

CARDIOLOGY CLERKSHIP

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General Description

Elective Rotation

This elective rotation is a four (4) week introductory, structured clinical experience under direct supervision designed to provide the student experience diagnosing, treating and caring for patients with cardiovascular disorders. There is *no* post-rotation exam for the elective

Purpose

Clinical experiences are intended to assist the student's transition from didactic to integrated clinical evaluation and patient management. Under supervision, students are expected to assist in the management of acute and chronic cardiovascular diseases. The student should also develop fundamental psychomotor skills by performing routine basic procedures under direct supervision.

Course Objectives

General Overview

This clerkship will provide patient and laboratory experiences in a setting of preceptored learning to facilitate development of skills in:

The student should be able to:

- elicit a record of an appropriately complete and organized history and physical with attention to the cardiovascular system.
- approach ECG interpretation in a systematic and logical fashion.
- use laboratory and imaging studies for diagnostic and therapeutic decision making.
- assist in the management of patients with cardiovascular disease.

Technical and Interpretation Skills

Students are expected to acquire certain technical skills and interpretation that are commonly employed in medical care.

The student should be able to:

- Record and interpret an ECG.
- Interpret serum markers of myocardial injury (biomarkers)
- Interpret a complete blood count and interpret common chemistry measurements (e.g. CMP)
- Interpret chest x-ray findings.
- Interpret arterial blood gas findings.

General Clinical Core Competencies

The curriculum detailed in the APPENDIX (adapted from the CDIM-SGIM Core Medicine Clerkship Curriculum Guide Ver.3.0) specifies course objectives in terms of the basic internal medicine core clinical competencies and the specific learning objectives (knowledge, skills, and attitudes) pertinent to those competencies. **Every effort should be made to integrate them into the cardiology clerkship.**

CARDIOVASCULAR CORE TOPICS AND DISEASES

The student is responsible for reviewing these topics during the rheumatology elective. Introductory information can be found in Internal Medicine Clerkship Guide, 3rd Ed. by Paauw *. Also there are excellent questions with answers and critiques in MKSAP for Students 5 †.

- Cardiovascular Medicine (Section 1†)
- Ischemic heart disease (pp. 239-246*)
- Congestive heart failure (pp. 233-239*)
- Hyperlipidemia (pp. 283-289*)
- Common cardiac arrhythmias (pp. 221-233*)
- Hypertension (pp. 445-455*)
- Dyspnea (pp. 126-133*)
- Chest pain (pp. 76-85*)

Students are encouraged to supplement these basic discussions by reference to Cecil Medicine or Harrison's Principles of Internal Medicine and current clinical papers from refereed journals.

➤ **Ischemic Heart Disease**

- chest pain and its evaluation
- stable & unstable angina pectoris
- coronary artery disease
- myocardial infarction
- congestive heart failure

- **Cardiomyopathies**
- **Lipid Disorders**
- **Common Cardiac Arrhythmias**
- **Valvular heart disease**
- **Infective endocarditis**
- **Shock syndromes**
- **Hypertensive urgencies and emergencies**
- **Pericarditis**

Implementation

Course objectives are to be accomplished in a college-affiliated hospital or clinical facility, under supervision. Course objectives should be covered during the rotation to assure adequate student preparation for board examinations. The use of diverse methods appropriate to the individual and the clinical site are encouraged, but patient-centered teaching is optimal.

Didactic methods to achieve required objectives include:

- reading assignments
- lectures
- computer-assisted programs (if available)
- student attendance at/participation in formal clinical presentations by medical faculty

Clinically oriented teaching methods may include:

- assignment of limited co-management responsibilities under supervision
- participation in clinic visits, daily patient rounds and conferences
- supervised and critiqued clinic work-ups of patients admitted to the service
- assigned, case-oriented reading case presentations

POST-ROTATION EVALUATION

At the beginning of the rotation, the physician/mentor should review expectations/guidelines of performance with the student. A mid-rotation evaluation is encouraged. On the last day of service, the supervising physician should review the student's performance with the student and have the student sign the evaluation form before submission. A student's signature simply indicates that the student has received a grade directly from the attending; it does not indicate agreement with the grade. Evaluations of students must be completed within two weeks of completion of the rotation.

TEXTS AND RESOURCES

Required Assignment Texts:

Kasper, et al (eds), Harrison's Principles of Internal Medicine 18th Ed., McGraw-Hill, 2012. (Available through Pulse-AccessMedicine)

or

Goldman, et al (eds), Cecil Medicine, 24th Ed., Saunders, 2011. (Available through Pulse-MD Consult)

Paauw, DS. (eds), Internal Medicine Clerkship Guide, 3rd. Ed., St. Louis, Mosby, 2008.

American College of Physicians, MKSAP for Students 5, 5th Ed., Philadelphia, ACP, 2011. (Available through Pulse- STAT! Ref)

Optional Reference Text

Bonow et al, Braunwald's Heart Disease, 9th Ed., Saunders 2011. Available through Pulse-MD Consult)

or

Fuster et al, Hurst's The Heart, 13th Ed., McGraw-Hill 2011. (Available through Pulse-AccessMedicine)

Additional Helpful Texts:

Goldberger, A. Clinical Electrocardiography: A Simplified Approach, 8th Ed., Mosby, 2013. . Available through Pulse-MD Consult)

or

Wagner, GS. Marriott's Practical Electrocardiography 12th Ed., Lippincott Williams & Wilkins, 2014.

READING ASSIGNMENTS

1. **Review all core topics and diseases listed above.**
2. In-depth reading (Cecil or Harrison) of individual diseases and disorders listed above.
3. Supplement readings in Braunwald or Hurst for increased detail regarding diseases and disorders listed above.

ELECTRONIC RESOURCES

(All are available through Pulse)

Evidence-Based Medicine:

- **Cochrane Library for Evidence-Based Medicine**- The Cochrane Library contains high-quality, independent, online evidence to inform healthcare decision-making.
- **UpToDate**[®] - an evidence-based knowledge system authored by physicians to help clinicians make the right decisions at the point of care. All UpToDate content is written and edited by a global community of 4,800 physicians, world-renowned experts in their specialties..
- **Essential Evidence Plus**- A powerful resource packed with content, tools, calculators and alerts for clinicians who deliver first-contact care.
- **ACP Smart Medicine**- ACP Smart Medicine is a comprehensive, evidence-based reference for fast, current answers on the best clinical care.

Electronic Texts:

- **Cecil Medicine**-Clinical Key
- **Harrison's Online**-AccessMedicine
- **Current Medical Diagnosis and Treatment 2013** -AccessMedicine
- **Clinical Key**- Provides full-text access to approximately 40 medical textbooks, 50 medical journals, comprehensive drug information, and more than 600 clinical practice guidelines
- **eJournals A-to-Z**- Database provides link and coverage information to more than 124,000 unique titles from more than 1,100 database and e-journal packages.
- **The Medical Letter on Drugs and Therapeutics**- An independent, peer-reviewed, nonprofit publication that offers unbiased critical evaluations of drugs, with special emphasis on new drugs.

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APPENDIX

DIAGNOSTIC DECISION-MAKING

Rationale:

Physicians are responsible for directing and conducting the diagnostic evaluation of patients with acute and chronic cardiovascular diseases. In a time of rapidly proliferating tests, medical students must learn how to design safe, expeditious, and cost-effective diagnostic evaluations.

Specific Learning Objectives:

- A. Knowledge:** Students should be able to define, describe, and discuss:
1. Key history and physical examination findings pertinent to the differential diagnosis. (*MK, OPP*)
 2. Information resources for determining diagnostic options for patients with common and uncommon cardiac problems. (*MK, PLI*)
 3. How critical pathways or practice guidelines can be used to guide diagnostic test ordering. (*MK*)
- B. Skills:** Students should demonstrate specific skills, including:
1. Identifying problems with which a patient presents, appropriately synthesizing these into logical clinical syndromes. (*PC*)
 2. Identifying which problems are of highest priority. (*PC*)
 3. Formulating a differential diagnosis based on the findings from the history and physical examination. (*PC, OPP*)
 4. Using the differential diagnosis to help guide diagnostic test ordering and sequencing. (*PC*)
- C. Attitudes and Professional Behaviors:** Students should be able to:
1. Seek feedback regularly regarding diagnostic decision-making and respond appropriately (*P*)
 2. Recognize the importance of and demonstrate a commitment to the utilization of other health care professionals in diagnostic decision making. (*P, SBP*)

AOA Competencies:

PC = Patient Care
MK = Medical Knowledge
PLI = Practice-Based Learning and Improvement
OPP = Osteopathic Philosophy, Principles and Practice

CS = Communication Skills
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HISTORY-TAKING AND PHYSICAL EXAMINATION

Rationale:

The ability to obtain an accurate medical history and carefully perform a physical examination is fundamental to providing comprehensive care to adult patients. In particular, the internist must be thorough and efficient in obtaining a history and performing a physical examination with a wide variety of patients with acute and chronic cardiovascular diseases.

Specific Learning Objectives:

- A. Knowledge:** Students should be able to define, describe, and discuss:
1. The significant attributes of a symptom, including: location and radiation, intensity, quality, temporal sequence (onset, duration, frequency), alleviating factors, aggravating factors, setting, associated symptoms, functional impairment, and patient's interpretation of symptom. *(MK, OPP)*
 2. The four methods of physical examination (inspection, palpation, percussion, and auscultation), including where and when to use them, their purposes, and the findings they elicit. *(MK, OPP)*
 3. The physiologic mechanisms that explain key findings in the history and physical exam. *(MK, OPP)*
- B. Skills:** Students should be able to demonstrate specific skills, including:
1. Using language appropriate for each patient. *(PC, CS)*
 2. Eliciting the patient's chief complaint as well as a complete list of the patient's concerns. *(PC, CS)*
 3. Obtaining a patient's history in a logical, organized, and thorough manner, covering the history of present illness; past medical history; preventive health measures; social, family, and occupational history; and review of systems.
 4. Demonstrating proper hygienic practices whenever examining a patient. *(PC)*
 5. Performing a physical examination for a patient in a logical, organized, respectful, and thorough manner, giving attention to the patient's general appearance, vital signs, and pertinent body regions. *(PC)*
- C. Attitudes and Professional Behaviors:** Students should be able to:
1. Recognize the essential contribution of a pertinent history and physical examination to patient care. *(P)*
 2. Establish a habit of updating historical information and repeating important parts of the physical examination during follow-up visits. *(P)*
 3. Demonstrate consideration for the patient's feelings, limitations, and cultural and social background whenever taking a history and performing a physical exam. *(P)*

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INTERPRETATION OF CLINICAL INFORMATION

Rationale:

In the routine course of clinical practice, most physicians are required to order and interpret a wide variety of diagnostic tests and procedures. Determining how these test results will influence clinical decision making and communicating this information to patients in a timely and effective manner are core clinical skills that third-year medical students should possess.

Specific Learning Objectives:

A. Knowledge: Students should be able to:

1. Interpret specific diagnostic tests and procedures that are ordered to evaluate patients who present with common symptoms and diagnoses encountered in the practice of cardiology. *(PC, MK)*
2. Take into account the important differential diagnostic considerations, including potential emergencies. *(PC, MK)*
3. Define and describe cardiac imaging studies:
 - Indications for testing. *(PC, MK)*
 - Critical results that require immediate attention. *(PC, MK)*
4. Independently interpret the results of the following laboratory tests:
 - CBC with diff and blood smear, UA, electrolytes, BUN/Cr, glucose, hepatic function panel, serum markers of myocardial injury (biomarkers), PT/INR, PTT, thyroid function tests, arterial blood gases *(PC, MK)*

B. Skills: Students should be able to demonstrate specific skills, including:

1. Approaching ECG interpretation in a systematic and logical fashion *(PC)*
2. Recording the results of laboratory tests in an organized manner, using flow sheets when appropriate. *(PC)*

C. Attitudes and Professional Behaviors: Students should be able to:

1. Appreciate the importance of follow-up on all diagnostic tests and procedures and timely communication of information to patients and appropriate team members. *(P)*
2. Personally review medical imaging studies, ECGs, lab studies, to assess the accuracy and significance of the results. *(P)*

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CASE PRESENTATION SKILLS

Rationale:

Communicating patient care information to colleagues and other health care professionals is an essential skill regardless of specialty. Students should develop facility with different types of case presentations (e.g. written, oral, new patient and follow-up, inpatient and outpatient).

Specific Learning Objectives:

- A. Knowledge:** Students should be able to define, describe, and discuss components of comprehensive and abbreviated case presentations (oral and written) and settings appropriate for each. (*MK*)
- B. Skills:** Students should be able to demonstrate specific skills, including:
1. Prepare legible, comprehensive, and focused new patient workups that include the following features as clinically appropriate:
 - Concise history of the present illness organized chronologically with minimal repetition, omission, or extraneous information, and including pertinent positives and negatives. (*PC, CS*)
 - A comprehensive physical examination with detail pertinent to the patient's problem. (*PC, CS, OPP*)
 - A succinct, prioritized, and, where appropriate, complete list of all problems identified by the history and physical examination. (*PC, CS, OPP*)
 - A differential diagnosis for each problem (appropriate for the student's level of training). (*PC, CS*)
 - A diagnostic and treatment plan for each problem (appropriate for the student's level of training). (*PC, CS, OPP*)
 2. Orally present a new or follow-up inpatient's or outpatient's case in a logical manner, chronologically developing the present illness, summarizing the pertinent positive and negative findings as well as the differential diagnosis and plans for further testing and treatment. (*PC, CS*)
- C. Attitudes and Professional Behaviors:** Students should be able to:
1. Demonstrate ongoing commitment to improving case presentation skills by regularly seeking feedback on presentations. (*PLI, P*)
 2. Accurately and objectively record and present all data. (*P*)

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THERAPEUTIC DECISION-MAKING

Rationale:

Internists are responsible for directing and coordinating the therapeutic management of patients with a wide variety of cardiovascular diseases. To manage patients effectively, physicians need basic therapeutic decision-making skills that incorporate both pathophysiologic reasoning and evidence-based knowledge.

Specific Learning Objectives:

- A. Knowledge:** Students should be able to define, describe, and discuss:
1. Information resources for determining medical and surgical treatment options for patients with common and uncommon cardiovascular problems. *(MK)*
 2. How to use critical pathways and clinical practice guidelines to help guide therapeutic decision making. *(MK)*
 3. Factors that frequently alter the effects of medications, including drug interactions and compliance problems. *(MK)*
 4. Factors to consider in selecting a medication from within a class of medications. *(MK)*
 5. Factors to consider in monitoring a patient's response to treatment, including potential adverse effects. *(MK)*
 6. Methods of monitoring therapy and how to communicate them in both written and oral form. *(MK)*
- B. Skills:** Students should be able to demonstrate specific skills, including:
1. Formulating an initial therapeutic plan. *(PC)*
 2. Accessing and utilizing, when appropriate, information resources to help develop an appropriate and timely therapeutic plan. *(PC, PLI)*
 3. Writing prescriptions and inpatient orders safely and accurately. *(PC)*
 4. Counseling patients about how to take their medications and what to expect when doing so, including beneficial outcomes and potential adverse effects. *(PC, CS)*
 5. Monitoring response to therapy. *(PC)*
- C. Attitudes and Professional Behaviors:** Students should be able to:
1. Incorporate the patient in therapeutic decision making, explaining the risks and benefits of treatment. *(CS, P)*
 2. Respect patient's informed choices, including the right to refuse treatment. *(P)*
 3. Recognize the importance of and demonstrate a commitment to the utilization of other health care professionals in therapeutic decision making. *(P, SBP)*

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