CSMLS SCSLM

Canadian Society for Medical Laboratory Science
Société canadienne de science de laboratoire médical

CLINICAL PLACEMENT BLUEPRINT

January 2013

TABLE OF CONTENTS

INSTRUCTIONS FOR THE APPLICANT

CSMLS assessors have determined that it will be necessary for you to fill certain identified gaps in your medical laboratory technology education before you can become eligible to write the CSMLS certification exam. Gaps identified in your "Learning Plan" requirements can be filled either by successfully taking specific pre-approved courses or by completing a supervised clinical placement.

The material in this Clinical Placement Blueprint describes the specific activities you will need to complete under supervision for each discipline. All activities for the disciplines identified in your Learning Plan must be completed before you become eligible to write the CSMLS certification exam.

It is your responsibility to find and secure a clinical placement. Potential sites include hospitals and private clinics. It is possible that not all activities can be completed in a single location. Therefore you may need to secure one or more sites to complete the requirements of your clinical placement. Please complete one Blueprint for each site used as part of your clinical placement. CSMLS is not responsible for securing a placement for you.

Page 3 of this document includes an information form that must be filled out before you submit the Blueprint to CSMLS. This includes your name and contact information, the start and end dates of your placement, the name of the institution where your clinical placement was completed, the contact information for your supervisor at this institution, and the names of all assessors who observed the various activities you completed.

A number of individual activities are listed under each discipline. Your qualified supervisor must observe you completing these satisfactorily and provide their signature next to each. While the duration of each placement will vary based on the individual, the site, and the discipline(s) involved, we expect that it will take you a maximum of 28 weeks to complete all five disciplines.

INSTRUCTIONS FOR THE SUPERVISOR AND ASSESSOR(S)

As you may know, CSMLS works on behalf of Canada's regulatory colleges to assess the knowledge and skills of internationally educated medical laboratory technologists (IEMLTs) prior to their becoming licensed. Many of these individuals have certain identified gaps that must be remediated before sitting the CSMLS certification exam. In many cases, individuals are able to fill these gaps through a focused clinical placement in a specific discipline. This Clinical Placement Blueprint details the specific activities an IEMLT must complete in a given discipline.

The terms of the clinical placement are solely the responsibility for you and the IEMLT to determine; CSMLS does not act as an intermediary in this regard. While the duration of each placement will vary based on the individual, the site, and the discipline(s) involved, we expect that it will take an IEMLT a maximum of 28 weeks to complete all five disciplines.

We ask that you provide the name of a supervisor and associated contact information for an individual at your organization whom we can contact to confirm related information, as well as the name of the individuals (assessors) who observed the IEMLT completing the enumerated tasks.

For each activity listed, we ask that the relevant assessors check a column next to each activity, either: ''completed satisfactorily'' or ''did not assess''. We also ask that assessors initial each activity.

INFORMATION SHEET

To be completed by the Applicant

Name: _____

File Number: _____

Start Date of Clinical Placement: _____

End Date of Clinical Placement: _____

To be completed by the Supervisor

Name of Organization: _____

Name of Primary Contact: _____

Address: _____

Phone: _____

Email: _____

Name(s) of Assessors: _____

	CLINICAL CHEMISTRY	Completed satisfactorily ✓	Did not assess ✓	Initials
	Instrumentation			
CC-1	• Verify specimen suitability according to established protocol for routine chemistry testing			
CC-2	• Analyze routine chemistry specimens using established protocols			
CC-3	• Perform instrument daily maintenance, start-up, calibration and quality control procedures			
CC-4	• Organize, operate and troubleshoot assigned workload on the principle analyzer			
CC-5	• Prioritize analyses (e.g., stat, urgent, routine, sample stability) and incorporate into workflow			
CC-6	• Perform calculations as required (e.g., clearance, urine results, anion gap)			
	Immunoassay			
CC-7	• Perform immunological techniques as appropriate			
CC-8	• Identify error codes and follow-up procedures for immunoassay testing			
	Toxicology and Therapeutic Drug Monitoring (TDM)			
CC-9	• Apply trough, peak, steady-state, collection time and patient history considerations to therapeutic drug monitoring			
CC-10	• Classify common types of drugs of abuse			
CC-11	• Perform analysis for drug monitoring including: assessing, preparing and processing specimens; instrument maintenance, start-up, calibration and quality control procedures; identifying and reacting to critical values			
	Electrophoresis			
CC-12	• Perform routine electrophoresis including densitometry			
CC-13	• Perform established maintenance procedures			
CC-14	• Identify sources of error encountered in, and corrective actions for, electrophoresis			
CC-15	• Correlate electrophoresis results to various disorders			
	Osmometry			
CC-16	• Operate a freezing point osmometer			
CC-17	• Comply with lab protocols with regard to problem solving, responding to stat and abnormal results, instrument maintenance and quality control/assurance practice			
CC-18	• Discuss the limitations of the method and the clinical significance of performing an osmolality and osmolar gap			

	Point of Care Testing (POCT)			
CC-19	• Describe the laboratory's role in point-of-care testing			
CC-20	• Perform point-of-care testing techniques			
	Endocrinology			
CC-21	• Explain the importance of following protocol with respect to specimen collection and handling for endocrinology			
	Blood Gases			
CC-22	• Correlate arterial blood gases (ABG) result with common disturbances			
CC-23	• Assess sample suitability			
CC-24	• Perform established maintenance procedures			
CC-25	• Illustrate how specimen type influences the parameters for arterial blood gases, pH and glucose			
	Specimen Handling			
CC-26	• Ensure required information is provided and corresponds with requisition and sample labeling			
CC-27	• Prioritize specimens by test request, urgency, and specimen type			
CC-28	• Comply with existing guidelines for specimen retention, storage, and disposal			
CC-29	• Ensure protocols are followed for specimens with legal implications (e.g., blood alcohol)			
	Urinalysis			
CC-30	• Verify specimen suitability according to established protocol for urinalysis			
CC-31	• Analyze urine specimens using established protocol			
CC-32	• Perform miscellaneous urine testing			
CC-33	• Prepare and perform physical and chemical analyses on urines			
CC-34	• Identify cellular and non-cellular components in microscopic urine sediment, differentiating between clinically significant and non-significant findings			
CC-35	• Perform calculations related to timed urines (e.g., clearance, estimated Glomerular Filtration Rate (e-GFR))			
CC-36	• Recognize instrument problems and participate in troubleshooting			
CC-37	• Recognize the implications of laboratory findings and identify further testing (e.g., dilutions, reflex)			

	Documentation, Interpretation & Reporting / Quality Management			
CC-38	• Follow established protocols and procedures, including those for continuous quality control/assurance/improvement, risk management and point-of-care testing			
CC-39	• Operate and maintain fridges, centrifuges and other laboratory equipment according to laboratory protocol			
CC-40	• Recognize and resolve common sample problems			
CC-41	• Recognize and address equipment/instrument malfunction (e.g., seek assistance and participate in troubleshooting)			
CC-42	• Follow established preventative maintenance programs and maintain instrument logs as directed			
CC-43	• Recognize the limitations and interference points of the techniques and reagents used			
CC-44	• Recognize the relationship between analyses, clinical information/condition, implausible results and diagnoses including the significance of reference ranges, critical values, method limitations, sources of interference and delta checks			
CC-45	• Recognize and investigate when results of patient analyses are unexpected (e.g., critical values, implausible results)			
CC-46	• Participate in maintaining appropriate documentation, (e.g., document laboratory errors and corrective measures taken as necessary)			
CC-47	• Recognize the implications of laboratory findings and identify further testing			
CC-48	• Verify that all ordered analyses have been completed			
CC-49	• Validate results before reporting			
CC-50	• Release, communicate, and document communications of results of laboratory analyses to clients and stakeholders (e.g., nurses, physicians, Public Health, Infection Control) in an appropriate and timely manner			
CC-51	• Use the computer adequately to record, store and retrieve data			
CC-52	• Retain laboratory results in accordance with existing legislation			
CC-53	• Comply with existing regulations for specimen retention, storage and disposal			
CC-54	• Demonstrate the principles of quality management			
CC-55	• Utilize responsible practices that contribute to the cost-effective use of health care resources			

		Safety			
CC-56	•	Apply appropriate laboratory hygiene and infection control practices to minimize possible dangers from biological specimens, laboratory supplies and equipment			
CC-57	•	Select and utilize appropriate methods for disinfection/sterilization of items while minimizing potential hazards			
CC-58	•	Apply the principles of standard precautions, including the use of personal protective equipment (PPE) (i.e., gloves, mask, goggles, lab coat, gown, face shield, and respirator)			
CC-59	•	Apply or demonstrate knowledge of spill containment and clean up procedures for infectious material and dangerous chemicals			
CC-60	•	Label, date, handle, store and dispose of chemicals, dyes, reagents, solutions and sharps, biological waste, toxic material, biological material according to the Workplace Hazardous Materials Information System (WHMIS), existing legislation and institutional policy			
CC-61	•	Apply or demonstrate knowledge of first aid measures in response to incidents, including the reporting procedures related to safety and personal injury (e.g., needle stick, physical or chemical injury)			
CC-62	•	Utilize laboratory safety devices in a correct manner (e.g., biological safety cabinets, fume hoods, laminar flow cabinets, safety pipetting devices, safety containers and carriers, safety showers, eye washes)			
CC-63	•	Apply or demonstrate knowledge in response to fire emergencies and evacuation procedures			
CC-64	•	Identify the location and use of all fire and protective equipment and select appropriate disinfectants			
CC-65	•	Handle and dispose of sharps according to institutional policy			
CC-66	•	Comply with safety regulations as they pertain to the medical laboratory department			

The recommended length for a clinical placement in clinical chemistry for internationally-educated clients is **6 weeks.**

HEMATOLOGY		Completed satisfactorily ✓	Did not assess ✓	Initials
	Coagulation			
HE-1	• Perform routine coagulation testing			
	Manual Cell Procedures			
HE-2	• Safely and correctly perform, and accurately report, the following tests: manual leukocyte count, manual platelet count			
	Peripheral Blood Film Examinations			
HE-3	• Prepare peripheral blood and bone marrow smears; identify and differentiate normal, immature and abnormal white blood cells, red cells (including parasites) and platelets; recognize normal and abnormal morphology for red cells, white cells and platelets			
	Erythrocyte Sedimentation Rates (ESRs)			
HE-4	• Correctly perform and accurately report ESRs following standard operating procedures and safety precautions			
	Automation			
HE-5	• Verify specimen suitability according to established protocols			
HE-6	• Process patient specimens and control materials through an automated multiparameter cell counter			
HE-7	• Perform instrument maintenance, start-up and quality control procedures			
HE-8	• Perform hemoglobin electrophoresis including densitometry			
HE-9	• Correctly interpret analyzer flags/alerts			
	Body Fluids			
HE-10	• Prepare, analyze and evaluate body fluids and cytospin smears			
	Specimen Handling			
HE-11	• Ensure required information is provided and corresponds with requisition and sample labeling			
HE-12	• Prioritize specimens by test request, urgency, and specimen type			
HE-13	• Comply with existing guidelines for specimen retention, storage, and disposal			

	Documentation, Interpretation & Reporting / Quality Management			
HE-14	• Follow established protocols and procedures, including those for continuous quality control/assurance/improvement, risk management and point-of-care testing			
HE-15	• Operate and maintain fridges, centrifuges and other laboratory equipment according to laboratory protocol			
HE-16	• Recognize and resolve common sample problems, such as lipemia, cold agglutinins, hemolysis, clots, EDT antibodies			
HE-17	• Recognize and address equipment/instrument malfunction (e.g., seek assistance and participate in troubleshooting)			
HE-18	• Follow established preventative maintenance programs and maintain instrument logs as directed			
HE-19	• Recognize the limitations and interference points of the techniques and reagents used			
HE-20	• Recognize the relationship between analyses, clinical information/condition, implausible results and diagnoses including the significance of reference ranges, critical values, method limitations, sources of interference and delta checks			
HE-21	• Recognize and investigate when results of patient analyses are unexpected (e.g., critical values, implausible results)			
HE-22	• Participate in maintaining appropriate documentation, (e.g., document laboratory errors and corrective measures taken as necessary)			
HE-23	• Recognize the implications of laboratory findings and identify further testing			
HE-24	• Verify that all ordered analyses have been completed			
HE-25	• Validate results before reporting			
HE-26	• Release, communicate, and document communications of results of laboratory analyses to clients and stakeholders (e.g., nurses, physicians, Infection Control) in an appropriate and timely manner			
HE-27	• Use the computer adequately to record, store and retrieve data			
HE-28	• Retain laboratory results in accordance with existing legislation			
HE-29	• Comply with existing regulations for specimen retention, storage and disposal			
HE-30	• Demonstrate the principles of quality management			
HE-31	• Utilize responsible practices that contribute to the cost-effective use of health care resources			

	Safety			
HE-32	• Apply appropriate laboratory hygiene and infection control practices to minimize possible dangers from biological specimens, laboratory supplies and equipment			
HE-33	• Select and utilize appropriate methods for disinfection/sterilization of items while minimizing potential hazards			
HE-34	• Apply the principles of standard precautions, including the use of personal protective equipment (PPE) (i.e., gloves, mask, goggles, lab coat, gown, face shield, and respirator)			
HE-35	• Apply or demonstrate knowledge of spill containment and clean up procedures for infectious material and dangerous chemicals			
HE-36	• Label, date, handle, store and dispose of chemicals, dyes, reagents, solutions and sharps, biological waste, toxic material, biological material according to the Workplace Hazardous Materials Information System (WHMIS), existing legislation and institutional policy			
HE-37	• Apply or demonstrate knowledge of first aid measures in response to incidents, including the reporting procedures related to safety and personal injury (e.g., needle stick, physical or chemical injury)			
HE-38	• Utilize laboratory safety devices in a correct manner (e.g., biological safety cabinets, fume hoods, laminar flow cabinets, safety pipetting devices, safety containers and carriers, safety showers, eye washes)			
HE-39	• Apply or demonstrate knowledge in response to fire emergencies and evacuation procedures			
HE-40	• Identify the location and use of all fire and protective equipment and select appropriate disinfectants			
HE-41	• Handle and dispose of sharps according to institutional policy			
HE-42	• Comply with safety regulations as they pertain to the medical laboratory department			

The recommended length for a clinical placement in hematology for internationally-educated clients is **4 weeks.**

	TRANSFUSION SCIENCE	Completed satisfactorily ✓	Did not assess ✓	Initials
	Pretransfusion Testing			
TS-1	• Ensure that appropriate ABO/Rh and antibody screening specimens are procured according to protocol			
TS-2	• Verify specimen suitability			
TS-3	• Verify identification of specimen and requisition. Check patient transfusion history and establish sample expiry date			
TS-4	• Perform ABO and Rh system typing, to include weak D testing and resolution of ABO grouping discrepancies			
TS-5	• Demonstrate grading and interpretation of ABO/Rh and antibody screening tests			
TS-6	• Perform and interpret antibody screen as required			
TS-7	• Select the suitable method for crossmatching donor units (i.e., electronic, immediate spin, full anti-human globulin (AHG) crossmatch or emergency uncrossmatched) and perform crossmatching			
TS-8	• Perform and evaluate a direct antiglobulin test (DAT), including follow-up testing if required (monospecific reagents, elution)			
TS-9	• Where available, operate a semi-automated (MTS) /automated transfusion analyzer including loading and unloading, maintenance, troubleshooting error codes and recognizing flagged results			
TS-10	• Apply the principles of microscopy to laboratory analysis where needed (inverted microscope)			
TS-11	• Document all aspects of pretransfusion testing accurately and legibly			
	Transfusion Reactions			
TS-12	• Check all relevant paperwork and verify patient identity			
TS-13	• Perform an investigation on a reported transfusion reaction			
TS-14	• Perform testing on pre- and post-transfusion reaction samples according to the laboratory standard operating procedure (SOP)			
TS-15	• Initiate appropriate follow-up for errors in documentation, positive DAT, hemolysis or icterus detected according to laboratory SOPs			

TS-16	• Perform initial and appropriate follow up tests on suspected transfusion reactions			
TS-17	• Perform additional follow-up test where required			

	Blood Components			
TS-18	• Operate, maintain and monitor all equipment (refrigerator, freezer, cell washers, centrifuges, platelet agitators, plasma washers, incubators)			
TS-19	• Identify and maintain optimal storage requirements for components and products			
TS-20	• Maintain sorted inventory and documentation of all blood components/products			
TS-21	• Respond to requests within appropriate time lines			
TS-22	• Select the most appropriate blood component and product			
TS-23	• Perform procedures required to make components/products transfusion ready			
TS-24	• Determine suitability of product before issuing			
TS-25	• Prepare blood and other related products for issue			
TS-26	• Document all steps in the procedure in order to trace the final disposition of all donor products			
TS-27	• Transport blood products according to institutional policy			
TS-28	• Track transfused units (i.e., lookback, traceback)			
	Pre/Post Natal Testing			
TS-29	• Perform prenatal tests and investigations			
TS-30	• Perform testing on postnatal and cord specimens			
TS-31	• Perform feto-maternal testing follow-up when required			
TS-32	• Determine which mothers are eligible to receive Rh immune globulin and calculate dose			
TS-33	• Issue Rh immune globulin			
TS-34	• Perform pretransfusion testing for neonatal transfusions			
	Antibody Investigation			
TS-35	• Perform irregular antibody investigations, including documentation of all results			
TS-36	• Perform an antibody investigation and exclude antibodies using the established laboratory protocol			
TS-37	• Differentiate between clinically significant and insignificant antibodies			
TS-38	• Perform the RBC phenotype for patient and donor units			
TS-39	• Select and issue the most appropriate blood for transfusion to patient with an unexpected antibody (autoantibody or alloantibody)			

	Documentation, Interpretation and Reporting/ Quality Management			
TS-40	• Follow established protocols and procedures, including those for continuous quality control/assurance/improvement, risk management and point-of-care testing			
TS-41	• Operate and maintain fridges, centrifuges and other laboratory equipment according to laboratory protocol			
TS-42	• Recognize and resolve common sample problems			
TS-43	• Perform quality control checks on blood components, reagents and equipment.			
TS-44	• Recognize and address equipment/instrument malfunction (e.g., seek assistance and participate in troubleshooting)			
TS-45	• Follow established preventative maintenance programs and maintain instrument logs as directed			
TS-46	• Recognize the limitations and interference points of the techniques and reagents used			
TS-47	• Recognize the relationship between analyses, clinical information/condition, implausible results and diagnoses including the significance of critical values, sources of interference and method limitations			
TS-48	• Recognize and investigate when results of patient analyses are unexpected (e.g., critical values, implausible results).			
TS-49	• Participate in maintaining appropriate documentation (e.g., document laboratory errors and corrective measures taken as necessary)			
TS-50	• Recognize the implications of laboratory findings and identify further testing			
TS-51	• Verify that all ordered analyses have been completed			
TS-52	• Validate results before reporting			
TS-53	• Release and communicate results of laboratory analyses to clients and stakeholders (e.g., nurses, physicians, Canadian Blood Services, Infection Control) in an appropriate manner			
TS-54	• Use the computer adequately to record, store and retrieve data			
TS-55	• Retain laboratory results in accordance with existing legislation			
TS-56	• Comply with existing regulations for specimen retention, storage and disposal			
TS-57	• Demonstrate principles of quality management regarding transfusion medicine reagents, equipment and records			
TS-58	• Utilize responsible practices that contribute to the cost-effective use of health care resources			

	Safety			
TS-59	• Apply appropriate laboratory hygiene and infection control practices to minimize possible dangers from biological specimens, laboratory supplies and equipment			
TS-60	• Select and utilize appropriate methods for disinfection/sterilization of items while minimizing potential hazards			
TS-61	• Apply the principles of standard precautions, including the use of personal protective equipment (PPE) (i.e., gloves, mask, goggles, lab coat, gown, face shield, and respirator)			
TS-62	• Apply or demonstrate knowledge of spill containment and clean up procedures for infectious material and dangerous chemicals			
TS-63	• Label, date, handle, store and dispose of chemicals, dyes, reagents, solutions and sharps, biological waste, toxic material, biological material according to the Workplace Hazardous Materials Information System (WHMIS), existing legislation and institutional policy			
TS-64	• Apply or demonstrate knowledge of first aid measures in response to incidents, including the reporting procedures related to safety and personal injury (e.g., needle stick, physical or chemical injury)			
TS-65	• Utilize laboratory safety devices in a correct manner (e.g., biological safety cabinets, fume hoods, laminar flow cabinets, safety pipetting devices, safety containers and carriers, safety showers, eye washes)			
TS-66	• Apply or demonstrate knowledge in response to fire emergencies and evacuation procedures			
TS-67	• Identify the location and use of all fire and protective equipment and select appropriate disinfectants			
TS-68	• Handle and dispose of sharps according to institutional policy			
TS-69	• Comply with safety regulations as they pertain to the medical laboratory department			

The recommended length for a clinical placement in transfusion science for internationally-educated clients is **6 weeks.**

	MICROBIOLOGY	Completed satisfactorily ✓	Did not assess ✓	Initials
	Specimen Processing			
MI-1	• Ensure that appropriate specimens are procured according to protocol			
MI-2	• Ensure specimens have been correctly accessioned			
MI-3	• Assess specimen suitability, specimen priority and apply rejection criteria, screening criteria, and reporting comments			
MI-4	• Prepare specimens for planting and microscopic examination			
MI-5	• Carry out planting all types of specimens for culture			
MI-6	• Incubate plates in the proper atmospheric conditions and temperatures			
MI-7	• Comply with existing guidelines for specimen retention, storage and disposal			
	Microscopy and Gram Stain			
MI-8	• Set up compound light microscope for Koehler illumination and demonstrate proficient use and care of the microscope			
MI-9	• Evaluate the quality of staining and take appropriate action to correct deficiencies			
MI-10	• Perform and interpret Gram stained direct smears from clinical specimens			
MI-11	• Identify and quantitate cells, bacteria and fungi in routine smears			
MI-12	• Microscopically assess the quality of lower respiratory tract specimens			
MI-13	• Assess vaginal smears for bacterial vaginosis and/or yeast			
MI-14	• Interpret wet preparations for Trichomonas and/or yeast			
	Colonial Morphology and Identification			
MI-15	• Characterize the colonial and microscopic morphology of organisms			
MI-16	• Recognize colonial morphologies of normal flora and potential pathogens on each			
MI-17	• Complete Gram stains from cultures			
MI-18	• Correlate culture results with the direct smear			
MI-19	• Perform analyses to screen and/or identify pathogens and rule out normal flora using appropriate tests, including immunological methods, test kits and automated instrumentation			
MI-20	• Subculture organisms to ensure pure culture and isolated colonies appropriately			
MI-21	• Correlate results with patient data such as age, symptoms and multiple collection results to determine possible pathogen identification			

MI-22	• Recognize the relationship between analyses, clinical information and diagnoses			
MI-23	• Rule out non-clinically significant organisms			
MI-24	• Apply molecular diagnostic techniques in pathogen detection			
MI-25	• Refer isolates to the reference lab for testing as required			
MI-26	• Recognize and investigate when results of patient analyses are unexpected (e.g., critical values, implausible results)			
MI-27	• Suggest appropriate follow-up testing for aberrant results			
	Urines			
MI-28	• Perform colony counts			
MI-29	• Calculate and compare colony counts with clinical information and work up			
MI-30	• Differentiate clinically significant and insignificant results including contamination			
MI-31	• Recognize normal flora, pathogenic bacteria and/or yeast from the urinary tract and be able to confirm the identity of each pathogen or potential pathogen			
MI-32	• Report urine cultures according to clinical site procedures			
	Gastro-intestinal (GI) Tract/Enteric			
MI-33	• Perform analyses for clinically significant organisms from the gastrointestinal tract			
MI-34	• Identify bacteria from gastrointestinal cultures			
MI-35	• Report enteric cultures according to clinical site procedures			
	Genital			
MI-36	• Recognize normal flora, pathogenic bacteria and/or yeast from the genital tract and be able to confirm the identity of each pathogen or potential pathogen			
MI-37	• Recognize colonial morphologies of normal flora and potential pathogens on each media used			
MI-38	• Perform rapid testing methods to isolate Group B Streptococcus in expectant mothers at risk			
MI-39	• Report genital cultures according to clinical site procedures			
	Respiratory			
MI-40	• Recognize colonial morphology of normal flora and potential pathogens on routine media			
MI-41	• Perform analyses to identify routine pathogens using appropriate tests including immunological methods, test kids and/or automated instrumentation			
MI-42	• Report respiratory cultures according to clinical site procedures			

	Wound, Tissue and Fluid Specimens			
MI-43	• Recognize normal flora and potential pathogens, both aerobic and anaerobic, based on colonial morphologies on routine media			
MI-44	• Perform analyses to identify routine pathogens using appropriate tests including immunological methods, test kits and/or automated instrumentation			
MI-45	• Report wound and sterile fluid cultures according to clinical site procedures			
	Blood Cultures			
MI-46	• Operate an automated blood culture system including loading and unloading, maintenance, troubleshooting error codes and recognizing flagged results			
MI-47	• Prepare and interpret Gram stained smears			
MI-48	• Differentiate possible contaminants from probable pathogens			
MI-49	• Correlate results of blood cultures with other body sites			
MI-50	• Report preliminary, positive and final negative blood cultures			
MI-51	• Suggest appropriate follow-up testing for aberrant results for blood cultures			
MI-52	• Operate and maintain an automated blood culture instrument			
	Susceptibility Testing			
MI-53	• Perform and interpret antimicrobial susceptibility testing on routine pathogens according to the Clinical and Laboratory Standards Institute (CLSI) Guidelines, including appropriate methods such as automated instrumentation, Kirby-Bauer, Double disk diffusion (D) test, Epsilometer (E) test			
MI-54	• Perform analyses to screen and/or identify common antibiotic resistance in organisms			
MI-55	• Categorize methicillin resistant staphylococcus aureus (MRSA), extended spectrum beta lactamase (ESBL), vancomycin resistant enterococcus (VRE), and beta lactamase producers			
MI-56	• Report any antibiotic resistant organism (ARO) isolate susceptibility testing as determined by established protocols			
MI-57	• Suggest appropriate follow-up testing for aberrant results for quality control and susceptibility testing			
MI-58	• Report antimicrobial susceptibility testing results according to clinical site procedures and specimen source			

	Documentation, Interpretation and Reporting/ Quality Management			
MI-59	• Follow established protocols and procedures, including those for continuous quality control/assurance/improvement, risk management and point-of-care testing			
MI-60	• Operate and maintain incubators, fridges, automated stainers, centrifuges and biohazard hoods according to lab protocol			
MI-61	• Recognize and resolve common sample problems			
MI-62	• Recognize and address equipment/instrument malfunction (e.g., seek assistance and participate in troubleshooting)			
MI-63	• Follow established preventative maintenance programs and maintain instrument logs as directed			
MI-64	• Recognize the limitations and interference points of the techniques and reagents used			
MI-65	• Recognize the relationship between analyses, clinical information/condition, implausible results and diagnoses including the significance of critical values, sources of interference and method limitations			
MI-66	• Recognize and investigate when results of patient analyses are unexpected (e.g., critical values, implausible results)			
MI-67	• Participate in maintaining appropriate documentation (e.g., document laboratory errors and corrective measures taken as necessary)			
MI-68	• Complete susceptibility testing and related quality control practices			
MI-69	• Recognize the implications of laboratory findings and identify further testing			
MI-70	• Verify that all ordered analyses have been completed			
MI-71	• Validate results before reporting			
MI-72	• Release and communicate results of laboratory analyses to clients and stakeholders (e.g., nurses, physicians, Public Health, Infection Control) in an appropriate manner			
MI-73	• Use the computer adequately to record, store and retrieve data			
MI-74	• Retain laboratory results in accordance with existing legislation			
MI-75	• Comply with existing regulations for specimen retention, storage and disposal			
MI-76	• Demonstrate the principles of quality management			
MI-77	• Utilize responsible practices that contribute to the cost-effective use of health care resources			

	Safety			
MI-78	• Apply appropriate laboratory hygiene and infection control practices to minimize possible dangers from biological specimens, laboratory supplies and equipment			
MI-79	• Select and utilize appropriate methods for disinfection/sterilization of items while minimizing potential hazards			
MI-80	• Apply the principles of standard precautions, including the use of personal protective equipment (PPE) (i.e., gloves, mask, goggles, lab coat, gown, face shield, and respirator)			
MI-81	• Apply or demonstrate knowledge of spill containment and clean up procedures for infectious material and dangerous chemicals			
MI-82	• Label, date, handle, store and dispose of chemicals, dyes, reagents, solutions and sharps, biological waste, toxic material, biological material according to the Workplace Hazardous Materials Information System (WHMIS), existing legislation and institutional policy			
MI-83	• Apply or demonstrate knowledge of first aid measures in response to incidents, including the reporting procedures related to safety and personal injury (e.g., needle stick, physical or chemical injury)			
MI-84	• Utilize laboratory safety devices in a correct manner (e.g., biological safety cabinets, fume hoods, laminar flow cabinets, safety pipetting devices, safety containers and carriers, safety showers, eye washes)			
MI-85	• Apply or demonstrate knowledge in response to fire emergencies and evacuation procedures			
MI-86	• Identify the location and use of all fire and protective equipment and select appropriate disinfectants			
MI-87	• Apply appropriate laboratory hygiene and infection control practices to minimize possible dangers from biological specimens, laboratory supplies and equipment			
MI-88	• Handle and dispose of sharps according to institutional policy			
MI-89	• Comply with safety regulations as they pertain to the medical laboratory department			

The recommended length for a clinical placement in clinical microbiology for internationally-educated clients is **8 weeks.**

HISTOTECHNOLOGY

		Completed satisfactorily ✓	Did not assess ✓	Initials
	Specimen Preparation			
HI-1	• Prioritize specimens by test request, urgency and specimen type			
HI-2	• Assess specimen suitability			
HI-3	• Ensure required information is provided and corresponds with requisition and sample			
HI-4	• Take corrective actions to address deficiencies			
HI-5	• Register specimens into Laboratory Information System			
HI-6	• Prepare and maintain gross dissection area			
HI-7	• Assist the pathologist in the gross room			
	Fixation			
HI-8	• Prepare appropriate reagents for fixation and decalcification if required			
HI-9	• Safely perform fixation, decalcification and secondary fixation as required and according to established protocols			
HI-10	• Prepare frozen sections			
HI-11	• Troubleshoot as necessary (e.g., fixation artifacts and pigments)			
	Processing			
HI-12	• Select appropriate reagents for paraffin processing			
HI-13	• Operate an automated tissue processor			
HI-14	• Perform maintenance of a tissue processor			
HI-15	• Perform basic troubleshooting procedures for processing			
	Embedding			
HI-16	• Correctly orientate and embed a variety of types of tissue specimens in paraffin blocks			
HI-17	• Operate and maintain an embedding center, cold plate, and accessories			
HI-18	• Perform troubleshooting procedures for embedding (incorrect orientation, unevenness)			

	Microtomy			
HI-19	• Cut artifact-free paraffin sections on a microtome and transfer to correctly-labeled slides			
HI-20	• Operate and maintain the microtome, water bath, slide dryer, and related accessories			
HI-21	• Recognize and troubleshoot slide preparation errors: chattering, compression, air bubbles, tears, folds, wrinkles, etc.			
	Frozen Sections			
HI-22	• Perform cryotomy on fresh tissue following established protocols			
HI-23	• Operate and maintain the cryostat and accessories			
HI-24	• Demonstrate knowledge of a cryostat decontamination procedure			
HI-25	• Perform a rapid Hematoxylin and Eosin (H & E) stain on a frozen section			
	Staining			
HI-26	• Perform stains of acceptable quality for the diagnosis on tissue sections, peripheral blood and bone marrow films and microbiological smears, including the selection of control slides where appropriate			
HI-27	• Perform and troubleshoot stained tissues: H & E, connective tissue, microorganisms, carbohydrates, lipids, pigments, immunochemistry (advanced technique)			
HI-28	• Correlate relationship between staining technique and target tissue component			
HI-29	• Apply the principles of microscopy to evaluate stained slides			
HI-30	• Simultaneously perform multiple special stains			
HI-31	• Prepare, store and dispose of reagents used in routine and special staining			
HI-32	• Safely and correctly perform manual and automatic cover-slipping and labeling of stained slides			
HI-33	• Operate and maintain an automated stainer and coverslipper (where available)			
	Microanatomy			
HI-34	• Identify and describe epithelial tissues, support tissues, muscle, cartilage, bone, nerve and vascular tissue using a correctly set-up microscope			
HI-35	• Identify and describe the following microanatomical tissues: lungs, esophagus, stomach, pancreas, small intestine, large intestine, appendix, liver, gall bladder, spleen, kidney, testis, skin, uterus, cervix, ovary, prostate, lymph node, breast, adrenal, thyroid, heart, cerebrum, cerebellum, bone			
HI-36	• Describe the relevance of microanatomical study to the histotechnologist, including its use in quality control/assurance practices			
HI-37	• Apply the principles of microscopy to viewing the microscope set in Kohler			

	Documentation, Interpretation and Reporting/ Quality Management			
HI-38	• Follow established protocols and procedures, including those for continuous quality control/assurance/improvement, and risk management			
HI-39	• Operate and maintain fridges, centrifuges and other laboratory equipment according to laboratory protocol			
HI-40	• Recognize and resolve common sample problems			
HI-41	• Recognize and address equipment/instrument malfunction (e.g., seek assistance and participate in troubleshooting)			
HI-42	• Follow established preventative maintenance programs and maintain instrument logs as directed			
HI-43	• Recognize the limitations and interference points of the techniques and reagents used			
HI-44	• Recognize the relationship between analyses, clinical information/condition, implausible results and diagnoses including the significance of critical values, sources of interference and method limitations			
HI-45	• Recognize and investigate when results of patient analyses are unexpected (e.g., critical values, implausible results)			
HI-46	• Participate in maintaining appropriate documentation (e.g., document laboratory errors and corrective measures taken as necessary)			
HI-47	• Recognize the implications of laboratory findings and identify further testing			
HI-48	• Verify that all ordered analyses have been completed			
HI-49	• Validate results before reporting			
HI-50	• Release, communicate, and document communications of results of laboratory analyses to clients and stakeholders (e.g., nurses, physicians, Infection Control) in an appropriate and timely manner			
HI-51	• Retain laboratory results in accordance with existing legislation			
HI-52	• Use the computer adequately to record, store and retrieve data			
HI-53	• Comply with existing regulations for specimen retention, storage and disposal			
HI-54	• Conform to lab protocols regarding storage of blocks and slides			
HI-55	• Demonstrate the principles of quality management			
HI-56	• Utilize responsible practices that contribute to the cost-effective use of health care resources			

	Safety			
HI-57	• Apply appropriate laboratory hygiene and infection control practices to minimize possible dangers from biological specimens, laboratory supplies and equipment			
HI-58	• Select and utilize appropriate methods for disinfection/sterilization of items while minimizing potential hazards			
HI-59	• Apply the principles of standard precautions, including the use of personal protective equipment (PPE) (i.e., gloves, mask, goggles, lab coat, gown, face shield, and respirator)			
HI-60	• Apply or demonstrate knowledge of spill containment and clean up procedures for infectious material and dangerous chemicals			
HI-61	• Label, date, handle, store and dispose of chemicals, dyes, reagents, solutions and sharps, biological waste, toxic material, biological material according to the Workplace Hazardous Materials Information System (WHMIS), existing legislation and institutional policy			
HI-62	• Apply or demonstrate knowledge of first aid measures in response to incidents, including the reporting procedures related to safety and personal injury (e.g., needle stick, physical or chemical injury)			
HI-63	• Utilize laboratory safety devices in a correct manner (e.g., biological safety cabinets, fume hoods, laminar flow cabinets, safety pipetting devices, safety containers and carriers, safety showers, eye washes)			
HI-64	• Apply or demonstrate knowledge in response to fire emergencies and evacuation procedures			
HI-65	• Identify the location and use of all fire and protective equipment and select appropriate disinfectants			
HI-66	• Handle and dispose of sharps according to institutional policy			
HI-67	• Comply with safety regulations as they pertain to the medical laboratory department			

The recommended length for a clinical placement in histotechnology for internationally-educated clients is **4 weeks.**