

Interpretation of Laboratory Results

Class

HPRS 1209

An introduction to interpretation of commonly ordered laboratory results.

Course Learning Objectives

1. Explain the significance and functions of the clinical laboratory. (I. A. 2 ; B. 4)
2. Differentiate between the laboratory departments that perform the testing. (A. 2 & 5)
3. Understand the clinical significance of common laboratory testing. (I. A. 1; B. 3, 4, 6)
4. Learn lab safety, infection control, and avoiding blood borne illness transmission using PPE and safe practices. (I. A. 1, 2, 4 ; B. 3, 4, 5, 6)
5. Learn the parts of a microscope, and how to correctly use and maintain them. (I. 1, 4; B 3, 4, 5, 6; II. C. 2; II. E. 1, 2, 3)
6. Identify the parts of the Urinary System, the types of urine specimens collected for testing, and the testing that is done in the clinical laboratory on urine. (I. A. 1, 2, 4, 5 ; B. 4, 5, 6)
7. Review correct venipuncture collection including site and tube selection. (I. A. 1, 4; B 1, 2, 3, 4, 5, 6; C 1, 2, 3, 4, 5; II. 1, 3)
8. Be familiar with a variety of lab requisitions and their proper usage and correlation with tube selection. (I. A. 1, 2, 3, 4, 5; B. 1, 2, 3, 4, 5)
9. Discuss the three phases of laboratory testing and factors that can negatively influence each phase. (I. A. 1, 2, 4, 5; B. 4, 5, 6)
10. Define Quality Assurance and perform quality control on waived testing procedures. (I. A. 1, 2, 3, 4; B. 1, 2, 3, 4, 6; C. 2, 4, 5; II. C. 1, 2, 3, 4)
11. Investigate the Hematology section of the clinical lab, testing performed, and the nature of the hematopoietic system and the blood cells. (I. A. 1, 2, 4, 5; B. 4, 5, 6)
12. Analyze the Chemistry section of the clinical lab, glucose and lipid metabolism, CLIA waived chemistry testing performance, and the clinical significance of common chemistry testing. (I. A. 1, 2, 4, 5; B. 4, 5, 6)
13. Describe the functions of the immune system, and identify immunological testing performed in the clinical laboratory, including common waived testing. (I. A. 1, 2, 4, 5; B. 4, 5, 6)
14. Develop an understanding of the Microbiology Department, including gram's staining, acid-fast staining, culture collections and set-up, and basic smear interpretations. (I. A. 1, 2, 4, 5; B. 4, 5, 6)
15. Know what testing is performed in the Toxicology section, including drug screen testing and performance, and therapeutic drug monitoring. (I. A. 1, 2, 4, 5; B. 4, 5, 6)
16. Gain an understanding of Electrocardiography, the electrical system of the heart, and normal and abnormal heart rhythms. (I. A. 1, 2, 3, 4, 5; B 1, 2, 3, 4, 5, 6; C. 1; II. C. 1, 2, 3)
17. Define spirometry, the anatomy of the lungs, and the diagnostic procedures involved including asthma therapies. (I. A. 1, 2, 3, 4, 5; B 1, 2, 3, 4, 5, 6; C. 1; II. C. 1, 2, 3)
18. Be familiar with Lab Tests Online, the Quest, CPL, ARUP, and Lab Corp web sites used to order and inquire about laboratory testing, normal values, and clinical significance. (I. A. 1, 2, 3, 4; B. 1, 2, 3, 4, 5, 6; C. 2, 5; II. B. 3, 4, 5, 6)

Explain the clinical significance of commonly ordered laboratory tests and the clinical laboratory that performs the testing. Identify normal ranges and discuss diseases or conditions that correlate with abnormal findings.

Required Textbooks

Marti Garrels, Laboratory and Diagnostic Testing in Ambulatory Care, Elsevier, 4th Ed., 2019, China.

Evaluation Standards

Evaluation Standards:

A = 90 – 100%

B = 80 – 89%

C = 75 – 79%

F = 0 – 74%

Evaluation will be based on 3 major exams and weekly assignments. This is a hybrid course, with many of the assignments and two of the major exams online. Exams will be timed, and the final exam will be taken on campus. There will be 2 hours per week of face to face lab. Major exams will be 50% of the final grade; assignments will be 25% of the final grade. Labs will be 25% of the final grade. Assignments and due dates will be listed in the Canvas modules.

Absences

This is a hybrid course. Although two exams and many assignments are online, labs will be done on campus.

Disabilities

ADA Statement:

Any student with a documented disability (e.g. learning, psychiatric, vision, hearing, etc.) may contact the Office on the Weatherford College Weatherford Campus to request reasonable accommodations. *Phone:* 817-598-6350 *Office Location:* Office Number 118 in the Student Services Building, upper floor. *Physical Address:* Weatherford College 225 College Park Drive Weatherford, TX.

Academic Integrity

Academic Integrity is fundamental to the educational mission of Weatherford College, and the College expects its students to maintain high standards of personal and scholarly conduct. Academic dishonesty of any kind will not be tolerated. Academic dishonesty includes, but is not limited to, cheating on an examination or other academic work, plagiarism, collusion, and the abuse of resource materials including unauthorized use of Generative AI. Departments may adopt discipline specific guidelines on Generative AI usage approved by the instructional dean. Any student who is demonstrated to have engaged in any of these activities will be subject to immediate disciplinary action in accordance with institutional procedures.

SCANS

Chart of SCANS Skills from, “*Guidelines for Instructional Programs in Workforce Education*”, p.36-37

SCANS Skills have been identified by the Texas Workforce Commission as necessary for success in the workplace. These skills are grouped in two areas: I. Foundation skills and II. Workplace competencies.

1. **Foundation Skills** are defined in three areas: A. Basic skills, B. Thinking skills, and C. Personal qualities.
1. **Basic Skills:** A worker must read, write, perform arithmetic and mathematical operations, listen, and speak effectively. These skills include:
 1. **Reading:** locate, understand, and interpret written information in prose and in documents such as manuals, graphs, and schedules.
 2. **Writing:** communicate thoughts, ideas, information, and messages in writing, and create documents such as letters, directions, manuals, reports, graphs, and flow charts.
 3. **Arithmetic and Mathematical Operations:** perform basic computations and approach practical problems by choosing appropriately from a variety of mathematical techniques.
 4. **Listening:** receive, attend to, interpret, and respond to verbal messages and other cues.
 5. **Speaking:** organize ideas and communicate orally.
- B. **Thinking Skills:** A worker must think creatively, make decisions, solve problems, visualize, know how to learn, and reason effectively. These skills include:

1. **Creative Thinking:** generate new ideas.
 2. **Decision Making:** specify goals and constraints, generate alternatives, consider risks, and evaluate and choose the best alternative.
 3. **Problem Solving:** recognize problems and devise and implement plan of action.
 4. **Visualize** ("Seeing Things in the Mind's Eye"): organize and process symbols, pictures, graphs, objects, and other information.
 5. **Knowing How to Learn:** use efficient learning techniques to acquire and apply new knowledge and skills.
 6. **Reasoning:** discover a rule or principle underlying the relationship between two or more objects and apply it when solving a problem.
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3. **Personal Qualities:** A worker must display responsibility, self-esteem, sociability, self-management, integrity, and honesty.
 1. **Responsibility:** exert a high level of effort and persevere toward goal attainment.
 2. **Self-Esteem:** believe in one's own self-worth and maintain a positive view of oneself.
 3. **Sociability:** demonstrate understanding, friendliness, adaptability, empathy, and politeness in group settings.
 4. **Self-Management:** assess oneself accurately, set personal goals, monitor progress, and exhibit self-control.
 5. **Integrity and Honesty:** choose ethical courses of action.

II. Workplace Competencies are defined in five areas: A. Resources, B. Interpersonal skills,

C. information, D. Systems, and E. Technology.

A. **Resources:** A worker must identify, organize, plan, and allocate resources effectively.

1. Time: select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.

2. Money: Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.

3. Material and Facilities: Acquire, store, allocate, and use materials or space efficiently.

4. Human Resources: Assess skills and distribute work accordingly, evaluate performance and provide feedback.

Examples: use computer software to plan a project; prepare a budget; conduct a cost/benefits analysis; design an RFP process; write a job description; develop a staffing plan.

2. Interpersonal Skills: A worker must work with others effectively.

1. **Participate as Member of a Team:** contribute to group effort.

2. **Teach Others New Skills.**

3. **Serve Clients/Customers:** work to satisfy customers' expectations.

4. **Exercise Leadership:** communicate ideas to justify position, persuade and convince others, responsibly challenge existing procedures and policies.

5. **Negotiate:** work toward agreements involving exchange of resources, resolve divergent interests.

6. **Work with Diversity:** work well with men and women from diverse backgrounds.

Examples: collaborate with a group member to solve a problem; work through a group conflict situation; train a colleague; deal with a dissatisfied customer in person; select and use

appropriate leadership styles; use effective delegation techniques; conduct an individual or team negotiation; demonstrate an understanding of how people from different cultural backgrounds

might behave in various situations.

3. **Information:** A worker must be able to acquire and use information.

1. **Acquire and Evaluate** Information.
2. **Organize and Maintain** Information.
3. **Interpret and Communicate** Information.
4. **Use Computers** to Process Information.

Examples: research and collect data from various sources; develop a form to collect data; develop an inventory record-keeping system; produce a report using graphics; make an oral presentation using various media; use on-line computer data bases to research a report; use a computer spreadsheet to develop a budget.

4. **Systems:** A worker must understand complex interrelationships.

1. **Understand Systems:** know how social, organizational, and technological systems work and cooperate effectively with them.
2. **Monitor and Correct Performance:** distinguish trends, predict impacts on system operations, diagnose deviations in systems' performance and correct malfunctions.

3. **Improve or Design Systems:** suggest modifications to existing systems and develop new or alternative systems to improve performance

Examples: draw and interpret an organizational chart; develop a monitoring process; choose a situation needing improvement, break it down, examine it, propose an improvement, and implement it.

5. **Technology:** A worker must be able to work with a variety of technologies.

1. **Select Technology:** choose procedures, tools or equipment including computers and related technologies.
2. **Apply Technologies** to Task: understand overall intent and proper procedures for setup and operation of equipment.
3. **Maintain and Troubleshoot Equipment:** Prevent, identify, or solve problems with equipment, including computers and other technologies.

Examples: read equipment descriptions and technical specifications to select equipment to meet needs; set up and assemble appropriate equipment from instructions; read and follow directions for troubleshooting and repairing equipment.