

Knowledge Objectives for Chemotherapy Section

Fall Semester 2009 (Lectures 10-22)

Dr Guenther

Selective Toxicity (Lecture 10)

Refer to your handout and know:

Definitions (Chemotherapy, Selective Toxicity, Chemotherapeutic Index)

General bases for selective toxicity

The table in the handout summarizes the important ones for the drugs we are presenting

General bases for drug resistance (again summarized in handout)

How R-factor plasmids work

How environmental antibiotics encourage the development of multiresistant microorganisms

Sulfonamides and Quinolones (Lecture 11)

Sulfonamides:

Know the basic sulfonamide structure and how it relates to PABA

Know in a general way the folate synthesis pathway, and where it is affected by sulfonamides and trimethoprim

Know why they are selectively toxic to microorganisms

Know important factors of disposition, i.e. : rapid absorption, high degree of plasma protein binding, metabolism by acetylation, renal elimination.

Know major toxicities and side effects (especially hematological and dermatological)

How do bacteria become resistant?

Compare mechanism of action of trimethoprim to that of SA's

What combinations are used?

Why is this an effective combination?

Know the major differences between short acting vs. long acting SA's (disposition, toxicity)

Know names of 4 major short acting and 1 long acting sulfonamide

When would non-absorbable SA's be used?

Know major uses for bacterial and non-bacterial infections

Quinolones (oxacin drugs)

What is their common structural feature?

How do they work?

Why are they selectively toxic?

What side effects are known?

What is their general clinical usefulness?

Dr. Mehta: Antibiotics (Lectures 12-14).

1. Know the components of bacterial cell wall, basic processes of cell wall synthesis and maintenance, and basic processes of bacterial protein synthesis.
2. Know the mechanism of antimicrobial activity for penicillins, cephalosporins, bacitracin, vancomycin, aztreonam, imipenem, clavulanic acid, sulbactam, aminoglycosides, tetracyclines, chloramphenicol and the macrolides.
3. Know the classification of penicillins and cephalosporins according to their chemical structure and their antimicrobial spectrum. Know lactamase resistant/sensitive drugs.
4. Know the most common adverse effects of the antimicrobial drugs.
5. Know the mechanisms of bacterial resistance for antimicrobial drugs.
6. Know the most common applications of these antibiotics for the treatment of disease. Which drugs are broad spectrum, and which have specific or unique uses.

Antituberculosis Drugs (lecture 15)

1. Know the major symptoms of tuberculosis and leprosy.
2. Know the mechanism of action of first and second line of anti-TB drugs.
3. Know the antimycobacterial agents used in prophylaxis and treatment of TB.
4. Know the most common adverse effects of the therapy.

Dr Chishti: Antiprotozoal, Antihelminthic, and Antifungal Drugs (Lectures 16 & 17)

1. Know the organisms responsible for malaria, onchocerciasis, amebiasis, and giardiasis.
2. Know the mechanisms of action of the antihelminthic and antiprotozoal drugs discussed in the lecture.
3. Know the life cycle of Plasmodium, and how this affects malaria treatment. Know which drugs are useful for which life stages.
4. Know the mechanisms of action of the major antimalarial drugs.
5. Know the major adverse effects of antimalarial drugs.
6. Understand how resistance to , and relapse from, antimalarial drugs occurs.
7. Know the topical and systemic antifungal agents.

8. Know the mechanism of action of antifungal agents.
9. Know the differences in absorption and adverse effects of imidazoles and triazoles.
10. Know the adverse effects of systemic antifungal agents.

Dr. Wary: Antineoplastic and Antiviral Drugs

Lectures 18 & 19 (Antineoplastic drugs):

1. If given the name of an antineoplastic, know how to place it in a specific class. For the alkylating agents know the subclasses, e.g., nitrosoureas which can cross the blood brain barrier.
2. Know the mechanisms of cytotoxicity of the different classes.
3. Most antineoplastics inhibit bone marrow function. Remember the exceptions to this rule, e.g., vincristine, asparaginase, bleomycin.
4. Regarding therapeutic uses: Remember those drugs which are listed as “drug of choice”, “most effective agent” or named combination regimen, e.g., MOPP. For the most part the uses in the handout are listed in the order of their effectiveness. Know at least one application for each drug.
5. Know how resistance can develop and know specifically mentioned drug interactions.

Lecture 20 (Antiviral Drugs):

1. Know which antiviral agents are used to treat influenza, herpes or HIV. Within each class, the drugs are listed in order of their relative importance.
2. Know which antiviral agents are **not** analogs of nucleosides.
3. Know the rationale for using nucleoside analogs and their mechanisms as antiviral agents.
4. Know the most common side effects.