LABORATORY CLINICAL EXPERIENCE OBJECTIVES

At the end of the clinical for MLS 415, Clinical Chemistry, the student will be able to:

1. Demonstrate the ability to process specimens in the clinical chemistry laboratory with safe biohazardous handling to generate accurate laboratory data. *(analytical)*
2. Perform waived and moderate complexity tests on clinical specimens. *(analytical)*
3. Describe the major clinical tests performed on serum, plasma, urines, and body fluids and correlate abnormal findings to specific diseases *(analytical)*
4. List the normal reference ranges used in interpretation of clinical chemistry laboratory data.
5. Apply QC rules for the determination on validity of obtained laboratory results.
6. Upon conclusion of testing exercises, the student will be able to justify the omission of erroneous results and offer resolution to rectify results.
7. Follow written and verbal instructions.
8. Prioritize tasks and work concurrently on at least two different tasks.
9. Advocate respect for self and others while working independently and in groups.
10. Identify correct pipetting techniques.
11. List laboratory safety measures and correct waste disposal guidelines.
12. Demonstrate technical ability to pipette accurately during performance of laboratory analysis.
13. Demonstrate the technical ability to use a centrifuge correctly and safely.
14. Identify various chemical grades for reagent preparations, primary standards, and secondary standards.
15. Apply computations such as dilutions and concentration conversions, required to accurately perform laboratory procedures.
16. Describe and operate laboratory spectrophotometers, electrophoretic systems, point-of-care analyzers, and autoclaves.
17. Describe Laboratory Information Technology (LIS) role and utilize LIS tools available to efficiently verify laboratory data.
18. Plot and interpret data obtained from a spectrophotometric colorimetric assay with the application of Beer's Law.
19. List the parameters of method evaluations that generate accurate and precise data from point-of-care testing and higher complexity analyzers.
20. Follow written and verbal instructions.
21. Prioritize tasks and work concurrently on at least two different tasks.
22. Advocate respect for self and others while working independently and in groups.

Students should work together with their respective mentors to complete the listed objectives. Accuracy, precision, timely reporting of test results, and demeanor must comply with the laboratory's acceptable standards. While working in the laboratory, the student must meet laboratory standards for work habit skills in patient confidentiality, communication skills, laboratory safety, universal precautions, waste disposal, and equipment/work area maintenance. It is requested that the student's laboratory competency evaluation be completed by the clinical mentor in the presence of the student to allow verbal feedback to the student regarding the student's progress and performance.

Note: As part of the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) accreditation regulations, no student may engage in service work during his/her clinical experience. All laboratory test results generated by students during their clinical hours must be directly supervised by clinical laboratory staff. While the student is performing their clinical hours, they must be performing duties as a student, and not an employee. Definition of Service Work: Providing or generating results of clinical tests on patient samples without direct supervision of clinical staff or supervisor managers which exceeds the expected component required for the educational process.

Student: _____

SCORING KEY

1: Discussed: Process was discussed, principle explained, student acknowledges an understanding of the process or principle.

2: Demonstrated: Process has been performed and demonstrated by the practicum instructor. Student has observed demonstration and has been allowed to ask questions as needed. The student acknowledges an understanding of the process or principle by verbally explaining the process or principle back to the practicum instructor.

3: Maximum Supervision: The student has performed the process under the direct, maximum supervision of the practicum instructor, and with the level of competency required by the laboratory for that task or process.

4: Minimum Supervision: The student can perform the process satisfactorily with only minimum or non-direct supervision by the practicum instructor, and the performance meets the level of competency required by the laboratory for that task or process.

N/A: Not Available: The nature of the laboratory does not allow the student access to the equipment/test method.

Note: The competencies will be graded for a total of 77 pts. Points will be deducted for competency categories that are not met. If an item is not available at the lab, please N/A that area so the student does not lose points. If something is not available, but was discussed with the student, please write, "1 – N/A". Students must achieve a minimum of 80% on their competency checklist to pass.

Please have all clinical preceptors sign and date below.

Clinical Preceptor Signature _____ Date _____

Clinical Preceptor Signature _____ Date _____

Clinical Preceptor Signature _____ Date _____

Clinical Preceptor Signature _____ Date _____

Comments:

General Laboratory Concepts	**Mandatory**	**Expected Score**	**Student Score**	**Date complete**	**Mentor initial**
Identify correct specimen types as specified by the clinical facility's requirements.	M	4			
Discuss proper specimen collection and storage for routine chemistry assays.	M	4			
Identify physical characteristics of samples that may interfere with testing.	M	4			
Properly reconstitute control or reagents using pipettes routinely used in the lab.	M	4			
Demonstrate understanding and proper use of pipettes used in the lab.	M	4			

Student: _____

Perform dilutions & calculations on patient samples (95% accuracy of previously analyzed samples)	M	4			
Perform daily, weekly, and monthly maintenance on an instrument in your laboratory.	M	4			
Perform QC procedures in accordance with the clinical institution's policy.	M	4			
Correctly document actions taken when results are not within acceptable limits.	M	4			
Perform the standard body fluid analysis assays or discuss where they are processed for your laboratory	M	4			
Perform daily, weekly, & monthly maintenance on photometric instrument in your lab	M	4			
Perform QC procedures in accordance with the clinical facility's policy.	M	4			
Correctly document actions taken when results are not within acceptable limits.	M	4			
Specimen Processing: labeling and specimen identification					
Label specimens according to facility's policy. Check for labeling compliance on all samples (i.e. name discrepancy).	M	4			
Identify correct specimen types as specified by the facility's requirements.	M	4			
Discuss proper specimen collection and storage for routine chemistry assays.	M	4			
Identify physical characteristics of samples that may interfere with testing.	M	4			
Interpretation and Acceptance of Results					
Discuss recording, reporting, and documenting results.	M	4			
Explain "panic values" or critical values". Demonstrate how & when to report them.	M	4			
Explain "linear limits", "linear ranges" or "reportable ranges" and demonstrate how to handle and report samples outside these limits.	M	4			
Performance of tests					
Perform Total Protein and Albumin assays. Calculate A/G ratios.	M	4			
Perform and manually calculate Creatinine clearances and 24 hour excretions.		4			
Perform or discuss protein electrophoresis		4			
Perform or discuss Thin Layer Chromatography amino acid separations.		4			
Perform all enzyme assays routinely performed in your laboratory.	M	4			
Recognize interfering factors associated with the analysis of enzymes.	M	4			
Perform any Endocrine function assays performed in your lab.		4			
Perform or discuss Thyroid surveys and correlation of results.	M	4			
Performance of tests – continued…	**Mandatory**	**Expected Score**	**Student Score**	**Date complete**	**Mentor initial**
Perform TDM or Toxicology analysis on instrumentation routinely used in your lab.	M	4			
Demonstrate understanding and correlation of numerous hemoglobin assays	M	4			
Demonstrate understanding of specimen integrity issues with collection of bilirubin.	M	4			
Demonstrate understanding and correlation of numerous body fluids and how to process them	M	4			

Student: _____

Discuss or perform glucose tolerance tests. (Discussion of tolerance testing should include Epinephrine tolerance test, Xylose tolerance test and Lactose tolerance test)		4			
Perform freeze-point osmometry or VP depression.		4			
Perform CSF Glucose and/or Lactate assays.		4			
Perform plasma lactic acid.		4			
Perform serum/plasma glucose on fasting and random samples.	M	4			
Perform or discuss Glycosylated Hemoglobin assays.		4			
Perform lipid panels	M	4			
Calculate LDL Cholesterols	M	4			
Perform Na, K, Cl, CO2, Ca, Mg, Phos, Iron, TIBC	M	4			
Perform and discuss ionized Calcium assays (understand collection and specimen integrity)		4			
Calculate and interpret anion gaps	M	4			
Perform Lithium assays		4			
Evaluate electrolyte results to scrutinize sources of significant error	M	4			
Explain and/or demonstrate collection, processing & storage of blood gas samples.	M	4			
Identify sources of error commonly encountered with blood gas analysis.	M	4			
Perform or discuss calibration of a blood gas analyzer.		4			
Urinalysis					
Correctly identifies urine sample based on color and character.	M	4			
Follows correct laboratory procedures in performing urine dipstick analysis.	M	4			
Follows procedures for urine confirmatory testing (SSA, Clinitest, Acetest, & Icotest).	M	4			
Follows correct laboratory procedures in performing urine microscopic analysis.	M	4			
Correctly identifies common cellular elements found in urine samples.	M	4			
Correctly identifies common crystals found in urine samples.	M	4			
Correctly identifies common casts found in urine samples.	M	4			
Distinguishes common microscopic artifacts from urinary formed elements.	M	4			
Demonstrates the ability to operate instrumentation used for routine urinalysis testing.	M	4			
Proficient in daily/weekly preventative maintenance on equipment used for urinalysis.	M	4			
Urinalysis – continued…	**Mandatory**	**Expected Score**	**Student Score**	**Date complete**	**Mentor initial**
Performs urinalysis daily/shift QC procedures according to lab standards.	M	4			
Evaluates urinalysis cumulative QC data for abnormalities.	M	4			
Student demonstrates honesty by:					
Maintaining strict patient confidentiality	M	4			
Accepting control values only when within acceptable limits	M	4			

Student: _____

Performing and documenting daily & weekly maintenance procedures, preventative maintenance, temperature checks, etc.	M	4			
Completing all procedures in adherence to laboratory SOPs, taking no shortcuts or unauthorized modifications of procedure	M	4			
Completing all procedures in adherence to laboratory SOPs, taking no shortcuts or unauthorized modifications of procedure	M	4			
Student demonstrates personal interactive skills and proper professional behavior by:					
Working with co-workers in a positive manner, promoting productive workflow.	M	4			
Refraining from making statements or actions that represent sexual, ethnic, racial, or homophobic harassment.	M	4			
Willingly and consistently using appropriate personal safety devices when handling caustic, infectious, or hazardous materials.	M	4			
Completing all required tasks and remaining in the work area when scheduled.	M	4			
Being punctual whenever scheduled.	M	4			
Adhering to current dress and appearance in the laboratory setting.	M	4			
Cleaning the work area when leaving the laboratory, returning supplies to appropriate storage location, & disinfecting all work areas used by the student.	M	4			
Student demonstrates professional responsibility by:					
Correctly reporting all patient test values, as well as recognizing and correctly reporting all patient critical test values.	M	4			
Resolving discrepancies in specimen labeling, handling, or collection before reporting results.	M	4			
Hours completed by student:					
Minimum time required for this lab competency is 96 hours. Clinical preceptors are encouraged to increase the number of hours dependent on individual student need.		96 hours			
Based on performance is this the type of person you would consider for potential employment?				Y ☐	N ☐