

CHAPTER 39

INTRODUCTION TO THE MEDICAL LABORATORY

Overview

Medical assistants play an important role in laboratory testing, which provides important diagnostic information to providers. Medical assistants may be responsible for patient preparation, obtaining specimens, and testing or sending specimens to an independent laboratory. Students learn about the departments inside a medical laboratory, the type of testing each department performs, and how to fill out a laboratory requisition form. They also learn about the importance of quality controls and safety standards and how to ensure that both are maintained. Standard Precautions for infection control are mandatory in the laboratory setting.

Lesson Plan

I. LEARNING OUTCOMES	ABHES	CAAHEP
A. Define, spell, and pronounce the key terms as presented in the glossary.		
B. Explain the reasons for performing laboratory testing.		
C. Describe the main similarities and differences between an independent laboratory and a physician's office laboratory (POL).		
D. Explain the levels of laboratory personnel in relation to their education, skills, and duties and where a medical assistant is placed in the hierarchy.	1d, 1e	IX.C.5
E. List eight different departments within the medical laboratory and list at least two types of testing performed within each of those departments.		
F. Name nine of the most common laboratory panels and explain the body system or function being surveyed.		
G. Explain the concepts of quality control and quality assurance in the medical laboratory.	10a	
H. Describe at least three methods of ensuring quality in the medical laboratory.	10a	
I. Demonstrate how to correctly complete a laboratory requisition.		
J. Explain the rationale behind proper patient preparation before laboratory testing.	9a, 9p	
K. Explain where accurate and reliable information might be obtained about proper procurement, storage, and handling of laboratory specimens.	10d	
L. Demonstrate the proper use and care of a compound microscope.		
M. Analyze the professionalism questions and apply them to this chapter's content.		

II. PROFESSIONALISM QUESTIONS

- A. Communication
 1. Did you speak at the patient's level of understanding?
 2. Did you explain procedures and expectations to the patient?
- B. Competency
 1. Did you pay attention to detail?
 2. Were you knowledgeable and accountable?
- C. Initiative
 1. Did you seek out opportunities to expand your knowledge base?
- D. Integrity
 1. Did you work within your scope of practice?
 2. Did you acknowledge the scope of practice of other health care professionals?

III. REFERENCES

- A. Lindh, Wilburta Q., Pooler, Marilyn S., Tamparo, Carol D., Dahl, Barbara M. & Morris, Julie, A. *Delmar's Comprehensive Medical Assisting: Administrative and Clinical Competencies 5e*
- B. Text Chapter 39, References/Bibliography
- C. Any other teacher-preferred reference material such as your program MSDS manual, website of OSHA, CLIA, and so forth

IV. VISUAL AIDS

- A. Computer access to identified Internet resources
- B. Any teacher-preferred visual aids (PowerPoint, etc.)
- C. Copies of available OSHA regulations, Material Safety Data Sheets (MSDSs), Standard Precautions, and CLIA '88

V. EQUIPMENT AND MATERIALS

- A. Computer, TV monitor, and Internet access
- B. Laboratory supplies: microscopes, slides, coverslips, sharps container, gloves, and immersion oil
- C. Operations/care manual for microscopes
- D. Pamphlets and articles on laboratory safety and bloodborne pathogens
- E. CLIA and OSHA regulations
- F. See IV: Visual Aids such as PowerPoint, etc.

VI. SAFETY

- A. Establish basic classroom procedures.
- B. Follow Standard Precautions.
- C. Maintain confidentiality in laboratory reports and other patient information.
- D. Follow CLIA and OSHA regulations.

VII. PREPARATION

- A. Arrange for visual aids equipment.
- B. Collect materials.
- C. Review Chapter 39 in the text, the Study Guide, the Competency Manual and the Instructor's Manual.
- D. Review CLIA and OSHA regulations and laboratory safety.

VIII. INTRODUCTORY REMARKS/ACTIONS

- A. Read Learning Outcomes in the text with students to introduce the chapter.
- B. Display microscope and slides.
- C. Introduce topic to students as follows: "The microscope is a basic and essential instrument that is found in every medical office laboratory. Why might a medical assistant need the use of a microscope?"
- D. Raise the question: "What sorts of dangerous encounters could occur in a medical laboratory?"

IX. PRESENTATION

- A. Laboratory testing
 - 1. Options for testing
 - a. POL collects and tests specimen
 - b. Specimen collected at POL and transported from provider's office to separate lab for testing
 - c. Specimen collected and tested at separate lab
 - 2. Purposes of Laboratory Testing
 - a. To record an individual's state of health
 - (1) Routine physical examination
 - (2) Provides baseline reference values for comparison
 - b. To satisfy employment, insurance, and legal requirements
 - (1) Employment-required drug and alcohol testing
 - c. Research statistics and clinical trials
 - d. To detect asymptomatic conditions or diseases
 - (1) Routine screening in another area reveals disorder
 - (2) No symptoms associated with disease process
 - e. To confirm a clinical diagnosis
 - (1) Clinical diagnosis determined through subjective and objective information
 - (2) Tests given to confirm diagnosis

- f. To differentiate between two or more diseases
 - (1) Perform simplest and least invasive test
 - (2) Rule out a disease
 - g. To diagnose
 - (1) If symptoms are vague
 - (2) Panel of tests may be ordered to narrow the field for diagnosis
 - h. To determine the effectiveness of treatments
 - (1) Regularly check on therapeutic levels of medications
 - (2) Checking on progress of treatments
 - i. To prevent diseases/disorders
 - (1) Preventing transmission of diseases
 - j. To prevent the exacerbation of diseases
 - (1) Assess chronic conditions
 - (2) Assess need to adjust diet or medication
- 3. Types of Laboratories
 - a. Procurement stations
 - b. Satellite laboratories
 - c. Hospital-based
 - d. Reference laboratories
 - e. Point-of-care testing (POCT)
 - (1) Bedside testing
 - (2) Rapid, accurate results
 - f. Provider's office laboratories (POLs)
 - (1) Types of tests commonly performed
 - (2) Use of self-contained tests
 - (3) At-home test kits
- 4. Laboratory Personnel (see Table 39-1)
- 5. Laboratory Departments (see Figure 39-1)
 - a. Hematology
 - b. Urinalysis
 - c. Clinical chemistry
 - d. Immunology
 - e. Serology
 - f. Toxicology
 - g. DNA testing
 - h. Microbiology
 - (a) Virology
 - i. Parasitology
 - j. Cytology
 - k. Histology
- 6. Panels of Laboratory Tests
 - a. CMS-approved organ- and disease-oriented panels
- 7. Billing for Laboratory Services
 - a. Diagnosis codes must correlate with tests ordered
 - b. ABN must be signed by Medicare patients
 - c. Reference text chapter 20
- B. Quality Controls/Assurances in the Laboratory
 - 1. Control tests
 - a. Have known value outcomes
 - b. Compare with results of patient's tests
 - c. Minimize human error
 - d. Check reagents/chemicals
 - 2. Proficiency testing
 - a. Required by CLIA
 - b. Results evaluated by outside agency
 - 3. Preventive Maintenance
 - a. Manufacturer's recommended maintenance
 - b. Temperature checks on refrigerators, freezers, and incubators

4. Instrument Validations
 - a. Check calibration and accuracy of instruments and machines
 - b. Ensure accurate results
5. The Medical Assistant's Role
 - a. Perform administrative office duties, prepare patients, collect specimens, and perform waived tests
 - b. Four aspects of quality laboratory testing for accurate results
 - (1) Patient prepared properly
 - (2) Specimen obtained as expertly as possible
 - (3) Reagents and equipment in best condition and calibration possible
 - (4) Test performed by trained professional
- C. Laboratory Requisitions and Reports
 1. Preprinted
 2. Computer-generated
 3. Features of requisition
 - a. Provider's information
 - b. Patient's name, address, phone numbers
 - c. Patient's billing information
 - d. Unique patient identifier
 - e. Patient's age/date of birth and gender
 - f. Source of specimen
 - g. Time and date of specimen collection
 - h. Test requested
 - i. Medications patient is taking
 - j. Clinical diagnosis
 - k. Urgency of results
 - l. Special collection/patient instructions
 - m. Other provider(s) to receive copies of report
 4. Laboratory written report features
 - a. Laboratory name, address, and phone numbers
 - b. Referring provider's name and identification numbers
 - c. Patient's name, ID number, age, and gender
 - d. Date specimen was received by laboratory
 - e. Date and time specimen was collected
 - f. Date laboratory reported results
 - g. Test name, results, and normal reference ranges
 5. Attach to patient's chart
 6. Notify provider of abnormal results
 7. Computerized laboratory report
- D. The Specimen
 1. Proper procurement, storage, and handling
 - a. Obtained from independent laboratories
 - b. Instruction manual
 - c. Guidelines (listed in the text)
 - d. Patient preparation instructions
 - e. Documentation
 2. Processing and sending specimens to a laboratory
- E. Microscopes
 1. One of most used pieces of equipment in laboratory
 2. Parts
 - a. Light source
 - b. Eyepiece
 - c. Objectives
 - d. Condenser
 - e. Diaphragm

3. Types
 - a. Compound
 - b. Phase contrast
 - c. Fluorescent
 - d. Electron
4. How to Use a Microscope
 - a. Adjusting focus with coarse and fine adjustments
 - b. Raising and lowering platform while viewing slide from the side
 - c. Control intensity of light with condenser and iris diaphragm
 - d. Oil-immersion lens
5. How to Care for a Microscope
 - a. Proper way to handle
 - b. Follow manufacturer's and clinic's rules
 - c. Cover microscope when not in use
 - d. Clean lenses with special lens paper after each use
 - e. Always focus away from lens to prevent lens from coming into contact with slide
 - f. Use oil only with oil-immersion lens

X. APPLICATION

- A. Use the Learning Outcomes at the beginning of Chapter 39 in the text as the basis for questions to assess comprehension.
- B. See the Classroom Activities section below for numerous application activities.
- C. Assign students to complete Chapter 39 in the Study Guide.
- D. Complete the Procedures in Chapter 39, using the Competency Manual to evaluate.

XI. EVALUATION

- A. Evaluate any assigned application activities.
- B. Evaluate student participation during presentation.
- C. Grade responses to Chapter 39 in the Study Guide.
- D. Evaluate student performance on text Chapter 39 Procedures.

Classroom Activities

1. Have students obtain materials such as hair, cheek lining, onion skin, and the letter *e* from the newspaper to view under the microscope, helping the students to gain proficiency in the use of the microscope.
2. Ask a local laboratory for slides of tissue, blood smears, or bacteria for students to practice using the low, high, and oil objectives to learn about any microscopic parts of the human body.
3. Invite a clinical laboratory technician to speak to the class about the importance of safety in the laboratory, requirements of their profession, duties of a technician, and other related topics.
4. Arrange a field trip to a local laboratory or the laboratory department of the local hospital. This helps students realize the importance of accuracy and proper labeling and preparation of specimens. It also helps students develop respect for other areas of the clinical laboratory.

Answers to Case Studies

Case Study 39-1

Refer to the scenario at the beginning of the chapter. Now imagine that Wanda sent Annette to the lab for the urinalysis rather than performing the test in the POL.

1. What was the advantage of Wanda performing the urinalysis in the POL rather than sending Annette to the lab for the urinalysis?

The advantages of performing the urinalysis in the POL is that the result is quickly obtained while the patient is present, giving the physician the opportunity to discuss treatment and further testing with the patient. The students may come up with other advantages as well.

2. What would have been an advantage of sending Annette to the outside lab for the urinalysis?

The advantage of sending Annette to the outside lab for the urinalysis is that it saves the POL the expense and time of performing the testing. This option is especially attractive if the provider's office doesn't have staff available or proper supplies or lacks space for lab testing. Students may think of other advantages also.

Case Study 39-2

Edith Leonard came to Inner City Health Care because she was experiencing sight disturbances, constant thirst, and fainting spells. After examining Edith, Dr. Ray Reynolds ordered a glucose tolerance test. Certified medical assistant Wanda Slawson gave Edith a special diet that she was to follow for the 3 days preceding the test and instructions regarding fasting before the test.

Edith has returned to the clinic to have the test. “Did you follow the diet I gave you, Mrs. Leonard?” Wanda asks. “Yes, I did.” “Did you have anything to eat this morning?” “No, but I did have a cup of coffee. I thought it would be all right because I drink it black. I can’t start the day without my coffee.”

1. Should Wanda perform the test? Explain your answer.

No, because the accuracy of the test can be compromised by the patient not fasting.

2. How can Wanda emphasize the importance of following the diet, fasting, and test instructions?

Explain the purpose of the test and the importance of fasting to obtain accurate results. Give the patient written information about the diet. Have the patient repeat the instructions.

3. What can Wanda do to try to ensure Edith’s cooperation?

Perhaps enlist the help of a family member or friend.

Answers to Certification Review Questions

1. b. must be performed by certified laboratory professionals
2. b. pathologist
3. b. studies blood and blood-forming tissues
4. d. all of the above
5. a. a written requisition
6. d. compound microscope
7. d. immunohematology
8. b. Critical Values
9. b. pathologist
10. c. number

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