

The 16 antibiotics that you need to know

(1) Penicillin

- Good gram-positive coverage, commonly used to treat streptococcal infections (e.g. strep throat, erysipelas)
- Covers some atypical organisms including the spirochetes causing syphilis and Lyme disease
- Watch out for hypersensitivity reactions and acute interstitial nephritis (this applies to all drugs in the penicillin class)

(2) Amoxicillin

- Aminopenicillin with good gram-positive coverage and improved gram-negative coverage compared with first-generation penicillins
- First-line treatment for otitis media and bacterial sinusitis

(3) Amoxicillin/Clavulanate (Augmentin)

- Aminopenicillin + beta-lactamase inhibitor, commonly used to treat otitis media and sinusitis refractory to amoxicillin
- Excellent anaerobic coverage, commonly used to treat abscesses and aspiration pneumonia

(4) Piperacillin/Tazobactam (Zosyn)

- Very broad-spectrum penicillin with excellent gram-positive and gram-negative coverage including Pseudomonas, often used as empiric treatment for pneumonia and sepsis in the ICU
- Excellent anaerobic coverage, often used as empiric treatment for peritonitis

(5) Ceftriaxone

- Third-generation cephalosporin with good gram-positive and gram-negative coverage, often used in combination with azithromycin to treat community-acquired pneumonia and pelvic inflammatory disease (covers gonorrhea)
- Excellent CSF penetration, commonly used to treat bacterial meningitis

(6) Cefepime

- Fourth-generation cephalosporin with excellent gram-negative coverage including Pseudomonas, often used in ICU setting
- First-line for empiric treatment of febrile neutropenia (common Step2CK question)

(7) Doripenem

- Very broad-spectrum carbapenem with excellent gram-positive and gram-negative coverage including Pseudomonas
- Similar spectrum and indications as zosyn and cefepime

(8) Aztreonam

- Monobactam antibiotic with excellent gram-negative coverage including Pseudomonas; poor gram-positive coverage
- Good choice for broad gram-negative coverage in a penicillin-allergic patient (monobactams have less cross-reactivity with other beta-lactam antibiotics)

(9) Vancomycin

- Excellent gram-positive coverage, used first-line for MRSA bacteremia, osteomyelitis, and endocarditis
- Oral vancomycin used as second-line treatment for C. difficile colitis
- Watch out for ototoxicity, nephrotoxicity, red man syndrome, and monitor serum level with troughs

(10) Genatmicin

- Aminoglycoside antibiotic with excellent gram-negative coverage including Pseudomonas
- Often used in combination with ampicillin to treat neonatal meningitis
- Watch out for ototoxicity, nephrotoxicity, and monitor serum level with troughs

(11) Azithromycin

- Macrolide antibiotic with excellent coverage of atypical organisms including Mycoplasma, Chlamydia, Legionella and Mycobacteria
- Often used as monotherapy or in combination with ceftriaxone to treat community acquired pneumonia and pelvic inflammatory disease
- Treatment and prophylaxis of atypical mycobacterial infections, used as MAC prophylaxis in HIV patients with CD4 count <50 (common Step2CK question)

(12) Doxycycline

- Tetracycline antibiotic with excellent coverage of atypical organisms including Chlamydia, Mycoplasma, Borrelia, Rickettsia and Ehrlichia; first-line treatment for Lyme disease and Rocky Mountain Spotted Fever
- Good gram-positive coverage, commonly used to treat MRSA skin/soft tissue infections
- Watch out for phototoxicity and gray enamel, avoid in children and pregnancy

(13) Ciprofloxacin

- Fluoroquinolone antibiotic with broad gram-positive and gram-negative coverage including Pseudomonas
- Commonly used to treat GI and GU tract infections including bacterial colitis, cystitis, prostatitis and pyelonephritis
- Watch out for Achilles tendonopathy (rare), avoid in children and pregnancy

(14) Trimethoprim/Sulfamethoxazole (Bactrim)

- Good gram-positive and gram-negative coverage, commonly used to treat MRSA skin/soft tissue infections and cystitis; first-line for Nocardia

- Treatment and prophylaxis of pneumocystis pneumonia, used as PCP prophylaxis in HIV patients with CD4 count <200
- Watch out for sulfa allergy, acute interstitial nephritis, and myelosuppression, avoid in children and pregnancy

(15) Clindamycin

- Excellent anaerobic coverage, commonly used to treat “anaerobes above the diaphragm” including oral abscesses and aspiration pneumonia
- Good gram-positive coverage, commonly used to treat MRSA skin/soft tissue infections
- Watch out for *C. difficile* colitis (common culprit on board exams)

(16) Metronidazole

- Excellent anaerobic coverage, commonly used to treat “anaerobes below the diaphragm” including intra-abdominal abscesses
- First-line treatment for *C. difficile* colitis, bacterial vaginosis, and many protozoal infections (*E. histolytica*, *G. lamblia* and *T. vaginalis*)
- Watch out for disulfiram reaction, tell patients to avoid EtOH