

# **SuccessTypes In Medical Education: Developing Analytic Thinking Skills**

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## **Preface**

What is a SuccessType?

The word “type” refers to a preference, but the SuccessType term does not refer to a preference for success. I created the term “SuccessTypes” to refer to those students who use their knowledge of personality type to develop themselves as a professional.

This handout is designed to support several different types of presentations, from a one hour lunch session to a multi-session workshop. It is condensed to be useful as a reference for later use. The SuccessTypes book is available free on-line at the SuccessTypes website also for use as a reference. Updated new chapters on brain research, group study, teacher oriented suggestions, communications skills, and specialty choice are planned.

### Major sections:

1. Personality type – How different types process information differently. SuccessTypes are students who use these insights constructively to develop their full professional potential.
2. Brain research – Effective learning strategies use and develop specific areas of the brain.
3. Concept mapping – The single most powerful tool that I have found to help develop the most effective learning. This handout supplements Chapter 7 in the SuccessTypes book.
4. Question Analysis – Students rarely use study questions properly. This method will change the way you read and improve test scores.
5. Group Study – The right way to study in groups. All types are group types, if the group follows some basic rules. Check this out in Chapter 8 in the SuccessTypes book.
6. Time management – How to use lectures to your advantage... even really bad ones. Check this out in Chapter 10 in the SuccessTypes book.
7. Appendix – Basic facts about personality type can be found in Chapters 1-5 in the SuccessTypes book.

# Understanding Personality Type

Dimensions of Type – The Four dimensions of Type have polar opposites:

Extraversion (E) ----- Introversion (I)

Sensing (S) ----- Intuition (N)

Thinking (T)----- Feeling (F)

Judging (J) ----- Perceiving (P)

Both are used by everyone, but one is usually preferred and better developed than the other.

## Extraversion (E) -----[]----- Introversion (I)

Extraversion: Overall stimulation of thinking is toward the outer world - *people and things*

Introversion: Overall stimulation of thinking is toward the inner world - *thoughts and reflections*

**Key words for comparison:**

Extraversion	Introversion
Active	Reflective
Outward	Inward
Many	Few
Talk it out	Think it through

"If you don't know what an extravert is thinking, you haven't been listening. But, if you don't know what an introvert is thinking, you haven't *asked!*"

1. Extraverts will be attracted to fields and specialties with high levels of interpersonal contact and/or which are action oriented.

## Extravert-Introvert Guide to Specialty Choice

2. Introverts will be attracted to fields and specialties requiring sustained attention, more time in solitary work or one-to-one interactions.

3. Introverts also will be found in greater numbers in fields requiring graduate and postgraduate training, and in academic settings.

## Extraversion and Introversion in Learning

Extraversion	Introversion
Good at initiating.	Good at reacting.
Think out loud and then work alone.	Work alone and then think out loud.
Learn best with others.	Learn best alone or one-on-one.
Put learning into action before the idea gets stale.	Need to understand clearly before action.

## Sensing (S) -----[]----- Intuition (N)

Sensing: Gives attention to what is being perceived by way of the five senses - *sight, sound, feel, taste, smell*

Intuition: Gives attention to what is being perceived by the imagination  
 - finds patterns and relationships

**Key words for comparison:**

Sensing	Intuition
Details	Patterns
Present	Future
Practical	Imaginative
Sequential	Random
Repetition	Variety
Specifics	The Big Picture

"Sensing types help intuitives keep their head out of the clouds,  
 while intuitives help sensing types keep their head out of a rut."

**Sensing and Intuitive Preferences in Learning**

Sensing	Intuitive
Patient with routine or detailed material.	Patient with abstract or complex material.
Annoyed when part of communication left to imagination.	Bored when communication too explicit.
Enjoy using skills already learned.	Enjoy learning new skills.
Work steady, step-by-step.	Works in bursts of energy.
Prefer to learn procedures	Prefer to solve problems

**Sensing-Intuitive Guide to Specialty Choice**

1. Sensing types will be especially attracted to fields requiring:
  - A. care and precision,
  - B. consistency in following established practices, and
  - C. practical attention to day-to-day events and use of well-learned knowledge
2. Intuitive types will be especially attracted to activities with diagnostic or treatment challenges.

## Thinking (T) -----[]----- Feeling (F)

Thinking: React to new information through logical analysis

Feeling: React to new information through personal values

### *Key words for comparison*

Thinking	Feeling
Logic	Values
Objective	Subjective
Impersonal	Personal
Analyze	Empathize

"Thinking types need to remember that feelings are also facts that they need to consider, while feeling types need to remember that thinking types have feelings too!"

### Thinking-Feeling Guide to Specialty Choice

1. Thinking types will be attracted to activities requiring technical skill with and to those aspects of patient care where tough-minded objectivity is an advantage.
2. Feeling types will be attracted to occupations where the human component is important, and will be most attracted to activities which require directly caring for people and understanding people.
3. Feeling types will need less training in communication skills than thinking types (with E-F types easiest of all to teach).

### **Thinking and Feeling Preferences in Learning**

Thinking	Feeling
Learn best when given a clear and objective rationale.	Learn best when given personal encouragement.
Like giving and receiving a critical analysis.	Criticisms are often taken personally.

## Judging (J) -----[]----- Perceiving (P)

Judging: Prefer to live a planned, orderly life.

Perceiving: Prefer to live a flexible, adaptive life.

**Key words for comparison:**

Judging	Perceiving
Organized	Flexible
Decisive	Curious
- ed	- ing
Plan	Wait (Procrastinate?)
Joy of Closure	Joy of Discovery

"Judging types can help perceiving types meet deadlines, while perceiving types can help keep judging types open to new information."

### **Judging-Perceptive Guide to Specialty Choice**

1. Judging types will be attracted to occupations and settings where schedules, system, and order are important.

2. Perceptive types will be attracted to situations requiring constant adaptability to changing demands.

3. Judging types will more often be classified as "over-achievers" and will average slightly higher grades than would be predicted from their aptitude scores.

4. Perceptive types will have somewhat higher aptitude scores than judging types, but will earn somewhat lower achievement scores than predicted from their aptitudes.

5. Judging types will be seen as more dependable, responsible, than perceptive types, but less open to new information and less adaptable than perceptive types.

6. Perceptive types will be rated higher in openness to new information, flexibility and adaptability, but lower in responsibility and dependability than judging types.

### **Judging and Perceiving in Learning**

Judging	Perceiving
Complete tasks on time early.	Postpone unpleasant tasks.
Often overachieving.	Often underachieving.
Value orderly use of information.	Value inquiry.
Complete tasks at expense of new information	Postpone tasks to acquire more information

## ***Brain Research – The Art of Changing the Brain***

We can learn more effective study practices from brain research. Correlations are emerging between learning and memory and the functional specialization of the brain.

- New learning starts temporary signaling pathways in brain neurons, but these fade and disappear if we don't put these neurons to use. It isn't enough to just look at words on a page or to highlight large sections of text.
- Studies by Kolb show that a learning cycle must be completed to remember facts longer. A larger benefit is that this learning cycle also helps us think better.
- Kolb learning cycle (from James Zull, "The Art of Changing the Brain," 2000, Stylus):
  1. Concrete experience – take in information through the senses, e.g. reading, listening, dissecting
  2. Reflective observation – compare information with stored knowledge to determine if it is new or already known.
  3. Generalizations and abstract concepts – connect the new information with what is known; find new possibilities; ask questions about significance; decide on probability.
  4. Active testing of generalizations – do something with the new information, e.g. explain something to someone, solve a problem with it, draw a concept map or a table or rewrite it in condensed form.
- The cycle never stops because all active testing becomes new input to remember.
- The brain areas that match these four steps are:
  - Concrete experience – sensory area (parietal lobes)
  - Reflective observation – temporal lobes
  - Generalizations and decisions – prefrontal lobes
  - Active testing – motor area (frontal lobes)
- This cycle is usually short-circuited in students that only memorize.
- *Passive* looking "at" or listening "to" vs. *active* looking "for" or listening "for"
- Eight hours of sleep after an evening of concept mapping the topic being learned provides enough REM cycles for the hippocampus to "rehearse" and store the map information in long-term memory.
- We think "back to the future"
  - Temporal (back) processing looks at
    - Facts
    - Grouping
    - Learned patterns
  - Frontal (future) processing looks at
    - "Discovered" grouping
    - New patterns
    - Inferences
    - Evaluation of options
  - Summing it up: If you teach the front of the brain, the back will follow.

# Concept Mapping

There's more to concept mapping (bubbling) than meets the eye. Important advantages:

- They use active learning – passive learning is an oxymoron; the real question is, “what type of activity?” Maps serve as a way of *actively* organizing what you are learning.
  - Map construction makes full use of the “learning cycle”
- Maps develop “pattern thinking” – facilitate integrative learning
- Maps provide an easy way to verify what you are learning through verbalization. Students rarely know how to evaluate their own learning.
- Visual learning – memory is established in the form of symbols; thinking is symbol manipulation.
- They serve as very effective review notes for examinations.
- Concept maps *contribute to effective reading by giving you a question to answer.*

## Concept Maps – Basic Anatomy

- Nodes, or “bubbles” that contain concepts.
  - Many nodes have branches; creates a hierarchy
  - Some nodes are lists; compatible with memorization
- Concept links create relationships; may contain descriptive text
  - Some links can converge on one node
  - Some links form cross-links between branches.

## Barriers to Concept Mapping

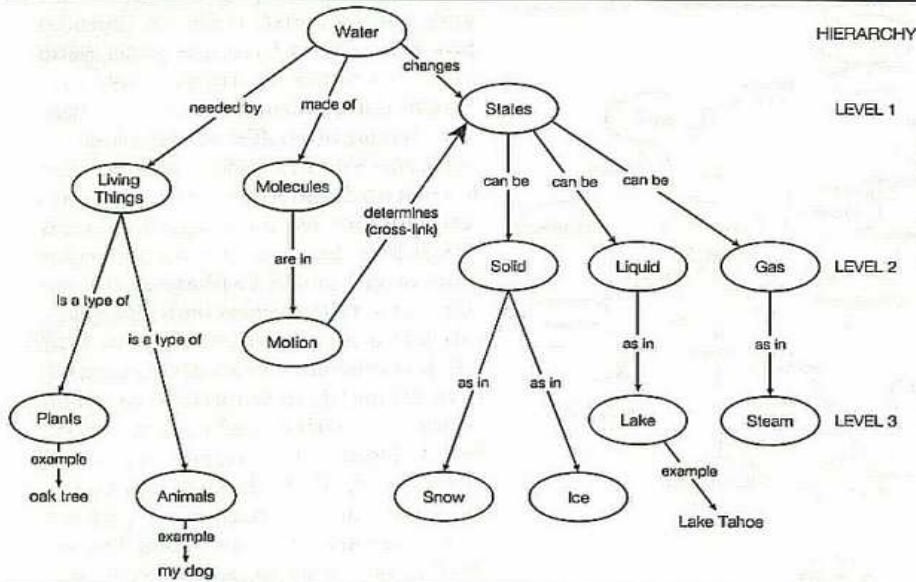
- Time
  - Requires deep reading, not surface reading
  - However, time recaptured during exam review; students study maps... not notes!
- Learning style
  - Linear learners tend to be insecure (not always)
  - Deciding on grouping items uncertain
- Energy
  - Active learning makes you tired
  - Requires alertness, attention

## General Recommendations

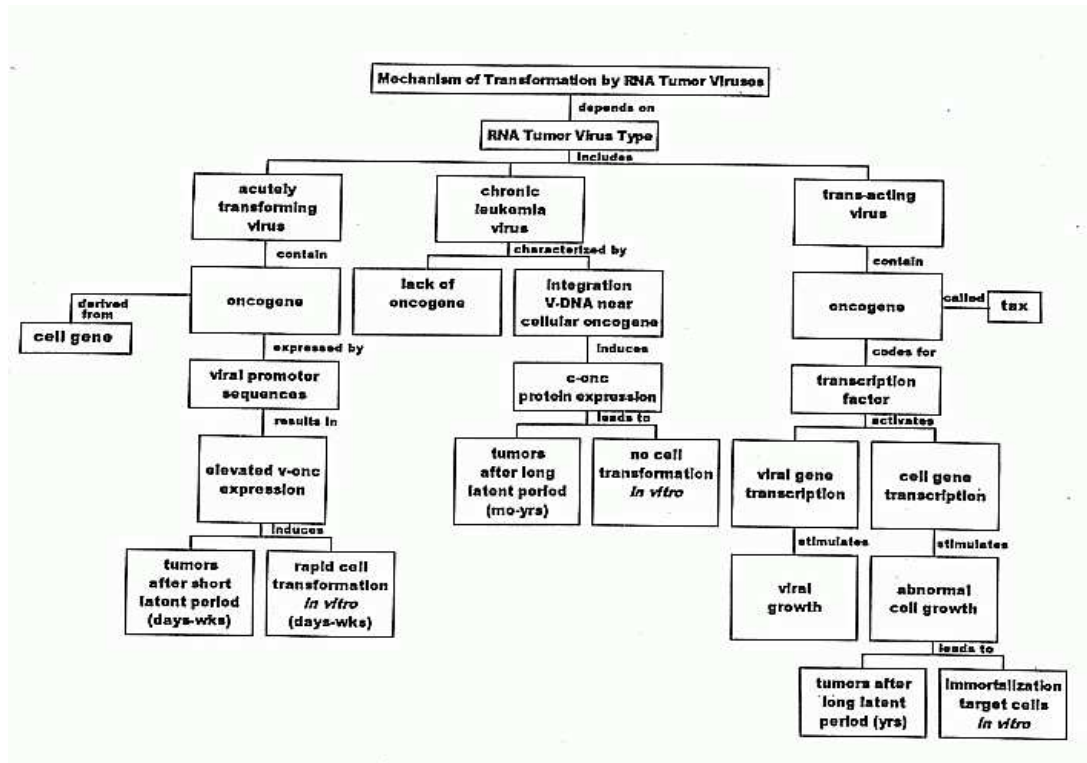
- Build maps from scratch; verbalize thinking (especially for Es).
- Always construct “top-down” or “side-side” – use “center-out” as needed.
- Review and compare maps with other students to compare different ways of seeing the material; only do this after you have tried your own map.
- If needed, just start with a 2-level map. This should only take about 10 minutes and will organize your reading. Give it some time and do what comes naturally, i.e. start extending your maps only when you feel you are ready.

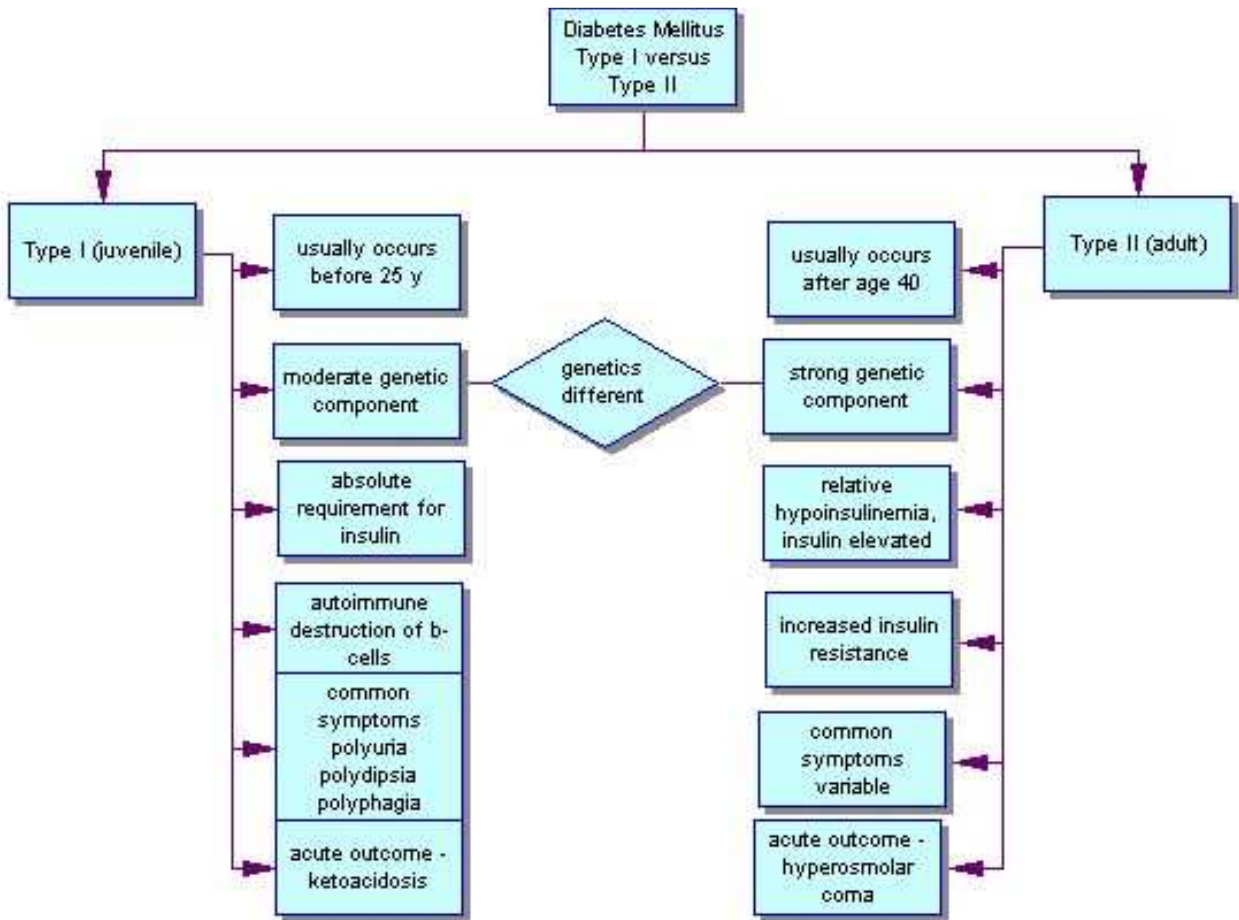
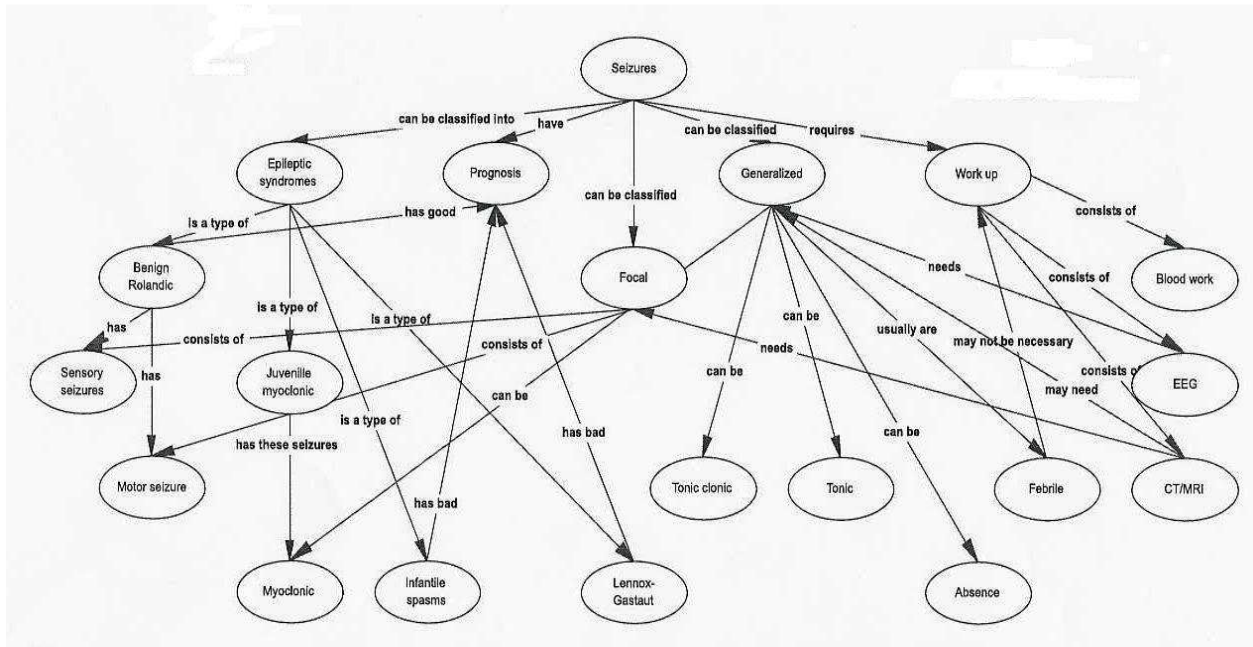
Examples (in addition to those in SuccessTypes):

Figure 1. Example Concept Map



Example map of water demonstrating the basic components of hierarchical concept maps. Note the cross-link (bold arrow) between the concepts *motion* and *states*. Reproduced with permission from Cambridge University Press.<sup>14</sup>





### Constructing a concept map

1. Select the topic to be studied. Since it is going to be subdivided, the size of the topic is not critical. It can be part of a lecture or material that is covered in several lectures.
2. Identify, by listing or highlighting, the major concepts from the text and/or lecture notes. Look for information that was emphasized. Avoid details (for now).
3. Select from the list the most general concepts (grouping). [*Expect this to be difficult at first, but to speed up with practice.*]
4. Arrange the concept map with the most general concept at the top. Link it to the less inclusive concepts and enclose the text with circles or other shapes.
  - If needed, label connecting lines with linking words that explain the relationship.
  - Arrowheads can show direction, cause-and-effect, etc.
5. Try to branch out at each level of the hierarchy with more than one link. This is an opportunity to reorganize
6. Identify and draw cross-links between related concepts.
  - *This is a powerful step in developing integrative thinking.*
7. Alternative patterns: A “spider” or cluster pattern can be constructed from the center outward, but this will not be seen as readily by linear learners.

#### To sum it up:

##### List – Group – Compare

1. List all major concepts; create a simple outline
2. Identify grouping concepts (circle/highlight)
  - organize grouping concepts and start construction of map
  - leave space for adding the details; highest item is broadest concept
  - emphasize reorganization
3. Integrate knowledge by drawing cross-links between branches of the map; look for convergence
4. Remember that concept maps are living documents, i.e. they grow and develop. Some things will drop out of your maps over time and new things, especially from other courses, will be included. This is a good thing.
5. Review maps on a weekly basis by verbalizing them; fine tune problem areas.

# How can you extract the maximum learning from examination questions?

Check this out in Chapter 8 in the SuccessTypes book.

## ***Is your study group asking enough questions?***

Group problem solving favors long term memory and understanding.

Rotating oral examination: Each student takes a turn answering questions from the group. Questioners can rephrase questions to guide responder if they get stuck. Students learn more from *preparing and asking questions* than from answering them. [Note: Time constraints make this the less used option. However, some groups prefer it and use it well.]

Question analysis: Use the question analysis method in a group to debate “ruling out” thinking. Focus discussion on “what do we need to know about this answer to rule it out?” When discussing the correct answer, just rephrase the question to “rule it in.”

1. Set a time limit of 90 minutes, preferably on the weekend.
  - Eliminates fatigue factor
  - Discourages spending too much time on minor issues
2. Group consensus refines understanding.
3. Students asking the questions should keep their notes open.
  - Verify accuracy of answers.
  - Refine notes based on discussion.
  - Divide responsibility for information resources among group members.
4. Focus primarily on the previous week's material
  - Include additional previous material when relevant.
  - For exam review emphasize integration; comparisons, contrasts, and cause-and-effect.
  - Decide at end of session on topics for next session.

### Contribution of different types to Group Study

All types benefit from the strengths of the other types in the group.

- Extraverts energize the group; introverts give it depth of thought.
- Sensing types hear intuitive thought and develop their own intuitive skills.
- Intuitive types are reminded of all those details that they tend to overlook.
- Feeling types develop the logical organization that comes from thinking skills.
- Thinking types can benefit from the enthusiasm of the feeling types.
- Perceptive types have an incentive to stay on schedule in order to be prepared for the group session.
- Judging types will keep the group on task
- Develops awareness and understanding of the contributions of each type
- Develops verification skills

Questions to guide group (or individual) study?

The following is a list of guidelines and/or steps in formulating study questions. It is designed to get students to think like the teacher.

- a. How many different things are related to each term? Don't limit yourself just to your list or to this lesson. This also applies to processes such as glomerular filtration or the cardiac cycle.
- b. Draw a concept map showing how this topic is organized.
- c. List any causes and/or effects of each term.
- d. What would each term be called if you had to rename it? Only use this to increase understanding, otherwise it will add to your memory load.
- e. Use a term to explain something about a major concept.
- f. Compare or contrast each term with one or more other terms.
- g. What could each term be confused with?
- h. Describe the relationship between...
- i. Explain the function of each step in (a sequence or a process).
- j. What do...have in common and how are they different?
- k. Why? Why? and Why? (asked in response to each answer; requires more complex answer each time)
- l. What symptoms would be produced if (process, structure, etc.) were defective or damaged? This is especially effective for anatomy.

***What if I don't have time for time management?  
(or, "You can't spend what you ain't got...,"  
Muddy Waters)***

- Check this out in Chapter 10 in the SuccessTypes book.
- Try a Two-level map during the identification stage to prepare for lectures.

***Is there any end to school?***

- Learning is a natural condition – except when we are *made to do it* – so try to keep it natural.
- Natural means to approach everything to be learned as looking up an answer to a question, e.g. “What is the best way to map this topic?”
- Learning in medical school should be approached like any other skill.
- Life-long learning occurs throughout the physician's career.
- Patterns set down in medical school can strongly enhance, or inhibit, life-long learning.