

Pharmacology Fundamentals

- A quick easy breakdown for MA students

Commonly prescribed medications

- Name
- Usual dosage
- Common side effects
- Contraindications
- interactions

Drug actions

1. Chemotherapeutic
2. Pharmacodynamic
3. Miscellaneous

Drug effects

- Categories
1. Local
 2. Remote
 3. systemic
 - Factors
 4. Age
 5. Weight

Administration route

1. Injection (fastest)
 - Intramuscular
 - Subcutaneous
 - Intradermal
 - intravenous
2. Oral
 - Sublingual
 - transdermal

Drug forms

- Capsules
- Drops
- Inhalants
- Liquid
- Powders
- Skin preparations
- Suppositories
- Tablets
- Patches

Drug names

1. Chemical name 2) generic name (official, FDA) 3) trade name

Ex:

- Trade name: Advil
- Generic name: ibuprofen
- Chemical name: (R_s)-2-(4-(2-methylpropyl)phenyl)propanoic acid
- Molecular formula: C₁₃H₁₈O₂

Governing agencies:

- Food and drug administration (FDA)
- Drug enforcement agency (DEA)

Controlled substances:

- Schedule I - little to no research
- Schedule II - have been researched and used for medical treatment, but are very tightly controlled
- Schedule III - acceptable research done and used for medical treatment, low to moderate risk of addiction
- Schedule IV - low risk for addiction w/ limited physical and psychological risks for dependence
- Schedule V - low risk for addiction w/ limited physical and psychological risks for dependence
- OTC - no risk for dependence / abuse
- Herbal supplements / vitamins

Physicians Desk Reference (PDR)

- Section 1: manufacturers index (white)
- Section 2: brand and generic name index (pink)
- Section 3: product category index (blue)
- Section 4: product identification guide (pictures)
- Section 5: product info section
- Section 6: dietary supplements

Drugs may have a therapeutic response that helps cure disease, but drugs cannot restore lost function of organs that are damaged beyond repair. Medications can enhance remaining function of a damaged organ or replace hormones and chemicals the body can no longer produce on its own

Chemotherapeutic drugs

Includes drugs used to cure a disease caused by an infectious organism or cancer.

Chemotherapeutics are used to treat:

- Infections by killing microorganisms or preventing them from reproducing
- Allergic diseases
- Autoimmune disorders
- Metabolic disorders
- Cancer
- Toxic diseases as a result of poisoning
- Mental illness

Pharmacodynamic drugs

Pharmacodynamic drugs that are noninfectious process by acting on different systems in the body to suppress chemicals or hormones being released by the body in excess or to augment chemicals or hormones that are being produced in insufficient amounts. By changing actions that normally occur in the body or interfering with unwanted actions, certain drugs exert their effects by:

- Preventing the action of naturally occurring enzymes or by mimicking the actions of enzymes, as one example of a pharmacodynamic drug. In this way, they can trick the body into either producing more or less of an enzyme that is causing or worsening a disease process
- Agonists and antagonists. Drugs can compete for a certain receptor site to stimulate or prevent an action, whereas an antagonist acts to prevent an action or effect on a receptor site. Drugs can also be synergistic to each other, meaning that they enhance or multiply the effects of other drugs or have additive effects, simply adding each drug's effects to the other. Nonspecific actions of drugs can be less distinct. They may be used to relieve itching on the skin or reduce stomach acids by changing the pH levels, as examples

Miscellaneous agents include all products that are not classified elsewhere. They include medications such as certain pain relievers, smoking cessation agents, and antipsoriasis agents which are medications used to treat psoriasis

Consideration of drug action

- Several considerations can affect how the body responds to a drug: age, weight, body surface area (BSA), method of administration, tolerance, allergies, time and interaction. Pediatric and geriatric patients and individuals with certain illnesses require a smaller dose than an average adult
- Another consideration is the rate at which the body responds to a drug
- A medication allergy may occur at any time to any individual, even if they have taken the same medication several times before. Occasionally, a patient might experience intolerance to a medication and not a true allergic reaction

For a prescription to be considered valid, it must be issued for a legitimate medical purpose by a licensed practitioner

Herbal supplements are an acceptable practice but only as long as they are revealed to the patient's provider and recorded accurately in the patient's record. Herbal remedies may be derived from naturally occurring substances that are the same as or similar to the substances found in many prescribed medications. When taking herbal preparations, it is critical not to duplicate the same compound by the use of prescription medications. The provider must be aware of herbal remedies the patient is using that might counteract prescription medications. Toxicity can also develop when a supplement is similar to or mimicking the effects of a prescription medication

In the absence of specific instructions, drugs may be disposed of in the trash after taking a few precautions:

- They should be removed from the original container and mixed with an undesirable substance to discourage accidental ingestion by humans or animals if found
- They should be placed in a plastic bag to prevent leakage
- To protect the patient's identity, the label should have all personal identity scratched off

A prescription must include:

- Practitioner's name and address
- # of refills authorized

- Date of issue
- Line or check box indicating whether it should be dispensed as written
- Pts name and address
- Drug name
- Dosage form
- Manual signature of provider
- Quantity prescribed
- Directions for use

The MA should always return an incomplete prescription or medication order for revision to the prescriber if any required info is missing

Prescriptions often contain a box or line w/ DAW, which means the medication cannot be substituted w/ a trade or generic form

Calling in a prescription - the pharmacist should repeat back all info to avoid dangerous misunderstandings. This is called joint commission

Summary

- Drugs are divided into different categories or classifications by the chemical type of the active ingredient contained in the drug or by how it is used to treat a disease/symptom
- Many classifications of medications provide similar results but do so through different mechanisms of action. Additionally, a single drug can also provide multiple effects, placing it in several categories
- Drugs are divided into groups by types of action on the body : chemotherapeutic, pharmacodynamic, and miscellaneous agents
- The effects of drugs are generally categorized as : local, remote, or systemic
- Drugs are identified by 4 names : generic, trade, chemical, and official
- Prescription drugs are those that may be purchased or given to a pt only w/ written instructions (prescription), from a licensed healthcare provider. Controlled substances come under a category of prescription drugs that have a potential for abuse or addiction. These drugs are categorized into 5 schedules, most to least dangerous