

Infectious Disease Drugs

1. Antibiotics

Beta-Lactams (Penicillins, Cephalosporins, Carbapenems, Monobactams)

- **MOA:** Inhibit bacterial cell wall synthesis by binding to penicillin-binding proteins (PBPs), leading to bacterial cell lysis.
- **Indications:** Respiratory infections, urinary tract infections (UTIs), skin infections, meningitis.
- **Common SE:** Allergic reactions (rash, anaphylaxis), diarrhea, nephrotoxicity (especially with high-dose cephalosporins).
- **Key Notes:**
 - Cross-reactivity in penicillin-allergic patients is possible with cephalosporins and carbapenems.
 - Carbapenems are broad-spectrum and used for multi-drug resistant infections.

Glycopeptides (e.g., Vancomycin, Teicoplanin)

- **MOA:** Inhibit bacterial cell wall synthesis by binding to D-Ala-D-Ala residues, preventing peptidoglycan cross-linking.
- **Indications:** MRSA infections, Clostridium difficile colitis (oral vancomycin).
- **Common SE:** Red man syndrome (rapid infusion), nephrotoxicity, ototoxicity.
- **Key Notes:** Requires therapeutic drug monitoring (TDM) for vancomycin to prevent toxicity.

Macrolides (e.g., Azithromycin, Clarithromycin, Erythromycin)

- **MOA:** Bind to the 50S ribosomal subunit, inhibiting bacterial protein synthesis.
- **Indications:** Atypical pneumonia, STIs (Chlamydia), *H. pylori* eradication.
- **Common SE:** GI upset, QT prolongation, hepatotoxicity.
- **Key Notes:** Macrolides inhibit CYP450 enzymes, leading to drug interactions.

Tetracyclines (e.g., Doxycycline, Minocycline, Tetracycline)

- **MOA:** Bind to the 30S ribosomal subunit, preventing tRNA attachment and inhibiting protein synthesis.
- **Indications:** Acne, Lyme disease, atypical pneumonia, malaria prophylaxis.
- **Common SE:** Photosensitivity, tooth discoloration in children, hepatotoxicity.
- **Key Notes:** Avoid in pregnancy and children <8 years.

Aminoglycosides (e.g., Gentamicin, Amikacin, Tobramycin)

- **MOA:** Bind to the 30S ribosomal subunit, causing misreading of mRNA and bacterial cell death.
- **Indications:** Severe gram-negative infections, sepsis, endocarditis.
- **Common SE:** Nephrotoxicity, ototoxicity, neuromuscular blockade.
- **Key Notes:** Requires TDM; avoid in patients with renal impairment.

Fluoroquinolones (e.g., Ciprofloxacin, Levofloxacin, Moxifloxacin)

- **MOA:** Inhibit DNA gyrase and topoisomerase IV, preventing bacterial DNA replication.
- **Indications:** UTIs, respiratory tract infections, osteomyelitis.
- **Common SE:** Tendon rupture, QT prolongation, CNS toxicity (confusion, seizures).
- **Key Notes:** Avoid in children and pregnancy; risk of Clostridium difficile infection.

Sulfonamides (e.g., Trimethoprim-Sulfamethoxazole)

- **MOA:** Inhibit folic acid synthesis, which is essential for bacterial DNA production.
- **Indications:** UTIs, MRSA skin infections, Pneumocystis jirovecii pneumonia.
- **Common SE:** Stevens-Johnson syndrome, hyperkalemia, bone marrow suppression.
- **Key Notes:** Avoid in sulfa-allergic patients.

Oxazolidinones (e.g., Linezolid, Tedizolid)

- **MOA:** Inhibit protein synthesis by binding to the 50S ribosomal subunit, preventing initiation complex formation.
- **Indications:** MRSA, VRE (vancomycin-resistant enterococci) infections.
- **Common SE:** Bone marrow suppression, serotonin syndrome (if combined with SSRIs).
- **Key Notes:** Monitor for thrombocytopenia with prolonged use.

2. Antivirals

Nucleoside Reverse Transcriptase Inhibitors (NRTIs) (e.g., Zidovudine, Lamivudine, Tenofovir)

- **MOA:** Incorporate faulty nucleotides into viral DNA, causing chain termination during replication.
- **Indications:** HIV, Hepatitis B.
- **Common SE:** Lactic acidosis, pancreatitis, hepatotoxicity.
- **Key Notes:** Monitor liver and renal function.

Neuraminidase Inhibitors (e.g., Oseltamivir, Zanamivir)

- **MOA:** Prevent viral release by inhibiting the neuraminidase enzyme on influenza virus.
 - **Indications:** Influenza A and B.
 - **Common SE:** GI upset, neuropsychiatric effects (rare).
 - **Key Notes:** Most effective if started within 48 hours of symptom onset.
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3. Antifungals

Polyenes (e.g., Amphotericin B, Nystatin)

- **MOA:** Bind to ergosterol in fungal cell membranes, forming pores that cause cell leakage.
- **Indications:** Systemic fungal infections, oral thrush (Nystatin).
- **Common SE:** Nephrotoxicity (Amphotericin B), infusion-related reactions.
- **Key Notes:** Liposomal Amphotericin B has fewer renal side effects.

Azoles (e.g., Fluconazole, Itraconazole, Voriconazole)

- **MOA:** Inhibit fungal ergosterol synthesis by blocking lanosterol 14-alpha-demethylase.
 - **Indications:** Candida infections, Cryptococcus meningitis.
 - **Common SE:** Hepatotoxicity, QT prolongation.
 - **Key Notes:** Monitor liver function tests (LFTs).
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4. Antiparasitics

Antimalarials (e.g., Chloroquine, Artemether-Lumefantrine)

- **MOA:** Interfere with parasite heme metabolism, leading to toxic accumulation in Plasmodium spp.
- **Indications:** Malaria treatment and prophylaxis.
- **Common SE:** Retinopathy (Chloroquine), GI upset.
- **Key Notes:** Chloroquine resistance is common.

Anthelmintics (e.g., Albendazole, Mebendazole, Ivermectin)

- **MOA:** Disrupt microtubule function in helminths, leading to paralysis and death.
- **Indications:** Helminthic infections (roundworms, tapeworms, hookworms).
- **Common SE:** Hepatotoxicity, GI upset.
- **Key Notes:** Take Albendazole with fatty food for better absorption.

Antiprotozoals (e.g., Metronidazole, Tinidazole)

- **MOA:** Generate reactive oxygen species (ROS) that disrupt protozoal DNA synthesis.
 - **Indications:** Giardiasis, Trichomoniasis, Amoebiasis.
 - **Common SE:** Metallic taste, disulfiram-like reaction with alcohol.
 - **Key Notes:** Avoid alcohol during and 48 hours after treatment.
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