

Standard Operating Procedure

 Eastern Health Laboratory Medicine	Section: Management System\EH Laboratories\Biochemistry\Collection Manual\		
	Title: Collection of Blood Specimens by Venipuncture		Number: 6975
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Effective Date: 2/9/2024			Status: Current

Purpose or Principle

This procedure provides instructions for staff performing blood collections in the preparation and collection of blood specimens by venipuncture. Staff members include MLA, MLT or other qualified health professionals.

Materials

Reagents

Not Applicable

Supplies

- Blood Collection Trays
- Disposable Non-latex Gloves
- BD Vacutainer® Safety-Loc™
- Blood Collection Needle – 21g and 23g
- Blood Collection Set – 21g and 23 g
- Blood Collection Tubes
- Disposable Tourniquets
- 70% Isopropyl Alcohol Wipes
- Non-sterile 2X2 Gauze
- Sharps Container
- Tape
- Cooling devices
- Warming Devices
- Tri-pad (Blue Pads) – to protect from blood spills.
- Disinfectant
- Computer generated labels/paper requisitions.
- Test Reference

Equipment

- Utility Cart

Sample

Not Applicable

Special safety precautions

- All laboratory specimens should be treated as infectious and handled according to “standard precautions”.
- The staff members must be aware of all possible signage or armbands with warnings regarding the patient.
- The staff members must **NOT** perform blood collection against the patient’s or guardian’s consent. Notify nursing staff or physician of the objection.
- The staff members should not enter the patient’s bedside without permission when patient is being consulted by the physician or nursing staff. When Blood Cultures are ordered they must always be collected first to maintain the aseptic field that is needed.
- The tourniquet should not be applied for longer than one minute. This may cause erroneous results. When the tourniquet has been applied for longer than one minute prior to performing the venipuncture, release tourniquet and reapply after two minutes.
- Patients shall be instructed to avoid hand pumping before and during collection which may affect the integrity of the specimen.
- Due to the likelihood of hemolysis **DO NOT** use butterflies or small gauge needles unless absolutely necessary for example, on a small child or in the hand.
- The staff members should not attempt venipuncture more than twice on a difficult patient. Refer to procedure *“Unable to Collect a Blood Specimen”*.
- Blood must **NEVER** be poured from one vacutainer tube into another.
- When antecubital veins are unavailable, veins on the back of the hand are acceptable and can be used. The underside of the wrist must **NOT** be used, as nerves and tendons are close to the surface. When collecting from the hand **ONLY** use a small gauge butterfly set.
- Avoid Veins that are in close proximity to an artery, as indicated by the presence of a pulse.
- Because of the potential for significant medical complications such as phlebitis, thrombosis, or tissue necrosis, ankle or lower extremities must **NOT** be used for venipuncture without written consent from physician.
- Specimens should not be collected from the arm or hand on the same side as a mastectomy; lymphostasis may occur. Unless all other sites have been ruled out and only with written consent from physician.
- Lab staff will only attempt collection of a venous blood gas sample via venipuncture (4ml vacutainer). Collection of a venous blood sample by any other method is not permitted by lab staff and must be deferred to **medical staff**.

Quality Control

Not Applicable

Procedure:

Follow the activities below to prepare and collect blood specimens by venipuncture.

Pre-Venipuncture

1. Prepare accession order.
2. Identify yourself to the patient and clearly explain the procedure to the patient.
3. Obtain patient consent. If patient consent is not obtained do not proceed and notify nursing staff or physician and document refusal in Meditech System.
4. Observe any isolation or precaution signage on the room door or over the bed. (Inpatient)
5. Perform Positive Client Identification in accordance with Eastern Health Policy (If patient is an outpatient, always ensure the Health Care card is returned).
6. If the venipuncture is taking place in an inpatient setting, patient hospital wrist band must be cross referenced with computer generated labels. As well as verbal confirmation of patient name and date of birth (Where possible).
7. If the venipuncture is taking place in an outpatient setting the client requisition must be cross referenced patient healthcare card and with computer generated labels to ensure all information entered is accurate. As well as verbal confirmation of patient name and date of birth (Where possible).
8. Check with patient to ensure any required preparation for the test has been followed such as fasting or diet restrictions.
9. Assemble all necessary supplies and select appropriate tubes for tests requested. Do not remove the needle cap or pierce the tube as this will result in a loss of vacuum pressure.
10. Sanitize hands and put on non-latex, non-sterile vinyl gloves for venipuncture.
11. Position patient in a chair suitable for venipuncture with support to the elbow. Position the arm in a downward position to prevent a backflow. For patients laying down, the staff member may need to place a pillow under the arm for support.
12. Apply tourniquet 3 to 4 inches above the venipuncture site. The tourniquet should not be left on any longer than 1 minute due to the possibility of hemoconcentration.
13. Select venipuncture site. (see appendix B) "The larger and fuller median cubital and cephalic veins are used most frequently; veins on the back of the hand and wrist are also acceptable for venipuncture...the underside of the wrist is never to be used.
14. Cleanse the venipuncture site in an outward circular motion with 70% alcohol swab and allow to **Air Dry**. It is important to remember when collecting an alcohol level, clean the puncture site with a non-alcohol solution such as providone-iodine or antiseptic soap. If necessary to re-touch the venipuncture site, the staff members must cleanse the site again and allow it to **Air Dry** again.
15. For any Unique venipuncture situations such as seizures, mastectomy, vascular access devices etc. refer to the SOP entitled "Unique Venipuncture Situations".

Post Venipuncture

1. Gently mix (never shake) each tube immediately after removing from the barrel by inverting 5-8 times, (3-4 times for citrates tubes). Tubes **must** be labelled and signed directly in front of the patient at the bedside or phlebotomy chair. The Collector must record date and time of collection along with mnemonics of collector on each specimen collected as well as any paper requisitions or documents needed for testing. In the case of microsamples record this information on the larger barcoded label.
2. Observe special handling instructions if required. Samples must be placed in a rack up right immediately following collection.
3. Check the patient's arm to ensure bleeding has stopped and patient is feeling ok, apply tape to keep gauze in place.
4. Raise the bedside rails if they were lowered during collection procedure on an inpatient.
5. Dispose of the used needle into a puncture-resistant **Sharps Container** and discard tourniquet as it is **Single Use** into the appropriate waste container. Ensure all supplies used in the procedure are removed from the patient's bedside.

NOTE:

- If performing a venipuncture on a psychiatric unit, remove all equipment from the room and discard it at the nursing station.

6. Clean phlebotomy chair arm rests between patients.

Calculations

Not Applicable

Interpretation/Results/Alert values

Not Applicable

Reference intervals

Not Applicable

Method performance specifications/limitations

Not Applicable

Result reporting

Not Applicable

References

- CLSI Standard H3-A6 – Procedures for the Collection of Diagnostic Blood Specimens by Venipuncture; Approved Standard – Sixth Edition
- Phlebotomy Essentials Fourth Edition – Ruth E. McCall and Cathee M. Tankersly. Published by Lippincott Williams and Wilkins, 2008.
- Becton Dickinson Vacutainer Systems
- Johns Hopkins Medicine Pathology Volume I – POC and Phlebotomy/Specimen Collection
- Calgary Laboratory Services Blood Collection Guidelines
- Eastern Health Laboratory Medicine Safety Manual

Related procedures

- Collection of Blood Specimens by Finger Puncture OrigID 6974
- Collection of Blood Culture Specimens OrigID 6972
- Unable to Collect Blood Specimen OrigID 7011
- Labeling Blood Collection Tubes with Barcode Labels OrigID 6992

Documents/Forms/Records

Not Applicable

Document Change Log	
Date	Changes
13 August 2015	Special Safety Precautions updated, bullets removed, sections deleted from Special Safety Precautions and Guidelines. Single Use Tourniquets added to Supplies. Changes to Procedure regarding patient consent and recording refusals. Information added for specimen labeling at time and point of collection.
03 November 2016	Change made under Special Safety Precautions to ensure use of butterfly set only when collecting from the hand and to instruct patient to avoid fist pumping during venipuncture. Reference to Lab Safety Manual also added. Step 1 under Post Venipuncture section updated to ensure staff gently mix tubes (never shake). Step 2 under the same section updated to insure specimens are placed in upright position immediately after collection.
30 April 2019	Reviewed for accuracy.

14 June 2019	Point added under Special Safety Precautions re; Patient signage and armbands.
25 March 2021	Section added under special safety precautions to address venous blood gas collection.
1 November 2023	Added: client requisition must be cross referenced patient healthcare card and computer-generated labels. Proper patient identification before venipuncture.
January 18, 2024	Updated appendix A Tube Types and Order of Draw to current 2023 version. https://www.bd.com › posters › blood-collection
January 25, 2024	Edited reference to MLA to staff members as some sites MLTs and other health professionals perform venipuncture.

Appendix A – Tube Types and Order of Draw

Venous blood sampling

Order of draw^{1,2} and specimen handling

Order of draw ^{1,2}	Colour code	Tube type	OR	Order of draw ^{1,2}	Colour code	Tube type
Discard tubes		EST or other suitable tube ³		Blood culture		Aerobic blood culture bottle
						Anaerobic blood culture bottle
Order of draw ¹	Colour code	Tube type	Recommended inversions	Minimum clotting time	Centrifugation conditions	
Coagulation tubes		Sodium citrate, plastic	3-4	n/a	2000-2500 g (RCF) for 10-15 min. at 18-25 °C	
Serum tubes, with or without separator		Serum with clot activator (silica particles)	5-6	60 min.	≤1300 g (RCF) for 10 min. at 18-25 °C	
		Serum thrombin	5-6	5 min.	≤1300 g (RCF) for 10 min. at 18-25 °C	
		BD RST (serum thrombin with gel)	5-6	5 min.	1500-2000 g (RCF) for 10 min, 2000g (RCF) for 4 min, or 4000g (RCF) for 3 min at 23-27 °C	
		BD SST™ II Advance (serum with gel)	6	30 min.	1300-2000 g (RCF) for 10 min. at 18-25 °C	
Heparin tubes, with or without separator		BD Bactec™	8	n/a	4000x g (RCF) for 3 min, 3000x g (RCF) for 5 min. at 18-25 °C or alternative centrifugation conditions ¹	
		Lithium & sodium heparin	8-10	n/a	≤1300 g (RCF) for 10 min. at 18-25 °C	
		BD PST™ II (plasma with gel)	8-10	n/a	1300-2000 g (RCF) for 10 min. at 18-25 °C	
EDTA tubes, with or without separator		EDTA	8-10	n/a	n/a	
		PAXgene® Blood DNA Tube	8-10	n/a	n/a	
		Blood banking	8-10	n/a	≤1300 g (RCF) for 10 min. at 18-25 °C	
		BD PPT™ EDTA with gel	8-10	n/a	1100 g (RCF) for 10 min. at 18-25 °C	
Glucose		Fluoride	8-10	n/a	≤1300 g (RCF) for 10 min. at 18-25 °C	
Tubes with other additives		ACD	8-10	n/a	n/a	
		Trace elements with EDTA	8-10	n/a	≤1300 g (RCF) for 10 min. at 18-25 °C	
		Trace elements serum with clot activator (silica particles)	5-6	60 min.	1300 g (RCF) for 10 min. at 18-25 °C	
		BD CPT™ Sodium Citrate or Sodium Heparin	8-10	n/a	Citrate tube 1500-1800 g (RCF) for 20 min. at 18-25 °C Heparin tube 1500-1800 g (RCF) for 15 min. at 18-25 °C	
		BD™ P800	8-10	n/a	1100-1300 g (RCF) for 20 min. at 18-25 °C (8.5 mL tube) 1100-1300 g (RCF) for 10 min. at 18-25 °C (2 mL tube)	
		BD™ P100	8-10	n/a	2500 g (RCF) for 20 min. at 18-25 °C (8.5 mL tube) 1000-3000 g (RCF) for 10 min. at 18-25 °C (2 mL tube)	
		PAXgene® Blood cfDNA Tube	8	n/a	1600-3000 g (RCF) for 15 min. at 15-25 °C	
		PAXgene® Blood RNA Tube	8-10	n/a	n/a	

IMPORTANT MIXING GUIDELINES

All BD Vacutainer® Tubes, except discard tubes, require immediate mixing following collection. Insufficient mixing can result in inaccurate test results and the need to re-draw. Correct mixing technique is to gently invert (180° and back) each tube the recommended number of times shown in the recommended inversions column.

*Discard tube is not required before blood collection for anaerobic and aerobic blood culture bottles.

n/a = not applicable

1. Sequence for sample taking according to Clinical and Laboratory Standards Institute (CLSI), Procedures for the Collection of Diagnostic Blood Specimens by Venipuncture: Approved Standard - Sixth Edition, CLSI document H3-A6 (ISBN 1-54238-655-6), Clinical and Laboratory Standards Institute, 940 West Valley Road, Suite 1400, Wayne, Pennsylvania 19087-1898 USA, 2007.

2. Srivastava AM et al. Working Group for Preanalytical Phase (WG-PRE), of the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM) and Latin American Working Group for Preanalytical Phase (WG-PRE LATAM) of the Latin American Confederation of Clinical Biochemistry (COALABIOCL). Joint IFCC/COALABIOCL Recommendation for various blood sampling. Clin Chem Lab Med. 2018 Nov 27;56(12):2015-2038. doi: 10.1515/clin-2018-0402.

3. BD Vacutainer® Bactec™ Blood collection tube Instructions for Use. www.bd.com/ifu



CE0123 applies to BD Vacutainer® CPT™ Cell Preparation Tubes, BD Vacutainer® EDTA Agglutinin Blood Collection Tubes, PAXgene® Blood cfDNA Tube and PAXgene® Blood RNA Tube.



CE applies to all other BD Vacutainer® Blood Collection Tubes and PAXgene® Blood DNA Tube



CE2797 applies to BD Bactec™ Blood Culture Bottles. 2797

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<https://www.bd.com › posters › blood-collection>

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Appendix B – Primary Venipuncture Sites