OBJECTIVES:

1. Define some of the principles for stimulating critical thinking.

2. Explore hypothesis formulation and its role in decision making.

I. CRITICAL THINKING PRINCIPLES

   A. Activate student’s prior knowledge
      - ask questions that determine knowledge deficits
      - put descriptions in context of scientific principles
      - prompt memory of experiences related to topic
      - mention practical aspects of information presented

   B. Put learning in the context of "real life" situations for students
      - anecdotes relating to student’s experience as a patient
      - case studies & description of situations involving physicians

   C. Stimulate the elaboration of knowledge by the student
      - prompt them to ask and answer questions
      - stimulate discussions among students
      - ask students to teach each other
      - have students critique and evaluate information

II. STRATEGY FOR SOLVING PROBLEMS

   1. Define the problem
      - analyze assumptions, presuppositions, presumptions
      - evaluate given data

   2. Formulate a hypothesis or develop a strategy
      - gather additional information if possible
      - rethink previous information

   3. Test the hypothesis or execute the strategy
      - evaluate accumulated data
      - use knowledge and skills to solve

   4. Evaluate the solution: How good is the plan?

   5. Consolidate the strategies into a final solution: learn from the experience
STUDY STRATEGIES

Above all, find a comfortable place to study where there are minimal distractions. Have reference books handy for information lookup. Make studying a pleasant experience. You might choose a darkly lighted room with the study area well-lighted. If you are an auditory learner, add non-disruptive, relaxing music to your study environment. If you study during the day, avoid positioning yourself near windows where you can be distracted by what is happening outside.

STRATEGIES FOR STUDYING

1. Skim reading (before lectures)
   - Quickly skim read the pertinent chapters
   - Pay attention to boldface, italicized print, charts, diagrams and graphs
   - Read the introductory and summary statements
   - Pay attention to similar and contrasting information
   - Develop a glossary of unfamiliar terms/ concepts and say them aloud
   - Choose a good medical dictionary to help you

2. Attend lecture and take notes
   - Listen attentively and ask questions immediately on material that is unclear
   - Highlight the handouts on items that are emphasized
   - Add comments to the handout as necessary, but not to excess
   - Sit in a front row to avoid sleepiness or any other distractions

3. Consult colleagues
   - Immediately after class, discuss concepts with colleagues
   - Write your colleagues’ ideas in different color ink on your lecture notes
   - Teach your colleagues what you know, learn from them

4. Review the handouts
   - Create your own outline from the text, with phrasing you better understand
   - Use different colors along the handout margin to create visual memory cues
   - Use identifying words (such as: structure, function) to organize details

5. Fill in from the text or handouts
   - Add notes from textbooks, handouts and from your colleagues to deepen your understanding and widen your knowledge
   - Use different colored ink for this new information

6. Look for patterns
   - Notice the relationships of drugs and drug classes to one another
   - Note mechanisms of action, therapeutic actions, and side effects and link them with previous information
   - Categorize information in ways that will increase your understanding
   - Develop explanations for the relatedness of drug actions
7. Analyze
- Explore the relationships between drug classes using a mechanistic approach
- Reflect on how drug actions relate to clinical applications

8. Memorize:
   a. For short-term memory:
- Hear, pronounce, visualize and use items in conversation at least three times
- Carry cards or a study guide for use while conducting mundane tasks
- Use highlighted diagrams, notes and amplified explanations to reinforce your understanding

   b. For long-term memory: be creative
- Reinforce the material each day, use different methods in your study
- Early expenditure in the learning process will save you time prior to exams
- Conduct weekly review of material processed
- Use all your senses to increase depth of understanding
- Reread
- Make compare/contrast figures and diagrams
- Compile flash cards
- Create mnemonics

9. Pre-test preparation:
   a. Discussion with colleagues
- Review material with colleagues
- Quiz each other in the form of exam questions
- If you are an Intuitive student, find a Sensory one
- If you are an Extravert, study with an Introvert.

   b. Formulate possible examination questions
- create complex questions that bring together several concepts
- analyze relationships of structure, function, mechanism of action
- make associations between physiological actions and clinical applications

   c. Challenge colleagues
- Review your notes & charts with colleagues who have different learning styles
- Compare your understanding to that of your colleagues’, concentrating on differences in interpretation
- Pose sample exam questions

   d. Reanalyze
- Integrate all new information and relationships between systems with known material, re-analyze data
- What does new material explain? What might be unexplained?
- Define significance of drug actions from clinical perspectives

   e. Fit new material into old concepts
- Be sure that new material fits into old concepts, facts that you already know
- Synthesize your learning to get a full picture
- Create questions that combine several concepts

PHARMACOLOGY RESOURCES ON THE INTERNET

Pharmacology Resources:

http://histo.ipfw.edu - Dr. K’s Medical Pharmacology website for the class

http://www.docguide.com - a good source of information and press releases on new drugs

http://www.cponline.gsm.com - Clinical Pharmacology Online - fee now charged

http://Pharminfo.com/drug/db/dbmnu/html - drug info

http://www.druginfonet.com/index.html - drug info

Resources for Medical Information:

http://www.medicinenet.com/ - disease lookup; drug lookup; clinical trial directory; info on biorhythms

http://www.pslgroup.com/DocGuide.html - information on latest drug releases; disease info; crosslinks to medical sites

Medical Student Sites:

http://www.scomm.net/~greg/med-ed/courses.html - resorces for medical students

http://www.imc.gsm.com site for medical curriculum - fee now charged

General:

http://www.yahoo.com/health/pharmacology

ASSIGNMENT

Look up information on the new drug that you are given and type a one page summary of the information you find on: mechanism of action, physiological effects, remarkable kinetics & dosing, clinical applications, side effects and potential for cross reactions with other drugs. This should be in your own words and not plagiarized from your sources. Be sure to use citations for the web sites you visited to find the information. This will be due next week at clinical conference. You will be responsible for getting it in before the deadline. You will not be reminded if you are late, but will loose the corresponding credit.
List for Fall 2000

Simulect (Basiliximab)
Copaxone (Glatiramer Acetate)
Quixin (levofloxacin)
Vivelle (estradiol transdermal system)
Zelmac (Tegaserod)
Sustiva (efavirenz)
Zyvox (Linezolid)
Aggrenox (aspirin/extended-release dipyridamole)
Rapamune (sirolimus)
Cenestin (synthetic conjugated estrogens)
Mylotarg (Gemtuzumab Ozogamicin)
Protonix (pantoprazole sodium)
Allovectin-7
Zadaxin (thymalfasin)
Trileptal (oxcarbazepine)
Hectorol (Doxercalciferol)
Singulair (Montelukast Sodium)
Novantrone (mitoxantrone)
Nexium (Esomeprazole)
Uprima (Apomorphine)
Zonegran (Zonisamide)

List for Fall 2001

Remodulin (treprostinil sodium)
Yasmin (Drospirenone/Ethinyl Estradiol)
Gleevec (Imatinib Mesylate)
Xeloda (Capecitabine)
Campath (Alemtuzumab)
Axert (Almotriptan malate)
Arixtra (Fondaparinux Sodium)
Ketek (Telithromycin)
Valcyte (Valganciclovir)
Reminyl (Galantamine Hydrobromide)
Nexium (Esomeprazole Magnesium)
Geodon (Ziprasidone mesylate)
Cancidas (Caspofungin Acetate)
Starlix (Nateglinide)

Femara (Letrozole)

Lovenox (Enoxaparin)