



Course Description

MLS4335 | Clinical Hemostasis | 3.00 credits

This course provides an overview application of hemostasis (coagulation), as it relates to the medical laboratory. Presents coagulation laboratory principles with hemostasis diagnostic procedures, interpretation, problem solving and correlation of laboratory findings and results in accordance to the disease states.

Course Competencies:

Competency 1: The student will demonstrate knowledge of the principals involved in Safety and procedures used in the laboratory procedures by:

1. Explain laboratory safety as described in the OSHA of 1970, 29 USCA sections 655 and all subsequent regulations including instructions in universal precautions
2. Choose potential laboratory safety hazard situations and take appropriate actions to minimize injury to self and others
3. Evaluate a specimen as acceptable for hematology testing or coagulation studies
4. Perform quality control as needed and take corrective actions to ensure the accuracy of all reported coagulation test results
5. Explain instrument maintenance and calibrations as required to ensure optimal instrument performance during use
6. Illustrate quality control data, equipment maintenance, corrective actions when troubleshooting defective equipment, and test results

Competency 2: The student will demonstrate an understanding of the origin of platelet and platelet testing products and its applications by:

1. Evaluate the ontogeny and theories of megakaryocytic processes in terms of what, when, why, where, and how it happens
2. Identify and describe classic morphologic characteristics at each stage of maturation for the thrombocyte.
3. Distinguish an immature from a mature megakaryocyte
4. Apply Platelet structure, physiology and function in correlation to the analyzer
5. Explain the mechanisms of coagulation and fibrinolysis by:
 6. defining what the intrinsic, extrinsic, common and alternate pathways are
 7. stating how they interact
 8. identifying by name and activity the plasma proteins and blood cells involved
9. Given a hematologic condition, relate smear findings to common hematological and hemostatic disorders

Competency 3: The student will demonstrate knowledge of Hemostasis applications of by:

1. Explaining the use materials and reagents necessary to: identify and distinguish between erythrocytes, leukocytes, and platelets; test for platelet functions; determine blood clot times and assess platelet functionality; and conduct quality control testing
2. Explaining the analytical principles (both manual and automated) and diagnostic utility for tests used in the evaluation of the disorders of red cells, white cells, platelets, and hemostasis to include: blood cell counts, reticulocyte counts, erythrocyte sedimentation rates, hematocrits, differentials, hemoglobinometry, hemoglobin solubility, hemoglobin electrophoresis, osmotic fragility, bleeding time, platelet aggregation, prothrombin time [PT], activated partial thromboplastin time [aPTT], thrombin time [TT], anti-Xa assay, fibrinogen, d-Dimer, FDP, mixing studies, factor assays, and regulatory protein assays (i.e., ATIII, Protein C/S)
3. Explaining the principles and diagnostic utility of the modes of action and therapeutic use of anticoagulants
4. Discussing the skills involved in using automated and manual methods to: quantitate thermostatically important plasma proteins and assess platelet functionality; and identify states of health or disease

Competency 4: The student will demonstrate knowledge of instrumentation applications of hemostasis by:

1. Selecting a testing procedural course of action appropriate for the type of blood sample received and the hematology test(s) and or coagulation studies to be performed
2. Analyzing laboratory and clinical data to recommend additional laboratory tests
3. Analyzing laboratory and clinical data to identify common hematological conditions and diseases including those related to bleeding disorders
4. Evaluating laboratory data to: recognize common procedural/technical problems; verify test results; check for and identify possible sources of pre-analytical and analytical error; determine possible inconsistent results; recognize health and disease states; differentiate specific hematologic disease states including anemias, thalassemias and hemoglobinopathies, myelodysplastic syndromes, lymphoproliferative and myeloproliferative disorders, immunoproliferative disorders, and malignant lymphomas; and to assess the accuracy of procedures for a given coagulation test

Competency 5: The student will demonstrate Interpersonal and Communication Skills by:

1. Demonstrating professional communication skills throughout their interactions with coworkers. Students will be expected to act as a constructive and proactive member of the practice
2. Applying medical knowledge to patients by demonstrating an investigatory and analytical thinking to clinical situations
3. Analyzing the morphology, physiology and biochemistry of coagulation disorders, Platelet function disorders, Clotting factor disorders, DIC
4. Evaluating Laboratory Test Principles and patient results associated with Thrombin Time, Fibrinogen Levels, Factor XIII assays, FDPs, D- Dimer, mixing studies, Heparin assay and PFA along with Coagulation Automation testing
5. Integrate knowledge and make informed judgments about hemostasis test results in the clinical setting,
6. Creating clear, answerable question, Predict Expected results and follow written protocols and verbal instructions

Learning Outcomes:

- Communicate effectively using listening, speaking, reading, and writing skills
- Use quantitative analytical skills to evaluate and process numerical data
- Solve problems using critical and creative thinking and scientific reasoning
- Demonstrate knowledge of ethical thinking and its application to issues in society