



# I | N | T | E | R | N | A | L medicine

"Medicine is a science of uncertainty and an art of probability"  
- Sir William Osler



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## 2 DESCRIPTION



**Internal Medicine (Third Year): 3 block rotation (12 weeks):** During your 12 week medicine rotation you are expected to meet and exceed the following requirements and challenge yourself, to be proactive learners and ask questions. This rotation is supposed to acquaint the student with the varied aspects of medical care for adults. This will be accomplished through rotating through the various subspecialties in medicine. There will be a larger emphasis on enhancing the skills of taking a complete history, performing a physical examination, presentations, developing a differential diagnosis for common clinical presentations and problems and finally, developing evidence-based high-value care plans. Most students will see a mix of patients in the office setting as well as in the inpatient setting while other students will only be seeing patients as inpatients.

Also remember that there is more than studying for “BOARDS.” Just because the you might think some of topics covered either in the readings or online questions are not “BOARD” relevant does not mean you should not know it, or be expected to know it. The boards likely will not expect you to know the components of the CHA<sub>2</sub>DS<sub>2</sub>-VAsC score and how to clinically apply it but it is still important to know and understand.

If there is a problem with one of the reading likes or questions please email me directly, [travis.smith@lecom.edu](mailto:travis.smith@lecom.edu).

### 3 REQUIREMENTS

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- Complete all reading requirements while on your respective Family Medicine Rotation including text book and online readings.
  - Students are encouraged to supplement required readings with additional readings based on your specific rotation exposures.
  - 10 hours per week of outside clinical reading.
- Complete the Weekly Online Questions of the Day in the coursework section
- Complete the online End of Rotation Quiz (Worth 20% of your final grade)
- Students MUST adhere to the ACGME rules regarding the workweek, which include working no more than 80 hours per week, no more than 24 hours continuously, except an additional 6 hours may be added to the 24 to perform wrap-up duties, and have at least one of every 7 days completely off from educational activities.
- Extended absences from the clerkship are not permitted. Any absence from the clerkship must be pre-approved by the regional campus dean prior to the beginning of the clerkship.

### 4 MATERIALS: REQUIRED AND SUPPLEMENTAL

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- Harrison's Principles of Internal Medicine: Volumes 1 and 2, 18th Edition **(Required)**
- Washington Manual of Medical Therapeutics, 35th Ed. (2016)- **(Required and free using Stat Ref)**
  - To access this text you must be logged into portal, then use this [hyperlink](#) and click Stat Ref. From there accept the terms and check the box of the desired textbook you want to review.
- Step Up to Medicine **(Required)**
  - Very thorough. Outline format. Separated by body systems. If it's not in this book, it will not be on the exam. Very long and can take a very long time to read. Need to read more than once in order to really take in all of the information contained in this book. Impossible if reading is not started the first week of the rotation.
- American Osteopathic Association. (2011). *Foundations for Osteopathic Medicine*. Philadelphia: Chila, Anthony G. Lippincott Williams and Wilkins. Foundations for Osteopathic Medicine 3rd ed., 2011 **(Required)**
- An Osteopathic Approach to Diagnosis and Treatment, DiGiovanna, Eileen L.; Schiowitz, Stanley; Dowling, Dennis J. (Eds.). (2005). *An Osteopathic Approach to Diagnosis and Treatment* (3rd ed.). Philadelphia: Lippincott Williams & Wilkins. **(Required)**
- OMT Review; A Comprehensive Review in Osteopathic Medicine, Savarese, Robert G.; Capobianco, John D.; Cox, James J. Jr. (2003). *OMT Review; A Comprehensive Review in Osteopathic Medicine*. S.I: Savarese. **(Required)**
- **Supplemental Readings:** To use the texts below you must be logged into the portal. Use this [hyperlink](#) then click Stat Ref. From there accept the terms and check the box of the desired textbook you want to review.
  - Scientific American Medicine: The chapters from this book are used as required clinical reading while on your rotations.
  - Evidence- Based Cardiology **(Supplemental)**
  - Infectious Diseases: The Clinician's Guide to Diagnosis, Treatment, and Prevention **(Supplemental)**
  - Textbook of Gastroenterology **(Supplemental)**
  - Medicine Resources for your boards and Shelf: Begin reading Step Up the first day of the rotation. Try to get through it twice before the subject exam. I would also get case files as well. Do USMLE world questions every day, to prepare yourself for the length of the vignettes.
    - Case Files: Internal Medicine: Presents common internal medicine subjects in the form of clinical vignettes similar to the subject exam. Relatively complete. Probably the 2nd best internal medicine subject exam resource. Not as much info as Step Up. Not separated into body systems, just random cases.

- Blueprints: Medicine: Presents common internal medicine subject in paragraph format. Not as informative to Step Up, Comparable to Case Files, just a different format. Contains practice questions at the end of the book. Could easily pass the exam using this resource.
- High Yield Internal Medicine: High Yield Not a complete resource by any means. Contains high yield, useful topics for the exam. Do not use this as your sole resource unless you really know your stuff or you are in a serious time crunch. Great if used as an adjunct to another book, especially the week before the exam.

## 5 EVALUATION: (EFFECTIVE JUNE 2017)

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- 50% based on rotation evaluation
- 30% based on the shelf examination
- 20% based on completion of the end of rotation quiz (50 questions) and completion of the weekly quizzes (the weekly quiz grades will not factor into your end of rotation quiz grade).
  - The end of rotation exam is due on the last Sunday of your rotation by 10PM eastern and will not be accepted late!
    - If you fail to complete the exam or fail turn it in on time (even 1 minute late), you are still required to take the make-up exam (while still receiving a 0% towards your grade)
    - If you then fail the makeup exam (<70%) or fail to take it completely by the end of your next rotation then you will be required to repeat the entire rotation during your elective month.

## 6 GOALS AND OBJECTIVES

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The Internal Medicine Clerkship will help students focus on developing the basic skills needed to succeed on their clerkship. The following are a list of goals for each student should focus on improving during their rotation:

- Clinical reasoning and patient communication skills with emphasis on advanced medical interviewing skills and hypothesis testing
- Basic and advanced case presentation skills including formal case presentations, calling consults, sign-out rounds and discharge planning rounds
- Applying physical examination skills to clinical reasoning
- Case write-up skills
- Interpretation of EKGs
- Interpretation of basic radiographs
- Interpretation of basic laboratory tests
- Evaluation of evidence in patient management
- Safe discharge planning skills

The following objectives should clearly outline expectations for each student by the end of their 12 week Internal Medicine Clerkship. Please review them carefully.

### 6.1 MEDICAL KNOWLEDGE

Demonstrate knowledge about established and evolving biomedical, clinical, and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to patient care.

- Apply pertinent basic science principles to patients with internal medicine problems
- Analyze pathophysiological principles to understand why patients develop signs and symptoms from various diseases. For example:
  - Explain shortness of breath and orthopnea secondary to heart failure
  - Explain referred pain from a myocardial infarction
  - Compare Polyuria in diabetes mellitus and diabetes insipidus
  - Contrast weakness due to anemia with neurological weakness
- Apply basic pharmacological principles to the treatment of common internal medicine diseases

- Hypertension, diabetes, coronary artery disease, congestive heart failure, chronic obstructive pulmonary disease, peptic ulcer disease, depression

## 6.2 PATIENT CARE

Provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.

- Demonstrate proficiency in obtaining a history from an adult patient
- Perform and record a complete physical examination in a logical, organized, and thorough manner for new patients and an appropriately focused physical examination for follow up patients. Specific physical examination skill we expect students to master by the end of the third year medicine clerkship includes:
  - Abnormal lung sounds: Be able to identify pulmonary crackles and wheezes.
  - Abnormal heart sounds: Be able to identify extra heart sounds (S3, S4, pericardial friction rubs), systolic vs. diastolic murmurs, and specifically aortic stenosis and mitral regurgitation.
  - Abnormalities related to liver disease: Be able to recognize and describe stigmata of liver disease including findings consistent with ascites, spider angiomas, palmar erythema, jaundice/scleral icterus
- Perform a problem focused physical examination on an adult patient
- Formulate and document an assessment that includes the relevant differential diagnoses based on data gathered to guide initial diagnostic evaluation and disease management.
  - Recognize when additional information is needed to care for the patient and demonstrate ongoing commitment to self-directed learning.
  - Demonstrate ability to answer clinical questions using evidence-based medicine.
  - Analyze gaps in knowledge and skills and see resources including assistance from colleagues to address gaps.
  - Consider factors when performing diagnostic testing, including pretest probability, performance characteristics of tests (sensitivity, specificity, and likelihood ratios) and cost, risk and patient preferences and interpret these tests.
- Formulate a differential diagnoses for common presenting symptoms of adult disease
  - Chest pain
  - Abdominal Pain
  - Low back pain
  - Lethargy and fatigue
  - Headache
  - Breathing difficulty
  - Depression and anxiety
- Develop specific motor skills necessary to perform procedures on IM patients
  - Demonstrate the proper use of the otoscope and ophthalmoscope
  - Describe the proper technique for a lumbar puncture, thoracentesis and central venous pressure line insertion
- Detect common potentially serious medical diseases.
  - Breast Cancer – Perform a routine breast exam
  - Cervical Cancer – Perform a PAP smear
  - Colon Cancer – Perform a stool occult blood test
  - Prostate Cancer – Perform prostate examination
  - Dyslipidemia
- Evaluate the preoperative patient with medical disease.
  - Identify those medical problems, which place the patient at risk and develop preliminary strategies to minimize those risks.
- Obtain and understand important supplemental information, including CBC, serum chemistries, ABG, coagulation studies, ECG, chest x-ray, and urinalysis.
- Manage the medical condition of the postoperative patient.
  - Identify those medical problems, which can potentially interfere with a patient's recovery and develop preliminary strategies to solve those problems.
- Evaluate the undifferentiated adult patient.
- Given a patient in the office or Emergency Room setting, conduct a history and physical examination to formulate a differential diagnosis.

### 6.3 INTERPERSONAL AND COMMUNICATION SKILLS

Demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their patients families, and professional associates.

- Develop communication skills that facilitate the transfer of information to persons from a different cultural or socioeconomic background.
- Utilize communication skills necessary to care for dying patients and their families
- Orally present a new patient's history and physical examination clearly and with appropriate detail. This is typically performed with the attending or resident one-on-one and feedback is given at that time, though this can occur as part of rounds.
- Write cogent, clear progress notes documenting working diagnosis and status of diagnostic evaluation and therapeutic plans. Students practice this by writing daily progress notes on all their patients.

### 6.4 PRACTICE-BASED LEARNING AND IMPROVEMENT

Investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices.

- Identify and utilize the sources for dissemination of new information regarding the practice of internal medicine
- Identify and utilize evidence-based medicine guidelines in the field of internal medicine
- Apply these principles to regular health maintenance

### 6.5 SYSTEMS-BASED PRACTICE

Demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.

- Employ a team oriented approach to problem solving in internal medicine
- Consult other physicians and health care providers in a manner that maximizes patient care and minimizes communication barriers.
- Question the increasingly larger role that financial considerations play in medicine
- Advocate for the needs of the patient, in light of society's inability to provide unlimited resources to everyone

### 6.6 PROFESSIONALISM

Professionalism should imbue all aspects of your performance. Medicine as a whole will continue to evolve and change but this aspect of your character will stick with you forever. Demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

- Exemplify those behaviors identified by the American Board of Internal Medicine that comprise professionalism. Those characteristics include altruism, accountability, excellence, duty, honor, integrity, and respect for others.
- Altruism: the best interest of the patient must come before the interests of the doctor
- Accountability: accountability to patients, to patients' families, to their colleagues and to society
- Excellence: an effort to exceed ordinary expectations
- Duty: a commitment to service
- Honor and integrity: a commitment to the highest standards of personal and professional behavior
- Respect for others: the essence of humanism. This includes respect for patients, their families, colleagues, nurses, students and residents and other medical personnel.
- Displaying good manners
- A commitment to caring for all patients regardless of their medical diagnoses or social factors.
- Displaying sensitivity to cultural differences
- Avoiding confrontations
- Demonstrate a positive attitude towards learning by showing intellectual curiosity, initiative, honesty, integrity, and dedication.
- Showing discernment while avoiding deception when communicating with patients and their families
- Effectively communicates empathy

- Showing intellectual curiosity
- Accepting responsibility for your patients
- Being prepared and on-time
- Being dependable
- Reliable attendance and participation
- Strive for excellence
- Not passing others' work off as your own
- Actively seek to broaden education and experience beyond clerkship requirements
- Avoid complaining
- Give feedback (including filling out course and teaching evaluations in a timely manner)
- Convey humility

## 6.7 CLINICAL TOPICS

- Each student must be able to demonstrate an understanding of the clinical presentation, basic physiology, key physical findings, evaluation and management of the following diseases that are frequently encountered in an inpatient medical setting:
  - **Diseases of the Cardiovascular System**
    - Ischemic Heart Disease
    - Arrhythmias
      - Tachyarrhythmias
      - Bradyarrhythmias
    - Diseases of the Heart Muscle
    - Pericardial Disease
    - Valvular Heart Disease
    - Congenital Heart Disease
    - Disease of the Vasculature
    - Cardiac Neoplasms
  - **Diseases of the Pulmonary System**
    - Obstructive Lung Disease
    - Lung Neoplasms
    - Diseases of the Pleura
    - Interstitial Lung Disease
    - Diseases of the Pulmonary Vasculature
  - **Diseases of the Gastrointestinal System**
    - Diseases of the Colon
    - Diseases of the Liver
    - Diseases of the Gallbladder and Biliary Tract
    - Diseases of the Appendix
    - Diseases of the Pancreas
    - Gastrointestinal Bleeding
    - Diseases of the Esophagus
    - Diseases of the Stomach
    - Diseases of the Small Bowel
    - Inflammatory Bowel Disease
  - **Endocrine and Metabolic Diseases**
    - Diseases of the Thyroid Gland
    - Diseases of the Pituitary Gland
    - Diseases of the Parathyroid Glands
    - Diseases of the Adrenal Glands
    - Diseases of the Pancreas
  - **Diseases of the Central and Peripheral Nervous System**
    - Stroke

- Movement Disorders
- Tremor
- Dementia
- Altered Mental Status
- Demyelinating Disease
- Neuromuscular Disease
- Neurocutaneous Syndromes
- Spinal Cord Disease
- **Connective Tissue and Joint Disease**
  - Connective Tissue Diseases
  - Rheumatoid Arthritis
  - Crystal Induced Arthritides
  - Myopathies and Pain Syndromes
  - Seronegative Spondyloarthropathies
  - Vasculitis
- **Diseases of the Renal and Genitourinary System**
  - Renal Failure
  - Proteinuria and Hematuria
  - Glomerular Disease
  - Tubulointerstitial Diseases
  - Renal Cystic Diseases
  - Renal Vascular Diseases
  - Stones and Obstructions
  - Neoplasms
- **Fluids, Electrolytes, and Acid-Base Disorders**
  - Volume Disorders
  - Sodium
  - Calcium
  - Potassium
  - Magnesium
  - Phosphate
  - Acid-Base Disorders
- **Hematological Diseases and Neoplasms**
  - Anemias
  - Platelet Disorders
  - Disorders of Coagulation
  - Anticoagulation
  - Plasma Cell Disorders
  - Lymphoma
  - Leukemia
  - Myeloproliferative Disorders
- **Infectious Diseases**
  - Infections of the Upper and Lower Respiratory Tract
  - Infections of the CNS
  - Infections of the Gastrointestinal Tract
  - Infections of the Genitourinary Tract
  - Sexually Transmitted Disease
  - Wound and Soft Tissue Infections
  - Infections of the Bones and Joints
  - Zoonosis and Arthropod-Borne Diseases
  - Common Fungal Infections
  - Common Parasitic Infections
  - Fever and Sepsis
- **Diseases of the Skin and Hypersensitivity Disorders**

- Acne
- Anaphylaxis and Hypersensitivity Reactions
- Approach to the Diagnosis of Skin Disease
- Atopic Dermatitis
- Cellulitis and Soft-Tissue Infections
- Cutaneous Adverse Drug Reactions
- Cutaneous Manifestations of Systemic Diseases
- Nail disorders and systemic disease
- Psoriasis

## 6.8 INPATIENT MEDICINE OBJECTIVES

Each student should be able to effectively apply all of the following objectives by the end of their 12 week Internal Medicine rotation:

- Perform an independent history and physical examination, with special focus to the nature of the encounter (new vs. follow up) or complaint (complete vs. focused).
- Demonstrate proficiency in specific physical exam and communication skills.
- Show empathy on each patient encounter.
- Identify and prioritize problems with which a patient presents, appropriately synthesizing these into logical clinical syndromes.
- Through acquired clinical reasoning skills, be able to formulate a differential diagnosis based on the findings from the history and physical exam.
- While considering test factors/characteristics, including their invasiveness, risks, benefits, limitations, and costs, each student must be able to construct an in-depth differential diagnosis to help guide diagnostic test ordering,
- Reasonably interpret laboratory and imaging tests.
- Formulate an initial and daily therapeutic plan based on diagnostic reasoning and scientific evidence.
- Adequately and legibly document a history, physical examination, and assessment and plan
- Present a complete history and physical examination findings, including an assessment and plan, modifying the presentation to fit the clinical situation.
- Describe and explain medical information in understandable terms to patients and families
- Become familiar with how to communicate life altering news to patients and families.
- Demonstrate inter-professional communication skills including giving appropriate feedback and respect to all members of the participating healthcare team.

## 6.9 OSTEOPATHIC PHILOSOPHY AND OSTEOPATHIC MANIPULATIVE MEDICINE

**Each student must be familiar with the following OMM learning objectives during each respective rotation. These objectives correlate with the specific reading assignments designated in the required readings sections:**

*“The role of the artery is supreme, The Osteopaths foundation is that all the blood must move all the time in all parts to and from all organs,” –Andrew Taylor Still*

### 6.9.1 Rotation 1: OMM Cardiology Objectives:

- How to effectively identify, diagnose, and correctly apply OMT in the treatment of patients with common cardiovascular problems:
  - ❖ Congestive heart failure
  - ❖ Coronary artery spasm
  - ❖ Hypertension
  - ❖ Lower Extremity Edema
  - ❖ Myocardial Infarction
  - ❖ Arrhythmias and Palpitations
- Understand the fundamentals of the osteopathic philosophy which is most notably present in the cardiac patient who presents with chest pain (cardiac nociception) whereby this renowned osteopathic concept is expressed with the examples of the structure-function relationship evidenced in viscerosomatic pain.

- Describe the physiologic factors associated with the circulatory system including acute and chronic heart disease, how it affects the musculoskeletal system, and be able to describe the important impact and effects of the lymphatic system on the function of the cardiovascular system.
- Be familiar with the impact and effects of the autonomic nervous system on the function of the cardiovascular system and describe the levels for the parasympathetic and sympathetic contributions in the control of the heart
- Be familiar the other common disorders of chest and thoracic cage that can mimic and cause “chest pain” such as:
  - ❖ Costochondritis
  - ❖ Costochondral separation
  - ❖ Rib fractures
- Be familiar with the changes of the musculoskeletal system that occur in patients with acute and chronic heart failure.
- Be familiar with the American College of Cardiology/American Heart Association College of Cardiology guidelines for initial evaluation of heart failure.
- Be familiar with the most common somatic dysfunctions and Chapman’s points found in patients with cardiac disease, hypertension, arrhythmias, and palpitations.
- Identify the common somatic dysfunctions of the ribs, sternum, clavicle, costovertebral articulation, and the scapulae.
- Understand the role of musculoskeletal medicine in the adult patient with chronic cardiovascular disease and be able to construct a rationale for the role of osteopathic treatment to assist in the restoration of homeostasis by applying the following five pathophysiologic models:
  - ❖ **Biomechanical model:**
  - ❖ **Respiratory-circulatory model:**
  - ❖ **Neurological model:**
  - ❖ **Metabolic-energy model:**
  - ❖ **Behavior model:**
- Identify the major elements of the cardiovascular anatomy and physiology below:
  - ❖ The heart – atria, ventricles, SA node, AV node.
  - ❖ The autonomic nervous system (right deep plexus, left deep plexus, and superficial plexus) and its preferred parasympathetic dominance
  - ❖ The carotid body and sinus.
  - ❖ The sympathetic innervation (lateral chain ganglia, T1-T5, cervical chain ganglia) and the complications that arise when overstimulated.
  - ❖ T10-L2 aorticorenal ganglion, celiac plexus, splanchnic
  - ❖ The parasympathetic innervation (vagus nerve)
  - ❖ Lymphatics chest, abdomen, pelvis
- Understand the concepts and connection between depression, anxiety, social isolation, effects on the allostatic load, and their outcomes in patients with heart failure.
- Describe the structural and viscerosomatic reflexes and changes that occur during heart failure and other above chronic cardiovascular diseases. Some common examples of changes in patients with CHF include the following:
  - ❖ Downregulation of beta receptors
  - ❖ Increased diastolic dysfunction
  - ❖ Increased wedge pressure
  - ❖ Impaired pulmonary diffusion
  - ❖ Muscle changes
  - ❖ Myocyte Apoptosis
  - ❖ Reduced capillary density
  - ❖ Change from fatigue resistant to fatigable
  - ❖ Change from anaerobic activity and increased lactic acid
  - ❖ Enhanced ergoreceptors and mechanoreceptors
  - ❖ Diaphragm change from type 2 to type 1 fibers
  - ❖ Structural changes affecting pre-load and after-load
  - ❖ Structural issues that can affect the oxygen demand of the body
  - ❖ Diminished parasympathetic tone
- Have a clear understanding of how OMT aimed improving lymphatic drainage, improves somatic dysfunctions, and balances the sympathetic and parasympathetic arms improve patient outcomes.
- List and perform key diagnostic techniques in the structural diagnosis of a patient as it relates to common cardiovascular problems causing somatic dysfunctions in the thoracic region and rib cage as well as the following:
  - ❖ Thoracic soft tissue diagnosis of the related sympathetic areas.
  - ❖ Thoracic skeletal/arthrodial diagnosis of the related sympathetic areas.

- ❖ Rib cage diagnosis of symmetry, motion and respiratory effort.
- ❖ Fascial assessment of the thoracic and lumbar secondary chain ganglia.
- ❖ OA and sacral soft tissue diagnosis of the related parasympathetic areas.
- ❖ OA and sacral skeletal/arthrodial diagnosis of the related parasympathetic areas
- List, relate and perform the following key OMT techniques utilized in the treatment of common cardiovascular problems:
  - ❖ Condylar decompression
  - ❖ Balanced Ligamentous Tension
  - ❖ Facilitated positional release
  - ❖ Indirect rib techniques
  - ❖ Indirect sacrum
  - ❖ Lymphatic pump techniques
  - ❖ Muscle energy and counterstrain techniques for the ribs
  - ❖ Myofascial release thoracic, lumbar, secondary chain ganglia
  - ❖ PINS technique
  - ❖ Redome diaphragm
  - ❖ Release thoracic inlets
  - ❖ Rib raising
  - ❖ Soft tissue stretch, knead, parasympathetic inhibition

### 6.9.2 Rotation 2: OMM Pulmonology Objectives:

- How to effectively evaluate, diagnose, demonstrate a constructive clinical approach, and apply OMT in the treatment of the patient with difficulty breathing and patients with the following common pulmonary problems:
  - ❖ Asthma
  - ❖ Bronchitis
  - ❖ Chronic Obstructive Pulmonary Disease (COPD)
  - ❖ Pneumonia
- Be able to list an adequate differential diagnosis and initial work up for dyspnea and hypoxemia in an elderly male with history of COPD and cardiovascular disease.
- Be familiar with the two main pathophysiological events of asthma and COPD that are mediated by the vagus nerve.
- Be familiar with the common 4 goals of treatment in patients presenting with bronchitis and pneumonia.
- Apply the five pathophysiologic models for musculoskeletal medicine for an adult patient presenting with shortness of breath:
  - ❖ **Biomechanical model:**
  - ❖ **Respiratory-circulatory model:**
  - ❖ **Neurological model:**
  - ❖ **Metabolic-energy model:**
  - ❖ **Behavior model:**
- Be familiar with the common physiological changes seen in COPD and Asthma such as chest cage compliance, diaphragmatic excursion changes in FEV1, FVC, total lung capacity, residual volume, and peak flow, and changes in sympathetic and parasympathetic innervations.
- Be familiar with the common musculoskeletal changes and areas of restriction seen in patients with COPD.
- Be familiar with the basic physiology of respiration, effectively evaluate all the components involved in respiration, and be able to identify the major elements of the pulmonary anatomy:
  - ❖ Central tendon – attachments, crura
  - ❖ Cervical chains
  - ❖ Diaphragm
  - ❖ Excursions – inspiration, expiration
  - ❖ Fissures and lung lobes
  - ❖ Lymphatic drainage
  - ❖ Lymphatic- Inlet/Outlet- Diaphragm
  - ❖ Muscles of respiration- Intercostal, pectoralis major, pectorales minor, subcostal, serratus posterior, serratus anterior, Lavatories – cost arum, trapezius, latissimus dorsa, rectus abdominis, sternocleidomastoid, platysma, Strap – hyoid, thyroid
  - ❖ Nerve supply- C3, 4, 5 (phrenic nerve), sympathetic (Phonic), and parasympathetic (vagus)
  - ❖ Pleura and pulmonary ligaments
  - ❖ Rib cage motion

- ❖ Sibson's fascia
- ❖ Thoracic duct
- ❖ Thoracic wall anatomy - Sternum- Ribs- Vertebra
- Be familiar with the effect of risk factors from smoking on loss of lung function (FEV1).
- Identify and understand the major elements of the following pulmonary physiology topics and specific OMT applications:
  - ❖ The most common somatic dysfunctions found in patients with lung disease.
  - ❖ The most common reflexes involving the vagus nerve.
  - ❖ The most common rib somatic dysfunctions present in the asthmatic patient.
  - ❖ The different type of somatic dysfunction present when pneumonia coexists with COPD
  - ❖ The spinal segments most likely to become facilitated with acute and chronic lung disease.
  - ❖ The effects of thoracic somatic dysfunction and the changes in orientation of functioning of the ribs and costal articulations.
  - ❖ The structural areas affected by sympathetic viscerosomatic reflex.
  - ❖ The structural areas which may play a role in vagal nerve facilitation.
  - ❖ The pulmonary effects of increased parasympathetic tone.
  - ❖ The pulmonary effects of increased acute and chronic sympathetic activation.
  - ❖ The posterior Chapman's points for lung dysfunction.
  - ❖ The common rib dysfunctions found as a result of paroxysmal coughing.
  - ❖ The effects of OMT on the changes in chest cage compliance and diaphragmatic excursion.
  - ❖ The effects of OMT focused on facilitating normal posture and function
  - ❖ The effects of OMT assisting in improvements in FEV1, FVC, total lung capacity, residual volume, and peak flow.
  - ❖ The effects of using OMT to alter the sympathetic and parasympathetic innervations.
  - ❖ The effects of using OMT and how it influences respiratory functions, augmentation of the lymphatic pump by increasing lymphatic drainage, increasing venous return, and enhancing negative intrathoracic pressure.
  - ❖ The effects of using OMT and how it decrease secretions, improves venous return, increases lymphatic drainage, and relieves and induces bronchospasm.
- Be able to diagnose and treat the following conditions using OMT:
  - ❖ Motion of 3-5 diaphragms
  - ❖ Rib motion - bucket/pump handle
  - ❖ Clavicle and sternal angle dysfunction
  - ❖ Cervical, thoracic, lumbar, and abdominal somatic dysfunction
- Be familiar with the 7 techniques that are suggested in the OMT protocol for treating patients with COPD.
- Be familiar with the recommended treatment intervals in the office setting in patients with COPD and in those presenting with acute asthma exacerbations.
- In addition to understanding the above protocol, be able to demonstrate the following key OMT techniques utilized in the treatment of common pulmonary problems:
  - ❖ Balanced ligamentous tension
  - ❖ Diaphragm release (thoracic inlet, abdominal, pelvic)
  - ❖ Facilitated Positional Release: T1-12
  - ❖ HVLA (if no contraindications apply)
  - ❖ Indirect technique for hyoid release
  - ❖ Lymphatic pump/effleurage
  - ❖ Muscle Energy: T1-12
  - ❖ Myofascial release to the thoracic cage and diaphragm impediments
  - ❖ Osteopathy in the cranial field (freeing the occipitoatlantal joint)
  - ❖ Paraspinal inhibition of the cervical region and suboccipital release influencing parasympathetic input to the lungs
  - ❖ PINS technique
  - ❖ Release thoracic inlet/Sibson's Fascia
  - ❖ Rib raising
  - ❖ Spencer techniques to the upper extremities
  - ❖ Springing technique for sternal angle

### 6.9.3 Rotation 3: OMM Neurology Objectives:

- How to effectively evaluate and diagnose, and apply OMT in the treatment of adult patients with that present with dizziness and vertigo.
- Be able to perform an accurate history and physical on a patient presenting with dizziness as it often presents a perplexing challenge for its diagnosis and treatment.

- Be familiar with the intricate interaction of three primary sensory inputs to the balance system, its two central processing areas, and the two primary motor responses that balance depends on.
- Understand the relevant functional anatomy and physiology of balance as well as the following different reflexes:
  - ❖ Vestibuloocular reflex
  - ❖ Vestibulospinal reflex
  - ❖ Vestibulocollic reflex
  - ❖ Cervico-ocular reflex
- Be familiar with the five most common causes of dizziness as well as each specific disease pathophysiology and treatment.
- Be able to apply the five pathophysiologic models for musculoskeletal medicine for the patient presenting with dizziness:
  - ❖ **Biomechanical model**
  - ❖ **Respiratory-circulatory model**
  - ❖ **Neurological model**
  - ❖ **Metabolic-energy model**
  - ❖ **Behavior model**
- Be familiar with the most common somatic manifestations of vestibular disease.
- Be familiar with the common OMT techniques used to help improve the following:
  - ❖ Normalize proprioceptive inputs
  - ❖ Improve range of motion
  - ❖ Promote venous and lymphatic circulation
  - ❖ Balance neurological reflexes
- Be familiar with and understand the anatomy of the central nervous system, its structures and their individual functions.
- Understand the course and function of all cranial nerves, their individual innervation including the following:
  - ❖ The 3 types of motor innervation
  - ❖ The 3 types of sensory innervation
- Be familiar with the common impingement neuropathies
- Be familiar with and understand the pathophysiology of Reflex Sympathetic Dystrophy including the following topics:
  - ❖ The proposed mechanism of pain
  - ❖ Common physical exam findings
  - ❖ Steps and keys to prevention
  - ❖ The common somatic dysfunctions, surgical and OMT treatment options.
- Be familiar with and understand the pathophysiology of Parkinson's Disease including the following topics:
  - ❖ List the common adopted postures and gait abnormalities
  - ❖ Know the several facets of Parkinson's complex that respond osteopathic manipulation
  - ❖ List the accomplishments achieved by instituting a combination of manipulation, physical therapy, and strength training.
  - ❖ Be familiar with the studies that demonstrate the benefits of osteopathic manipulation.
  - ❖ Know the most helpful OMT techniques
    - Understand the role and concepts of osteopathy in the cranial field in those with Parkinson's.
  - ❖ List the least helpful OMT technique
- Be familiar with and understand the pathophysiology of Bell's Palsy including the following topics:
  - ❖ Its commonly associated somatic dysfunction
  - ❖ OMT techniques used to treat associated facial pain and improve lymphatic and venous flow

## 7 REQUIRED READING

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During your clinical rotations these articles are to be read during each respective rotation while on the wards. They are broken down into 3 sections and should supplement your other required readings while on your rotation. The questions and quizzes are not entirely pulled from these articles but the topics tested each week are congruent.

## 7.1 ROTATION 1 READINGS

- **Week 1: Diseases of the Cardiovascular System**
  1. [Abdominal Aortic Aneurysm: In the Clinic](#)
  2. [Acute Coronary Syndrome: AAFP](#)
  3. [Atrial fibrillation: In the Clinic](#)
  4. [Aortic Stenosis: In the Clinic](#)
  5. [CHF: Systolic Dysfunction: In the Clinic](#)
  6. [CHF Diastolic Dysfunction: In the Clinic](#)
  7. [Ischemic Heart Disease: In the Clinic](#)
  8. [Pericarditis: In the Clinic](#)
  9. [Preoperative Evaluation: In the Clinic](#)
  10. [Syncope: The Evaluation of Syncope: AAFP](#)
  11. American Osteopathic Association, and Anthony Chila. **Chapter 55: Adult with Chronic Cardiovascular Disease.** *Foundations of Osteopathic Medicine, 3rd ed.* Baltimore, MD: Lippincott Williams & Wilkins, 2011, pp. 889-902.
  12. DiGiovanna, Eileen L.; Schiowitz, Stanley; Dowling, Dennis J. (Eds.). (2005). **Chapter 113: Circulatory System.** *An Osteopathic Approach to Diagnosis and Treatment (3rd ed.)*. Philadelphia: Lippincott Williams & Wilkins. pp. 594-597.
  13. DiGiovanna, Eileen L.; Schiowitz, Stanley; Dowling, Dennis J. (Eds.). (2005). **Chapter 113: Cardiac Applications.** *An Osteopathic Approach to Diagnosis and Treatment (3rd ed.)*. Philadelphia: Lippincott Williams & Wilkins. pp. 624-630.
  
- **Week 2: Diseases of the Skin and Hypersensitivity Disorders**
  1. [Approach to the Diagnosis of Skin Disease](#)
  2. [Anaphylaxis and Anaphylactoid Reactions](#)
  3. [Cellulitis and Soft-Tissue Infections: In the Clinic](#)
  4. [Cutaneous Adverse Drug Reactions](#)
  5. [Cutaneous Malignant Disorders](#)
  6. [Cutaneous Manifestations of Systemic Diseases](#)
  7. [Nail disorders and systemic disease: CCJM](#)
  8. [Psoriasis: In the Clinic](#)
  
- **Week 3: Diseases of the Gastrointestinal System**
  1. [Acute Liver Failure NEJM](#)
  2. [Cirrhosis and Chronic Liver Failure: Diagnosis and Evaluation: AAFP](#)
  3. [Cirrhosis: Does This Patient With Liver Disease Have Cirrhosis: JAMA](#)
  4. [Clostridium Difficile Infection: In the Clinic](#)
  5. [Diverticulitis: NEJM Review](#)
  6. [Gastrointestinal Bleeding: In the Clinic](#)
  7. [Hepatitis C: In the Clinic](#)
  8. [Hepatitis B Diagnosis and Treatment: AAFP](#)
  9. [Jaundice in the Adult Patient: AAFP](#)
  10. [Pancreatitis: In the Clinic](#)
  
- **Week 4: Endocrine and Metabolic Diseases**
  1. [Adrenal Mass: The Incidentally Discovered Adrenal Mass](#)
  2. [Diabetes Type 2: In the Clinic](#)
  3. [Diabetic Ketoacidosis: In the Clinics](#)
  4. [Hirsutism in Women: AAFP](#)
  5. [Hyperthyroidism: In the Clinic](#)
  6. [Hypothyroidism: In the Clinic](#)

7. [Hypoparathyroidism: NEJM](#)
8. [Pituitary Adenomas: An Overview: AAFP](#)
9. [Primary Hyperparathyroidism: NEJM](#)

## 7.2 ROTATION 2 READINGS

### ○ **Week 1: Diseases of the Pulmonary System**

1. [Asthma: In the Clinic](#)
2. [Asthma and Chronic Obstructive Pulmonary Disease Exacerbations: Similarities and Differences](#)
3. [Asthma and COPD: Intravenous or oral steroids: Which is better for acute exacerbations?](#)
4. [COPD: In the Clinic](#)
5. [Pleural Effusion Review](#)
6. [Obstructive Sleep Apnea: In the Clinic](#)
7. [Pneumonia: In the Clinic](#)
8. [Pulmonary Hypertension: In the Clinic](#)
9. [Sarcoidosis: In the Clinic](#)
10. American Osteopathic Association, and Anthony Chila. **Chapter 59: Difficulty Breathing.** *Foundations of Osteopathic Medicine, 3rd ed.* Baltimore, MD: Lippincott Williams & Wilkins, 2011, **pp. 931-938.**
11. DiGiovanna, Eileen L.; Schiowitz, Stanley; Dowling, Dennis J. (Eds.). (2005). **Chapter 112: Pulmonary Applications.** *An Osteopathic Approach to Diagnosis and Treatment (3rd ed.)*. Philadelphia: Lippincott Williams & Wilkins. **pp. 618-623.**

### ○ **Week 2: Connective Tissue and Joint Disease**

1. [Antiphospholipid syndrome: A review](#)
2. [Chronic Fatigue Syndrome: Diagnosis and Treatment: AAFP](#)
3. [Gout: In the Clinic](#)
4. [Osteoarthritis: In the Clinic](#)
5. [Rheumatoid Arthritis: In the Clinic](#)
6. [Systemic Lupus Erythematosus: In the Clinic](#)
7. [Systemic Vasculitis Syndromes: Scientific American Medicine](#)
8. [Giant Cell Arteritis: In the Clinic](#)
9. [Low Back Pain: In the Clinic](#)

### ○ **Week 3: Diseases of the Renal and Genitourinary System/ Fluids, Electrolytes, and Acid-Base Disorders**

1. [Acute Renal Failure: JAMA](#)
2. [Chronic Kidney Disease: In the Clinic](#)
3. [Dialysis: When to start?: Initiating Dialysis Early and Late \(IDEAL\) study](#)
4. [Cardio Renal Syndrome: A review](#)
5. [IgA Nephropathy](#)
6. [Renal Tubular Acidosis](#)
7. [Renal Failure in Cirrhosis NEJM](#)
8. [Potassium Disorders: Hypokalemia and Hyperkalemia: AAFP](#)

### ○ **Week 4: Fluids, Electrolytes, and Acid-Base Disorders Cont./Acute and Chronic Pain**

1. [Acid-Base Problems in Diabetic Ketoacidosis](#)
2. [Hyponatremia: In the Clinic](#)
3. [Understanding Hypernatremia](#)
4. [Lactic Acidosis](#)
5. [Metabolic Acidosis: Case Report: CCJM](#)
6. [Hypercalcemia: A Case Report: CCJM](#)
7. [Physiological Approach to Assessment of Acid-Base Disturbances](#)

8. [Opioid Abuse in Chronic Pain Misconceptions and Mitigation Strategies](#)
9. [Diagnosis and Management of Acute Pain in the Hospitalized Patient](#)
10. [Safe use of opioids in hospitals](#)

## 7.3 ROTATION 3 READINGS

- **Week 1: Diseases of the Central and Peripheral Nervous System**
  1. [Epilepsy: In the Clinic](#)
  2. [Dementia: In the Clinic](#)
  3. [Headache Assessment and Management: JAMA](#)
  4. [Migraine: In the Clinic](#)
  5. [Multiple Sclerosis: In the Clinic](#)
  6. [Myasthenia Gravis: NEJM](#)
  7. [Stroke: Fibrinolytic Therapy in Acute Stroke](#)
  8. [Transient Ischemic Attack: In the Clinic](#)
  9. [Vertigo: Does This Dizzy Patient Have a Serious Form of Vertigo?](#)
  10. [Vertebrobasilar Disease: NEJM](#)
  11. American Osteopathic Association, and Anthony Chila. **Chapter 57: Dizziness.** *Foundations of Osteopathic Medicine, 3rd ed.* Baltimore, MD: Lippincott Williams & Wilkins, 2011, pp. 910-917.
  12. DiGiovanna, Eileen L.; Schiowitz, Stanley; Dowling, Dennis J. (Eds.). (2005). **Chapter 117: Neurological Applications.** *An Osteopathic Approach to Diagnosis and Treatment (3rd ed.)*. Philadelphia: Lippincott Williams & Wilkins. pp. 660-664.
- **Week 2: Infectious Diseases**
  1. [Infective Endocarditis: BMJ](#)
  2. [HIV: Management of Newly Diagnosed HIV: In the Clinic](#)
  3. [Lyme Disease: In the Clinic](#)
  4. [Meningitis in adults](#)
  5. [Mycotic Infection](#)
  6. [Infections Due to Mycobacterium Leprae and Nontuberculosis Mycobacteria](#)
  7. [Septic Arthritis, Bursitis, Osteomyelitis](#)
  8. [Sepsis: The Surviving Sepsis Campaign](#)
  9. [Tuberculosis: In the Clinic](#)
- **Week 3: Hematological Diseases**
  1. [Anemia: Production Defects](#)
  2. [Bleeding Disorders](#)
  3. [Deep Venous Thrombosis: In the Clinic](#)
  4. [Hematologic Complications of Pregnancy](#)
  5. [Hemolytic anemias](#)
  6. [Iron metabolism, iron overload, and the porphyrias](#)
  7. [Leukocyte Disorders](#)
  8. [Platelet Disorders](#)
  9. [Polycythemias](#)
  10. [Pulmonary Embolism: NEJM](#)
  11. [Sickle Cell Anemia: Updates in Treatments](#)
  12. [Transfusion medicine](#)

○ **Week 4: Oncology Topics**

1. [Acute Leukemia: Scientific American Medicine](#)
2. [Breast Cancer: Scientific American Medicine](#)
3. [Care of the Adult Cancer Survivor](#)
4. [Chronic lymphocytic leukemia](#)
5. [Colorectal Cancer](#)
6. [Hematopoiesis transplantation](#)
7. [Hodgkins Lymphoma](#)
8. [Lung Cancer](#)
9. [Myeloproliferative Neoplasms](#)
10. [Non-Hodgkin lymphoma](#)
11. [Palliative Care: In the Clinic](#)
12. [Tumor Lysis Syndrome: Guidelines for the Management: Journal Of Clinical Oncology](#)

## 8 INTERNAL MEDICINE JOURNALS

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- [Annals of Internal Medicine](#)
- [American Journal of Medicine](#)
- [American Journal of Clinical Medicine](#)
- [Archives of Internal Medicine](#)
- [BMC Medicine](#)
- [British Medical Journal](#)
- [Cleveland Clinic Journal of Medicine- Highly Recommended](#)
- [Internal and Emergency Medicine Journal](#)
- [JAMA](#)
- [Journal of General Internal Medicine](#)
- [Lancet](#)
- [Mayo Clinical Preceding's](#)
- [Mount Sinai Journal of Medicine](#)
- [New England Journal of Medicine](#)
- [PLoS Medicine](#)

## 9 INTERNAL MEDICINE EDUCATIONAL LINKS

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### 9.1 ATRIAL FIBRILLATION TREATMENT GUIDELINES

- [European Society of Cardiology Guidelines 2010](#)
- [American College of Cardiology Foundation / American Heart Association / Heart Rhythm Society Guidelines 2011 Update](#)
- [American College of Cardiology Foundation / American Heart Association / Heart Rhythm Society 2006 Guideline](#)
- [Canadian Cardiovascular Society Guidelines 2010](#)
- [NICE Guideline 2006 – currently under review.](#)

### 9.2 HEART SOUNDS

- <http://www.blaufuss.org/>
- <http://www.cardiologysite.com/auscultation/html/index.html>
- <http://depts.washington.edu/physdx/heart/history.html>

## 9.3 PULMONOLOGY

- [A Primer on Reading Pulmonary Function Tests](#)
- [A Primer on Arterial Blood Gas Testing](#)
- [A Primer on Mechanical Ventilation](#)
- [American Thoracic Society: Reading List](#)
- [Virtual Bronchoscopy Simulator](#)

## 10 SHELF AND BOARD EXAM REVIEW

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The Medicine subject exam very closely mimics the material that medical students were taught during 2nd year of medical school. This exam is 2nd in the amount of testable material, with family medicine being first. The exam is not hard to pass, but is fairly difficult to break the 80th percentile. Do USMLE world questions throughout the rotation. Below is a breakdown of the topics on prior exams.

### General Principles 1%-5%

### Organ Systems 95%-99%

- Immunologic Disorders 5%-10%
- Diseases of the Blood and Blood-forming Organs 5%-10%
- Diseases of the Nervous System and Special Senses 5%-10%
- Cardiovascular Disorders 15%-20%
- Diseases of the Respiratory System 15%-20%
- Nutritional and Digestive Disorders 10%-15%
- Gynecologic Disorders 1%-5%
- Renal, Urinary, and Male Reproductive System 10%-15%
- Disorders of the Skin and Subcutaneous Tissues 5%-10%
- Diseases of the Musculoskeletal System and Connective Tissue 5%-10%
- Endocrine and Metabolic Disorders 5%-10%

### Physician Tasks

- Promoting Health and Health Maintenance 10%-15%
- Understanding Mechanisms of Disease 20%-25%
- Establishing a Diagnosis 40%-45%
- Applying Principles of Management 20%-25%

Medicine Resources for your Boards and Shelf: Begin reading Step Up the first day of the rotation. Try to get through it twice before the subject exam. I would also get case files as well. Do USMLE world questions every day, to prepare yourself for the length of the vignettes.

- Step Up to Medicine: Very thorough. Outline format. Separated by body systems. If it's not in this book, it will not be on the exam. Very long and can take a very long time to read. Need to read more than once in order to really take in all of the information contained in this book. Impossible if reading is not started the first week of the rotation.
- Case Files: Internal Medicine: Presents common internal medicine subjects in the form of clinical vignettes similar to the subject exam. Relatively complete. Probably the 2nd best internal medicine subject exam resource. Not as much info as Step Up. Not separated into body systems, just random cases.
- Blueprints: Medicine: Presents common internal medicine subject in paragraph format. Not as informative to Step Up, Comparable to Case Files, just a different format. Contains practice questions at the end of the book. Could easily pass the exam using this resource.

- High Yield Internal Medicine: High Yield Not a complete resource by any means. Contains high yield, useful topics for the exam. Do not use this as your sole resource unless you really know your stuff or you are in a serious time crunch. Great if used as an adjunct to another book, especially the week before the exam.