

Musculoskeletal and Skin Course

Written by: Mitu Bhattatiry, Amber Khan, Rutvi Patel, Matthew Tran, Connie Wang, Brian Lue, Mackenzie Parker, Holden Archer

Course Director: Dr. Heather Woodworth Goff (Dermatology)

Associate Directors: Dr. Alexandra Callan (Skeletal), Dr. Hunter Cai (Skeletal Muscle), Dr. David Karp (Rheumatology), Dr. Heather Woodworth Goff (Dermatology)

GPA Factors: 2.0 credit hour, P/F

Grading:

Final Exam: 40%

Quizzes (2): 30%

Dermatology TBL (2): 10%

FCR TBL: 5%

Path Small Group Quiz: 5%

Online Problem Sets (3): 10%

Calendar:

Throughout January

Lecture: 9 am – 12 pm most days

Required Activities: 3 online problem sets, 2 quizzes, pathology small group sessions and quiz, 2 dermatology TBLs, 1 FCR TBL, final exam

Syllabus:

The syllabus is very detailed and includes most of the information you will be tested on. This is the main reading material for this course in addition to Robbin's Pathology for the pathology sessions. Each lecturer's syllabus section may have slides, reference articles, and videos to view. All questions on quizzes will come from the syllabus sections and materials provided by the lecturers for any given module.

Textbook:

None, other than Robbin's Pathology for pathology small groups

General Comments:

The course is divided into sections: skeleton, rheumatology, skeletal muscle, and dermatology. Try your best to learn each section as it passes so you don't have to go back and review more in depth for the final. Make sure to not neglect the skeleton and skeletal muscle for the final because the final covers all material, including what previously showed up on quizzes. The tutoring sessions do a great job of covering the material.

There are two quizzes in the course that each have an equal amount of information, with reviews for each quiz afterwards. You will receive feedback at the end of the course on how well you did for each subsection of material (ex: Autoimmune, Skeletal Muscle, Derm, etc.). This is not punitive, it simply allows you to focus your future review of material more usefully.

During the Dermatology section of the course, there is a corresponding clinician led interactive Dermatology session in Colleges that many students found very worthwhile in terms of seeing unique dermatologic clinical scenarios. For the dermatology section, it is a good idea to become very familiar with the images of different skin conditions as they are presented in the lecturers' slides.

Make sure to attend all the review sessions! Dr. Callan and Dr. Goff give very high-yield review sessions that many students found invaluable for the final exam. Note on final exam: it is quite long (>100 questions), and exhaustive in terms of content covered. It will likely be one of, if not the, longest exam you will take during IM blocks, so make sure to attend the final review.

There are tutoring sessions led by upperclassmen SASS tutors that focus on reviewing important concepts. You can either opt to attend these sessions and ask questions in person or review the presented slides sent out after each week's review. These slides include student written practice questions for each lecture.

Hematopoietic Course

Written by: Dustin Buller, Taylor Dess, Ypaul GoldenMerry, Lorraine James, Gunjan Singh, Brian Lue, Mackenzie Parker, Holden Archer

Course Director: Yu-Min Shen, M.D.

Course Co-Directors: Weina Chen, M.D./Ph.D., Lily Huang, Ph.D.

GPA Factors: 2.0 credit hour, P/F

Grading:

TBLs (3): 27%

Final exam: 25%

Midterm exam: 20%

Problem Sets (2): 18%

Histology PBL: 5%

Pathology small group quiz: 2%

Attendance at sessions (3): 3%

Calendar:

Throughout February

Lecture: 9 am – 12 pm most days

Required Activities: TBLs, Pathology Small Group, TBLs, histology PBL, other sessions optional but worth 1% each

Syllabus: The syllabus is very detailed and includes most of the information you will be tested on. This is the main reading material for this course in addition to Robbin's Pathology for the pathology sessions. Each lecturer's syllabus section may have slides, reference articles, and videos to view. All questions on quizzes will come from the syllabus sections and materials provided by the lecturers for any given module.

Textbook: None required, other than Robbin's Pathology for pathology small group sessions

General: This block covers a wide range of subjects: genetic anomalies, biochemical principles about hemoglobin, coagulation, cytopenias, infectious diseases, pulmonary embolisms, and hematologic malignancies - all are fair game. As such, the class feels overwhelming at the beginning because it starts quickly.

Many of the questions you will encounter during this block emphasize clinical integration and building your analytical skills by connecting various pieces of information (clinical information, lab results, histological findings). Hence, studying early and learning the differentials for anemia and properly identifying the various hematologic malignancies with histological descriptions or slides early on will be invaluable. Students found the week 1 problem set review lecture/video helpful as faculty provided

great information on how to process the deluge of information and organize a thought process to answer questions.

Although lectures and tutoring slides cover all material that will be tested, some students may find it difficult to organize complex topics such as the different types of anemias and hematologic malignancies. Pathoma is an excellent outside resource that provides a broad overview of all the different leukemias and lymphomas. It also has a *very* good overview of the high yield hematologic pathologies, though it is a considerable commitment.

Some students find it helpful to study by creating a slide deck (in PowerPoint, Anki, Quizlet, etc..) of each disease learned with a helpful picture or two (histology, rash, etc...), symptoms, any genetic abnormality, and any buzzwords all on the same slide. This can be very time intensive up front, but creates a great study tool come time for the final, not to mention down the road for Step 1. This block is particularly focused on minutiae so this is especially helpful especially in the last couple weeks for the hematologic malignancies and infectious diseases.

Fundamental info is very important: Know the clotting cascade and the names/abbreviations of each component of the pathway!

Histology:

The Histology TBL is a great opportunity to learn to identify the different types of cells. This is an essential part of the course, so it's best to try to learn as soon as possible – it will make the rest of the class easier. Practice identifying each cell types on slides, and be able to explain the difference in function and characteristics between each stage, this will be useful for board prep as well.

Biochemistry/Physiology: Whenever an important biochemical relationship is established or depicted using a graph (eg: Hb binding curve, the types of Hb expressed during development), try to spend time drawing that graph so that reproducing it/remembering it on an assessment becomes easy. Make sure that you *understand* the principles behind the graphs so that you can apply them to questions. Some students found it helpful to use outside resources (e.g. Pathoma, Boards and Beyond) to learn platelet aggregation and the coagulation cascade.

Pathology: For the anemias, familiarize yourself with a flowchart as both an organizational and study tool (an excellent one can be found in First Aid). Ensure that you are also familiar with additional lab and histological findings that help distinguish the anemias; you should be able to distinguish likely causes of an anemia from lab findings and a blood smear alone. It is also helpful to know distinguishing features, symptoms, and associations for some of the causes of anemia (e.g. iron deficiency & pica, B12 deficiency & neuro symptoms).

Make sure to understand the congenital/acquired clotting factor deficiencies, particularly the coagulation testing interpretation (given PT/INR, PTT, bleeding time, and whether they are normal or abnormal). Pathoma and other YouTube videos are very good additional outside resources, if desired.

For the various hematologic malignancies, know the genetic abnormalities, immunohistochemical stains, and histology patterns very well. Many students found Pathoma very helpful to learn the organization.

Blood Borne Infections: (Malaria, CMV, EBV, HIV/AIDs) Many find SketchyMicro helpful; however, the syllabus goes into greater detail than Sketchy. Additionally, some of the questions that will be asked on assessments necessitate the additional level of detail not found in Sketchy. Know the general clinical pictures of these bugs well, malaria treatment resistance, and unique symptoms that differentiates each pathogen.

Pharmacology: Know the functions of antithrombotic therapies and be able to distinguish among them (antiplatelets, anticoagulants, thrombolytics). Be able to distinguish classes of chemotherapeutic agents and their mechanisms of action (don't worry too much about which drugs are good for specific cancers). As with all drugs and therapies, it is useful to know broad classes and their MOAs and then to memorize groups of drugs that fall into those classes. SketchyPharm has excellent videos that many students find helpful, and the material presented in these videos can be reinforced with Anki.

TBL:

The TBL specific syllabus guides are very important, focus mainly on these for preparation. Generally, students found the TBLs for this course to be more challenging than for other courses, so don't be alarmed by the difficulty of the iRAT/gRAT questions. Questions that will appear on the assessments are easier.

Kidney and Genitourinary Course

Written by: Dustin Buller, Taylor Dess, Ypaul GoldenMerry, Lorraine James, Gunjan Singh, Brian Lue, Mackenzie Parker, Holden Archer

Course Director: Biff Palmer, M.D.

GPA Factors: 2.0 credit hour, P/F

Grading:

Final exam: 40%

Quizzes (2): 20%

TBL: 10%

Histology problem set: 5%

Path small group: 5%

PBL attendance: 5%

UTI virtual lab: 5%

SIM: 5%

Epidemiology problem set: 5%

Calendar:

Throughout March; Spring Break occurs immediately following this block

Lecture: 9 am – 12 pm most days

Required Activities: TBL, Pathology Small Group, Gross Tissue Lab and Simulation Lab, CBL (colleges session)

Syllabus: The syllabus is very detailed and includes most of the information you will be tested on. This is the main reading material for this course in addition to Robbin's Pathology for the pathology sessions. Each lecturer's syllabus section may have slides, reference articles, and videos to view. All questions on quizzes will come from the syllabus sections and materials provided by the lecturers for any given module.

Textbook: None, except for Robbin's Pathology for pathology small group sessions

General: Expect to put in more time at the beginning of the course, studying lots for physiology, electrolyte handling, and acid/base problems, with a gradual slowing of pace throughout the pathology and urology sections in the 3rd and 4th week. Also make sure you know if/when you might have phlebotomy training for colleges during this block as this can greatly affect your energy and study time for a week.

Physiology: Make sure you really learn this material, as it will be invaluable for many, many classes and exams (including Step!) to come. Boards and Beyond is an excellent resource for concise explanations, would highly recommend. Doing practice questions (like the ones on the O: drive, see below) to apply the physio concepts you are learning can be helpful. Other paid outside resources, like the Amboss

question bank, can provide more practice questions to reinforce application of physiology concepts (it also doubles as good Step prep).

Some videos you may find helpful:

<https://www.youtube.com/watch?v=5HBdaE9IckI>

<https://www.youtube.com/watch?v=mcQQGGShmLs&list=PLbKSbFnKYVY2NV3CWR7UR9VLRyKvJVpfG>

<https://www.youtube.com/watch?v=l128tW1H5a8>

<https://www.youtube.com/watch?v=4wMEMhvrQxE>

It is also helpful simply to memorize a few nice, non-overwhelming diagrams of the ion channels in each region of the nephron. First Aid has a good set, for example. This will help you to “logic” your way through electrolyte/ion handling.

Electrolyte Handling: First Aid was good for finding acronyms that helped you memorize what you were learning in class (eg MUDPILES, HARDASS), and for simple diagrams of ion channels throughout the nephron.

For potassium, water handling, and acid/base especially, it is extremely helpful to know Dr. Palmer’s “clinical approach” flowcharts. Dr. Palmer will always give you enough lab values in his cases to narrow down to an exact diagnosis using the flowcharts. Memorize them! Best way to reinforce these concepts also is through practice questions.

Pathology: Dr. Sattar of Pathoma does an excellent job of explaining the differences between nephrotic and nephritic syndromes, a foundation you will want to have early in this block. Some students found it helpful to watch once through at the beginning and then again closer to the test as a review. The chart in the syllabus called “Urinalysis findings and selected features of renal disease syndromes” is extremely high yield; it explains the different diagnostic features found in each syndrome. First Aid also has its own division.

Clinical: Some of the best lectures were given by clinicians towards the end of the block, especially those by urology. It was nice because they were the ones closer to the test and were easier to learn while reviewing old material. The microbiology lectures/lab were a series of short online videos produced by Dr. Greenberg that had interactive pre and post lecture questions - they take about twice the amount of time than just streaming one hour-long lecture, but the information presented during the lectures were very helpful and he makes the videos engaging and humorous. Dr. Greenberg also uploaded the powerpoints and questions that he discussed during the virtual lecture onto D2L so that you can review them for the test.

Review of material/practice questions:

There are lots of good resources for practice questions including the tutor slides, the questions from the block three practice final in the O drive, etc. Good to practice trying to recreate the various flowcharts.

<http://library.med.utah.edu/WebPath/EXAM/MULTORG/ren1frm.htm> contains some good practice clinical medicine questions.

Many students found Dr. Palmer's review sessions very helpful – he takes time to go through the high yield concepts and works through practice questions.

TBL: Before the TBL we were emailed about the lectures that would be covered (there were 3-4). The iRAT was fairly detailed but that was taken into account and they made the iRAT grade only 20% of the total TBL (gRAT was 80%). During the TBL we went through patient cases and worked on developing differentials based on clinical information/history/lab data. Before you come to the TBL make sure you have a working understanding of how the renal disorders will present in lab results (i.e: identifying types of acid base disorders by calculating anion gap, determine volume status looking at labs, etc.)

Respiratory Course

Written by: Shantan Cheemerla, Raamis Khwaja, Rohan Kulagara, Subadeep Paul, Shayna Ratner, Brian Lue, Mackenzie Parker, Holden Archer

Co course Directors: Dr. Won Lee and Dr. David Finklea

Associate Directors: Dr. David Greenberg (Microbiology)

GPA Factors: 2.0 credit hour, P/F

Grading – NOTE, subject to change year by year

Final exam:	45%
Problem sets (3):	30%
Histology PBL:	5%
Pathology small group:	5%
Micro quiz:	5%
Pulmonary TBL:	5%
Epidemiology problem set:	5%

Calendar:

Throughout April

Lecture: 9 am – 12 pm most days (some days start at 8 am)

Required Activities: Histology PBL, 3 problem sets, pathology small group, microbiology quiz, epidemiology problem set, Pulmonary Disease TBL, Final Exam

Dr. Lee has a great color-coded course schedule – make sure you refer to this

Syllabus:

Some of the syllabi are book chapter sections from a respiratory textbook (physiology and some of the clinical and microbiologic topics); however, the majority is a traditional syllabi. Make sure if you choose to use them you use the relevant parts – some have extra information (optional additional reading).

It is helpful to break up the syllabus in terms of course content and week. *Pay particular attention to the learning objectives at the beginning, since many test and quiz questions for physiology came from the learning objectives in the syllabus.* Also note that the syllabus contains case studies that are covered in lecture and TBL. These case studies are helpful to look over since they are a great review of the physiology content and are tested on the final exam.

The second portion of the syllabus is a mix of clinical lectures, pathology, and pharmacology. The consensus was that these lectures can be harder to master because they cover such a wide variety of topics and because the organization can be a little confusing. Here is a helpful breakdown:

1. Mainly clinical: Pulmonary history and physical, Radiology, all ENT lectures
2. Mix of clinical and basic: PFTs and Volume Loops (*very important lecture*), Restrictive Lung Disease, Obstructive Lung Disease, Pulmonary HTN, Asthma, Rhinitis & Anaphylaxis
3. Mainly basic (most of the pathology lectures): Neoplastic lung diseases, Upper Respiratory Tract and Obstructive Lung Disease, Restrictive Lung Disease and Pulmonary Vascular Disease, and physiology
4. Pharm: Asthma Treatment, Antihistamines (some basic science here too)

Textbook:

Robbin's Pathology for pathology small group sessions. Costanzo physiology textbook is used for the physiology section. Weinberger's respiratory textbook for few selected chapters. (These will all be included in the syllabus, as mentioned prior!)

General Comments:

This course has undergone some major revisions – as of Spring 2022, there were no quizzes for the class and were replaced with 3 open-note problem sets. These are a great way to make sure you really know the information. They are not timed, so you may find it helpful to try to go through it without any materials and then going through it with notes/class material to see what you missed. This was a good way to learn the material but also make sure we turned in the right answers.

Not having quizzes is a perk as it can allow more time to master the material rather than cramming. However, that can be a double-edged sword – make sure you are keeping up with the material even if there is not an upcoming quiz, as the amount of material can be deceptive. **Note from the course director:** *It is likely that a midterm and quiz will be added for future iterations of this course.*

For the micro quiz, make sure you listen very carefully to Dr. Greenberg during the lab. He will tell you 100% of the information you need for the quiz, but you will miss it if you're not careful. Pay extra attention when he emphasizes anything.

As always, watch Dr. Lee/Finklea's review at the end of the course; they provide very high-yield points that will definitely show up on your final exam!

There are weekly SASS tutoring sessions led by upperclassmen. You can either opt to attend these sessions and ask questions in person or review the presented slides sent out after each week's review. These slides include student written practice questions for each lecture.

Now for some nuanced tips while you are studying:

1. Learn the physiology well. Spend time early in the course reasoning it out. Once you have this part down, it's much easier to recall for the exam. Pulmonary physiology can be frustrating, but it is vital to all the disease processes you will be covering. Pay special attention to the formulas (A-a gradient, blood O₂ content, acid base physiology, and PFTs). **Boards and Beyond videos and the charts in First Aid were a great resource for this.**
2. Clinical lectures in pulmonary can be hard to master. Make sure you know how to differentiate between restrictive and obstructive lung disease from both a physiological and pathological sense, along with which specific pathologies classify as restrictive (e.g. ILF, pneumoconiosis) vs. obstructive (e.g. asthma, COPD).
3. The path lectures in Pulmonary are tested heavily. There is a lot of minute details, but make sure to know these cold. Know the defining characteristics (patient population, location in lung) of various cancers and the paraneoplastic syndromes that can arise with each. The latter in particular is a favorite of board and shelf exams.
4. Microbiology is vital to learn! SketchyMicro is an excellent resource for keeping many of the pathogens straight. Additionally, knowing which pathogens are most common in age groups, particular patient populations (elderly, immunocompromised), and community vs. hospital settings will be useful.

5. Pharm is lighter in this course and with due diligence, can be mastered more easily than in other courses. Watch out for the odd basic science correlation, especially in your Antihistamine Lecture.

Cardiovascular Course

Written by: Mitu Bhattachary, Amber Khan, Rutvi Patel, Matthew Tran, Connie Wang, Brian Lue, Mackenzie Parker, Holden Archer

Course Director: Beth Brickner, M.D.

Co-Director: Archana Dhar, M.D.

GPA Factors: 2.0 credit hour, P/F

Grading:

Final exam: 40%

Midterm: 20%

Physiology quiz: 10%

Pathology small groups (2): 10%

Physiology workbooks: 6%

ECG/ heart sounds/ pharm quiz: 5%

Interactive case sessions (2): 4%

TBL: 3%

Attendance (2): 2%

Calendar:

Throughout May

Lecture: 9 am – 12 pm most days. (Some days have an earlier start. Also, look out for optional activities in the afternoon)

Required Activities: Cardiovascular TBL, Pathology Small Group, Gross Tissue Lab and Simulation Lab, Interactive Case Scenarios on Zoom, Cardiovascular CBL (colleges session), Cardio-Exploration

Syllabus: The syllabus is very detailed and includes most of the information you will be tested on. This is the main reading material for this course in addition to Robbin's Pathology for the pathology sessions. If outside reading material is desired, for the first week of the course, BRS Physiology is a good resource to supplement the cardiovascular physiology material. For the ECG section, Dubin's Rapid Interpretation of ECG is a helpful resource to supplement information provided in the lecture/syllabus and to practice EKG interpretation. Each lecturer's syllabus section may have slides, reference articles, and videos to view. All questions on quizzes will come from the syllabus sections and materials provided by the lecturers for any given module.

Textbook: There is no required textbook. Recommended resources include Robbins Basic Pathology, Dubin's Rapid Interpretation of ECG and BRS Physiology.

General Comments:

There are two quizzes in the course that each had an equal amount of information, with reviews for each quiz afterwards. You will receive feedback at the end of the course on how well you did for each subsection of material (ex: Physiology, TBL iRAT scores, etc.). The first quiz is worth 10% and covers physiology, so it's important to pay close attention to the workbook sessions. The midterm covers physiology in addition to material presented after the first quiz. Make sure that you keep up with

physiology! All the quizzes have questions which have a clinical vignette, have elements derived from other preceding courses, and test your clinical reasoning.

As a general learning tool, the learning objectives are a good way to assess your comprehension of the syllabus, along with doing any and all practice problems provided. Additionally, there are weekly review sessions led by SASS tutors. You can either opt to attend these sessions and ask questions or review the presented slides sent out after each week's review. These slides include student written practice questions for each lecture.

Many people found the optional ECG sessions to be very helpful, especially in preparation for the correlated assessments. Reviewing ECGs is a great way to improve, and there are a few ECG patterns that are vital for the midterm and final (and for the rest of your medical career). The session proved to be a helpful resource for seeing example questions that were very similar to the actual quiz questions.

Specific things to focus on during the Cardiovascular block: Perhaps more so than any other organ block, physiology is *vital*. You will be tested on it *ad nauseum*, from the first quiz and all the way to every single one of your board exams. The first week is a whirlwind of information, so it may be useful to use outside resources to reinforce your understanding of the material. Boards and Beyond is a terrific source for this. This can't be emphasized enough: **learn cardiovascular physiology now**, and your future MS2, MS3, and MS4 selves will thank you.

Many students struggle with ECGs and heart sounds. Unfortunately, as with cardiovascular physiology, there is a virtual guarantee you will be asked questions on these from now until the end of medical school and beyond. The best way to learn is through practice. There are plenty of YouTube videos that are excellent for learning heart sounds; just be sure to use a good pair of headphones or earbuds when listening to the videos.

Learn the drugs very well. They are taught towards the end of the course and involve a lot of details to be memorized (contraindications, adverse effects, multiple therapeutic uses, etc.). Many of the drugs also come up again in later blocks, so learning them well the first time is high yield. They are also heavily tested, so knowing them very well will help for the final. SketchyPharm is an excellent resource for this. Learn the Wiggers diagram. Learn it well and be able to reproduce it from memory. Pathoma is very helpful for the pathology portion of the course.

Push through! It's your last block before summer!