUG / TOXIN	ANTIDOTE
Opioids	Naloxone	**Benzodiazepines**	Flumazenil
Acetaminophen	N-acetylcysteine	**Warfarin**	Vitamin K / FFP
Heparin	Protamine sulfate	**Magnesium**	Calcium gluconate
Digoxin	Digoxin immune Fab	**Iron**	Deferoxamine
Beta-blocker OD	Glucagon	**CCB OD**	Calcium
Organophosphate / cholinergic	Atropine (+ pralidoxime)	**Dabigatran**	Idarucizumab
Factor Xa inhibitors	Andexanet alfa	**Malignant hyperthermia/NMS**	Dantrolene
Ethylene glycol / methanol	Fomepizole	**Methotrexate**	Leucovorin
Anticholinergic toxicity	Physostigmine	**Extravasation (vasopressor)**	Phentolamine

16 · IV FLUID TYPES

FLUID	TONICITY	EFFECT / USE	CAUTION
0.9% NS, LR, D5W*	**Isotonic**	Expands intravascular volume; shock, dehydration, blood compatible (NS)	**Fluid overload**
0.45% NS, 0.225% NS	**Hypotonic**	Shifts fluid into cells; cellular dehydration, hypernatremia, DKA (later)	**Cerebral edema; not for ↑ICP/burns/trauma**
3% NS, D10W, D5½NS	**Hypertonic**	Pulls fluid into vessels; severe hyponatremia, cerebral edema	**Fluid overload; give slowly, central line for 3%**

*D5W is isotonic in the bag but becomes hypotonic once dextrose is metabolized.

17 · ELECTROLYTE REPLACEMENT ESSENTIALS

ELECTROLYTE	NORMAL	REPLACEMENT NOTES
Potassium	`3.5–5.0 mEq/L`	Never IV push; dilute & pump; ensure urine output; oral with food
Sodium	`135–145 mEq/L`	Correct slowly (cerebral edema / osmotic demyelination)
Calcium	`9–10.5 mg/dL`	IV calcium slowly; cardiac monitor; antidote for mag toxicity
Magnesium	`1.3–2.1 mEq/L`	Monitor DTRs/RR; calcium gluconate for toxicity
Phosphate	`3.0–4.5 mg/dL`	Inverse to calcium; binders with meals in CKD

18 · CONTROLLED SUBSTANCE SCHEDULES

SCHEDULE	ABUSE POTENTIAL	EXAMPLES
I	**Highest; no accepted medical use**	Heroin, LSD
II	**High; severe dependence**	Opioids (morphine, fentanyl, oxycodone), amphetamines
III	Moderate	Codeine combos, ketamine, anabolic steroids
IV	Lower	Benzodiazepines, zolpidem, tramadol
V	Lowest	Antidiarrheals/cough preps with small opioid amounts

Controlled substances require count/waste with a witness and secure storage.

19 · KEY FOOD / TIMING INTERACTIONS

DRUG	INTERACTION / TIMING
Warfarin	Keep vitamin-K (leafy greens) intake **consistent**
MAOIs	Avoid **tyramine** (aged cheese, cured meats, wine) → hypertensive crisis
Levodopa	High-protein meals ↓ absorption
Tetracyclines / fluoroquinolones / iron	Separate from dairy/antacids/calcium (chelation)
Statins / CCBs	Avoid **grapefruit juice** (↑levels)
Metronidazole / sulfonylureas / some cephalosporins	Avoid alcohol (disulfiram reaction)
Levothyroxine / bisphosphonates	Empty stomach, AM; separate from other meds
Lithium	Consistent sodium & fluid; avoid NSAIDs
Spironolactone / ACE / ARB	Avoid salt substitutes / K supplements (hyperkalemia)

20 · VITAMINS & CLINICAL USES

VITAMIN	USE / DEFICIENCY	VITAMIN	USE / DEFICIENCY
Vitamin K	Warfarin antidote; clotting	**Vitamin B6 (pyridoxine)**	Prevents INH neuropathy
Vitamin B12	Pernicious anemia (IM lifelong)	**Folic acid**	Pregnancy (neural tube), methotrexate
Vitamin D + Calcium	Osteoporosis, bone health	**Vitamin C**	↑Iron absorption; wound healing
Vitamin A	Vision; teratogenic in excess	**Thiamine (B1)**	Alcohol use disorder (Wernicke's)
Fat-soluble (A,D,E,K)	Supplement in malabsorption (e.g., CF)	**Iron**	Iron-deficiency anemia

21 · TERATOGENIC / PREGNANCY-CAUTION DRUGS

AVOID IN PREGNANCY	WHY
ACE inhibitors / ARBs	Fetal renal damage
Warfarin	Fetal malformations (use heparin/LMWH)
Statins	Fetal development

AVOID IN PREGNANCY	WHY
Tetracyclines	Tooth/bone discoloration
Isotretinoin / high-dose vitamin A	Severe birth defects
Many antiepileptics (valproate, phenytoin)	Neural tube / craniofacial defects
Methotrexate	Abortifacient/teratogen
Finasteride / misoprostol	Fetal harm / abortifacient (avoid handling)
Live vaccines	Contraindicated in pregnancy

22 · VACCINE ESSENTIALS

CONCEPT	KEY POINT
Live attenuated	MMR, varicella, intranasal flu, rotavirus, yellow fever — **avoid in pregnancy & immunocompromised**
Inactivated / subunit / toxoid	IM flu, Tdap, hepatitis B, HPV, pneumococcal — safe in immunocompromised
Egg allergy	Caution/screen with some influenza vaccines
Spacing live vaccines	Give same day or separate by ≥4 weeks
Tdap in pregnancy	Recommended each pregnancy (27–36 wks)
Documentation	Record lot #, site, route, date; provide VIS

PHARMACOLOGY MASTERY CHECKLIST

SELF-CHECK BEFORE TEST DAY

I CAN CONFIDENTLY… ✓

- ☑ Identify a drug class from its suffix/stem
- ☑ Name the gating parameter to check before high-alert drugs (HR, BP, K^+, RR, level)
- ☑ Sequence insulin peaks and apply "clear before cloudy"
- ☑ Choose the correct IV fluid by tonicity and recognize overload
- ☑ Flag teratogenic drugs and live-vaccine contraindications
- ☑ Apply food/timing/alcohol interaction rules
- ☑ Know which meds need tapering vs which can stop
- ☑ State the action, key side effects, and #1 teaching point for each class
- ☑ Recall every major antidote/reversal pairing
- ☑ State therapeutic ranges and toxicity signs for narrow-index drugs
- ☑ Replace electrolytes safely (never IV-push KCl)
- ☑ Recognize the classic toxicity syndromes (serotonin, NMS, EPS, digoxin, salicylism)
- ☑ Distinguish expected effects (orange/dark fluids, black stools) from adverse ones
- ☑ Apply the 6 Rights and controlled-substance handling every time

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