

User Guide for Clinical Specimen Collection



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1.0 ABBREVIATIONS

Sr. No.	Abbreviation	Full Name
1.	a.P.T.T.	Activated - Partial Thrombin Time
2.	Beta-hCG	Human chorionic gonadotropin
3.	CSF	Cerebro-spinal fluid
4.	DOS	Directory of services
5.	EDTA	Ethylene diamine tetra acetic acid
6.	FNAC	Fine needle aspiration cytology
7.	GTT	Glucose Tolerance Test
8.	HIV	Human immunodeficiency virus
9.	I.V.	Intravenous
10.	i-PTH	Intact - Para Thyroid Hormone
11.	P.T.	Prothrombin Time
12.	SST	Serum separating tube
13.	TRF	Test requisition form

2.0 Overview

Phlebotomy – the drawing of blood – has been practiced for centuries and is still one of the most common invasive procedures in health care. However, practice varies considerably between countries, and between institutions and individuals within the same country. These differences include variations in blood-sampling technique, training (both formal and “on-the job”), use of safety devices, disposal methods, reuse of devices and availability of hepatitis B vaccine. *Valid laboratory results are dependent upon proper specimen collection and handling prior to the arrival of the sample in the laboratory.*

The following is a basic phlebotomy procedure, followed by procedures specific for each type of collection.

3.0 Phlebotomy procedure

3.1 Prerequisites for specimen draw:

- 3.1.1 Test requisition form:** The patient must have TRF written by its treating/referring clinicians mentioning following mandatory details clearly:

Patient's name, age, gender, tests required, clinical history (wherever appropriate) and sign / stamp of clinician. Any missing information must be completed by communicating with treating/referring clinician. Any special patient's requirement (e.g. fasting condition, consenting & counseling, physical disposition) for laboratory test is clarified by receptionist before registration is executed. *It is mandatory to take written consent from patient in case HIV or FNAC test is prescribed. The referring laboratory is responsible to take consent of patient for HIV testing before the sample is drawn and sent to the referral laboratory.* For self-referring patients, one copy of bill receipt will be acknowledged & signed by patient, and is retained with “self-referred” remarks by reception staff.

- 3.1.2 Phlebotomist preparation for blood draw:** Phlebotomist must have following materials readily available & accessible before drawing blood sample.

3.1.2.1 Venipuncture collection only:

- Tourniquet, discard if visibly soiled, Do not clean tourniquets
- Vacutainer safety needles
- Winged collection (butterfly) safety needles
- Syringe
- Needle holder
- Safety blood transfer device
- Vacutainer collection tube(s)
- Blood culture bottles

3.1.2.2 Capillary collection only:

- Safety lancets
- Microtainer tube and extender
- Microhematocrit tubes and sealant
- Heel warmer (or moist compress) – used for heel sticks

3.1.2.3 General collection supplies:

- 70% Isopropyl alcohol wipes
- Betadine or iodine – for infant blood cultures or blood alcohol collections
- Gauze squares
- Adhesive bandages – gauze or paper tape preferred, shall never be applied to patients younger than 2 years unless the patient is under close observation until the bandage is removed. Small children may choke on bandages.
- Disposable gloves – proper fit is important for safety. If too small, the gloves may tear. If too large, items may be more easily dropped. Replace gloves immediately when ripped, torn or contaminated (soiled or wet). Do not wash or disinfect gloves for reuse.

3.1.3 Phlebotomy Safety:

- Gloves are to be worn when performing all phlebotomy procedures. Gloves are not to be altered. The use of straight, non-safety needles is prohibited.

- Dispose of all sharps immediately after use sharps container. Needles are to be used only once and never recapped. Do not bend or break needles or remove them from disposable syringes or holders.

Table 1 Laboratory waste segregation

Color code	Type of Waste
	General non-infectious waste.
	Sharp metal material like needle, blade etc. in puncture proof, leak proof & temper proof container.
	Waste glassware in cardboard boxes with blue marking
	Infectious recyclable plastic waste
	Infectious - anatomical, solid items contaminated with blood / body fluids, chemical; medicines; liquid waste to be pre-treated with disinfectant.

3.2 Patient preparation & blood draw procedure:

3.2.2 Patient identification & preparation:

- 3.2.2.1 Verify patient's identity by asking him / her full name as on TRF.
- 3.2.2.2 Examine the patient's arms and obtain information from the patient as to phlebotomy restrictions (i.e., patient's choice of arms, limitations due to surgeries, nerve damage, mastectomies, etc.).
- 3.2.2.3 A physician order is required to draw from the same side as a mastectomy or from a foot vein on patients older than 2.
- 3.2.2.4 Inform the patient of the procedure(s) that you are about to perform and obtain their permission and cooperation.

Situations/conditions where the patient is uncooperative should be referred to the pathologists or guardian who is in charge of their care (an ordering physician, or in the case of children, a parent or guardian).

- 3.2.2.5 Perform phlebotomy once the patient or patient's guardian is set.

3.2.3 Patient Instructions for sample requirements:

- 3.2.3.1 **Fasting Plasma Glucose:** Fasting period of 8-10 hours required. Blood & first voided midstream morning urine for urine glucose.

- 3.2.3.2 **Postprandial Plasma Glucose:** Blood and urine specimens collected at 2 hours after completion of meals.

- 3.2.3.3 **Lipid Profile:** 8 – 10 hours of fasting required.

- 3.2.3.4 **Glucose Tolerance Test (GTT):** The patient should be on a balanced diet (containing normal daily requirement of carbohydrates approximately 300 mg) at least for 2 to 3 days prior to the test. Patient must come to the laboratory after adhering to 8 to 10 hours fasting period. Patient must collect a fasting midstream urine specimen in a clean dry container and submit it.

- 3.2.3.5 Since subsequent samples have to be collected at an interval of one hour/30 minutes each, the patient has to be made aware of the waiting period of 2 to 3 hours in fasting condition at the pathology department.

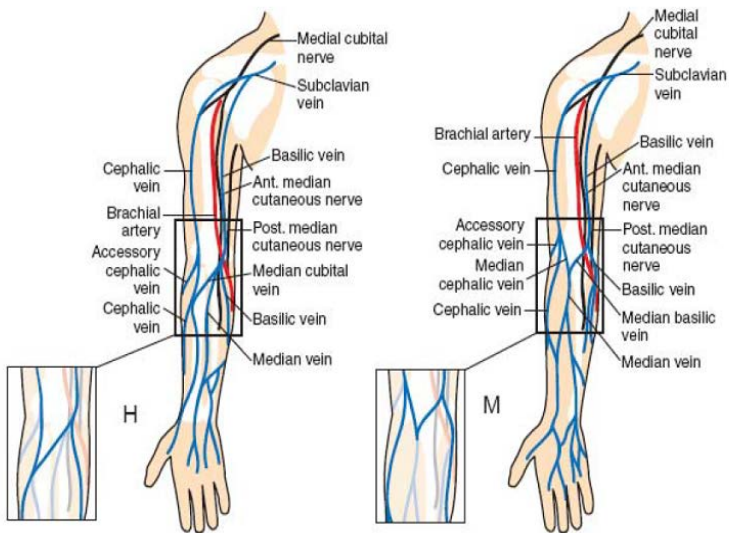
The patient must be given 75 grams of Glucose. The time is noted down for intake of glucose. For pregnant patient 100 grams of glucose shall be given. Two Blood specimen and urine specimen are collected at one hourly interval for subsequent two hours for GTT 2 samples & at 30 minutes interval for subsequent five hours for GTT 5 samples. At every interval one blood specimen and urine specimen is collected. Each of these specimens is labelled appropriately indicating specimen type and time of collection. Fasting

Blood Specimen must be collected in the grey top sodium Fluoride Vacutainer to a full draw and fasting urine specimen must be collected in clean urine container.

3.2.4 Venipuncture procedure:

- 3.2.4.1 Prepare patient as defined under "Patient Identification & preparation" section.
- 3.2.4.2 Position or instruct the patient so that the patient's arm is comfortably extended. Phlebotomy should never be performed while the patient is standing.
- 3.2.4.3 Wash hands with 7 step medical hand washing procedure or sanitize hands with handrub. Put on properly fitting gloves.
- 3.2.4.4 Apply the tourniquet 3 to 4 inches above the venipuncture site with enough tension to compress the vein, but not the artery.
- 3.2.4.5 Palpate or feel for the vein even when it can be seen.

Figure 1 Selection of Vein during Phlebotomy



- 3.2.4.6 If a vein is difficult to find, it may become easier to see after

massaging the arm from the wrist to elbow, which forces blood into the vein. You may need to examine the patient's other arm if you are having difficulty finding a vein. You may select a dorsal hand or wrist vein and collect with a smaller gauge needle (22g or 23g).

- 3.2.4.7 Release the tourniquet. Hemoconcentration will occur after one minute.

NOTE: *If a tourniquet has been applied for longer than one minute while you searched for a vein, release it for at least two minutes, reapply the tourniquet and relocate the vein.*

- 3.2.4.8 Cleanse the area for venipuncture in a circular motion from the center to outward with a 70 % isopropyl alcohol pad. Allow to air dry.

- 3.2.4.9 Reapply tourniquet.

- 3.2.4.10 Anchor the vein by placing your free thumb below the venipuncture site where the needle is to enter and pull skin taut.




a) Method: Vacutainer system (Close draw system):



1. Introduce the Vacutainer needle apparatus with the bevel up at a 15- to 30-degree angle to the skin and parallel to the vein.
2. Once the needle is properly positioned in the vein, anchor the needle by grasping the holder with thumb on top and other fingers under the holder, resting securely on the patient's arm. Push the appropriate Vacutainer tube into the holder with gentle pressure in order to puncture the cap. The tube will automatically fill with blood.
3. Watch the blood as it flows into the Vacutainer tube until collection is complete.
4. For draws requiring multiple tubes, the tubes must be drawn as per order of draw (Refer Table 2):
5. Gently invert all tubes 5 - 10 times after filling (as per company's Vacutainer mixing chart).
6. Label specimen tubes before leaving the patient with barcode or name, age, date & time.
7. **Compare the labeled specimen(s) to the patient's identification**



number, requisition or ask the patient to confirm the tube is properly labeled with the correct spelling of first and last name.

8. Wash hands thoroughly after removing gloves.

Table 2 Tube Chart & Order of Draw

Tube Type and Order	Common Tests	Collection Instructions
 <p>Blood Cultures</p>	<p>Microbiology: Septicemia, Toxaemia and bacterial culture.</p>	<p>Aerobic (green) bottle MUST be collected first then Anaerobic (Orange). Pediatric Collection - Yellow bottle only. <u>Mix the specimen with gentle agitation.</u> Label bottles with Patient's full name, date of birth, date & time of collection and barcode.</p>
 <p>Sodium Citrate (BLUE)</p>	<p>Haematology: Prothrombin times, Coagulation Studies, INR, Factor VIII, Lupus Anticoagulant, D-Dimer, Protein C+S, APC, AT3, PFA100 (Platelet Function Test)</p>	<p>Note: Correct volume critical. See marker level on tube INVERT tube GENTLY 6-8 times after collection.</p>
 <p>Plain (RED)</p>	<p>Biochemistry : Therapeutic Drugs and Antibiotics, Serum Copper</p>	<p>INVERT tube GENTLY 6-8 times after collection</p>

Tube Type and Order	Common Tests	Collection Instructions
 <p>SST (GOLD)</p>	<p><u>Biochemistry:</u> Lipids, LFT's U/E, Creatinine, SUA, Cardiac Enzymes, Amylase, Calcium, Phosphate, Ionised Calcium, Protein Assays, TFT, βHCG Iron Studies, C Reactive Protein, B12, PSA, Insulin Endocrinology – Hormones</p> <p><u>Serology / Immunology:</u> Hepatitis A, B, C, Allergy, Rubella, Rheumatoid Factor, EPG, HIV, ANA, Viral antibodies, Syphilis.</p>	<p>Collect extra tube for Hepatitis Serology or HIV Collect extra tube for Endocrinology Collect dedicated tube for Ionised Calcium- Seal and do not open prior to testing.</p> <p><u>For Creatinine Clearance: Collect tube when 24hr urine is collected.</u></p>
 <p>Lithium Heparin (GREEN)</p>	<p><u>Cytogenetics, Biochemistry:</u> Cholinesterase, Red cell & Insecticide - Organochlorines</p>	<p>INVERT tube GENTLY 6-8 times after collection</p>

Tube Type and Order	Common Tests	Collection Instructions
 <p>EDTA (PURPLE)</p>	<p>Haematology : FBC, Blood Film, Hb, WCC, Diff, Platelets, blood group, Hb Electrophoresis (EPG), Glycated Hb (HbA1C), T&B Cells, ESR, Malaria Parasites (Thick & Thin Films), IM (Infectious Mononucleosis)</p> <p>Biochemistry : Red cell Folate, Carboxy - Hb, Manganese, Ammonia, Homocysteine, Troponin / Beta HCG (AQT90 – Regional and Perth peripheral labs)</p>	<p>INVERT tube GENTLY 6-8 times after collection</p>
 <p>Fluoride Oxalate (GREY)</p>	<p>Biochemistry : Glucose, Alcohol, Lactate</p>	<p>INVERT tube GENTLY 6-8 times after collection</p>

b) Method: Winged Collection (Butterfly) with Evacuated Tubes or Syringe (Open draw system):

NOTE: *This method is used primarily for difficult draws, hand draws, infant draws and blood culture collections. For pediatric and neonatal patients, The choice of site and procedure (venous site, finger-prick or heel-prick – also referred to as “capillary sampling” or “skin puncture”) will depend on the volume of blood needed for the procedure and the type of laboratory test to be done.*

1. Prepare patient as defined under “Patient Identification & preparation”

section. Perform phlebotomy with winged butterfly set using a Vacutainer holder or remove the luer lock at the end of the butterfly tubing and attach a syringe. Use a winged steel needle, preferably 23 or 25 gauge.

2. Wash hands. Put on properly fitting gloves.
3. Select the puncture site for pediatric or neonatal patients – heel or finger. In heel-pricks, the depth should not go beyond 2.4 mm. For premature neonates, a 0.85 mm lancet is available. The distance for a 7 pound (3 kg) baby from outer skin surface to bone is: a) medial and lateral heel – 3.32 mm; b) posterior heel – 2.33 mm (this site should be avoided, to reduce the risk of hitting bone); c) toe – 2.19 mm. The recommended depth for a finger-prick is: a) for a child over 6 months and below 8 years – 1.5 mm; b) for a child over 8 years – 2.4 mm.
4. Immobilize the baby or child with the help of another phlebotomist and parents. Ask the immobilizer to stretch an arm across the table and place the child on its back, with its head on top of the outstretched arm; pull the child close, as if the person were cradling the child; grasp the child's elbow in the outstretched hand; use their other arm to reach across the child and grasp its wrist in a palm-up position.
5. Holding the wings of the butterfly with your dominant hand, smoothly insert the needle with the bevel up, parallel to the vein, at approximately a 10- to 15-degree angle.
6. Once the needle is properly positioned in the vein, hold one wing of the winged collection set and insert evacuated tubes using the vacutainer holder according to the order of draw. For syringe draws, gently pull on the plunger to allow blood to flow into syringe. Pulling on the plunger too fast may cause possible collapse of the vein and restrict blood flow into the syringe and/or hemolyze the sample.
7. When sufficient blood has been collected, release tourniquet within

one minute.

8. Place gauze over the site, and remove the needle from the patient's arm. Activate the safety feature of the device.
9. Apply pressure to the site until bleeding has stopped.
10. Discard the holder and butterfly device into a sharps container.
11. If a syringe was used with the butterfly, properly discard butterfly device into a sharps container, and attach a transfer device to the syringe. Fill the appropriate tubes without applying force on the plunger.
12. The order in which vacutainer tubes are filled from the syringe is the same as for the vacutainer system.
13. Inspect the puncture wound. When the bleeding has stopped completely, apply a bandage. If bleeding continues, apply pressure for an additional three-five minutes. Prolonged bleeding may be related to the patient's disease or medication.
***Exception:** A bandage should never be applied to patients younger than 2 years unless the patient is under close observation by an adult until the bandage is removed. Small children may choke on bandages. If a bandage is applied, instruct the adult to remove it within two hours.*
14. Label specimen tubes before leaving the patient as defined in the labeling section of this procedure.
15. **Compare the labeled specimen(s) to the patient's identification number, requisition or ask the patient to confirm the tube is properly labeled with the correct spelling of first and last name.**
16. Wash hands thoroughly after removing gloves.

c) Blood culture procedure:

NOTE: *Each set of blood cultures requires a separate venipuncture.*

1. Prepare patient as defined in "Patient Identification & preparation"

section.

2. Wash hands. Put on properly fitting gloves.
3. Cleanse the rubber stoppers on the blood culture bottle(s) with 70 % isopropyl alcohol. Do not use Betadine. Allow to air dry completely.
4. Apply tourniquet and select venipuncture site.
5. Remove tourniquet, Cleanse the area for venipuncture in a circular motion from the center to outward with a 70% isopropyl alcohol pad. Cleanse the site again with iodine in a circular motion from the center outward and followed by 70% isopropyl alcohol. Allow to air dry for 1 minute.
6. The site must dry completely. Do not palpate or blow on the vein after it has been disinfected. For newborns, allow the iodine to dry at least one minute and then remove with sterile water prior to venipuncture.
7. Reapply tourniquet and perform the venipuncture following procedures described on preceding page using a winged collection needle and sterile syringe obtaining up to 20 ml blood. For newborns, draw 0.5 to 1.0 ml blood. **Refer label for required blood draw volume on blood culture vial.**
8. Perform the venipuncture without retouching the site.
9. If absolutely necessary to palpate the site of venipuncture, put on sterile gloves after swabbing the site.
10. If multiple specimens for testing need to be obtained at the same time, draw blood cultures first with the syringe attached, or attach a second syringe to collect blood for other samples. A vacutainer adapter may be attached if necessary to draw the remainder of the samples.
11. Release the tourniquet (within one minute), place gauze square over the puncture site and withdraw the needle. Activate the safety device of the butterfly.
12. Remove safety activated winged collection set from the syringe and put into the sharps container.

13. Apply a blood transfer device to the syringe. Inoculate the anaerobic bottle first (do not allow any air to enter the anaerobic bottle), then inoculate the aerobic bottle.
14. Divide the specimen equally, approximating the amounts. If less than 1 ml is obtained for pediatric or infant blood cultures, inoculate only the aerobic bottle unless otherwise instructed by the physician.
15. Discard the syringe and transfer device into the sharps container.
16. Apply pressure to the site until bleeding has completely stopped. Inspect the puncture wound.
17. When the bleeding has stopped, apply a bandage. If bleeding continues, apply pressure until bleeding has stopped. Prolonged bleeding may be related to the patient's disease or medication.
18. Label specimen bottles before leaving the patient as defined in the labeling section of this procedure.
19. For blood cultures, also note on the specimen label: series number (ex. 1 of 2 or 2 of 2) of the blood culture, site on the patient where drawn, volume (ml) in each bottle.
20. Compare the labeled specimen to the patient's identification bracelet, requisition or ask the patient to confirm the tube is properly labeled, especially the spelling of the names and date of birth.
21. Wash hands thoroughly after removing gloves.

3.2.5 Post blood draw procedure: Dispose off the waste according to BMW segregation rules. Distribute the samples to concerned testing areas. The technicians will verify the sample ID and samples as written in Reception workbook and accepts by signing with time.

3.2.6 Troubleshooting hints for blood collection:

Table 3 No blood seen or too little blood flow into the tube

Causes	Solutions
Needle may not be placed at the center of the stopper causing blockage	Remove and reposition the tube correctly

Causes	Solutions
Needle bevel may be positioned against the wall of the vein causing blockage	Rotate the needle ¼ turn clockwise*
Tourniquet applied too lightly or too long stopping blood flow	Remove tube from the holder & discard. Release tourniquet and allow vein to recover. Re-apply tourniquet to continue in new tube.
Tube may have been previously punctured or tube may have previously been opened	Replace tube
The needle has transfixed the vein (going through the back wall of the vein)	Pull back slightly on the needle holder* Be alert to hematoma
The needle is not completely in the vein or has not reached the vein	Advance the needle forward until you feel the "give" as the needle penetrates the vein*
The vein has collapsed	Remove tube. Allow vein to recover by releasing tourniquet. Re-apply tourniquet & re-insert same tube.
* The tubes may be removed from the holder during the repositioning process. Re-insert the same tube in the holder when the needle is repositioned.	

Table 4 Under filling of tubes

Causes	Solutions
Premature removal of tube	Ensure tube remains in place until 'vacuum' is exhausted and blood flow ceases
'dead space' in tubing of winged collection set	Draw "discard tube" first to ensure accurate test results. Particularly important with small draw (e.g. 2.7ml & 1.8 ml Sodium citrate tubes)

Table 5 Blood stops flowing during blood collection

Causes	Solutions
Vein may have collapsed	Remove tube. Allow vein to recover by releasing tourniquet. Re-apply tourniquet & re-insert same tube.
Needle may have been repositioned outside the vein during venipuncture	Reposition needle or repeat venipuncture at different site if hematoma occurs.

Table 6 Occurrence of Hematoma

Causes	Solutions
Needle not completely in vein	Release tourniquet and remove the needle.
Needle transfixes the vein	Apply firm pressure over swollen area (or elevate affected arm). Reassure patient that the bruise will resolve. Repeat venipuncture at a different site (opposite arm or distal to original site).

Table 7 Volume draw too large

Causes	Solutions
Draw volume of tubes may be inappropriate for patient e.g. pediatric patients	Change to smaller tubes or use Micro vacutainer for pediatric patients

Table 8 Possible causes of haemolysed specimens

Causes	Solutions
Vigorous mixing of tubes	Mix tubes by gentle inversions
Under filling of tubes	Redraw specimens as indicated with trauma – free venipuncture
Transferring from syringe & needle to evacuated tube	Safely remove needle from syringe and remove stopper of tube before transferring specimen
Alcohol contamination (skin preparation)	Allow disinfected site to “air-dry” before venipuncture procedure

Causes	Solutions
Prolonged tourniquet application (> 1 minute)	Release tourniquet, re-apply and perform the appropriate palpation again

Table 9 Complications associated with blood collection

Complications	Description / Causes	Management
Fainting (Syncope)	Many patients become dizzy and may faint at the thought / sight of blood	The phlebotomist should be aware of the patient's condition throughout the collection procedure. This can be done by asking ambulatory patients if they feel faint or if they have ever fainted during previous blood collections. If so, they should be moved from a seated to a lying position. If a patient faints during the procedure, the phlebotomist should try to terminate the venipuncture procedure immediately and make sure that the patient does not fall. The phlebotomist should seek assistance but remain with the patient who should be placed in a 'head down' position. Patients who faint must be allowed to recover fully before being allowed to leave and should be instructed not to drive a vehicle for at least 30

Complications	Description / Causes	Management
<p>Hematoma</p>	<p>This complication can occur when the needle has gone completely through the vein. The bevel opening is partially in the vein. Or not enough pressure is applied to the site after puncture.</p> <p>Susceptibility to hematoma may be increased in patients with bleeding disorders and those receiving certain drugs (aspirin, warfarin, and cortisone). Strenuous use of the arm following venipuncture may also induce hematoma.</p>	<p>minutes.</p> <p>If a hematoma begins to form, the tourniquet and the needle should be removed immediately, and firm pressure should be applied to the area for at least 5 minutes. If bleeding continues, a nurse / doctor should be notified.</p> <p>Conscious patients should be instructed to maintain firm pressure on the puncture site beyond this minimum time.</p> <p>Phlebotomists should not leave an unconscious patient until they are satisfied that the hematoma is stabilized or responsibility has been passed to a nurse or doctor.</p>
<p>Thrombosis</p>	<p>Thrombi are solid masses (clots) that reside in blood vessels. Veins with thrombi are rigid / bumpy and lack elasticity.</p>	<p>Avoid collecting blood from thrombosed veins.</p>
<p>Petechiae</p>	<p>Small red spots appearing on patient's skin, indicating minute amount of blood escaping into the skin epithelium. This complication may be a result of coagulation defects such as platelet abnormalities or other blood disorders.</p>	<p>Patients displaying this complication may bleed excessively. Always make sure bleeding has stopped after venipuncture before leaving patient's side.</p>

Complications	Description / Causes	Management
Excessive bleeding	Patients on anticoagulation therapy, and/or those taking other medication, may bleed for a longer period	Remember to apply pressure to the venipuncture site until bleeding stops. Phlebotomist must not leave the patient until bleeding stops or a nurse takes over to assess the patient's situation.
Seizures	This is a rare complication that may occur during blood collection.	If seizure occurs, the phlebotomist should immediately release the tourniquet & needle, attempt to maintain pressure over puncture site & call for help from the doctor. No attempt should be made to place anything in the patient's mouth. The phlebotomist should remain with the patient.
Mastectomy	Patients who have undergone mastectomy may have lymphostasis (no lymph flow). This increases the risk of thrombophlebitis.	Venipuncture should not be performed on the same side as that of mastectomy.
Collapsed veins	If the syringe plunger is withdrawn quickly during venipuncture, or vacuum of a tube is too great, the vein may collapse. Smaller veins and veins of geriatric patients are most susceptible.	Where a needle and syringe technique is used, the syringe plunger should be pulled slowly during collection. Use smaller draw volume or 'partial draw' evacuated tubes for patients with smaller veins

Complications	Description / Causes	Management
		<p>and geriatric patients.</p> <p>Following venous collapse, release tourniquet and remove tube from holder. Re-apply tourniquet and once vein has re-dilated, replace tube in holder. Do not probe a collapsed vein.</p>
<p>Burned or scarred area</p>	<p>This complication involves areas that have been burned or scarred, e.g. burn scars, graft sites, etc.</p>	<p>Burned areas are very sensitive and susceptible to infection. Veins under scarred areas are difficult to palpate. Avoid these areas.</p>
<p>Edema</p>	<p>Abnormal accumulation of fluid in the intercellular spaces of the body.</p>	<p>Blood collection should be avoided from these sites because veins in these areas are difficult to palpate and puncture. Specimens may become contaminated with tissue fluid.</p>
<p>Obesity</p>	<p>Obese patients generally have veins that are difficult to visualize & palpate.</p>	<p>Take extra time locate suitable veins, e.g. massage arm, with arm hanging down, use of ward towel etc. take care not to probe excessively.</p>
<p>Intravenous therapy (Damaged, sclerosed or occluded veins)</p>	<p>Patients on IV therapy for extended periods often have veins that are palpable & visible but partially occluded or sclerosed.</p>	<p>Avoid using the arm with IV line. Instead, use the other arm / site. Where both arms have IV devices, collection should be distal ('upstream') from the point of infusion. If a</p>

Complications	Description / Causes	Management
		<p>proximal ('downstream') site cannot be avoided, the IV line can be disconnected (obtain permission from the physician or nurse in-charge of the patient). After a minimum of 3 minutes delay and with the first drawn tube discarded, samples can then be collected.</p>
<p>Hemo concentration</p>	<p>Increased concentration of larger molecules and formed elements in the blood. Several factors can cause this complication.</p>	<p>Avoid the following. Prolonged tourniquet application* Excessive massaging / squeezing / probing a site Sclerosed / occluded veins *Maximum time 1 minute</p>
<p>Hemolysis</p>	<p>Haemolysis can be caused by improper phlebotomy technique and may also be the result of physiological abnormalities.</p>	<p>Avoid the following: Use of small gauge needles (21 g recommended). Where a needle and syringe collection technique is used, do not draw or expel syringe plunger too rapidly. Never transfer specimen from syringe to tube via the needle. Shaking / missing tubes vigorously. Failure to allow alcohol skin preparation to dry.</p>
<p>Allergies</p>	<p>Some patients are allergic to</p>	<p>If a patient indicates this</p>

Complications	Description / Causes	Management
	povidone iodine (Betadine) or plasters.	symptom, all efforts should be made to use an alternative product.

i. Handling home-visit requests:

1. Home visit requests are made by patients through telephone to sterling Accuris labline 079 - 4903 0000 (for Gujarat) or 8128130000 (for other states). The labline staff collects the required information telephonically and arrangement for specimen collection is made by the laboratory.
2. Phlebotomist going for home visit must carry "Home Sample Collection TRF" and shall fill it up during his / her visit. The original copy of above TRF shall be given to patient and carbon copy shall be submitted to laboratory reception with cash collected from patient.
3. Patient shall be informed to carry the TRF for report pick-up.

4.0 Urine Sample Collection:

4.1 24 hours Urine Collection: Instruct the patient about the preservative and restrict patient from discarding the same.

To start collection: - Ask the patient to discard the first urine passed in the morning. Note down the exact time (i.e. 7:00 am). From this time onwards collect all subsequent urine samples in the container provided. Collection should be continued till same time the next day (i.e. last void at 7:00 am next day). The patient should return the 24 hours urine sample containers within 1 hour to the pathology department.

4.2 Urine collection for Urine Routine Examination:

Specimen: Urine specimen must be first voided mid-stream morning Urine. It must be collected in the clean plastic container.

Instruction given to the patient: Patient must be instructed to void directly in to the container. During the collection the initial portion of urine stream is allowed to escape while the mid-stream portion is collected.

Preservation: In case of delay in testing, urine must be stored at 2 to 8°C (Lower cooling compartment of the refrigerator).

4.3 Urine for Culture Examination:

Specimen: Urine specimen must be first voided mid-stream morning Urine. It must be collected in the **sterile** plastic container.

Instruction given to the patient: Patient must be instructed to clean the folds of skin (labia) from front to back with wet tissue paper. Allow a small amount of urine to fall into the toilet bowl. (This clears the urethra of contaminants) Do not touch the inside of the cup.

Preservation: In case of delay in testing, urine must be stored at 2 to 8°C (Lower cooling compartment of the refrigerator).

5.0 Stool sample collection:

No special preparation is required before collecting a stool specimen (sample). Patient must be given a sterile container with spatula to collect the specimen. Following procedure must be explained to patient for collecting the stool specimen.

Procedure:

- a. Urinate before collecting the stool so that you do not get any urine in the stool sample. Do not urinate while passing the stool.
- b. Stool can contain material that spreads infection, so wash your hands before and after you collect the specimen.
- c. Pass stool (but no urine) into a cleaned plastic cup / disinfected clean bedpan. Cleaned plastic cup can be placed in toilet seat to catch the stool sample.
- d. Either solid or liquid stool can be collected with help of spatula attached with stool container cap.
- e. Do not mix toilet paper, water, or soap with the sample.

- f. Place the lid on the container and label it with your name and the date the stool was collected.
- g. Transport the stool specimen immediately to the laboratory.

6.0 Semen specimen collection:

The semen specimen should be collected after minimum 3 days of sexual abstinence unless otherwise instructed by physician.

Give following instructions to patient for collecting semen specimen.

Procedure:

- a. Collect the specimen by masturbation into a sterile container (containers are provided by the laboratory). **Collecting semen in a condom or by coitus interruptus is not acceptable.** Since the volume of semen produced may be significant to diagnosis, it is important to submit the entire specimen. The container lid should be closed tightly.
- b. Label the container with patient's name, date of collection, and exact time of collection.
- c. Keep the sample near body temperature (25°-40° C or 77°-104° F) during transportation.

7.0 Sputum Specimen Collection:

Instruct the patient as following.

7.1 A container will be given from laboratory.

7.2 Wash hands with soap and water.

7.3 The sputum sample obtained should be the result of a deep cough, thick of nature and not saliva.

7.4 Collect an early morning specimen BEFORE breakfast.

7.5 DO NOT use mouthwash, brush teeth, or gargle before collecting the sputum sample.

- 7.6 The patient should cough the sputum directly into the sterile container provided.
- 7.7 Replace the container lid and close securely.
- 7.8 Wash hands after collecting the sample.
- 7.9 Label the container with patient's name, age, gender and date of collection.

8.0 Specimen Transportation:

8.1 Blood, Urine / stool & specimens for microbiology:

- 8.1.1 Specimens are checked for any leakage or absence of identity.
- 8.1.2 Verify that TRF is filled up properly.
- 8.1.3 Ensure that specimens are tightly capped.
- 8.1.4 Arrange blood samples in upright position in rack with cool packs packed in plastic bag (wherever required).
- 8.1.5 The samples to be transported on ambient temperature shall be kept in separate compartment of bag.
- 8.1.6 Place the TRFs separate from sample in order to prevent soiling due to sample leakage.
- 8.1.7 The racks are placed in thermocol / carton box and closed.
- 8.1.8 Place the cool pack in plastic bag and keep it aside of thermocol / carton box. Carry this box in sample carrier hand bag.
- 8.1.9 Transport the specimen to laboratory at earliest.

8.2 Histopathology & Cytopathology specimens:

- 8.2.1 Small biopsies may be put in a small bottle containing formalin. The size of the container should be adequate

show as the biopsy must be accommodated properly with formalin.

- 8.2.2** Quantity of formalin added to preserve the tissue specimen in transit, must be ten times volumes of the tissue biopsy.
- 8.2.3** The container should be sealed tightly and additionally fortified by brown tape.
- 8.2.4** The specimen container / Plastic bag must then be packed in a corrugated cardboard box along with the request form labeled with biohazard sticker and transported in the laboratory.
- 8.2.5** If slides and blocks are being sent, these should be placed in cardboard slide boxes/envelope.
- 8.2.6** As far as possible both fixed and air dried smears of FNA/ Non gynaec cytology must be sent.
- 8.2.7** Pap smears are transported in containers with 80% alcohol.
- 8.2.8** Smears fixed with cytofix must dry before being wrapped in paper and then transported in an envelope.
- 8.2.9** Cytology smears including FNAC are to be transported in a tray when dry fixed.
- 8.2.10** For outside samples- for air dried smears, these smears must be dried before being wrapped in paper and then placed in an envelope.
- 8.2.11** All cytology smears which are wet fixed are to be transported in containers with 80% alcohol.
- 8.2.12** The fluids are transported in plain container.

8.3 Frozen Section: Sample for frozen section is to be transported in plain container (without any preservative) immediately to the laboratory.

8.4 Renal biopsy specimens: Renal biopsy specimens are to be transported in saline (phosphate buffered) or MICHEL'S media at room temperature (16 - 24°C) within 24 hours.

Table 10 Test specific instructions

Sr. No.	Test	Instruction
1.	Cortisol	Cortisol blood tests may be drawn at about 8 am, when cortisol should be at its peak, and again at about 4 pm, when the level should have dropped significantly. Sometimes urine is tested for cortisol; this usually requires collecting all of the urine produced during a day and night (a 24-hour urine) but sometimes may be done on a single sample of urine collected in the morning.
2.	Beta HCG	Last menstrual period date of patient needs to be recorded.
3.	FNAC (Fine needle aspiration cytology)	This test involves final needle aspiration procedure to be conducted on specific body part and hence written consent for the same is required from the patient / guardians.
4.	Urine for porphyrins (porphobilinogen)	Sample must be collected in dark container. Exposure to light shall be prevented and sample must be immediately transported to the lab.
5.	Double / triple / quadruple marker	Duly filled "Maternal marker patient information form" and Sonography report shall be collected from the patient for accurate result interpretation.
6.	Biopsy	Relevant clinical details, radiological reports and blood reports shall be collected from patient.
7.	HIV	Pre-test and post-test counselling shall be done. Written consent from patient is required before sample collection.
8.	Body fluids for Cytopathology	Clinical information on medication is required to be collected.
9.	Bone marrow / Flowcytometry workup	Duly filled "Bone marrow / Flowcytometry workup requisition form" by physician is required to be collected.
10.	Culture and drug sensitivity	Clinical information on antibiotic treatment is required to be collected.
11.	Blood gas analysis, Lactate (Arterial/Venous), Ammonia, Alcohol Level, PTH (i-PTH), Electrolytes (Sodium, Potassium, Chloride, Bicarbonate)	Fresh collected sample is required.

Sr. No.	Test	Instruction
12.	P.T. (Prothrombin time) & a.P.T.T. (Activated Partial Thrombin Time)	Clinical information on medication is required to be collected.

9.0 Specimen Rejection Criteria:

The specimen rejection criteria have been developed by the pathology department on the basis of international standards as well as manufacturer's guidelines.

1. Identification of patient detail on specimen is inadequate or missing.
2. Illegibility of test requisition form or sample labels.
3. Inadequately filled test requisition form.
4. Specimen in under filled or over-filled quantity (as per DOS – Directory of services requirement).
5. Specimen collected in an expired or inappropriate container or preservative.
6. Contamination suspected (in case of leakage found or container is not closed properly or mixing of two samples).
7. Prolonged transport (more than 24 – 72 hours based on specimen type and anticoagulant used) or inappropriate storage of specimen during transport (as per DOS requirement).
8. Sample and/or patient details not matching with the test requisition form.
9. Clotted whole blood (**EDTA**, **Citrate**, **heparin**, **fluoride**, blood culture bottle etc.) specimens.
10. Haemolysed blood specimens (**EDTA**, **Citrate**, **Heparin**, **Plain tube**, **SST gel**, **fluoride**, separated plasma / serum etc.)
11. Grossing form missing or inadequately filled for Histopathological investigations.
12. When dilution of blood samples with I.V. fluids is suspected.
13. Test requisition form (TRF) without patient's clinical information/history when required as per test specification.

NOTE:

1. Clinical specimens like biopsies, bone marrow, cytological specimens, CSF or body fluids, arterial blood for blood gas analysis are precious and hence cannot be rejected. All attempts are made to resolve inadequacy of specimen telephonically or by other means. Specimens must be sent to testing area for processing. Reporting must be done only after the inadequacy of specimen is resolved with appropriate remarks wherever required.
2. If specimens have highly suspicious lab results indicative of possible IV contamination, the test requester may be asked to recollect and send the specimen to the laboratory. This is to confirm the abnormal results. The lab will not report suspicious results until the results have been confirmed by re-drawn specimen testing.