### Succeeding in Anatomy (ANTR510)

What resources are available to help me learn anatomy?

Do I need to know details for the exams?

There’s so much to learn, how should I approach studying?

How much time should I spend on this course?

How should I divide my time between lecture and lab?

Should I go to lecture?

What if I don’t learn well from a live lecture?

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**Have a positive attitude! Set high personal standards! Be realistic!**

*Do not judge yourself by the behavior of others! Breathe deeply! Stay passionate! Feel gratitude!*

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### WHAT RESOURCES ARE AVAILABLE TO HELP ME LEARN ANATOMY?

- Course instructors and on-site faculty for content questions and study advice
- Your Peers
- Peer Mentor Anatomy Tutors (2nd year MSUCOM students)
- Acland’s DVD Atlas of Human Anatomy
- Anatomy apps for the mobile devices
- Internet resources

### DO I NEED TO KNOW DETAILS FOR THE EXAMS?

Yep! Some details are very important – exams often test your knowledge of “details”

However, if your study goal is to simply **memorize** all the details, you will fail to grasp the **basics** and forget most of what you’ve learned

**Details (def):**

- Individual parts
- All elements of the whole
- Small features
- The specifics
- All of the particulars
- Insignificant aspects**

**Significance is in the eye of the beholder. An expert knows which details are important, but a novice does not. Beginners often perceive all details as equally trivial and meaningless. Exam questions that require knowing details are labeled “nit-picky.” Yet, details are the very things that make anatomy relevant and useful to the practice of medicine. The real question is not which details are important, but rather in what context are the details most important. Part of your learning strategy must be to figure out how to figure this out (e.g., by “reading” the professor, listening carefully for clues, by asking the right questions, by using your intuition).**

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**Terminology (know the language)**

- Directional terms: Medial, lateral, ventral, dorsal, superior, inferior, median, sagittal, superficial, deep, etc.
- The names of anatomical structures.
- Definitions – for example, a bony “joint” or “articulation” is where two or more bones come together.

**The BIG stuff (literally)**

- Learn big vessels B4 small ones
- Learn big nerves B4 little ones
- Learn whole bones B4 bony bumps

**Themes, patterns, categories & groupings**

- Structures with names that contain the root word “brachi-” are typically found in the arm.
- In the upper limb, flexors are anterior and extensors are posterior.

**General principles and concepts**

- A principle of circulation is that arteries carry blood away from the heart and veins carry blood toward the heart.
- A principle of innervation is that skeletal muscle is innervated by the somatic nervous system.
- Conceptually, in the skeletal system, ligaments function to stabilize joints.
THERE’S SO MUCH TO LEARN, HOW SHOULD I APPROACH STUDYING?

Start, by learning the names of things

Don’t rely on recognition, aim for total recall – the lab exams are short answer, not multiple choice – you must be able to pull the names out of your head, so practice doing just that

- Make lists, from memory, to test yourself

Next, answer Qs about basic anatomy

What does it look like?

Where is it located?

- Where is it in the body?
- What structures are nearby?

What does it do?

- Clinical relevance: What would happen if it stopped doing what it’s supposed to do?

What vessel provides its blood supply?

What nerve innervates it?

Last, layer on the details

Throughout, test yourself frequently

See everything as many times as possible

Don’t be a perfectionist about every little detail

Get the big picture initially and review to add detail

Pre-lab as much as time permits

At the end of each lab, review what you’ve done previously

Know etymology (word origins) and create mnemonics

Learning produces long-term changes in the brain

A learning strategy is not the same as a study strategy – studying may or may not produce learning

Remembering requires initial storage, commonly referred to as memorizing, and subsequent recall (retrieval of stored information), e.g., to answer a test question

- Memorizing and understanding are two very different things – if you want to remember something long-term and be able to apply your knowledge, then you must avoid exclusively using rote (repetitive) study techniques

Recall is the tricky part of memory, and is improved by

- Creating a link between new information and something you already know
- Sleeping on it to consolidate your new neural connections

Students tend to spend most study time on information “input” (e.g., memorizing)

Instead, students should spend half their study time on information “output” or retrieval, e.g., pulling information out of their brain by self-testing / quizzing / free recall exercises
What are some effective study practices?

- Study in small groups (3 - 4 people)
  - Divide up the workload, then teach and quiz each other
  - Draw, Act, Talk things out
  - Palpate structures on yourself & others – get used to groping your classmates

- Generate lists, tables, tree diagrams, flow charts, especially from memory as a way to self-test
  - Purchase a large white board

- Create 1-page summaries of lectures

Self-test often

- Use free recall exercises to test your memory and understanding – “Do I really know this?”
- Don’t mistakenly think that because something seems familiar you know it

Do practice questions

Should I make my own flashcards?

- Probably not, but you might want to buy some
  - Making flashcards is so time-consuming most students aren’t able to review them, which defeats the primary purpose, which is rehearsal

- Writing your own self-test questions would be a more effective use of your time
  - Instead of simply highlighting important facts, for important information, write a question instead, then use your own questions to test yourself later
  - Try to think of what you might be asked on the exam and how you will be asked

What are some INEFFECTIVE study methods?

- The following methods tend to not work in medical school
  - Writing everything out and re-copying notes (there is not enough time)
  - Reading and rereading the same stuff over and over (there is not enough time)
  - Highlighting your notes, books or coursepack (false sense of accomplishment)
  - Making own flashcards (there is not enough time to make and review)
  - Cramming for a test (there is too much to learn and not enough time)
  - Using all available learning resources (there is not enough time) – focus on the actual course materials

What we’re saying is that time is the major limiting factor in medical school

Caution: It can be risky and misleading to use practice Qs as a mechanism for predicting exam performance

Do NOT take a “practice exam” the night before the real exam

- If you do poorly on the practice exam, you have no time to fill your knowledge gaps AND You. Are. Going. To. Freak. Out!

Consider the source of the questions

- Do you know if they are truly representative of the exam Q content, format, style, and difficulty?
- Did the same person write both the practice Qs and the exam Qs?

Use Qs to identify areas requiring further review

- Make sure you know why the right answer is right, and make sure you know a similar level of detail about all the other options
- If you get a practice Q wrong, don’t just review that specific detail; make sure you review all the anatomy associated with that practice Q

Use the style of the practice Qs to think of your own Qs

- How could you rewrite a Q to make a “wrong” answer a right answer?
**HOW MUCH TIME SHOULD I SPEND ON THIS COURSE?**

Short answer: A LOT of time!!

Don’t underestimate the challenge of anatomy!

You will need to spend as much time as is required to learn the material!

How will you know when enough is enough?

Option A: Wait and see how you do on the exam

Option B (better): Engage in continual self-assessment
  - Goal: know what you know and know what you need to know better!
  - You’ve studied enough when you can pass your own self-tests at a level that makes you feel confident you will pass the exam
  - If passing is set at 75%, then achieving 75% on your self-tests is NOT likely to be sufficient!

Take frequent short breaks (10 minutes per hour)
  - Take a longer break every 2 or 3 hours
  - When you take a break, get up and move around – get the blood pumping; don’t just jump on Facebook or Twitter or Instagram

Make sure your “Study Time” = time on task
  - When you set out to study, actually study!
  - Work hard THEN play hard

**Tips to help you become more efficient**

Do not multitask!

Avoid distractions!

Be very disciplined about studying daily and keep up with the material

Procrastinators get started or get help

Develop a daily routine (see below)

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**Proposed Daily Routine:** Monday through Friday

**Attend** Lecture = 2 hours

Attend Lab = 2 hours

Prepare for next day’s lab (“Prelab”) = 2 hours

Review the morning lectures = 3 hours

Return to lab each evening to review = 2 hours

Preview next day’s lecture = 1 hour

**Total time = 12 hours**

**Yep, you read that right**

Weekdays:
  - 12 hours = anatomy
  - 7-8 hours = sleep

**Leaving 4-5 hours each weekday for other important stuff (eating, exercising, socializing)**

What about weekends?
  - The wise medical student will use weekends for review, not for catch-up!

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Author: Gillian Bice, PhD
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**How Should I Divide My Time Between Lecture and Lab?**

Strategically

<table>
<thead>
<tr>
<th>Should you spend more time: (1) in lab or (2) reviewing lecture notes?</th>
</tr>
</thead>
<tbody>
<tr>
<td>It’s not a question of more or less time</td>
</tr>
<tr>
<td>Anatomy is fundamentally visual, and most people have a preference for visual learning – they learn anatomy better when they have seen and <em>touched</em> the structures in lab</td>
</tr>
<tr>
<td>Lecture and lab are two sides of the same coin</td>
</tr>
<tr>
<td>➢ It’s one course with two components: a lecture and lab</td>
</tr>
<tr>
<td>➢ The lab is where you see with your own eyes what you’ve only before seen in pictures</td>
</tr>
<tr>
<td>➢ Integrate what you’re learning in lecture with what you see in lab</td>
</tr>
<tr>
<td>Spending time in lab will most likely help you do <strong>better</strong> on the written exams - “A picture is worth a thousand words”</td>
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<tr>
<td>Long-term retention will improve if you can associate what you see in lab with what you read in your coursepack</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>The goal of lab is identification, but not just identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is it AND <strong>how do you know</strong> it is what it is?</td>
</tr>
<tr>
<td>➢ What is it about the structure that confirms its identification?</td>
</tr>
<tr>
<td>➢ Pay attention to context – identity relates to continuity and/or relationship to the surrounding structures</td>
</tr>
<tr>
<td>➢ Every structure is unique in its appearance, its location, or its course through the body</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Why is it important to prepare for lab (pre-lab)?</th>
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<tbody>
<tr>
<td>To gain familiarity with what you’re looking for, what it looks like, and where in the body you should look for it</td>
</tr>
<tr>
<td>To keep you from wasting a ton of time aimlessly searching for stuff in the lab, or passively following someone else around</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How should you prep for lab?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open your</td>
</tr>
<tr>
<td>➢ Atlas</td>
</tr>
<tr>
<td>➢ Course pack</td>
</tr>
<tr>
<td>➢ Lab manual</td>
</tr>
<tr>
<td>Read the course pack while looking at the atlas plates</td>
</tr>
<tr>
<td>Jot down some <em>brief</em> descriptions in your lab manual and make simple sketches</td>
</tr>
<tr>
<td>Answer the questions in lab manual</td>
</tr>
</tbody>
</table>
**SHOULD I GO TO LECTURE?**

YES

**WHAT IF I DON'T LEARN WELL FROM A LIVE LECTURE?**

You should not expect that after attending a lecture you will have “learned” all you need to know – the lecture is but one step in the learning process.

Educational research suggests that while lectures are not necessarily the most effective learning activity, especially for some individuals, they are still one of the most efficient ways to deliver key information on a large-scale.

Students often feel they do not learn well during a live lecture, and would therefore prefer to view the streamed lecture from home or the recorded lecture at a different time, however attendance at live lectures serves several useful functions:

- It gets you up early, out of your home and engaged with anatomy
- It helps you stay caught up
- It enhances state- and context-dependent learning – recall is enhanced when test environment (classroom) matches the learning environment (classroom)

**How can I get more from lecture?**

First, preview the coursepack the night before to create familiarity with the topic and stimulate awareness.

Then, Attend Lecture and Pay Attention!!!!

- Watch!!
- Listen!!
- Engage your brain
- Sit up straight
- Hold a pen or pencil
- Don’t text, IM, surf the Internet, Tweet, shop on Amazon, take selfies, or do anything other than pay attention

Don’t take detailed notes during lecture, but **do** write some stuff down and/or doodle

- Write less, see more
- Make note of something if it’s emphasized
- Write questions to yourself if you didn’t understand
- If you learn best by writing, take detailed notes when you re-watch the recorded lecture

Don’t worry if you’re struggling to follow along in your course packet

- **Just pay attention!!!**

Use the SQR3 method ([http://educatoral.com/SQR3.html](http://educatoral.com/SQR3.html))

Skim the course pack

Create a skeleton outline of major topics

Think about how the new material relates to content from previous lectures

Think about what you already know about it

- Improve long-term retention by making associations between existing and new information

Lastly, seek help early if you’re struggling!

Best Wishes for a successful first semester!

Your Academic and Career Guidance Team