

MLT Clinical Chemistry

Course Information

Developers: Medical Laboratory Technology State Curriculum Committee

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Credit Hours: 6

Prerequisite: Admission to the MLT program or instructor approval.

Description:

This course will cover the physiology of the body and the biochemical reactions that are necessary for a healthy existence. The human condition is evaluated by biochemical shifts in different systems that maintain homeostasis during healthful periods. Basic interpretations of biochemistry and the concentration of enzymes, carbohydrates, lipids, proteins, electrolytes, blood gases, and therapeutic drug monitoring will be discussed. The student will perform routine clinical tests on biological fluids, maintain quality assurance records, and perform preventative maintenance on instrumentation.

Outcomes:

1. Relate the proper specimen collection and handling, type of quality control used, reference ranges, principle of analysis currently available, and sources of analytical errors for each of the analytes discussed or approached in the course.
2. Perform all procedures with regard to prescribed safety protocol and confidentiality.
3. Correlate abnormal results with the most likely disease process by determining the clinical significance of the findings.
4. Outline the normal digestion, anabolism and catabolism of carbohydrates, proteins, and lipids within the body.
5. Discuss the basic principles of laboratory instrumentation and state how they relate to the measurement of serum or body fluid analytes.
6. Demonstrate an understanding of the mechanism by which the body regulates water and pH homeostasis.
7. Discuss the anatomy and physiology of the following organs or systems. State some of the common pathological states and what analyte measurements would be utilized to monitor the function of each: Renal, Cardiovascular, Hepatic, Thyroid, Bone, and Pancreatic.

8. List the reasons that therapeutic drugs are monitored and state the current drugs most often monitored and the procedure most often used.
9. Demonstrate the following skills as pertaining to each individual test that is listed.
 - a. Relate the proper specimen collection and handling techniques.
 - b. Perform acceptable quality control measures.
 - c. State if results are within reference range.
 - d. State principle of analysis of method available.
 - e. State sources of error and methods to minimize or eliminate these errors.
 - f. Perform the analysis within $\pm 2SD$ of the recognized mean for a control serum; Proteins, enzymes, electrolytes, carbohydrates, lipids, nonprotein nitrogen.
 - g. Perform & Calculate: creatinine clearance, anion gap, osmolarity, dilutions, VLDL, LDL, Beers Law.
10. Explain the basic principles of laboratory instrumentation available in the clinical labs.
11. Perform routine preventative maintenance and troubleshooting procedures on the instruments available.
12. Determine if the results on different analytes are consistent as far as determining the status of the following organs or systems: Renal, cardiovascular, hepatic, pancreatic, thyroid and bone.