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# SYLLABUS

# PHLEBOTOMY MEDICAL TECHNICIANS

**PBMT Approved in April 2021 for training implementation Jan 2023.  
For exams from October 2024**

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## 1. INTRODUCTION

Phlebotomy is a term used for a discipline which incorporates the pre-analytical phase in a medical laboratory.

The objective of this syllabus is to provide the student Phlebotomy Technicians with a guideline on the essential aspects that must be covered in order to adequately prepare themselves for the HPCSA's Professional Board of Medical Technology examination.

The examination is in the form of two, two hours, written papers which will be based on the contents of this syllabus and related theoretical and practical knowledge gained during study at an HPCSA accredited training facility.

Candidates are required to attain a minimum of 50% overall and a sub-minimum of 50% for each of the papers written. Emphasis will be placed on the ability to relate practical and theoretical knowledge to clinical conditions.

Please refer to:

- Appendices
  - Recommended textbooks

HPCSA regulations require that accredited training laboratories perform a minimum of 80% of the tests identified in this syllabus. Laboratories are required to ensure that the student Phlebotomy Technician receive appropriate training in the tests contained within the syllabus, but which are not routinely performed on site. (Where practical training at an alternate training facility is not feasible, minimum of theoretical and written assessments is compulsory)

## 2. STATUTORY REGULATIONS AND ETHICS

### Objective

Enable students to understand and apply the regulations and ethical principles which apply to the scope of practice of a Medical Phlebotomy Technician.

### Specific outcomes

On completion of this section the student should be able to:

- © Demonstrate an understanding of the relevant Acts and regulations.

**Range** - Acts & regulations include but are not limited to:

☀ Health Professions Act 56 of 1974	☀ Patients' Rights Charter
☀ National Health Act 61 2003	☀ POPIA
☀ Children's Act	

- ⊙ Demonstrate knowledge of the structure and function of the Health Professions Council of South Africa (HPCSA).
- ⊙ Demonstrate knowledge of the structure and function of the Professional Board for Medical Technology.
- ⊙ Discuss the HPCSA regulations relating to the scope of practice as well as the scope of profession and code of conduct for medical phlebotomy technicians.
- ⊙ Describe the legal and ethical standards related to the professional practice of phlebotomy for the fields of medical pathology and blood transfusion. (Refer HPCSA Rule Book)
- ⊙ Demonstrate knowledge of patient and/or donor rights and responsibilities with particular regard to confidentiality. (Refer HPCSA Rule Book)
- ⊙ Explain the ethical and professional rules and regulations regarding patient/donor informed consent for procedures. (Refer HPCSA Rule Book)
- ⊙ Apply ethical standards in the handling of internal and external customers in accordance with organizational policies and procedures. (Refer HPCSA Rule Book)
- ⊙ Demonstrate knowledge of the requirements for the acquisition of continual education units (CEUs) and maintenance of licensure.

### 3. TOTAL QUALITY MANAGEMENT SYSTEM

#### 3.1 LABORATORY SAFETY AND INFECTION CONTROL

##### **Objective**

Provide knowledge of all safety procedures that must be applied in the workplace and an understanding of the relevant legislation.

##### **Specific outcomes**

On completion of this section the student should be able to:

- ⊙ Explain and apply the fundamental concepts of the relevant legislation pertaining to laboratory safety.

##### **Range:**

<ul style="list-style-type: none"> <li>☀ Occupational Health and Safety Act</li> <li>☀ Hazardous Substances Act</li> </ul>	<ul style="list-style-type: none"> <li>☀ Compensation for Occupational Injuries and Diseases Act</li> </ul>
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- ⊙ Identify and describe the use of all safety equipment.

##### **Range:**

<ul style="list-style-type: none"> <li>☀ Fire hose</li> <li>☀ Fire blanket</li> <li>☀ Spill kits – biological and hazardous chemicals</li> <li>☀ Fire alarms</li> </ul>	<ul style="list-style-type: none"> <li>☀ Fire extinguishers – all classes</li> <li>☀ Safety shower</li> <li>☀ Eye wash station</li> <li>☀ First aid box</li> </ul>
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- ⊙ Demonstrate knowledge of the protocols to follow in the event of injuries on duty, including needle-stick injury.
- ⊙ Demonstrate knowledge of the procedures to follow in the event of laboratory accident or emergency.

**Range:**

☀ Fire, Flood, Bomb threat	☀ Chemical or bio-hazardous spill
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- ☉ Describe procedures to follow for the prevention (immunization), control and management of laboratory acquired infections including the prevention and control of infection by blood borne viruses.
- ☉ Describe and apply good general housekeeping procedures including the decontamination of equipment.
- ☉ Describe the application of laboratory safety procedures to the collection, transport, storage and analysis of biological specimens.
- ☉ Describe the purpose and basic content of the material safety data sheets (MSDS).
- ☉ Describe the basic principles for the storage, handling, and disposal of chemicals; poisons; flammable substances; gases and infectious material.
- ☉ Describe the correct procedures for the storage, handling, and disposal of laboratory waste.

**Range:**

☀ Biological specimens	☀ Solid and liquid bio-hazardous waste
☀ Human tissue	☀ Radioactive waste
	☀ Sharps

- ☉ Define the role of the designated safety personnel.

**Range:**

☀ First aid officer	☀ Safety representative
☀ Fire marshall	

- ☉ Recognize the international safety symbols used in the laboratory environment.
- ☉ Identify hazards and risks in the working environment.

## 3.2 INFECTION CONTROL, FIRST AID AND PERSONAL WELLNESS

### Objective

- ⊙ To provide students with the knowledge to protect themselves, patients, co-workers and others from infection and injury.
- ⊙ To provide students with the knowledge to stay healthy both physically and emotionally, without compromising the quality of patient care.

### Specific Outcomes

On completion of this section the student should be able to:

- ⊙ Demonstrate knowledge of terminology and practices related to infection control.
- ⊙ Identify key elements of the blood borne pathogen standard and needle stick and mucous membrane safety.
- ⊙ Recognize symptoms needing first aid including shock, CPR and electrocution.
- ⊙ Describe role of personal wellness as it relates to nutrition, rest, exercise, stress management and back protection.
- ⊙ Understand terminology specific to infection control, communicable diseases, nosocomial infections.
- ⊙ List and draw the links associated with the chain of infection.
- ⊙ Explain each link in the chain and understand examples of each.
- ⊙ Explain the different methods of breaking the chain of infection.
- ⊙ Perform infection control practices including handwashing, use of personal protective equipment, environmental cleaning and disinfecting equipment
- ⊙ Describe the principles of asepsis and aseptic technique.
- ⊙ List and explain the different isolation procedures including protective or reverse isolation, universal precautions, transmission-based precautions, contact precautions and airborne precautions.
- ⊙ List and understand general laboratory safety rules.
- ⊙ Understand the different biohazard routes.
- ⊙ List the various blood borne pathogens including Hepatitis A, B, C, D and HIV.
- ⊙ Explain needle stick and mucous membrane splash safety.
- ⊙ Understand the process to clean up blood or other body fluid spills.
- ⊙ List and understand the first aid for shock, cardiopulmonary resuscitation, and electrocution.
- ⊙ List and understand the concepts of personal wellness including proper nutrition, rest and exercise, personal hygiene, back protection and stress management.

## 3.3 SPECIMENS /PRE-ANALYTICAL REQUIREMENTS – SPECIMEN RECEPTION

### Objective

Provide an understanding of the optimal specimen requirements for the maintenance of the integrity and suitability for all types of laboratory analysis with particular reference to the tests and specimens specified throughout this syllabus.

### Specific outcomes

On completion of this section the student should be able to:

- ⊙ Describe the optimal specimen requirements for the individual tests.
- ⊙ Describe the conditions under which the specimens must be transported to the laboratory
- ⊙ Display knowledge of the optimal storage conditions should testing be delayed and the stability of the specimen for the individual testing process.
- ⊙ Capture the data and patient demographics that are required for the registration of the specimens at the laboratory accurately.
- ⊙ Explain the principle of continuous identification of the specimen, aliquots and documentation.
- ⊙ Describe the process for the rejection of unsuitable specimens.

### 3.4. LABORATORY EQUIPMENT

#### **Objective**

Explain the correct use, principle of operation, maintenance of laboratory equipment and the appropriate troubleshooting procedures to apply when indicated.

#### **Specific outcomes – Applicable to all equipment/instruments**

On completion of this section the student should be able to:

- ⊙ Describe the components of the equipment and their principle of operation.
- ⊙ Describe the limitations of the equipment in use.
- ⊙ Operate all equipment optimally in accordance with the recommended procedures and required specimen separation as applicable.
- ⊙ Demonstrate knowledge of, and apply, the correct safety precautions during the operation and maintenance of the equipment.
- ⊙ Conduct applicable decontamination procedures.
- ⊙ Describe and apply the appropriate functional checks to ensure optimal operation.
- ⊙ Describe and implement troubleshooting procedures when optimal operation is not demonstrated by the functional checks.
- ⊙ Demonstrate full knowledge of, and maintain, all equipment records and documentation required for good laboratory practice.

#### **Range:**

<ul style="list-style-type: none"><li>✱ Pipettes – glass, automated, air displacement and disposable</li><li>✱ Fridges</li><li>✱ Stopwatches/timers</li><li>✱ Thermometers – min/max, electronic and mercury</li></ul>	<ul style="list-style-type: none"><li>✱ Centrifuges – micro-haematocrit, safety, temperature controlled, Fixed/swing head centrifuges and ultra-centrifuges.</li></ul>
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### 3.5 STOCK CONTROL

#### **Objective**

Outline the processes involved in good stock management.

#### **Specific outcomes**

On completion of this section the student should be able to:

- ⊙ Demonstrate knowledge of the basic principles to apply when managing stock.
- ⊙ Demonstrate an understanding of the receipt of stock including the required records regarding condition of goods, expiry dates and lot numbers.
- ⊙ Demonstrate an understanding of stock rotation with particular reference to expiry dates.
- ⊙ Describe the correct storage conditions for all stock.
- ⊙ Differentiate between open vial stability and expiry date.
- ⊙ Demonstrate knowledge of company policy with regard to the use of expired reagents, controls and calibrators.

**Objective**

Expose the student to all aspects of quality control.

**Specific outcomes**

On completion of this section the student should be able to:

- ⊙ Discuss quality assurance and quality control in the correct context.
- ⊙ Define and apply the appropriate processes of quality assurance in the pre-analytical, analytical and post analytical areas.
- ⊙ Demonstrate general knowledge on the term’s accreditation and ISO.
- ⊙ Define and explain all terminology used in the assessment of quality control results.

**Range**

<ul style="list-style-type: none"> <li>✿ Precision</li> <li>✿ Imprecision</li> <li>✿ Reference range</li> <li>✿ Linearity</li> </ul>	<ul style="list-style-type: none"> <li>✿ Reportable range</li> <li>✿ Uncertainty of measurement</li> <li>✿ Accuracy</li> </ul>
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- ⊙ Have basic knowledge of all the procedures, principles and interpretation of internal quality control data.
- ⊙ Describe the potential causes and apply appropriate troubleshooting procedures in the event of failed Internal, quantitative and qualitative quality control.
- ⊙ Define and explain all quality assurance terminology

**Range**

<ul style="list-style-type: none"> <li>✿ Non-conformance</li> <li>✿ Corrective action</li> <li>✿ Preventive action</li> </ul>	<ul style="list-style-type: none"> <li>✿ Root cause analysis</li> <li>✿ Continual improvement</li> <li>✿ Audits – Internal &amp; External</li> </ul>
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3.7 PERSONNEL

**Objective**

Provide knowledge of basic requirements for personnel in terms of relevant ISO standards.

**Specific outcomes**

On completion of this section the student should be able to:

- ⊙ Describe the personal documents and records which are required for all laboratory personnel.
- ⊙ Demonstrate an understanding of the term’s ‘competency’ and ongoing competency’ in terms of the training of all laboratory personnel



### 3.8 DOCUMENTATION

#### Objective

Provide knowledge of basic requirements of documentation in terms of relevant ISO standards.

#### Specific outcomes

On completion of this section the student should be able to:

- ⊙ Demonstrate knowledge of document control requirements in terms of relevant ISO standards.
- ⊙ Demonstrate knowledge of the required content of SOP's including the minimum content of the cover page.
- ⊙ Know the process on how to make documents obsolete.
- ⊙ Demonstrate knowledge on the retention and disposal of this documentation.
- ⊙ Demonstrate knowledge on document control and review.
- ⊙ Differentiate between a record and document.

#### Range:

<ul style="list-style-type: none"><li>✿ Policies</li><li>✿ Procedures (SOPs)</li><li>✿ Working instructions</li><li>✿ Package inserts</li></ul>	<ul style="list-style-type: none"><li>✿ Equipment records</li><li>✿ Quality control records</li><li>✿ Personnel records</li></ul>
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## 4. COMPUTERS

#### Objective

Provide the student with an introductory knowledge of basic computer skills.

#### Specific outcomes

On completion of this section the student should be able to:

- ⊙ Have a basic overview concept on result entry/transcription that can be done on tests listed in the syllabus.
- ⊙ Perform basic data capturing of patient or donor information.
- ⊙ Handle enquiries and look up test and specimen information.
- ⊙ Creating shipping lists and arrange shipping of send away specimens.
- ⊙ Print, re-print and sort patient reports (reason for POPIA compliance)
- ⊙ Print and action worksheets.
- ⊙ Scan request forms. (Reason for POPIA compliance)
- ⊙ Print previously scanned forms.
- ⊙ Print and action management report.

## 5. HEALTHCARE SETTING

### Objective

Understand the setting within the healthcare system.

### Specific outcomes

At the end of this training the student will be able to:

- ⦿ Demonstrate basic knowledge of terminology for healthcare settings
- ⦿ List the personnel levels in the clinical analysis area of a laboratory
- ⦿ List the different departments found in a clinical analysis area
- ⦿ List different tests and test panels performed in these different departments

### **Range:**

☀ Inpatient	☀ Outpatient
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## 6. ANATOMY AND PHYSIOLOGY & MEDICAL TERMINOLOGY

### Objective

Instruct students in anatomy, physiology, and medical terminology relevant to the performance of phlebotomy related tasks.

### Specific outcomes

On completion of this section the student should be able to:

- ⦿ Demonstrate an understanding of the appropriate use and meaning of medical terminology through knowledge of the construction of medical terms using prefixes, suffixes and roots.
- ⦿ Apply medical terminology & abbreviations associated with the fields of medical pathology and blood transfusion.

### **Range**

☀ Anatomical directional terminology ☀ Names and meanings of common medical investigations and procedures.	☀ Medication that influences the interpretation of laboratory results.
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- ⦿ Describe the human cell and tissues with the aid of diagrams.
- ⦿ Identify the organs associated with the different body systems and describe their main function.
- ⦿ Identify common diseases and the related laboratory tests of the different body systems in the range.

### **Range – Body Systems**

☀ Integumentary (Skin) ☀ Muscular ☀ Nervous: Central (CNS) and Peripheral Nervous System (PNS)	☀ Endocrine: Names of glands and the hormones produced ☀ Circulatory: Cardiac cycle
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<ul style="list-style-type: none"> <li>✿ Respiratory: Exchange of gases (internal and external)</li> <li>✿ Male and female reproductive system – including menstruation</li> <li>✿ Digestive: Basics of ingestion, digestion, absorption &amp; elimination</li> <li>✿ Urinary: Urine formation and excretion</li> </ul>	<ul style="list-style-type: none"> <li>✿ Cardio-vascular: heart structure, cardiac cycle, pulse, blood pressure</li> <li>✿ Lymphatic/ Immune</li> <li>✿ Skeletal</li> </ul>
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- ⊙ Identify veins and arteries suitable for the collection of blood specimens, within the scope of practice, and the proximity of nerves, muscles, tendons and bones to these sites.
- ⊙ Describe the function of blood and the coagulation system.

## 7. HIV PRE AND POST TEST INFORMATION AND SUPPORT

### Objective

Describe the role the phlebotomy technician will play when dealing with clients in respect of conducting phlebotomy procedures for the purposes of HIV testing.

### Specific outcomes

On completion of this section the student should be able to:

- ⊙ Demonstrate an understanding of National legislation and policies related to HIV and AIDS.
- ⊙ Demonstrate a sound knowledge of the modes of transmission of HIV and preventative measures that can be utilized.
- ⊙ Describe the body's immune responses post-HIV exposure.
- ⊙ Describe the stages of the disease including the window period.
- ⊙ Conduct pre-HIV test and post HIV test information sessions with the clients.

### **Range – Information session include**

<ul style="list-style-type: none"> <li>✿ Explaining the patient's rights.</li> <li>✿ Conducting a risk assessment.</li> </ul>	<ul style="list-style-type: none"> <li>✿ Obtaining informed consent.</li> <li>✿ Establishing the client's knowledge of HIV and AIDS</li> </ul>
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- ⊙ Consult with clients providing advice on delaying the onset of AIDS, dispelling myths and common misunderstandings of the disease.
- ⊙ Demonstrate knowledge of the implications and socio-economic effect of HIV and the AIDS pandemic on infected persons, affected individuals and on our society.

## 8. SPECIMEN COLLECTION

### A. Pre-collection requirements

#### Objective

Instruct the student in the procedures to follow at all times when interacting with patients for the purpose of the collections of all specimens and specialized testing processes within the specified scope of practice.

**Range – Blood and non-blood specimens within scope of practice are:**

<ul style="list-style-type: none"><li>☀ Venous, capillary and radial arterial blood samples from adults, children and babies.</li><li>☀ Collection of samples from arterial lines</li></ul>	<ul style="list-style-type: none"><li>☀ Urine – (24-hour, clean catch, paediatric urine collection, catheter urine collection), stool, sputum, semen, nail clippings and filings, hair and pus swabs, nasopharyngeal and oropharyngeal swabs, rectal swabs, environmental swabs, skin allergy tests for medical pathology and blood transfusion purposes</li></ul>
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**Note:** The following are specifically excluded from the scope of practice:

Collecting venous or arterial blood from premature neonates; umbilical, internal and external jugular veins; brachial or femoral arteries; anterior fontanelle and central venous pressure lines. Collection of non-blood aspirates, tissue for histology, PAP smears and swabs requiring specialised knowledge and/or skills i.e., urethral, vaginal swabs.

#### Specific outcomes

On completion of this section the student should be able to:

- ☉ Interact with patients and all personnel in a professional and ethical manner at all times.
- ☉ Identify the patient/donor and obtain informed consent prior to sample collection/specialised testing process in accordance with prescribed protocol.
- ☉ Obtain and record the required patient/donor demographics and clinical data according to the protocols of the workplace.
- ☉ Demonstrate full knowledge of the pre-collection limitations applicable to the required specimen and testing process.

**Range - Pre-collection limitations include but are not limited to:**

<ul style="list-style-type: none"><li>☀ Timing of specimen collection</li><li>☀ Dietary requirements</li><li>☀ Basal state</li></ul>	<ul style="list-style-type: none"><li>☀ Drug/chemical intake</li><li>☀ Sexual abstinence as applicable</li><li>☀ Suitability of the donor through application of risk assessment protocols</li></ul>
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- ☉ Demonstrate knowledge of the purpose and safe use of all equipment used in the collection of all specimen types and specialized testing procedures within the scope of practice.
- ☉ Select and prepare all required equipment.
- ☉ Demonstrate full knowledge of the type and safe use of preservatives and/or additives required to ensure optimum specimen requirements are met for the type of specimen and requested test.
- ☉ Assess and record any factors relating to the quality of the specimen/blood pack.
- ☉ Collect all specimens from the appropriate site using aseptic techniques according to laboratory procedures for the specimen type and requested test.
- ☉ Follow appropriate infection control procedures throughout the full process of specimen collection.

**Range:**

<ul style="list-style-type: none"><li>☀ Surgically clean hand washing techniques pre- and post-collection</li><li>☀ Cleansing of site using aseptic techniques applicable to specimen requirements</li><li>☀ Prevention of accidental exposure to blood borne pathogens</li></ul>	<ul style="list-style-type: none"><li>☀ Hospital isolation and cross infection</li><li>☀ Discarding of medical and general waste</li></ul>
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- ⊙ Position and prepare the patient/donor for the procedure according to the site chosen, the test to be performed and related safety requirements.
- ⊙ Demonstrate full knowledge of factors which may affect the quality of the specimen arising either pre-, post or during specimen collection and apply appropriate actions to avoid their occurrence.

**B. Collect blood for medical pathology and blood transfusion**

**Objective**

Train students in the collection of venous, capillary and radial arterial blood samples from adults, children and babies for medical pathology and blood transfusion purposes.

**Specific Outcomes**

**i. Prepare for venous and capillary blood collection** (See (iii) for arterial blood collection.)

On completion of this section the student should be able to:

- ⊙ Demonstrate full knowledge of the anatomy of the arm relevant to phlebotomy – veins used for venipuncture, bones, nerves, muscles and arteries located near venipuncture sites.
- ⊙ Identify the appropriate collection site and collection method according to venous accessibility of the individual patient/donor and required specimen.

**Range:**

<p><b>Sites:</b></p> <ul style="list-style-type: none"><li>☀ Preferred, lesser preferred and sites which may not be accessed for venous and capillary punctures</li></ul>	<p><b>Collection methods:</b></p> <ul style="list-style-type: none"><li>☀ Evacuated, non-evacuated and capillary collections</li><li>☀ Capillary collections include heel and finger prick - tube and blood spot collections.</li></ul>
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- ⊙ Demonstrate knowledge of pre-existing conditions which would exclude sites from selection for venous and capillary puncture.

**Range: Conditions include but are not limited to:**

<ul style="list-style-type: none"><li>☀ Intra-venous infusion</li><li>☀ Haematoma</li><li>☀ Side of mastectomy</li></ul>	<ul style="list-style-type: none"><li>☀ Presence of scar tissue</li><li>☀ Oedema</li><li>☀ Infection</li></ul>
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Demonstrate full knowledge of the selection of the correct additives to use, their function and correct mixing procedures to ensure optimum specimen integrity is met for the requested test.

**Range: Additive include but are not limited to:**

<ul style="list-style-type: none"><li>✿ Tri-sodium citrate</li><li>✿ Clot activator</li><li>✿ Gel separator</li><li>✿ Lithium heparin</li><li>✿ Sodium heparin</li></ul>	<ul style="list-style-type: none"><li>✿ Thrombin</li><li>✿ Sodium polyanethol sulfonate</li><li>✿ Acid citrate dextrose</li><li>✿ EDTA</li><li>✿ Sodium fluoride</li><li>✿ Potassium oxalate</li></ul>
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- ⊙ Demonstrate full knowledge of the complications that may arise when collecting specimens at the different sites.

**ii. Blood collection**

On completion of this section the student should be able to:

- ⊙ Demonstrate full knowledge and use the correct order of draw when multiple additive tubes are to be utilized for multiple test requests.
- ⊙ Use the correct technique to access the selected vessels for venipuncture or site for dermal puncture.
- ⊙ Apply special considerations for the collection of blood from babies, with range from Neonates (0 to 28 days old), infant (29 days to 1 year), toddler (1 year to 4 years), children, the elderly and physically disadvantaged.
- ⊙ Manage venepuncture complications which may arise.

**Range:**

<ul style="list-style-type: none"><li>✿ Difficulty in finding veins</li><li>✿ Infection</li><li>✿ Nerve damage</li><li>✿ Inadvertent arterial puncture</li><li>✿ Backflow of anti-coagulants</li><li>✿ Vein damage</li><li>✿ Failure to stop blood flow</li></ul>	<ul style="list-style-type: none"><li>✿ Iatrogenic anaemias</li><li>✿ Haemoconcentration</li><li>✿ Haemolysis</li><li>✿ Partially filled tubes</li><li>✿ Specimen contamination</li><li>✿ Failure to obtain blood</li></ul>
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- ⊙ Manage dermal puncture complications which may arise.

**Range:**

<ul style="list-style-type: none"><li>✿ Bruising</li><li>✿ Infection</li><li>✿ Haemolysis</li></ul>	<ul style="list-style-type: none"><li>✿ Poor blood flow</li><li>✿ Contaminated specimen</li></ul>
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- ⊙ Demonstrate full knowledge of, and apply, appropriate corrective actions in the event of inadequate blood flow.
- ⊙ Demonstrate full knowledge of potential adverse patient/donor reactions which may occur at any time during the procedure, the underlying cause and the appropriate corrective action to apply.

**Range: Adverse reactions include but are not limited to:**

<ul style="list-style-type: none"><li>✿ Syncope</li><li>✿ Haematoma</li><li>✿ Excessive pain</li><li>✿ Skin reaction</li></ul>	<ul style="list-style-type: none"><li>✿ Excessive post-puncture bleeding</li><li>✿ Nausea/vomiting</li><li>✿ Seizures/convulsions</li><li>✿ Anaphylactic shock</li></ul>
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- ⊙ Measure and record patient/donor vital signs as required by protocol.
- ⊙ Stem the blood flow post collection according to protocol.

### iii. **Arterial blood collection**

On completion of this section the student should be able to:

- ⊙ Describe and apply knowledge of the radial arterial site and the proximity of bone, nerves and tendons to the site.
- ⊙ Demonstrate full knowledge of the relevance of recording patient temperature, oxygen usage and exercise prior to the test.
- ⊙ Perform Allen's test to verify integrity of arterial circulation.
- ⊙ Apply aseptic technique throughout the procedure of safe withdrawal of blood from the radial artery.
- ⊙ Describe and apply the procedures for the maintenance of sample integrity pre-analysis.

**Range - Procedures for maintenance of integrity include:**

☀ Use of appropriate additive in syringe	☀ Expulsion of air
☀ Mixing	☀ Cooling

- ⊙ Demonstrate full knowledge of potential adverse patient reactions which may occur at any time during the procedure, the underlying cause and the appropriate corrective action to apply.

**Range - Adverse reactions include but are not limited to:**

☀ Arterial spasm	☀ Skin reaction
☀ Syncope	☀ Excessive post-puncture bleeding
☀ Haematoma	☀ Nausea/vomiting
☀ Excessive pain	☀ Seizures/convulsions

- ⊙ Measure and record patient vital signs as required by protocol
- ⊙ Stem the blood flow post collection according to protocol.

## C. **Collection of non-blood specimens**

### **Objective**

Instruct the student in the procedures to follow when receiving, collecting or instructing patients in the self-collection of non-blood specimens.

#### ***i. Instruct the patient in the self-collection of the required specimen/s.***

On completion of this section the student should be able to:

- ⊙ Communicate instructions regarding self-collection of non-blood specimens to patients.
- ⊙ Ensure understanding of the procedure, labelling requirements, specified limitations, safe use of any required equipment and chemicals through verbal questioning.

#### ***ii. Assess the suitability of a specimen collected by a patient.***

On completion of this section the student should be able to:

- ⊙ Apply appropriate questioning technique to the patient to assess compliance with given instructions.
- ⊙ Demonstrate knowledge of the criteria to apply to the visual assessment of the specimen to ensure optimum suitability.

**Range – Criteria include:**

✿ Macroscopic appearance of specimen ✿ Type of container	✿ Quantity of specimen ✿ Labelling of container
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**D. Specialised phlebotomy procedures**

**Objective**

Provide the student with the knowledge and skills to perform specified specialised phlebotomy procedures which deviate from routine blood collection.

**Range - Specialized procedures within scope of practice are:**

✿ Glucose and lactose tolerance tests including the oral administration of glucose or lactose as per dosages specified in prescribed protocol ✿ Collection of specimens for blood culture	✿ Bleeding time ✿ TB skin testing including the administration of intradermal purified protein derivative (PPD)
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***NOTE: The following are specifically excluded from the scope of practice:***

Administration of intramuscular or intravenous drugs that may be required during the test procedures.

**Specific outcomes**

***i. Perform tolerance tests.***

On completion of this section the student should be able to:

- ⊙ Demonstrate knowledge of the pre-test fasting requirements.
- ⊙ Demonstrate knowledge of, and apply, the criteria to be met prior to administration of glucose or lactose as per specified dosage.
- ⊙ Explain possible adverse reactions to the ingestion of glucose or lactose and the appropriate actions to take should they occur.
- ⊙ Apply appropriate pre-determined time intervals when taking specimens to completion of the tolerance test.

***ii. Collect samples for blood culture.***

On completion of this section the student should be able to:

- ⊙ Demonstrate knowledge of the relevance of documenting anti-microbial therapy.
- ⊙ Apply specific aseptic technique and use appropriate sterile equipment for the collection of blood culture specimens.

***iii. Perform a bleeding time test.***

On completion of this section the student should be able to:

- ⊙ Demonstrate knowledge of the coagulation process (haemostasis) relevant to the bleeding time test.
- ⊙ Demonstrate knowledge of potential technical errors and how they would impact on the bleeding time test result.
- ⊙ Demonstrate knowledge of pre-existing conditions which would exclude sites from selection for performing the bleeding time.



**Range: Sites to exclude include but are not limited to:**

<ul style="list-style-type: none"><li>✿ Intra-venous infusion sites</li><li>✿ Side of mastectomy</li><li>✿ Presence of superficial veins</li><li>✿ Haematoma</li></ul>	<ul style="list-style-type: none"><li>✿ Scar tissue,</li><li>✿ Oedema</li><li>✿ Infection</li></ul>
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**iv. Perform TB skin prick testing**

On completion of this section the student should be able to:

- ⊙ Demonstrate knowledge of the cause TB and how the disease is spread.
- ⊙ Demonstrate understanding of and ability to explain the reason for performing the TB skin test.
- ⊙ Explain the contra-indications and side effects of the TB skin prick test.

**Range - Contra-indications include but are not limited to:**

<ul style="list-style-type: none"><li>✿ Use of beta-blockers and angiotensin-converting enzyme inhibitors</li><li>✿ Pregnancy</li><li>✿ Previous positive TB test or history of TB</li></ul>	<ul style="list-style-type: none"><li>✿ Recent vaccination for measles, mumps, polio or rubella</li><li>✿ Currently on steroids</li><li>✿ Severe malnutrition</li></ul>
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- ⊙ Perform the intra-dermal injection of the purified protein derivative (PPD) according to protocol.
- ⊙ The recording of the reaction measurement and record according to protocol

**E. Miscellaneous functions**

**Specific outcomes**

On completion of this section the student should be able to:

- ⊙ Assist nurses, doctors or pathologists with medical procedures which may include the preparation of equipment, care of the patient before, during and after such procedure.

**Range – Medical procedures include:**

<ul style="list-style-type: none"><li>✿ PAP Smear collection</li><li>✿ Skin Biopsy collection</li><li>✿ Bone Marrow aspiration</li></ul>	<ul style="list-style-type: none"><li>✿ Fine Needle aspiration</li><li>✿ Stimulation Tests</li></ul>
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**NOTE: Excludes the making of smears**

- ⊙ Perform short medicals for insurance purposes.
- ⊙ Complete the Short Medical Reports for the Insurance company.

**F. Post collection requirements**

**Specific outcomes**

On completion of this section the student should be able to:

- ⊙ Dispose of all medical and general waste in accordance with protocol
- ⊙ Complete all documentation as required by protocol.
- ⊙ Record patient/donor details on specimen/blood pack labels according to protocol.
- ⊙ Prepare specimens/blood packs for transit to testing or storage sites in accordance with protocols relevant to the specimen type

## 9. WORK IN A BLOOD DONOR CLINIC

### **Objective**

Provide the student with the knowledge and skills required to work in a blood transfusion donor clinic environment in either a mobile or fixed clinic.

### **Specific outcomes**

#### ***i. Blood transfusion regulations and donor acceptance criteria***

On completion of this section the student should be able to:

- ⊙ Explain the contents of the current Standard of Practice for Blood Transfusion in South Africa.
- ⊙ Describe the criteria for the acceptance of blood donors.

#### ***ii. Blood products, tests and collection procedures***

On completion of this section the student should be able to:

- ⊙ Demonstrate knowledge of the type of tests that are performed on donated blood.
- ⊙ Demonstrate knowledge of the different blood products, their use and storage requirements.

#### **Range - Blood products include but are not limited to:**

☀ Whole blood	☀ Coagulation factors
☀ Red blood cells	☀ Immunoglobulin
☀ Platelets	☀ Albumin
☀ Fresh frozen plasma	☀ Cryoprecipitate

- ⊙ Describe the relevant collection procedure for the individual product.

#### **Range – Procedures include:**

☀ Autologous,	☀ Homologous
☀ Plasmapheresis	☀ Directed donation
☀ Cytapheresis	☀ Therapeutic Apheresis

#### ***iii. Work in a blood donation clinic***

On completion of this section the student should be able to:

- ⊙ Organize educational materials appropriately to ensure the public has maximum exposure to information.
- ⊙ Set up the clinic according to protocol.
- ⊙ Monitor the flow of blood donors through the clinic.
- ⊙ Address donor concerns.
- ⊙ Store and transport blood and blood products to a processing facility.

## 10. POINT OF CARE TESTING

### Objective

Provide students with the knowledge and skills to use point of care (POC) biomedical instrumentation and rapid test kits competently.

### Range:

<b>Test performed on POC instruments:</b>	<b>Rapid test kits:</b>
<ul style="list-style-type: none"><li>☀ HBA1C</li><li>☀ Cardiac Enzymes – Myoglobin, CKMB Mass, Trop I/T</li><li>☀ Lipogram – Cholesterol, Triglyceride, HDL, LDL</li><li>☀ β-HCG</li><li>☀ D-dimer</li><li>☀ PCT</li><li>☀ CRP</li><li>☀ INR</li><li>☀ Blood Gas</li><li>☀ COVID19 antigen test</li></ul>	<ul style="list-style-type: none"><li>☀ HIV</li><li>☀ Malaria</li><li>☀ Glucose</li><li>☀ RPR</li><li>☀ PCT</li><li>☀ Blood groups and Rh</li><li>☀ Urine dipsticks</li><li>☀ Pregnancy test</li><li>☀ Haemoglobin</li></ul>

### Specific Outcomes

#### ***Use of the POC instruments and rapid test kits***

On completion of this section the student should be able to apply the following to all POC and rapid test kits in the specified ranges:

- ⊙ Describe the principle of operation of the POC instrumentation.
- ⊙ Demonstrate basic knowledge of the reference ranges for all of the tests in the range.
- ⊙ Follow the correct procedures when handling critical/life threatening results.
- ⊙ Demonstrate a basic knowledge of the clinical significance of the test requested
- ⊙ Operate all instruments and utilize test kits optimally in accordance with the recommended procedures.
- ⊙ Apply the correct safety precautions during the operation and maintenance of instruments.
- ⊙ Demonstrate full knowledge of, and apply, the correct maintenance, service and calibration requirements.
- ⊙ Conduct applicable decontamination procedures.
- ⊙ Describe the principle of the test process of the rapid test kit
- ⊙ Follow the appropriate quality control procedures to ensure optimal operation.
- ⊙ Describe and implement troubleshooting procedures when optimal operation is not demonstrated by the quality control results.
- ⊙ Demonstrate full knowledge of, and maintain, all instrument records and documentation required for good laboratory practice.
- ⊙ Describe the limitations of the instruments and test kits.
- ⊙ Record all patient and quality control results in accordance with laboratory procedures.

## 11.APPENDICES

### 11.1 RECOMMENDED TEXTBOOKS

- © Phlebotomy Essentials by Ruth E McCall and Cathee M Tankersley – 7<sup>th</sup> Edition
- © Phlebotomy Essentials Workbook by Ruth E McCall and Cathee M Tankersley – 7<sup>th</sup> Edition

#### **THE FOLLOWING BOOKS ARE USED FOR EXTRA STUDY AND NOT AS A GUIDELINE WHEN MARKING EXAM PAPERS**

- © Phlebotomy Handbook – blood collection essentials by Diana Garza and Kathleen Becan – McBride
- © Phlebotomy Technician Specialist – A practical guide to Phlebotomy by Kathryn A Kalanick
- © Phlebotomy Worktext and Procedures Manual by Sommer Warekois
- © Medical Terminology for students of the health professions - Author: JP Bosman, JPK Kritzing, JH Meiring, CJ Schumann, PH Abrahams, LM Greyling
- © Stedmann's concise medical dictionary (or any suitable medical dictionary)
- © Anatomy and Physiology for Nursing and Health Professionals, 2009. Bruce Colbert, Jeff Ankney, Karen Lee, Martin Steggall and Maria Dingle. Published by Pearson Higher Education. – THIS BOOK IS NO LONGER AVAILABLE COMMERCIALY
- © ISTB Science Series – Introduction to blood transfusion technology by B Armstrong, J Hardwich, L Raman, E Swart, R Wilkinson.
- © Phlebotomy technician specialist by Kathryn A Kalanick
- © Phlebotomy Worktext and procedures manual by Sommer Warekois

## **PORTFOLIO OF EVIDENCE**

The portfolio of evidence is proof that you have performed the minimum number of supervised procedures prior to your final competency assessment.

This portfolio must be carried to work with you daily.

Please enter in numerical order the patient requisition number for the number of bleeds supervised in the appropriate blocks, together with the name and signature of the person that has supervised you.

Your portfolio will be collected monthly by your allocated practical trainer and each procedure will be inspected to check that procedures were performed as per the required standard operating procedure under supervision.

A final competency assessment will only be carried out once you have completed your portfolio.

Please adhere to the minimal numbers for each procedure as per below:

### **BLOOD COLLECTION**

- Evacuated tube system – 50
- Evacuated tube system – Blood Transfusion - 10
- Syringe attached to needle or winged infusion set - 10
- Winged Infusion set -10
- Paediatric Venepuncture -10

### **CAPPILLARY PUNCTURE**

- Dermal punctures (Heel and/or Finger prick) -10

### **SPECIAL PROCEDURES**

- Blood cultures -20
- Glucose/Lactose Tolerance Tests -10
- Bleeding Time -5
- Collection from arterial lines

### **POINT OF CARE (POC)**

- Malaria - 5
- RPR - 5
- HIV - 5
- Haemoglobin - 5
- Blood group and Rh factor - 5
- Glucose - 5
- BHCG - 5
- Skin tests/PPD(Mantoux) - 3
- Urine dipstick - 5
- Radial Arterial Blood gas – 10
- CRP - 5
- INR – 5
- COVID19 Antigen test – 5
- HBA1C – 5
- Cardiac Enzymes – 5
- Lipogram - 5
- D-dimer – 5
- PCT - 5

**NON-BLOOD SPECIMENS**

- 24hr urine collection - 5
- Clean catch - urine male and female – 5
- Catheter urine – 5
- Paediatric urine collection - 5
- Semen - 5
- Sputum - 5
- Stool - 5
- Throat swabs – 5
- Pus swab - 5
- Nasopharyngeal swabs – 5
- Environmental swabs – 5
- Rectal Swabs – 5
- Skin allergy test – 5
- Nail & hair collection/scraping - 5

**BLOOD COLLECTION**

**Evacuated Tube System**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.


**Evacuated Tube System – SANBS**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.


**Syringe attached to needle or winged infusion set**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.


**Winged infusion set**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.


**Paediatric Venepuncture**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.


**CAPILLARY PUNCTURE**

**Dermal punctures (Heel and/or finger prick)**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.


**SPECIAL PROCEDURES**

**Blood Cultures**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.


**Glucose/Lactose Tolerance tests**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.


**Bleeding Time**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**Collection of samples from Arterial Line**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.


**NON-BLOOD SPECIMENS**

**24-hour urine collection**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**Clean catch urine – male & female**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**Urine - Catheter collection**

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**Paediatric Urine - Collection**

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**Semen**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**Sputum**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**Stool**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**Throat Swab**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**Pus Swab**

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**Rectal Swab**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**Nasopharyngeal Swab**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**Nail/Hair Collection/Scraping**

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**Environmental Swab**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**Skin Allergy Test**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**POINT OF CARE TESTING**

**Malaria**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**RPR**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**HIV**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**Haemoglobin**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**Blood Group and Rhesus factor**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**Glucose**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**BHCG**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**CRP**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**INR**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**COVID19 Antigen Test**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**HBA1C**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**CARDIAC ENZYMES**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**LIPOGRAM**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**D-DIMER**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**PCT**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**Skin tests – PPD (Mantoux)**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.

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**Radial arterial blood gas**

Please enter the date, patient requisition number, supervisor name and signature in the blocks below.
