Revised: Fall 2016

MDL 290
Coordinated Practice in the Clinical Laboratory

COURSE OUTLINE

Prerequisites:

Successful completion of all MLT didactic courses in the MLT Curriculum.

Course Description:

Introduces students to the workings of a hospital clinical laboratory, this is the clinical rotation component of the VWCC Medical Laboratory Program. Students will rotate through all areas of the hospital laboratory, including Clinical Chemistry, Clinical Hematology/Coagulation, Blood Bank, Special Testing, and Clinical Microbiology and Parasitology/Virology. The clinical practicum gives students the opportunity to work with sophisticated instrumentation, and learn how to adequately handle the flow of work in a hospital clinical environment. The clinical component provides an opportunity for the student to apply theories and techniques learned in the didactic courses to the actual testing of patients' blood and body fluids in the hospital environment.

Semester Credits: 5

Lecture Hours: Select Hours

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Student Outcomes for the Course:

At the completion of this course, the student should be able to:

- Operate sophisticated laboratory equipment in all areas of the clinical laboratory, including Hematology/Coagulation, Clinical Chemistry and Urinalysis, Clinical Microbiology, and the Blood Bank.
- Differentiate and recognize pre-analytical, analytical, and post-analytical sources of error, with the emphasis on the analytical and post-analytical components in the clinical laboratory setting.
- Recognize the importance of performing delta checks on automated results
- Adequately perform basic quality control and quality assurance practices to ensure that instrument generated results are accurate and precise.
- Maintain a professional disposition and communicate effectively with other laboratory and hospital personnel, and the patient. Professionalism includes being on time for the clinical day, taking appropriately times lunches and breaks, and not engaging in activities that are not related to the clinical experience. This includes taking personal phone calls, playing computer games, texting, and surfing the internet while at the hospital or facility.
- Demonstrate competency in the performance of routine laboratory procedures
- Properly handle multitasking so that several tests can be accomplished in the same timeframe, without compromising quality of the laboratory results

MDL 290 Coordinated Practice Course Outline

Coordinated Practice is the clinical component of the Medical Technology Program. Students will spend 2 weeks in each major area of the hospital clinical laboratory, where they will work alongside of a clinical preceptor. Students will be expected to perform routine laboratory tests on patient samples, as if they were employed by the laboratory as a medical laboratory technician. Students will rotate through the 4 main areas of the clinical laboratory. Since most areas of today's clinical laboratory are highly automated, especially clinical chemistry and hematology, the student will be expected to gain experience in the programming and analysis of routine patient tests on these instruments. Aside from simply learning how to use the instrumentation, students should also learn basic troubleshooting and common causes of erroneous results, such as low sample volumes, clotting of samples, and inappropriately collected blood, urine and body fluid samples. The clinical areas of rotation are listed below along with select testing that will be done by students in each area:

I. Clinical Chemistry and Urinalysis

- Basal Metabolic Panel (BMP)
- Comprehensive Metabolic Panel (CMP)
- Electrolyte Panel
- Blood glucose
- Hemoglobin A_1C
- Cardiac enzymes
- Liver Panel
- Tumor markers
- Renal Panel
- Thyroid Function Panel
- Therapeutic Drug Monitoring (TDM)
- Complete Macroscopic and Microscopic Urinalysis

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II. Clinical Hematology and Coagulation

- Complete Blood Count (CBC)
- White Blood Cell Differential Count
- Reticulocyte Count
- Erythrocyte Sedimentation Rate (ESR)
- Test for G6PD Deficiency
- Prussian Blue Stain
- Wright's Stain of Bone Marrow Aspiration
- Cytospin of Cerebrospinal Fluid
- Prothrombin Time (PT)
- Partial Thromboplastin Time (PTT)
- Thrombin Time
- Fibrinogen
- Fibrin Degradation Products
- Levels of Clotting Proteins
- Platelet Function
- Hemoglobin Electrophoresis (Including Hemoglobin A2 and Hemoglobin F)
- Heinz Bodies
- Schilling Test
- Osmotic Fragility
- Leukocyte Alkaline Phosphatase (LAP Score)

III. Clinical Microbiology and Parasitology

- Gram staining
- Proper plating of bacteria onto various media for identification
- Identification of pathogenic bacteria in blood cultures
- Identification of pathogenic bacteria in urine, feces, sputum, joint aspirates, tissue samples and cerebrospinal fluid
- Determination of antibiotic resistance
- Workup of acid fast bacilli
- Molecular methods in bacterial identification
- Preparation of fecal samples for parasite identification
- Methods of identifying parasites in human specimens

IV. Blood Bank

- Receipt of reagents and supplies
- Reagent organization, storage and management
- Daily start-up and as needed reagent quality control
- Verify test requisition(s) and assess sample suitability
- Receipt of blood components
- Discuss/observe/ perform ABO/Rh typing
- Discuss/observe the detection and resolution of ABO/Rh typing discrepancies
- Discuss/observe/perform direct antiglobulin testing (DAT)
- Discuss/observe/perform antibody detection and antibody identification techniques
- Discuss/observe/perform antibody screening and antibody resolution techniques
- Discuss/observe any available Special Testing/ Chemical Techniques performed by the blood bank
- Discuss/observe any available Adsorption techniques
- Discuss/observe/perform crossmatching and labeling of units for transfusion
- Testing involved for HDFN
- Rh immune globulin workup
- Workup for neonatal transfusion