

CARIBBEAN REGIONAL COMPETENCY PROFILE
for
MEDICAL LABORATORY TECHNOLOGY

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INTRODUCTION

The Competencies identified in this profile are the expected competencies of an entry -level medical laboratory technologist in the Caribbean. They were developed by representatives from each of MLT programs in the Caribbean region, a representative from the professional association CASMET, and representatives from the Project Implementation Unit/CAREC for strengthening Medical Laboratory Services in the Caribbean. The development process was facilitated by a Curriculum Consultant from The Michener Institute for Applied Health Sciences, Toronto, Canada.

The competencies represent the broad occupational skills, attitudes, and abilities that must be mastered for entry into the profession. The competencies describe outcomes that must be achieved by the end of an educational program and may be addressed by a wide variety of learning experiences (e.g. courses, laboratories, clinical rotations, independent research, presentations, and projects). Competencies encourage learners to integrate related outcomes and perform at higher and more complex levels. The competencies are written in a performance based format, however the assumption is that an entry level medical laboratory technologist also has the background knowledge, skills and attitudes to attain each competency.

These competencies provide the basis for educational programs in medical laboratory technology. The minimum levels for evaluation of the competencies have been identified to reflect current practice in the region.

The levels are described as follows:

Level One: applies knowledge of the elements of the competency

Level Two: performs in simulated setting

Level Three: performs independently under supervision

Level Four: performs independently

Levels are indicated in brackets, e.g. (level 4) at the end of each competency.

It must be noted that the words '**safe** and **appropriate**' are inherent and integral for each of the following statements of competence.

Category I: Professional Responsibility

The medical laboratory technologist meets the legal and ethical requirements of practice and protects the patient's right to a reasonable standard of care. The medical laboratory technologist projects a professional image and follows generally accepted practices regarding interactions with clients/patients and colleagues.

Note: All competencies in this category are considered Level 4

1. Assumes responsibility and is accountable for professional actions and growth.
2. Seeks help and guidance when asked to perform beyond their level of competence.
3. Discusses procedure in order to facilitate informed consent.
4. Respects a patient's right to refuse treatment
5. Exercises a judicious approach to the right to refuse to participate in potentially dangerous situations
6. Complies with legislation and regulations governing medical laboratory technology and applies these to the practice of the profession
7. Provides for the health care needs of the public, keeping the welfare and confidentiality of the patient paramount at all times, and respecting the dignity, values, privacy, and beliefs of the individual
8. Identifies learning needs and participates in continuing education and training
9. Keeps abreast of laboratory techniques and research and shares new knowledge with Co-workers
10. Adapts to rapidly changing situations, e.g., responds appropriately to critical situations; retains composure in stressful situations; applies existing skills to new situations
11. Builds upon current knowledge to facilitate the acquisition of new knowledge from other health professionals, i.e., multi-tasking, cross-training, etc.
12. Acts in a professional manner demonstrating effective communication techniques, interpersonal skills and conflict resolution methods
13. Recognizes how legal and ethical issues in the health care environment affect the medical laboratory technologist
14. Demonstrates an attitude of inquiry by being open to new ideas
15. Promotes the image and status of the profession of medical laboratory technology as members of the health care team by maintaining high standards in practice.
16. Promotes an awareness and understanding of the contribution the medical laboratory technologist provides to the consumer and public
17. Participates actively in the professional association
18. Reports accurately and in a timely manner all results of patient tests and examinations to the appropriate authority
19. Recognizes limitations of his/her scope of practice
20. Examines the assumptions underlying one's own beliefs

Category 2: Safe Work Practices

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

Note: All competencies in this category are considered Level 4

1. Applies the principles of universal precautions
2. Uses personal protective equipment, e.g., gloves, gowns, mask, face shields, aprons
3. Applies proper laboratory hygiene practices
4. Minimizes possible dangers from biological specimens, laboratory supplies, radioactive material, and equipment
5. Utilizes laboratory safety devices in a correct manner. e.g., fume hoods, laminar flow cabinets, safety pipetting devices, safety containers and carriers, safety showers, eye washes
6. Labels, dates, handles, stores, and disposes of chemicals, dyes, reagents, and solutions according to WHMIS and institutional policies, regional guidelines or existing legislation
7. Handles and disposes of "sharps" according to institutional policy
8. Stores, handles, transports and disposes of biological, toxic, and radioactive material according to institutional policies, regional guidelines or existing legislation
9. Selects and utilizes the appropriate method for items to be disinfected/sterilized/incinerated
10. Minimizes the potential hazards related to disinfection/sterilization methods
11. Applies first-aid measures in response to incidents, e.g., chemical injury, traumatic injury, electrical shock, burns, radioisotope contamination
12. Handles leaks or spills of infectious materials and dangerous chemicals according to institutional policy
13. Responds appropriately to fire emergencies
14. Reports incidents related to safety and personal injury (e.g., needle stick injuries), in a timely manner
15. Maintains a clean, orderly and organized work area

Category 3: Communication, Teamwork and Interactive Skills

The medical laboratory technologist interacts with clients/patients in a professional and competent manner, using effective listening, verbal, nonverbal and written communication in interactions with laboratory colleagues, clients/patients and other health professionals. The medical laboratory technologist interacts with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.

Note: All competencies in this category are considered Level 4

1. Practices effective communication with clients/patients, families, other health professionals, and other clients while maintaining a professional image
2. Uses effective listening skills with patients, co-workers, and other health professionals
3. Communicates effectively verbally, nonverbally and in writing.
4. Implements interdisciplinary learning in personal practices to develop teamwork skills in interactions with clients/patients, other health professionals, and other clients.
5. Respects cultural diversity
6. Promotes interdisciplinary collaboration in dealings with other health professionals
7. Uses basic patient care skills relevant to the laboratory professional
 - i. Recognizes common indicators of patient stress
 - ii. Initiates appropriate follow-up procedures where necessary for patient well-being
 - iii. Demonstrates adaptive skills in dealing with patients with varying levels of acuity
8. Treats other members of the group or team equitably and fairly
9. Contributes one's own ideas, opinions, and information while demonstrating respect for others
10. Contributes to a group's evaluation of its progress and interactions
11. Completes own share of tasks necessary to complete a project
12. Builds on individual team members' strengths
13. Resolves differences for the benefit of the team
14. Takes personal responsibility for accomplishing goals
15. Willing to self disclose within team
16. Evaluates outcomes

Category 4 : Critical Thinking, Problem Solving and Decision Making

The medical laboratory technologist employs constructive "habits of the mind" within his/her work environment. This is demonstrated through his/her ability to solve problems and make decisions in the management of his/her own workload, the workload of the team and in interactions with clients/patients and members of the healthcare team.

Note: All competencies in this category are considered Level 4

Exhibit critical thinking

1. Analyzes errors in specific information or in a specific process
2. Constructs support for or against a specific claim (e.g. idea, recommendation)
3. Considers two or more perspectives and the reasoning behind them on an issue (e.g. topic, recommendation, situation)
4. Discusses the potential consequences of several alternative courses of action
5. Analyzes arguments and generate insight into particular meaning and interpretations
6. Views issues from multiple perspectives (local and global)

Solve problems using a variety of strategies

7. Analyzes the problem
8. Frames useful questions in search of a solution
9. Selects the thinking skills and strategies (e.g., inductive and deductive thinking, brainstorming, clustering) which could be used to solve the problem
10. Develops solutions using selected skills and strategies
11. Implements preferred solution(s)
12. Evaluates the effectiveness of the strategies and the solution

Apply techniques of effective decision-making skills.

13. Recognizes current decision-making patterns
14. Acquires accurate information to make appropriate decisions
15. Formulates informed decisions based on limited information
16. Formulates decisions (choices) based on consideration of potential consequences (short term and long term)
17. Makes decisions among apparently equal alternatives

Category 5: Computer Skills

The medical laboratory technologist uses computer skills to manage data efficiently using available software packages and LIMS (Laboratory Information Management Systems).

Note: All competencies in this category are considered Level 3 unless otherwise indicated

1. Uses various hardware packages
2. Uses various office applications (word processing, spreadsheet and presentation packages)
3. Uses various software applications applicable to the laboratory setting (e.g. QC packages)
4. Inputs data into various LIMS
5. Retrieves data from various LIMS
6. Uses the Internet for searching information and retrieving data (level 4)
7. Uses various forms of distance learning (web-based learning, asynchronous and synchronous discussion)
8. Uses e-mail (level 4)
9. Troubleshoots basic computer problems (level 4)

Category 6: Quality Management System

The medical laboratory technologist practises and promotes the principles of a quality management system and the efficient utilization of resources

Note: All competencies in this category are considered Level 3 unless otherwise indicated

1. Applies the principles of a Quality Management System within the practice of medical laboratory technology (level 4)
2. Follows established protocols as defined in policy and procedure manuals (level 4)
3. Determines the need for calibration of instruments and solutions when indicated
4. Performs and assesses quality control (internal and external)
5. Utilizes statistics and indicators to monitor the acceptability of results based on established quality control ranges
6. Maintains appropriate documentation, e.g., document laboratory reporting errors and corrective measures taken
7. Utilizes responsible practices which contribute to the cost-effective use of health care resources
8. Follows established preventive maintenance programs and maintains instrument logs
9. Recognizes malfunctions in equipment/instruments

10. Addresses equipment/instrument malfunction according to established protocol
11. Analyzes QC data

Category 7: Pre-Examination Processes

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

Note: All competencies in this category are considered Level 4 unless otherwise indicated

1. Educates the client/patient with respect to preparation for tests
2. Verifies the client/patient is prepared for a test.
3. Ensures relevant information is on the requisition
4. Procures reagents and materials
5. Confirms the identity of the patient
6. Collects and labels blood and other specimens according to specific requirements, in a variety of conditions.
7. Performs venipuncture and capillary blood collection to obtain appropriate samples for laboratory analysis
8. Provides the necessary information for the patient to understand the specimen collection procedure
9. Obtains agreement from the patient to proceed with specimen collection
10. Observes established protocol for collection and handling of specimens with legal implications, e.g., blood alcohol
11. Collects, labels and delivers specimens in a safe and timely manner according to priority
12. Verifies specimen suitability including adequate amount/volume and integrity
13. Validates documentation to ensure that it corresponds with the specimen
14. Registers specimens into laboratory information system, e.g., logbook, computers
15. Complies with existing guidelines for specimen retention and rejection
16. Takes corrective action when errors in specimen collection are identified
17. Packages and ships specimens according to established guidelines to ensure specimen integrity and quality (level 3)
18. Prepares specimens for analysis, e.g., centrifuging, aliquoting, preserving according to institutional policy and/or regional guidelines
19. Ensures appropriate storage of specimens

Category 8: Examination Processes

The medical laboratory technologist analyzes specimens and validates results using established protocol

Note: All competencies in this category are considered Level 3 unless otherwise indicated.

1. Prioritizes analyses, e.g., stat, urgent, routine, sample stability
2. Maximizes efficient use of resources, e.g., time, equipment, personnel
3. Recognizes appropriate and inappropriate requests for basic laboratory testing and informs supervisor
4. Prepares and uses calibrators, standards, quality control materials
5. Organizes specimens from work-lists, log books and computerized work documents (level 4)
6. Performs analyses within acceptable limits of variation
7. Verifies test results using calibration data and quality control
8. Recognizes possible specimen/analytical deficiencies and takes appropriate action
9. Identifies implausible results and takes appropriate action
10. Verifies that specimen identification is traceable throughout the analysis (level 4)
11. Verifies that all ordered analyses have been completed (level 4)

Category 9: Examination Procedure

The medical laboratory technologist understands the principles and performs analytical techniques on specimens that originate from a variety of sources.

1. Applies the principles of microscopy to laboratory analyses (level 4)
 - i. uses and maintains the compound light microscope (level 4)
 - ii. uses the appropriate application of the following modifications of the light microscope: fluorescence, dark field, (level 2)
 - iii. selects the appropriate application of the following modifications of the light microscope: phase contrast, polarizing, inverted (level 1)
2. Applies the physical and chemical principles of staining to laboratory analyses: (level 4)
 - i. identifies staining problems and initiates corrective action (level 4)
3. Applies principles of light measuring systems to laboratory analyses: (level 3)
 - i. operates and maintains common instruments using: absorption spectrophotometry, emission spectrophotometry, reflectometry, turbidimetry (level 3)
 - ii. identifies sources of interference and initiates corrective action as applicable (level 3)
4. Applies principles of electrochemical systems to laboratory analyses (level 3)

- i. operates and maintains common instruments using: ion selective electrodes, conductance electrodes (level 3)
 - ii. identifies sources of interference and initiates corrective action as applicable (level 3)
- 5. Applies principles of electrophoresis and chromatography to laboratory analyses (level 3)
 - i. operates and maintains common instruments (level 3)
 - ii. identifies sources of interference and initiates corrective action as applicable (level 3)
- 6. Applies principles of immunoassays to laboratory analyses (level 3)
 - i. operates and maintains common instruments (level 3)
 - ii. identifies sources of interference and initiates corrective action as applicable (level 3)
- 7. Applies principles of particle counting systems to laboratory analyses (level 3)
 - i. operates and maintains common instruments used to evaluate blood cells (level 3)
 - ii. identifies sources of interference and initiates corrective action as applicable (level 3)
 - iii. assesses results to initiate follow-up testing (level 3)
 - iv. performs manual counting procedures as appropriate (level 4)
- 8. Performs analyses to assess and monitor hemostasis (manual level 4) (automated level 3)
 - i. identifies the need for follow-up action (level 3)
- 9. Performs qualitative and quantitative biochemical analyses (manual level 4) (automated level 3)
 - i. assesses results to initiate follow-up testing (level 3)
- 10. Prepares blood, body fluids and other clinical specimens for microscopic examination (level 4)
 - i. operates and maintains common instruments (level 4)
 - ii. identifies sources of interference and initiates corrective action as applicable (level 3)
- 11. Identifies and evaluates the morphology of cellular and non-cellular elements in microscopic preparations (level 4)
 - i. differentiates between clinically significant and insignificant findings (level 3)
 - ii. initiates follow-up action as applicable (level 3)
- 12. Uses immunological techniques to detect antigens and antibodies (level 4)
- 13. Identifies common red blood cell antigens and antibodies (level 4)
 - i. operates and maintains common instruments/ equipment (level 3)
 - ii. interprets results to determine phenotype/genotype (level 4)
 - iii. differentiates between clinically significant and insignificant antibodies (level 3)
 - iv. performs compatibility analyses (level 3)
 - v. assesses results and initiates follow-up action as necessary (level 3)
- 14. Prepares and issues blood products (level 3)
 - i. assesses suitability of donor/product (level 3)
 - ii. ensures proper storage of blood products (level 4)
 - iii. evaluates the quality of blood products (level 4)
 - iv. evaluates the appropriateness of the blood product for the patient's clinical situation (level 3)
- 15. Recognizes and investigates the adverse effects of transfusion according to established protocol and initiates follow-up action as required (level 3)

16. Performs analyses to detect and identify clinically significant, environmental and food-borne micro-organisms (level 4)
 - i. selects appropriate media and environment for the isolation of common clinically significant organisms from all body sites (level 4)
 - ii. prepares appropriate media and environment for the isolation of common clinically significant organisms from all body sites (level 4)
 - iii. recognizes common clinically significant organisms according to body site (level 4)
 - iv. confirms identification using staining techniques, biochemical and/or serological tests (level 4)
 - v. applies the principles of instrumentation to the detection and identification of organisms (level 3)
17. Performs appropriate anti-microbial susceptibility analyses according to regional or international guidelines (level 4)
 - i. identifies sources of error and initiates corrective action (level 3)
18. Uses molecular biology techniques (e.g., commercially prepared kits) (level 3)
19. Performs tissue preparation techniques to produce paraffin and frozen sections for microscopic examination (level 3)
 - i. operates and maintains common instruments/ equipment (level 3)
 - ii. assesses the quality of the preparation and initiates corrective action as required (level 3)
20. Performs techniques to demonstrate cellular and non-cellular components in tissue and body fluids (level 3)
 - i. operates and maintains common instruments/equipment (level 3)
 - ii. assesses quality of staining and initiates corrective action as required (level 3)
21. Develops Standard Operating Procedures (SOPs) (level 4)
22. Operates the centrifuge (level 4)

Category 10: Post Examination Process

The medical laboratory technologist, using scientific knowledge as the basis, interprets, communicates and documents confidential data.

1. Recognizes the relationship between analyses, diagnoses, clinical information and treatment by assessing results on the basis of:
 - i. reference values (level 4)
 - ii. critical values (level 4)
 - iii. method limitations, e.g. dynamic ranges, interferences, specificity, sensitivity
 - iv. patient delta checks (level 4)
 - v. recognition of implausible results (level 4)
 - vi. relationship to clinical conditions (level 3)
 - vii. relationship to other laboratory findings (level 3)
2. Releases results of laboratory analyses that meet internal quality control criteria to the appropriate client in a timely and efficient manner (level 4)

3. Recognizes when results of patient analyses are outside expected findings and responds appropriately (level 4)
4. Investigates and verifies unusual findings prior to reporting (level 4)
5. Recognizes critical values and responds in accordance with laboratory protocol (level 4)
6. Communicates information regarding laboratory analyses to clients in an appropriate manner (level 3)
7. Ensures that laboratory results are accurately documented and retained in accordance with existing protocols, standards and legislation (level 4)
8. Uses an appropriate information management system for data entry, storage and retrieval (level 3)
9. Ensures appropriate storage of specimens (level 3)

Category 11: Disease Prevention and Control

The medical laboratory technologists applies the principles of disease prevention and control to health promotion in their role as partners in the delivery of Public Health Services

1. Interprets lab data and respond accordingly to established guidelines for disease prevention and control (level 3)
2. Alerts lab authorities when the potential for a public health concern exists (level 3)
3. Collects, collates and presents lab data in statistically valid format (level 3)
4. Participates in health promotion interventions to select appropriate materials for public health promotion (level 3)
5. Exhibits the behaviors that indicate adoption of a wellness model in professional and personal life. (level 4)

Category 12: Research

The medical laboratory technologist applies the appropriate methodologies and tools to initiate and conduct a research based study of public health or professional interest

1. Identifies possible areas of public health interest for investigation (level 2)
2. Conducts a literature review using available resources (level 4)
3. Critiques a scientific article/paper related to the profession (level 4)
4. Designs a research proposal to an acceptable standard (level 4)
5. Uses selected tools and methodologies to collect data (level 3)
6. Presents research findings in oral and written forms (level 4)
7. Develops a case study during the practicum (level 4)

Category 13: Management

The medical laboratory technologist applies the basic principles of management to ensure the efficient and effective delivery of laboratory information in the provision of quality health care

1. Utilizes organizational skills (level 4)
2. Recognizes the importance of the various elements of a budget (level 2)
3. Interfaces professionally with other members of the health team (level 4)
4. Applies principles of efficient inventory control in the use of materials (e.g. chemicals, reagents, stationery, etc.) (level 4)
5. Applies the principles of planning (e.g. strategic, tactical, quality) (level 2)
6. Explains the requirements of spatial design of the laboratory (level 2)
7. Assesses the implications of the environmental aspects of laboratory design (level 2)
8. Recognizes the value (influence) of networking (level 4)
9. Conducts a meeting (level 2)

Category 14: Leadership

The Medical Laboratory Technologist exercises leadership when placed in an environment or situation which requires it

1. Recognizes the role of a leader (level 4)
2. Utilizes leadership skills to influence change for the improvement of the work environment (level 2)
3. Implements goals and objectives (level 3)
4. Recognizes the need for team building (level 4)
5. Functions as a team member (level 4)
6. Mobilizes colleagues and resources (level 3)
7. Resolves conflict (level 4)
8. Values the contribution of colleagues (level 4)
9. Advocates for needs of team (level 2)
10. Provides a positive influence (level 4)
11. Communicates ideas and feelings to illustrate, articulate or justify a position (level 4)
12. Assesses one's own strengths and weaknesses in leadership style and attributes (level 2)
13. Establishes a favorable and encouraging environment for expressing competing and often conflicting ideas (level 4)
14. Supports policies, procedures and authority (level 4)
15. Projects emotional stability (level 4)