

Document History:

Title: Phlebotomy Collection Manual **Site(s):** Shared Health Diagnostic Services

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Section:	Operations	Subsection:	General Laboratory

Approved by: <i>(approval on file)</i>	Dr. A. Sokoro	Date:	28-JUL-2022
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Details of Recent Revision:

Version 7.1 – Chlorhexidine gluconate (0.5%) changed to “Chlorhexidine gluconate (recommended 2 % concentration) (pg.16, point 3)

Appendix 6 Blood Culture Collection:

- Referral to LIM added; removed referral to the Clinical Microbiology Sample Collection Manual
- Critical Factors:
 - point 2. Revised and clarified number of bottles and collection sites;
 - point 3. Minimum total volume of blood changed from 30 mL to 40 mL (20 mL from each site)
 - point 5. Information provided on how to visually inspect the blood culture bottle for contamination
- Skin Preparation for Phlebotomy
 - point 3. ‘chlorhexidine/70% alcohol’ changed to ‘Chlorhexidine gluconate (0.5%) – Ethyl alcohol (70% v/v) swabs’; added “Alcohol swabs and povidone are not acceptable for site preparation.”
 - point 10. Added “Do not cover barcodes on blood culture bottles with labels.”
 - point 11. Added “Note that one requisition should be submitted for each venipuncture/site.”
- Pediatric Collections
 - Chart revised re: blood volume and number of bottles for >27 kg (>60 lbs)
- Storage and Transport
 - Information added to collect and transport the set of blood cultures at the same time.
- Comments
 - 1st bullet, refer to LIM added; referral to doc# 120-10-05 removed (document archived)
 - 2nd bullet, added order of draw for blood culture bottles when other bloodwork is ordered
 - 3rd bullet, re: central line infection removed
 - 4th bullet, information added re: new peripheral IV lines
 - 6th bullet, clarification added re: volumes of blood for each bottle
 - 7th bullet, 30 mL changed to 40 mL

Removed Appendix 12 Order of Draw Poster for evacuated tubes

- Added reference to F100-10-20 Order of Draw Poster

Added Appendix 18 Hand Hygiene

- Added Poster for Proper Hand Hygiene
- Added references to appendix in Sections 7.0 Procedure for Venipuncture and 8.0 Skin Puncture Collection

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- 1. Purpose** This document will explain the proper collection techniques for obtaining blood samples and endeavor to inspire confidence and professionalism in phlebotomists.
- These goals can be achieved by a thorough understanding of proper pre-analytical techniques that ensure a safe and positive work environment is maintained.
- 2. Scope** Phlebotomy is the process of obtaining a blood specimen from a patient for testing in the diagnostic laboratory.
- Phlebotomists are a critical member of the health care team. They represent Shared Health as front line staff to patients.
- Techniques used to procure a blood specimen must be performed in a professional manner that promotes a positive experience for the patient and ensures quality specimens are collected for laboratory analysis.
- Collecting a blood specimen is a critical step in providing the best possible patient care; it is vital that a phlebotomist follow proper procedures when performing collections in order to avoid errors that may significantly affect the results of the testing
- 3. Safety Precautions** As it is impossible to know if specimens are infectious, all patient and laboratory specimens are treated as infectious and handled according to Routine Practices.
Refer to Policy: Diagnostic Safety Manual, 100-10-28
Refer to Work Related Injury Form F70-10-07
- 4. Requisition / Test Request Completion** **Refer to policy: Specimen Acceptance Policy, 10-50-03**
Blood specimens are not to be collected unless the phlebotomy requisition is in possession of the phlebotomist at the time of collection and has complete patient demographics present.
- 5. Materials**
1. Completed requisition
 2. Evacuated collection tubes
 3. Safety engineered needles (multi-sample, syringe type)
 4. Single use latex free tourniquet
 5. Single use vacutainer holder/adapter
 6. Packaged alcohol swabs or pads
 7. 3 mL, 5 mL, 10 mL, 20 mL syringes
 8. 21-23 gauge safety butterfly with bottle adapter (for blood cultures)
 9. Chlorhexidine/alcohol swab sticks or pads (for blood cultures)
 10. Chlorhexidine swab sticks with no alcohol (for ethanol and nursery collections)
 11. Gauze (Cotton Balls not recommended)
 12. Adhesive tape or bandages/hypoallergenic tape
 13. Blood lancets
 14. Microtainer tubes
 15. Latex free gloves
 16. Safety sharps container
 17. Syringes/winged collection sets
 18. Transfer device for syringe collections
 19. Face masks
 20. Permanent ink marking pen (preferably black)
 21. Facility Approved Disinfectants. (<https://sharedhealthmb.ca/files/facility-approved-disinfectants.pdf>)

6. Patient Identification

Correct patient identification is **CRUCIAL & MANDATORY**.

The blood specimen **MUST** be collected from the right patient; the phlebotomist is the only person who can ensure the right person's blood is in the tube being sent to the laboratory. Misidentification of the patient, and therefore the sample, can lead to a critical medical error.

When patient demographics (full name, DOB and PHIN) have been verified, indicate this with checkmarks on the labels or requisition.

6.1 Pertinent Pre-Collection Instructions/Detail

Be aware of any signs that would indicate phlebotomy restrictions such as, but not limited to:

1. "No venipuncture on right/left arm"
2. "NPO (Fasting)"
3. "Patient has a cannula/fistula"
4. "Patient hard of hearing"
5. "Patient on strict isolation"

Be aware of patient preparation and/or requirements for the collection. The Laboratory Information System will provide guidance. Examples include, but are not limited to:

- A. When did you receive your last dose of medication? When is your next dose?
- B. Are you fasting? When was the last time you had something to eat, drink or chew besides water? Record Fasting Hours on the requisition.
- C. Did you follow a special diet for today's test?

6.2 Inpatient

The following procedure for identification must be used:

1. The following two sources of ID must be used and compared to requisition:
 - a. Patient self-ID: the patient verbally states their full name and DOB and spells their full name; be aware of the approach used for patient self-identification; ask the patient what their name is and what their date of birth is. ****DO NOT** ask using phrases such as "Is your name John Doe? John is your birthday January 1, 1923?", in which the patient may simply answer "yes"***
 - b. Wristband: verify information (name, DOB, PHIN or MRN) with requisition
2. If wristband or verbal ID not available:
 - a. Wristband/no patient self-ID: have nursing staff confirm patient identification and sign requisition/labels with their full name and designation, date and time.
 - b. No wristband/patient self-ID or no patient self-ID: ask nursing staff for wristband. **DO NOT** collect specimen until armband in place.
3. Resolve any discrepancies with nursing staff prior to collection.
4. Proceed with collection.

6.3 Neonates

Neonates are banded with two different bands. One band contains the neonates personal information at birth and the other band is used to link mother to the neonate.

Steps:

1. Confirm the requisition and band match identically for the following: (**ensure you use the neonate information**)
 - a. Newborn's last name
 - b. Gender
 - c. DOB
 - d. Health Record Number (HRN)

Resolve any discrepancies with nursing staff prior to collection.

6.4 Outpatients

Steps include:

1. Ask patient for Medical Health Card at the front desk.

2. Ask patient to state and spell their full name and DOB.
3. Verify information on requisition and health card or alternate accepted form of unique patient identifier, may include Military, RCMP, First Nation Inuit and Aboriginal Health or Health Card from another province,
4. If no health card, it is necessary to use another unique identifier. Document on requisition this visual check took place. For deviations related to standard patient identification refer to:

Refer to Policy-100-10-79A Client Identification Waiver Procedure
Refer to Form-F100-10-79A Client Identification Waiver Form

5. Check to see if the patient is required to be fasting, if so ask the patient **“When was the last time you had something to eat, drink or chew besides water?”** Document the Fasting status and the number of hours on the requisition and enter in Delphic at the time of registration. (SOP 100-30-03, 100-30-02.)
6. When dealing with infants, children, mentally incompetent patients and those with existing language barriers that cannot self-identify, please identify patient with assistance of nurse and/or family member/care giver. Ensure the caregiver also signs requisition and provides designation and can confidently confirm identification. Please also request contact information of caregiver to be noted on the requisition for documentation purposes.
7. The phlebotomist will also ask the patient to state and spell their full name and provide their date of birth prior to collecting any blood work.

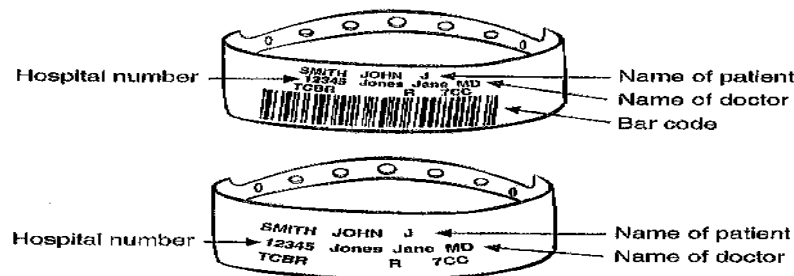
If any discrepancies present, do not collect blood until resolved. All necessary measures must be taken to ensure identification.

6.5 Personal Care Homes

Note: PCH often do not use armbands

Steps include:

1. Ask clients to self-identify by stating and spelling their full name and DOB.
2. If clients cannot self-identify, have nursing staff or caregiver confirm patient identification and sign requisition with their full name, designation, date and time.
3. If client does have armband, follow in-patient procedure.



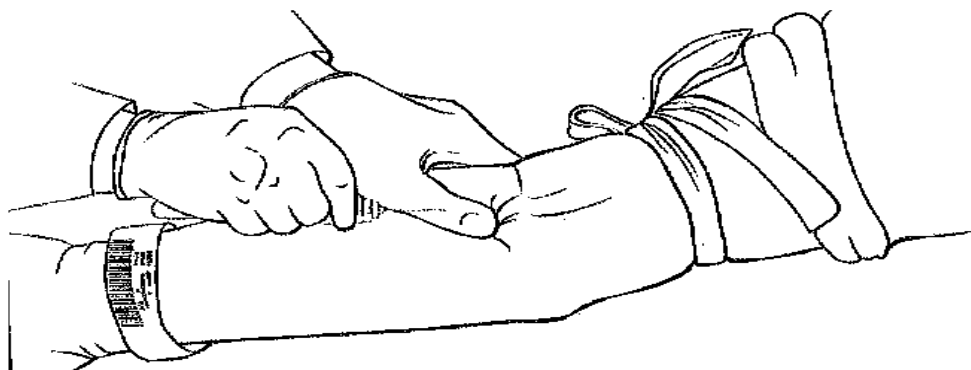
7. Procedure for Venipuncture

The following steps are to be followed for ensuring a properly collected sample:

1. Ensure hand hygiene performed prior to calling in client, or entering patient's room. See Appendix 18 Hand Hygiene for proper steps.
2. Greet patient in a positive manner.
Reference Job Aide: Patient Greeting and Guidelines JA100-10-79
3. Review requisition to ensure applicable special conditions (fasting, timed dosage); as appropriate ask the client/patient if they are fasting, or taking medications. If the patient is fasting, ask them how many hours it has been since they had something to eat, drink or chew and record this on the requisition. It is very important to ask the questions required for collections and pay attention to the detail on the request form.
4. Positively identify patient/client in accordance to the category in which they fall as described in **6.0 Patient Identification: 6.2 Inpatient, 6.3 Neonates, 6.4 Outpatient, 6.5 Personal Care Home Client.**
5. Obtain patient's clear consent to proceed. If a patient offers their arm, this can be taken as implied consent. Consent for minors may be obtained by the accompanying parent or guardian where required.
6. Reassure patient/client and try to relieve any apprehension they may feel.
7. Explain what you are going to do.
8. Assemble necessary supplies.
9. Wear gloves during procedure.
10. Apply tourniquet above intended venipuncture site, should **NOT** be on for more than 1 minute.
11. Have patient/client make a fist. **DO NOT** pump hand.
12. Select vein.
13. Remove tourniquet.
14. Cleanse site and allow to dry.
15. Re-apply tourniquet; if possible place arm in downward position to prevent "backflow" from the collection tube into the vein.
16. Anchor vein from below the site only. Do this by drawing the skin taut with the thumb of phlebotomist's hand that is firmly holding the patients arm.
17. Ensure bevel is up; angle of insertion of 30 degrees or less.
18. Perform venipuncture following the correct order of draw and give tubes an initial mix as you transfer tubes. Fill tubes to their stated volume (vacuum is evacuated) for best results. Always remove the last tube from vacutainer prior to removal of the needle.
19. Release tourniquet as soon as blood flow is established to first tube and within one minute. Ask the patient to relax and open their hand.
20. Remove needle, activate safety, and apply pressure to venipuncture site. If using a push button butterfly, activate the safety while the needle is still in the arm and this will remove the needle, and then apply pressure with gauze.
21. Continue to mix the tubes by gentle inversions as per manufacturer recommendations.
22. Dispose of contaminated material/supplies in the designated waste containers.
23. Tubes are wiped with facility approved disinfectant. Allow to dry.
24. Label tube(s) in the presence of the patient/client; record time as well as date of collection and ensure collector's identification is on requisition. Take note of any other required labeling in accordance to standard operating procedures and the lab information manual.
25. Inspect puncture wound to ensure patient/client is not bleeding and bandage arm. Bandage should stay on for 15 minutes.
26. Remove gloves and wash hands and ensure all supplies are removed and put away.

Please Note the following important information:

- Never tell a patient the procedure will not hurt; be honest.
- Patient/client **MUST** be sitting or lying down; **NEVER** collect from a standing patient.
- Tourniquet should be applied 3-4 inches above the intended site.
- If tourniquet is on longer than 1 minute, it **MUST** stay off for 2 minutes prior to collection.
- Do not collect from underside of wrist.



Please note the following important information:

- **NEVER** transfer blood from one tube to another.
- Do not ask patient to bend their elbow as a substitute for pressure, as this may cause a hematoma to form.
- **Do not bandage immediately after the draw.** Allow time for clotting to take place and always check before bandaging.
- Vein prioritization in the Antecubital Fossa is first the Median Cubital Vein, then the Cephalic Vein and as a last resort, the Basilic Vein.
- If you miss on your poke and feel confident of the location of the vein you may attempt a calculated relocation by releasing the vacuum on the vein, pulling back on the needle to just below the dermis, re-anchor the vein, and reorient the needle towards the perceived location of the vein. Then reapply the vacuum. If this fails, then needle must be removed. Sideways needle relocation must never be attempted as nerves and arteries may be injured.

Note: *It is important that after two unsuccessful attempts, a new phlebotomist should make one last attempt if confident. (If there is no order for COAG, you may consider doing a finger poke.) Thereafter, consultation with nursing and/or clinician responsible for care is required. Always ensure patient/client provides consent for any phlebotomy attempt.*

8. Skin Puncture Collection

Skin puncture is performed on adult, children and infant, whose sites are warm, pink and free of scars. **DO NOT** select a site that is cold, cyanotic or edematous.

The recommended site for skin puncture on adults or children >1 year of age is the palmar surface of the distal phalanx of middle or ring fingers only of non-dominant hand.

The following steps are to be followed for ensuring a properly collected sample:

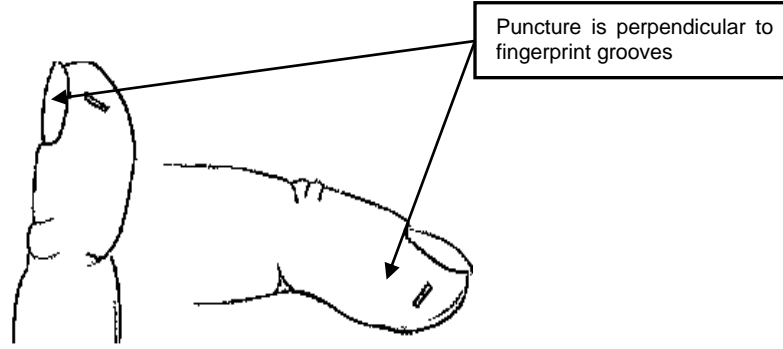
1. Ensure hand hygiene performed prior to calling in client, or entering patient's room. See Appendix 18 Hand Hygiene for proper steps.
2. Greet patient/client in a positive manner.
Reference Job Aide- Patient Greeting and Guidelines JA100-10-79
3. Review requisition to ensure applicable special conditions (fasting, timed dosage); as appropriate ask the patient/client if they are fasting, or taking medications. It is very important to ask the questions required for collections and pay attention to the detail on the request form.
4. Positively identify patient/client in accordance to the category in which they fall and described in **6.0 Patient Identification**: 6.2 *Inpatient*, 6.3 *Neonates*, 6.4 *Outpatient*, 6.5 *Personal Care Home Client*.
5. Obtain patient's clear consent to proceed. If a patient offers their hand, this can be taken as implied consent. Consent for minors may be obtained by the accompanying parent or guardian where required.
6. Reassure patient/client and try to relieve any apprehension they may feel.
7. Explain what you are going to do.
8. Assemble necessary supplies.
9. Wear gloves during procedure.
10. Ensure arm is supported and palmar surface facing up.
11. Select site; middle or ring finger of non-dominant hand.
12. Cleanse and let air dry.
13. Pull protective tab off end of lancet.
14. Grasp finger firmly between your thumb and index finger.
15. Position lancet so puncture will be perpendicular to fingerprint grooves.
16. Press white button with thumb to activate lancet.
17. Wipe away first drop of blood as presumed contaminated with tissue fluid.
18. Position finger downward while apply moderate pressure.
19. **Do not squeeze or massage vigorously.**
20. Collect sample with scoop of microtainer allowing blood to run along wall.
21. Tap tube gently to ensure blood settles in bottom and mixes with anti-coagulant.
22. Cap tubes and mix gently.
23. After collection, apply pressure with clean gauze until bleeding stops.
24. Discard puncture device in sharps container.
25. Apply bandage if required. **DO NOT** apply bandages to children <3 years of age; if a client has a caregiver present please ask if it is suitable that a bandage be applied as this may pose a safety risk to some patients. For infants in NICU, use gauze with Coban Wrap, for normal nurseries use gauze and small piece of tape.
26. Label tube(s) in the presence of the patient/client; record time as well as date of collection and ensure collector's identification is noted on requisition. Take note of any other required labeling in accordance to standard operating procedures and the lab information manual.
27. Remove gloves and wash hands and ensure all supplies are removed from area.

Note: Order of draw differs for microtainers. See Appendix 11 for Guidelines.

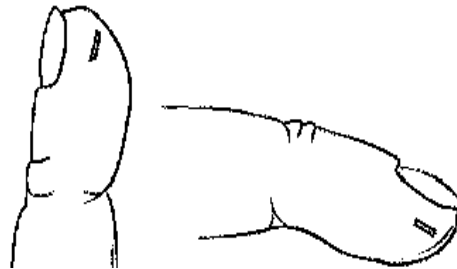
Note: Puncture should be made in the central fleshy portion of finger, slightly to side of center and perpendicular to grooves (whorls) of fingerprint.

Correct Lancet Placement

Puncture site should look like this when completed:



Incorrect lancet placement



Please note the following:

- When puncture site is perpendicular to the fingerprint, this allows the blood to form a bead or drop that is easily collected. Warming the intended site increases the arterial blood flow; dangling the hand will also increase the blood flow. If blood is collected by skin puncture, this **MUST** be documented on the requisition and in the computer if there is an LIS.

Appendix 1 Specimen Collection Procedures for Children

Skin Puncture in Infants < 1 year old: The heel is the recommended site for collection of infants less than 1 year. **If a venipuncture is required on a child younger than one year of age, the phlebotomist should consult with the physician. An exception is in the Emergency Department, where the phlebotomist may attempt venipuncture in patients greater than 1 month old without consulting the physician.**

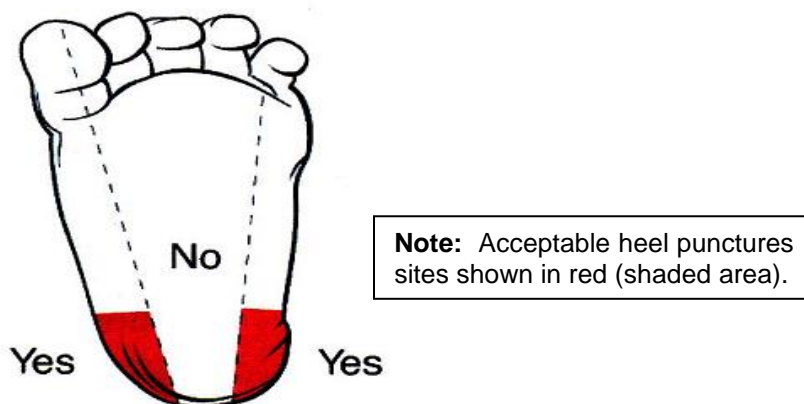
Follow the steps from Section 8 .0 Skin Puncture Collection.

A complication of heel puncture is calcaneal osteomyelitis. To avoid this complication, the following should be done:

1. Only perform punctures on the most medial or most lateral portion of the plantar surface of the heel.
2. Puncture no deeper than 2.0 mm.
3. Do not puncture through previous puncture sites.
4. Do not puncture the posterior curvature of the heel or in the area of the arch.

Ensure the site is warm to guarantee dilated skin vessels and thus a free flow of blood. Cover site for 3 minutes with a hot, moist towel or gel pack at a temperature no higher than 42°C.

- To obtain good samples without hemolysis or contamination with tissue fluid, blood flow must be quite free.
- Any milking of site **must** be avoided.



Venipuncture Procedure in Children: Collection procedure is the same as with adults BUT with the following considerations:

1. Venipuncture is not recommended on children <1 year of age. If a venipuncture is required on a child younger than one year of age, the phlebotomist should consult with the physician.
 - a. In the Emergency Department, consultation with physician is NOT required for children < 1 year old.
2. Take special care to secure the child's arm to prevent injury caused by unexpected movement when the needle enters the skin.
3. Use a syringe with a 23 gauge needle or a 23 gauge winged infusion set with attached tubing.
4. Do not draw directly to vacutainer tubes with a butterfly.

Sample Requirements for Neonate Collection

Neonatal Protocol
(Type & Screen + Direct Antiglobulin Test)
or
Type & Screen ONLY

Direct Antiglobulin Test ONLY



(Examples are to scale)

Appendix 2 Recommended Draw Volumes

Recommended Volume Limits for a Single Blood Draw*

Weight in Pounds	Weight in Kilograms	2 cc/kg Recommended Max Blood Draw (mL)	Weight in Pounds	Weight in Kilograms	2 cc/kg Recommended Max Blood Draw (mL)
2	1	2	90	41	82
3	1.5	3	92	42	84
4	2	4	94	43	86
5	2.5	5	96	44	88
6	3	6	99	45	90
7	3.5	7	101	46	92
8	4	8	103	47	94
9	4.5	9	105	48	96
11	5	10	107	49	98
13	6	12	110	50	100
15	7	14	112	51	102
17	8	16	114	52	104
19	9	18	116	53	106
22	10	20	118	54	108
24	11	22	121	55	110
26	12	24	123	56	112
28	13	26	125	57	114
30	14	28	127	58	116
33	15	30	129	59	118
35	16	32	132	60	120
37	17	34	134	61	122
39	18	36	136	62	124
41	19	38	138	63	126
44	20	40	140	64	128
46	21	42	143	65	130
48	22	44	145	66	132
50	23	46	147	67	134
52	24	48	149	68	136
55	25	50	151	69	138
57	26	52	154	70	140
59	27	54	156	71	142
61	28	56	158	72	144
63	29	58	160	73	146
66	30	60	162	74	148
68	31	62	165	75	150
70	32	64	167	76	152
72	33	66	169	77	154
74	34	68	171	78	156
77	35	70	173	79	158
79	36	72	176	80	160
81	37	74	> 176	> 80	160
83	38	76			
85	39	78			
88	40	80			

* Ordering physician may approve larger volumes.

Courtesy of David F. Friedman, MD. This guideline is based on a survey of institutional protocols and the consensus clinical practice of the Clinical Laboratory of the Children's Hospital of Philadelphia. Reproduced with permission.

Appendix 3 Quick reference for Transfusion Medicine Specimens**Labeling Blood Transfusion Medicine Specimens:**

NOTE: Any incompletely, improperly or incorrectly labeled tubes collected for Transfusion Medicine purposes will be rejected for testing.

Please refer to 160-MP-02, *Specimen Acceptance, Rejection & Suitability*, for all requirements for transfusion medicine including requirements for neonate collections.

All tubes for crossmatch, type and screen, miscellaneous transfusion testing, MB Rh program and Transfusion Reaction investigations must be hand labeled using indelible ink with:

- Patient first and last name – NO abbreviations
- PHIN number or unique identifier (MRN) – no exceptions will be made for MB residents (MRN will be used for newborns, otherwise PHIN is preferred.)
- Date of specimen collection (dd/mm/yyyy) and Time of collection
- Facility name
- Phlebotomist's initials

Appendix 4 Syringe and Winged Collection Procedure

Note: Syringe and winged collection procedure is not required for routine vascular access and in general should be avoided. *Only use the safety winged collection sets when vascular access is compromised as with children or elderly fragile veins. For small or fragile veins the butterfly should be attached to a syringe where you can control the pressure on the vein.*

The following steps are to be followed for ensuring a properly collected sample:

Follow Steps 1-9 under Section 7 Procedure for Venipuncture

1. Assemble needle and syringe.
Note: Break the seal of the plunger and advance it fully forward, expelling air from syringe before use.
2. Anchor vein below by drawing the skin taut with the thumb of phlebotomist's hand that is firmly holding the patient's arm.
3. Perform venipuncture, bevel up and designated angle of insertion (15-30 degrees of angle)
4. Successful insertion is indicated by a flow of blood into the hub of the syringe or line of winged set.
5. Pull gently back on syringe plunger to start flow of blood into syringe. Remove tourniquet as soon as possible once blood begins to flow. Continue to gently pull back on syringe until desired amount of blood is obtained.
6. After removal of needle from vein, activate the safety feature on the needle. **NOTE:** Some butterflies have safety features that you activate while the needle is still in the arm (push button). Apply pressure to the site.
7. If using a winged collection set, continue to pull gently back on the syringe to ensure all blood is removed from the line.
8. Disconnect the syringe from the needle and/or winged set
9. Discard the needle/collection set in appropriate waste container
10. Connect syringe to transfer device, pierce the stopper of the tube with the needle and allow the tube to fill without applying any additional pressure to the plunger until flow ceases.
11. Dispense blood into tubes as per Order of Draw. See Appendix 11 Mix blood tubes gently and thoroughly by inverting the tube slowly for the required number of inversions
12. Dispose of contaminated material/supplies in the designated waste containers
13. Ensure patient is not bleeding and bandage arm. Observe for a hematoma
14. Label tube(s) in the presence of the patient/client; record time and date of collection and collector's identification on requisition
15. Remove gloves and wash hands and remove supplies from area

NOTE: *If drawing with a butterfly to a vacutainer for coagulation testing, it is important to use a discard tube so that the air in the butterfly tubing does not evacuate the Sodium Citrate tube. The discard tube should be a non-additive tube or Na Citrate tube and does not need to be filled. The purpose is to draw blood and fill the tubing of the butterfly prior to collecting the tube for coagulation which must be full. Do not ever force blood into an evacuated tube when filling with a blunt needle.*

Appendix 5 Manitoba Newborn Screening Card Procedure

How to collect an Acceptable Blood Spot specimen:

Reference Document Number: 15.04.003 – Cadham Provincial Laboratory, amended for use

Steps to follow using Capillary Tubes:

1. **Follow Procedure outlined in Phlebotomy Collection Manual 100-10-79; Section 8.0 Skin Puncture Collection**
2. Once selected site is punctured, gently squeeze and wipe first drop of blood with gauze
3. Wait for formation of large blood droplet at site
4. Apply gentle pressure with thumb around the heel but not near the puncture site, and ease intermittently as drops of blood form.
5. Collect blood into a non-additive capillary tube, approximately 2/3 full.
6. Hold horizontally over collection circle and start to raise the capillary tube until 2 free drops fall onto the center of the circle. Let blood flow outward to fill the circle. Fill all the circles on the card.
7. Check backside of paper/requisition to be sure that it is completely saturated the circle
8. It is preferable to NOT touch the capillary tube to the card. DO NOT “layer” blood in the circle by adding to the sample that has already started to dry. DO NOT add sample to back of card.
9. All used items should be disposed of in an appropriate biohazard container.
10. After the specimen is collected, elevate the infant’s foot and, using gauze; briefly apply gentle pressure to the puncture site until the bleeding stops.
11. DO NOT apply adhesive bandage. Use gauze and small piece of tape for normal nurseries and use gauze with Coban Wrap for NICU babies.
12. Allow blood specimen to AIR DRY THOROUGHLY, on a horizontally level, non-absorbent, open surface, such as a drying rack or plastic coated test tube rack, for a minimum of three hours at ambient temperature.
13. Keep specimen away from direct sunlight (do not stack or heat)
14. After the specimen has dried, place in an approved container for transport.

Steps to follow using Filter Card: (This is the best practice from Cadham Lab.)

1. Follow steps 1-4 as noted above
2. Gently touch the filter paper card to the blood drop and fill each printed circle with a single application of blood
3. Apply blood to one side only
4. Observe the saturation of each printed circle as the blood flows through the filter paper
5. Continue with steps 9-14 from previous section

FRONT OF CARD



ACCEPTABLE
Circle filled
And evenly saturated

UNACCEPTABLE
Layering

Insufficient
Multiple applications

BACK OF CARD



Appendix 6 Blood Culture Collection

Refer to Policies: LIM entry for Blood Culture Collection:
<https://apps.sbggh.mb.ca/labmanual/test/view?seedId=41056>
Blood Culture Procedure Manual MALDI-ToF 120-10-07

Critical Factors

The four most critical aspects of optimal blood cultures are:

1. Adequate skin preparation is required to reduce contamination
2. A minimum of two separate venipuncture's are required to facilitate differentiation between positive blood cultures and bacterial contamination (adults and children >27Kg patients). Draw two bottles (aerobic and anaerobic) from each site. The phlebotomist should never draw a blood culture from a single site unless they can confirm that a second site (e.g., line collection) has already been drawn in the last 60 minutes or is simultaneously being drawn by nursing staff. If this cannot be confirmed, a two-site collection is required.
3. A minimum total blood volume of 40 mL (adult patients) (20 mL from each site) is required.
Note: Pediatric blood culture bottles should not be used to collect from adult patients.
4. Blood culture volumes collected from pediatric patients should be based on patient weight, not patient age. For example, when a child weighs 27 kg (60 lbs) they are treated as an adult for blood culture volume collection.
5. Visually inspect each blood culture bottle for contamination before inoculating with patient sample.
 - Ensure broth is clear with no evidence of turbidity or cloudiness.
 - The disk at the bottom of the bottle should be a greenish grey colour. If it is yellow, the bottle should not be used.

Skin Preparation for Phlebotomy

1. Remove the outer cap of each blood culture bottle required and disinfect the rubber stopper with 70% alcohol. Let dry.
2. Follow steps 1-9 as outlined in Section 7 Procedure for venipuncture and Appendix 4 (as applicable).
3. Using Chlorhexidine gluconate (recommended 2% concentration) – Ethyl alcohol (70% v/v) swabs, use a back and forth friction rub to cleanse selected site, using sufficient pressure so the handle bends slightly. Cleanse with one side of swab with an **up and down** motion for 15 seconds covering a 4x4 cm area. Turn swab over and cleanse area using a **back and forth** friction rub in opposite direction for 15 seconds. Let dry 20 seconds. Alcohol swabs and povidone are not acceptable for site preparation.
4. Pre-mark 10 mL on the side of your bottles using graduations on the label as a volume drawing guide.
5. Without re-palpating vein, perform venipuncture, drawing desired volume of blood (20 mL first site adult, up to 4 mL pediatric bottle).
6. Release tourniquet.
7. When using a syringe, inject the appropriate volume of blood into the previously prepared bottles. When using a butterfly type needle, it is important to utilize the appropriate bottle adaptor in conjunction with the needle. If using a syringe to draw the 20 mL, the bottles should be inoculated upright with the syringe. Inoculate the anaerobic bottle first. If using a butterfly and adapter, the aerobic should be inoculated first. This is to avoid putting air in the anaerobic bottle, which is in the hub and tubing of the butterfly and adapter, and against the plunger if using a syringe.
8. Discard all used needles into sharps container.
9. Gently mix bottles several times to prevent clotting.
10. Label each bottle drawn, in presence of patient/client, with patient/client demographics, date, time, and site. Do not cover barcodes on blood culture bottles with labels.
11. Repeat steps 1-9 for each additional site cultured. Note that one requisition should be submitted for each venipuncture/site.

Pediatric Collections

If a pediatric blood culture bottle is used, the maximum draw is up to 4 mL. The recommended blood culture draw for pediatric patients is **WEIGHT** dependent, **NOT** age dependent.

WEIGHT	REQUIRED BLOOD VOLUME	NUMBER OF BOTTLES
<4 kg	0.5-1 mL	1 pediatric
4 - <9 kg (<20 lbs)	2-4 mL	1 pediatric
9 – 27 kg (20-60 lbs)	10 mL	1 adult aerobic
>27 kg (>60 lbs)	40 mL	2 adult aerobic and 2 anaerobic

Storage and Transport

Blood culture bottles should not be refrigerated or held at 35°C prior to transport to the processing lab as storage under these conditions will adversely affect culture results. Blood cultures must be stored at room temperature prior to and during transport (optimal transport time is up to 24 hrs. if referring work). Every effort should be made to transport blood cultures bottles to the lab immediately after collection.

All collections (sites) from a blood culture set should be collected at the same time and sent to the laboratory at the same time. If a line-drawn culture is required as part of the set, the nursing staff and laboratory staff should coordinate to ensure samples are sent together.

Comments:

- If there is an indication that the blood culture is being drawn for suspect *Malessezia*, *Histoplasma*, *Coccidioides*, *Legionella*, *Bartonella* or mycobacteria (AFB), refer to Blood Culture in Laboratory Information Manual (LIM) online at <https://apps.sbgh.mb.ca/labmanual/test/view?seedId=40802>, re: specific collection devices. Approval for the release of these collection devices may require prior consultation with the medical or clinical microbiologist.
- When other bloodwork is ordered with blood cultures, blood culture bottles must be collected first. This is to maintain sterility and to expel air from the butterfly line before filling evacuated tubes.
- DO NOT draw blood from a vein into which an IV solution is running.
- DO NOT draw blood from an established peripheral intravenous line. A new peripheral IV line can only be used if it was established using the skin decontamination procedure outlined above.
- Pediatric bottles do not support the growth of anaerobic microorganisms.
- 10 mL should be inoculated into each bottle. Minimum volume requirement for adult bottles is 8 mL to ensure the minimum total volume collection (~20 mL) from each site. However, a bottle with insufficient blood volume inoculated due to technical issues should still be submitted to the microbiology laboratory and an additional bottle (aerobic) can be taken from that site to ensure the total volume per site is ~20 mL. Bottles should never have more than 12 mL added, use graduations on side of blood culture bottles for a volume draw guide if a butterfly is being used.
- If a patient/client has poor venous access, split the available blood between aerobe and anaerobic bottles; a second site is always preferred as it assists in ruling out contamination. The total volume of 40 mL is important for the sensitivity of the test. If 40 mL was not obtained with two venipunctures, attempt a third collection.
- If blood cultures are being drawn to rule out line sepsis; in addition to the culture drawn through the line a peripheral blood culture must also be drawn.
- When both a line draw and a peripheral draw are done on the same patient, they must be *drawn within one hour of each other* or it will not be viewed as a complete collection. The set (line and peripheral) should be sent to the laboratory together.

Appendix 7 Collecting Samples from an IV Arm

Every attempt should be made to perform collection from a site other than the arm with an IV. If this attempt fails, specimens may be collected from a vein several centimeters below the point of infusion. *Collection above an IV is a last resort.* Specimens collected above an IV site have a higher change of contamination with fluid and/or medications which will interfere with testing.

Collection below IV:

1. Ensure a suitable vein is available for collection by applying tourniquet below IV site.
2. Remove tourniquet and have nursing staff turn IV off for a minimum of 2 minutes prior to collection of specimen.
3. After 2 minutes, reapply tourniquet (between the IV site and the venipuncture site) and perform phlebotomy. Alert the nursing staff that the specimen collection has been completed and the infusion may be restarted
4. Document collection below IV on requisition or labels. (i.e. "Collection below IV; IV off for 2 minutes.")

Collection above IV (This should be avoided if at all possible. Microcollection is a better alternative.)

1. Ensure this is the only suitable vein available for collection.
2. Request nursing staff to turn IV off for a minimum of 2 minutes prior to collection of specimen. Apply tourniquet 3-4 inches above the antecubital fossa, perform venipuncture. Alert the nursing staff that the specimen collection is complete and the infusion may be restarted
3. Document collection above IV on requisition or labels. (i.e. "Collection above IV; IV off 2 minutes.")

Note: IV pump will beep at the two minute mark after being shut off.

Appendix 8 Special Collections

It is necessary for all special collections and handling be retrieved as per the Laboratory Information Manual (LIM) which can be located at:

<https://apps.sbgh.mb.ca/labmanual/test/findTestPrepare>

Appendix 9 Dealing with Patient Complications during Collection Procedures

Refer to the following documents as appropriate:

- 70-20-13, Dealing with Complications during Phlebotomy Procedures and IV Insertions and
- Site specific approved procedures for dealing with Medical Emergencies or
- F70-20-13 – template which may be completed and used as a site specific document for dealing with Medical Emergencies

Appendix 10 Management of Phlebotomy Matters**Blood stops Flowing into the Tube**

- Vein may have collapsed. Release the vacuum pressure, wait for vein to fill and then reapply vacuum pressure. If tourniquet has been released you may try to reapply constriction. Remove the needle, take care of the puncture site and redraw. You may make second attempt with a smaller needle.
- Needle may have pulled out of the vein when switching tubes. Hold equipment firmly and place fingers against patient's arm, using the flange for leverage when withdrawing the inserting tubes. To relocate the vein you may attempt to go in a bit deeper.
- Try new tube as you may have lost the vacuum on the current tube.

Hematoma

- Sometimes the needle penetrates through both walls of the vein. Blood leaking from the vein into surrounding tissue may form a hematoma.
- Puncture only the uppermost wall of the vein fully as partial penetration may allow blood to leak into the soft tissue surrounding the vein.
- Be sure to remove tourniquet before removing needle.
- Remove tube from holder before removing the needle.
- Release the tourniquet immediately if a hematoma forms and withdraw the needle; apply firm pressure.

Preventing Hemolysis

- Avoid vigorously mixing or shaking of the tubes; gently invert filled tubes as directed by manufacturer.
- Avoid drawing blood from a site that has a hematoma.
- When using a syringe assembly, avoid pulling the plunger back too forcefully. As well, avoid forcefully transferring the syringe's contents into the collection tube.
- Make sure the venipuncture site is dry; no residual alcohol.
- Avoid a probing and traumatic venipuncture.
- Avoid prolonged use of a tourniquet (no longer than 1 minute).
- Avoid repeated fist clenching or pumping.
- Avoid using a needle that is too large or too small (avoid 25 gauge needles for phlebotomy).

Complication

- A shooting, electrical pain sensation, tingling or numbness during the procedure indicates potential nerve involvement.
- If nerve involvement is suspected, remove the needle immediately and perform the venipuncture on a different site, preferably the opposite arm.
- Advise and explain the situation to the patient/client; notify superior regarding incident.
- Document the incident (Write up NCR.)

Other Problems

1. Arterial Blood: Blood is bright red, or rapidly forming hematoma or rapid tube fill may be arterial rather than venous. Withdraw needle and apply firm pressure for more than 5 minutes until active bleeding has ceased. Notify nursing staff and/or physician and document the incident according to SHARED HEALTH and facility policies. Consult Discipline Teams to determine if specimen collected is suitable for testing, also review appropriate testing SOP's.
2. Rolling Veins: When a vein rolls, the needle may slip to the side of the vein without penetrating it. Remove the tourniquet, withdraw the tube and remove the needle from the arm.

Appendix 11 Guidelines for Patients on Isolation

1. Read and observe all conditions as outlined on the specific Additional Precautions signage. Refer to Additional Precautions in the Acute Care Infection Prevention and Control Manual for additional information if required.
2. Prior to entering the room/bed space:
 - a. Perform hand hygiene. See Appendix 18 Hand Hygiene for proper steps.
 - b. Gather supplies (only take in necessary equipment).
 - i. Prepare a clean transport bag and tape it just outside the room
 - ii. Collection tubes and red tube holder (if available) (inside a plastic bag or glove to keep clean)
 - iii. Alcohol swab and/or chlorhexidine/alcohol swab if blood cultures are required
 - iv. Gauze
 - v. Butterfly with vacutainer
 - vi. Piece of tape (to secure gauze on puncture site)
 - vii. Latex free single use tourniquet
 - viii. Paper towels
 - c. Apply the appropriate PPE as indicated on the Additional Precautions sign:
 - i. Don a gown; tie neck strings and lap the gown at the back to cover as much uniform as possible. Tie waist straps.
 - ii. Don a mask or respirator, depending on Precautions.
 - Procedure or surgical mask; avoid touching of face (for Droplet or Droplet involved Precautions).
 - Don an N95 respirator and perform seal check (for Airborne or Airborne involved Precautions).
 - iii. Don protective eyewear.
 - iv. Don gloves, pulling cuffs over cuffs of the gown.
 - d. Leave lab tray and requisition outside the room.
3. Perform venipuncture:
 - a. Place clean paper towels on bed or bedside table and place phlebotomy equipment on them until you are prepared to collect blood.
 - b. Collect specimen(s), clean the collection tube(s) with Oxivir wipe before leaving the patient room but before labeling. Dispose of blood collection assembly into sharps container.
 - c. Discard supplies that are unused.
4. Prior to exiting the patient room/bed space:
 - a. Open door; dump the clean tubes into specimen bag taped to door. Leave the contaminated plastic bag in the room's garbage. NOTE: sample leaving the room must be clean as it will be treated the same as any other in the laboratory.
 - b. Remove gloves using "glove-to-glove, skin-to-skin" technique.
 - c. Discard gloves into garbage.
 - d. Perform hand hygiene.
 - e. Untie neck tie first, then waist ties on the gown.
 - f. Place fingers of one hand under the opposite cuff and pull cuff over hand.
 - g. Using the gown-covered hand, pull the gown down over the other hand.
 - h. Pull the gown off arms taking care that hands do not touch the outside of the gown.
 - i. Hold the gown away from your body and roll it up keeping the contaminated side inside, minimizing air disturbance.
 - j. Dispose of gown into the garbage or laundry hamper.
 - k. Perform hand hygiene, exit room.
 - l. Label all tubes. Document collection time and date along with phlebotomist information.
5. After exiting the patient room/bed space:
 - a. Use both hands to remove eye protection by the sides; discard eye protection in garbage if disposable or in basket if reprocessed.

- b. Use both hands to pull loops from behind ears or to undo ties; pull mask away from face using ties or loops (preventing self-contamination).
- c. Discard into garbage.
- d. Perform hand hygiene.
- e. Place tubes in a secondary container (leak-proof plastic bag) that will hold the specimen if the primary container breaks or leaks in transit to the lab.









Appendix 12 Order of Draw Poster

See document # F100-10-20 Order of Draw Poster for information regarding evacuated tubes.

Appendix 12 Order of Draw Poster (Continued)

Micro-Collections via Skin Puncture

Order of Draw

Closure Color	Additive	Mix by Inverting
 Lavender	K ₂ EDTA	10x
 Green	Lithium Heparin	10x
 Mint Green	Lithium Heparin and Gel for plasma separation	10x
 Mint Green		
 Grey	NaF/ Na ₂ EDTA	10x
 Gold	Clot Activator and Gel for serum separation	5x
 Gold		
 Red	No additive	0x

Appendix 13 Areas to Avoid When Collecting a Blood Specimen

The following sites and/or areas should be avoided:

- Extensive Scarring
- IV
- Mastectomy Arm*
- Feet
- Hematoma
- Wrist
- Skin disorders
- Cannula or fistula arm**
- Edematous sites as it may alter test results
- Extremities affected by stroke and injury as inability to detect adverse reactions ie nerve injury pain or infection

*Blood should not be collected from the arm on the side of a mastectomy. For patients who have undergone bilateral mastectomies, the physician must provide a written permission letter listing where phlebotomy can be done on the patient. Permission letters can be kept on file for future draws.

**Patients with fistulas in both arms will also require a permission letter from the physician as to the acceptable site to use for phlebotomy. This letter can be kept on file for future draws.

Appendix 14 Most Common Mistakes Made in Phlebotomy

1. Failure to confirm patient identification.
2. Not asking patient if they had any prior complications/incidents with blood draws.
3. Not releasing tourniquet after 1 minute.
4. Not re-cleansing the site after re-palpating.
5. Specimen labeling errors.
6. Wrong tubes used for test ordered or tubes filled in wrong order.
7. Quantity not sufficient – tubes containing anticoagulants must have a specific amount of blood in them; incorrect volumes will alter test results.
8. Not observing the site for bleeding for at least five minutes before bandaging.
9. Failure to adhere to special requirements for specimen handling. For example:
 - a. Delays in transport
 - b. Specimen not placed on ice
 - c. Specimen not protected from light

Appendix 15 Collection of Blood for Legal Purposes

Please reference policy document 100-10-60 Collection of Blood for Legal Purpose Policy.

Appendix 16 Specimen Collection on Mental Health Patients

Perform blood collection according to previously described process earlier in this document.

DO NOT discard any phlebotomy supplies in the mental health clinical areas or outside patient areas with potential mental health clients such as Emergency Departments.

Take all phlebotomy supplies back to an approved disposal area such as the lab

Appendix 17 Blood Patch Collection

A blood patch procedure can be used to relieve post-dural puncture headaches caused by lumbar puncture. A small amount of the patient's blood is injected into the epidural space near the site of the original puncture (epidural or spinal tap). The resulting blood clot then "patches" the meningeal leak.

Critical Factors

1. Adequate skin preparation is required to reduce contamination. The blood is being injected back into the patient so it is critical that it remains sterile.
2. A blood volume of 20 mL is required.

Phlebotomy Procedure

1. Follow steps 1-13 as outlined in Section 7 Procedure for venipuncture and Appendix 4 (as applicable).
2. Using chlorhexidine/70% alcohol, use a back and forth friction rub to cleanse selected site using sufficient pressure so the handle bends slightly. Cleanse with one side of swab with an up and down motion for 15 seconds covering a 4x4 cm area. Turn swab over and cleanse area using a back and forth friction rub in opposite direction for 15 seconds. Let dry 20 seconds.
3. Without re-palpating vein, perform venipuncture, drawing desired volume of blood (20 mL).
4. Draw blood once the anesthetist has located the epidural space.
5. Release tourniquet, withdraw the needle, and apply pressure with gauze to phlebotomy site.
6. Activate the safety cover of the needle and remove it from the syringe without touching/contaminating the end of the syringe.
7. Hand the 20 cc syringe to the anesthetist when he/she is ready.

HAND HYGIENE

USING SOAP AND WATER

Use in all situations where soap and water are available

- Rinse hands with warm running water, add soap to palms and rub hands together to create lather
- Thoroughly cover all the surfaces of your hands and fingers (including nails) for 15 to 20 seconds
- Rinse under warm running water
- Dry hands thoroughly with single-use towel or hand dryer
- Turn off the tap with a clean paper towel

USING AN ALCOHOL-BASED HAND RUB

Use when soap and water are NOT available, except if hands are visibly soiled

- Take a small amount of alcohol-based hand rub (about the size of a nickel)
- Rub it on your fingertips, both sides of your hands and between your fingers
- Continue to rub until your hands are dry
- There is no need to rinse or dry

Warning: The product is flammable when wet so ensure your hands are dry before performing another task.

HELP
PREVENT
THE SPREAD OF
INFECTION

References

1. GP41-7th Edition, April 2017, Collection of Diagnostic Venous Blood Specimens, CLSI
2. CSLI Standards H3-A6. (n.d.).
3. Kiechle, F. L. (2013). *So you're going to collect a Blood Speciment, An introduction to Phlebotomy 14th Edition*. Northfield Illinois: CAP Press.

Associated Documents and Policies

1. Diagnostic Safety Manual, doc# 100-10-28
2. Work Related Injury Near Miss Form, doc# F70-10-07
3. Specimen Acceptance Policy, doc# 10-50-03
4. Client Identification Waiver Procedure, doc# 100-10-79A
5. Client Identification Waiver Form, doc# F100-10-79A
6. Job Aide Patient Greeting and Guidelines, doc# JA100-10-79
7. Specimen Acceptance, Rejection and Suitability, doc# 160-MP-02
8. Cadham Laboratory 15.04.003
9. Clinical Microbiology Sample Collection Manual, doc# 120-10-05
10. Blood Culture Procedure Manual MALDI-ToF, doc# 120-10-07
11. Order of Draw, doc# F100-10-20
12. Collection of Blood for Legal Purposes Policy, doc#100-10-60