Course Map

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| **Course Name:** Practicum II: Microbiology, Immunology, Immunohematology (9 weeks) | **Course Number:** MLT 231 |
| **Instructor Name: LATI:** Alison Albertson/Kelly Pesek  **Sim Lab: Bernie Reddy/Bob Jenson**  **Clinical Site: various clinical instructors** | **Date:** |
| **General Lab Practice**   1. **Follows test procedures-does not take short-cuts.** 2. **Well organized work area-keeps area neat and clean.** 3. **Demonstrates safety within the laboratory.** 4. **Demonstrates an understanding of the principles of each of the test methods performed during rotation.** 5. **Provides notification and clarification on problem specimens.** 6. **Demonstrates proper use and care of the microscope.**   **Microbiology**   1. **Determines acceptability of specimen.** 2. **Logs in specimen properly.** 3. **Selects and labels proper media for specimen.** 4. **Inoculates media with proper plate-streaking technique.** 5. **Selects proper incubation temperature and atmosphere.** 6. **Maintains a well organized work area – keeps area neat and clean.** 7. **Practices acceptable sterile technique throughout each step of the set-up.** 8. **Recognizes colony morphology of common bacteria.** 9. **Recognizes normal flora.** 10. **Recognizes contamination and reports appropriately.** 11. **Grades sputums properly.** 12. **Sets up and calculates the correct colony count on urine specimens.** 13. **Performs microbiology laboratory procedures utilizing manual and/or automated techniques and obtains results within acceptable limits of accuracy.** 14. **Performs QC, daily maintenance and troubleshooting with automated equipment when available.** 15. **Obtains organisms in pure culture.** 16. **Indicates which tests are needed to identify common pathogens.** 17. **Inoculates biochemicals properly.** 18. **Reads biochemicals and identifies common organisms.** 19. **Correctly identifies a series of unknown organisms.** 20. **Selects correct colony for identification and sensitivity testing.** 21. **Sets up and reads sensitivity test correctly.** 22. **Prepares smears (for gram staining, other) and stains properly.** 23. **Recognizes the morphology of various bacteria.** 24. **Performs and reports a Gram stain according to laboratory protocol.** 25. **Performs and reports KOH preps.** 26. **Performs any parasitology or mycology work done by the clinical site.** 27. **Identifies the patient and collects blood cultures properly.** 28. **Processes positive blood cultures following correct protocol.** 29. **Recognizes preanalytical, analytical and post-analytical variables and handles appropriately.** | |
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| **Immunology**   1. **Performs immunology/serology laboratory procedures utilizing manual and/or automated techniques and obtains results within acceptable limits of accuracy.** 2. **Performs QC on the tests required, recognizes “out of limits” QC and does not report patient results until appropriate troubleshooting has been completed and documented correctly.** 3. **Recognizes pre-analytical, analytical and post-analytical variables and handles them appropriately to ensure accurate test results and reporting.** 4. **Correlates patient test results with the disease process it signifies, relates this result to all lab tests performed on the patient.**   **Immunohematology**   1. **Washes cells and prepares a 3-5% RBC suspension.** 2. **Grades agglutination reaction correctly.** 3. **Recognizes hemolysis as a positive result.** 4. **Performs and interprets ABO typing (forward and reverse) with 100% accuracy.** 5. **Performs and interprets Rh typing to include "weak D's".** 6. **Performs and interprets the direct antiglobulin test.** 7. **Performs and interprets antibody screens.** 8. **Performs antibody identification panels, and crosses off correctly to ID the correct antibody.** 9. **Performs gel tests; preparation of cell suspensions, adding the correct specimen to each well and interprets the results correctly.** 10. **Selects the appropriate type of blood for crossmatch.** 11. **Performs a number of crossmatches under the supervision of staff tech.** 12. **Performs testing for and observes the issue of RHIg when indicated.** 13. **Performs fetal screen and/or fetal stain when indicated.** 14. **Documents test results in the blood bank log completely and accurately** 15. **Tags units of blood for transfusion.** 16. **Observes the issuance of blood including documentation** 17. **Explains and applies component usage.** 18. **Performs all quality control procedures in the blood bank, recognizing "out-of-limits" QC and taking appropriate action (not reporting patient results until appropriate troubleshooting has been completed and QC is within acceptable limits).** 19. **Recognizes preanalytical, analytical and postanalytical errors and follows up appropriately.l** 20. **Explains emergency blood issue protocol** 21. **Explains proper reissue of blood back into the bank.** | |
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**Course Materials**

**Textbooks and/or Resources:**

* + Books: BOC Study Guide 5th edition and Quick Review Cards (at bookstore)

**Course Description: The student will spend 3 weeks in Blood Bank and Microbiology Sim Lab on the LATI campus and will complete 6 additional weeks in Blood Bank, Microbiology and Immunology rotations at a hospital lab.**

**CRITERIA FOR EVALUATION: The student will pass the course with a minimum of 80%.**

**MLT Practicum II affective evaluation = 20%**

**MLT Practicum II technical evaluation = 40%**

**Media Lab Comprehensive Test= 20%**

**BOC Comprehensive Test = 20%**

**Rubrics:** Rubrics and specific grading criteria are included at the end of the course map.

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| **Module # and Title** | **Objectives or Competencies** | **Content, Activities, or Challenges**  **(Learner Interaction & Engagement)** | **Assessments, Rubrics**  **(feedback)** | **Publish to OER** |
| Blood Bank Sim Lab | The student will complete blood bank lab testing at LATI on simulated specimens provided by the SIM lab instructor. | Blood Bank Lab Procedure per the SIM LAB procedure manual | Practicum 2 Student Evaluation: Affective Objectives and Technical Objectives:, General Lab and Blood Bank section completed by the SIM Lab instructor | Blood Bank SIM LAB Procedure Manual |
| Microbiology SIM Lab | The student will complete microbiology testing at LATI on simulated specimens provided by the SIM lab instructor. | Manual and Automated Lab Procedures per the Microbiology SIM LAB procedure manual | Practicum 2 Student Evaluation: Affective Objectives and Technical Objectives: General Lab and Microbiology section completed by the SIM Lab instructor | Microbiology SIM LAB Procedure Manual |
| Clinical Practicum completed at a Hospital Laboratory | The student will become proficient as an entry level technician by performing the Blood Bank, Microbiology and Immunology tests at a clinical site. | **Rotate through the Microbiology, Blood Bank and Immunology areas of the lab and complete the lab tests in these areas with supervision.**  **Media Lab Tests**  CLIA Blood Banking Competency Assessment  CLIA Hematology/Hemostasis Assessment  CLIA Chemistry/Urinalysis Assessment CLIA Microbiology/Serology Assessment  CLIA General Lab Miscellaneous Assessment  **BOC Review** Complete all the questions in the BOC Review Book | Keep track of the tests performed using the Clinical Practicum Checklist (not graded).  Clinical Supervisors will complete the Practicum 2 Technical and Affective Student Evaluation for Blood Bank, Microbiology and Immunology  Take the comprehensive test over these Media Lab tests in the last 2 weeks of your clinical experience  Take the comprehensive test over the material in the BOC book in the last 2 weeks of your clinical. |  |

**Lake Area Technical Institute**

**MLT STUDENT CLINICAL PRACTICUM CHECKLIST**

The clinical practicum is the capstone experience for the MLT students. It is the component of education where the student combines didactic/book learning with the important technical skills required in order to become a quality graduate and employee. The goal of the clinical practicum is to assist the MLT student in gaining the needed skills and competencies that are expected of an entry-level MLT employee.

Student experiences in the clinical affiliate are directed by the clinical affiliate and the workflow. We have provided a minimum number for the various tests in order to ensure a level of standardization for each student’s clinical experience. The minimum number required for a test may be exceeded during the clinical rotation. If a student performs a test, but receives an unsatisfactory rating, the performance should not be counted toward the total.

**GENERAL LABORATORY SKILLS/PHLEBOTOMY: Listed are the tests designated as basic entry-level medical laboratory technician skills that the student should demonstrate upon completion of the General Laboratory Skills/Phlebotomy sections of the Clinical Practicum. Skills not listed have been designated as optional, as these are not performed at every clinical site. These skills can be recorded in the comment section at the end of the evaluation.**

**General Laboratory Skills/Phlebotomy Goals:**

**Upon completion of the General Laboratory Skills/Phlebotomy Clinical Practicum, the MLT student will be able to:**

**1.** **Accurately perform all General Laboratory Skills/Phlebotomy procedures at his/her Clinical Facility with the competence of an entry-level technician.**

**2.** **Assess specimen acceptability and results acceptability.**

**3.** **Take the ASCP BOR MLT certification test and pass the General Laboratory Skills/Phlebotomy components.**

**Objectives:**

**Given the necessary supplies and equipment, the student will:**

**1.**  **Perform all General Laboratory Skills/Phlebotomy procedures done at the Clinical Facility accurately, timely, and according to laboratory protocol.**

**a.** **Given 50 patients for venipuncture and the physician’s orders, the MLT student will obtain patient samples for each of the tests ordered, using either a syringe or multi-sample technique, following standard protocol 100% of the time.**

**b.** **Given 10 patients for dermal puncture and the physician’s orders, the MLT student will obtain patient samples for each of the tests ordered, with 100% accuracy.**

**c.** **Given 5 patients for blood cultures (with physician’s orders), the MLT student will obtain blood cultures, with 100% accuracy.**

**d.** **Given 2 patients, the MLT student will observe the collection of blood gases.**

**e.** **Given 50 patient’s blood or fluid samples for a variety of tests, to include processing and distribution to laboratory departments, the MLT student will process (including centrifugation) the samples with 100% accuracy.**

**f.** **Given 50 patient’s samples, requisitions, specimens, etc., the MLT student will enter the correct information into the Laboratory Information System, with 100% accuracy.**

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| **Test Name/Procedure--number** | **# Performed** | **Rating (Satisfactory—S or Unsatisfactory—U. If U—documentation required and immediate contact with LATI MLT faculty)**  **and Comments** |
| Pipets accurately |  |  |
| Properly utilizes glassware, supplies, instruments |  |  |
| Follows safety guidelines |  |  |
| Obtain samples via venipuncture--50 |  |  |
| Obtain samples via capillary puncture--10 |  |  |
| Obtain blood cultures--5 |  |  |
| Observe blood gases collection--2 |  |  |
| Uses the laboratory information system for data entry--50 |  |  |
| Performs laboratory calculations (dilutions) correctly |  |  |
| Process STAT requests in a timely fashion |  |  |
| Complies with federal laws, regulations, guidelines |  |  |
| Correctly labels samples and reagents |  |  |
| Other |  |  |

**URINALYSIS/BODY FLUIDS: Listed are the tests designated as basic entry-level medical laboratory technician skills that the student should demonstrate upon completion of the Urinalysis/Body Fluids section of the Clinical Practicum. Skills not listed have been designated as optional, as these are not performed at every clinical site. These skills can be recorded in the comment section at the end of the evaluation.**

**Urinalysis Goals:**

**Upon completion of the Urinalysis/Body Fluids Clinical Practicum, the MLT student will be able to:**

**1.** **Accurately perform all Urinalysis/Body Fluids procedures at his/her Clinical Facility with the competence of an entry-level technician.**

**2.** **Assess specimen acceptability and results acceptability.**

**3.** **Take the ASCP BOR MLT certification test and pass the Urinalysis/Body Fluids components.**

**Objectives:**

**Given the necessary supplies and equipment, the student will:**

**1.**  **Perform all Urinalysis/Body Fluids procedures done at the Clinical Facility accurately, timely, and according to laboratory protocol.**

**a.** **Given 40 urine samples, the MLT student will perform routine urinalysis (physical, chemical and microscopic exam) on each obtaining results within 100% accuracy of predetermined/technologist’s results.**

**b.** **Given 5 urine samples, the MLT student will perform back-up tests to include Ictotest, Acetest, Clinitest and protein precipitation method (if available) on each obtaining results within 100% accuracy of predetermined/technologist’s results.**

**c.** **Given 10 urine samples, the MLT student will perform specific gravity determination by refractometry when required on a routine urinalysis and obtain results within 100% accuracy of predetermined/technologist’s results.**

**d.** **Given 5 urine samples, the MLT student will observe the processing of the sample for send out and refer to the protocol in the reference manual to include centrifugation and addition of preservative or storage at the appropriate temperature within 100% accuracy.**

**e.** **Given 3 body fluid samples (seminal, serous, synovial, CSF) the student will perform the tests required obtaining results within 100% accuracy of predetermined/technologists results and will store the specimen according to the lab’s protocol.**

**f.** **Given 10 occult blood specimens, the student will perform fecal occult blood testing on each obtaining results withn 100% accuracy of predetermined/technologists results.**

**g.** **Given 10 urine samples, the student will perform pregnancy testing on each obtaining results within 100% accuracy according to the lab’s protocol.**

**h.** **Given quality control material, the MLT student will perform the daily quality control and daily maintenance on the automated instrument for 5 consecutive days, with acceptable results, as determined by the supervising technician/technologist.**

**2.** **Assess the acceptability of specimens (including identification) and results.**

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| **Test Name/Procedure--number** | **# Performed** | **Rating (Satisfactory—S or Unsatisfactory—U. If U—documentation required and immediate contact with LATI MLT faculty)**  **and Comments** |
| Observe the Processing of Samples  **(to include preservatives and centrifugation)** |  |  |
| Urine Physical and Chemical Analysis 40 |  |  |
| Urine: Specific Gravity (refractometer) 10 |  |  |
| Urine: Clinitest 5 |  |  |
| Urine: Ictotest 5 |  |  |
| Urine: Acetest 5 |  |  |
| Urine: SSA 5 |  |  |
| Urine: Automated or Manual Chemical analysis |  |  |
| Urine Microscopic Analysis 40 |  |  |
| Body Fluids: Manual Cell Count 3 |  |  |
| Body Fluids: Differential 3 |  |  |
| Body Fluids: Chemical Analysis 3 |  |  |
| Body Fluids: Cytospin Slide Prep 3 |  |  |
| Semen Analysis 3 |  |  |
| **Urine pregnancy test 10** |  |  |
| **Fecal Occult Blood 10** |  |  |
| **Routine UA Quality Control 5** |  |  |
| **Preventive and Regular Instrument Maintenance 5** |  |  |
| **Other** |  |  |

**HEMATOLOGY: Listed are the tests designated as basic entry-level medical laboratory technician skills that the student should demonstrate upon completion of the Hematology section of the Clinical Practicum. Skills not listed have been designated as optional, as these are not performed at every clinical site. These skills can be recorded in the comment section at the end of the evaluation.**

**Hematology Goals:**

**Upon completion of the Hematology Clinical Practicum, the MLT student will be able to:**

**3.** **Accurately perform all Hematology procedures at his/her Clinical Facility with the competence of an entry-level technician.**

**4.** **Assess specimen acceptability and results acceptability.**

**5.** **Take the ASCP BOR MLT certification test and pass the Hematology components.**

**Objectives:**

**Given the necessary supplies and equipment, the student will:**

**2.**  **Perform all Hematology procedures done at the Clinical Facility accurately, timely, and according to laboratory protocol.**

**a.** **Given 40 blood samples, the MLT student will perform automated CBC’s on each obtaining results within 100% accuracy of predetermined/technologist’s results.**

**b.** **Given 40 blood samples, the MLT will prepare and stain the blood smear, obtaining results determined as acceptable by supervising technician/technologist.**

Criteria of a Good Smear

1. Smooth uninterrupted film. It should be thickest at the origin and gradually thinning. No ridges, lines, or holes should be present.

2. The length of the smear should cover ½ to ¾ the length of the slide.

3. Narrower than the actual slide. The slide should not extend to the edge of the slide.

4. The drop of blood that is placed at the origin of the film should be used up entirely.

5. The smear should have a good feathered edge.

6. There should be an even distribution of leukocytes and the erythrocytes should not show any distortion due to the process of making the film.

7. Slide should be of proper thickness. The area used should be approximately 22 mm in length. This “usable” area extends from the “minimal” area where red cells are one to three cell diameters apart to the “maximal” area where the red cells barely touch each other or slightly overlap. (There should be ten or more low-power fields in which the erythrocytes barely touch but do not overlap.)

**c.** **Given 50 blood samples, the MLT will perform differential counts, leukocyte estimates, platelet estimates and describe erythrocyte morphology, obtaining results within 100% accuracy of predetermined/technologist’s results. Twenty of these will be abnormal.**

**d.** **Given 5 blood samples, the MLT student will perform erythrocyte sedimentation rates on each, obtaining results within 100% accuracy of predetermined/technologist’s results.**

**e.** **Given 5 blood samples, the MLT student will perform reticulocyte counts on each, obtaining results within 100% accuracy of predetermined/technologist’s results.**

**f.** **Given quality control material, the MLT student will perform the daily quality control and daily maintenance on the automated instrument for 5 consecutive days, with acceptable results, as determined by the supervising technician/technologist.**

**6.** **Assess the acceptability of specimens (including identification) and results.**

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| **Test Name/Procedure--number** | **# Performed** | **Rating (Satisfactory—S or Unsatisfactory—U. If U—documentation required and immediate contact with LATI MLT faculty)**  **and Comments** |
| CBC (hemoglobin, hematocrit, RBC, WBC, indices, differential, platelet count, absolute/relative counts)--40 |  |  |
| ESR--5 |  |  |
| Retic count (machine or manual)--5 |  |  |
| Manual Differential (including RBC morphology, inclusions, indices; WBC morphology, artifacts, inclusions; and WBC and platelet estimates from blood smear)—50; at least 20 of these must be abnormal |  |  |
| Slide Preparation and Staining--50 |  |  |
| Quality Control—5 |  |  |
| Preventive and Regular Instrument Maintenance--5 |  |  |
| Other |  |  |

**COAGULATION: Listed are the tests designated as basic entry-level medical laboratory technician skills that the student should demonstrate upon completion of the Hematology section of the Clinical Practicum. Skills not listed have been designated as optional, as these are not performed at every clinical site. These skills can be recorded in the comment section at the end of the evaluation.**

**Coagulation Goals:**

**Upon completion of the Coagulation Clinical Practicum, the MLT student will be able to:**

**1.** **Accurately perform all Coagulation procedures at his/her Clinical Facility with the competence of an entry-level technician.**

**2.** **Assess specimen acceptability and results acceptability.**

**3.** **Take the ASCP BOR MLT certification test and pass the Coagulation components.**

**Objectives:**

**Given the necessary supplies and equipment, the student will:**

**1.**  **Perform all Coagulation procedures done at the Clinical Facility accurately, timely, and according to laboratory protocol.**

**g.** **Given 15 blood samples, the MLT student will perform PT and APTT tests obtaining results within 100% accuracy of predetermined/technologist’s results.**

**h.** **Given 2 blood samples, the MLT student will perform fibrinogen, FDP or D-dimer or other coagulation tests obtaining results within 100% accuracy of predetermined/technologist’s results.**

**i.** **Given quality control material, the MLT student will perform the daily quality control and daily maintenance on the automated instrument for 5 consecutive days, with acceptable results, as determined by the supervising technician/technologist.**

**3.** **Assess the acceptability of specimens (including identification) and results.**

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| **Test Name/Procedure--number** | **# Performed** | **Rating (Satisfactory—S or Unsatisfactory—U. If U—documentation required and immediate contact with LATI MLT faculty)**  **and Comments** |
| Prothrombin Time and INR--20 |  |  |
| **A**PTT--15 |  |  |
| Fibrinogen**--**2 |  |  |
| FDPor D-Dimer--2 |  |  |
| Quality Control--5 |  |  |
| Preventive and Regular Equipment Maintenance--5 |  |  |
| **Other** |  |  |

**Immunohematology Goals:**

**Upon completion of the Immunohematology Clinical Practicum, the MLT student will be able to:**

**1.** **Accurately perform all Immunohematology procedures at his/her Clinical Facility with the competence of an entry-level technician.**

**2.** **Assess specimen acceptability and results acceptability.**

**3.** **Take the ASCP BOR MLT certification test and pass the Immunohematology components.**

**Objectives:**

**Given the necessary supplies and equipment, the student will:**

**1.**  **Perform all Immunohematology procedures available at the Clinical Facility accurately, timely, and according to laboratory protocol.**

**a.** **Given 20 specimens of different blood groups, the MLT student will ABO and Rh typing on each obtaining results within 100% accuracy of predetermined/technologist’s results.**

**b.** **Given 20 specimens, the MLT student will perform Antibody Screen, Crossmatch on each according to the lab’s protocol and obtaining results within 100% accuracy of predetermined/technologist’s results.**

**c.** **Given 5 positive antibody screens, the MLT student will perform antibody identification, autocontrol and antigen phenotype (if required) on each according to the lab’s protocol and obtaining the correct identification within 100% accuracy of predetermined/technologist’s results.**

**d.** **Given 5 specimens, the MLT student will complete RhIg testing on each according to the lab’s protocol and obtaining results within 100% accuracy of predetermined/technologist’s results.**

**e.** **Given 3 specimens (if available), the MLT student will perform a fetal stain (Kleihauer Betke) obtaining correct number of RhIg vials needed for administration with 100% accuracy of predetermined/technologist’s results.**

**f.** **Given 5 specimens, the MLT student will complete DAT testing on each according to the lab’s protocol and obtaining results within 100% accuracy of predetermined/technologist’s results.**

**g.** **Given 10 patients requiring blood components, the MLT student will Issue or observe the issue of blood components (prbc, platelets, fresh frozen plasma).**

**h.** **Given quality control material, the MLT student will perform the daily quality control and daily maintenance on the automated instrument for 5 consecutive days, with acceptable results, as determined by the supervising technician/technologist.**

**2.** **Assess the acceptability of specimens (including identification) and results.**

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| **Test Name/Procedure--number** | **# Performed** | **Rating (Satisfactory—S or Unsatisfactory—U. If U—documentation required and immediate contact with LATI MLT faculty)**  **and Comments** |
| ABO/Rh  **20** |  |  |
| Antibody Screen  **20** |  |  |
| IS or AHG Crossmatch 20 |  |  |
| Autocontrol 5 |  |  |
| Antibody Identification -5 |  |  |
| Antigen Phenotype 5 |  |  |
| Enzyme Panel |  |  |
| Direct Antiglobulin Test (DAT) 5 |  |  |
| Elution |  |  |
| Cord Blood Testing 5 |  |  |
| Fetal Screen 5 |  |  |
| Kleihauer-Betke Testing 3 |  |  |
| Antibody Titer |  |  |
| Prepare Plasma Products (pool or thaw) |  |  |
| Issue Products (RBCs, platelets, FFP) 10 |  |  |
| Discrepancy Resolution |  |  |
| **Quality Control 5** |  |  |
| **Other** |  |  |

**Immunology Goals:**

**Upon completion of the Immunohematology Clinical Practicum, the MLT student will be able to:**

**1.** **Accurately perform all Immunology procedures at his/her Clinical Facility with the competence of an entry-level technician.**

**2.** **Assess specimen acceptability and results acceptability.**

**3.** **Take the ASCP BOR MLT certification test and pass the Immunology components.**

**Objectives:**

**Given the necessary supplies and equipment, the student will:**

**1.**  **Perform all Immunology procedures available at the Clinical Facility accurately, timely, and according to laboratory protocol.**

**a.** **Given 40 specimens, the MLT student will perform** Strep, ASO, HCG, RPR, Infectious Mono, Influenza, CRP, RA, etc **obtaining results within 100% accuracy of predetermined/technologist’s results.**

**b.** **Given 20 specimens, the MLT student will perform automated immunology tests available to include nephelometry, turbidometry, chemilluminescent, EIA, ELISA, FIA etc. obtaining results within 100% accuracy of predetermined/technologist’s results.**

**c.** **Given 5 specimens, the MLT student will perform diffusion tests (if available) such as double immunodiffusion and radial immunodiffusion. obtaining results within 100% accuracy of predetermined/technologist’s results.**

**d.** **Given 5 specimens, the MLT student will perform electrophoretic techniques such as IEP, IFE, etc obtaining results within 100% accuracy of predetermined/technologist’s results.**

**e.** **Given quality control material, the MLT student will perform the daily quality control and daily maintenance on the automated instrument for 5 consecutive days, with acceptable results, as determined by the supervising technician/technologist.**

**2.** **Assess the acceptability of specimens (including identification) and results.**

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| **Test Name/Procedure--number** | **# Performed** | **Rating (Satisfactory—S or Unsatisfactory—U. If U—documentation required and immediate contact with LATI MLT faculty)**  **and Comments** |
| Performs tests for Strep, ASO, HCG, RPR, Infectious Mono, Influenza, CRP, RA, etc 40 |  |  |
| Performs tests representative of the following methodology:  Automated Immunologic techniques  EIA, ELSIA FIA, nephelometry, turbidometry chemilluminiscent, etc. 20 |  |  |
| Performs tests representative of the following methodology:  Diffusion  Double Immunodiffusion or Radial Immunodiffusion 5 |  |  |
| Performs electrophoresis methods such as IEP, IFE etc. 5 |  |  |
| Performs and interprets the acute and convalescent serum results |  |  |
| Interprets the significance of a positive test for IgM versus a positive test for IgG |  |  |
| **Quality Control 5** |  |  |
| **Other** |  |  |

**CHEMISTRY : Listed are the tests designated as basic entry-level medical laboratory technician skills that the student should demonstrate upon completion of the Chemistry section of the Clinical Practicum. Skills not listed have been designated as optional, as these are not performed at every clinical site. These skills can be recorded in the comment section at the end of the evaluation.**

**Chemistry Goals:**

**Upon completion of the Chemistry Clinical Practicum, the MLT student will be able to:**

**1.** **Accurately perform all Chemistry procedures at his/her Clinical Facility with the competence of an entry-level technician.**

**2.** **Assess specimen acceptability and results acceptability.**

**3.** **Take the ASCP BOR MLT certification test and pass the Chemistry components.**

**Objectives:**

**Given the necessary supplies and equipment, the student will:**

**1.** **Perform all Chemistry procedures done at the Clinical Facility accurately, timely, and according to laboratory protocol.**

**a.**  **Prepare reagents of various concentrations.**

**b.**  **Prepare calibration materials for different automated/manual methods.**

**c.** **Perform calculations, as need, (24 hour urine protein, 24 hour urine creatinine, creatinine clearance, anion gap, BUN/creatinine ratio, unconjugated bilirubin, globulin, and others)**

**d.** **Perform pipet calibrations.**

**e.** **Given blood samples, the MLT student will perform automated analyses to include spectrophotometric (endpoint and kinetic) and electrochemical methods (ISE, etc.) such as**

**i.** **Electrolytes (40 of these)**

**ii.** **Chemistry profiles and individual tests to include:**

**1.** **Protein tests (total protein and albumin) (40 of these)**

**2.** **Calcium, Phosphorus, Magnesium (40 of these)**

**3.** **Glucose, Hb A1c (40 of these)**

**4.** **BUN and Creatinine, eGFR, creatinine clearance, cystatin C (40 of these)**

**5.** **Enzyme tests (AST, ALT, ALP, LD, Amylase, Lipase, others) (40 of these)**

**6.** **Cholesterol, Triglycerides, Lipid Profile (40 of these)**

**7.** **Iron, TIBC, Ferritin (5 of these)**

**8.** **Uric Acid (5 of these)**

**9.** **Troponins, BNP (5 of these)**

**10.** **Bilirubin (total and direct) (10 of these) obtaining results within 100% accuracy of predetermined/technologist’s results.**

**f.** **Given 5 arterial/capillary blood samples, the MLT student will perform blood gas analyses, obtaining results within 100% accuracy of predetermined/technologist’s results.**

**g.** **Given quality control materials, the MLT student will perform the daily quality control and daily maintenance and calibration on automated instrumentation for 5 consecutive days, with acceptable results, as predetermined by the clinical supervisor.**

**h.** **Given 10 blood samples, the MLT student will perform:**

**i.** **Drug analysis (therapeutic and toxic)**

**ii.** **Hormone analysis**

**obtaining results within 100% accuracy of predetermined/technologist’s results.**

**2.** **Assess the acceptability of specimens (including identification) and results.**

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| **Test Name/Procedure--number** | **# Performed** | **Rating (Satisfactory—S or Unsatisfactory—U. If U—documentation required and immediate contact with LATI MLT faculty)**  **and Comments** |
| Blood Gas Analysis--5 |  |  |
| **Protein tests (total protein and albumin)—40** |  |  |
| **Calcium, Phosphorus, Magnesium--40** |  |  |
| **BUN and Creatinine, eGFR, creatinine clearance, cystatin C, microalbumin--40** |  |  |
| **Glucose, Hb A1c--40** |  |  |
| **Enzyme tests (AST, ALT, ALP, LD, Amylase, Lipase, others)--40** |  |  |
| **Cholesterol, Triglycerides, Lipid Profile--40** |  |  |
| **Iron, TIBC, Ferritin--5** |  |  |
| **Uric Acid --5** |  |  |
| **Troponins, BNP--5** |  |  |
| **Bilirubins (total/direct)--10** |  |  |
| **Electrolytes--40** |  |  |
| **Therapeutic Drug Monitoring/Toxicology --10** |  |  |
| **Hormones--10** |  |  |
| **Quality Control--5** |  |  |
| **Preventive and Regular Instrument Maintenance--5** |  |  |
| **Other** |  |  |

**MICROBIOLOGY: Listed are the tests designated as basic entry-level medical laboratory technician skills that the student should demonstrate upon completion of the Microbiology section of the Clinical Practicum. Skills not listed have been designated as optional, as these are not performed at every clinical site. These skills can be recorded in the comment section at the end of the evaluation.**

**Microbiology Goals:**

**Upon completion of the Microbiology Clinical Practicum, the MLT student will be able to:**

**1.** **Accurately perform all Microbiology procedures at his/her Clinical Facility with the competence of an entry-level technician.**

**2.** **Assess specimen acceptability and results acceptability.**

**3.** **Take the ASCP BOR MLT certification test and pass the Microbiology components.**

**Objectives:**

**Given the necessary supplies and equipment, the student will:**

**1.** **Perform all Microbiology procedures done at the Clinical Facility accurately, timely, and according to laboratory protocol.**

**a.** **Given 50 specimens of various types of specimens from multiple sources, the MLT student will:**

**i.** **Process the specimens appropriate for culturing and/or reference lab processing**

**1.** **Perform 25 gram stains and interpretations to include gram reaction, morphological characteristics, arrangements, leukocyte numbers, within 100% accuracy of predetermined/technologist’s results.**

**2.** **Select the proper media for each sample, streak for isolation, transfer colonies for subculturing or confirmatory tests, identifying the colony count (if urine) and organism within 100% accuracy of predetermined/technologist’s results.—25 (including urine, throat, wound, CSF, sputum, genital, stool)**

**3.** **Perform antibiotic suspceptibility testing, within 100% accuracy of predetermined/technologist’s results.—25**

**4.** **Process 5 blood culture specimens to include subculture and gram stain interpretations, preliminary reporting within 100% accuracy of predetermined/technologist’s results.**

**5.** **Demonstrate correct operation of automated instrumentation and equipment including QC, daily maintenance and troubleshooting for 5 consecutive days within 100% accuracy of predetermined/technologist’s results.**

**6.** **Test 2 specimens for parasites using the clinical facilities protocol within 100% accuracy of predetermined/technologist’s results.**

**2.** **Assess the acceptability of specimens (including identification) and results.**

|  |  |  |
| --- | --- | --- |
| **Test Name/Procedure--number** | **# Performed** | **Rating (Satisfactory—S or Unsatisfactory—U. If U—documentation required and immediate contact with LATI MLT faculty)**  **and Comments** |
| **Processing and plating of specimens (respiratory, throat, wound, urine, stool, body fluids, genital)--25** |  |  |
| **Processing of parasitology--2** |  |  |
| **Gram stains of specimens and correctly reports the Gram stain results-25** |  |  |
| **Interpretation of cultures and identification of organisms (including Staphylococcus aureus, Staphylococcus epidermidis, Streptococcus pyogenes, Streptococcus agalactiae, E. coli, Klebsiella pneumonia, other enterics, Streptococcus pneumonia, Enterococcus faecalis, Campylobacter spp., Pseudomonas aeruginosa, Haemophilus influenza, Neisseria gonorrhea, and others)-25** |  |  |
| **Susceptibility (Kirby-Bauer/MIC, D test, beta lactamase)--25** |  |  |
| **Automated Blood Cultures--5** |  |  |
| **Automated Organism Identification--25** |  |  |
| **Throat Cultures—just tell how many were done** |  |  |
| **Urine cultures—just tell how many were done** |  |  |
| **Sputum cultures—just tell how many were done** |  |  |
| **Wound/Abscess cultures—just tell how many were done** |  |  |
| **Body Fluid cultures—just tell how many were done** |  |  |
| **Anaerobic cultures—just tell how many were done** |  |  |
| **Rapid Group A Strep Antigen Tests—just tell how many were done** |  |  |
| **Parasitology Identification--2** |  |  |
| **Quality Control--5** |  |  |
| **Preventive and Regular Instrument Maintenance--5** |  |  |
| **Other** |  |  |

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