Finger Prick Blood Sampling

Short Title	Finger Prick
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A. PURPOSE

Finger prick blood sampling method is used when only a small sample is required for analysis (e.g., 20 µl). It is commonly used in physiology to measure blood lactate or glucose.

B. SCOPE AND APPLICABILITY

1. This protocol does not apply to venous or arterial blood sampling.
2. This operating protocol refers to all instances in which capillary blood micro-samples are taken following pricking of one or more fingers or other skin sites (e.g., fleshy part of the ear lobe). Typical analytical determinations from the sampled blood include, but are not limited to, blood lactate or glucose levels via hand-held, rapid-response micro-analyzers, or via capillary glass tubes (for analysis in other analyzers).
3. The micro-analyzers and sampling devices (lances, lancing units) are commercial and approved devices that do not require medical prescription or training. As such, similar finger/ear blood sampling is currently performed by the general public with no specific training.
4. Sampling may occur both in laboratory and in field settings

C. RESPONSIBILITIES

1. The main aim of this protocol is to ensure the safety of the tested individuals as well as the testing personnel and anyone who might inadvertently come in contact with the associated equipment and materials. More specifically, the aim is to ensure that blood from a tested individual is not carried over, coming in contact with another individual during or following the testing procedure. The risks of blood-borne pathogen transmission are described in Appendix 1, below.

D. MATERIALS AND EQUIPMENT

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1. It is recommended that all testing equipment and materials are stored and transported in a carrying case, such as a tool-box. Equipment may include:
    1.1. Micro or hand-held analyzer.
    1.2. Analyzer-associated sampling devices (e.g., sticks, tabs).
    1.3. Lancets.
    1.4. Lancing device(s). Note: Multiple-use lancing devices are ubiquitous, made by numerous manufacturers, and come in various styles. They all can be disinfected in the manner described below. Choosing a device should be guided by suitability, availability, and personal preference.
    1.5. Protective, latex or equivalent gloves.
    1.6. Cotton balls/gauze pads, or equivalent.
    1.7. Disinfecting fluid (typically, 70% isopropyl alcohol, or equivalent) in two distinct containers.
    1.8. Main dispensing container.
    1.9. Smaller, wide mouthed and sealable container for lancing-device immersion/disinfection.
    1.10. Biohazard waste-and sharps-disposal containers (see Appendix 3 below).

E. PROCEDURE

1. Prepare a clean, uncluttered work area where testing will take place.
2. Arrange equipment/materials in a practical, ergonomic manner.
3. The researcher should cover all exposed and damaged skin on his/her arms (e.g., long sleeves). For what constitutes damaged skin, refer to Appendix 1 below.
4. Wear protective gloves.
5. With any blood sampling technique, there is a risk of the participant fainting at the sight of the lancet, or the sight of blood. Ensure that the participant is comfortably sitting such that there is minimal risk of injury in the event of a fainting spell. If the participant begins to lose colour, begins sweating excessively, or shows other signs of feeling faint, discontinue immediately and abort the procedure. For more on the risk of fainting please see Appendix 2 below.

6. Load a lancet into a clean, disinfected lancing device and cock it. If applicable, set the device for the appropriate pricking depth. Note: Deeper pricks generally prevent the occasional need for multiple pricks for a single sample and end up being less painful overall.
7. Dry the skin surface around the intending pricking site (e.g., from sweat) as much as possible. Clean the intended pricking site with disinfectant-impregnated cotton ball within 60 seconds of actual pricking. If still wet, wipe the site dry just prior to pricking.
8. Apply the lancing device to the pricking site with moderate pressure and release the device's trigger.
9. Sample the blood when a sufficiently large drop has developed to cover the analysis tab or stick appropriately.
10. Apply a clean and dry cotton ball to the pricked site and instruct the participant to hold it there until bleeding ceases (~30-90 s).
11. Wipe the lancing device clean with disinfectant-impregnated cotton ball (or equivalent) after each use.
12. Read and record the analyzer's reading.
13. Carefully remove and dispose of lancet in sharps-disposal container.
14. If repeated sampling is called for on the same individual, replace the sampling stick/tab and lancet and repeat the procedure from 1 to 12.
15. If sampling is being performed on different individuals during the same experimental session, a separate lancing device must be used for each individual. The researcher must change gloves as well.
16. If any bodily contamination occurs, please follow instructions outlined in Appendix 4 below)
17. Dispose of waste materials in the appropriate containers (see Appendix 3 below).
18. Clean and disinfect the work area.
19. Store disinfected lancing device(s) in a sealable plastic (e.g., Ziploc) bag, or hard case.

F. REFERENCES (if applicable)

G. APPENDICES

1. Risk of transmission of blood-borne pathogens:

Blood-borne pathogens, such as HIV, Hepatitis B Virus (HBV), and Hepatitis C Virus (HCV), can be transmitted through contact with infected human blood (as well as other body fluids). ***Note***: infected individuals might be asymptomatic carriers of the pathogen, who are not necessarily aware of the infection, nor show any signs or symptoms of disease. It is therefore necessary to avoid contact with blood, even when it comes from apparently healthy individuals.

HIV, HBV, and HCV can be transmitted in many ways. The following are relevant to finger/ear-pricking and finger/ear-tip blood sampling:

a. Accidental puncture from contaminated lancets, broken glass, or other sharps.

b. Sharing/re-using of lancets and contaminated lancing devices between individuals.

c. Contact of blood residues or blood-contaminated equipment (*e.g.*, lancing devices, gloves) with broken/damaged skin (*e.g.*, open sores, cuts, abrasions, acne, blisters, sun-burns), or mucous membranes (*e.g.*, eyes, nose, mouth).

2. Risk of participant fainting

As stated above in the methods, many participants can unexpectedly feel faint or actually lose consciousness with the sight of the lancet or at the sight of blood. It is important that the researcher that is present during the experiment has completed first aid training to deal with such adverse events.

It is important that the researcher ensures that the participant is comfortably seated before beginning to avoid any injury that may happen with a fall. The researcher must be vigilant for signs of discomfort in the participant to avoid a full faint (e.g., loss of facial colour, sweating excessively, disconnectedness, distress), but must also keep in mind that fainting can happen without warning.

In the event that the participant does not feel well, terminate the procedure immediately and make sure that the participant rests comfortably until they are ready to leave the lab. The researchers can assess whether or not the participant needs to be accompanied home and should touch base with the participant later to ensure that there were no residual effects from the event.

If the participant loses consciousness, follow first aid rules to ensure that the participant is properly cared for. The participant may require assistance to get home, and follow up communication is required to ensure that the participant recovered from the event.

Remember to report any adverse events to the Research Ethics Office (reb@brocku.ca) (see Appendix 4).

3. Disposal of bio-hazardous materials

Any material or equipment contaminated, or suspected as being contaminated with blood, and which could not or would not normally be disinfected, must be disposed of in an appropriate, University-authorized, bio-hazardous waste-disposal container, as follows:

a. Used lancets, glassware (if any), and any object capable of penetrating the skin, must be disposed of in a Sharps Container.

b. Any other materials, such as cotton-balls, gauze pads, gloves, paper towels or rags, and plastic containers, must be disposed of in general (solid) bio-hazardous waste-disposal container. An exception to this can be made when only a limited amount of non-sharps material must be disposed of (e.g., a pair of gloves and some cotton-balls). In such a case the materials could be disposed of in the sharps container.

c. All bio-hazardous waste-disposal containers shall be kept in a safe place to prevent inadvertent mishandling by unauthorized persons. When full, or when further testing / waste generation is not foreseen for several weeks, containers shall be appropriately disposed of (Sharps room or autoclaving) by authorized personnel.

4. What to do if bodily contamination did occur

a. When intact skin has been contaminated with blood, clean and disinfect the site and the immediately surrounding area with cotton-ball/gauze soaked with 70% isopropyl alcohol.

b. Any adverse event that occurs during an experiment must be reported to the Research Ethics Office (within 24 hours) at reb@brocku.ca. All incidents and accidents that result in a potential exposure to blood, as described in Appendix 1, must be promptly reported (within 24 hours, at the latest), using the University Injury/Incident Report form available at: http://brocku.ca/hr-ehs/environment-health-safety.

c. Incidents must be reported as soon as possible (within 24 hours, at the latest). Do not delay submitting the form due to technicalities; missing signatures can be obtained later. The form should be submitted to the supervisor (Principal Investigator, faculty/staff in charge), as well as to the University Biosafety Officer via email to besafe@brocku.ca, or in person to office 507 in the Cairns building.