



Edward Via College of Osteopathic Medicine

MED 8040/MED 8045
Clinical Internal Medicine I and Modules
Academic Year 2024 - 2025

ROTATION SYLLABUS



Marc Ciesco, DO
Discipline Co-Chair, Internal Medicine
Carolinas Campus
Phone: 864-327-9891
mciesco@carolinas.vcom.edu



William Cox, DO, MBA, FACP, FACIA
Discipline Chair, Internal Medicine
Virginia Campus
Phone: 540-239-6826
wcox01@vt.vcom.edu



Nathan Douthit, MD
Discipline Co-Chair, Internal Medicine
Auburn Campus
Phone: 334-442-4051
ndouthit@auburn.vcom.edu



Rekha Lall, MD, FACP
Discipline Co-Chair, Internal Medicine
Auburn Campus
Phone: 334-442-4013
rlall@auburn.vcom.edu



Andy Langley, DO
Associate Dean for Clinical Affairs & Discipline
Chair for Internal Medicine
Louisiana Campus
Phone: 318-342-7133
dlangley@ulm.vcom.edu



Stanley Miller, MD
Discipline Co-Chair, Internal Medicine
Carolinas Campus
Phone: 864-327-9922
smiller02@carolinas.vcom.edu

I. Rotation Description

As clinicians, teachers, and researchers, our internal medicine faculty members are committed to the college's mission to provide medical education and research that prepares globally minded, community-focused physicians and to improve the health of those most in need.

The Internal Medicine faculty are passionate about medicine and medical education. The Internal Medicine faculty include those practicing primary care internal medicine, hospital medicine, and those who practice in the full range of sub-specialties. Sharing the college's mission, and leading by example, members of our faculty provide volunteer care for the under-served in regional free clinics, and on international medical missions.

During the third-year internal medicine rotations, students expand their knowledge of adult health and wellness, preventative, primary, secondary and tertiary care. They learn about the treatment of acute and chronic medical conditions, palliative and end of life care and gain the ability to apply this knowledge in the clinical setting. The curriculum is taught through case modules, assigned readings, bedside and clinic teaching, journal clubs, tumor boards, grand rounds, and through one-on-one student-preceptor experience in caring for patients in the clinical setting.

Students are expected to complete their assignments for both internal medicine and the longitudinal OMM course. The Core Internal Medicine rotations include inpatient and outpatient exposure, as well as general internal medicine and medical sub-specialty exposure. The practice of internal medicine occurs in the private, public and governmental clinic settings, in long-term care facilities, in inpatient institutional settings and in the emergency departments of hospitals and institutions. Due to the variety of practice opportunities and formats in internal medicine rotations, students should review their [specific site instructions](#) for a more detailed description of their specific practice setting.

II. Course Goals and Objectives

A. Goals of the Course

- To acquire the knowledge, skills and competencies that are required to evaluate and treat patients with acute and chronic medical conditions commonly found in the adult at a level consistent with a graduating generalist medical student.
- To develop the physical examination and clinical skills required of a graduate medical student in general internal medicine practice, including the ability interpret information relative to normal and abnormal structure, function and physiology.
- To apply historical and clinical information for problems solving to advance the health of the patient.
- To develop the psycho-social and communication skills and competencies that are required to communicate with, and treat a wide diversity of patients in acute, outpatient and institutional settings.
- To develop the ability to research medical literature and scientific resources for information that affects the patient's condition, treatment and outcomes and the ability to evaluate and apply scientifically valid information to maximize the outcome of the patient.
- To develop knowledge, skill application and understanding of the indications, contraindications and application of medical procedures and therapies common to the specialty, including but not limited to ordering and interpretation of diagnostic studies, utilization of pharmacological agents, psychological and nutritional therapies, incorporation of osteopathic principles and practices into the patient's care, and clinical procedures such as central line placement, lumbar punctures, intubation, management of ventilators, etc.

B. Clinical Performance Objectives

While the end-of-rotation exam is derived from the didactic curriculum and objectives described above in the “Clinical Modules – Required Curriculum” section, the end-of-rotation evaluation completed by your preceptor is based on clinical core competencies. These core competencies reflect student performance in 6 key areas: communication, problem solving, clinical skills, medical knowledge, osteopathic medicine and professional and ethical considerations. Your end-of-rotation evaluation from your preceptor will be based directly on your performance in these 6 core competencies as described below.

1. **Communication** - the student should demonstrate the following clinical communication skills:
 - a. Effective listening to patient, family, peers, and healthcare team
 - b. Demonstrates compassion and respect in patient communications
 - c. Effective investigation of chief complaint, medical and psychosocial history specific to the rotation
 - d. Considers whole patient: social, spiritual & cultural concerns
 - e. Efficiently prioritizes essential from non-essential information
 - f. Assures patient understands instructions, consents & medications
 - g. Presents cases in an accurate, concise, well organized manner
2. **Problem Solving** – the student should demonstrate the following problem-solving skills:
 - a. Identify important questions and separate data in organized fashion organizing positives & negatives
 - b. Discern major from minor patient problems
 - c. Formulate a differential while identifying the most common diagnoses
 - d. Identify indications for & apply findings from the most common radiographic and diagnostic tests
 - e. Identify correct management plan considering contraindications & interaction
3. **Clinical Skills** - the student should demonstrate the following problem-solving skills:
 - a. Assesses vital signs & triage patient according to degree of illness
 - b. Perform good auscultatory, palpatory & visual skills
 - c. Perform a thorough physical exam pertinent to the rotation
4. **Osteopathic Manipulative Medicine** - the student should demonstrate the following skills in regards to osteopathic manipulative medicine
 - a. Apply osteopathic manipulative medicine successfully when appropriate
 - b. Perform and document a thorough musculoskeletal exam
 - c. Utilize palpatory skills to accurately discern physical changes that occur with various clinical disorders
 - d. Apply osteopathic manipulative treatments successfully
5. **Medical Knowledge** – the student should demonstrate the following in regards to medical knowledge
 - a. Identify & correlate anatomy, pathology and pathophysiology related to most disease processes
 - b. Demonstrate characteristics of a self-motivated learner including demonstrating interest and enthusiasm about patient cases and research of the literature
 - c. Are thorough & knowledgeable in researching evidence-based literature
 - d. Actively seek feedback from preceptor on areas for improvement
 - e. Correlate symptoms & signs with most common disease
6. **Professional and Ethical Behaviors** - the student should demonstrate the following professional and ethical behaviors and skills:
 - a. Is dutiful, arrives on time & stays until all tasks are complete
 - b. Consistently follows through on patient care responsibilities
 - c. Accepts & readily responds to feedback, is not resistant to advice
 - d. Assures professionalism in relationships with patients, staff, & peers

- e. Displays integrity & honesty in medical ability and documentation
- f. Acknowledges errors, seeks to correct errors appropriately
- g. Is well prepared for and seeks to provide high quality patient care
- h. Identifies the importance to care for underserved populations in a non-judgmental & altruistic manner

III. Rotation Design

A. Educational Modules

Educational modules using lectures, cases, and other forms of delivery are used for third year curriculum. Each student must complete a post-rotation exam to assure that the expected basic content or medical knowledge has been acquired during the rotation. In addition to the experiences received in the clinical training sites, students are expected to read the content of the assigned textbooks and online materials in order to complete the entire curriculum assigned for the clinical module.

B. Formative Evaluation

Student competency-based rating forms are used by the preceptor to evaluate each student's clinical skills and the application of medical knowledge in the clinical setting. These forms are only completed by the clinical faculty member or preceptor. Performance on rotations will be evaluated by the primary clinical faculty member precepting the student. VCOM uses a competency-based evaluation form which includes the osteopathic core competencies. These competencies evaluated include:

- a. Medical knowledge;
- b. Communication;
- c. Physical exam skills;
- d. Problem solving and clinical decision making;
- e. Professionalism and ethics;
- f. Osteopathic specific competencies; and
- g. Additional VCOM values.

Student competency is judged on clinical skill performance. Each skill is rated as to how often the student performs the skill appropriately (i.e. unacceptable, below expectation, meets expectation, above expectation, exceptional).

C. Logging Patient Encounters and Procedures

During the clinical years students need to develop the clinical competencies required for graduation and post-graduate training. These competencies are evaluated in many different ways: by faculty observation during rotations, by examinations, by the COMLEX Level 2 CE examination, and VCOM's OMS 3 summative examinations. In order to develop many of these competencies and meet the objectives required for graduation, VCOM needs to ensure that each student sees enough patients and an appropriate mix of patients during their clinical years. For these reasons, as well as others discussed below and to meet accreditation standards, VCOM has developed requirements to log patient encounters and procedures.

Each day, students are required to log all patient type/clinical conditions and procedures/skills that they encounter that day into the VLMS application.

- Within the daily log, the Clinical Discipline Chairs have also identified a specific set of patient presentations and procedures that each student is expected to see/do during the course of the rotation. This list serves as a guide for the types of patients the clinical faculty think students should encounter during the rotation. The list does not include every possible diagnosis or even every diagnostic entity students must learn. The list reflects the common and typical clinical entities that the faculty feels VCOM students should experience.

- Students must learn more than they will experience during clinical rotations. The log does not reflect the totality of the educational objectives during the rotation. Clinical experience is an important part, but only a part, of your rotation requirement. Students may discover they have not seen some of the presentations/procedures on the list during the rotation; however, they should arrange to see these problems in the fourth year or learn about them in other ways through the other course materials provided. Students need to commit themselves to extensive reading and studying during the clinical years. “Read about patients you see and read about patients you don’t see”.

One of the competencies students must develop during their clinical training involves documentation. Documentation is an essential and important feature of patient care and learning how and what to document is an important part of medical education. The seriousness and accuracy with which students maintain and update their patient logs are measures of professionalism. Students must review these logs with their preceptor prior to the end of the rotation period, as required by the final preceptor evaluation form. Students are encouraged to periodically review their VLMS entries with their preceptor during the rotation period.

Throughout the year, data is reviewed by Clinical Affairs, the curriculum committees, and administration to ensure the clinical experiences meet the objectives of the rotation and to assess the comparability of experiences at various sites. The logs serve to:

- Demonstrate student exposure to patients with medical problems that support course objectives.
- Demonstrate level of student involvement in the care of patients.
- Demonstrate student exposure to, and participation in, targeted clinical procedures.
- Demonstrate student exposure to patient populations in both inpatient and outpatient settings.
- Demonstrate comparability of experiences at various clinical sites.
- Quantify for students the nature and scope of their clinical education and highlight educational needs for self-directed learning.

Students will receive a report at the end of the OMS 3 year that outlines the patient encounters the student was involved in throughout their rotations. These individual log reports can be shared during interviews/audition rotations/future credentialing to demonstrate the scope of their clinical experiences.

IV. Credits

MED 8040: 4 credit hours

MED 8045: 1 credit hour

V. Course Texts and Reference Materials

A. Required Textbooks

- American Osteopathic Association, & Chila, A. *Foundations of Osteopathic Medicine*, 3rd ed. Baltimore, MD: Lippincott Williams & Wilkins, 2010. ISBN: 978-0781766715
- Kuchera, Michael, Kuchera, William. *Osteopathic Considerations in Systemic Dysfunction*, Revised 2nd ed., Greyden Press, Dayton, OH: 1994. ISBN:978-1570741548 (retail price \$55.00)
- Nicholas, Alexander, and Evan Nicholas. *Atlas of Osteopathic Techniques*, 4th ed. Baltimore, MD: Lippincott, Williams & Wilkins, 2023. ISBN: 978-1975127480978-1451193411 (retail price \$179.99) – Available in VCOM’s eLibrary in LWW Osteopathic Medicine Collection
- Seffinger, Michael. *Foundations of Osteopathic Medicine*, 4th ed. Philadelphia, PA: Wolters Kluwer Health, 2019. ISBN: 978-1496368324 (retail price \$142.99) – Available in VCOM’s eLibrary in LWW Osteopathic Medicine Collection

- Wing, Edward J., and Fred Schiffman. Benjamin, Ivor, et al. *Cecil Essentials of Medicine*, 10th ed. Philadelphia, PA: Elsevier, 2021. ISBN: 978-0323722711 (retail price \$89.99) – Available in VCOM's eLibrary in Clinical Key

VI. Course Grading and Requirements for Successful Completion

A. Requirements

- Attendance according to VCOM and preceptor requirements as defined in the [College Catalog and Student Handbook](#).
- Review of the syllabus topics, learning objectives, and reading assignments:
 - In addition to the learning experience in the clinical site, the clinical curriculum consists of the reading assignments and learning objectives that are included in this syllabus, as well as clinical case modules and Aquifer Radiology cases that are derived from some, but not all, of the learning objectives. A student's success as a physician will depend upon the learning skills they develop during this core rotation, as guided by this syllabus and clinical case modules. National boards, residency in-training examinations, and specialty board examinations require ever increasing sophistication in student's ability to apply and manipulate medical knowledge to the clinical context.
- Completion and submission of 14 clinical case modules:
 - The clinical case modules were developed by VCOM Discipline Chairs and are intended to provide an OMS 3 student with a clinical, patient-centered approach to the learning content of this rotation. The modules should not be approached as rote learning, but should provide structured, clinically focused learning from the evidence base for this rotation. The same module may be included under multiple topics in the syllabus to show its relevance to the topic, but students only need to complete the module once. The clinical case modules must be submitted in Canvas **by no later than 5 PM on the day of your end of rotation exam** at: <https://canvas.vcom.edu>. **Failure to do so will result in a deduction of 5 points from your end-of-rotation exam score.**
 - [Chest Pain](#)
 - [Arrhythmias & Valvular Disorders](#)
 - [Disorders of Cardiac Output](#)
 - [Inpatient Management of Diabetes Mellitus, Electrolyte Disorders and Acid-Base Disorders](#)
 - [GI Bleed](#)
 - [Inpatient Management of Pneumonia](#)
 - [Jaundice and Hepatitis](#)
 - [AKI and Hematuria](#)
 - [Sepsis and Common Hospital Infections and Healthcare Associated Infections](#)
 - [Coagulation and Bleeding Disorders](#)
 - [Neurological Infections](#)
 - [Hypertension and Stroke](#)
 - [Inpatient COPD](#)
 - [Altered Mental Status](#)
- Completion of 3 Aquifer Radiology cases:
 - Aquifer Radiology is a case-based virtual course that provides realistic case scenarios that demonstrate best-practices, helping students develop clinical reasoning skills that bridge the gap from content to practice. Upon completion of the cases, students should have a basic understanding of the principles and applications of medical imaging and be able to interpret common radiological studies in the context of presenting patient conditions. In

addition, students should be able to recognize common osteopathic structural and viscerosomatic/somatosomal changes that correlate to specific radiographic findings.

- In order to receive credit for the radiology cases and meet the requirements for passing the rotation, students must complete the cases, including all associated components of the online program such as the knowledge assessment questions associated with the cases. The same case may be included under multiple topics in the syllabus to show its relevance to the topic, but students only need to complete the case once. Progress will be reviewed by the online administrator to ensure completion of these requirements. Students must successfully complete the cases and knowledge assessment questions **by no later than 5 PM on the day of your end of rotation exam.**

- [Aquifer Radiology Case 4](#)
- [Aquifer Radiology Case 10](#)
- [Aquifer Radiology Case 17](#)

- To get full credit for each case completed, please be sure to click forward to the page at the end of the case that states “Summary of Your Case Session” in the upper left-hand corner.
- Register for the Aquifer cases at: <https://www.aquifer.org>

Your email has been pre-loaded into Aquifer, and you should have received an email about how to set up your account.

- If you are a first-time user:

- Click “Sign in” in the top right corner.
- Enter your institutional email address in the email box. Then click on the “Register” button at the bottom of the page.
- You will be sent an email with a link to complete registration. Upon receipt of the registration email, click on the link “Click Here”. You will then be brought to the profile setup page. An email will be sent to you. Follow the instructions in the email to set up your account.
- You will be asked to fill in your profile information and set up a password (8 character minimum). Once you have completed your user profile and created a password, you will receive a welcome email with links to useful information and guides. You would also be logged into the Aqueduct learning management system.
- Once your profile is completed successfully, you will be brought to your institution’s Course page.
- You will also receive a “Thank you for registering with Aquifer” email with links to tools, resources, and Aquifer news.

- If you are a returning user:

- Click “Sign in” in the top right corner.
- Please log in with your institutional email and account password and click “Sign In”.

- Logging Patient Encounters and Procedures in VLMS:

- **Students are required to log daily** - Students are **required to log all patient type/clinical conditions and procedures/skills that they encounter that day** into the VLMS application at: <https://vlms.app/login.html>

- Within the daily log, the Clinical Discipline Chairs have also identified a specific set of patient presentations and procedures that each student is expected to see/do during the course of the rotation. This list serves as a guide for the types of patients the clinical faculty think students should encounter during the rotation. The list does not include every possible diagnosis or even every diagnostic entity students must learn. The list reflects

the common and typical clinical entities that the faculty feels VCOM students should experience.

- Students should log only an encounter with or exposure to a real patient.
 - Simulated patients, case presentations, videos, grand rounds, written clinical vignettes, etc. should not be logged even though they are all important ways to learn clinical medicine. Many of these educational experiences, along with self-directed reading, are necessary preparation for COMLEX Level 2 and postgraduate training. This log, however, focuses on a unique and critical component of clinical training, namely, involvement with “real” patients.
 - Longitudinal care of a patient that results in a new diagnosis or secondary diagnosis should be entered as a new entry instead of editing the original entry.
 - Multiple encounters with the same patient that do not result in a new diagnosis or procedure should not be logged. However, if multiple encounters result in a new diagnosis or a new procedure is performed, these should be entered as a new entry.
 - Student involvement with patients can occur in various ways with different levels of student responsibility. The most “meaningful” learning experience involves the student in the initial history and physical exam and participation in diagnostic decision making and management. A less involved but still meaningful encounter can be seeing a patient presented by someone else at the bedside. Although the level of responsibility in this latter case is less, students should log the diagnoses seen in these clinical encounters. Patient experiences in the operating or delivery room should also be logged.
- All students must review these logs with their preceptors prior to the end of the rotation period, as required by the final preceptor evaluation form. Students are encouraged to periodically review their VLMS entries with their preceptor during the rotation period. These reviews should stimulate discussions about cases and learning objectives, as well as identify curriculum areas the student may still need to complete.
- Failure to log daily results in the following:
 - First notification: Email warning outlining consequences
 - Second notification: Meeting with the Associate Dean
 - Third notification: Behavioral contract
 - Fourth notification: Students will receive an IP “In-Progress” grade for the rotation until logging for the rotation is completed.
 - Fifth notification: Referral to PESB/Honor Code (whichever is most appropriate), which could lead to sanctions and/or permanent record in the student file or MSPE.
- Rotation Evaluations:
 - Student Site Evaluation: Students must complete and submit at the end of rotation. See the VCOM website at: <https://intranet.vcom.edu/clinical> to access the evaluation form.
 - Third-Year Preceptor Evaluation: It is the student's responsibility to ensure that all clinical evaluation forms are completed and submitted online or turned in to the Site Coordinator or the Clinical Affairs Office at the completion of each rotation. Students should inform the Clinical Affairs Office of any difficulty in obtaining an evaluation by the preceptor at the end of that rotation. See the VCOM website at: <https://www.vcom.edu/academics/clinical-education-third-year/forms> to access the evaluation form.

- Mid-Rotation Evaluation: The mid-rotation evaluation form is not required but highly recommended. See the VCOM website at: <https://www.vcom.edu/academics/clinical-education-third-year/forms> to access the mid-rotation evaluation form.
- Successful completion of the end-of-rotation written exam:
The content of the end-of-rotation exams will be based upon the learning objectives and reading assignments, including OMM, in this syllabus, the clinical case modules, and the Aquifer Radiology cases and their associated references.

B. Grading

Students must pass both the "module" and "rotation" portions of the course. All rotations have a clinical rotation grade and clinical modules/exam grade. Failure to submit all of the case module files using the Canvas link provided above and the Aquifer Radiology cases **by no later than 5 PM on the day of your end of rotation exam** will result in a **deduction of 5 points from your end-of-rotation exam score. VLMS logs are due no later than 5 PM on the day of your end of rotation exam.**

Clinical Grading Scale and GPAs						
OMS 3 End-of-Rotation Exam Grades			OMS 3 AND OMS 4 Clinical Rotation Grades		Other Grades	
A	90-100	4.0	H	Honors	IP	In Progress
B+	85-89	3.5	HP	High Pass	INC	Incomplete
B	80-84	3.0	P	Pass	CP	Conditional Pass
C+	75-79	2.5	F	Fail	R	Repeat
C	70-74	2.0			Au	Audit
F	<70	0.0				

C. Remediation

Students who fail a clinical rotation, fail an end-of-rotation exam twice, or who have more than one first attempt failure on end-of-rotation exams within an academic year (even if the student has successfully remediated the prior end-of-rotation exam on the second attempt) will be referred to the Promotion Board. If a student fails the professionalism and ethics portion of the evaluation he or she may be removed from the rotation and referred to the Professional and Ethical Standards Board. No grade will be changed unless the Office of Clinical Affairs certifies to the Registrar, in writing, that an error occurred or that the remediation results in a grade change.

- **Failure of an End-of-Rotation Exam**

Students must pass each end of rotation exam with a C (70%) or better to receive a passing grade for the clinical medical knowledge module. Students who fail an end of rotation exam but pass the clinical rotation evaluation component have a second opportunity to pass the exam within 28 days of notification. If the student passes the remediation exam, the remediated exam grade will be the grade recorded on the transcript and be GPA accountable.

If the student fails the end of rotation exam a second time, the student will receive an "F" grade for the rotation and will be brought before the Promotion Board. If the student is allowed to repeat the rotation, all components of the rotation must be repeated, and the repeated rotation must be with a different preceptor than the one from the original rotation that the student failed. Once repeated, the transcript will show both the initial clinical medical knowledge module course and the initial clinical rotation competency evaluation course, as well as the repeated clinical medical knowledge module course and the repeated clinical rotation competency evaluation course. The repeated courses will have the letter "R" at the end of the course number to reflect that they are repeated. Both the grade earned for the initial courses and the

repeated courses will be recorded on the transcript, but only the repeated courses will be GPA accountable, regardless of whether the initial or repeated course grade is higher.

In addition, students who fail more than one first attempt failure of end-of-rotation exams within a semester (i.e. failed the first attempt end-of-rotation exam for pediatrics and failed the first attempt end-of-rotation exam for surgery within the first semester), even if the student has successfully remediated the prior end-of-rotation exam on the second attempt, will be placed on academic probation (at a minimum through their OMS 3 year) by the Campus Dean.

- **Failure of a Rotation**

If a student fails the clinical rotation evaluation the student will receive an “F” grade for the rotation and will be brought before the Promotion Board. If the student is allowed to repeat the rotation, all components of the rotation must be repeated and the repeated rotation must be with a different preceptor than the one from the original rotation that the student failed. Once repeated, the transcript will show both the initial clinical medical knowledge module course and the initial clinical rotation competency evaluation course, as well as the repeated clinical medical knowledge module course and the repeated clinical rotation competency evaluation course. The repeated courses will have the letter “R” at the end of the course number to reflect that they are repeated. Both the grade earned for the initial courses and the repeated courses will be recorded on the transcript, but only the repeated courses will be GPA accountable, regardless of whether the initial or repeated course grade is higher.

- **Failure to Make Academic Progress**

In general, students should show a progression of improvement in clinical performance throughout rotations. Repeated poor or failing performance in a specific competency area on the evaluation form across more than one rotation may also be a reason for a required remediation at the discretion of the Associate Dean for Clinical Affairs in consultation with the clinical chair, the preceptor, and the Promotion Board. Those students who receive a mere “Pass” on multiple rotations will be counseled about overall performance and may be required to complete an additional rotation at the end of the year. Any additional curriculum or required remediation will be based on the performance measure. Those students who continually score in the "unsatisfactory" category or repeated "performs some of the time, but needs improvement" consistently and do not improve over time or who fail one or more rotations may be deemed as not making academic progress and, as a result, may be referred to the Promotion Board and be required to complete additional curriculum. Multiple rotation failures may result in dismissal.

Poor ratings on the clinical rotation evaluation in the professional and ethical areas of the assessment are addressed by the Associate Dean for Clinical Affairs. The Associate Dean may design a remediation appropriate to correct the behavior or if needed, may refer the student to the Professional and Ethical Standards Board. In the case of repeated concerns in a professional and/or ethical area, the Associate Dean for Clinical Affairs may refer the student to the Campus Dean for a referral to the Professional and Ethical Standards Board or Promotion Board. The Campus Dean will act upon this referral depending on the severity and the area of the performance measure. Poor ratings in this area will include comments as to the exact nature of the rating.

VII. Academic Expectations

Grading policies, academic progress, and graduation requirements may be found in the [College Catalog and Student Handbook](#).

A. Attendance

Attendance for all clinical rotation days is mandatory. The clinical site will determine the assigned days and hours to be worked within the rotation period. Students are required to attend any orientation the clinical site sets as mandatory prior to any rotation or the clinical year. The orientation sessions vary by site and are required to maintain assignment to the site. Although the clinical site determines the assigned days and hours to be worked, VCOM has established the following guidelines:

- 4-week rotations may not be less than 20, eight-hour days for a total of a minimum of 160 hours and often average 180 hours or greater.
 - Students may be required to work up to 24 days in a 4-week period or 25 days in a 1-month rotation, including call and weekends at the discretion of the clinical site.
 - If the clinical site requires longer daily hours or shift work, the student may complete the required hours in less than 20 days with the following specifications:
 - Students should not work greater than an average of 12 out of every 14 days
 - Students should not work more than 12 hours daily, exclusive of on-call assignments.
 - If on-call hours are required, the student should not be on duty for greater than 30 continuous hours.
 - Students may be required to work weekends but in general should have 2 weekends per month free and an average of 2 of 7 days per week free.

It should be noted that preceptors will have final determination of the distribution of hours, which may vary from this policy but should not in general be less than 160 hours for a 4-week rotation. The institution's DSME and assigned clinical faculty determine clinical duty hours. Students are responsible to the assigned clinical faculty and are expected to comply with the general rules and regulations established by the assigned clinical faculty, and/or the core hospital(s), or facility associated with the rotation.

The average student clinical day begins at 7 am and ends at 7 pm. Students are expected to work if their assigned clinical faculty is working. Some rotations assign students to shifts and in such cases the student may be required to work evening or night hours. If on-call hours are required, the student must take the call; however, the student should not be on duty for greater than 30 continuous hours. Students may be required to work weekends, but in general should have two weekends per month free and two of seven days per week free. Student holidays are determined by the clinical site and follow those of other students and/or residents from the clinical site. Students must be prompt and on time for the clinical rotation.

Students are expected to arrive on time for all clinical rotations. If a student is late, he or she must notify the site coordinator and the preceptor prior to or at the time they are scheduled to arrive. Students must have a reason for being late such as illness or vehicle issues and it is not anticipated that this would occur more than one occasion AND it is important the student call in prior to being late. Repeated tardiness is considered as unprofessional behavior and is a reason for dismissal from a rotation. Students with repeated tardiness will be referred to the PESB. Tardiness is defined as more than 5 minutes after the scheduled time the preceptor designates as the expected arrival time.

The Office of Clinical Affairs requires that the medical student complete and submit an Excused Absence Clinical Rotations Approval form for any time "away" from clinical rotations. Forms are available at: <https://www.vcom.edu/academics/clinical-education-third-year/forms>. The student must have this form signed by their preceptor and others designated on the form to obtain an excused absence and must be provided to the DSME and the Office of Clinical Affairs through the site coordinator. The form must be completed prior to the beginning of the leave. If an emergency does not allow the student to submit this prior to the absence, the "Excused Absence Clinical Rotations Approval" form must be submitted as soon as the student is physically able to complete the form. In

addition to completion of the form, students must contact the Department of Clinical Affairs, the Site Coordinator, and the preceptor's office by 8:30 AM on the day they will be absent due to an illness or emergency. No excused absence will be granted after the fact, except in emergencies as verified by the Associate Dean for Clinical Affairs.

Regardless of an excused absence, students must still complete a minimum of 160 hours for a 4-week rotation in order to pass the rotation. Any time missed must be remediated during the course of the rotation for credit to be issued. Students may remediate up to four missed days or 48 hours missed during any rotation period by working on normal days off. OMS 3 students who have any unexcused absences will be referred to the PESB.

B. Prohibited Use of External Accelerators

At times, there may be lectures on VCOMTV where completion will be documented as part of passing the course (these will be clearly indicated in the course syllabus). For these lectures, the use of an external accelerator is prohibited, as VCOMTV is unable to track completion through these programs. If a student uses an external accelerator for these assignments, they will be required to re-watch the lecture(s) in VCOMTV within the required timeline. Failure to document a student's completion of these assignments within the required timeline due to use of an external accelerator may result in failure of the course.

VIII. Professionalism and Ethics

It is advised that students review and adhere to all behavioral policies including attendance, plagiarism, dress code, and other aspects of professionalism. Behavioral policies may be found in the [College Catalog and Student Handbook](#).

A. VCOM Honor Code

The VCOM Honor Code is based on the fundamental belief that every student is worthy of trust and that trusting a student is an integral component in making them worthy of trust. Consistent with honor code policy, by beginning this exam, I certify that I have neither given nor received any unauthorized assistance on this assignment, where "unauthorized assistance" is as defined by the Honor Code Committee. By beginning and submitting this exam, I am confirming adherence to the VCOM Honor Code. A full description of the VCOM Honor Code can be found in the [College Catalog and Student Handbook](#).

IX. Syllabus and Rotation Schedule

Please use this syllabus as a guide, paying particular attention to the learning objectives as an outline of what you are expected to know for each topic/module. Refer to the rotation calendar for specific dates of exams.

The faculty of the course will make every effort to adhere to the syllabus and rotation schedule; however, the Office of Clinical Affairs reserves the right to make changes to the syllabus; including changes to examinations, quizzes, modules, homework or other assignments; and/or the schedule with as much advance notice as possible. These changes will be communicated to the students in writing via Canvas or email.

X. Internal Medicine I Clinical Curriculum

In addition to the topics below with reading references and learning objectives, students must also complete the assigned clinical cases and the assigned Aquifer Radiology cases. The content of the end-of-rotation exams will be based upon the learning objectives and reading assignments, including OMM, in this syllabus, the clinical case modules, and the Aquifer Radiology cases and their associated references.

The clinical case modules must be submitted in Canvas at: <https://canvas.vcom.edu>

1. History, Note Taking and Transitions of Care

Topics Included: Completing a history and physical, admission note, progress note, discharge summary and ICU notes & orders, transitions of care

Reading Reference: [History, Note Taking, and Transitions of Care PowerPoint](#)

Learning Objectives:

- a. Generate inpatient notes for the following:
 - i. Admission history and physical
 - ii. Daily progress
 - iii. Intensive care unit
 - iv. Procedures
 - v. Discharge summary
- b. Develop a differential diagnosis and expanded plan covering active inpatient problems.
- c. Formulate orders corresponding to admission, inpatient service, and discharge.
- d. Identify the hazards transitions of care pose to patients.
- e. Identify strategies to mitigate the hazards of transitions of care
- f. Recognize the key components of a safe discharge plan (e.g. accurate medication list, follow-up plan), including comparing potential sites for discharge.

2. Chest Pain

Topics Included: acute coronary syndrome (complications, management, diagnosis), aortic aneurysm/dissection, ischemic heart disease, pericarditis, pulmonary embolus, pneumothorax

Module: [Chest Pain](#)

Reading Reference:

- Cecil's Essentials of Medicine, 10th ed.
 - Ch. 3 Evaluation of the Patient with Cardiovascular Disease
 - Ch. 4 Diagnostic Tests and Procedures in the Patient with Cardiovascular Disease
 - Ch. 8 Coronary Heart Disease
 - Ch. 10 Pericardial and Myocardial Disease
 - Ch. 12 Vascular Diseases and Hypertension
- Osteopathic Considerations in Systemic Dysfunction, Rev 2nd ed.
 - Osteopathic Considerations in Cardiovascular Disorders pp 53-72

Learning Objectives:

- a. Identify etiologies of acute chest pain and narrow the differential based on specific physical exam and history findings.
 - i. Outline 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.
 - ii. Describe the important impact and effects of the lymphatic system on the function of the cardiovascular system.
 - iii. Relate somatic changes of the thoracic spine to effects in cardiovascular system.
- b. Differentiate causes of acute chest pain utilizing the following diagnostic tests.
 - i. EKG
 - ii. Computed Tomography
 - iii. Angiography
 - iv. Enzyme levels (troponin, CK-MB, D-dimer)
 - v. Chest X-Ray
 - vi. Echocardiography
- c. Interpret laboratory and diagnostic studies including patient demographics to determine a pre-test probability of the most likely etiologies of chest pain.
- d. Identify cardiovascular risk factors.

- e. Predict an appropriate diagnostic and treatment plan for various types of chest pain—including recommended lifestyle modifications.
- f. Define and correlate the pathogenesis, signs, and symptoms of the acute coronary syndromes.
- g. Distinguish between STEMI and non-STEMI and recognize the difference in work up and therapy.
- h. Identify complications of STEMI and non-STEMI, e.g. pericardial tamponade, papillary muscle rupture, etc.
- i. Categorize the patient's symptoms as angina pectoris, atypical angina, or non-cardiac chest pain.
- j. Differentiate stable versus unstable angina.
- k. Relate primary and secondary prevention of ischemic heart disease to the reduction of cardiovascular risk factors (e.g. controlling hypertension and dyslipidemia, aggressive diabetes management, avoiding tobacco, and aspirin prophylaxis).
- l. Choose appropriate anti-anginal medications when indicated and identify potential side effects.
- m. Identify common etiologies of pericarditis as well as differential diagnosis
- n. Predict treatment strategies for pericarditis.
- o. Recognize the signs, symptoms, and risk factors for pulmonary embolism (PE).
- p. Calculate pre-test probability for pulmonary embolism with Wells Score and relate pre-test probability to diagnostic work-up.
- q. Interpret various diagnostic tests for pulmonary embolism.
- r. Choose an appropriate management plan for pulmonary embolism, including choosing appropriate anticoagulants, their duration, and workup for associated causes of venous thromboembolism.
- s. Describe the clinical settings in which the D-dimer test performs well as a screening method for PE.
- t. Explain when a V/Q versus a CT pulmonary angiogram may be indicated for the evaluation of suspected PE.
- u. Assess the probability of PE when the V/Q scan report says normal, low, intermediate, and high probability.
- v. Describe three common indications for the placement of IVC filters.
- w. Compare and contrast the Stanford A type and Stanford B type aortic dissection based on anatomy and management.
- x. List the imaging options for patients with suspected aortic dissection.

3. Arrhythmias & Valvular Disorders

Topics Included: Heart sounds, atrial fibrillation, AV blocks (first, second & third degree), torsades de pointes, valve diseases (AS, MS, MR)

Reading Reference:

- Cecil's Essentials of Medicine, 10th ed.
 - Ch. 3 Evaluation of the Patient with Cardiovascular Disease
 - Ch. 4 Diagnostic Tests and Procedures in the Patient with Cardiovascular Disease
 - Ch. 7 Valvular Heart Disease
 - Ch. 9 Cardiac Arrhythmias

Module: [Arrhythmias & Valvular Disorders](#)

Learning Objectives:

- a. Define grading of the intensity of cardiac murmurs.
- b. Identify and interpret murmurs based on location, characteristics, and associated findings.
- c. Relate surgical and non-surgical indications for treatment valvular heart disease.
- d. Identify supraventricular and ventricular arrhythmias on an electrocardiogram.
- e. Identify the common causes of supraventricular and ventricular arrhythmias.
- f. Evaluate a patient with atrial fibrillation (including stroke and bleeding risk scoring) to choose appropriate treatment.
- g. Identify indications for permanent pacing.

- h. Identify a bundle branch block on electrocardiogram.
- i. Differentiate SA and AV nodal blocks based on pathophysiology electrocardiography findings.
- j. Devise a management plan of a patient with a left bundle branch block.
- k. Define Long QT syndrome and its risk factors including common drugs.
- l. Predict treatment regimens for ventricular tachycardia (including torsades de pointes).

4. Disorders of Cardiac Output

Topics Included: Congestive heart failure, hypertrophic cardiomyopathy, dilated cardiomyopathy, myocarditis cardiac tamponade

Reading Reference:

- Cecil's Essentials of Medicine, 10th ed.
 - Ch. 3 Evaluation of the Patient with Cardiovascular Disease
 - Ch. 5 Heart Failure and Cardiomyopathy
 - Ch. 10 Pericardial and Myocardial Disease
- Osteopathic Considerations in Systemic Dysfunction, Rev 2nd ed.
 - Osteopathic Considerations in Cardiovascular Disorders pp 53-72

Online Case: [Aquifer Radiology Case 17](#)

Module: [Disorders of Cardiac Output](#)

Learning Objectives:

- a. Interpret physical exam findings for a patient with suspected heart failure such as jugular venous distention (JVD), hepatojugular reflux, and peripheral edema.
- b. Categorize the major pathologic states causing dyspnea and their clinical presentations.
- c. Categorize heart failure as reduced ejection fraction, improved ejection fraction, mildly reduced ejection fraction or preserved ejection fraction incorporating common etiologies, presenting clinical features, and treatment strategies.
- d. Categorize a patient's heart failure utilizing the NYHA Functional Class status.
- e. Identify risk factors for heart failure exacerbation and prevention strategies.
- f. Interpret B-type natriuretic peptide (BNP) results and recognize appropriate clinical situations for its use.
- g. Relate acute and chronic pharmacologic management of heart failure.
- h. Diagnose myocarditis using clinical, laboratory and imaging findings.
- i. Differentiate cardiomyopathy subtypes including hypertrophic and dilated cardiomyopathy.
- j. Recognize clinical, exam, laboratory and imaging findings for cardiac tamponade.
- k. Outline 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.
- l. Describe the important impact and effects of the lymphatic system on the function of the cardiovascular system.
- m. Relate somatic changes of the thoracic spine to effects in cardiovascular system.
- n. Describe key OMM treatment approaches utilized in the care of patients with congestive heart failure and specifically how treatments may affect sympathetic and parasympathetic tone as well as lymphatic return.
- o. Describe the appearance and significance of septal. ("Kerley B") lines).
- p. List four imaging findings of pulmonary edema on chest radiograph.
- q. Differentiate these imaging findings in order of severity.
- r. Describe measurements defining thresholds for normal and abnormal size of the cardiac silhouette on PA and AP chest radiographs.
- s. Propose imaging strategy options for the evaluation of chest pain and dyspnea (of suspected cardiac origin).
- t. Propose appropriate imaging for initial evaluation and follow up of a pulsatile abdominal abnormality discovered on physical exam.
- u. Outline the potential advantages and disadvantages of US and CT in the evaluation of

- abdominal aortic aneurysm.
- v. List the chest radiographic findings associated with CHF.
- w. Appreciate the difference between terms "CHF" and "pulmonary edema".
- x. Identify the positions of cardiac chambers and heart valves on chest radiographs.
- y. Outline the imaging alternatives for evaluation of myocardial perfusion using MR and nuclear medicine cardiac scans.
- z. Appreciate the radiation dose involved with cardiac nuclear medicine and CT imaging.
- aa. Outline imaging strategies for evaluation of cardiac ischemia (reversible and fixed) using nuclear medicine and cardiac MR techniques.
- bb. List possible advantages of lower extremity CT angiography over conventional catheter angiography.
- cc. Identify the radiographic appearance of common catheters used in the ICU.
- dd. Appreciate the use and radiographic appearance (and safe positioning) of pulmonary artery catheters (Swan-Ganz) and intra-aortic balloon pumps (IABP) in the ICU.
- ee. Outline radiation risks for a patient regarding cardiac imaging studies (echo, MRI, CT, and nuclear medicine).
- ff. Appreciate the anatomic basis for the common locations of bowel ischemia.
- gg. Describe the potential advantages of CT angiography versus catheter angiography in the evaluation of coronary artery disease in intermediate and low risk populations.
- hh. Outline the surgical and endovascular treatment options for AAA.
- ii. Recognize the ultrasound appearance of an abdominal aortic aneurysm.

5. Diabetes Mellitus – Inpatient Management

Topics Included: Diabetic emergencies, initiating insulin & other treatment options

Reading Reference:

- Cecil's Essentials of Medicine, 10th ed., Ch. 68: Diabetes Mellitus, Hypoglycemia
- American Diabetes Association Guidelines on Diabetes screening: www.diabetes.org
- United States Preventive Services Task Force Guidelines on Diabetes screening: <https://www.uspreventiveservicestaskforce.org/uspstf/>

Module: [Inpatient Management of Diabetes Mellitus, Electrolyte Disorders and Acid-Base Disorders](#)

Learning Objectives:

- a. Identify the American Diabetes Association (ADA) and the U.S. Preventive Task Force (USPTF) recommendations to screen for diabetes, including recognizing risk factors.
- b. Compare and contrast the pathogenesis of Type 1 and Type 2 diabetes.
- c. Diagnose type 2 diabetes mellitus using the four accepted criteria and relate the diagnostic criteria for impaired fasting glucose and impaired glucose tolerance.
- d. Utilize anion gap, osmolar gap, and corrected sodium to distinguish Diabetic ketoacidosis and hyperosmolar hyperglycemic state.
- e. Define hyperosmolar hyperglycemic state (HHS), including nonketotic coma.
- f. Recognize precipitants and presenting symptoms and signs of HHS and diabetic ketoacidosis (DKA) and relate the pathophysiology for the abnormal laboratory values of each.
- g. Distinguish the basic management of diabetic ketoacidosis and nonketotic hyperglycemic states, including the similarities and differences in insulin therapy and fluid and electrolyte replacement.
- h. Distinguish the ADA-recommended targets for glycemic control for adults.
- i. Relate the differences between types of insulin and the indications for their use.
- j. Recognize the clinical presentation and work up of hypoglycemia.
- k. Generate a treatment plan for hypoglycemia.

6. Gastrointestinal Bleed

Topics Included: Gastric ulcers, peptic ulcer disease, esophageal and gastric varices and acute inflammatory diverticulitis

Reading References:

- Cecil's Essentials of Medicine, 10th ed.
 - Ch. 32 Common Manifestations of Gastrointestinal Disease, Subchapter: Gastrointestinal Hemorrhage
 - Ch. 35 Endoscopic and Imaging Procedures
 - Ch. 36 Esophageal Disorders
 - Ch. 37 Diseases of the Stomach and Duodenum
- [Sleisenger and Fordtran's Gastrointestinal and Liver Disease, Chapter 20](#) (Available in VCOM Electronic Library in Clinical Key)

Module: [GI Bleed](#)

Learning Objectives:

- a. Identify the presentation of upper and lower gastrointestinal bleed.
- b. Define hematemesis, melena, and hematochezia.
- c. Identify the common causes of gastrointestinal bleeding such as *Helicobacter pylori* infection, non-steroidal anti-inflammatory drugs, alcohol, coagulopathies, chronic liver disease, ischemic bowel, diverticulitis, angioectasia, malignancies, etc.
- d. Identify physical exam findings in a patient with suspected GI bleed.
- e. Interpret laboratory and diagnostic tests in the evaluation of GI bleeding.
- f. Recognize an appropriate evaluation and treatment plan for patients with a gastrointestinal bleed that includes:
 - i. Establishing adequate venous access
 - ii. Administering crystalloid fluid resuscitation
 - iii. Ordering blood and blood product transfusion
 - iv. Prescribing appropriate medications
- g. Identify indications for consulting a gastroenterologist for upper endoscopy.

7. Pneumonia – Inpatient Management

Topics Included: Nosocomial pneumonias including Hospital acquired pneumonia (HAP) and Ventilator associated pneumonia (VAP). Complications of pneumonia, acute respiratory failure and mechanical ventilation.

Reading References:

- Cecil's Essentials of Medicine, 10th ed.
 - Ch. 14 General Approach to the patient with Respiratory Disorders
 - Ch. 19 Disorders of the Pleura, Mediastinum, and Chest Wall
 - Ch. 94 Infectious of the Lower Respiratory Tract
 - Ch. 101 Healthcare Associated Infections
- [Govindan, S. & Hyzy, R. C. \(2016\). The 2016 treatment guidelines and outcomes of hospital-acquired and ventilator-associated pneumonia: A selection correction? *American Journal of Respiratory and Critical Care Medicine*, 194\(6\). doi: 10.1164/rccm.201607-1447ED](#)
- [Torres, A., Ferrer, M., & Badia, J. R. \(2010\). Treatment guidelines and outcomes of hospital-acquired and ventilator-associated pneumonia. *Clinical Infectious Diseases*, 51 \(Suppl 1\), S48-53.](#)
- Osteopathic Considerations in Systemic Dysfunction, Rev 2nd ed.
 - Osteopathic Considerations in Lower Respiratory Disorders pp 33-50

Module: [Inpatient Management of Pneumonia](#)

Learning Objectives:

- a. Differentiate the common pneumonia pathogens (viral, bacterial, mycobacterial, and fungal) in various clinical scenarios.
- b. Relate radiographic findings associated with specific pathogens.

- c. Relate physical exam findings, including bronchial breath sounds, rales (crackles), rhonchi, wheezes, tactile fremitus, egophany, and percussion to pulmonary pathologies such as pneumonia and effusions.
- d. Identify the structural areas which may play a role in Vagal nerve facilitation.
- e. Identify the common rib dysfunctions found as a result of paroxysmal coughing.
- f. Describe the pulmonary effects of increased parasympathetic tone.
- g. Describe the pulmonary effects of increased acute/chronic sympathetic activation.
- h. Identify the spinal segments most likely to become facilitated with lung dysfunction.
- i. Identify how the biomechanical, respiratory, neurological, metabolic and behavioral models describe contributions to the development of symptomatic disease and address treatment for each component.
- j. Recognize and identify an appropriate OMT treatment plan in a patient with lower respiratory disease.
- k. Identify methods to incorporate holistic care in the management of a patient with lower respiratory disorders.
- l. Recognize the most common complications of pneumonia, including parapneumonic effusions and empyema.
- m. Recall indications for thoracentesis and chest tube placement.
- n. Interpret diagnostic laboratory studies for pulmonary pathologies to determine treatment options.
- o. Select an appropriate empiric antibiotic regimen for nosocomial, immunocompromised-host, and aspiration pneumonia, taking into account pertinent patient features.
- p. Define healthcare-acquired and ventilator-associated pneumonia.
- q. Apply the current guidelines for empiric antibiotic treatment for HAP and VAP.
- r. Identify prevention strategies HAP and VAP.
- s. Identify indications for CXR and CT scan imaging of the chest for pneumonia.

8. Hepatic & Biliary Disorders

Topics Included: Jaundice workup, hepatitis, hepatic and pancreatic tumors, NAFLD, Wilson, Gilbert, alpha 1 antitrypsin deficiency, hemochromatosis

Reading Reference:

- Cecil's Essentials of Medicine, 10th ed.
 - Ch. 40 Laboratory Tests in Liver Disease
 - Ch. 41 Jaundice
 - Ch. 42 Acute and Chronic Hepatitis
 - Ch. 44 Cirrhosis of the Liver and Its Complications

Module: [Jaundice and Hepatitis](#)

Learning Objectives:

- a. Differentiate conjugated and unconjugated hyperbilirubinemia utilizing pathophysiology and associated diagnostic findings.
- b. Categorize the common types of liver diseases and their risk factors (including inherited and acquired).
- c. Diagnose causes of liver disease utilizing history and diagnostic testing such as patterns in liver function tests.
- d. Identify indications for a liver biopsy.
- e. Identify the signs, symptoms, and complications of cirrhosis and portal hypertension.
- f. Understand the general management of liver cirrhosis and complications of advanced liver disease.
- g. Recognize the clinical presentation, diagnosis, and treatment of spontaneous bacterial peritonitis (SBP).
- h. Identify physical exam maneuvers to evaluate for ascites.

- i. Identify the indications for paracentesis and interpret ascitic fluid including the serum to ascites albumin gradient (SAAG).
- j. Identify indications for hepatic transplantation referral in end stage liver disease.
- k. Identify risk factors and common clinical presentations for viral hepatitis.
- l. Interpret viral hepatitis serologies.

9. Nephrology

Topics Included: Pyelonephritis, glomerulonephritis, nephrotic syndrome, nephritic syndrome, pre-renal azotemia, post-renal azotemia, acute kidney injury, nephrolithiasis, cystitis, urethritis, dehydration

Reading Reference:

- Cecil Essentials of Medicine, 10th ed.
 - Ch. 24 Approach to the Patient with Renal Disease
 - Ch. 26 Glomerular Diseases
 - Ch. 27 Major Nonglomerular Disorders of the Kidney
 - Ch. 29 Acute Kidney Injury

Module: [AKI and Hematuria](#)

Learning Objectives:

- a. Interpret various nephrology tests such as urinalysis, urine culture, urine microscopy, and stone analysis.
- b. Compare the pathophysiology of major etiologies of acute renal failure including decreased renal perfusion (pre-renal), intrinsic renal disease, and acute renal obstruction (post renal).
- c. Distinguish pre-renal, intrinsic renal disease, and post-renal failure utilizing the fractional excretion of sodium.
- d. Distinguish a differential diagnosis for acute kidney injury based on clinical history and basic diagnostic studies.
- e. Identify appropriate management plan for acute renal failure including volume management, dietary recommendations, drug dosage alterations, electrolyte monitoring, and indications for dialysis.
- f. Identify risk factors for contrast-induced nephropathy and recommend steps to prevent this complication.
- g. Differentiate nephrotic syndrome and nephritic syndrome.
- h. Recall the normal structure and physiological function of the renal and urinary tract systems.
- i. Indicate the appropriate evaluation of patients with complaints common to nephrology.
- j. Identify history and physical examination findings to assess volume and hydration status.
- k. Identify vital signs and laboratory abnormalities associated with dehydration.
- l. Calculate glomerular filtration rate, creatinine clearance, fractional excretion of Na and identify its impact on treatment and medications.
- m. Distinguish findings in the elderly with dehydration.
- n. Identify the common causes of dysuria, pain, hematuria, renal failure, in the adult patient.
- o. Identify and relate co-existing socio-economic or genetic factors contributing to the patient with dysuria, pain, hematuria, and nephrolithiasis.
- p. Develop an appropriate diagnostic and treatment plan for the nephrology patient.
- q. Create a differential diagnosis for hematuria.
- r. Describe three managements to potentially decrease renal toxicity from IV contrast in a patient with impaired renal function.

10. Electrolyte Disorders

Topics Included: Hypo/hyper kalemia, natremia, calcemia, phosphatemia, pseudohyponatremia, diabetes insipidus

Reading Reference: Cecil's Essentials of Medicine, 10th ed., Ch. 25: Fluids and Electrolyte Disorders

Module: [Inpatient Management of Diabetes Mellitus, Electrolyte Disorders, Acid-Base Disorders](#)

Learning Objectives:

- a. Identify the electrolyte disorders based on clinical presentation and diagnostic testing.
- b. Classify hyponatremia and hypernatremia based on volume status.
- c. Identify complications in rapid treatment of hyponatremia and hypernatremia.
- d. Select appropriate fluid and replacement orders for patients with common electrolyte and metabolic disturbances.
- e. Relate electrocardiograph findings to electrolyte disorders.
- f. Recognize the clinical presentation of diabetes insipidus.
- g. Identify the diagnostic work up for diabetes insipidus.
- h. Select appropriate treatment for diabetes insipidus.

11. Acid-Base Disorders

Topics Included: Anion gap, Osmolar gap, metabolic vs. resp. acidosis/alkalosis

Reading Reference: Cecil's Essentials of Medicine, 10th ed., Ch. 25: Fluids and Electrolyte Disorders

Module: [Inpatient Management of Diabetes Mellitus, Electrolyte Disorders, Acid-Base Disorders](#)

Learning Objectives:

- a. Calculate anion gap, osmolar gap, and correct sodium to distinguish hyponatremia from pseudohyponatremia.
- b. Relate the pathophysiology of simple and mixed acid-base disorders clinical scenarios.
- c. Calculate the anion gap and relate its relevance to determining the cause of a metabolic acidosis.
- d. Identify the differential of anion-gap metabolic acidosis.
- e. Differentiate types of renal tubular acidosis based on laboratory findings.
- f. Calculate urine anion gap to diagnose normal anion-gap metabolic acidosis.
- g. Relate the pathophysiology of ethylene glycol toxicity to acid-base abnormalities.
- h. Diagnose ethylene glycol toxicity utilizing laboratory studies including urinalysis.
- i. Select treatment for ethylene glycol toxicity.

12. Sepsis and Common Hospital Infections

Topics Included: Diagnosis and treatment, sepsis, SIRS, septic shock, DIC, endocarditis, ARDS

Reading Reference:

- Cecil's Essentials of Medicine, 10th ed.
 - Ch. 52 Disorders of Hemostasis: Bleeding
 - Ch. 91 Bacteremia and Sepsis
 - Ch. 95 Infections of the Heart and Blood Vessels

Module: [Sepsis and Common Hospital Infections and Healthcare Associated Infections](#)

Learning Objectives:

- a. Define sepsis.
- b. Identify risk factors for sepsis.
- c. Recognize prognostic scoring tools for identifying sepsis.
- d. Differentiate etiologies of shock.
- e. Differentiate sepsis from septic shock.
- f. Recognize appropriate laboratory and imaging studies to diagnose shock.
- g. Predict treatment principles of sepsis including early recognition, measuring lactate aggressive fluid resuscitation, early broad-spectrum antibiotic administration and vasopressor administration.
- h. Distinguish DIC (disseminated intravascular coagulation) based on physical exam findings and laboratory data.

- i. Predict appropriate therapy for DIC
- j. Identify risk factors for infective endocarditis.
- k. Identify common clinical presentations of infective endocarditis.
- l. Distinguish infective endocarditis utilizing modified Duke criteria.
- m. Recognize treatment principles for infective endocarditis.
- n. Recognize indications and prophylaxis regimens for infective endocarditis.
- o. Define acute respiratory distress syndrome (ARDS)
- p. Identify risk factors and common patient presentation for ARDS.
- q. Predict treatment and prevention strategies for ARDS.

13. Healthcare Associated Infections

Topics Included: C diff, MRSA, Infection control, central line-associated bloodstream infections, catheter-associated urinary tract infections (Does not include surgical site infections)

Reading Reference: Cecil's Essentials of Medicine, 10th ed., Ch. 101: Health Care-Associated Infections

Module: [Sepsis and Common Hospital Infections and Healthcare Associated Infections](#)

Learning Objectives:

- a. Define healthcare associated infections.
- b. Identify risk factors for healthcare associated infection.
- c. Identify system-based practices to prevent health care-associated infections.
- d. Predict treatment strategies for various healthcare associated infections.
- e. Select types of patient isolation precautions and their indications.

14. Coagulation & Bleeding Disorders

Topics Included: Factor V Leiden, protein C and protein S deficiency, anti-thrombin III, VTE and VTE prophylaxis, ITP, TTP/HUS, von Willebrand, HIT

Reading Reference:

- Cecil's Essentials of Medicine, 10th ed.
 - Ch. 12 Vascular Diseases and Hypertension
 - Ch. 52 Disorders of Hemostasis: Bleeding
 - Ch. 53 Disorders of Hemostasis: Thrombosis

Module: [Coagulation and Bleeding Disorders](#)

Learning Objectives:

- a. Identify indications for and contradictions for various methods of deep vein thrombosis prophylaxis.
- b. Identify risk factors for the development of a deep vein thrombosis (DVT).
- c. Recognize the signs and symptoms of DVT.
- d. Calculate pre-test probability for DVT with Wells Score and relate pre-test probability to diagnostic work-up.
- e. Interpret various diagnostic tests for DVT.
- f. Choose an appropriate management plan for DVT, including appropriate use and monitoring of heparin, bridging therapy, and oral anticoagulants including warfarin and direct oral anticoagulants.
- g. Predict the site where a thrombus formed in the deep veins of the lower extremity will lodge after traveling through the circulation.
- h. Diagnose congenital and acquired thrombophilia disorders utilizing clinical history and diagnostic testing.
- i. Recognize the common causes associated with prolonged bleeding times both diseases and medications.
- j. Differentiate between primary and secondary hemostasis disorders.
- k. Classify thrombocytopenia in terms of diseases that cause decreased platelet production, and accelerated platelet destruction.

- l. Define ITP (Idiopathic Thrombocytopenic Purpura) in terms of causes, lab testing and various treatment modalities depending on platelet counts.
- m. Define Heparin induced thrombocytopenia in terms of pathophysiology.
- n. Define thrombotic thrombocytopenic purpura and the hemolytic syndrome in terms of associated disorders, clinical signs and symptoms, lab tests and treatment options. Recognize the association of O157:H7 and HUS (Hemolytic Uremic Syndrome).

15. Neurological Infections

Topics Included: Meningitis, encephalitis, cerebral abscess

Reading Reference: Cecil Essentials of Medicine, 10th ed., Ch. 92: Infections of the Central Nervous System

Module: [Neurological Infections](#)

Learning Objectives:

- a. Recall risk factors for meningitis.
- b. Differentiate the clinical presentations of meningitis, encephalitis, and cerebral abscess.
- c. Distinguish indications, contraindications, and complications of lumbar puncture.
- d. Interpret the analysis of cerebrospinal fluid.
- e. Differentiate bacterial from viral meningitis based off typical cerebrospinal fluid findings.
- f. Identify the most common causative organisms associated with meningitis, encephalitis, and cerebral abscess.
- g. Predict empiric antibiotic treatment for meningitis based on age and clinical risk factors.
- h. Recognize complications and management of neurological infections.
- i. Identify the use of the meningitis vaccine and age for vaccination.

16. Hypertension and Stroke

Topics Included: Urgent and emergent conditions, and their treatment, TIA, CVA (hemorrhagic & ischemic) and post-stroke rehabilitation, intracranial hemorrhages

Reading Reference:

- Cecil Essentials of Medicine, 10th ed.
 - Ch. 12 Vascular Diseases and Hypertension
 - Ch. 118 Cerebrovascular Disease

Online Case: [Aquifer Radiology Case 10](#)

Module: [Hypertension and Stroke](#)

Learning Objectives:

- a. Distinguish between hypertensive urgency and emergency.
- b. Differentiate between the most common causes of secondary hypertension, including associated clinical characteristics upon presentation and diagnostic modalities.
- c. Identify how to diagnose for pheochromocytoma and therapy prior to surgery.
- d. Recognize the various drug classes of antihypertensive medications, indications, contraindications, and side effects.
- e. Identify patient lifestyle modifications to reduce the risk of end-organ damage.
- f. Define stroke and TIA (Transient Ischemic Attack).
- g. Identify common risk factors for stroke and TIA.
- h. Recognize the clinical presentation and physical examination findings of stroke and TIA.
- i. Recall the differential diagnosis and treatment of acute neurologic deficits, including intracranial hemorrhages.
- j. Interpret the location of the neurologic lesion based on the clinical presentation.
- k. Recall appropriate laboratory and imaging studies to evaluate the acute stroke and intracranial patient.
- l. Recall acute stroke therapy including thrombolysis and infer relative and absolute contraindications.

- m. Identify blood pressure management in suspected stroke.
- n. Recognize pharmacologic and rehabilitation therapies in a patient with stroke.
- o. Generate patient counseling information regarding the early recognition of stroke symptoms.
- p. Identify a preliminary management plan for patients presenting with functional deficits, including adaptive interventions and involvement of interdisciplinary team members from appropriate disciplines, such as social work, nursing, rehabilitation, nutrition, and pharmacy.
- q. Identify appropriate imaging algorithms to evaluate headache.
- r. Describe the appearance of gray matter, white matter, and CSF on T1, T2, and FLAIR images.
- s. Describe the appearance of stroke on DWI imaging.
- t. List common sites for berry aneurysms.
- u. Demonstrate localization and identification of the major intracranial vascular structures.
- v. Describe treatment options for patients with cerebral aneurysms.
- w. Compare and contrast the techniques and applications of catheter angiography, MR angiography and CT angiography.
- x. Recognize the typical appearance and locations of subarachnoid hemorrhage on brain CT.
- y. Outline clinical and imaging strategies to distinguish cerebral lymphoma from toxoplasmosis.
- z. Explain the concept behind MR spectroscopy of the brain and its application.
- aa. Describe the features of mass effect on brain CT and MRI scans.

17. Obstructive Lung Disease: Inpatient Management

Topics Included: Acute exacerbation treatment of COPD, respiratory failure, asthma (acute), criteria for admission

Reading Reference:

- Cecil's Essentials of Medicine, 10th ed.
 - Ch. 14 General Approach to Patients with Respiratory Disorders
 - Ch. 16 Obstructive Lung Disease
 - Ch. 22 Preoperative and Postoperative Care
- Osteopathic Considerations in Systemic Dysfunction, Rev 2nd ed.
 - Osteopathic Considerations in Lower Respiratory Disorders pp 33-50

Online Case: [Aquifer Radiology Case 4](#)

Module: [Inpatient COPD](#)

Learning Objectives:

- a. Differentiate signs and symptoms of COPD with acute exacerbation from other etiologies of acute dyspnea
- b. Differentiate common etiologies of acute exacerbation of COPD in clinical scenarios
- c. Relate radiographic and spirometry findings associated with COPD.
- d. Relate physical exam findings including distant breath sounds, wheezing, prolonged expiratory phase associated with COPD.
- e. Recognize the most common complications of acute exacerbations of COPD.
- f. Interpret laboratory findings for acute and chronic respiratory acidosis.
- g. Select an appropriate diagnostic workup for acute exacerbation of COPD.
- h. Select appropriate empiric treatment regimen for acute exacerbation of COPD based on current guidelines.
- i. Identify prevention strategies for exacerbations of COPD.
- j. Recognize indications for hospitalization and ventilation support in acute exacerbation of COPD.
- k. Identify treatment of an asthma exacerbation and identify high-risk features of an exacerbation.
- l. Recognize the typical changes of emphysema and COPD in chest radiographs.
- m. Identify the structural areas which may play a role in Vagal nerve facilitation.
- n. Describe the pulmonary effects of increased parasympathetic tone.

- o. Describe the pulmonary effects of increased acute/chronic sympathetic activation.
- p. Identify the spinal segments most likely to become facilitated with lung dysfunction.
- q. Identify how the biomechanical, respiratory, neurological, metabolic and behavioral models describe contributions to the development of symptomatic disease and address treatment for each component.
- r. Recognize and identify an appropriate OMT treatment plan in a patient with COPD

18. Altered Mental Status

Topics Included: Delirium, Dementia, (Alzheimer, Lewy Body, Vascular, Frontotemporal, Parkinson's, infectious), Normal Pressure hydrocephalus, Wernicke-Korsakoff

Reading Reference: Cecil's Essentials of Medicine, 10th ed.

- Ch. 110 Dementia and Memory Disturbances
- Ch. 126 The Aging Patient

Module: [Altered Mental Status](#)

Learning Objectives:

- a. Distinguish between delirium and dementia.
- b. Identify causes of altered mental status and delirium in hospitalized patients.
- c. Define adverse consequences of delirium.
- d. Identify the differential diagnosis for altered mental status and narrow the differential based on history and physical examination.
- e. Recognize tools such as CAM to identify delirium.
- f. Identify appropriate work-up including lab and imaging to aid in diagnosis of altered mental status.
- g. Identify pharmacologic and non-pharmacologic treatments for delirium.
- h. Identify delirium prevention techniques.
- i. Recognize preferred screening tools for dementia.
- j. Recognize differences between various cause of dementia.
- k. Identify treatment and prevention strategies for dementia.