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

Competency Profile
General Medical Laboratory Technologist

Competencies Expected of an Entry-Level General Medical Laboratory Technologist

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Code of Professional Conduct

- Medical laboratory professionals are dedicated to serving the health care needs of the public. The welfare of the patient and respect for the dignity of the individual shall be paramount at all times.
- Medical laboratory professionals work with other health care professionals, to provide effective patient care.
- Medical laboratory professionals shall promote the image and status of their profession by maintaining high standards in their professional practice and through active support of their professional bodies.
- Medical laboratory professionals shall protect the confidentiality of all patient information.
- Medical laboratory professionals shall take responsibility for their professional acts.
- Medical laboratory professionals shall practise within the scope of their professional competence.
- Medical laboratory professionals shall endeavour to maintain and improve their skills and knowledge and keep current with scientific advances. They will uphold academic integrity in all matters of professional certification and continuing education.
- Medical laboratory professionals shall share their knowledge with colleagues and promote learning.
- Medical laboratory professionals shall be aware of the laws and regulations governing medical laboratory technology and shall apply them in the practice of their profession.
- Medical laboratory professionals shall practise safe work procedures at all times to ensure the safety of patients and co-workers and the protection of the environment.

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Examination Blueprint

CSMLS General MLT exams are based on this plan

Categories	Mark %
1. **Safe Work Practices**	5-7%
2. **Data and Specimen Collection and Handling**	5-7%
3. **Analytical Processes**	30-35%
4. **Interpretation and Reporting of Results**	20-25%
5. **Quality Management**	20-25%
6. **Critical Thinking**	5-10%
7. **Communication and Interaction**	3-5%
8. **Professional Practice**	5-7%

Assumptions about Medical Laboratory Science

The Medical Laboratory Technologist

Upon successful completion of both an accredited program/CSMLS prior learning assessment **and** the CSMLS national certification examinations, the Medical Laboratory Technologist:

- has developed a broad knowledge base and practical skills that enable them to analyze specimens, assess and report laboratory results according to institutional policies and professional standards
- applies critical thinking and problem solving strategies to ensure best practices
- practices and promotes the principles of continuous quality improvement including professional development and using personal initiative to improve laboratory practice
- practices to ensure the safety of patients, colleagues, self, and the environment
- contributes to the health care and education of the public, promotes patient welfare and respects patient diversity, dignity, and confidentiality
- is an integral member of the health care team who shares knowledge that is essential to the prevention, diagnosis, treatment and monitoring of disease, promotes learning, and collaborates with other professionals in providing effective patient care
- is responsible and accountable for professional acts and practices according to standards of practice as well as legislation and regulations governing the profession
- abides by the CSMLS Code of Professional Conduct
- uses effective interpersonal skills to maintain a professional relationship with colleagues, patients/clients and health care professionals
- uses all available resources to provide service in a timely, accurate, and cost-effective manner.

The Client/Patient

The client/patient is any individual who interacts with the medical laboratory technologist, e.g. patient, patient representative, health care professionals, other laboratory professionals.

The Environment

The Medical Laboratory Technologist is prepared to work in a variety of settings including, but not limited to, hospitals, private and government laboratories, industry, and educational institutions.

The Medical Laboratory Technologist practices in a safe environment that is dynamic and evolving.

General MLT Competency Categories

Categories	Description
1. Safe Work Practices	The medical laboratory technologist conducts their professional practice according to established protocols, safety guidelines, and existing legislation.
2. Data and Specimen Collection and Handling	The medical laboratory technologist verifies relevant data and ensures that appropriate specimens are collected and handled according to established protocols.
3. Analytical Processes	The medical laboratory technologist understands the principles and performs analytical techniques and assesses results on a variety of specimens. NOTE: The term "common" is used in reference to blood group antigens, micro-organisms, etc. and should be interpreted as those which occur frequently in the population and are encountered on a regular basis in clinical practice. The competencies should be interpreted in their broadest sense and not limited by the concept of the five laboratory disciplines.
4. Interpretation and Reporting of Results	The medical laboratory technologist uses scientific knowledge and skills to interpret, document and report laboratory results according to established protocols.
5. Quality Management	The medical laboratory technologist practices and promotes the principles of quality management.
6. Critical Thinking	The medical laboratory technologist applies critical thinking skills to constructively investigate, evaluate and problem solve.
7. Communication and Interaction	The medical laboratory technologist interacts using effective communication, teamwork skills and interprofessional collaboration with patients/clients and other health care professionals.
8. Professional Practice	The medical laboratory technologist meets the legal and ethical requirements of practice and protects the patient's right to a reasonable standard of care. Professional responsibility encompasses scope of practice, accountability, and professional development.

Category 1
Safe Work Practices

The medical laboratory technologist conducts their professional practice according to established protocols, safety guidelines, and existing legislation.

Number	Competency
1.01	Applies the principles of routine practices
1.02	Uses personal protective equipment, e.g. gloves, gowns, mask, face shields, aprons
1.03	Applies laboratory hygiene and infection control practices
1.04	Minimizes possible dangers from biological specimens, laboratory supplies and equipment
1.05	Uses laboratory safety devices, e.g. biological safety cabinets, fume hoods, laminar flow cabinets, safety pipetting devices, safety containers and carriers, safety showers, eye washes
1.06	Labels, dates, handles, stores, and disposes chemicals, dyes, reagents, and solutions according to legislation, e.g. WHMIS
1.07	Handles and disposes sharps
1.08	Stores, handles, transports and disposes biological and other hazardous materials according to legislation
1.09	Uses disinfection and sterilization methods
1.10	Minimizes potential hazards related to disinfection/sterilization methods
1.11	Applies measures in response to laboratory accidents/incidents
1.12	Applies spill containment and clean up procedures for biological and other hazardous materials
1.13	Responds appropriately to workplace emergencies
1.14	Reports and documents all incidents related to safety and personal injury
1.15	Applies proper ergonomic principles to minimize risk of injury

Category 2
Data and Specimen Collection and Handling

The medical laboratory technologist verifies relevant data and ensures that appropriate specimens are collected and handled according to established protocols.

Number	Competency
2.01	Verifies relevant information is provided for test request
2.02	Provides information to the client on specimen collection, transportation and storage
2.03	Confirms the identity of the patient and performs venipuncture and capillary blood collection to obtain appropriate samples for laboratory analysis
2.04	Performs sample collection and chain of custody procedures relating to specimens with legal implications
2.05	Adheres to established protocols for labeling and traceability of specimens
2.06	Delivers specimens taking into account priority and stability
2.07	Assesses suitability of the specimen for testing
2.08	Verifies that the pertinent data on the specimen and requisition correspond
2.09	Accessions specimens into laboratory information systems
2.10	Adheres to guidelines for specimen retention, storage, transportation and disposal
2.11	Prepares specimens for analysis
2.12	Identifies, documents and initiates corrective action for pre-examination (pre-analytical) errors

Category 3
Analytical Processes

The medical laboratory technologist understands the principles and performs analytical techniques and assesses results on a variety of specimens.

Number	Competency
3.01	Applies the principles of microscopy: • bright field • fluorescence • polarizing • inverted
3.02 3.02.01	Applies the physical and chemical principles of staining Assesses the quality of staining and initiates corrective action
3.03 3.03.01	Applies principles of light measuring systems used in common instruments: • absorption spectrophotometry • reflectometry • turbidimetry Assesses results, identifies sources of interference and initiates corrective action
3.04 3.04.01	Applies principles of electrochemical systems used in common instruments: • ion selective electrodes • conductance electrodes Assesses results, identifies sources of interference and initiates corrective action
3.05 3.05.01	Applies principles of electrophoresis and chromatography Assesses results, identifies sources of interference and initiates corrective action
3.06 3.06.01	Applies principles of osmometry Assesses results, identifies sources of interference and initiates corrective action
3.07 3.07.01	Applies principles of immunoassays Assesses results, identifies sources of interference and initiates corrective action
3.08	Demonstrates knowledge of principles of mass spectrometry
3.08.01	Assesses results, identifies sources of interference and initiates corrective action
3.09 3.09.01	Applies principles of particle analysis used in common hematology instrumentation Assesses results, identifies sources of interference and initiates corrective action and/or follow up testing

Number	Competency
3.09.02	Performs manual counting procedures
3.10	Demonstrates the knowledge of principles of flow cytometry
3.10.01	Assesses results, indenties sources of interference and initiates corrective action
3.11	Applies the principles of hemostasis to perform coagulation testing
3.11.01	Assesses results, identifies sources of interference and initiates corrective action and/or follow up testing
3.12	Performs qualitative and quantitative biochemical analyses
3.12.01	Assesses results, identifies sources of interference and initiates corrective action and/or follow up testing
3.13	Prepares blood, body fluids and other clinical specimens for microscopic examination
3.14	Identifies and evaluates the morphology of cellular and non-cellular elements in microscopic preparations
3.14.01	Differentiates between clinically significant and insignificant findings
3.14.02	Assesses results, identifies sources of interference and initiates corrective action and/or follow up testing
3.15	Applies principles of immunology to the detection of antigens and antibodies
3.16	Performs testing to identify common red blood cell antigens and antibodies
3.16.01	Interprets results to determine phenotype/genotype
3.16.02	Differentiates between clinically significant and insignificant antibodies
3.16.03	Performs compatibility analyses
3.16.04	Assesses results, identifies sources of interference and initiates corrective action and/or follow up testing
3.17	Prepares and issues blood products
3.17.01	Assesses compatibility of donor/product
3.17.02	Ensures proper storage of blood products
3.17.03	Evaluates the quality of blood products
3.17.04	Evaluates the appropriateness of the blood product for the patient's clinical situation

Number	Competency
3.18	Describes and investigates the adverse effects of transfusion according to established protocol and initiates follow-up action
3.19	Performs analyses to detect and identify common clinically significant micro-organisms
3.19.01	Selects appropriate culture media and environment for isolation
3.19.02	Describes common clinically significant micro-organisms according to body site
3.19.03	Confirms identification using staining techniques, biochemical, serological and automated testing methods
3.19.04	Applies the principles of instrumentation to the detection of micro-organisms
3.20	Performs antimicrobial susceptibility analyses
3.20.01	Assesses results, identifies sources of error and initiates corrective action and/or follow up testing
3.21	Applies molecular diagnostic principles to identify nucleic acid sequences
3.21.01	Assesses results, identifies sources of interference/errors, initiates corrective action and/or follow up testing
3.22	Performs tissue preparation techniques: • Grossing • Processing • Embedding • Sectioning (paraffin and frozen)
3.22.01	Assesses quality of the preparation and initiates corrective action and/or follow up
3.23	Performs techniques to demonstrate cellular and non-cellular components in tissue and body fluids
3.23.01	Assesses quality of the technique and initiates corrective action and/or follow up
3.24	Operates and maintains standard laboratory equipment/instruments
3.24.01	Prepares reagents, calibrators, standards and quality control materials
3.25	Describes the role of the laboratory in point-of-care testing
3.25.01	Performs point-of-care techniques, assesses results, identifies sources of interference and initiates corrective action

Category 4
Interpretation and Reporting of Results

The medical laboratory technologist uses scientific knowledge and skills to interpret, document and report laboratory results according to established protocols.

Number	Competency
4.01	Recognizes the relationship between analyses, diagnoses, clinical information and treatment by assessing results on the basis of: • specimen integrity • reference values • critical values • method limitations, e.g. dynamic ranges, interferences, specificity, sensitivity • patient delta checks • clinical conditions • other laboratory findings
4.02	Reports results that meet quality control criteria
4.03	Identifies unexpected or implausible results and takes appropriate action prior to reporting
4.04	Recognizes and acts on critical values
4.05	Documents results accurately
4.06	Accounts for all tests requested

Category 5
Quality Management

The medical laboratory technologist practises and promotes the principles of quality management.

Number	Competency
5.01	Demonstrates knowledge of quality systems essentials (QSE)
5.02	Follows established protocols as defined in policy, process and procedure manuals
5.03	Assesses quality control data and calibration data
5.04	Uses statistics to monitor and track the acceptability of quality control results
5.05	Identifies, documents and reports deficiencies that may affect the quality of testing
5.06	Performs and documents preventative maintenance according to established protocols
5.07	Recognizes malfunctions in equipment/instruments, initiates and documents corrective action
5.08	Participates in continuous quality improvement activities
5.09	Demonstrates knowledge of risk management
5.10	Participates in internal and external quality assurance activities, e.g. proficiency testing, audits, accreditation
5.11	Demonstrates knowledge of inventory maintenance
5.12	Demonstrates information management skills, e.g. computer, laboratory information systems and related technology

Category 6
Critical Thinking

The medical laboratory technologist applies critical thinking skills to constructively investigate, evaluate and problem solve.

Number	Competency
6.01	Demonstrates knowledge of a dynamic environment; adapts and responds to change
6.02	Recognizes that change initiated in one area may impact other areas of health care services
6.03	Engages in reflective practice; stops and thinks about practice, consciously analyzes decision making and draws conclusions to improve future practice
6.04	Organizes work to accommodate priorities
6.05	Maximizes efficient use of resources, e.g. time, equipment, personnel
6.06	Demonstrates effective problem solving/trouble-shooting strategies and initiates appropriate follow up
6.07	Contributes to implementation strategies that integrate timelines, resource management and communication related to projects or research/studies
6.08	Practices evidence-based decision-making skills such as literature review, data analysis and research methodologies/studies

Category 7
Communication and Interaction

The medical laboratory technologist interacts using effective communication, teamwork skills and interprofessional collaboration with patients/clients and other health care professionals.

Number	Competency
7.01	Practices effective communication with colleagues, patients/clients and other health care professionals: • Active listening • Verbal communication • Non-verbal communication • Written communication • Conflict management • Identifying barriers to effective communication • Using technology appropriately to facilitate communication
7.02	Demonstrates effective teamwork skills
7.03	Demonstrates interdisciplinary/interprofessional team skills: • Communication • Collaboration • Role clarification • Reflection
7.04	Demonstrates adaptive skills when interacting with patients/clients

Category 8
Professional Practice

The medical laboratory technologist meets the legal and ethical requirements of practice and protects the patient's right to a reasonable standard of care. Professional responsibility encompasses scope of practice, accountability, and professional development.

Number	Competency
8.01	Maintains confidentiality of healthcare information
8.02	Complies with legislations that govern medical laboratory technology
8.03	Recognizes limitations of own competence and seeks action to resolve
8.04	Obtains informed consent prior to procedure and respects a patient's right to refuse
8.05	Recognizes potentially dangerous situations and understands the right to refuse unsafe work
8.06	Takes responsibility and is accountable for professional actions
8.07	Recognizes the need for and participates in continuing education and training
8.08	Promotes the image and status of the profession of medical laboratory science as members of the health care team
8.09	Recognizes how ethical issues in the health care environment affect the medical laboratory technologist and clients
8.10	Demonstrates knowledge of the health care system, professional laboratory organizations and their responsibilities
8.11	Demonstrates knowledge of the determinants of health and their implications for the laboratory system
8.12	Respects the diversity, dignity, values, and beliefs of patients/clients and colleagues
8.13	Demonstrates knowledge of interpersonal skills: • Recognizes signs of individual and group stress • Recognizes signs of patient stress • Exhibits empathy when assisting patients and colleagues

CSMLS Acronyms & Definitions – General MLT

Acronymes et définitions de la SCSLM – ALM

English		Français	
ALP	Alkaline Phosphatase	Phosphatase alcaline	ALP/PAL
ALT	Alanine Aminotransferase	Alanine aminotransférase	ALT
APTT	Activated partial thromboplastin time	Temps de thromboplastine partielle activée Temps de céphaline activé	TCA
ASAP	As Soon As Possible	Dès que possible	
AST	Aspartate Aminotransferase	Aspartate aminotransférase	AST
BUN	Blood Urea Nitrogen	Azote uréique sanguin	BUN
C & S	Culture & Sensitivity	Culture et antibiogramme	
CAMP	Christie, Atkins, and Munch-Petersen	Test Christie, Atkins et Munch-Petersen	CAMP
CBC	Complete blood count	Formule sanguine complète	FSC
CD	Cluster of Differentiation	Classe de différenciation	CD
CFU	Colony forming Unit	Unité formant colonie	UFC
CK	Creatine Kinase	Créatine kinase	CK
CMV	Cytomegalovirus	Cytomégalovirus	CMV
CSF	Cerebrospinal fluid (SF)	Liquide céphalorachidien	LCR
CV	Coefficient of variation	Coefficient de variation	CV
DAT	Direct antiglobulin test	Test à l'antiglobuline direct (Coombs direct)	TAD
DDAVP	d-D-arginine-vasopressin; desmopressin	d-D- arginine-vasopressine; desmopressine	DDAVP
DNA	Deoxyribonucleic Acid	Acide désoxyribonucléique	ADN
EDTA	Ethylenediamine tetraacetic acid	Éthylène diamine tétraacétate	EDTA
ERC	Erythrocyte	Érythrocyte / Globule rouge	GR
ESR	Erythrocyte sedimentation rate	Vitesse de sédimentation érythrocytaire	VSE / SEDI
G6PD	Glucose-6-phosphate	Glucose-6-phosphate	G6PD
GGT	Gamma-glutamyl Transferase	Gamma-glutamyl transférase	GGT
GHS	Globally Harmonized System (in place of WHMIS)	Système général harmonise (remplace SIMDUT)	SGH
GTT	Glucose Tolerance Test	Hyperglycémie provoquée *per os*	HGPO
H&E	Hematoxylin and eosin	Hématoxyline et éosine	H&E

English		Français	
HbA_1C	Hemoglobin A_1C, glycated hemoglobin	Hémoglobine A_1C, hémoglobine glyquée	HbA_1C
HCG	Human Chorionic Gonadotrophia	Gonadotrophine chorionique humaine	HCG
HCT	Hematocrit	Hématocrite	Ht
HDL	High-density Lipoprotein	Lipoprotéine de haute densité	HDL
HDN	Hemolytic disease of the newborn	Maladie hémolytique du nouveau-né	MHNN
HGB	Hemoglobin	Hémoglobine	Hb
HIV	Human Immunodeficiency Virus	Virus de l'immunodéficience humaine	VIH
HPF	High power field	Champ à fort grossissement	
IAT	Indirect antiglobulin test	Test à l'antiglobuline indirect (Coombs indirect)	TAI
INR	International normalized ratio	Rapport international normalisé	RNI
ISE	Ion selective electrode	Électrode sélective d'ions	ISE
ISI	International Sensitivity Index	Indice de sensibilité international	ISI
IVIg	Intravenous Immunoglobulin	Immunoglobuline intraveineuse	IgIV
LAP	Leukocyte alkaline phosphatase	Phosphatase alcaline leucocytaire	PAL
LD	Lactate dehydrogenase	Lactate-déshydrogénase	LD
LDL	Low-density Lipoprotein	Lipoprotéine de basse densité	LDL
LIS	Laboratory information system	Système d'information de laboratoire	SIL
LKS	Leukocytes	Leucocytes / Globule blanc	GB
LPF	Low power field	Champ à faible grossissement	
MCH	Mean corpuscular hemoglobin	Teneur globulaire moyenne en hémoglobine	TGMH
MCHC	Mean corpuscular hemoglobin concentration	Concentration- globulaire moyenne en hémoglobine	CGMH
MCV	Mean corpuscular volume	Volume globulaire moyen	VGM
MSDS	Material Safety Data Sheet	Fiche signalétique	FS
NRBC	Nucleated red blood cell	Globule rouge nucléé / érythroblaste	
O&P	Ova and parasite	Recherche de parasites (œufs et vers)	
ONPG	Ortho-nitrophenyl B-galactopyranoside	Ortho-nitrophénol B-galactopyranoside	ONPG
PCR	Polymerase chain reaction	Réaction en chaîne de la polymérase	PCR
PLT	Platelet	Plaquette	Plaq
POCT	Point of Care Testing	Analyse hors-laboratoire	AHL
PPE	Personal Protective Equipment	Équipement de protection individuelle	EPI

English		Français	
PT	Prothrombin time	Temps de prothrombine/Temps de Quick	TP/TQ
PTT	Partial thromboplastin time	Temps de thromboplastine partielle Temps de céphaline	TTP
PYR	Pyrrolidonyl-B-Napthylamide	Pyrrolidonyl-B-Napthylamide	PYR
QA	Quality assurance	Assurance de la qualité	AQ
QC	Quality control	Contrôle de la qualité	CQ
RBC	Red blood cell	Globule rouge	GR
RDW	Red cell distribution width	Indice de distribution du volume érythrocytaire	IDVE
RNA	Ribonucleic Acid	Acide ribonucléique	ARN
SD	Standard deviation	Écart-type	SD
SOP	Standard operating procedure	Procédure opérationnelle normalisée	PON
SPS	Sodium polyanethol sulphonate	Polyanétholsulfonate de sodium	SPS
STAT *	Immediately	Immédiatement	STAT*
T_3	Triiodothyronine	Triiodothyronine	T3
T_4	Thyroxine	Thyroxine	T4
TIBC	Total iron binding capacity	Capacité totale de fixation du fer	TIBC/CTFF
TRALI	Transfusion-related acute lung injury	Complication pulmonaire post-transfusion	TRALI
TSH	Thyroid-stimulating hormones	Hormones stimulant la thyroïde	TSH
TSI	Triple sugar iron	Trois sucres et fer	TSI
WBC	White blood cell	Globule blanc	GB
WHMIS	Workplace Hazardous Materials Information System	Système d'information sur les matières dangereuses utilisées au travail	SIMDUT

**STAT: derived from the Latin word *Statim,* meaning immediately / STAT: dérivé du mot *Statim* en Latin, qui signifie immédiatement

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