Achievable

USMLE STEP 1 DUMP SHEET

Antimicrobial drugs

Antibacterials by target

Target	Drugs	Key adverse effects
Cell wall: PBPs	Penicillins, cephalosporins, carbapenems	Hypersensitivity, C. difficile, hemolysis; imipenem: seizures
Cell wall: D-Ala-D-Ala	Vancomycin	Red man syndrome (histamine release), phlebitis; check renal function
Membrane	Polymyxin B, colistin (gram-negative LPS)	Nephrotoxicity, neurotoxicity, neuromuscular blockade
30S	Aminoglycosides (gentamicin)	Nephrotoxicity, ototoxicity, neuromuscular blockade
30S	Tetracyclines; tigecycline	Teeth discoloration, photosensitivity, esophageal ulcers
50S	Macrolides (erythromycin, azithromycin)	Prokinetic, long QT; erythro- and clarithromycin inhibit CYP450
50S	Clindamycin; chloramphenicol	Clindamycin: C. difficile. Chloramphenicol: aplastic anemia, gray baby
50S initiation	Linezolid	Myelosuppression, serotonin syndrome, optic neuritis
DNA gyrase, topo IV	Fluoroquinolones (ciprofloxacin)	Tendon rupture, cartilage damage, long QT, worsens myasthenia gravis
Folate synthesis	Sulfonamides; trimethoprim (DHFR)	SJS, kernicterus. Trimethoprim: hyperkalemia. TMP-SMX raises warfarin
RNA polymerase	Rifampin	Orange body fluids, hepatitis; CYP450 inducer; resistance via rpoB
DNA (free radicals)	Metronidazole	Disulfiram-like. For anaerobes, Giardia, Trichomonas, H. pylori

Beta-lactams

- **Penicillin G, V:** streptococci, meningococci, syphilis
- **Nafcillin, oxacillin:** penicillinase-resistant; staph, not MRSA
- **Ampicillin, amoxicillin:** add H. influenzae, E. coli
- **Piperacillin:** Pseudomonas; with tazobactam
- **Cephalosporins:** 1st cefazolin, 2nd cefoxitin, 3rd ceftriaxone, 4th cefepime, 5th ceftaroline
- **Cefotetan:** disulfiram-like, raises PT

Antifungals

- **Azoles:** block ergosterol synthesis; inhibit CYP450. Ketoconazole: gynecomastia
- **Amphotericin B:** binds ergosterol; nephrotoxicity, infusion fevers
- **Echinocandins** (caspofungin): β-glucan; not Cryptococcus
- **Terbinafine:** squalene epoxidase; onychomycosis
- **Flucytosine:** to 5-FU in the fungus; myelosuppression

Resistance

- **MRSA:** mecA → PBP2a. Vancomycin, daptomycin, linezolid
- **VRE:** vanA, D-Ala-D-Lac. Linezolid, daptomycin
- **ESBL** (extended-spectrum β-lactamase): carbapenems
- **Metallo-β-lactamases:** zinc; resist carbapenems
- **Efflux pumps:** macrolides, tetracyclines, quinolones
- **Daptomycin:** myopathy, high CK

HIV therapy

- **NRTIs:** zidovudine (anemia), abacavir (hypersensitivity), tenofovir (bone)
- **NNRTIs:** efavirenz (vivid dreams), nevirapine; rash, hepatotoxicity
- **Protease inhibitors:** hyperglycemia, lipodystrophy; indinavir stones
- **Integrase:** dolutegravir, raltegravir. **Maraviroc:** CCR5
- **Regimen:** 2 NRTIs + integrase inhibitor, NNRTI or PI

Antivirals

Drug	Mechanism	Use	Adverse effects
Oseltamivir, zanamivir	Neuraminidase: no virion release	Flu A, B (48 h)	Zanamivir: bronchospasm
Acyclovir, valacyclovir	Thymidine kinase → DNA polymerase	HSV, VZV	Renal insufficiency
Ganciclovir	Viral kinase (UL97) → DNA polymerase	CMV	Myelosuppression
Foscarnet, cidofovir	DNA polymerase; no viral kinase needed	CMV, resistant HSV	Nephrotoxicity; foscarnet: electrolytes
Ribavirin	IMP dehydrogenase, RNA polymerase	RSV, HCV	Hemolytic anemia; teratogen
Sofosbuvir; ledipasvir	HCV polymerase; NS5A	HCV	Bradycardia with amiodarone
Entecavir	HBV polymerase	Chronic HBV	Lactic acidosis
Palivizumab	Antibody to RSV F protein	Prophylaxis	Does not treat infection