QUALIFIED MEDICAL
LABORATORY TECHNICIAN

PHLEBOTOMY

2023 CURRICULUM

Part One: Common Curriculum

Part Two: Discipline Specific Curriculum

Introduction

Definition of a Medical Laboratory Technician
A Medical Laboratory Technician (MLT) is a person employed to perform routine tasks by following established protocols under the supervision or direction and control of a Registered Medical Laboratory Scientist. A MLT may only practise within their area of competence, in a health service that forms part of the medical laboratory science profession. During training, supervision would be direct. However, after suitable assessment of competency, it may be replaced with direction* by a Registered Medical Laboratory Scientist or another registered health practitioner with an appropriate scope of practice, other than a Medical Laboratory Technician.

The QMLT candidate has two curricula to study:

- **The Common Curriculum** which is common to all NZIMLS technician qualifications.
- **The Discipline Specific Curriculum** which is common only to the discipline in which the candidate is sitting the QMLT exam.
- This document combines both the **Common Curriculum (Part One)** and the **Discipline Specific Curriculum (Part Two)**.

Objectives

1. Education of Medical Laboratory Technicians and Medical Laboratory Pre-Analytical Technicians

a. To provide an employer recognisable qualification in a New Zealand Medical Laboratory/Blood Service.

b. To provide a qualification that is recognised by the Medical Sciences Council of New Zealand for the Registration of Qualified Medical Laboratory Technicians (QMLT) and Qualified Medical Laboratory Pre-Analytical Technicians (QMLPAT).

c. To provide sufficient theoretical training to enable a medical laboratory technician or medical laboratory pre-analytical technician to perform their practical work with accuracy, reliability and efficiency.

d. To enable them to appreciate the reasons for, and the importance of the procedures and the tests that they perform.

e. To enhance interest in their work and increase job satisfaction and self-esteem.

2. QMLT and Common Curricula

a. To prescribe the course of study for the QMLT examination.

b. To define the composition of the examination.

The NZIMLS Council has prepared both a curriculum and practical assessment for use by Trainee Medical Laboratory Technicians preparing for the NZIMLS QMLT examinations.

The Practical Assessment **is compulsory** and has been included to aid candidates preparing for the QMLT examinations and to be a record of training or practical competency, accomplished by mastery assessment.

NOTE -The Practical Assessment is a requirement and must be presented as part of the examination and qualifying process.

The NZIMLS Council has taken significant steps to limit the theoretical knowledge required, to be sufficient to perform bench procedures and understand the importance of recognising abnormal or anomalous results for referral to a supervisor.

The request for specific numbers of points and the reduction in the number of tests to be performed in the Practical Assessment is an endeavour to limit the quantity of information to learn and examine.

This does not preclude employers training their laboratory assistants for their own needs.

Part One
Common Curriculum

Competence Standards

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Competence standards are a description of the ability of a medical laboratory science practitioner to practise safely and effectively in a variety of contexts and environments. Competence is influenced by many factors including, but not limited to, the practitioner's qualifications, clinical experience, professional development and his/her ability to integrate knowledge, skills, attitudes, values and judgements within a practice setting. A critical value of competence standards is the capacity to support and facilitate professional practice and growth.

The standards set out in this document are expressed as entry-level competencies and behaviours. However, it is expected that all practitioners will successively build on these competence standards to levels expected of experienced practitioners.

The competence standards identify the minimum knowledge, skills and professional attributes necessary for practice. During any one procedure it is expected practitioners will demonstrate elements of practice across a number of broadly defined domains of competence. This recognises that competent professional practice is more than a sum of each discrete part. It requires an ability to draw on and integrate the breadth of competencies to support overall performance.

Context of the Competence Standards

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The competence standards are directly linked to the three medical laboratory science scopes of practice defined by the Council under the Act.

Medical laboratory science practitioners in Aotearoa New Zealand practise within a legislated regulatory framework under the Health Practitioners Competence Assurance Act 2003. Defining scopes of practice serves to protect the health and safety of the public through the use of protected professional titles. Only individuals who hold current registration with the Medical Sciences Council are permitted to use the professional titles of:

- Medical Laboratory Scientist
- Medical Laboratory Technician
- Medical Laboratory Pre-Analytical Technician

Competence Standards for Medical Laboratory Science Practitioners in Aotearoa New Zealand
An Overview of the Competencies Domains

(*Reproduced with permission from the Medical Sciences Council of New Zealand)*

Key competencies are arranged within a number of integrated themes called *Domains.* There are five domains of competence that apply to each of the scopes of practice for medical laboratory science practitioners. In addition, competencies specific to each scope of practice are articulated in a number of subsets (5A to 5C) of the fifth domain.

Domain 1: Professional and Ethical Conduct
This domain covers practitioners' responsibility to be professional and ethical and to practise within the current medico-legal framework. Includes their responsibility for ensuring patient confidentiality/privacy is maintained at all times while recognising the potential role as a patient advocate.

Domain 2: Communication and Collaboration
This domain covers practitioners' responsibility in utilising appropriate, clear and effective communication and their responsibility for ensuring they function effectively as a member of ahealth team at all times.

Domain 3: Evidence-Based Practice and Professional Learning
This domain covers practitioners' responsibility to engage in evidence-based practice and to critically monitor their actions through a range of reflective processes. It includes their responsibility for identifying, planning and implementing their ongoing professional learning needs.

Domain 4: Safety of Practice and Risk Management
This domain covers practitioners' responsibility to protect patients, others and the environment from harm by managing and responding to the risks inherent in both healthcare and medical laboratory science practice. It includes their responsibility for ensuring high quality professional services are provided for the benefit of patients and other service users.

Domain 5: Medical Laboratory Science Practice
This domain covers the knowledge, skills and capabilities practitioners need to practise the profession of medical laboratory science. Elements in this domain are common to all medical laboratory science practitioners, taking into account the different requirements of each scope of practice.

Domain 5A: Medical Laboratory Scientist
This domain covers the additional knowledge, skills and capabilities specific to the Medical Laboratory Scientist scope of practice.

Domain 5B: Medical Laboratory Technician
This domain covers the additional knowledge, skills and capabilities specific to the Medical Laboratory Technician scope of practice.

Domain 5C: Medical Laboratory Pre-Analytical Technician
This domain covers the additional knowledge, skills and capabilities specific to the Medical Laboratory Pre- Analytical Technician scope of practice.

More detailed information on these Standards can be found on the Medical Sciences Council website under "Competence Standards for Medical Laboratory Science Practitioners in Aotearoa New Zealand (revised November 2018).

Definitions

1. **Quality assurance**
   All those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy a given requirement for quality.

2. **Quality Control**
   The monitoring and control of the process producing the product and service.

3. **Total Quality Management (TQM)**
   Management philosophy of continual incremental improvement through total involvement. Seeks, through the utilisation of fully trained, informed and involved employees, participating and working with management to satisfy customer requirements, to improve overall quality, productivity, efficiency and company viability.

   Reference ISO 15189

4. **Ethics**
   The rules or principles that govern right conduct.

5. **Confidential information**
   Information (written or spoken) given on the understanding that it will not be passed on to others.

6. **Patient/Donor confidentiality**
   Non-disclosure of patient's/donor's personal information, other than to his or her clinician, unless authorised by that patient/donor.

7. **Informed consent**
   Agreeing to something once provided with all the facts, understanding them fully andknowing one's rights as an individual.

8. **Cultural Competence**
   A set of congruent behaviours, attitudes and policies that enables effect interaction in cross-cultural situations. 'Culture' refers to integrated patterns of human behaviour that include language, thoughts, communications, actions, customs, beliefs, values and institutions ofracial, ethnic, religious or social groups. 'Competence' implies having the capacity to functioneffectively as an individual and an organisation within the context of the cultural beliefs, behaviours and needs presented by patients and their communities.
   (Adapted from Cross 1989).

   Refer also to Medical Sciences Council of New Zealand Policy and Guideline: Cultural Competence found on the MSCNZ website under resources.
   https://www.mscouncil.org.nz/assets_mlsb/Uploads/2018-Jun-V1-MSC-Cultural-Competence.pdf

Word Definition

The following word definitions will be used to describe the level of knowledge a QMLT shall be required to achieve. Examination questions will also use these words.

WORD DEFINITIONS	
CALCULATE	Perform a mathematical process to get the answer
CLASSIFY	Designate to a group
COMPARE	Detail both the differences and the similarities
COMPLETE	Finish, have all the necessary parts
CONVERT	Express in alternative units
DEFINE	State meaning clearly and concisely
DESCRIBE	Give a complete account demonstrating a thorough practical knowledge in a logical sequence
DISCUSS	Give details, explaining both the positives and negatives
DISTINGUISH	Briefly point out the main differences
EXPAND	Express at length or in greater details
INDICATE	Briefly point out
IDENTIFY	Recognise according to established criteria
INTERPRET	Express the results of a test or series of tests in a meaningful format
LABEL	Give a name to
LIST	Headings only
MATCH	Find one that closely resembles another
NAME	A word or group of words used to describe or evaluate
OUTLINE	Write brief notes incorporating the essential facts
STATE	Give the relevant points briefly

Dilution Factor Definitions (where applicable)

Due to inconsistencies in nomenclature associated with dilution expression, the following will be used for calculations in the examination:

½ and 1 in 2: implies 1 part added to 1 part making a total of 2 parts,
ie. A dilution factor of x2.

1 to 2: implies 1 part added to 2 parts making a total of 3 parts,
ie. A dilution factor of x3.

Because of the dual meaning of the expression 1:2, it will not be used in the examinations.

1.0 What is Medical Laboratory Science?

1.1 Describe the role and understand the definition of medical laboratory science within the context of sample collection and analysis to aid the diagnosis and monitoring of disease, medical conditions and treatments thereof and in the testing and accreditation of donated blood and blood products to ensure the health of the donor and the safety of the blood supply.

1.2 Describe the concept of cultural competence, professional behaviour and attitude within a Medical Laboratory or Blood Service pertaining to:

- Patients, clinicians and colleagues.
- Patient fluid, tissue and body parts.
- Blood donors.
- Donated blood, blood components, or tissue.
- Be familiar with the MSCNZ Policy and Guideline: Cultural Competence, June 2018, including the attitudes knowledge and skills expected of a QMLT or QMLPAT in their dealings with patients and colleagues, and expectations of cultural competence in practice.

1.3 Outline the role of the professional/legislative bodies representing, training and governing Medical Laboratory Science in New Zealand.

- NZIMLS (New Zealand Institute of Medical Laboratory Science).
- MSCNZ (Medical Sciences Council New Zealand).
- Universities that train Medical Laboratory Scientists.
- Understand the five domains of competencies (Professional and ethical conduct, Communication and collaboration, Evidence-based practice and professional learning, safety of practice and risk management and medical laboratory science practice) and associated standards as outlined in the Medical Sciences Council New Zealand's Competence Standards for Medical Laboratory Science Practitioners in Aotearoa New Zealand.

1.4 Outline the major functions of the following departments / sections and their interrelationships within a laboratory.

- Haematology
- Biochemistry
- Microbiology
- Immunology
- Histology
- Cytology
- Cytogenetics
- Forensic Science / Mortuary Practice
- Molecular Diagnostics
- New Zealand Blood Service
- Collection services (Phlebotomy)
- Call Centre for helpline, results & enquiries
- Specimen Services

1.5 Outline the major functions / roles of the following laboratory staff:

- Laboratory Clinical Director.
- Pathologist, general and specialist.
- Laboratory Manager.
- Technical Head / Head of Department.
- Section Leader / Technical specialist / Supervisor.
- Scientific Officer.
- Registered Medical Laboratory Scientist.
- Registered Medical Laboratory Technician (QMLT).
- Registered Medical Laboratory Pre-Analytical Technician (QMLPAT).
- Registered Nurse within the New Zealand Blood Service.
- Clerical / Administration staff.

1.6 Outline the role of the Laboratory with referring health professionals such as General Practitioners, specialists/ consultants, nurse practitioners, nurses and midwives, and with patients.

1.7 Identify and expand basic medical terminology and general abbreviations that relate to the laboratory. To include common prefixes and suffixes (e.g. hyper, hypo, -itis, neuro, -philia).

2.0 Ethics and Legislation

2.1 Outline:

- Patient/Donor confidentiality.
- Informed consent.
- Duty of care (do no harm).
- Statutory requirements for release of body parts to patients / families.
- Statutory obligations for the release of samples (to referral laboratories, chain of evidence parties, patients).
- Laboratory policies for the release of information / results to patients/donors.
- The principles of Te Tiriti o Waitangi as applicable to the health and disability system. See https://www.health.govt.nz/our-work/populations/maori-health/he-korowai-oranga/strengthening-he-korowai-oranga/treaty-waitangi-principles.
- The Code of Health & Disability Services and Consumer Rights.
- The NZIMLS code of ethics.
- Knowledge of Health Practitioners Competence Assurance Act (2003).

2.2 Outline how the Health Practitioners Competence Assurance (HCPA) Act 2003 and following amendments relates to Medical Laboratory Science and the Health sector.

2.3 Describe the legal obligation for technicians to be registered and to hold an annual practicing certificate.

2.4 Define scope of practice.

2.5 Describe the scope definitions for a medical laboratory technician and medical laboratory pre-analytical technician, including the difference between provisional and full registration.

3.0 Human Anatomy and Physiology

3.1 Identify the position of the major organs of the human body.

3.2 Outline their basic function.

3.3 Identify the specimen types (and their origin) encountered in Medical Laboratories.

4.0 Specimens

4.1 Outline procedures for the packaging and transport of specimens for delivery to a laboratory(from the patient to a laboratory, and between laboratories).

4.2 Outline the procedures for the selection, preparation and storage of specimens within thelaboratory.

4.3 Describe minimum specimen labelling requirements including those for New Zealand Blood Service.

5.0 Safety

List your personal duties as a worker under the Health and Safety at Work Act 2015.

5.1 Define, with examples, a notifiable injury or illness, notifiable incident, and notifiable event, according to the Health and Safety at Work Act 2015.

5.2 Describe safety precautions and emergency procedures for incidents involving the following:

- Fire
- Electrical apparatus
- Chemical (poisons, carcinogens, corrosive and volatile substances, gases,radioactive substances, liquid nitrogen)
- Spillages of blood and other biological fluids
- Earthquakes

5.3 Outline an accident reporting procedure for the workplace.

5.4 Outline the role of a health and safety representative.

5.5 Describe the safe handling of biological material under the following headings:

- Identification of routes of infection
- Types of infectious material
- Safety equipment
- Handling
- Disposal
- Decontamination
- Transportation

5.6 Identify international safety symbols that are used in the workplace.

5.7 Describe the concept of safe practice within the workplace.

5.8 Describe the prevention and emergency treatment of the following:

- Eye splashes
- Cuts and bleeding
- Needle or sharps injury
- Blood and Body Fluid exposure
- Burns
- Poisoning
- Electric shock
- Loss of consciousness

5.9 Outline the principles of and basic processes for Hazard Identification and Management including the use of Material SafetyData Sheets.

5.10 Outline the concept of occupational health and the role of self-protection through staffvaccination programmes, e.g. Hepatitis B vaccination.

5.11 Outline the principle of Occupational Overuse Syndrome/Gradual Process Injuries and itsrelevance in the laboratory, including some prevention strategies.

5.12 Outline the management of workplace stress

6.0 Equipment

6.1 Describe the use and routine maintenance (where applicable) of the following equipment:

- Thermo-regulated apparatus (Incubators, water baths, heating blocks, refrigerators,freezers)
- Balances
- Distilled/deionised water apparatus
- Pipetting devices - manual and automated/mechanical liquid handling devices
- Biohazard cabinets
- Fume hoods/fume cupboards
- Transport systems (including pneumatic tubes, couriers)
- Countdown timers

(NOTE**: "Maintenance"** in the context of this curriculum refers to daily good house-keeping practices required to keep equipment clean and functioning at peak efficiency. Medical laboratory technicians are encouraged to recognise faults in equipment but must refer them to their supervisor for corrective action.)

6.2 Centrifuges:

- Outline the principle of centrifugation.
- Distinguish between Relative Centrifugal Force (RCF) and Revolutions Per Minute (RPM).
- Describe the use and maintenance required.
- Describe the safety precautions necessary including specimen breakage.

6.3 Computers:

- Outline basic computer components including hardware and software.
- Describe the role of computers in the laboratory / workplace.
- Outline the utility of middleware in the laboratory.
- Describe precautions taken by laboratories to ensure safety and security of data.
- Outline the responsibilities of individual practitioners regarding cyber security in the workplace.

6.4 Barcodes and Scanners:

- Describe the use of barcodes and barcode scanners, and define and distinguish between linear barcodes and matrix (or two-dimensional) barcodes e.g. QR codes.

7.0 Quality Assurance

7.1 Define quality assurance and total quality management.

7.2 Describe quality control.

7.3 Define and distinguish accuracy and precision.

7.4 Define a Biological Reference Interval.

7.5 Describe the role of ISO 15189 within the Medical Laboratory.

7.6 Outline internal and external audit processes including the assessment bodies (e.g. International Accreditation New Zealand (IANZ), Ministry of Primary Industries (MPI)).

7.7 Outline the purpose of Document Control within the Medical Laboratory, and how it is achieved.

7.8 Outline quality feedback by customers (patients, donors and health professionals), including the objective of obtaining feedback and how it is used.

8.0 Calculations

The student shall be able to perform basic laboratory calculations including:

- Converting units – for example: µmol to mmol, ml to L, g to kg, fractions to percentage.
- Define SI units – pico, nano, mili, micro, kilo as they relate to the power of 10.
- Define pH and use this understanding to differentiate between acidic and basic solutions.

8.1 Statistics:

- Calculation of average and mean using a calculator.
- Outline the principle of standard deviation and coefficient of variation.
- Creation of and plotting results onto a Levy Jennings graph.
- Outline the interpretation of Levy Jennings graphs.

See Guide to Calculations on the NZIMLS website under Education.

9.0 Reference Texts

Below are listed suggested reference texts. The latest versions are recommended. This is notan exhaustive list.

9.1 Specimens

Diagnostic Samples: From the Patient to the Laboratory: The Impact of Preanalytical Variableson the Quality of Laboratory Results
Guder W.G, Narayansan S, Wisser H,
Zawta BWiley-Blackwell

Clinical Diagnostic Technology – The total Testing Process, Volume 1: The Preanalytical PhaseWard-Cook K.M, Lehmann C.A, Schoeff L.E, Williams R.H
AACC Press, Washington DC

IATA Infectious Substances Shipping Regulations
IATA Dangerous Goods Regulations
https://www.iata.org

Land Transport Rule Dangerous Goods 2005
https://www.nzta.govt.nz/resources/rules/dangerous-goods-2005/

9.2 Human Anatomy and Physiology

Phlebotomy
Handbook Garza d,
Becan-McBride K
Pearson Educational, New Jersey USA

Phlebotomy
Essentials McCall R.E,
Tankersley C.M
Lippencott, Williams & Wilkins, Philadelphia, USA

9.3 Equipment

Clinical Chemistry: Theory Analysis and CorrelationKaplan L.A., Pesce A.J.
Mosby; Missouri, USA

TIETZ: Textbook of Clinical Chemistry and Molecular Diagnostics
Carl A Burtis, Edward R Ashwood and David E Bruns Saunders;
Philadelphia, USA

TIETZ: Fundamentals of Clinical Chemistry and Molecular Diagnostics
Carl A Burtis and David E Bruns Saunders; Philadelphia, USA

9.4 Safety

Clinical Microbiology Procedures HandbookAmy L. Leber, Editor-in-Chief
American Society for Microbiology Washington DC

Laboratory Safety Principles and Practices Fleming D.O., Richardson 1.H., Tulis 1.1, Vesley D.American Society Microbiology Washington DC.

Workplace stress: Www.employment.govt.nz (search stress),

Worksafe.govt.nz (search stress)

9.5 **Legislation and Standards**

Health Practitioners Competence Assurance Act (2003)

ISO 15189:2012 Medical laboratories – Requirements for quality and

competenceAS/NZS 2243 Safety in laboratories

Clinical and Laboratory Standards Institute (CLSI) guidelines
www.legislation.govt.nz

Code of Ethics of the New Zealand Institute of Medical Laboratory Sciencewww.nzimls.org.nz

Competence Standards for Medical Laboratory Science Practitioners in Aotearoa New Zealand (revised November 2018). www.mscouncil.org.nz

Policy and Guideline: Cultural Competence (June 2018) www.mscouncil.org.nz

Te Tiriti o Waitangi Principles: https://www.health.govt.nz/our-work/populations/maori-health/he-korowai-oranga/strengthening-he-korowai-oranga/treaty-waitangi-principles

Part Two
Discipline Specific Curriculum
Phlebotomy

1.0 Anatomy and Physiology

Learning outcome: The candidate will be able to describe the structure and function of specified blood collection sites and of the circulatory system and outline the haemostasis process.

1.1 Blood Collection Sites

Describe:
- Recommended sites for blood collection
- The structure of the arm, hand and foot
- Location of arteries, veins, capillaries and nerves in the arm, hand and foot

1.2 Circulatory System

Describe:
- Blood – composition
- Blood vessels and structure – arteries, veins and capillaries
- Differences between venous, arterial and capillary blood samples
- Heart – structure and function
- Vascular system – circulation

1.3 Haemostasis and Coagulation:

Outline:
- Vascular Phase – vasoconstriction
- Platelet Phase - platelet plug formation
- Coagulation Phase - fibrin clot formation
- Clot Retraction and Destruction – fibrinolysis

2.0 Health, Safety and Infection Control

Learning outcome: The candidate will be able to discuss safety policies and procedures and describeappropriate first aid and the practice of Infection control

2.1 General rules for health and safety

Discuss:
- Hazard identification and management
- Prevention and management of work-related injury
- Needle stick injury to include prevention, first aid and reporting
- Sharps disposal
- Waste types – biological and non-biological

2.2 Infection control

Describe:
- Concept and practice of Barrier Precautions (Isolation technique)
- Concept and practice of Standard Precautions
- Hand hygiene and cleansing procedures including the WHO Five Moments of HandHygiene concept, see appendix
- Modes of transmission of infection
- Process for decontamination, cleaning and disinfection of work surfaces, kits, trays,trolleys, beds, chairs, tourniquets and needle holders
- Types of infection
- Multiple Resistant Organisms (MROs)
- National Pandemic Influenza Guidelines
- Use of Personal Protective Equipment (PPE)

2.3 Adverse Incidents

Describe:
- Accidental arterial puncture
- Anaphylaxis
- Bleeding
- Bruising
- Cardiac Arrest
- Faint (vaso-vagal events)
- Haematoma
- Nausea/Vomiting
- Penetrating nerve injuries
- Seizures
- Shock

Describe Appropriate First Aid:
- First response
- Call for help
- Cardio Pulmonary Resuscitation (CPR)
- Recovery position
- Reporting / documentation

3.0 Laboratory Request Form:

Learning outcome: The candidate will be able to discuss the laboratory request form requirements and classify common laboratory tests into a group or profile, identify commonlyused clinical details and commonly used clinical abbreviations.

3.1 Discuss the laboratory request form requirements

Before Collection:
- Patient identification i.e., minimum requirements
- Tests requested
- Collection timing e.g., pre, post and random

- Patient status e.g. fasting status, pregnant
- Report destination
- Personnel authorised to order laboratory tests
- Requestor's medical council number and signature
- Patient Eligibility, Test Charging – who pays?
- Use of name codes for confidentiality
- Electronic orders (e-ordering request)

After Collection:

- Name of collector
- Time and date of collection
- Type of blood – venous, capillary, arterial

3.2 Classify common laboratory tests into a group or profile.

- Liver function tests
- Renal function tests
- Cardiac markers / enzyme tests
- Iron / anaemia studies
- Thyroid function tests
- Lipid tests
- Metabolic screening
- Coagulation studies
- Haematology tests
- Immunology tests

3.3 Clinical Details:

- Identify commonly used clinical details, refer to recommended text references

3.4 Abbreviations:

- Identify commonly used clinical details, refer to recommended text references

4.0 Pre-Analytical Variables for Blood Collection

Learning outcome: The candidate will be able to discuss the effects of pre-analytical variation with consideration to patient status, collection technique, storage and transportation of specimen to include, but not limited to the following list of factors.

4.1 Pre-analytical Variables

Patient Status:

- Dietary factors
- Diurnal variations
- Effects of medications
- Effects of medical conditions e.g., Hypotension, Pregnancy, Dehydration, Chemotherapy,Steroids
- Patient anxiety
- Posture e.g., Prone and upright collection
- Timed specimens

Collection Technique:
- Tube additive
- Additive: Blood ratio
- Causes of haemolysis
- Order of draw
- Use of tourniquet
- Venepuncture technique

Storage and Transportation:
- Light Sensitivity
- Rapid transport times
- Temperature Control
- Ambient
- Maintaining 37ºC
- On ice

5.0 Collection of Venous and Capillary Blood

Learning outcome: The candidate will be able to describe blood collection equipment in terms of itsuse and function, discuss venous blood collection procedures, discuss capillary blood collection procedures and discuss blood culture collection procedures.

5.1 Blood Collection Equipment

Describe:
- Antiseptics, disinfectants and cleansing agents
- Collection site dressings
- Equipment maintenance and storage
- Safety devices
- Evacuated blood collection equipment
- Needles and syringes including winged (butterfly) systems
- Lancets / Skin cutting devices
- Tourniquets
- Blood collection tubes to include:
- Additives and their modes of action
- Colour codes
- Order of draw
- Volumes

5.2 Venous Blood Collection

Discuss:
Patient Preparation
- Approaching and greeting a patient
- Patient identification.
- Patient consent and explanation of procedure
- Positioning of patient
- Assessment and selection of a vein, to include application of heat, alternative sites,requirements for the elderly and young, sites to avoid eg: burns, mastectomy, amputation, oedema, IV lines

- Assessment of collection method e.g.: evacuated tube system, syringe or winged(butterfly) system
- Selection and preparation of equipment
- Site preparation

Collection Process
- Appropriate use of equipment
- Aseptic Technique
- Refer Practical Assessment

Post Collection
- Disposal of sharps and other waste
- Documentation and specimen labelling
- Puncture site care
- Farewelling patient
- Specimen care
- Transportation considerations

5.3 Capillary Blood Collection

Discuss:
Patient Preparation
- Approaching and greeting patient
- Patient identification.
- Patient consent and explanation of procedure
- Positioning of patient
- Assessment and selection of site
- Selection and preparation of equipment
- Site preparation

Considerations for Neonates
- Delicate skin (no plaster)
- Position of incision (avoid calcaneous)
- Risk of osteomyelitis
- Use of gauze

Collection Process
- Appropriate use of equipment
- Aseptic technique
- The use of micro-collection tubes (e.g., microtainers®)
- Avoidance of micro-clots and haemolysis
- Specific considerations when collecting e.g.
- Capillary blood gas tubes
- Order of draw
- National Testing Centre Card for neonatal screening for metabolic diseasesof the newborn
- Use of gloves
- Refer Practical Assessment

Post Collection
- Disposal of sharps and other waste
- Documentation and specimen labelling
- Puncture site care
- Farewelling patient
- Specimen care
- Transportation considerations
- Cleaning of reusable equipment

5.4 Blood Culture Collection

Discuss:
Collection of Blood Cultures to include:

- Aerobic and Anaerobic bottles
- Appropriate volumes
- Order of draw
- Procedure
- Aseptic collection technique
- Refer Practical Assessment
- Patient Preparation
- Approaching and greeting a patient
- Patient identification.
- Patient consent and explanation of procedure
- Positioning of patient
- Assessment and selection of a vein
- Selection and Preparation of equipment
- Site Preparation

Collection Process

- Appropriate use of equipment
- Refer Practical Assessment

Post Collection

- Disposal of sharps and other waste
- Documentation and specimen labelling
- Puncture site care
- Farewelling patient
- Specimen care
- Transportation considerations

6.0 Specialised Collection Procedures

Learning outcome: the candidate will be able to outline special considerations and documentation for the following tests:

6.1 Outline:

- Drug levels including peaks, troughs and hours post-dose
- Glucose Tolerance Test (GTT) and Polycose Test
- Group and Hold/Cross-matching
- Tissue typing
- Platelet Function Assay (PFA)
- Adreno-corticol function tests, Dexamethasone suppression test and Synacthen testprocedure
- DNA paternity testing
- Serial insulin testing
- Cold agglutinins / Cryoglobulin / Cryofibrinogen
- Quantiferon TB Gold
- Venous Blood gas

7.0 The Collection and Handling of Non-Blood Specimens

Learning outcome: the candidate will be able to identify specimens, describe the collection and outline safe handling and transportation of non-blood specimens under the following headings.

7.1 Urine, Faeces, Sputum, Swabs, Mycology and Seminal Fluid

SpecimensDescribe:

- Equipment – containers and volumes
- Procedure for collection
- Specimen Integrity
- Specimen labelling including site
- Sterility issues
- Storage
- Transportation

- Urine:
- Catheter
- First Catch e.g. for Chlamydia, *Neisseria gonorrhoea*
- Clean catch
- Creatinine Clearance test (plus serum)
- Cytology
- Drug screen including evidential (Chain of Custody)
- Mid-Stream
- Microalbumin (Albumin/Creatinine Ratio)
- Paediatric
- Random
- Tuberculosis
- 24 hour – acid and non-acid bottles

Faeces:

- Culture and Parasites
- Faecal Elastase test
- *Helicobacter pylori* (H pylori) faecal antigen (dietary and medication)
- Occult Blood (dietary requirements)
- Reducing Substances (lactose tolerance in infants)
- Serial specimens

- Sputum
- Culture
- Cytology
- Tuberculosis

- Saliva
- Salivary tests e.g. Progesterone and Testosterone

Swabs

- Bacterial
- Bordetella pertussis
- Chlamydia
- Multi-resistant organisms (MROs)
- Technique for dry and moist sites
- Viral

- Mycology Specimens and Skin Parasites
- Patient questionnaire
- Sites and methods of collection to include:
- Skin, hair and nail fungal infections and/or parasites
- Wood's Lamp (ultraviolet) including use and safety precautions

- Seminal Fluid
- Fertility
- Post-vasectomy

7.2 Other Specimens

Outline:

- Aspirates
- Cytology specimens
- Fine needle aspirates for cytology/histology
- Histology specimens including frozen and formalin preserved

8.0 Specialised Tests and Procedures

Learning outcome: the candidate will be able to outline the specialised tests and procedures listedbelow under the following headings.

8.1 Mantoux Test

- Principle
- Health and safety considerations
- Site selection and preparation
- Use of equipment
- Aftercare
- Interfering factors
- Sources of error

8.2 Skin Prick Testing (Skin Allergy Testing)

- Principle
- Health and safety considerations
- Site selection and preparation
- Use of equipment
- Aftercare
- Interfering factors
- Sources of error

9.0 Recommended reference texts and related documents (Latest Editions)

There is no single textbook that covers the entire Phlebotomy syllabus however, the following books are all valuable resources.

- Phlebotomy Handbook Blood Collection Essentials. Garza D., Becan-McBride; K Appleton and Lange. Stamford Connecticut
- Phlebotomy Essentials. McCall R. E., Tankersley C.M. Lippincott, Williams and Wilkins.Philadelphia

- Additional texts:
- Phlebotomy for Nurses and Nursing Personnel. Ernst D; Ernst C.
- Applied Phlebotomy. Ernst D.
- Samples: From the Patient to the Laboratory. Guder W.G., Narayanan S., Wisser H., Zawta B.
- Mosby's Manual of Diagnostic and Laboratory Tests. Pagan K., Pagana T.
- Handbook of Phlebotomy. Pendergraph G.E.
- Phlebotomy Exam Review, Ruth E. McCall; Cathee M. Tankersley.

Related documents:

- ISO 15189

- Clinical and Laboratory Standards Institute (CLSI) Guidelines – These include international consensus documents pertaining to phlebotomy and specimen collection

- Hazard and Risk Management.

- Health and Disability Commissioners Code of Health and Disability Services Consumers Rights

- http://www.who.int/gpsc/5may/background/5moments/en/ (5 Moments of Hand Hygiene)

10.0 NZ Legislation and Standards

The latest edition of the NZ legislation can be found on the internet. Refer to the latest edition.

The application of the legislation in the workplace may be examined.

Informed Consent

- Privacy Act
- Health Information Privacy Code

Infection Control

- Standards New Zealand – Infection Control NZS 8142
- WHO Five Moments of Hand Hygiene

Specific Procedures for Blood Transfusion:

- ASBT Guidelines for Pre-transfusion Testing

Hazard and Risk Management

- Health and Safety in Employment Act
- Health and Safety in Employment Amendment Act
- Health and Safety In Employment Relations
- Hazardous Substances and New Organisms (HSNO) Act
- Dangerous Goods Act
- Land transport Rules for Dangerous Goods – Rule 45001
- NZS 5433: Transport of Dangerous Goods on Land
- Codes of Practice as issued by Occupational Safety and Health (which is part of theDepartment of Labour)
- NZS 8142: – Infection Control
- Health and Disability Services – Safety Act
- NZS 4304: – Management of Healthcare Waste
- Ministry of Health. *National Laboratory Guidelines for Pandemic Influenza: Collection and handling of human specimens for laboratory diagnosis of influenza with pandemicpotential. (*www.moh.govt.nz)
- WHO Five Moments of Hand Hygiene
- Manufacturers Guidelines