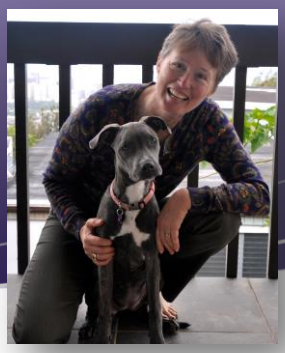
Therapeutics

Using drugs to treat disease

In this fact sheet we will:

- *Look at drug-induced diseases*
- *Discuss the factors affecting drug therapy*



Basic Therapeutic Considerations…

Taking a Patient History

Your interview should accomplish a number of goals. You need to get personal information such as age, occupation, height and weight as well as marital status. You also need to determine why the client is present, that is, why are they seeking care, what is their complaint? Some of this information will be important to determine dosages.

You will get information about the current complaint, such as when did it start, how bad is it, how long has it been going on, has it happened before, does anything make it better/worse? You can use this information to confirm the appropriateness of medications.

The history of past illnesses will also be important including, neurological or psychiatric illnesses, and conditions related to allergies, and all the major organ systems. These conditions can put the patient into a "special population."

Drug-induced Diseases

- Allergy
- Nervous system effects
  - Central effects
  - Peripheral effects
- Major organ system effects
  - Liver, kidney, lung, heart, GIT, blood, skin, etc.
- Sensory organ effects
  - Vision, hearing, taste
- Weight gain or loss
- Effects on pre-existing diseases

Image courtesy of foto76 at www.freedigitalphotos.net

Boxed warnings
Are particularly dangerous effects potentially caused by a medication.

Poisoning happens, so do overdoses. Learn S/S.

The signs and symptoms (S/S) of poisoning or overdose need to be learned for the most problematic drug classes. Those with the most poisonings or overdoses are:

- Acetaminophen
- Aspirin and other NSAIDs
- Opiates or Opioids (approximately 75% of prescription drug overdoses are due to prescription analgesics). See the CDC articles: "Prescription Painkiller Overdoses" and "Prescription Painkiller Overdoses in the US."
- Benzodiazepines

The Centers for Disease Control (CDC) recommends health care providers reduce the risk for overdose by:

1. Screen/monitor for substance abuse & mental health issues
2. Use patient-provider agreements
3. Talk to patients about safe use, storage and disposal of medications. Use the DEA's National Take Back Days.

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Preventing medication errors

BEFORE administering a medicine: KNOW

1. Generic & Trade name of medicine
2. Purpose (use and indications)
3. Effects (good and bad)
4. Onset and Duration
5. Interactions
6. Special instructions
7. Where to get help

Don't let a medication error happen to you!

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S/S of Opioid OD

- Faintness or dizziness
- Nausea and/or vomiting
- Cold and clammy skin
- Bradycardia (slow heart rate)
- Difficulty breathing (respiratory depression – usually very slow breathing)
- Pin point pupils
- Convulsions

More people now die from accidental opioid OD than in car accidents.

Examples: morphine, fentanyl, meperidine, oxycodone, hydrocodone and methadone.

Some Drugs Cause Withdrawal Syndromes

We normally think of withdrawal syndromes only associated with addictive drugs like the opioids and benzodiazepines, but many drugs have severe withdrawal syndromes and need to be tapered off (never suddenly stopped). A few are discussed below….

Opioids (morphine, fentanyl, oxycodone, methadone…)

Read about Opioid Withdrawal.

- Early symptoms
  - Agitation & Anxiety
  - Muscle aches & pains
  - Increased secretions (runny eyes, nose, sweating)
  - Yawning, but insomnia
- Late symptoms
  - Abdominal cramping
  - Diarrhea
  - Goose bumps
  - Dilated pupils
  - Nausea & vomiting

Beta blockers (Propranolol, Atenolol, Metoprolol)

- Angina and potentially a heart attack
- Tachycardia
- Anxiety
- Thyroid storm (hyperthyroidism)

Selective Serotonin Reuptake Inhibitors (SSRIs) (Fluoxetine, Paroxetine, Sertraline, Citalopram….)

"FINISH"

- Flu-like symptoms
- Insomnia
- Nausea
- Imbalance
- Sensory disturbances
- Hyper-arousal

Clonidine Read about Clonidine withdrawal

- Hypertensive crisis
- Headaches
- Tremor
- Restlessness & Anxiety
- Nausea

Other antidepressants/antipsychotics

Read about antidepressant discontinuation syndromes.

- Mood changes, psychosis
- Headache, nausea, vomiting, diarrhea
- Excessive, vivid dreams

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Special populations

Special populations include:

- The very young and old
- Pregnant women
- Patients with pre-existing conditions, especially liver, kidney, and cardiovascular diseases, but also allergies, neurological and psychological conditions. Other common pre-existing diseases, including glaucoma or diabetes mellitus, may also need to be taken into account.
- Patients with certain genetics….

Concurrent medications

Most people are not going to know the names of the medications they are taking. They may not even remember the names of OTC products they are taking, or will forget to mention them. They may not realize how important it is for their health care provider to know everything they are taking, including herbal products and supplements.

Interactions

Clinically significant drug interactions include:

- Inhibiting the absorption of another drug
- Inducing biotransforming enzymes
- Inhibiting biotransforming enzymes
- Altering renal (or hepatic) clearance
- RARELY competition for plasma proteins (this is no longer considered to be clinically significant).

Contraindications

All drugs are contraindicated in people who are allergic to the drug. Usually, the list of contraindications is very short.

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www.freedigitalphotos.net

You are so special

One reason people respond differently to the same medication is because we differ genetically.

Usually, we can sort people based upon their responses to certain medications into slow, normal or fast (sometimes, ultra slow, slow, normal, fast, ultra fast) metabolizers.

It may correlate with race or sex, but it may not.

We also respond differently due to age-related changes in how our bodies are able to handle medications. The very young don't have the machinery yet and the very old have worn out theirs. See the Beer's List for medications to avoid in the elderly.

Another reason we respond differently is because of our sex. Men only have one X chromosome, so if there is a mutation to a trait, like G6PD that is carried on the X chromosome, they are more likely to be affected. Women get pregnant and pregnancy makes huge changes in a woman's ability to metabolize.

We also eat, drink, and do things like smoke… all of which can alter therapeutics.

(continued)

Patient and family teaching

You will need to teach the client or a family member or other caregiver, how and when to take the medication.

Other instructions include warnings about side effects, whether or not the medication can be taken with food, if it can be crushed, how the patient should feel and when they should expect to feel better.

The Institute for Safe Medication Practices (ISMP) publishes a list of Do Not Crush medications.

If they are taking an antibiotic, you should also council them to take all the medication and to not share medications.

Some drugs will have very particular instructions.

Sound alike and look alike names.

The Institute for Safe Medication Practices (ISMP) publishes a list of sound alike and look alike names.

This non-profit organization has a number of online resources for healthcare professionals.

Drug-induced Diseases

Drugs can induce a wide variety of diseases. It may seem strange, but they often cause the condition they are being used to treat. For instance, antibiotic use often leads to superinfections with bacteria or fungi. Using anti-arrhythmic drugs can cause arrhythmias. Anti-anginal drugs can cause angina (if suddenly stopped). The list goes on.

Here is a bit of information regarding other drug-induced diseases.

Allergy

- Up to 10% of ADRs are allergic reactions

Acute Kidney Failure may be caused by:

- Antibiotics
- NSAIDs
- Antihypertensive drugs

Depression is often a result of therapy with:

- Antivirals
- Immunomodulators (especially interferon)
- Antihypertensives
- Antidepressants, antipsychotics
- Retinoids

Fall Hazards are created by:

- Antihypertensives
- Antidepressants, antipsychotics
- Sedatives, hypnotics, anxiolytics

Urine retention may be caused by:

- Anticholinergic drugs
    - Represented by drugs in MANY different classes!!
- Opioids, sedatives, hypnotics

See the lecture notes for more examples…

Placebo effect

A well-known phenomenon is the placebo effect, where simply taking action, for instance, taking a pill, can improve your condition. What is underappreciated is how common the effect is as well as the psychological effect of the caregiver's attitude towards therapy.

A caregiver who presents a positive attitude towards the therapy provides more benefits than one who is neutral or dismissive of the therapy.

Alternative therapies may also be very beneficial, including journaling, meditation, acupuncture, massage and visualization. Go to www.nccam.gov for more information on alternative and complementary medicine.

Image courtesy of: www.freedigitalphotos.net (stockimages)

The "anticholinergic" drugs fall into many drug classes because this is a common secondary effect of many drugs. It is important to be able to recognize the signs and symptoms of drugs with anticholinergic effects. Here is a mnemonic we will repeat MANY times in MANY lectures… learn it and soon you will be able to give examples of S/S represented by each of the elements in the mnemonic:

"Dry as a bone, Hot as a poker, Red as a beet, Blind as a bat, Mad as a hatter, Fast as a hart"

Homework and Exercises

1. Read the "START HERE" announcement in Laulima for updates and instructions
2. Reading from *Pharmacology: Connections to Nursing Practice, 2nd Edition*
    a. Chapter 6 - Adverse Drug Effects and Drug Interactions
    b. Chapter 7 - Medication Errors and Risk Reduction
    c. UNIT 2 (see "Reading for Therapeutics" video for an overview of this UNIT).
3. Listen to the face-to-face audio recording along with your powerpoint slides.
    a. To listen to an NPR Science Friday interview on Placebos, click HERE.
4. Complete the SLO practice set in Tasks, Tests and Surveys
5. Take the quiz in Tasks, Tests and Surveys