MLPAO APLMO

Medical Laboratory Professionals' Association of Ontario
L'Association des professionnels des laboratoires médicaux de l'Ontario

Medical Laboratory Assistant/Technician (MLA/T) Competency Guidelines

Competencies expected of an Entry-Level Medical Laboratory Assistant/Technician (MLA/T)

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Forward

The Medical Laboratory Professionals' Association of Ontario (MLPAO) sets the provincial standard for entry to practice for Medical Laboratory Assistant/Technicians (MLA/Ts) in Ontario. The MLPAO certification program validates that an individual has attained a recognized level of competency and training through either an EQual™ accredited (and MLPAO approved) educational institution or via the special consideration process.

The goal of MLPAO MLA/T certification is to provide the public with assurance of competent healthcare providers, employers with assurance of competent MLA/Ts who meet provincial standards, and newly certified MLA/Ts with increased employment opportunities and portability.

The MLA/T Competency Guidelines set the minimum standard of competency which must be met for certification. Competencies define the knowledge, skills, attitudes, and behaviours expected of MLA/Ts at entry to practice. By legislation, the MLA/T is required to work under the supervision of a Medical Laboratory Technologist (MLT). MLA/Ts are expected to recognize problems and errors and refer to the supervising MLT for direction.

The MLPAO offers the Certification Exam four times per year; the Competency Guidelines are reviewed every 5 years or in the event of major shifts in the lab profession.

In addition, the MLPAO MLA/T Standards of Practice define the expected level of performance which forms the framework for Medical Laboratory Assistant/Technician practice and against which competency is evaluated.

The revisions in this document were developed through collaborative consultation and information sharing with stakeholders across various laboratory sectors.

RECOMMENDATIONS - MLA/T programs are advised to verify students as competent to perform phlebotomy and ECG during the didactic portion of the MLA/T program, prior to attending clinical placement. It is recommended that students complete the following:

1. **Phlebotomy** - a minimum of 30 successful patient phlebotomies, with a minimum of 15 being completed during the didactic phase of the program. The remainder can be completed during clinical placement.
2. **ECG** - a minimum of 5 successful ECG tracings during the didactic phase.

Use of Simulation

"Simulation is an educational technique used to imitate real life scenarios (in part or whole), which enables participants to demonstrate and receive feedback on knowledge, skills, abilities and/or judgment."[1] (See Definitions section for complete definition).

MLPAO, in collaboration with stakeholders, has reviewed the competencies for MLA/T entry to practice and determined which competencies can be met by simulation. Simulation can be used to attain competency for many of the MLPAO competencies and must include an assessment that demonstrates competency of the required skill or knowledge. Through simulation, educators can replicate laboratory situations which allow students to develop and practice their laboratory skills in a safe environment. Increased use of simulation can help to ensure that students are competent in the required skills while addressing the limitations of some clinical placement settings to cover all competencies.

To best prepare students for the certification exam and for entry to practice as MLA/Ts, the MLPAO recommends that MLA/T programs select placement sites where students will have the opportunity to attain experience in as many competencies as possible during their clinical placement.

Each competency has been reviewed to determine if simulation can be used for assessment. Competencies where simulation can be used for assessment can be evaluated during the didactic phase of the program and are not required to be completed during the clinical placement. Competencies that cannot be assessed by simulation require completion and evaluation during the clinical placement. Competencies that cannot be assessed by simulation are based on the need for students to experience these competencies in the day-to-day clinical work environment.

Clinical placement sites are encouraged to provide students with an opportunity to experience as many competencies as possible while on clinical placement, including those that have been assessed through simulation.

Each competency category identifies the maximum percentage of competencies that can be assessed by simulation.

Competencies assessed in simulation must have a formal evaluation component including demonstration of the skill, where applicable, and supporting documentation with instructor sign-off.

[1] https://csmls.org/Research/Projects,-Reports-Presentations/Simulation-Clinical-Placement-Initiative.aspx

Definitions

Medical Laboratory Technologist (MLT) – a person who is registered with the College of Medical Laboratory Technologists of Ontario (CMLTO) and who, under general supervision performs tests which require the exercise of independent judgment

Medical Laboratory Assistant/Technician (MLA/T) – a person who, under direct supervision, performs laboratory tests which require limited technical skills and responsibilities.[2] The examinations performed shall not require interpretation, assessment, or the exercise of independent judgment.[3]

Basic knowledge – entry level comprehension of theory

Demonstrate – clearly show and express knowledge through words or actions

Practical – demonstrate ability to perform a technique

Theoretical – knowledge of the theory of subject or area of study

Simulation - "Simulation is an educational technique used to imitate real life scenarios (in part or whole), which enables participants to demonstrate and receive feedback on knowledge, skills, abilities and/or judgment. This can include but is not limited to communication, problem-solving, critical thinking and the ability to collaborate and work effectively within a health care team. Simulation can reflect simple to complex situations or processes and can be accomplished in any of the following examples:

- through interactive written case-based scenarios;
- computerized laboratory information system gaming;
- inter- or intra-professional role playing;
- standardized patients;
- task trainers such as rubber arms for phlebotomy;
- virtual simulation for specimen identification;
- haptic simulation;
- high fidelity simulation, or
- hybrids of any of these examples.

Similar to healthcare simulation, academic student simulation encompasses a range of activities with a broad common purpose of improving the effectiveness and efficiency of services and ultimately, enhancing competency acquisition by students in a safe and secure environment that reduces potential harm to patients, students, and the laboratory and general healthcare systems." From https://csmls.org/Research/Projects,-Reports-Presentations/Simulation-Clinical-Placement-Initiative.aspx[4]

Standards of Practice – define the expected level of performance which forms the framework for Medical Laboratory Assistant/Technician practice and against which competency is evaluated. (**New**)

[2] Ontario Regulation 45/22

[3] Medical Laboratory Assistant/Technician Duties

[4] https://csmls.org/Research/Projects,-Reports-Presentations/Simulation-Clinical-Placement-Initiative.aspx

Composition of the MLA/T Certification Exam

The table below shows percentage composition of the MLPAO's Medical Laboratory Assistant/Technician Certification Exam by competency category.

Competency Category	Competency	Percent of Test
1	Professional Practice	8-10%
2	Medical Terminology, Basic Biology, Anatomy and Physiology	7-9%
3	Laboratory Mathematics, Statistics and Quality Management	10-12%
4	Specimen Procurement, Processing and Data Collection	12-16%
5	Laboratory Safety	12-16%
6	Laboratory Equipment and Supplies	5-7%
7	Histology and Cytology	4-6%
8	Clinical Microbiology	7-9%
9	Clinical Chemistry	8-10%
10	Clinical Hematology	8-10%
11	Transfusion Medicine	3-5%
12	Electrocardiograms and Holter Monitors	5-7%

Category 1: Professional Practice

Competency Statement: The Medical Laboratory Assistant/Technician meets the legal and ethical requirements of practice and acts in a professional manner to provide optimal patient care and practice competently and safely within their scope.

**Blue font indicates new to competency profile*

Number	Competency Statement *Up to 25% of competencies in this category can be assessed in simulation.*	Can simulation be used for assessment?
1.1	Take responsibility for their work and professional conduct	No
1.2	Maintain confidentiality of all patient information	No
1.3	Practice within the scope of their competence and seek assistance when beyond their competence	No
1.4	Apply the laws and regulations governing medical laboratory technology to their practice including: • Health Care Consent Act, 1996 • Canada Health Act • Regulated Health Professions Act (RHPA), 1991, with special attention to Section 11 O. Reg. 107/96 Controlled Acts and Exemptions • Laboratory & Specimen Collection Centre Act, Regulation 45/22 • Personal Information Protection and Electronic Documents Act (PIPEDA) • Mandatory Blood Testing Act, 2006, S.O. 2006, c. 26 • Personal Health Information Protection Act (PHIPA) • Ontario Human Rights Code, R.S.O. 1990, c. H.19 • Occupational Health and Safety Act • Workplace Hazardous Materials Information System (WHMIS) • Human Pathogens and Toxins Act • Transportation of Dangerous Goods Act (TDG) and Regulations	No
1.5	Use safe work practices at all times for the protection of self and others	No
1.6	Adhere to organizational policies and procedures	No
1.7	Recognize the ethical principles and framework that influences the practice of medical laboratory technology	Yes
1.8	Describe the difference between direct supervision and general supervision related to MLA/T and MLT practice	Yes
1.9	**NEW** - Demonstrate knowledge of healthcare systems, professional, and regulatory organizations	Yes
1.10	**NEW** – Demonstrate knowledge of the relationship between the health of the population and the effects on the laboratory system	Yes
1.11	**NEW** - Communicate effectively, both written and verbal	No
1.12	Cooperate with other members of the healthcare team to provide effective patient care through interprofessional collaboration	No
1.13	Act with courtesy, consideration, and professionalism in all interactions	No
1.14	**NEW** -Recognize and report unprofessional behaviour to appropriate leaders as per organizational policies	Yes
1.14	**NEW** –Respect the diversity and values of patients, colleagues, and other healthcare workers	No
1.15	**NEW** – Practice effective organizational and time management skills	No
1.16	**NEW** - Perform troubleshooting and problem-solving within scope of practice	No
1.17	**NEW** - Adapt and respond to changes in the workplace	No
1.18	Promote the image and status of the medical laboratory profession by maintaining high standards in their work habits and through active support of the MLPAO	No
1.19	Maintain and improve knowledge and skills through continuous learning	Yes

Category 2: Medical Terminology, Basic Biology, Anatomy and Physiology

Competency Statement: The Medical Laboratory Assistant/Technician shall have a fundamental vocabulary of medical terms, and be able to explain basic human biology, anatomy, and physiology.

**Blue font indicates new to competency profile*

Number	Competency Statement *Up to 100% of competencies in this category can be assessed in simulation.*	Can simulation be used for assessment?
2.1	Identify root words, suffixes and prefixes for common medical words and terms	Yes
2.2	List anatomic locations including body cavities (skull, thorax, abdomen, pelvis), organs, and their functions	Yes
2.3	Describe the 4 main elements (Hydrogen, Oxygen, Carbon, and Nitrogen) and how they relate to proteins, carbohydrates, and fats	Yes
2.4	Describe the human cell and the structural and functional characteristics of the basic tissue types: epithelium, connective, muscular and nervous	Yes
2.5	**NEW** – Describe the structure, function and replication of DNA and RNA with respect to polymerase chain reaction (PCR) testing	Yes
2.6	Describe the body systems and their function: • Circulatory • Digestive • Endocrine • Integumentary • Immune/Lymphatic • Musculoskeletal • Nervous • Renal/Urinary • Reproductive • Respiratory	Yes
2.7	Know the common tests related to monitoring the body systems	Yes

Category 3: Laboratory Mathematics, Statistics, and Quality Management

Competency Statement: The Medical Laboratory Assistant/Technician shall utilize laboratory mathematics and statistics, and practice the principles of Quality Management Systems.

**Blue font indicates new to competency profile*

Number	Competency Statement *Up to 90% of competencies in this category can be assessed in simulation.*	Can simulation be used for assessment?
3.1	Use the metric system and International System (SI) units for volume, weight, linearity, concentration, and temperature	Yes
3.2	Define terms used in statistical analysis: mean, median, mode, standard deviation, coefficient of variation, uncertainty measurement, accuracy, precision	Yes
3.3	Describe the difference between critical values, reference ranges and detection limits	Yes
3.4	Differentiate between standards and controls used in the laboratory	Yes
3.5	Differentiate between commercial controls, in-house pools, and blind duplicate patient samples	Yes
3.6	Describe the effects of potential sources of error	Yes
3.7	Calculate ratio and proportion	Yes
3.8	Describe the use of exponents in the laboratory	Yes
3.9	Perform lab math including significant digits and rounding off	Yes
3.10	Prepare and store molar, isotonic and percentage (w/w, v/v, w/v) solutions	Yes
3.11	Calculate and prepare dilutions	Yes
3.12	Identify the different grades of chemicals and when they are used	Yes
3.13	Explain the difference between deionized and distilled water, grades of water, and their uses	Yes
3.14	**NEW** - Demonstrate knowledge of the theory of Quality Management Systems (QMS) and their application in the laboratory	Yes
3.15	**NEW** - Describe the components of a Quality Management System (QMS), i.e., Quality System Essentials (QSE)	Yes
3.16	**NEW** - Describe risk management and its role in the QMS	Yes
3.17	**NEW** - Describe the following terms as they relate to the QMS: • No-blame culture • Quality indicators • Nonconformances, adverse events or occurrences, near misses, including reporting and recording • Corrective and preventative actions	Yes
3.18	**NEW** – Demonstrate the role of the MLA/T in supporting the QMS	No
3.19	**NEW** - Participate in internal and external quality assurance activities and continuous quality improvement initiatives and projects – i.e., accreditation, proficiency testing, audits, contribute to procedure updates, etc.	No

Category 4: Specimen Procurement, Processing and Data Collection

Competency Statement: The Medical Laboratory Assistant/Technician shall ensure that appropriate specimens are procured according to established protocols to ensure patient safety and maintain specimen integrity.

**Blue font indicates new to competency profile*

Number	Competency Statement *Up to 50% of competencies in this category can be assessed in simulation.*	Can simulation be used for assessment?
4.1	Recognize that specimen collection requests must be generated by authorized health care professionals	Yes
4.2	Review requisition data to verify patient information and test requests, with knowledge of specimen requirements	No
4.3	**NEW** – Obtain informed consent from patients prior to specimen collection	No
4.4	Explain the importance of proper specimen collection for patient care and patient safety	Yes
4.5	Explain the importance of proper patient and specimen identification in all stages of specimen handling, from collection to final disposition	Yes
4.6	**NEW** - Verify patient identity using two unique identifiers	No
4.7	Locate appropriate sites for venous and capillary collection for adults and infants	No
4.8	Select appropriate equipment for blood collection including vacutainer system, needle gauge, butterfly needle, lancet, anticoagulant and microtubes	No
4.9	Identify anticoagulants and preservatives, their use for various tests, and the impact of incorrect anticoagulants on patient results.	Yes
4.10	Follow correct order of draw for specimen collection and know the implications of incorrect order of collection.	No
4.11	Perform venous and capillary blood collection	No
4.12	**NEW** - Follow appropriate procedures for phlebotomy in different patient situations (i.e., difficult venous access, mastectomy patient, etc.)	No
4.13	Describe the potential hazards to the patient and the MLA/T during specimen collection and handling	No
4.14	Adhere to procedures for patient after-care including dealing with complications associated with blood collection	No
4.15	Perform blood culture collection including use of proper aseptic technique	No
4.16	Describe the procedure for collection of timed specimens and blood alcohol levels	Yes
4.17	Describe the procedure for legal testing and chain of custody procedures	Yes
4.18	Follow procedures when repeat collections are required	No
4.19	Describe isolation precaution procedures for contact, droplet, and airborne modes of disease transmission, including the difference between isolation and reverse isolation	Yes
4.20	Adhere to procedures for preservation and safe shipment of biological specimens in accordance with current legislation.	No
4.21	Describe collection and preservation of a 24-hour urine specimen.	Yes
4.22	Describe collection of a mid-stream urine (MSU) specimen	Yes
4.23	Describe the technique for collection of fecal specimens: ova and parasites (O&P), culture and sensitivity (C&S), fecal fat and viral studies	Yes
4.24	Describe the requirements for collection of microbiology specimens	Yes
4.25	Describe the technique and specimen requirements for sputum samples for C&S and cytology	Yes
4.26	State the specimen requirements for seminal fluid for fertility or post vasectomy studies	Yes
4.27	Describe the technique for the preservation of fine needle aspirate biopsy smears and specimens	Yes
4.28	Describe the specimen and handling requirements for body fluids	Yes

Number	Competency Statement *Up to 50% of competencies in this category can be assessed in simulation.*	Can simulation be used for assessment?
4.29	Provide kits and instructions for collecting skin scrapings	Yes
4.30	Handle specimens according to priority and stability	No
4.31	Assess samples for suitability and follow criteria for rejection of unacceptable specimens and follow-up as per organizational procedures	No
4.32	Receive and accession specimens	No
4.33	Perform serum/plasma separation and storage	No
4.34	**NEW** – Process samples and quality control for testing	No
4.34.1	**NEW** – Process samples for testing using basic molecular techniques	Yes
4.35	Describe possible interferences and other deficiencies that may affect the quality of testing, and refer problems to an MLT	No
4.36	Describe the system of reporting laboratory results using a laboratory information system (LIS) including the test request, requisition, specimen collection, specimen receipt, access to patient records, and the electronic medical record (EMR)	Yes
4.37	**NEW** - Demonstrate knowledge of Laboratory Information systems (LIS)	Yes
4.38	Recognize abnormal results which must be referred to an MLT, including critical values	Yes
4.39	Adhere to the regulatory requirements for patient confidentiality including requests for results from unauthorized persons	No
4.40	**NEW** – provide or record results for review and release by MLT according to organization procedures, legal and regulatory requirements	Yes
4.41	Recognize the legal and clinical consequences of reporting patient results	Yes
4.42	Describe the procedure for retention and disposal of documents	Yes

Category 5: Laboratory Safety

Competency Statement: The Medical Laboratory Assistant/Technician shall maintain a safe work environment, follow safety legislation and protocols, including appropriate response to safety incidents.

**Blue font indicates new to competency profile*

Number	Competency Statement *Up to 50% of competencies in this category can be assessed in simulation*	Can simulation be used for assessment?
5.1	Follow provincial and federal legislation, regulations and guidelines related to laboratory safety including: a) Occupational Health and Safety Act b) WHMIS 2015 c) Hazardous Products Regulations d) Transportation of Dangerous Goods Act and Regulations e) Canadian Nuclear Safety and Control Act f) Human Pathogens and Toxins Act	Yes
5.2	Adhere to general safe laboratory and infection control practices including appropriate response to safety issues	No
5.3	Use personal protective equipment effectively, including donning and doffing	No
5.4	Use laboratory safety equipment and devices effectively, including: • Safety needles • sharps containers • acid bottle carriers • fume hood • biological safety cabinet • safety cans • flammable storage cabinet • gas cylinder carts	No
5.5	Use laboratory emergency equipment effectively, including: • eyewash station and emergency shower • spill kit • first aid kit • fire extinguisher and fire blanket	Yes
5.6	Identify and minimize biological hazards in the laboratory including: • Use of routine practices and additional precautions • Containment levels 1 and 2 • Use of biological safety cabinet	No
5.7	Identify and minimize chemical hazards in the laboratory including: • WHMIS symbols, labels and SDS • Safe storage of chemicals • Handling compressed gases • Handling cryogenic fluids	No
5.8	Identify and minimize physical hazards in the laboratory including: • Response to fire and use of fire extinguisher • Electrical precautions • Noise hazards	Yes
5.9	Identify and minimize radiation hazards in the laboratory including: • Define Ionizing and non-ionizing radiation • Describe radiation monitoring	Yes
5.10	**NEW** – Set up working environment with proper ergonomics to minimize risk of injury	No

Number	Competency Statement *Up to 50% of competencies in this category can be assessed in simulation*	Can simulation be used for assessment?
5.11	Describe the use of the steam autoclave for sterilization and decontamination of biohazardous waste	Yes
5.12	Dispose of biological specimens and other waste safely, in accordance with institutional policies and government regulations including: • general waste • chemical, biological, and radioactive waste • biomedical waste including sharps, specimens and storage of waste • waste treatment options – autoclave, chemical decontamination	No
5.13	**NEW** - Respond to emergencies and incidents in the laboratory, including, biological, chemical and radioactive spills, leaking specimens, personal injury, and incident reporting	Yes
5.14	Recognize the need for first aid in the event of needlestick injury; body fluid, chemical, heat, electrical, or radioisotope exposure; or trauma, and follow institutional policies and procedures	Yes
5.15	Perform basic CPR	Yes

Category 6: Laboratory Equipment and Supplies

Competency Statement: The Medical Laboratory Assistant/Technician shall demonstrate knowledge of the theory and application (handling, storage, safety precautions, care, cleaning, and basic troubleshooting) of the equipment and supplies used in the laboratory.

**Blue font indicates new to competency profile*

Number	Competency Statement *Up to 40% of competencies in this category can be assessed in simulation*	Can simulation be used for assessment?
6.1	**NEW -** Operate equipment correctly, safely, and according to procedure	No
6.2	**NEW -** Perform basic maintenance on laboratory equipment	No
6.3	**NEW -** Load specimens and quality control samples on automated and manual instrumentation	Yes
6.4	**NEW -** Perform minor troubleshooting on laboratory equipment	No
6.5	Describe the common types of laboratory glass and plasticware with specific reference to the effects of temperature extremes, solvents and corrosive chemicals	Yes
6.6	Use labware appropriate to the task, including glassware and micropipettes	Yes
6.7	Use and differentiate between TD, TC, and frosted ring pipettes	Yes
6.8	Use a compound microscope, including identification of the parts and their function	Yes
6.9	Perform general care and maintenance of the compound microscope	Yes
6.10	Explain the theory and purpose of Kohler illumination.	Yes
6.11	Use and describe the principles of point of care testing, the requirements for operator training, maintaining certification and instrument verification for, but not limited to, blood glucose	Yes
6.12	Adhere to inventory procedures and temperature requirements for the ordering, receipt and storage of reagents and consumables.	Yes

MANDATORY Equipment (MUST be available for student use)		
Autoclave	Holter Monitor	Point of Care Testing - Glucometer
Balance (mechanical and analytical)	Incubator	PPE (gloves, goggles, splash shields, lab coats, gowns)
Centrifuge	Laboratory glass and plastic ware	Refrigerator, Freezer
Class 1 Biological Safety Cabinet	Loop Incinerator/Bacti-cinerator/ Disposable Loops	Tubes for Erythrocyte Sedimentation Rate (ESR)
Compound Microscope	Microhematocrit centrifuge	Spill kit
Culture Media (plates, tubes)	Micropipette	Thermometer
ECG Machine	Mixing Devices (i.e., vortex, shaker)	Urinalysis reagent strips
Eyewash Station	Phlebotomy supplies	Waterbath
Flammable Cabinet	pH Meter	

OPTIONAL Equipment (Knowledge of theory is required)		
Automated antibiotic susceptibility testing	Class II and III biological safety cabinet	Microtome
Automated blood culture system	Coverslipper	Micro typing system – incubator and centrifuge
Automated cell counter	Cryostat	Microwave
Automated chemistry analyzer	Cytospin	Multichannel pipettes and microtiter plates
Automated coagulation analyzer	Desiccator	Point of Care Testing - urinalysis, pregnancy tests
Automated microbial identification system	Heating block	Refrigerator, freezer with alarm system and recorder
Automated slide stainer	H&E Stainer	Serofuge
Automated strip reader for urinalysis	Hot air oven	Tissue processor (open and closed system)
Blood gas analyzer	Liquid dispensing systems; automated and bottle top	Thermocycler
Cell washer	Liquid handler	Water distiller

Category 7: Histology and Cytology

Competency Statement: The Medical Laboratory Assistant/Technician shall demonstrate knowledge of the theory and procedures related to histology and cytology specimens.

**Blue font indicates new to competency profile*

Number	Competency Statement *Up to 100% of competencies in this category can be assessed in simulation.*	Can simulation be used for assessment?
7.1	Describe specimen processing in histology including fixation, decalcification, and tissue processing	Yes
7.2	Describe specimen processing in cytology including fixation/preservation, centrifugation, cell block preparation, cytocentrifugation, direct smear preparation and liquid based processors	Yes
7.3	Perform staining including Hematoxylin and Eosin (H&E), Romanowsky and Papanicolaou	Yes
7.4	Prepare and maintain stains and reagents for histology and cytology	Yes
7.5	Explain the risks of cross-contamination and the procedures required during specimen processing and staining to minimize risks	Yes
7.6	Perform manual and automated staining and coverslipping in histology and cytology	Yes
7.7	Identify quality assurance requirements in histology and cytology	Yes
7.8	Follow laboratory safety requirements specific to histology and cytology i.e., formalin, xylene	Yes
7.9	Adhere to procedures for filing, storage and retrieval of histology/cytology specimens, blocks, and slides	Yes

Category 8: Clinical Microbiology

Competency Statement: The Medical Laboratory Assistant/Technician shall demonstrate knowledge of the theory and procedures related to microbiology specimens.

**Blue font indicates new to competency profile*

Number	Competency Statement *Up to 100% of competencies in this category can be assessed in simulation.*	Can simulation be used for assessment?
8.1	Describe the classifications of microorganisms: • Bacteria • Viruses • Parasites • Protozoa • Fungi, molds, and yeasts • Chlamydia • Rickettsia	Yes
8.2	Describe the following terms: • normal flora • opportunist • commensal • pathogen • Risk Group 1, 2, 3 and 4 organisms	Yes
8.3	Adhere to requirements for transportation of microbiology specimens	Yes
8.4	Distinguish between non-selective, selective, differential, and enriched media	Yes
8.5	Describe the use of common media, i.e., Blood Agar, MacConkey Agar, Chocolate Agar, CNA, GC selective media	Yes
8.6	Perform specimen inoculation using: • Agar media (use appropriate streak method) • Agar slant tubes • Culture broth tubes • Automated plate streaker	Yes
8.7	Prepare slides for microbiological review	Yes
8.8	Describe the incubation of specimens: • Correct time and temperature requirements • Anaerobic conditions: anaerobic jar including gas-pak method, anaerobic glove box • Increased CO_2 tension: CO_2 incubator • Microaeorophilic conditions	Yes
8.9	Describe the basic operation of automated systems for: • Microbial identification and susceptibility testing • Blood cultures	Yes
8.10	Follow lab procedures to prepare media	Yes
8.11	Describe the principle and procedure for gram stain and acid-fast stain	Yes
8.12	Describe the principle of fluorescent and fluorescent antibody stains	Yes
8.13	Describe the fundamental differences between gram-positive and gram-negative bacteria	Yes
8.14	Describe the fundamental differences between cocci and bacilli	Yes

Category 9: Clinical Chemistry

Competency Statement: The Medical Laboratory Assistant/Technician shall demonstrate knowledge of the theory and procedures related to clinical chemistry specimens.

**Blue font indicates new to competency profile*

Number	Competency Statement *Up to 70% of competencies in this category can be assessed in simulation.*	Can simulation be used for assessment?
9.1	Recognize the reportable ranges and variant results for routine clinical chemistry tests	Yes
9.2	Recognize and take appropriate action with samples that are: • lipemic • hemolyzed • icteric • time-dependent for analysis (i.e., urine)	No
9.3	Perform urinalysis procedures related to routine and microscopic (R&M) analysis including specimen collection and rejection, preparation, and preservation for microscopic examination	Yes
9.4	Measure total volume of 24-hour urine and follow preservation guidelines	Yes
9.5	Follow the lab procedure for tolerance and stimulation testing including: • Describe types of routine tolerance and glucose load testing • Provide glucose solutions to patients • Recognize negative patient reactions to glucose load and initiate protocols for ending the test • Conduct timed specimen collection	Yes
9.6	Identify and describe the rationale for ordering grouped chemistry tests: • Liver function • Renal function • Lipid profile • Cardiac markers • Endocrine function • Tumour markers • Drug levels • Hepatitis testing • Electrolytes • Glucose testing	Yes
9.7	Describe the principles of operation of automated biochemistry analyzers	Yes

Category 10: Clinical Hematology

Competency Statement: The Medical Laboratory Assistant/Technician shall demonstrate knowledge of the theory and procedures related to clinical hematology specimens.

**Blue font indicates new to competency profile*

Number	Competency Statement *Up to 90% of competencies in this category can be assessed in simulation.*	Can simulation be used for assessment?
10.1	Describe the components and normal ranges of the complete blood count (CBC) • Hemoglobin • Hematocrit • RBC and indices • WBC • Platelets • Differential	Yes
10.2	Recognize and take appropriate action with samples which are: • Lipemic • Clotted • Agglutinated	No
10.3	Describe the basic operation of automated hematology and coagulation analyzers	Yes
10.4	Recognize the most common coagulation tests and their normal ranges (PT, PTT, INR)	Yes
10.5	Prepare smears including blood films, and thick and thin smears and reticulocytes	Yes
10.6	Perform routine and special staining according to lab procedures	Yes
10.7	Identify common staining problems and initiate corrective action	Yes
10.8	Prepare body fluid specimens for testing and microscopic examination	Yes
10.9	Describe the use of counting chambers including the dilution of sample and flooding the chamber	Yes
10.10	Set-up erythrocyte sedimentation rate (ESR) testing and identify potential sources of error	Yes
10.11	Differentiate between Westergren and Wintrobe methods for ESR testing	Yes
10.12	Identify hematology tests that require special handling	Yes

Category 11: Transfusion Medicine

Competency Statement: The Medical Laboratory Assistant/Technician shall demonstrate knowledge of the theory and procedures related to transfusion medicine specimens.

**Blue font indicates new to competency profile*

Number	Competency Statement *Up to 100% of competencies in this category can be assessed in simulation.*	Can simulation be used for assessment?
11.1	Describe blood groups and blood products	Yes
11.2	Identify storage requirements and the effects of storage on blood and blood products, including expiration dates and stock rotation	Yes
11.3	Describe the tests routinely performed in transfusion medicine including the anticoagulant used for specimen collection	Yes
11.4	Describe the lab procedure and the implications of errors for ABO grouping, Rh typing, and antibody screening/testing	Yes
11.5	Describe the collection of whole blood including the anticoagulant used and the preparation of blood components	Yes
11.6	Describe the name, constitution, handling, and storage of common blood products	Yes
11.7	Describe the tests routinely performed on all blood donations	Yes

Category 12: Electrocardiograms (ECG) and Holter Monitors

Competency Statement: The Medical Laboratory Assistant/Technician shall demonstrate knowledge of the theory and procedures related to Electrocardiograms (ECG) and Holter monitors.

**Blue font indicates new to competency profile*

Number	Competency Statement *Up to 100% of competencies in this category can be assessed in simulation.*	Can simulation be used for assessment?
12.1	**NEW** – Explain anatomy and electrophysiologic principles of the heart, cardiac conduction system and indications associated with ECG and Holter cardiac monitoring	Yes
12.2	Prepare patient and obtain an electrocardiogram (ECG) and Holter monitor tracings including correct placement of leads	Yes
12.3	**NEW** - Adapt ECG preparation and assessment techniques based on the patient age and gender	Yes
12.4	**NEW** - Assess the quality of the ECG tracing report, make necessary adjustments to minimize artifacts and take appropriate post-tracing actions	Yes
12.5	**NEW** – Perform required ECG equipment preventative maintenance and quality control procedures to ensure equipment appropriateness and readiness	Yes
12.6	**NEW –** Explain the difference between different types of ECG and heart monitors	Yes

References

ISBN	Title	Author
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978-0323377119	Clinical Procedures for Medical Assistants, 10th ed, 2022	K. Bonewit-West
978-0328299342	Linne & Ringsrud's Clinical Laboratory Science: The Basics and Routine Techniques, 9th ed, 2023	M. L. Turgeon
9780323697033	Mosby's Canadian Manual of Diagnostic and Laboratory Tests, 7th ed, 2022	K. D. Pagana; T. J. Pagana;T. N. Pagana
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978-0995245358	Cytology and Histology for the Canadian Lab Technician	K. Haddad
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978-0-323-35482-0	Baily & Scott's Diagnostic Microbiology 14th Edition	Patricia Tille
PHLEBOTOMY		
CLSI GP41	GP41 – Collection of Diagnostic Venous Blood Specimens, 7th ed, 2017	Clinical and Laboratory Standards Institute (CLSI)
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	Reference Guide of Acts and Regulations for MLA/Ts in Ontario, 2022	MLPAO
	CMLTO Delegation Guidelines for Medical Laboratory Technologists, 2023 http://www.cmlto.com/images/stories/About_CMLTO/2023_delegation_guidelines.pdf	CMLTO

ISBN	Title	Author
	Practice Guidelines for Members Regarding health Care Consent Act (HCCA) http://www.cmlto.com/images/stories/Members/practice_guidelines_for_members_regarding_the_health_care_consent_act_hcca.pdf	CMLTO
NEW	MLPAO Standards of Practice	MLPAO
	CSMLS Code of Professional Conduct	CSMLS
	Laboratory and Specimen Collection Centre Licensing Act and Regulation 45/22	Government of Ontario
QUALITY MANAGEMENT SYSTEMS (QMS)		
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TRANSFUSION MEDICINE		
	Circular of Information for the Use of Human Blood and Blood Components. https://www.blood.ca/en/hospitals/ciruclar-information	Canadian Blood Services

Revision History

Date	Revisions
August 2024	New version released
April 2025	Removed “molecular techniques” from competency 4.34 and included a new sub-competency 4.34.1 related specifically to processing samples for molecular testing, which can be assessed using simulation.