



# COMPETENCY GUIDELINES

---

## MEDICAL LABORATORY ASSISTANT

COMPETENCIES EXPECTED OF AN ENTRY-LEVEL MEDICAL  
LABORATORY ASSISTANT

**February 2011**

**BCSLS COMPETENCIES**

**FOR CERTIFICATION OF MEDICAL**

**LABORATORY ASSISTANTS**

*This document describes the minimum level of knowledge and skills required for the certification of a Medical Laboratory Assistant.*

©

Approved by the Board of Directors on: Feb 8, 2011

The BCSLS would like to acknowledge and thank the CSMLS and OSMT for allowing us to use excerpts from their MLA Competency Guidelines in the formulation of these guidelines for British Columbia. This ensures that the guidelines are national in scope and contribute to the portability of skills and the mobility of the MLA workforce.

# 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 the 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 the professional acts.
- ❖ Medical laboratory professionals shall practice 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.
- ❖ 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 practise of their profession.
- ❖ Medical laboratory professionals shall practise safe work procedures at all times to ensure the safety of patients and coworkers and the protection of the environment.

\*\*Adopted from the CSMLS Code of Conduct --with permission 2006

# **UNIT 1**

- A. Role of Medical Laboratory Assistants**
  - B. Professionalism**
  - C. Legal and Ethical**
  - D. Communication**
  - E. Quality Management and Improvement**
- 

## ***A: ROLE OF MEDICAL LABORATORY ASSISTANT***

The Medical Laboratory Assistant is an integral member of the health care team who shares knowledge, promotes learning, and collaborates with other professionals in providing effective patient care.

<b>COMPETENCIES:</b>
Perform the required duties within the scope of practice of the Medical Laboratory Assistant in the hospital laboratory system; community laboratories; public health laboratories and private laboratories
Knowledgeable in the theory, technical skills and clinical application of procedures performed in the laboratory
Understand the importance of the skill of the Medical Laboratory Assistant in relation to patient care; specimen procurement and specimen integrity
Participate in providing 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.
Remain current in worksite policies and guidelines and MSP regulations and protocols
Participate in continuous learning by attending internal and external education opportunities

## ***B: PROFESSIONALISM***

The Medical Laboratory Assistant is responsible and accountable for his/her professional actions and practices according to standards of practice as well as laws and regulations governing the profession.

### **COMPETENCIES:**

Understand and discuss the components of professionalism  
Accountability  
Responsibility  
Communication  
Motivation and attitude  
Safety  
Competence  
Continuing Education

Promote the image and status of the profession of medical laboratory science as a member of the health care team by maintaining established standards of practice; dress code, personal hygiene, and appearance.

## ***C: LEGAL AND ETHICAL ISSUES***

The Medical Laboratory Assistant complies with legislation governing medical laboratory science and applies the legislation to the practice of the profession.

### **COMPETENCIES:**

Define, understand and practice the principles of Confidentiality

Define legal and ethical terms and discuss how these terms apply to the scope of practice for the Medical Laboratory Assistant

Assault and Battery  
Duty of Care  
Competence  
Liability  
Negligence  
Consent  
Patient Rights  
Patients Rights to refuse  
Employees Rights to refuse

Knowledge of:  
Personal Health Information Protection and Electronic Documents Act(PIPEDA),  
Chain of Custody documentation  
FOI – Freedom of Information

## **D: INTERPERSONAL COMMUNICATION**

The Medical Laboratory Assistant interacts in a professional and competent manner, using effective listening, verbal and written communications in dealing with laboratory colleagues, patients, students, clients, and other health professionals.

<b>COMPETENCIES:</b>
Write and speak clearly and concisely
Work effectively as a team member and is aware of response to others - feedback, listening skills, verbal and non verbal communication
Respond to negative effects of ineffective and confrontational communication approaches
Understand factors that may influence effective communication: Age, physical, mental condition, Stress levels, fear, etc.
Understand the effectiveness of time management and establishing priorities
Demonstrate the characteristics and qualities of caring: respect; courtesy, empathy, and warmth

## **E: QUALITY MANAGEMENT**

The Medical Laboratory Assistant understands the importance of Quality Management and Quality Assurance in performance of Standing Operating Procedures and in specimen integrity

<b>COMPETENCIES:</b>
Follow Standard operating procedures and policies within the laboratory and specimen procurement
Understand Quality control measures
Provides feedback on new procedures and workflow
Understand Risk Management
Complete documentation required for temperature recordings
Complete documentation required for equipment maintenance
Complete necessary documentation for critical incidents involving patients or specimen procurement
Understand and participate in new initiatives such as LEAN/ Six Sigma.

## **UNIT 2**

- A. Anatomy and Physiology**
  - B. Laboratory Terminology and Measurement**
  - C. Laboratory Safety and Infection Control**
- 

### ***A: ANATOMY AND PHYSIOLOGY***

The Medical Laboratory Assistant must be able to demonstrate basic knowledge of the human body structure and the major body systems and functions

<b>COMPETENCIES:</b>
General knowledge of the following Body Systems:  Integumentary Musculoskeletal Circulatory Urinary Digestive Respiratory Nervous Reproductive Endocrine Lymphatic Immune
Identify the main structures and functions of the Circulatory system relevant for blood collection:  Arteries, veins, capillaries Blood components Coagulation theory and factors
Knowledge of the common tests and procedures related to the above body systems.

## ***B: LABORATORY TERMINOLOGY AND MEASUREMENT***

The Medical Laboratory Assistant demonstrates understanding and the use of correct medical terminology and measurements (basic SI units commonly used in the laboratory and 24-hr clock)

<b>COMPETENCIES:</b>
Define and use correct terminology related to specimen collection
Define terminology commonly used in the laboratory
Define terminology related to the major body systems and diseases
Understand and define terminology related to the measurement systems used in the laboratory: <ul style="list-style-type: none"><li>• SI Units</li><li>• Metric System</li><li>• 24 hour clock</li></ul>

## ***C: LABORATORY SAFETY AND INFECTION CONTROL***

The Medical Laboratory Assistant conducts professional practice according to established protocols, safety guidelines, and existing legislation and in the use of safety equipment.

<b>COMPETENCIES: LABORATORY SAFETY:</b>
Knowledge of and demonstrate good practice in: <ul style="list-style-type: none"><li>• Standard Precautions</li><li>• Handling and disposal of Sharps</li><li>• Handling and packaging of specimens</li><li>• Utilization of Laboratory Safety equipment : fume hoods, biological cabinets</li><li>• Use of protective clothing and equipment (PPE) – gloves; gowns, masks, shields,</li></ul>
Knowledge of Isolation and Reverse isolation techniques
Knowledge of disinfection; decontamination and sterilization of laboratory equipment and premises
Knowledge of storage of reagents and chemicals within the laboratory
Knowledge of chemical hazards

Knowledge of electrical safety
Knowledge of fire safety and use of fire extinguishers
Knowledge of use of spill kits and containment procedures for biological or chemical hazards
Knowledge of radiation hazards
<p>Knowledge of legislated Acts and importance of documentation and reporting requirements:</p> <ul style="list-style-type: none"> <li>• MSDS ( Material Safety Data Sheets)</li> <li>• WHMIS</li> <li>• TDG (Transport of Dangerous Goods)</li> <li>• Work Safe BC</li> <li>• Blood and Body Fluid and Needle stick protocols</li> <li>• Biohazard specimens</li> <li>• Hazard and Incident reporting</li> <li>• FIT Testing (N95 Mask)</li> </ul>
Knowledge of Pandemic procedures – SARS; H1N1; Norwalk
<p>Knowledge of Legislated packaging and transport :</p> <ol style="list-style-type: none"> <li>a. Human except Specimens</li> <li>b. Category B specimens</li> <li>c. Category A specimens</li> </ol>

<b>COMPETENCIES: INFECTION CONTROL</b>
Knowledge of and describe infectious diseases and etiological agents : bacteria, fungi, viruses, parasites
<p>Have knowledge of and describe basic mechanisms of disease transmission and host interaction and prevention</p> <ul style="list-style-type: none"> <li>• Importance of hand washing, good hygiene; disinfection controls</li> <li>• MRSA</li> </ul>
<p>Have knowledge of transmission and prevention of Hep A; B; C</p> <ul style="list-style-type: none"> <li>• Have knowledge of Importance of Hep B vaccination</li> <li>• Have knowledge of Transmission and prevention of HIV</li> </ul>

## **UNIT 3**

- A. Patient Identification**
  - B. Specimen Collection by Venipuncture**
  - C. Specimen Collection by Skin Puncture**
  - D. Collection and Handling of Urine Specimens**
  - E. Collection and Handling of Microbiology Specimens**
  - F. Specimen Handling and Processing : Hematology/Chemistry**
  - G. Miscellaneous Specimen Collection and Processing**
  - H. Pre Analytical Specimen Preparation**
- 

### ***A: PATIENT IDENTIFICATION***

The Medical Laboratory Assistant verifies relevant data and ensures that appropriate specimens are procured according to established protocols and specimen integrity. The medical laboratory assistant verifies accurate patient identification

<b>COMPETENCIES:</b>
Demonstrates knowledge of established protocols for accurate patient identification.
Demonstrates knowledge of rules of confidentiality in regards to personal patient information
Demonstrates knowledge of the steps for proper patient and sample identification in all stages of data entry; specimen collection and handling to generation of report to physician
Demonstrates knowledge of the protocols for procurement of information with legal/industrial implications and ensures chain of custody is maintained, e.g. blood alcohol, urine drug testing; confidential testing e.g. HIV

## B: SPECIMEN COLLECTION – VENIPUNCTURE

The Medical Laboratory Assistant ensures that appropriate specimens are procured according to established protocols and specimen integrity. Patient safety and safe specimen procurement practices are integral to this function.

<b>COMPETENCIES:</b>
Identify and describe location of major veins and arteries in arms and hands
Knowledge of guidelines in selection of appropriate venipuncture site in arms and hands and feet
Knowledge of guidelines in selection of venipuncture vs skin puncture
Identify and describe the types, parts and demonstrate appropriate uses of equipment required to collect specimens by venipuncture: <ul style="list-style-type: none"><li>• Vacutainer needles and gauge of needle needles including adapters and holders</li><li>• Types of evacuated tubes and determine additives and their requirement for testing procedures</li><li>• Use and release of tourniquets</li><li>• Antiseptic cleansing solutions; alcohol; iodine</li><li>• Use of butterfly and safe disposal</li><li>• Use of syringe and syringe transfer device</li><li>• Sharps disposal systems for needles</li></ul>
Demonstrate correct venipuncture technique and established procedures: <ul style="list-style-type: none"><li>• Verification and identification of patient according to established protocols</li><li>• Select appropriate sites for venous collection for adults, children and infants</li><li>• Demonstrate positioning of patient for blood collection</li><li>• Demonstrate correct technique for venipuncture</li><li>• Demonstrate successful collection of blood by venipuncture</li></ul>
<b>NOTE: BCSLS GUIDELINE: STUDENTS MUST DEMONSTRATE SUCCESSFUL COMPLETION OF A MINIMUM OF 12 VENIPUNCTURES PRIOR TO PRACTICUM</b>
<ul style="list-style-type: none"><li>• Demonstrate verification and labeling of specimens</li><li>• Have knowledge of importance of order of draw</li><li>• Demonstrate correct inversion of vacutainer tubes according to guidelines</li><li>• Demonstrate care after collection</li></ul>
Knowledge of appropriate blood volumes for collection

## **SPECIMEN COLLECTION CONT'D**

Knowledge of how to deal with complications associated with venipuncture:

- Patients with no identification
- Failure to draw blood
- Rolling Veins
- Sclerosed Veins or scarred veins
- Collapsed Veins
- Hematoma
- Thrombosed area
- Endemnitous area
- Burned area
- Excessive Bleeding
- Petechiae

Knowledge of how to deal with unusual patient circumstances:

- Unconscious
- Obesity
- Uncooperative
- Anxious
- Fainting
- Seizures
- Impaired patient
- Abusive patient

Knowledge of how to deal with circumstances or collections requiring special care:

- Infections
- Burns
- Diabetic patients
- Cancer patients
- Dialysis patient – fistulas, shunts
- Children and infants
- Mastectomy
- PIC lines
- Arterial lines
- IV areas

Knowledge of procedures determining specimen integrity:

- specimen priority
- turn around time
- basal state and factors affecting basal state
- rationale for rejection of specimens
- protocols regarding repeat collections
- transport and storage of specimens

### **C: SPECIMEN COLLECTION BY CAPILLARY (MICRO COLLECTION)**

The Medical Laboratory Assistant verifies relevant data and ensures that appropriate specimens are procured according to established protocols for skin puncture and specimen integrity. The medical laboratory assistant verifies accurate patient identification

<b>COMPETENCIES:</b>
Knowledge of the types of equipment used to collect skin puncture and demonstrate appropriate use.
Knowledge of use of micro collection containers and knowledge of min/max levels
Knowledge of use of cleansing solutions of skin as per protocols
Demonstrate correct technique for skin puncture for adults, children, infants and neonates <ul style="list-style-type: none"><li>• choice of correct equipment for testing</li><li>• Choice of appropriate collection site in finger or heel</li><li>• Appropriate warming, cleansing of site</li><li>• Knowledge of complications and limitations of skin puncture collection</li><li>• Demonstrate care after collection</li></ul>
Knowledge of procedures determining specimen integrity: <ul style="list-style-type: none"><li>• Standards of blood volume collection in infants and neonates</li><li>• Protocols of repeat collections</li><li>• Knowledge of handling and transport of specimens</li><li>• Storage of specimens</li></ul>

### **D: COLLECTION AND PREPARATION OF URINE SPECIMENS**

The Medical Laboratory Assistant has the knowledge and skills necessary for the collection and testing of urine specimens and instruction to the patient on the established procedure in collection of the specimens

<b>COMPETENCIES:</b>
Knowledge of the types of urinalysis collection containers

Knowledge of and demonstrate the ability to provide instructions for the common tests for urinalysis:

- routine and microscopic
- culture and sensitivity
- 24 hour urine
- Cytology urine
- Urine drug screens

Knowledge of established instructions for 24 hour urine collections

Knowledge of 24 hour urine preservation, preservatives and their proper use

Demonstrate the procedures for measuring total volume of 24 hour urine and have knowledge of the requirement to the test requested

Knowledge of the terminology associated with urinalysis collection procedures:

- random
- first morning
- timed
- midstream
- clean catch

Knowledge of criteria for rejection of unacceptable specimens

Demonstrate correct labeling; preparation and storage of urine samples according to established protocols

Knowledge of the preparation of urine for microscopic examination

Have knowledge of requirements and preparation of urine collection for Cytology

Knowledge of requirements and documentation for testing for urine drug screens

- knowledge of non legal testing requirements and protocols
- knowledge of legal testing requirements and protocols
- knowledge of chain of custody procedures

## ***E: COLLECTION AND PREPARATION OF MICROBIOLOGY SPECIMENS***

The Medical Laboratory Assistant has the knowledge and skills necessary for the collection of microbiology specimens and instruction to the patient on established procedure in collection of the specimens.

<b>COMPETENCIES:</b>
Knowledge of the principles of blood culture collection; distinguish between aerobic; anaerobic
Demonstrate collection and labeling of blood culture specimens according to required protocols
Knowledge of appropriate containers and specimen collection requirements of common microbiology tests
Knowledge of and demonstrate the ability to instruct the patient in the collection of common microbiology tests:
Demonstrate correct labeling of specimens for testing
Knowledge of specimen preparation for testing and transport (temperature requirements)
Knowledge of storage of microbiology specimens
Knowledge of protocols regarding testing of specimens
Knowledge of protocols regarding referred specimens: e.g. BCCDC
Knowledge of specimen rejection criteria

The Medical Laboratory Assistant has the knowledge and skills necessary for the preparation and testing of microbiology specimens

<b>COMPETENCIES:</b>
Have basic knowledge of the classification of organisms
Knowledge and use of common media and selection of media
Demonstrate inoculation and streak methods
Knowledge of automated plating methods/machines e.g.: ISO Plater
Knowledge of staining methods
Knowledge of fundamentals of Gram positive; gram negative

**F: SPECIMEN COLLECTION AND PROCESSING:  
HEMATOLOGY/CHEMISTRY**

The Medical Laboratory Assistant shall have the knowledge of general hematology and chemistry tests and the specimen requirements for the collection of tests in these disciplines

<b>COMPETENCIES: Hematology</b>
Knowledge of commonly ordered hematology tests and clinical implication
Knowledge of tubes and additives required for the collection of hematology specimens
Knowledge of required specimen volumes for hematology and coagulation testing
Knowledge of hematology testing requiring special handling e.g. cold agglutinins
Knowledge of specimen rejection criteria for hematology testing
Knowledge of referred hematology specimens e.g. BCCA
Knowledge of blood smear stains
Knowledge of hematology instruments
Knowledge of loading of instruments
Knowledge of and handling of time sensitive tests: eg coagulation
Knowledge of specimen rejection criteria for hematology testing
Demonstrate slide making technique for blood smear
Demonstrate thick and thin slide making technique

**COMPETENCIES: Chemistry**

Knowledge of commonly ordered chemistry tests and clinical implication

Knowledge of tubes and additives required for the collection of chemistry specimens

Knowledge of required specimen volumes for chemistry testing

Knowledge of chemistry testing requiring special handling e.g. metal collections; lactose

Knowledge of specimen rejection criteria for chemistry testing

Knowledge of procedures for Glucose Tolerance testing

- Types of glucose tolerance testing and clinical implication
- Determination and administration of glucose load
- Patient response and protocols for ending test

Knowledge of timed specimen collections

Knowledge of time sensitive collections eg. ionized calcium; blood gases

Knowledge of referred chemistry specimens e.g. BCCA

Knowledge of loading of chemistry analyzers

**POINT OF CARE TESTING:**

The Medical Laboratory Assistant shall have knowledge of the principles of point of care testing procedures for related Hematology and Chemistry tests.

**G: Miscellaneous Specimen Collection and Processing**

The Medical Laboratory Assistant shall have the knowledge of general testing and specimen requirements for the collection of tests in the following disciplines:

- Transfusion Medicine (Immunohematology)
- Histology
- Cytology

<b>COMPETENCIES:</b>
Knowledge of the tests routinely performed in Transfusion Medicine
Demonstrate the collection protocol required for Transfusion Medicine
Knowledge of procedures performed in Histology
Knowledge of tests performed in Cytology

### ***H: Pre – Analytical Specimen Preparation (Accessioning)***

The Medical Laboratory Assistant shall have the knowledge of specimen preparation; handling and packaging and shipping required in the pre analytical phase

<b>COMPENTENCIES:</b>
Knowledge of patient registration according to recognized MSP guidelines
Knowledge of TDG packaging for transport by land and air
Knowledge of automated instruments in the laboratory
Knowledge of manual instruments in the laboratory
Demonstrate loading and use of the centrifuge
Demonstrate aliquoting technique using pipettes
Knowledge of secondary containers for serum and urine specimens
Demonstrate correct use of barrier garments and safety devices; eg. gloves; gowns; shields; protective eye wear

## **UNIT 4**

- A. Cardiac Anatomy and Conduction System of the Heart**
  - B. Electrocardiograph Equipment and Components**
  - C. Recording an Electrocardiogram**
  - D. Evaluation of Electrocardiogram**
  - E: Specialized Cardiac Testing: Holter Monitor; 24 HR BPM**
- 

The Medical Laboratory Assistant has knowledge of the anatomy and electrical conduction system of the heart; demonstrates correct procedure for performance of an electrocardiogram, use and maintenance of equipment and has knowledge of analysis of electrocardiogram tracings including detection and correction of artifacts and recognition of critical arrhythmias

<b>COMPETENCIES:</b>
<b>A:</b> Knowledge of cardiac anatomy and circulation of blood through the heart  Knowledge of the electrical conduction system of the heart and identify pattern of conduction through the heart
<b>B:</b> Knowledge of electrocardiograph equipment, components and their function  Knowledge of care and maintenance of electrocardiograph equipment <ul style="list-style-type: none"><li>• Broken wires, damaged cables</li></ul>

**C:** Knowledge of the theory and demonstrate the practice of performing a technically accurate 12 Lead electrocardiogram:

- patient instructions
- Skin preparation
- Accurate placement of electrodes according to accepted standards
- Recording the electrocardiogram
- Calibration
- Speed
- Baseline determination
- Recognition and correction of artifact
- Recognition of lead reversal
- Recognition of R wave progression

Knowledge of electrode placements due to special cases

- Wheelchair
- Obesity
- Amputee
- Tremor
- Wounds/Burns
- Hairy chest or other impediments

**NOTE: BCSLS GUIDELINE: STUDENTS MUST DEMONSTRATE SUCCESSFUL COMPLETION OF 6 TECHNICALLY ACCURATE ELECTROCARDIOGRAMS PRIOR TO START OF PRACTICUM**

Knowledge of indicators for 15 Lead ECG; placement and recording

Knowledge of indicators for Right Side lead recording and placement

Knowledge of Pediatric ECG recording:

- Electrode placement
- Criteria for 12 lead and or 15 lead

**D:** Have knowledge of normal sinus rhythm

Have knowledge and recognition of abnormal rhythms

Have knowledge of patient symptoms and response

Have knowledge and recognition of rhythms indicating critical values and response

Have knowledge and recognition of Myocardial Infarction patterns and response

**E:** Have knowledge of indicators and protocols for Holter monitor testing

Have knowledge of Holter monitor application and disconnection

Have knowledge of indicators and procedures for 24 HR BPM

# **LABORATORY EQUIPMENT & SUPPLIES**

The Medical Laboratory Assistant shall demonstrate the knowledge and application of the following equipment. This includes knowledge of the associated handling, storage, safety precautions, cleaning and maintenance and calibration methods.

**This knowledge may be obtained by instruction at the school and/ or demonstrated at the practicum site.**

## **Phlebotomy Equipment:**

- Vacutainer holders
- Vacutainer needles – variable gauges
- Evacuated tubes
- Tourniquets
- Butterfly needles
- Syringe
- Syringe Transfer Device
- Cotton balls or gauze
- Isopropyl alcohol

## **Equipment for Capillary Puncture**

- Lancets for micro collection
- Micro collection vials
- Gauze
- Band-Aids
- Sharps Containers

## **Miscellaneous Collection supplies:**

- Blood Culture tubes
- Masks
- Gloves
- Aprons
- Antiseptic cleansing agents

## **ECG Equipment:**

- ECG machine
- Holter Monitor
- Electrodes for application

## **General Equipment and Supplies**

- Centrifuge (including cytospin)
- Balances
- Laboratory glass and plastic ware
- Parafilm
- Pipettes for specimen aliquot
- Frosted end slides
- Heat Block
- Water Bath
- Digital and manual thermometers
- Compound Microscope
- Mixing devices

## **Thermal Equipment:**

- Hot Air Ovens
- Incubators
- Hot plate
- Autoclave
- Refrigerator/Freezer
- Microwave oven

## **Microbiology:**

- Blood Culture bottles
- Culture Media plates and tubes
- Planting loops
- Automated Media processor (practicum sites)