

# Guide for Academic Success

Updated May 5, 2020



Michigan State University College of Osteopathic Medicine  
**Academic and Career Advising**

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# Developing Study Skills:

## Start with a Self-Assessment:

### Self-Assessment of Your Learning Skills

**Step One: SELF-ASSESSMENT** – How developed are your academic and learning skills?

The results of this exercise are for your eyes only.  
It is to your benefit to answer as honestly as you possibly can.  
(See resource links on the second page)

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1. I use my time effectively					
2. I avoid procrastination					
3. I usually arrive on time to classes, appointments, meetings and so on					
4. I set achievable goals					
5. I am able to develop a reasonable plan to accomplish my goals					
6. I have an accurate sense of my strengths and weaknesses					
7. I seek feedback about my performance from external sources (e.g., other people)					
8. I am confident that I can be successful in my medical school courses					
9. I am motivated to work hard					
10. I easily stay focused while studying material that interests me					
11. I easily stay focused while studying material that does not interest me					
12. I enjoy reading					
13. I am a fast reader					
14. I easily understand what I have read					
15. I take my own notes while studying					
16. I frequently test myself while studying to gauge my understanding					
17. I avoid multi-tasking while studying					
18. I remember much of what I have learned even after the exam is over					
19. I have good test-taking skills					
20. I have my test-anxiety under control					

**Step Two: SELF-JUDGMENT** – What would you like to learn to do better?

- No one is perfect! We all have areas in which we can improve. The statements in Step One (above) highlight academic skills that are very important in medical school. We suggest you reflect on your responses in the self-assessment exercise to identify your strengths and weaknesses, and then use your best judgment to determine your next course of action. For example, are you happy with where you are, or do you believe you need to make a change?
- From the list above, what are the things you do the best?
- From the list above, what are some areas in which you would like to improve?

**Step Three: SELF-IMPROVEMENT** – Creating your plan for success!

- Step 1: Identify the skill(s) you would like to improve.
- Step 2: Set a performance goal.
- Step 3: Identify your resources, e.g., books, courses, websites, people.
- Step 4: Enumerate the steps in the process you will undertake to achieve your goal.
- Step 5: Develop a timeframe for improvement. Make sure to include a few checkpoints along the way to keep you on track toward achieving your goal.
- Step 6: Gather feedback at these checkpoints – through self-assessment and/or by asking others – to help you determine if you are making adequate progress.
- Step 7: Make adjustments to your plan, if necessary.
- Step 8: Repeat as needed

Skills	General Category	
		Self-Directed Learning Resources You can find other helpful resources at: <a href="#">The Learning Scientist</a>
1-3	Time Management	Time Management: <a href="#">MSUCOM's Guide to Time Management</a> <a href="#">MSUCOM's Time Management Video Module</a>  Procrastination: <a href="#">MindTools Tips for How to Stop Procrastinating</a>
4 & 5	Goal setting	Goal Setting: <a href="#">MindTools' Steps to Personal Goal Setting</a> <a href="#">Setting and Reaching Academic Goals</a>
6 & 7	Self-regulation	Self-Regulation Articles: Ericsson, K.A., Prietula, M.J., & Cokely, E.T. (2007). The Making of an Expert. Harvard Business Review (July-August): 115-121. <a href="http://hbr.org/2007/07/the-making-of-an-expert/ar/1">http://hbr.org/2007/07/the-making-of-an-expert/ar/1</a> Winne and Hadwin (2010) Self-Regulated Learning and Socio-Cognitive Theory. International Encyclopedia of Education (3rd ed), 503-508. <a href="http://www.sciencedirect.com/science/article/pii/B978008044894700470X">http://www.sciencedirect.com/science/article/pii/B978008044894700470X</a>  Managing Multiple Priorities: <a href="#">MSUCOM's Managing Multiple Priorities Video Module</a>
8-11	Motivation	Motivation Articles: <a href="#">Motivate Yourself in 3 Steps</a> <a href="#">The Basics of Motivation</a>
12-14	Reading	Improving Reading Comprehension: <a href="#">MSUCOM's Tips for Improving Your Reading Comprehension</a>
15-18	Studying	How to Get the Most Out of Studying Video Series: <a href="#">Five-part series brought to you by Samford University</a>  Improving Long-Term Memory Retention and Recall: <a href="#">MSUCOM's Study Tips for Improving Long-Term Memory</a>  Articles on Studying: <a href="#">The Myth of Multitasking</a> <a href="#">Note Taking Help</a>  Helpful Study Resources: <a href="#">The Learning Scientist</a>  MSUCOM's Video Modules: <a href="#">Power Study Hour</a> <a href="#">Active Study Methods</a>
19 & 20	Test-taking	A Guide to Testing Smart of Multiple Choice Exams: <a href="#">MSUCOM's Guide to Testing Smart on Multiple Choice Exams</a>  Coping with Test Anxiety: <a href="#">MSUCOM's Guide to Coping with Test Anxiety</a>  Managing Test Anxiety: <a href="#">MSUCOM's Managing Test Anxiety Video Module</a>

## How to get the most out of Studying:

This excellent five-part series (the longest is 9 minutes) is packed with solid information and practical advice. [Dr. Stephen Chew discusses](#) the following topics:

- Developing a Mindset for Successful Learning
  - Overview of the information presented in the video series. The information is organized into 10 Principles of Effective Studying that students should understand if they wish to maximize learning from their study time.
- Beliefs That Make You Fail...Or Succeed
  - Examines common mistaken beliefs students often possess that undermine their learning. The video tries to correct those misconceptions with accurate beliefs about learning.
- What Students Should Understand About How People Learn
  - Introduces a simple but powerful theory of memory, Levels of Processing, that can help students improve their study.
- Cognitive Principles for Optimizing Learning
  - Operationalizes the concept of level of processing into four principles that students can use to develop effective study strategies.
- Putting the Principles for Optimizing Learning into Practice
  - Applies the principles of deep processing to common study situations, including note taking and highlighting while reading.
- "I Blew the Exam, Now What?"
  - Addresses what students should and should not do when they earn a bad grade on an exam.

### *How to study detailed information:*

Medical school challenges students with a large volume of information for each exam. Many students compare the amount of information you are given to drinking out of a firehose. Here are some tips we recommend for studying the detailed information:

#### MYTH BUSTERS

Myth: Details aren't important; what matters most is truly understanding concepts and principles.

Reality check: **WRONG!** Details are important, but all details are not equally important in every context – that's the trick. You need to understand concepts and general principles to make sense of and apply the details. It's the details that make the difference between a right and a wrong diagnosis.

There are two types of students – those who like details and those who don't, but in medical school both types may struggle with remembering details. Why? Volume.

- Detail-oriented people dive in headfirst and focus their attention on committing all the details to memory, often at the expense of understanding the "big picture." In many contexts, this serves them well, but in medical school, the sheer volume of information that must be committed to memory may be overwhelming and unmanageable. As a detail-oriented student, you may find that your normal study routine of systematically and methodically going through the information from beginning to end, has you simply running out of time before you've memorized it all.
- What should detail-oriented people do?
  - If you derive pleasure from learning the specifics – facts and data – you need to make an extra effort to give the information meaning and to look for patterns. Take a step back and look for the underlying structure of what you're learning, i.e., how the information is organized. [Try the SQR3 study method.](#) Chunk and categorize information to decrease

the load on your short-term memory. Take some time to think about the information and to make meaningful associations in your long-term memory, which will aid in recall and help you think through test questions even if you can't recall the specifics.

- Big-picture thinkers tend to intensely dislike “the details”; what matters most to them are meaning, interconnectedness, and underlying patterns. As a big-picture thinker, you may find yourself “zoning-out” when a lecture or a reading assignment focuses on the specifics. You may have latched onto the notion that as long as you understand the concepts, you’ll do fine. You may have found yourself thinking after an exam that the questions were “nit-picky” and tested your knowledge of useless facts/trivia.
- What should big-picture thinkers do?
  - Be mindful of details and allocate the appropriate amount of time to memorizing them. Your “big picture” thinking is of great value in coming up with ways to chunk and categorize the information to make it more manageable. Your big challenge is getting over your [aversion to memorizing facts and data](#) – sometimes it’s necessary. While studying, pay attention to when you get fidgety, frustrated, or sleepy, or when you start flipping pages looking for something interesting. These may be clues that the material is very detail-oriented. Rather than skipping, skimming, or flying through the material, this is your signal to slow down and spend more, not less, time.

### *How to Make Lecture Attendance a Good Use of Your Time:*

If you do not attend lecture, you may be behind already. If you think attending lecture is a waste of your time, try these tips for what to do before, during and after lecture:

### What to Do Before Lecture

Each day or night before your upcoming lectures, take 15-20 minutes per lecture to:

- ✓ Skim the recommended reading assignments and/or relevant course pack pages
- ✓ Read through the learning objectives
- ✓ Identify key terminology and concepts, look at diagrams and figures and read the captions
- ✓ Familiarize yourself with the main ideas to develop a sense of the “big picture”
- ✓ Don’t pay attention to details
- ✓ Look for the organizational structure of the topic - how is the information presented?
- ✓ Does it begin with an example or application that is followed by explanation?
- ✓ Does the information build from the general to the specific?
- ✓ Does it go from specific instances to general principles?
- ✓ Does the information describe a process?
- ✓ Is the presentation linear (sequentially ordered) or is it complex and interconnected?
- ✓ Write down questions that come to mind
- ✓ If the upcoming lecture is related to the previous lecture, then quickly skim your notes from the previous lecture

Why? What is the point of doing this?

- ✓ The goal is to “prime the pump,” to prepare your brain to receive new information by creating a context for what you’ll be learning
- ✓ To gain understanding of how the new info fits in with other topics you’ve learned
- ✓ To get you thinking about what you might already know about the topic
- ✓ To “pique your curiosity”
- ✓ Having this overview will facilitate your understanding of the lecture, help you keep up, and make it easier to take complete notes

- ✓ If you have four lectures the next morning, this entire process should take no more than 60-80 minutes of your time. Remember, your goal is to simply prepare your brain to receive new information. You do not have to know any details at this point.
- ✓ Rapid Skimming. It should not take more than 10-15 minutes to pre-read for an hour's worth of lecture material; if it does, you're not pre-reading – you're reading!
- ✓ Looking for the “big picture” or main points in the text. Is there a unifying concept?
- ✓ Getting a sense of the vocabulary by learning new terms that will appear in the lecture and in later focused reading.
- ✓ Spotting the patterns of relationships between subtopics and main topics.
- ✓ Analyzing causes and effects, comparisons and contrasts, the time sequencing, and so on.

## How to Pre-read:

You may pre-read from a variety of materials:

Textbook	Review Books
Course syllabus	

Obviously, you can't pre-read from every source available. It's important to find the best one or two sources for each class.

When you pre-read, notice the following:

Study questions – read these first then scan for the answers	Boxed information Diagrams Shaded areas	Lists Pictures Glossary of new terms
First paragraph	Charts	Summary
Bold-faced print	Tables	Objectives
Subtitles	Graphs	First sentence of paragraphs
Colored print		
Italicized print		

Pre-reading encourages active (vs. passive) learning to take place – anticipating what is coming instead of just letting it “wash over you” and hoping that some will stick.

While pre-reading look for the following:

- Key Ideas
- Main subordinate details

When is the best time of day or week to pre-read? Usually in the evening prior to the next morning's lectures. Some students prefer to pre-read immediately before a lecture, but because most lectures are scheduled in the morning, that would necessitate being an extra-early riser.

## What to Do During Lecture

1. Be fully engaged: listen and [pay attention](#)
  - a. Retention begins with Attention!
  - b. Your brain is good at filtering out unattended information as “background noise” including important things that you should be paying attention to, e.g., the lecture topic, and it won't make it into long-term memory
2. Avoid distractions and avoid multitasking
  - a. Don't sleep, eat, email, text, Google, read the paper, etc.
  - b. To keep from dozing off, sit up straight instead of slouching, and keep both feet on the floor
3. Take your own notes
  - a. [Taking notes](#) (and reviewing notes) improves retention and exam performance

- b. For an effective approach, try the [Cornell Method](#)
  - c. “Good notetakers listen actively while they write, think while they listen, and make conscious choices about what to record.”<sup>1</sup>
4. What if you're a poor or inefficient note-taker?
    - a. Good news: the availability of lecture recordings removes the pressure of taking detailed notes during a live lecture
    - b. Focus on the visual information being presented and, on the presenter, including the instructor's tone of voice, body language, and other non-verbal information, if discernable
    - c. Take detailed notes while watching the recorded lecture
    - d. Even better news: studies have shown that simply doodling can increase retention and recall of information
    - e. Draw or write anything; it helps prevent daydreaming
  5. What should you write during class if trying to take good notes is too distracting?
    - a. A simple outline of key points
    - b. Anything the professor emphasizes, e.g., “This is really important!”
    - c. Simple diagrams, sketches, or doodles
    - d. Questions you have (especially if something does not make sense, otherwise you might forget to ask)
    - e. Thoughts about associations (e.g., X reminds me of... X looks like...) to serve as memory retrieval cues
  6. Why bother taking your own notes when you can just follow along in your course pack?
    - a. Because the word “follow” says it all; it's a passive process
    - b. Note-taking promotes active listening and active learning

## What to Do Within 24 Hours After Lecture

1. Before beginning your review, take a few minutes to actively recall from memory what the lecture was about
  - a. What stuck? What didn't?
  - b. Do you remember the main idea, but not the details?
  - c. Do you remember random details, but not the main point of the lecture?
  - d. Testing your recall helps build strong memories
  - e. You may recall more or less than you expect, but either way, it's a very worthwhile exercise
2. Review your lecture notes
  - a. Re-watch lecture, if necessary, to fill-in any gaps in what you recorded in your notes
  - b. If using the Cornell System, write your “cues” and summary
3. Thoroughly read the associated coursepack pages for detail
  - a. [Use SQR3](#) (Survey, Question, Read, Recite, Review)
  - b. Make notes in the coursepack or fill-in gaps in your lecture notes with detail from the coursepack
  - c. Look up unfamiliar terminology
  - d. Resolve any questions you have sooner rather than later
  - e. Try on your own to resolve your questions, but give yourself a time limit – don't spend hours trying to research something on the Internet, and don't get distracted from your primary goal
  - f. If you can't figure it out, get clarification from an instructor, a classmate, or a different (reputable) information source
  - g. Rewrite and reformulate important concepts in your own words – don't simply recopy
  - h. Condense, reduce, consolidate, and integrate information as you review

4. THINK! Pause frequently to reflect on the material and actively recall what

## Improving Reading Comprehension

Is reading fluency a limiting factor for you?

- Reading fluency is the ability to read quickly, accurately, and with comprehension. In an ideal world you would have enough time to read at your own pace and to think about what you've read in order to make sense of it. In medical school the volume of information that must be read and processed – both while studying and while taking an exam – does not afford this luxury and reading fluency can be a limiting factor for some individuals.
- Many extremely intelligent and capable medical students are hindered by their reading fluency. It can be particularly problematic for students' whose primary language is not English (i.e., ESL students), but can also be true of anyone from any background. Low reading fluency can be associated with a learning disability, such as dyslexia, but that is not always the case.
- You may not realize low reading fluency is a problem for you because it can manifest in different ways:
  - Having to read things over and over again while studying
  - Having to read every word individually
  - Having to mouth the words, read quietly out loud, or subvocalize (imagine words being spoken)
  - Avoidance of reading textbooks or other information written in paragraph formatted prose
  - Poor exam performance
  - Running out of time on exams
  - Tendency to get long-stem questions wrong

Tips for how to improve your reading speed and comprehension

- As with any skill, practice is important. Practice reading for speed and comprehension each day. Check your words-per-minute (WPM) rate and check your comprehension by summarizing what you read. [Over time try to increase your rate while maintaining comprehension.](#)
- Other Speed-Reading Resources:
  - [Iris Reading](#)
  - [Read Speeder \(Free\)](#)
  - [Acceleread](#) (download in iOS App Store)
- Read in an environment conducive to concentration, one without interruptions and distractions and that has good lighting.
- Read difficult material when you are most alert.
- Take frequent breaks, at least 10 minutes every hour.
- Use the SQR3 reading method
- Chunk your reading material – break a long or difficult reading assignment into shorter blocks of material and read for shorter periods of time. Use the SQR3 method for each block of material rather than for the entire assignment as a whole. At the end, make sure to go back and see how the “blocks” fit together to make the whole (get the big “big picture”).
- Try to read phrases (groups of words), not every word separately.
- Time yourself during practice exams – try to work at a pace averaging approximately one question per minute.

When to seek professional help

- It is important to realize that you may need to seek professional assistance. If you think reading fluency is an obstacle to your academic success, or you've tried the methods above to no avail, please contact the MSUCOM Office of Academic and Career Advising: 517-884-3893 or email [com.acadvising@msu.edu](mailto:com.acadvising@msu.edu)

# Study Tips for Improving Long-Term Memory Retention and Recall

## MYTH BUSTERS

Myth: When a teacher says, “don’t memorize this,” it means stop paying attention because this won’t be on the exam.

Reality check: WRONG! This is an unfortunate and all-too-common source of teacher-student miscommunication. What they almost always mean is that you should understand it, not just memorize it for later regurgitation. More than likely, it will be on the exam!

## Building a memory

- On its journey through the three stages of the brain’s memory storage system – sensory, short-term (STM), and long-term (LTM) – a tremendous amount of information is filtered out. Your goal as a medical student is to select learning strategies that maximize retention and minimize loss of important information.
- What are the take home messages?
  - Pay attention to the learning task at hand and avoid distractions
  - Get 7-8 hours of quality sleep on a regular basis
  - Incorporate “active recall” into your study plan
  - Deliberately link new information to existing knowledge

All perceived stimuli enter your memory storage system as “sensory memories.” Stimuli you attend to enter short-term memory (STM) – your attention signals the brain, “Hey, that’s important!” Depending on what you do next, some STMs will be lost and some will enter long-term storage. In the absence of continuous rehearsal (e.g., repeating a phone number over and over again), anything you can recall after 24-hours (and probably after a minute) is a long-term memory (LTM). Even so, many common study methods create “weak” memories (neural networks) that render retrieval all but impossible after a short period of time (hence erroneously referred to as “short-term” memory). Imagine that forming a LTM is like wearing a path in a rug. The first time you walk across a rug you leave footprints, but after a short time they are no longer detectable (STM). However, the more you traverse the same path (rehearsal), the deeper and more permanent the wear pattern becomes (LTM).

Sensory Memory	Process: Sensory Encoding	Short-Term Memory	Process: Consolidation	Long-Term Memory
A sensory buffer that briefly and accurately holds all perceived sensory stimuli – sight, sound, smell, taste, & touch – for less than a second.	Crucial first step in memory creation. Attention is essential: ignored information vanishes. Not all information makes it into STM.	Holds 7 +/- 2 items for less than a minute. Chunking increases the amount of information that can be held in STM. Rehearsal increases the length of time in STM and improves chances of transfer to LTM. Poor STM can be a limiting factor in learning.	Stabilization process in the conversion of STM to LTM. Deep (slow-wave) sleep is essential to creating long-term memories. Not all STM become LTM (or at least not in a way that can be later retrieved) New LTM is linked to existing LTM via formation & strengthening of neural synapses (neural network).	Permanent storage. LTMs are distributed throughout the brain. Memory decay diminishes ability to access a memory at a future time. Accessing LTMs (e.g., recall) strengthens the neural networks.

## How are long-term memories (LTM) stored?

- The brain has a complicated storage system for long-term memories. An LTM is distributed in a neural network (i.e., group of neurons primed to fire together) with different aspects of the same memory stored in different brain areas, e.g., visual aspects of an episodic memory stored in the visual cortex and associated sounds stored in the auditory cortex.

## How are memories retrieved?

- “Remembering” (accessing a stored memory) involves replicating the pattern of neural activity that occurred when the memory was originally formed. The relative ease or difficulty of memory retrieval is related to the “strength” of the neural connections (like the depth of the wear pattern in a rug). Because memories are stored throughout the brain, retrieval involves reconstructing the memory, like putting together a jigsaw puzzle.
- Example: Imagine trying to remember someone’s name, but you can only recall that the person was female and her name began with the letter ‘B’. So, you mentally run through all the female names you know that begin with the letter B. Alas, recollection finally comes from a different retrieval cue altogether, “Her name was Betty and I remember because we talked about how much we both liked the Flintstones when we were kids.”
- To be readily accessible, a memory needs to have multiple, relevant retrieval cues. Study methods that improve long-term retention and subsequent access to a stored memory involve intentionally creating meaningful associations. In the example above, retrieval cues included: female category, name begins with letter B, instance of discussing mutual fondness of the Flintstones, and Betty Rubble was a Flintstones’ character.
- Two main processes are used to access memories: recognition and recall. Recognition involves comparing a current stimulus (e.g., a sight, sound, or smell) to something sensed in the past; it is a single step process and is generally easier and faster. Recall involves directly accessing information in LTM and is generally more difficult because there are no direct retrieval cues, thus the entire neural path must often be reconstructed.
- When retrieved, information is pulled from LTM back into “working” STM and must undergo a process of reconsolidation, which can strengthen and even alter the memory.

## What does it mean to “forget”?

- In the absence of pathology, the human brain is capable of storing LTMs permanently, but “memory decay” is a normal physiological process. Just as new neural connections can be made, old ones that haven’t been used in a while can be “pruned” – “use it or lose it.” Forgetting is either the result of poor initial encoding and/or faulty retrieval – without adequate retrieval cues, a memory might as well not exist. Forgetting happens rapidly at first but slows as time progresses. Re-studying information at spaced intervals staves off forgetting and improves long-term retention and retrieval. The MSUCOM curriculum takes advantage of this aspect of memory by revisiting certain topics over again, but you can also incorporate this into your overall study strategy.

## What is “rote learning”?

- Rote learning methods are based exclusively on repetition and rehearsal – the idea is that the more something is repeated the easier (and more quickly) it can be recalled.
- Is rote learning a good study method?
- In some situations, but generally not. Rote methods represent a surface approach to learning that are very useful for some learning tasks, such as memorizing a long list of random words or numbers. Medical students often utilize rote learning to their detriment, and describe their learning process as memorizing the course material. However, “memorizing” and learning are not synonymous. Of course, one must “remember” something in order to later recall it to answer a test question, but rote memorization creates LTMs that are particularly devoid of context, associations, and meaning. Rote study techniques do not lead to genuine understanding and fail to produce retrieval cues required to recall and apply information in a novel context such as answering an unfamiliar or higher order exam question (i.e., knowledge “transfer”).

## What are alternatives to rote learning?

- Alternatives to rote learning include deep learning approaches: meaningful learning, associative learning, and active learning.

## Study tips for improving long-term retention and retrieval

- What are some study methods that produce deep learning?
  1. Link new information to things you already know ("elaborative rehearsal"). Access to memories is greatly improved when the information being learned is meaningful. To aid in recall, study methods should involve deliberate creation of logical, intuitive, and even fanciful associations with existing knowledge. Make sense of new information and develop an organizational scheme/framework. Information you understand rarely needs to be "memorized" using rote techniques.
  2. What to do:
    - Use your own words to rephrase definitions/descriptions
    - Think of familiar examples – things that you can relate to
    - Use familiar acronyms, acrostics, analogies, codes, musical jingles and rhymes
    - Relate new information to knowledge from other courses (past or present) or to life experiences
    - Relate theory to everyday practice
    - Think about how the information relates to the medical "big picture": What is the clinical/practical significance? Why are you learning this? What is the impact on/relationship to patient diagnosis and treatment?
    - Create concept maps
- Actively participate in your own learning ("generation effect"). [Retention and recall](#) are improved when you actively participate in the creation of your own knowledge. What to do:
  1. Create your own summaries, study guides, diagrams, charts, etc.
  2. Ask and answer your own questions.
  3. Use your whole brain, not just your left hemisphere. Play around with information until some outstanding feature suggests a memory "hook", such as a mnemonic, picture, pattern, rhyme, or story; the more emotive (funny, dirty, disgusting), the better.
  4. Note: As a medical student you don't have time to do this for all your course material; sharing student-created study aids is both necessary and beneficial. However, the learning benefits of the creation process are undeniable. In the interest of efficiency, reserve self-generated memory-enhancing study materials primarily for concepts that you find difficult or for trying to remember very detailed information that you are struggling with.
  5. Create both a visual and a verbal memory for the same information ("dual coding").
  6. What to do
  7. Associate words with pictures
  8. Use your own words to describe a picture/figure/diagram
  9. Translate a written passage into a drawing or diagram
  10. Examples of specific memorization techniques that employ imagery include the method of loci and journey method.
- Whenever possible, study in an environment that is similar to the testing environment ("state- & context dependent memory"). Recall is enhanced when the environmental context is similar during both the encoding (learning) and recall phases and is one reason why studying in a quiet place is generally preferable to a noisy one.
- Spread studying out over several days, rather than cramming ("[spaced practice](#)"). Say you're going to spend 10 hours studying a particular topic, it is more effective to spend that time as 10 one-hour sessions, or 5 2-hour sessions, or even 2 5-hour sessions, spread out over two or more days, than it is to spend one marathon 10-hour session. This is why it is so very important to review every day. Obviously, you cannot review everything every day, but make sure you frequently review the things that are most challenging to you.
- Avoid multitasking when learning difficult or dense material. Research has found that although multitasking does not impact recall, it is extremely detrimental to the encoding process.

Multitasking divides attention takes up valuable short-term memory space, and negatively impacts on LTM formation.

- Review information you're trying to memorize right before you go to sleep. Deep sleep plays an important role in memory consolidation. This is a good time to spend a few minutes reviewing a chart or going through some flashcards. To further enhance your memory, try to recall the information shortly after you wake up.
- Self-quiz frequently by recalling information from your memory. Every time you access a memory, you strengthen it. So, not only does self-quizzing help you identify your areas of weakness, it also helps you retain the information for later recall by strengthening the neural connections.

USEFUL RESOURCES RELATED TO MEMORY AND LEARNING:

[Memory](#)

[Memory Techniques](#)

[How to Improve Your Memory](#)

[Enhancing Memory](#)

## 10 Habits of Highly Successful MSUCOM Students

### What is “success”?

Success means different things to different people: personal satisfaction, being the best in their field, making lots of money, having a prestigious job, etc. We consider “a highly successful MSUCOM student” to demonstrate all of the following: above-average academic performance in coursework and COMLEX, excellent interpersonal skills, community involvement, exemplary professionalism, and good clerkship evaluations. Highly successful medical students are not necessarily more intelligent than their peers, nor do they necessarily work harder.

### Highly successful MSUCOM students tend to:

1. Maintain a “big picture” perspective. They are mindful of the importance of what they're learning and understand that the pay-off for their sacrifice and hard work will be the ability to accurately diagnose and treat their future patients.
2. Have a “deep” approach to learning that guides how they study. They are intrinsically motivated to learn as much as possible. They avoid rote methods that are based purely on repetition and rehearsal, and instead strive to develop an organizational framework for new knowledge that focuses on ways to integrate what they're learning with what they already know. Need some extra practice? Learn how by watching our video covering [active study methods](#).
3. Avoid “cramming” for exams. They keep up with the material and have a regular study routine. Many successful students plan to not study the day or evening before the exam. They put their books away early because they know they are prepared. One routine that has been proven successful with students is adapting to a power study hour. [Our advising team breaks down this approach in this video](#).
4. Self-regulate effectively. They set goals, plan, monitor their own progress, seek feedback from multiple sources, and make adjustments as necessary. They are generally self-aware and have well developed metacognitive skills. They know what they know, and they know what they don't know.
5. Manage their life well. They are organized and time efficient without sacrificing effectiveness. They understand the difference between important and urgent and are good at prioritizing. They know what needs to be done and they do it. Find out our approach to time management by [watching this video](#).

6. Maintain balance in their lives. They understand that by prioritizing well they will still have time to do the things that are important to them and the things they love to do, including hobbies, socializing, maintaining relationships, spiritual enrichment, volunteering, participating in school and community, etc. They also know that sleeping, eating a healthful diet, and exercising are not luxuries, but rather important activities for maintaining emotional, cognitive, and physical wellbeing. Managing multiple priorities in medical school can be tough but [watch this video](#) for some of our suggestions.
7. Continually strive for self-improvement. They seek feedback from external sources on their performance, take advantage of opportunities, and aren't afraid to step out of their comfort zone to learn a new skill. Meeting with a member of the advising team can be very helpful throughout your time at MSUCOM. [Email our office](#) if you'd like to meet with a member of our team.
8. Delay gratification. They know that the reward comes after the hard work.
9. Practice what they want or need to learn. They know that deliberate practice is required to learn anything well.
10. Have a positive outlook. They are resilient and see mistakes as a growth opportunity, not the end of the world. Find out more about the power of a positive mindset by [watching this video](#) we put together for you.

## Five Factors Related to High Performance in Medical School

1. Time on task
  - a. Genuine learning takes time and cannot be rushed. Efficiency is about eliminating waste (e.g., by not doing unnecessary things); it is not about taking short cuts. It is often stated that learning course material requires 2-3+ hours outside of class for every hour in class, but exactly how much time it will take you to learn something depends on variables including your learning goals, your existing knowledge or familiarity with the subject, the volume, density and complexity of the information, your individual learning preferences/style, as well as the study methods and behaviors you employ. Learning is a very individual process; it may take you longer than your peers to master the material.
  - b. Answer honestly, "Am I giving this material the time it deserves?"
2. Attention during task
  - a. Getting information into short-term memory and from there into long-term memory requires that you be present and focused while studying. No amount of time on task is going to be effective if your attention is directed elsewhere (e.g., multitasking, distractions, sleepiness, anxiety, negative thoughts, etc.).
  - b. Answer honestly, "While I'm studying, am I giving the material the attention it deserves?"
3. Study methods & strategies
  - a. Not all study methods and strategies are created equal. Furthermore, a study method that works for one subject or type of material may not be appropriate for other topics. It is important to have a learning "toolkit"—be adept at using a variety of study methods and strategies—and to be flexible and adaptive. Your individual learning "style" (preferences for how you learn) can help or hinder you depending on whether or not they are a good "match" for what you are learning.
  - b. Answer honestly, "Am I approaching this material in the appropriate way?"

4. State of mind
  - a. Your attitude toward studying and learning, as well as, your overall emotional state can strongly influence your ability to process, retain, and apply information. Not surprisingly, enjoyment of learning and positive emotions, such as happiness, pride, and gratitude, are correlated with improved retention and creative problem solving, while negative emotions (fear, resentment, anger, sadness) are associated with rote learning and reduced performance. Healthy behaviors related to stress management, recreation, adequate sleep, good nutrition, exercise, socializing, personal development and spirituality can help you develop and maintain a positive attitude.
  - b. Answer honestly, "Do I have a positive attitude, and if not, what can I do to improve it?"
5. Metacognition
  - a. Metacognition means "thinking about thinking." It is a mental process of self-reflection and analysis that, among other things, helps determine if one's actions are working to achieve the desired outcome. Thinking about the sorts of questions mentioned above involves metacognition.
  - b. While studying, be sure to take the time to reflect on the following sorts of questions, "Is what I am doing working?" "Do I know / understand this?" "Should I change my approach?"

## Quick Study: Activities That Take 30 Minutes or Less

(From the University of Illinois)

### 5-Minute Activities

- Review study note cards (good for learning: terminology, foreign language vocabulary, math formulas, pharmaceutical/medical terminology, etc.).
- Skim a section in a chapter / look over the subtitles in a chapter of your textbook.
- Review a page or two of notes.
- Look through your planner and remind yourself about what you need to get done today.
- Write a "To Do" list.
- Feeling stressed: do deep breathing exercises, pray, or meditate.
- Call the Writing Center, your professor, or an academic support center to schedule an appointment.

### 15-Minute Activities

- Skim two (2) sections in a chapter.
- Organize one of your notebooks.
- Make study note cards.
- Work a math problem.
- Study a diagram in your science textbook.
- Review and fill in your lecture notes from one of your classes.
- Using your notes, quiz yourself over one of your lectures or textbook chapters.
- Update your planner by recording any upcoming assignments or exams.

### 30-Minute Activities

- Read a few pages from one of your books.
- Work a few math/chemistry problems.
- Review and organize your lecture notes for one class.
- Skim an article.
- Develop an outline for a paper.
- Review some of the textbook readings you've recently completed.
- Organize a mini study session with a few classmates after class or just prior to class.
- Listen to a lecture that you have tape recorded.

- Call your friends or parents. Save your study time for study.

## Coping with Test Anxiety

### What is test anxiety?

- Test anxiety is a type of performance anxiety characterized by an extreme or irrational level of physical and/or psychological distress before, during, and even after an exam. Although many people feel a little anxious about an upcoming exam, test anxiety can dramatically hinder learning and lower performance.

### What causes test anxiety?

- Anxiety is a normal part of life. A little anxiety (arousal) is necessary to keep us awake and alert and a moderate amount actually enhances motivation and performance. Beyond a point, however, anxiety is harmful.
- True test anxiety should be distinguished from other causes of anxiety about an upcoming exam, such as not studying enough, not studying effectively, or generally not being prepared. If you're anxious about an upcoming exam because you know you have not adequately prepared, then you're probably justifiably nervous, but that isn't the same thing as test anxiety.
- The physical manifestations of test anxiety (see below) are triggered by the body's "fight or flight" response and experiencing these symptoms can actually make the sufferer more anxious. However, it is generally not the physical symptoms that lower performance, but rather the emotionality, worrying, and negative self-talk, which distract from the task at hand and impact negatively on cognition. Non-task related thought processes come to dominate both the test-taker's time and short-term memory storage space, decreasing their ability to focus, reason, and problem solve.
- Test anxiety can have a number of underlying psychological causes, including low self-esteem, low self-efficacy, fear of failure, etc., and can be very difficult to "self-treat." Professional assistance is strongly recommended.

### What are the manifestations of test anxiety?

- Physical
  - Sweating
  - Cold, clammy skin
  - Dry mouth
  - Trembling / shaking
  - Rapid heart rate
  - Chest tightness
  - Difficulty catching breath / rapid breathing
  - Nausea / vomiting / diarrhea or constipation / stomach cramps
  - Frequent urination
  - Headaches
  - Muscle tension
  - Lightheadedness / fainting
  - Insomnia
- Behavioral
  - Pacing / fidgeting
  - Avoidance / procrastination
  - Giving up
- Emotional
  - Anger / frustration / fear
  - Nervousness
  - Hopelessness / helplessness
  - Depression
- Cognitive
  - Inability to recall previously known information, e.g., "Blanking"
  - Inability to focus / concentrate
  - Racing thoughts
  - Negative self-talk / worry / distracting thoughts of failure / "what if" thoughts

### What are some "self help" strategies for coping with test anxiety?

- Prior to Test Day
  - Develop good study and test-taking skills / habits to build confidence in ability to perform
  - Ensure adequate preparation for the test – this should include learning about the exam (topics covered, # of questions, question format, time allotted), developing a comprehensive review schedule, studying effectively, and self-testing frequently to guide your content review
  - Practice stress reduction and relaxation techniques (exercise, deep breathing, progressive muscle relaxation)
  - Have a positive mental attitude, practice positive self-talk, and visualize success
  - Get plenty of sleep each night, especially the night before the exam
  
- On Test Day
  - Eat a light meal/snack before the exam to settle your stomach and stave off distracting hunger pangs
  - Avoid drinking caffeinated beverages (coffee, tea, energy drinks) prior to or during the exam – these can trigger and exacerbate anxiety
  - Arrive early to the test location
  - Avoid discussing the exam with classmates who are anxious or who make you feel anxious
  - Avoid cramming right before the test
  - Try not to misinterpret physical symptoms of anxiety as meaning that you will fail – anxiety is a normal physiological response to stressful situations – try to calm down and go with the flow
  - Spend 10 minutes prior to exam focusing on relaxing (e.g., practice deep breathing)
  - Take 10 minutes before the exam to write specifically about your anxiety – how you feel, what you're worried about, etc. – this pre-exam “venting” has been demonstrated to help
  
- During the exam
  - Remain calm
  - Focus on one question at a time
  - Focus on answering the questions, not on your grade
  - Remind yourself to stay on task
  - Challenge negative self-talk, “I’m going to fail,” with positive messages, “I studied for this and I will do my best”
  - If you feel yourself beginning to panic, take three slow, deep breaths
  - Practice good time management strategies, e.g., moving on when a question has you stumped

### When should you seek professional assistance?

Test anxiety can be extremely debilitating. You should seek help as soon as possible, and especially if/when you feel that you cannot cope on your own. Do not feel ashamed! Test anxiety is very common and is not a sign of weakness.

For a counseling appointment, contact the [Office of Wellness and Counseling](#) representative at your site

Additional resources:

[Test anxiety – Minnesota State University: Mankato](#)

[Test anxiety tips](#)

## How to Minimize Distractions and Stay Focused

One of the more common concerns expressed by medical students is a tendency to be easily distracted while studying. Distractions draw attention away from the task at hand and can result from a variety of internal or external sources. Attention is a cognitive function that allows us to select appropriate stimuli,

while filtering out others, maintain concentration, and interact with space and time<sup>1</sup>. Attention is a critical first step in creating a long-term memory; therefore, distractions can severely hamper learning. Our level of distractibility at any given time can be influenced by such things as boredom, hunger, worry, stress, anxiety, tiredness, physical discomfort, presence of environmental stimuli (noises, sights, smells), and easy access to other, perhaps more enjoyable, activities. Avoiding or minimizing distractions involves recognizing that you have a choice and can exert control over your circumstances.

Note: Most students who find themselves unable to stay focused on their work do not have AD/HD; however, if you have a family history or feel strongly that you might have an attentional deficit, we strongly recommend that you seek professional help for diagnosis and treatment.

## Tips for minimizing or avoiding distractions

- Structure your life
  - Establish a regular study routine<sup>2</sup>
  - Have a designated study area
  - Set study goals, plan your strategy, and manage your priorities
  - Set reminders and use a timer to keep you on track
  - Take frequent short breaks, e.g., 10 minutes per hour, and do something different, such as moving around; even more frequent breaks may be necessary when you're tired
- Control your study environment
  - Select a study location / environment that minimizes competing stimuli (e.g., a quiet location)
  - Make sure you have everything you need nearby so you aren't distracted by looking for things
  - Don't "multitask"; turn-off electronic devices when possible or restrict your access with website or software blockers, don't listen to music that makes you want to sing along
- Address your state of mind<sup>4</sup>
  - Center yourself to prepare for each study session
  - Be present; when you feel your attention drift remind yourself to "be here now"
  - Schedule worry / think time; set aside a specific time each day to allow yourself to think about the things that tend to interfere with study and then remind yourself of that time when a distracting thought interrupts your concentration
  - Change study topics every one to two hours to keep your brain engaged and alternate study activities, e.g., switch between reading and more active learning methods
  - Reward yourself for completing a task

## It's time to change the way you think about time management

Time management:

Reflects your values and priorities – what's important to you and what you want out of life.

Involves setting goals, determining what you need to achieve them, and creating a plan to make them happen.

Requires flexibility, not rigid adherence to a schedule.

Enables you to live a fulfilling and balanced life in a way that won't compromise your values and sacrifice your important goals.

Fosters self-empowerment through recognition that outcomes, such as getting to class on time or doing well in your courses, are a result of your choices and actions (e.g., having an internal locus of control).

A train or bad traffic may make you tardy, but the real reason you arrived late is because you didn't leave early enough to allow for a delay. Some people are always early. How do they do it? They plan ahead and anticipate possibilities like traffic delays. Likewise, failing an exam cannot

be blamed on bad questions. Failing an exam is about insufficient preparation. Both scenarios, being late and failing an exam result from poor planning.

How you use your time is strongly influenced by a number of different factors, such as:

- Core personality
- Prior experiences
- Current circumstances
- Attitude
- Motivation
- Goals
- Habits

### *Habits versus Goals*

Time management behaviors are largely habitual, and therein is our challenge. We do what we do because we do it. Habits are automatic, triggered by environmental or mental cues – we go on autopilot and stop thinking. We rationalize, after the fact, that what we do is worthwhile simply because it's what we do, "This must be important otherwise I wouldn't be doing it."

There is a fundamental difference between habitual and goal-directed behavior. Habitual behavior is initiated at a subconscious level while goal directed behavior is conscious; different brain regions are involved. A behavior may begin as goal-directed, but through time and repetition becomes habitual. Because habits are subconscious, they are notoriously difficult to break or change.

We need to periodically recalibrate to ensure that what we do really is important and worthwhile and aligned with our goals and values. We need to make sure we're doing the right things for the right reasons<sup>2</sup> to get us where we want to go and lead the life we want to lead. We need to be aware of and reflect on the underlying motivations that guide our behavior and potentially cause us to spend valuable mental energy and time on things that aren't really important and might in fact be self-defeating. Your attitudes, values and goals are the foundation of effective time management and should guide your selection and use of time management tools and tactics. To become good at time management, you may need to break some old habits and start new ones.

### *Time Management Tools:*

- Smart Phone Planning Apps
- Alarm Clocks, Watches, Timers
- Course Schedule
- MSUCOM Calendar
- Personal Calendar
- To-Do Lists

### *How can time be managed?*

Time management tools are often useful, even indispensable:

- If you don't naturally wake up on time, you set an alarm.
- If you don't know what time it is, you look at a clock.
- If you can't remember what you need to do, you make to-do lists.
  
- But time management is not about tools. Owning a toolbox doesn't make you a carpenter. Deciding what to do, when to do it, and even how to do it, that's time management. Time management isn't even about managing time. How can you manage something you can't control?
- Time management is about managing yourself. It is a life philosophy, which guides your selection and use of tools, tactics, and strategies as a means of organizing your life and using your time both efficiently and effectively.

For better or worse, your use of time says something about you. You may consider yourself organized and efficient, while others see you as rigid and controlling. You may feel carefree and easy-going, but chronic tardiness may send the message, “My time is more important than yours.”

I’ve known academically successful students who made a bad impression and even failed a clerkship rotation for being late to didactics or rounds. It is beneficial to consider other’s expectations and perceptions of you (especially those who will evaluate you and have the potential to influence your career).

There’s more to becoming a doctor than “wanting to help people” and passing exams. What’s more, passing exams often comes down to how you use your time. You can decide whether or not you’re going to be caught up in your classes or cram for the exam at the last minute. You will develop a study schedule and determine how much effort to put into preparation for COMLEX. These are decisions you can and must make. Your choices, your priorities, what you deem important and worthy of your time – it’s all up to you – and while you cannot always control the consequences of your choices you need to take responsibility for making them.

### *The M.A.G.I.C. of time management*

Motivation drives you. Attitude guides your behavior. Goals provide direction – a target to aim for. Initiative involves planning – without plans, goals are just fantasies. Without commitment, nothing gets accomplished. Each of these elements of time management is discussed below.

### M is for Motivation

Remember your excitement when you received that letter, email, or phone call offering admission to medical school? Remember how it made you feel when you accepted that invitation? The wording is a reminder that you’re here by your own choice because something drove you to medicine. Now, note your position on the approximate timeline below. You’re probably 6 or 7 years or more from being fully licensed to practice medicine.

Between now and then...		
Courses	Base hospital selection	Residency application deadlines
Studying	BLS, ACLS certification	Writing your CV
Exams	Level 1 Board exam	Asking for letters of recommendation
More exams	Rotations in specialties you don’t like or care about	Level 2 Board exam
OSCEs	Even more exams	Interviews
Assignments	Evaluations	Residency match
Immunizations	Dealing with mean people	Level 3 Board exam
BBP & HIPAA compliance training	Long hours	Subspecialty exam
Fingerprinting, background checks, and drug screening	Not having control over schedule	

Motivation is an essential element of achievement. You really have to want it, whatever “it” is. The more challenging the goal, the more motivation you need to be successful. In medical school, motivation to maintain a high level of commitment often wanes as the day-to-day reality sets in (see above).

“I don’t know what’s wrong with me. I feel motivated. I really want to be a doctor, but I can’t get myself to study.”

Now that you’re here, you may find that you’re not always interested in what you’re learning, or that the idealized notion of “being a doctor” doesn’t quite match the reality of the process of becoming a doctor. The fact is that medical school requires sacrifice and hard work and doing things you don’t want to do and yet doing them anyway because you know they’re a necessary means to a desired end. Hopefully, some of it will be interesting and fun, but not all of it will be or should be.

Are your reasons for becoming a doctor sufficiently motivating to sustain you through tough times?  
 Are you willing to delay gratification and do what needs to be done?

## A is for Attitude

Attitude is an amalgam of your beliefs, values, emotions, and disposition that guides your behavior. The following attitudinal characteristics demonstrate a positive correlation with academic success.

### Personal Responsibility:

- Individuals with a strong Internal Locus of Control believe their successes and failures result from variables under their own control, and are not the result of external forces or circumstances
- Self-regulated learning behaviors
- Metacognition – thinking about thinking
- Strategic action – goal-setting, planning, self-monitoring, and self-assessment
- Motivation to learn – the driving force behind academic achievement
- Self-efficacy – belief in one’s ability to achieve a goal or complete a task
- Conscientiousness
- Conscientiousness is a personality trait strongly correlated with academic and career success
- Conscientious people are typically meticulous, reliable, thorough, and hard working; they pay attention to detail, seek out important information, and follow through with commitments; hence they tend to achieve their goals
- Positive emotions
- Enjoyment, hope, and pride

## G is for Goals

Goals determine our priorities. Though demonstrated to be beneficial, setting achievable goals is a learned skill that must be practiced.

### Academic Achievement Goals

Your academic achievement goals determine how you approach learning, including how much time you allocate for studying. Research has demonstrated a relationship between achievement goals, learning, and performance. Some findings are presented below.

Goal Level	Learning / Achievement Goal	Outcome	Correlations / Associations
Mastery	Goal: Learn as much as possible (Internal standard of competency)	Positive	High effort and task focused approach Intrinsic interest and enjoyment of learning Deep learning (retention)
Performance approach	Goal: Do better than others (External normative standard)	Positive (mixed)	Competitiveness and test anxiety Increased exam scores, but low retention Low persistence after failure
Performance avoidance	Goal: Not do worse than others (External normative standard)	Negative	Low performance, low interest, and low effort Test anxiety, anger, hopelessness Self-handicapping behaviors
Work avoidance	Goal: Exert minimal effort (No standard of competence)	Negative	Similar to above

### Goal-Setting

- Do you have specific, well-articulated goals?
- Have you written them down?
- Have you told someone about your goals?

To take your goals from an abstract idea to a concrete reality, write them down and analyze them. Are they the right goals for the right reasons? Are they SMART?

Set S.M.A.R.T. goals:

- ✓ S = Specific as opposed to vague

- ✓ M = Measurable as opposed to nebulous
- ✓ A = Achievable as opposed to unrealistic
- ✓ R = Relevant as opposed to trivial
- ✓ T = Time-bound as opposed to open-ended

What are your long-range, “big picture” life goals? These guide sub-goals, decision-making, and priority setting. Where do you want to be in 5 years? In 10 years? What specialty interests you? Do you want to have your own practice? Do you want a family?

What are your short-range goals? Short-range goals are important because they keep you focused and can make your plan feel more manageable. Short-range goals help with planning and time utilization. Are your short-range goals consistent with your long-range goals? They shouldn’t steer you “off course.”

What are your career goals? Your academic goals? Your personal goals? Are they compatible?

Goal: Obtain Dermatology residency in California.

This career goal leads to a number of short-range goals.

Short-range Goal #1: Score high (~700) on COMLEX exam.

Short-range Goal #2: Learn as much as possible (Mastery goal).

Short-range Goal #3: Focus on academics and maintain high level of performance in courses.

Short-range Goal #4: Improve self-regulatory behaviors (e.g., Metacognitive skills, Time management, Self assessment).

Certain things follow from the goals we set for ourselves, right and wrong ways to approach them, effective versus ineffective ways to attain them. Don’t leave the achievement of your goals to chance.

Share your goals with another person. Discussing your goals accomplishes three important things:

It makes them feel more real

It makes you more accountable – it’s harder to back out of a goal if you’ve told someone about it

It provides an opportunity for others to support and motivate you to succeed.

## I is for Initiative

Initiative is about strategic planning. In order to plan effectively, we need information; we need self-awareness, but all too often we are completely unaware of how we spend our time. To get a handle on your time utilization, complete the exercise located in the appendix.

### Be Proactive

What is under your control?

As your life unfolds, you can choose to be reactive or proactive. Being proactive means looking ahead to see what’s coming, and doing what you can to be prepared; it’s about anticipation and planning.

True story: A distraught second year medical student came to me in a panic because her June wedding and COMLEX test date were only days apart. She asked, “How can I plan a wedding and study for COMLEX at the same time?” I told her, “I don’t know.” I only know what I can and cannot do.

Absolute control is a fantasy. You cannot control other people. You cannot control consequences. But there are things you can control, and one of them is you! There are lots of things you can choose to do or not do. For example, you can choose to not get married during May or June of your 2nd year.

The point is you are not a hapless victim of circumstances. Be proactive not reactive. Between a stimulus and your response there is the opportunity for choice. How you react is up to you.

## Urgent versus Important

Every activity can be defined by two factors: urgency and importance. Urgency refers to time frame; urgent things need to be done now. Importance refers to results and benefits; important things enhance

your life and further your goals. Although this distinction seems to imply a dichotomy: urgent or not urgent, important or not important, it is more realistic to think of urgency and importance as lying along a continuum from low to high.

It is argued that truly successful and effective people spend more time pursuing activities that are important but not particularly urgent<sup>2</sup>, in contrast to the more common assumption that high-achievers are always dealing with matters of extreme urgency. Success does not require only doing important things – that’s highly impractical, if not impossible – but by being proactive through anticipation and planning you can prevent many things from becoming urgent. As with a health problem that, if ignored, can become an emergency, so can other things in your life, such as paying bills, car maintenance, and studying for an exam.

## Efficient versus Effective

You may be “busy” but are you really getting the job done or just wasting time?

Many students choose to not attend lecture. In justifying this choice, they often refer to the concept of “triage,” a medical decision-making process by which priorities are determined. Triage, however, is not about deciding what doesn’t need to be done; it’s about determining the order in which to do the things that must be done. One cannot choose when to attend a live lecture – it is when it is. Choosing to view a lecture recording or watch the streamed lecture from home is not applying the concept of triage.

Question: Isn’t prioritization an important part of good time management?

Answer: Yes, but the more important question is, “How do you make these decisions?” What are your criteria for distinguishing between what’s important and what’s “got to go”? Is it based on what’s most needed, effective, and important, or on what is most desired, efficient, and convenient?

Out of necessity, medical students become obsessed with efficiency, often to their detriment. With reference to class attendance, the notion is that you can’t do it all, and going to class is believed by many to be a waste of time, unless there are points to be earned. Decisions like these are not about learning. Someone who is intrinsically motivated to learn does not need to be motivated by points. Though a lecture or lab may be skipped for the sake of “efficiency,” at the same time, medical students often overlook the many things they do that really are inefficient.

When you set out to study, how much time does it take to get all your stuff out of your backpack? Do you spend time searching for your highlighters or getting your computer ready? How often have you sat down to study and within a couple minutes jumped up to grab a beverage? Or maybe, just as you were settling in, your phone rang, or you realized the place was too noisy, or too quiet, or you weren’t comfortable? How many times have you set out to study only to have a million little things keep you from getting much done, yet at the end of the night, you look at the clock and think, “Wow, I just spent 4 hours studying”?

Complete the statement: “I waste my time by \_\_\_\_\_.”

- 1.
- 2.
- 3.
- 4.
- 5.

What can you do to streamline some of your processes?

To become more efficient, we often choose short cuts, but are they worth it? Maybe. Perhaps. Sometimes. The problem is that while short cuts take less time, there’s good reason to believe they are not effective.

Many common study methods might be efficient (take less time) but are not likely to be effective for learning and retention.

- Cramming (a.k.a. massed effort; as opposed to studying/reviewing material in several sessions spread out over a longer time interval, i.e., distributed effort).
- Trying to guess what will be on the exam in order to reduce how much you need to remember.
- Using other people's study aids instead of creating your own.
- Skipping lecture because it's "not a good use of your time."
- Listening to lectures at double-speed.
- Doing multiple things all at once (multitasking).

On the flip side there are also learning techniques that can be effective but are very inefficient, e.g., copying your notes or reading your notes over and over again.

## The Myth of Multitasking

- What is multi-tasking?
- How does it affect learning?
- Do you think you're good at multitasking?

While reading this, have you checked your email, read or sent a text message, snapped a selfie, checked Facebook, Tweeted, or Googled something? Do you do these sorts of things while sitting in lecture or studying? This is multitasking.

Have you ever been so distracted while you were talking that you said the wrong thing, "T-cells mature in the pizza"? If you were counting, and someone began saying random numbers out loud, would you lose focus?

Distractions divide or divert your attention. They provide a novel stimulus that makes your brain sit-up and take notice. When your conscious attention is drawn to something it enters your working memory. Once there, it can be used immediately (e.g., to make a decision) or potentially stored in long-term memory. When a memory is stored it is linked to existing memories. Distractions while studying can produce wrong or irrelevant connections. Because they're irrelevant and incidental they don't function as effective retrieval cues; there's nothing to associate them with the "right" memory. You might remember that the person sitting next to you during lecture fell asleep and drooled, but that probably won't help you answer a test question. This is similar to being able to recall the color you used to highlight something, but not the information itself. The brain is a peculiar organ.

Multitasking is the (mythical) ability of humans to do more than one thing at a time. We can't do it; we switch-task. Every time we switch task, time is wasted. People think they're good multitaskers. They're not. They might do many things at once, but they don't do them well. Is it effective? In a word, "no." Is it efficient? Also, "no." Research suggests that although we think we're getting more done, productivity actually declines when we try to do several things simultaneously.<sup>5</sup> In addition, multitasking compromises your ability to acquire transferrable knowledge.<sup>6</sup> Knowledge transfer is when stuff you learn in one context can be applied in another (novel) context. This is the type of knowledge you need in order to apply what you learn through studying to answer a test question, or make a medical diagnosis.

Bottom line: Multitasking while studying actually wastes time and prevents you from being fully mentally engaged in the important task, learning your course material.

## Effective study strategies:

- Focus on one task at a time
- Monitor actual time-on-task
- Control your environment and avoid distractions
- Know which activities can be combined (e.g., socializing and exercise)
- Know which activities require single-minded focus (e.g., studying complex material)

## Planning and Scheduling

Planning is an important activity, not an urgent one. Goals without plans are just fantasies. If all you do is plug events into your iPhone, Outlook calendar or planner, then wait for an alarm to go off reminding you where to be, you're not planning, you're reacting.

If all you do is day-to-day scheduling, you lose sight of the big picture of your life, your goals and values. You tend to ignore importance, focus on the urgent, and function in continual crisis mode.

However, strategic planning can be challenging. It does take some up-front time and requires knowing what you need to do, breaking larger tasks into smaller pieces, prioritizing to make sure you actually accomplish what you need to accomplish without wasting time, and being flexible so you can adapt to changing circumstances. Here are some steps in that process as described in an excellent short article by Dr. Susan Johnson.

- Priorities: How to Decide What to Do and When
- What to do: Create a written list of all your projects no matter how big or small.
- Begin by listing everything
- Then, remove unnecessary items
- First, sort projects into categories:
  - Required
  - Promised to someone
  - Important
  - Just interested (distinguish needs from wants)
  - Second, remove:
    - Things not promised
    - Things you merely hope to do or wish to do
  - Third, if the final list is still unmanageable, re-think your workload

## When to do it: Develop a Weekly Schedule and a Daily Priority To-do List

- Create a weekly schedule with time blocked out for lectures, labs, sleeping, and eating.
- Fill in with other scheduled (important, required) commitments (e.g., appointments, meetings, etc.).
- Set aside blocks of time for family and friends, exercise, and thoughtful reflection.
- Set specific time limits for email and other mundane activities.
- Each day identify a short list (<5) of must-do tasks (alternate between high-priority projects and other categories, such as laundry and mundane chores).
- Use your time strategically.
- When you're most alert, study your most difficult material.
- When you are brain-fried, perform less cognitive tasks (email, chores, exercise)
- Review your schedule on a weekly basis to connect your goals with your day-to-day life.
- Identify potential new projects, upcoming deadlines, and areas of focus.
- Revise schedule as necessary.

## C is for Commitment

Commitment is about getting things done, which requires making and keeping promises to yourself and others.

How do you feel when you decide to study but you don't do it? Or you resolve to attend lecture, but when the alarm goes off in the morning, you hit snooze, roll over, and go back to sleep?

We all have an inner guide that tells us what we should do – our conscience – but sometimes we don't listen, and ultimately, this can erode our feelings of self-worth. If you frequently break promises, pledges and resolutions, it's time to make some changes! There are numerous potential barriers to action, such as: procrastination, perfectionism, indecision, lack of information, lack of tools and "not enough time." To overcome barriers and get things done that you need to/should be doing, try the following steps taken from another excellent short article by Dr. Susan Johnson.

Execution: Getting Your Work Done

- Use next action thinking
- Just as goals need to be specific and achievable, projects need to be broken down into actionable pieces. Dr. Johnson recommends using action verbs when itemizing steps.
- To determine whether something is really a “next” action, ask yourself, “Could I do this right now if I had the time?” If “no,” why not? Is it because you don’t have what you need to do it? If so, then completing the missing step (e.g., obtaining a piece of information) should be your next action.
- Use, don’t lose, short unscheduled bits of time
- Small time increments, when added up, can amount to hours of lost time every day – 5 minutes here, 10 minutes there.
- Use these “bits” of time to accomplish a small “next action” task.
- Begin before you’re ready
- If you wait to start a project until everything is “just right” – the stars are aligned and you feel “ready” – you might delay starting indefinitely.
- Tricks to get you moving when you’re really stuck.
- Set a timer for 5 minutes and promise yourself you’ll work until it goes off.
- Choose a task at random and complete it. Successfully completing even a small task is rewarding and might provide the momentum you need to keep going.
- Keep a “reverse” to-do list and write things down as you complete them.
- Put the materials for your task right in front of you.
- Take a break for 10 minutes then try again.

### Do you procrastinate?

- Medical students cannot afford to procrastinate. If procrastination is a problem that impacts many aspects of your life, seek counseling. If you are putting off a particular task, ask yourself 3 questions:
- Is this task really the next action?
- Does this task or project really need to be done at all?
- Am I experiencing an emotional block?

### Summary

- There’s no “right or wrong” way to spend your time, it’s all about doing the right thing at the right time, and this is a very personal, subjective thing. Being efficient and effective is about making the best use of the time you have, and this requires strategic planning. Take a moment for a reality check – a calibration moment, an opportunity for reflection – to ensure you’re doing what you need to do to achieve your goals.
- Self-awareness is the first step in making positive changes.
- How you manage your time sends a message to others about you; send the message you want to send.
- Breaking old habits and establishing new ones is hard work that takes intentional effort and deliberate practice. It doesn’t just happen by chance or good fortune; you have to make it happen.
- Be proactive and exercise choice in the space between stimulus and response.
- Schedule but don’t over-schedule.
- Prioritize. Plan. Execute.

You have an inner guide (your conscience) that tells you what you should do – listen.

### Where does your time go?

[Determine how many hours a day you spend completing your tasks.](#)

## Create a Strong Schedule Each Week

Try looking at your days by the hour and mapping out what you need to be doing. Here is a blank schedule for you to use to plan out your week:

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
5-6 am							
6-7 am							
7-8 am							
8-9am							
9-10am							
10-11am							
11am-12pm							
12-1pm							
1-2pm							
2-3pm							
3-4pm							
4-5pm							
5-6pm							
6-7pm							
7-8pm							
8-9pm							
9-10pm							
10-11pm							
11pm-12am							
12-1am							
1-2am							
2-3am							
3-4am							
4-5am							

# Develop Solid Test-Taking Skills

## *A Guide to Testing Smart on Computer-Based Multiple-Choice Exams*

This guide provides basic tips and strategies for improving performance on multiple-choice exams. Topics include knowing the rules, time management, minimizing silly errors, over-thinking, second-guessing, changing answers, guessing strategies, Bloom's taxonomy, positive-thinking, test anxiety, and sleep.

A basic 10-step test-taking strategy

1. Know the rules and follow instructions.
2. Read each question carefully and thoroughly. Don't assume you "get it" before you read the whole thing—you could miss a key word or important detail.
3. For particularly long questions, first read the last sentence of the stem (i.e., the actual question). This may allow you to more efficiently evaluate the information provided.
4. Try to predict the correct answer before looking at the options.
5. Match your predicted answer to the options provided.
6. If your response is there, still read each of the other options before making your final selection to make sure there isn't a better response, then mark your answer and move to the next question.
7. If your response is not there, re-read the question and proceed to ruling-out incorrect options (distractors).
8. If you're stuck, re-read the question. Don't just keep reading the options. Remember: the correct answer follows from the information in the question stem, so always go back to the question.
9. If you're still stuck, take your best guess, mark the question, and move on.
10. Double-check your answer selections.

## Rules of engagement

Understanding the rules to which you will be held accountable is an underappreciated aspect of testing smart. When it comes to rules, there's no such thing as "blissful ignorance." Don't risk your grade and your professional reputation: be sure to review and understand the [MSUCOM Computer-Based Testing Policy](#).

## As time goes by

Time management is an important test-taking skill. It's just as bad to rush through an exam and leave early, without checking your work, as it is to get bogged down by a few very difficult questions and miss out on easier points because you run out of time! Having a time management plan that keeps you moving at a reasonable pace throughout the exam can keep you from panicking and prevent you from wasting time and making silly mistakes. Plan your time usage strategy before the exam so that you can pace yourself appropriately during the exam. Do some arithmetic to help you set a maximum amount of time to spend on tough questions before you make your best guess and move on.

Example: Your exam is 60 questions and 80 minutes long.

- Subtract ~5 minutes from the total exam time for settling in and receiving instructions.
- Subtract ~5 seconds per question from the total exam time for double-checking your work & making sure you've correctly selected the option you intended.
- Do the math. For this example:  $80 - 5 - 5 = 70$  minutes to take the exam, which is a bit more than one minute per question. Most questions will take less time.

With Computer-Based Tests (CBT), you are able to mark questions to return to—take advantage of this feature. Statistically speaking, you're more likely to get difficult questions wrong, so don't spend too much time on them. If you can eliminate some options, do so, then guess, mark the question to come back to later, and move on. If you really get stuck and feel your anxiety rising and confidence tanking, then skim and skip questions until you come to one you can answer. Answering "easy" questions first (1) maximizes the amount of time you'll have for difficult Qs, (2) increases your odds of getting all the "easy" points you

can, (3) builds your confidence so that you can tackle the more difficult questions, and (4) could provide clues to the more difficult questions.

1. To not err
2. To minimize the type of errors that make you want to kick yourself later:
3. Listen to and follow instructions.
4. Make sure you know how many questions there are, so you don't accidentally miss some.
5. Check and double-check your responses to eliminate selection errors and other "silly" mistakes.
6. Use your scratch paper to jot down key words, write notes, and draw diagrams. Everyone's ability to think through a question is limited by short-term working memory capacity (STM holds about 7-10 items for about 30-60 seconds). The more information you have to sort through while figuring out the correct answer, the more likely you will forget something or make a mistake, so write things down as they come to you. For example, draw a simple sketch of the brachial plexus or jot down a helpful mnemonic.
7. Be on the alert for thought-shifting words such as, but, although, however, on the other hand, while, in spite of, despite, except, etc. These words can make the difference between a right and wrong answer.

### "Just the facts ma'am"

- Don't fall into the trap of thinking you "recognize" a practice question you've seen before. Professors often write new exam questions by changing just a word or two in a practice question, which creates an entirely different question! They're not trying to trick you; modifying old questions is a very common technique for generating new questions.
- Select the best option for the context of the question. In other words, don't read stuff into a question that's not there (often described as "over-thinking"), a significant cause of wrong answer selection among people who "know" the material. If you have to use your imagination to come up with a scenario that makes an option correct, it's probably not the correct answer—re-read the question. Remember, your selection must answer the question posed, not the one you've created in your head.
- Don't be fooled by options that seem correct because they "sound" right or are simply true statements—these options might be correct answers to a question, but not the question. Your selection must answer the question, so once you've made your choice, re-read the question to make sure you've answered it!
- A factually correct option may not be the right / correct answer to the question. In fact, there may be several options that are factually correct. The right / correct answer is the one that best answers the question. It's often about context, so read the question carefully. Once you've selected your answer, continue to read the options, benchmarking them against your first answer selection, and evaluating them within the context of the question stem. This isn't second-guessing, it's simply making sure you haven't been too hasty and overlooked something.
- Don't allow your emotions to dictate your answer. People with intuitive and feeling personality types (NFs; take the Jung Typology Test<sup>1</sup>) may be influenced by emotions and value judgments when answering questions<sup>2</sup>. Keep to the facts of the question, and remember that the best possible option may not be one of the choices you're given. Just because you can imagine a better answer does not invalidate the question. Get over it!
- Don't assume the test-writer is trying to trick you. So-called "trick" questions are usually either poorly written (it happens; nobody's perfect) or difficult. A challenging question is not the same thing as a tricky question—it just means you haven't quite reached the depth of understanding you need to easily answer the question. It is totally legitimate and fair to include questions that differentiate among students' level of knowledge and understanding of the material. By assuming the test-writer is out to get you, you're setting yourself up for "over-thinking" the question and jeopardizing your exam performance. Keep in mind, however, that while the question stem is not

meant to trick you, the answer options will most likely include distractors that represent “common” mistakes / misunderstandings—that’s just good test-writing!

### Uh, I’d like a second opinion

Second-guessing makes you your own worst enemy and is often a result of low self-confidence (or overthinking the question or assuming the test-writer is trying to trick you or some combination of factors). Conquer second-guessing by having a sound test-taking strategy and by over-preparing.

Sometimes second-guessers say they were “over-prepared” or “knew too much.” There’s no such thing as knowing too much! In reality, it probably means they had a superficial understanding of the topic (breadth as opposed to depth) or they read things into the question that were not there (made assumptions about conditions or context that weren’t presented in the question). Exams test your knowledge and understanding of a subject. Bottom line: when you know the material well, you will be more confident of your answer selection, and less likely to second-guess yourself.

Many people talk themselves out of a correct answer when confronted by an option with which they are less familiar. In other words, imagine you read a question and think you know the correct answer: option B. Then you look at option D and realize that you don’t remember exactly what option D is, so, you select D, not B. The faulty thought process goes something like this: I can’t remember what option D is, so I can’t rule it out, so it may be the right answer. Bottom line: select your response based on what you do know, not on what you don’t know.

### To change or not to change: is that the answer?

Many of you have heard the refrain, “never change your first answer!” The idea is that your first impression is usually correct, so go with it. However, this notion has not been borne out by research. On the contrary, people are more likely to change a wrong answer to a right answer, or a wrong answer to another wrong answer, than a right answer to a wrong answer. Nevertheless, it is still not good strategy to randomly change your answers, based on lack of self-confidence or second-guessing, you should have a good reason to change your answer. The only good reasons to change your answer are:

- You realize you misread the question stem or the options the first time through, or
- You come across information later in the exam that strongly suggests your first answer was wrong, or
- You recall specific, factual information that strongly suggests your first answer was wrong.

### Guessing games

If there are 5 options, you have a 20% chance of guessing correctly, right? Not necessarily, that’s only if your guessing strategy is purely random. Making a truly random choice is hard for people to do—we have a lot of subconscious biases. If your strategy is not truly random, it is possible to guess wrong on every question! One recommendation is to always select the first choice of those remaining (after you’ve eliminated obvious wrong answers). If you can’t eliminate anything, then your choice is ‘A’. If you’ve eliminated ‘A’, then your answer is ‘B’ and so on. But, that doesn’t mean you should only make random guesses when you’re stumped. You can significantly improve your odds of guessing correctly by using critical reasoning to eliminate options. When eliminating options; however, the trick is to NOT eliminate the correct option—once you’ve done that, your chance of correctly answering the question is 0%.

### Anyone up for a game of clue?

Content clues or taking advantage of information provided in the exam.

Information you need to answer a question may be found in other questions, which is one reason why it can be beneficial to quickly skim through the exam before diving into your first question or to move on from a difficult question you are struggling to answer.

- Idiosyncratic clues or taking advantage of the test-maker.
- Disclaimer: If you know the correct answer, don’t let these things dissuade you from selecting it. “Idiosyncratic clues” can be helpful, but only if you have to guess.

- Avoid options with absolutes such as “always” and “never”—they tend to be wrong.
- Long answers that contain more information are often correct.
- Grammatical agreement between the question stem and the correct answer can sometimes give away the correct answer.
- If two of the answers are opposites, one of them is likely correct.
- If two of the options are indistinguishable, neither one of them is likely correct.

## A Bloom by any other name

Understanding a little about test construction and levels of knowledge can help—perhaps not during the exam, but certainly in preparation for it. It can help to know what types of questions or what level of understanding will be required of you. Bloom’s taxonomy is a way of ranking the level of knowledge being tested. Six levels are described (levels 3 and up represent “higher-order thinking”): 1) Knowledge – tests recall of facts, but does not require or demonstrate understanding. 2) Comprehension – tests understanding of meaning and the ability to associate, generalize, and predict. 3) Application - tests ability to use or apply information in a different context from how it was presented, and tests the ability to problem solve according to established rules and principles (e.g., perform calculations using formulae). 4) Analysis – tests ability to break down information into its constituent parts to see how it’s organized, and demonstrates an ability to differentiate, compare and contrast. 5) Synthesis – tests ability to create new information and ideas from old ones, make connections, generate hypotheses and design experiments. 6) Evaluation – tests ability to make judgments about the value of theories and ideas, weigh information appropriately and use reason and logic to determine if an argument is good or bad.

- Practice questions and quizzes tend to emphasize levels 1 and 2 (knowledge and comprehension), while unit exams and national boards (COMLEX and USMLE) ask mostly higher-order questions. This is an important principle to keep in mind as you study. Higher-order questions are usually perceived as more difficult. This is one reason why students tend to do better on practice questions than on course/unit exams.
- The little doctor that could: “I think I can, I think I can, I think I can”
- Don’t underestimate the power of positive thinking! Develop or adopt an affirming positive mantra that you regularly repeat, such as, “I have studied all I can, I know the material well, and there’s no question I cannot answer.”

## High anxiety!

Test anxiety can be profoundly debilitating; however, often what seems like test anxiety is simply a well-founded lack of confidence due to under-preparation (e.g., you know you didn’t study enough or don’t know the material well enough). Some anxiety can be motivating (e.g., a fear of failure can make you study harder); some people even enjoy the “adrenaline rush” they feel before an exam. If you think you genuinely suffer from debilitating test anxiety, you will need professional counseling to overcome it; it is a psychological issue requiring diagnosis and treatment (e.g., therapy and / or medication). The most successful treatments for anxiety are typically some combination of cognitive behavioral therapy, to control negative thoughts, and desensitization therapy. Meditation and relaxation techniques can also help minimize the impact of test anxiety.

## Indicators of test anxiety include:

- Past history of test anxiety,
- Negative self-image,
- Anxiety and worry that creeps into other aspects of your life,
- Being bombarded by negative thoughts during the exam (“I’m so stupid,” “I’ll <sup>[1]</sup>never be a doctor,” “I’m going to fail”),
- Comparing one’s performance after the exam to that of classmates (asking <sup>[1]</sup>friends what they put for question X),
- Inability to sleep the night before the exam,

- Physiological symptoms of a general stress response before or during the exam (sweaty, shaky, difficulty breathing, rapid heart rate, nausea), or
- “Racing thoughts” or “blinking out” during the exam.

A basic 3-step strategy for controlling test anxiety is:

1. Calm down: Remind yourself it's not the end of the world and that panic is unproductive. Your body and brain are treating the situation as though it's life-threatening, but it isn't.
2. Take several deep breaths: Controlling your breathing can help reduce the physiological symptoms of anxiety.
3. Push “worry” thoughts away and replace them with positive thoughts: Negative thoughts take time away from the cognitive task-at-hand. This greatly diminishes your mental processing efficiency, and tends to have a larger detrimental effect on exam performance than the more obvious physiological symptoms.

### To sleep, perchance?

So, here's a question for you: What sucks knowledge out of your head faster than you can put it in during an all night cram session? You guessed it! Inadequate sleep. Adequate sleep for most people is 7-8 hours per night. Very few people—probably those with a specific gene<sup>4</sup>—can get by with less. You're probably not one of these people! Sleep deprivation, even for just one night, impairs important cognitive abilities like judgment, reasoning, memory recall and focus. It can increase the number of silly mistakes you make, as well as, severely impair your ability to recall information you've learned, even if you know it pretty well. Studies comparing driving while under the influence of alcohol to driving while sleep deprived have shown that sleep deprived individuals (less than 6 hours) perform worse than folks with a blood alcohol level of 0.055! So, say nighty-night to your books at a reasonable hour, spritz your pillowcase with the scent of lavender, count sheep, and let the Zzzzzz's carry you away.

## Worksheet for analyzing your exam performance

The first step toward improving your exam performance involves identifying the types of errors you make either while studying for the exam or while taking the exam. The purpose of this worksheet is to assist you in this process by having you evaluate what went wrong for each incorrectly answered question (Part I), and also what went wrong for the exam as a whole (Part II).

Part I-A: individual item performance analysis	For each incorrect answer, determine which of the following criteria apply	Tally the # of incorrectly answered exam questions that meet the criterion described on the left			Total # of items missed
Errors of Test Preparation	I do not recall having studied the information in the question				
	I recall studying the information but did not know it well enough				
	I knew the main ideas / concepts but could not recall specific details				
	I knew the details but could not apply them				
	I focused on the wrong information when studying				
Errors of Test Taking	I misread the question or options				
	I knew the correct answer but carelessly marked a wrong choice				
	I narrowed the options to two but selected the wrong one				
	I did not notice limiting words or double negatives in the question stem				
	I made arithmetic errors				
	I changed a correct answer to a wrong one				
	I 2nd guessed my answer due to non-content issue, e.g., 4 'C's in a				
<b>PART I-B: KNOW – THINK – GUESS</b>		Tally the # of questions that meet the criterion described on the left	Tally the # of incorrectly answered questions	Calculate the % correct in each category	
I was very confident of my answer choice during the exam (K = Know)					
I was somewhat confident of my answer choice (T = Think; ruled-out 2 or 3 options)					
I absolutely guessed (G = Guess; only able to rule out one or no options)					
<b>PART II: Overall EXAM PERFORMANCE ANALYSIS</b>		Yes	No	To some extent	Comments:
I am generally confident in my test-taking abilities					
I experienced mental block during the exam					
I experienced racing thoughts during the exam					
I experienced negative self-talk about my performance during the exam					
I was so tired I could not concentrate					
I was so hungry I could not concentrate					
I panicked right before or during the exam					
I rushed through the exam and finished early					
I took time to double check my answers before submitting					
I ran out of time and could not finish the exam					
I spent time after the test comparing answers with peers					

# Wellness

## Maintaining Balance in Medical School

### *What does it mean to be balanced?*

Feeling “out of balance” is a common reason for seeking to improve time management skills as it can have a profoundly negative impact on attitude, motivation, and happiness. Balance is hard to define, so we tend to define it by how it feels when we sense it’s lacking. People often try to alleviate perceived imbalance by attempting to do more, which generally makes matters worse. Feeling out of balance results from inner conflicts between values and actions or between competing values. Resolving conflicts requires making difficult choices and prioritizing.

Balance is not about doing more. It’s not about spending equal amounts of time on all your high-priority projects; some things don’t warrant as much time as others. It’s not about a 50-50 split between medical school and “your life”; medical school is a big part of your life. In fact, balance is not really about time. As long as you’re healthy and fulfilled, you can be balanced even if you focus most of your time and attention on one aspect of your life. In contrast, you can outwardly appear balanced – spend time doing a variety of things – yet be inwardly miserable. Achieving balance requires aligning your values with your behaviors and your short-term goals with your long-term goals. It also requires distinguishing needs from desires and prioritizing.

Balance over a lifetime might require shorter periods of significant imbalance in which a large percentage of your time and energy is directed toward one thing. The caveat – that one thing should be important. If medicine is the career you want, then medical school is where you need to be, and it is normal and necessary for your life to be a little asymmetrical (i.e., “unbalanced”) right now. There’s really no getting around it, for long periods of time over the next four years, you will spend an disproportionate amount of time and energy focusing on your career (i.e., your medical education). This is the reality of becoming a physician, something you have chosen. Unfortunately, there is no miraculous time management tip that will allow you to have it all... all at once... right now.

The periods of imbalance you will experience are not all bad. Intense investment makes the difference between success and failure, excellence and mediocrity. By committing to your values and making the time for proper planning, short-term imbalance can create long-term balance. In addition, it can make you more appreciative and respectful of the time you do have for other interests. It can make you less likely to squander your time in frivolous pursuits.

Juggling multiple roles and responsibilities and balancing your own needs with commitments to others makes achieving a sense of balance much more difficult than if you were truly an independent agent. By focusing on yourself (e.g., your education), you may feel you’re being selfish and letting others down. In addition, family and friends may place unreasonable demands on your time and energy. You might feel pulled in multiple directions. To achieve long-term balance, you might need to say “no” more often. You may have to explain to a loved one that, at least temporarily, you must focus on your needs, and one of these is uninterrupted study time. These challenges are often daunting for non-traditional students – those who are married and have children or other dependents, such as elderly parents – but can be equally challenging to someone who is single and living at home with parents and siblings who don’t fully understand or appreciate the demands of a medical education.

Resources tend to identify the following “dimensions” that should be considered when attempting to re-balance one’s life: health/well-being, significant relationships (family, friends, romantic partners), career, community, hobbies, and spirituality.

### *Balancing self-care and academics*

Self-care includes activities such as eating a healthful diet, getting adequate exercise and sleep, maintaining important relationships, engaging in true recreation (rejuvenating activities), and nurturing one’s spirituality. These represent some of the basic necessities of life, and yet, they are often the very

things that medical students push aside and treat as optional luxuries. Quite the contrary, these things are vitally important to a medical student, and the most successful students make them high priority items. The key is planning. When organizing one's life and creating a schedule, it is important to allocate specific blocks of time for self-care. The payoff is high – better health, better emotional/mental wellbeing, and sharpened mental focus. The challenge is in recognizing that quality, not quantity, is what matters. None of these things have to take a lot of time – make a 15-minute phone call to a friend, select the healthy menu item or take a few extra minutes to cook a healthy meal, engage in “high-intensity interval training” (HIIT) or 4-minute “Tabata” workouts, which take very little time but share the same health benefits as lengthier workouts, spend an hour each week on a favorite pastime or in thoughtful reflection/meditation/prayer.

### *Balancing family and medical school*

Balancing medical school with marriage and children can be particularly challenging, especially for, but certainly not limited to, women. Some have access to resources that allow them to do this extremely well, others don't. It's difficult to overemphasize the importance of having a support network, including individuals who have been where you are and can offer practical advice based on personal experience. Don't go it alone; seek out clinical faculty and mentors, talk to peers, or get assistance from the MSUCOM Offices of Personal Counseling and Academic and Career Advising. But remember, everyone is different. What was right for one person may not be right for you. Gather information and talk to people, but ultimately, make decisions based on your values, goals, and circumstances.

### *Balancing romantic relationships and medical school*

Medical school is a tough time to begin dating and can add significant stress to established relationships. It's not impossible or even inadvisable to begin a new relationship but be realistic. In order to be a successful medical student, you cannot afford drama. Having a partner who supports what you're doing is important and emotionally satisfying, but if you're with someone who doesn't “get it,” is jealous of the time you need to study, and makes you feel bad about yourself, the relationship is doomed. Openly and honestly communicate your needs, boundaries and limitations, but if that doesn't work, and if the relationship is important to you, then seek professional assistance from the MSUCOM Office of Personal Counseling.

### *Balancing academics and extracurricular activities*

Extracurricular activities (e.g., student organizations) and elective courses provide numerous potential benefits. They are often a powerful reminder of the very reason you are in medical school, and in that sense, they serve a vital motivational function in your medical education. They allow you to broaden your horizons, introduce you to other possibilities you may want to explore, and can look very good on a CV, but there is a dark side too. Extracurricular activities can leave you stretched too thin and allow you to take your eye off the ball. Not all activities are equal in terms of long-term benefit, and if your participation comes at the expense of academic performance you may be doing yourself more harm than good. Striking the right balance between academics and extracurricular activities requires knowing your long-range goals and evaluating how these activities fit into the big picture. It necessitates determining your priorities and carefully planning to ensure you aren't sacrificing something even more important. You don't have to take advantage of every “once in a lifetime” opportunity, and you don't have to do it all now. There will be other opportunities in the future. Make smart, informed choices. If you find yourself struggling to keep up in your required coursework, forgetting to do important things, neglecting your health, or damaging your relationships, you will need to let things go.

Additional resources on achieving balance:

[Evaluate Priorities to Balance Personal Life, Medical School](#)

[How to Create a Balanced Life](#)

[The Wheel of Life](#)

[HIT/HIIT](#)

[Tabata](#)

## *Accommodations During Medical School*

Many medical students don't know that they can receive accommodations during medical school especially if they had accommodations throughout undergrad. If you feel like you'd like to proceed with obtaining accommodations in medical school please reach out to the [MSU Resource Center for Persons with Disabilities](#).

## *Sleep Matters: A Wake-up Call*

"Healthy sleep is essential for optimal learning and memory function."

You need sleep. Your brain needs sleep. Sleep is not a luxury. When was the last time you stopped eating? Sleep is like food. Without it academic performance plummets and you become sick. Yes, sleep deprivation can even kill you; it's that important. Unfortunately, the immediate physical consequences of sleep deprivation aren't as dramatic or recognizable as hunger pangs. You may think you're fine, but if you're not sleeping enough, you're not OK.

Sleep deprivation is a serious problem. Much research has been motivated by the dire consequences caused by sleep deprived truck drivers, and, yes, medical students and residents. Sleep is so essential to your performance in medical school and residency that you need to allocate 6-8 hours per day. If you think you can't afford the time for sleep, think again and reevaluate your time commitments. You can't skip sleep to gain study time. Sleep is non-negotiable.

The purpose of sleep is to reenergize, refresh and restore the body. Even though we appear to shut down while sleeping, it is a time when important biological processes occur, such as: (1) Long-term memory consolidation, and (2) Tissue, cellular, and biochemical repair and renewal.

Sleep is divided into two distinct states – REM and non-REM – as different from each other as both are from being awake. Non-REM and REM states alternate in 90-110 minute cycles throughout the night. REM sleep makes up roughly 25% of the sleep cycle, and is when most dreaming takes place. Slow wave, non-REM sleep (SWS or deep sleep) plays an important role in memory consolidation.

## *Sleep deprivation*

Insomnia (inability to fall or stay asleep) may be a symptom of a treatable medical or psychological condition. If you suffer from insomnia, especially if it lasts more than a week, see your doctor. The effects of sleep deprivation can be as dramatic as excessive alcohol consumption. One study found that after 17-19 hours of being awake, individuals performed worse than people with a 0.05 blood alcohol content (considered legally impaired in most of Europe).

Short-term deprivation leads to irritability, loss of concentration, reduced attention span, inability to focus on mental tasks, slower reaction speed, diminished coordination, and reduced ability to do simple motor tasks (e.g., accurately bubble in a scantron). The impact on concentration, coordination, and reaction time make sleep deprivation a major cause of traffic fatalities – up to 60% of road accidents may be attributable to lack of sleep. Poor exam performance is also a common result of failure to get an adequate night's sleep. "Pulling an all-nighter" or studying into the wee hours is not worth it. Any information you might cram during your late night study session will likely be negated (and then some) by your sleep-deprived poor performance during the exam.

Long-term deprivation has even more serious physical and mental consequences, including reduced immunity (leading to more frequent colds and flu) and profound cognitive effects (moodiness, psychosis, vision problems, and headaches). Obviously, these can seriously compromise academic performance, to say nothing of the enjoyment of life.

Sleep loss is cumulative. For every night you don't get enough sleep you accrue "sleep debt" from which your body will try to recover. The more sleep debt you accumulate, the sleepier you'll be during the day. You may find yourself dozing off in class, while studying, or possibly while driving.

### *How much sleep do you need?*

The normal range is 6 to 9 hours out of every 24, but everyone needs a different amount, and it varies among individuals, as well as over the lifetime of a single individual. During periods of stress, you may need more sleep than normal. Unfortunately, stress can also produce insomnia. One way to know whether you've had enough sleep is if you feel alert within 45 minutes of waking up. Quantity of sleep isn't the only issue. Sleep quality and keeping in sync with your internal circadian rhythms (circadian refers to a 24 hour cycle) are also important. Taking two-hour naps every 12 hours can attenuate the negative consequences of prolonged sleep deprivation (e.g., staying up for 3 days in a row), but cannot make up for long term sleep loss, and should not be considered a long-term solution.

### *Tips for getting a better night's sleep*

- Avoid alcohol
- Avoid caffeine within two hours of bedtime
- Establish a sleep routine, such as going to bed at about the same time every night
- Don't study in the bedroom
- Practice stress reduction techniques daily (exercise, meditation)
- Perform breathing exercises and progressive muscle relaxation techniques right before bed
- If you don't fall asleep within 30 minutes of lying down, get up and do some small task – it might actually make you sleepy – then try again
- Keep a notebook and pencil on your nightstand – if your brain is caught in an endless loop thinking about something, write it down so you can review it the next day

## Are You a Fraud? Coping with Impostor Syndrome

### *Got crippling self-doubt?*

"I don't belong here!"

Have you ever felt that the only reason you've made it so far is through good fortune and your uncanny ability to fool people into believing you're more capable and intelligent than you really are? If so, you're not alone.

Intense feelings of self-doubt are very common among highly successful individuals, especially women. In the 70s, psychotherapists gave it a name, "Impostor Syndrome," though not a clinically recognized psychological disorder. Failing to appropriately attribute your successes to your own abilities is associated with perpetually feeling like a fraud, and can lead to isolation, depression and anxiety.

People with "Impostor Syndrome" may even develop self-sabotaging behaviors, such as extreme procrastination. Why? The reason may be a fear of success. The more successful they are, the higher the stakes and the greater the risk and fear of being "out-ed" as a phony.

Learn more about Impostor Syndrome and how to overcome it:

[Banishing impostor syndrome](#)

[Do you have the impostor syndrome?](#)

[Feeling like a fraud: living with impostor syndrome](#)

[Feel like a fraud?](#)

[Who do you think you are? 8 tips to beat the Impostor Syndrome](#)

[Impostor Syndrome Quiz 1](#)

[Impostor Syndrome Quiz 2](#)

Sometimes it helps to simply know you're not alone, if so rest assured. But if the coping strategies you've developed are holding you back and/or risking your success in medical school, seek help.

## Coping with Stress in Medical School

Stress and burnout are extremely common among medical students, residents, and even practicing physicians. As [HelpGuide.org](#) points out, while stress is about “too much” – too many demands, too much to do, too many pressures – burnout is about “feeling empty, devoid of motivation, and beyond caring.” Complete mental and physical exhaustion – burnout – often results from high levels of unrelenting stress, which is, in fact, how medical students often describe medical school – it never stops and there’s no time to catch your breath. The best way to deal with burnout is to prevent it in the first place through effective stress management. The consequences of burnout can be devastating. Seek professional help if (1) you have no energy, don’t see the point of anything, feel depressed, don’t enjoy anything anymore, or have thoughts or suicide, or (2) if you see signs of these things in a friend or peer, or know someone who has become socially isolated.

### *Manage stress to prevent burnout*

Stress is a normal part of a medical student's life. First rule: don't assume that everyone else is coping better than you are, that you're the only one who feels stressed-out, or that your high levels of stress mean there's something wrong with you. Some individuals are better able to put on their “calm face,” while others exhibit obvious signs of being overly stressed. Everyone copes differently, and how you cope depends on a number of factors, including genetics, personality, health, past experiences, and current circumstances. Be aware that there are healthy and unhealthy ways to deal with stress.

### *Unhealthy coping mechanisms include:*

- Physically harming yourself and/or engaging in self-destructive behaviors (promiscuous sex, gambling, excessive gaming) and/or addictive behaviors (drinking too much, taking illicit drugs, over-medicating, smoking, consuming too much caffeine)
- Over- or under-eating
- Procrastinating and/or wasting time in trivial pursuits, e.g., watching TV or surfing the Internet
- Sleeping too much
- Staying “busy” to avoid dealing with problems
- Withdrawing from relationships
- Becoming angry and lashing out at others

### *Quick tips:*

- Inventory your stressors to determine which you can avoid, minimize, adapt to, or accept
- Exercise regularly, eat a balanced diet, get at least 7 hours of sleep each night, nourish your healthy relationships, and banish your toxic relationships
- Practice deep breathing and other relaxation techniques daily, especially before bed time
- [10 Relaxation Techniques That Zap Stress Fast](#)
- [Stress management](#)

## In-Person Resources:

- One-On-One Meeting with an Advisor:
  - Volunteer Meeting
  - Academic Success Check up
- Academic Workshops
- **Supporting Competency in Integrative Learning Skills (SCILS) Seminar Series**
  - A series of four 90-minute workshops designed to help you learn how to build a strong foundation of medical knowledge by processing and connecting information. The core elements include pattern recognition, clinical reasoning, and active engagement with curricular content. In addition, self-reflection and insight are encouraged. You will learn techniques to help you become an effective and efficient learner in medical school.
  - The series is presented each semester for four consecutive weeks. You are free to attend all the seminars in the series or individual workshops as your schedule allows. You may attend as many times as you would like and in as many semesters as would like to refresh your skills.
  - **SCILS Topics**
    - **Workshop 1: Perspective**
      - Identify and understand your strengths and weaknesses to survive and thrive in medical school
      - Apply multiple perspectives to enhance your well-being and deepen your knowledge base
    - **Workshop 2: Prioritization**
      - Become effective and efficient with your time, your energy, and your study techniques
      - Use specific study techniques to manage large volumes of information for long-term retention and recall
    - **Workshop 3: Connections**
      - Process and connect information as you develop clinical reasoning skills
      - Integrate and analyze concepts to recognize common clinical and scientific patterns
    - **Workshop 4: Context**
      - Use clinical context to enhance your understanding of the stem of board style questions
      - Learn to “see the obvious” by applying the principles of clinical reasoning to patient scenarios
      - Open to all students (any class year)
- **OST 592: Self-Directed Integration of Medical Knowledge**
  - An elective course offered in the Spring and Fall semesters and open to students in Years 1,2,3,4.
  - This course is not available to students who are currently enrolled full time in the MSUCOM curriculum.
  - Course Coordinators are Jane Gudakunst MD and C.Pauline Tobias MA
  - OST 592 is a 6 -credit hour course that utilizes two approaches 1) Coaching and 2) Group Seminars to enable students to understand who they are as learners, how they learn and, to conduct a successful, self-directed review of basic science information. The students will be guided and encouraged to integrate this information with medical systems content knowledge and clinical correlations. The course includes checkpoints through submission of written self-assessment reflections (SAR); regularly scheduled meetings and feedback in person, through zoom, or by phone call; and scheduled group workshop sessions. Active participation and student engagement is essential to success in this course.

- The goal of this course is to enable the student to be successful in a self-directed review of basic science information with integration of medical content knowledge and clinical correlations by providing structure, support, study guides, and resources.
- After completing this course, students will be able to:
  - Assess their individual learning needs for professional development
  - Prioritize important life goals and adjust their schedule as needed to work toward those goals.
  - Utilize active studying and various resources to acquire basic scientific and clinical information through the process of identification of relevant information, analysis of information from various sources, and synthesis of information that is relevant to their specific learning needs.
  - Appraise the credibility of information sources and be able to describe the rationale for their choices.

## Citations and Resources:

- Study Without Stress: Mastering Medical Sciences, E.G. Kelman and K.C. Straker, 2000, pgs 46-48. Sage Publications.
- DeZure D, Kaplan M, and Deerman MA Research on student notetaking: implications for faculty and graduate student instructors. [http://www.math.lsa.umich.edu/~krasny/math156\\_crlt.pdf](http://www.math.lsa.umich.edu/~krasny/math156_crlt.pdf)
- Andrade J (2010). What does doodling do? Applied Cognitive Psychology, 24(1), 100-106. <http://onlinelibrary.wiley.com/doi/10.1002/acp.1561/abstract>
- <http://www.human-memory.net/processes.html>
- Reference:
- Tigner RB (1999). "Putting Memory Research to Good Use" College Teaching, 47(4) 149.
- References
- Jung Typology Test (<http://www.humanmetrics.com/cgi-win/JTypes2.asp>).
- Lawrence, G. People Types and Tiger Stripes. Center for Applications of Psychological Type, Inc., 1979.
- Eysenck MV and MG Calvo (1992) "Anxiety and Performance" in Cognition and Emotion 6(6): 409-434.
- <http://news.bbc.co.uk/2/hi/health/4493113.stm>
- CNN.com (<http://archives.cnn.com/2000/HEALTH/09/20/sleep.deprivation/>) [accessed on 8/13/09].
- Sleep, Learning, and Memory: <http://healthysleep.med.harvard.edu/healthy/matters/benefits-of-sleep/learning-memory>
- Coping with Excessive Sleepiness: <http://www.webmd.com/sleep-disorders/excessive-sleepiness-10/default.htm>
- Sleep Disorders: <http://www.talkaboutsleeeep.com/sleep-disorders/>
- Dement WC and Vaughan C (1999). The Promise of Sleep. Dell Publishing: New York.
- Wood and Neal (2007). A New Look at Habits and the Habit-Goal Interface. Psych Rev, 114(4): 843-863.
- Covey et al (1998) First Things First. Free Press: New York.
- Harackiewicz et al (2008). The Role of Achievement Goals in the Development of Interest: Reciprocal Relations Between Achievement Goals, Interest, and Performance. J Ed Psych, 100(1): 105-122.
- Pekrun et al (2009). Achievement Goals and Achievement Emotions: Testing a Model of Their Joint Relations with Academic Performance. J Ed Psych, 101(1): 115-135.
- Ophir et al (2009). Cognitive Control in Media Multitaskers. PNAS, 106(37): 15583-15587.
- Foerde et al (2006). Modulation of Competing Memory Systems by Distraction. PNAS, 103(31): 11778-11783.
- Johnson (May 2007). Priorities: How to Decide What to Do and When. Academic Physician and Scientist, p.4-5.
- Johnson (October 2007). Execution: Getting Your Work Done. Academic Physician and Scientist, p.4-5.
- Gitelman, DR (2003). "Attention and its disorders," British Medical Bulletin 65(1):21-34 <http://bmb.oxfordjournals.org/content/65/1/21.full>
- SelfRestraint (PC), SelfControl (Mac), Focus (Mac)
- <http://www.studygs.net/concent.htm>