Title	**Collection of Venous Blood Sample using a Catheter (Adult)**
SOP Code	SOP ContAct004-02
Effective Date	29-August-2025

A. PURPOSE AND BACKGROUND

Performing a procedure on tissue below the dermis is considered a controlled act. This SOP describes the procedures for researchers to collect venous blood samples using an over the needle catheter from adult study participants. This technique is used when repeated blood sampling will occur over a number of hours. **A separate SOP is to be followed for youth and children.**

B. PROCEDURES/STUDY PROTOCOL

1. The researcher washes hands thoroughly with soap and warm water or an alcohol-based sanitizer. Hands are to be properly cleaned before the gloves are put on and after the gloves are removed. Hand hygiene is also needed before and after the replacement of gloves during a procedure or in between tasks. The use of gloves does not replace the need for hand hygiene.

2. If fasting blood samples are to be taken, the researcher verbally confirms the participant did not eat and drink for 10-12 hours prior to the blood draw. If the criteria are not met the researcher follows the study protocol.

3. The researcher asks the participant if they would like blood drawn from the non-dominant hand/arm to minimize interference with daily activities. Participant's arms and hands will be inspected for a vein of reasonable size. This is most often the medial cubital vein, although other veins can be used.

4. Once a suitable vein is selected by the researcher, the participant is asked to sit or lie down in a position that provides the researcher access to the vein and that is comfortable for the participant. The position must minimize risk of injury in the event of fainting. The participant may also lie down if there is any history or concern with fainting.

5. The skin superficial to the vein is cleaned with an alcohol wipe and allowed to dry. The alcohol needs to dry to ensure the area is disinfected and to prevent additional discomfort for the participant (i.e., stinging feeling).

6. A tourniquet is applied 5-10 cm above the intended site of the venous puncture.

7. Puncture: The catheter-over-needle is unsheathed and inserted through the skin and into the vein at an angle of 15 to 30 degrees. On insertion into the vein, a flash of blood is observed in the needle flash chamber.

8. Once puncture is complete, the tourniquet is removed.

9. Catheter Positioning: The researcher advances the catheter portion forward 1 cm into the vein, sliding it over the needle in a smooth motion.

10. Needle Removal: The researcher presses on the vein below the puncture to slow the flow of blood up the arm. The researcher removes the needle (by pulling back) and immediately connects a sterile stopcock to the open catheter. The needle is disposed of directly into the sharps container.

11. The catheter and stopcock will be secured with medical adhesive sheets or skin tape.

12. A single-use syringe may be connected at this point and the stopcock opened to draw blood into the syringe. Timing and volume of blood drawn depends on the protocol. Blood will be transferred from the syringe(s) to prepared tubes that contain the required anticoagulants/additives as appropriate for the analysis of the blood.

13. Sterile saline is drawn up into another sterile, single-use syringe and pushed into the stopcock and catheter to replace the blood. The amount will be carefully monitored and the transparent catheter observed carefully so that only the exact amount of saline is inserted. The purpose of the saline is to prevent blood clotting. Saline is not injected into the participant.

14. Following each sample collection, the stopcock is turned off, and the syringes are disposed of in the biohazard waste containers. The stopcock is flushed with sterile saline drawn up into another sterile, single-use syringe to make the stopcock ready for subsequent use.

15. The stopcock is cleaned with an alcohol swab for 30 seconds before next use.

16. The catheter is to remain in the arm vein while blood draws are repeated at intervals required by the study protocol. The catheter itself is soft, flexible Teflon and the participant may move their arm without pain or discomfort.

17. Next blood draw: Always using a fresh syringe, the researcher will first draw out the saline and discard. Then additional blood may be drawn up into another syringe and transferred to waiting tubes for processing.

18. When the last blood draw is complete, the tape securing the catheter is removed and the catheter portion is withdrawn from the vein.

19. A cotton ball/swab is pressed on the site of venous puncture and the participant is asked to sit still and apply pressure to stop the bleeding and reduce the risk of bruising (2 to 3 minutes).

20. The researcher disposes of the catheter directly into the sharps disposal.

21. Once the bleeding has stopped, the participant is offered a bandage to apply over the puncture area and the participant is asked to sit for a minimum of 5 minutes.

22. The participant is informed there may be bruising at the site of the puncture for the next few days. The participant is advised to keep the puncture area clean/dry to promote rapid healing and to avoid heavy lifting for 24 hours to prevent further bruising.

23. The participant is informed there is a rare risk of infection and to watch for redness, pain, swelling, and/or fever.

24. If a participant is asked to fast prior to the session, they will be offered a beverage (e.g., juice) and/or a small snack (e.g., granola bar).

C. EQUIPMENT

- Over-the-needle catheter for each participant
- Appropriate sized (1,3 or 5ml) sterile needle-less syringes for each participant
- Sterile saline single-use size bottles (10 ml) for each participant
- Blood collection tubes
- Tourniquet
- Nitrile/vinyl gloves
- Alcohol wipes
- Cotton balls/swabs
- Bandages

- Pillow/pad for raising arm
- Juice/snacks for fasting participants

Disposable, single use materials or equipment are to be used whenever possible and any reusable materials or equipment must be cleaned and disinfected with alcohol-based sanitizers before use with another participant.

D. DESCRIPTION TO STUDY PARTCIPANTS

1. Each individual interested in participating is asked if they are:
   - comfortable having blood drawn, and
   - have allergies/sensitivities to rubbing alcohol or adhesives.

2. Individuals who indicate they are uncomfortable with the procedure and/or are allergic/sensitive to rubbing alcohol should not participate in the blood draw. Appropriate bandages/tape are used for individuals who are sensitive to adhesives.

3. The information-consent letter must include the following:
   - An overview of the training and experience of the person performing the finger prick. If an individual has been delegated this task, a description that a physician has authorized the trained and qualified person to carry out the procedure, ensuring it is done safely and within legal guidelines.
   - A description of the catheter insertion blood draw procedure: the procedure requires wiping an area of the skin with rubbing alcohol, puncturing a suitable vein, positioning the catheter, removing the needle, and adding a stopcock to the catheter.
   - The amount of blood to be drawn.
   - The risks and safeguards.
   - To wear a loose shirt or a short sleeve shirt for blood collection.
   - Participants can ask questions or ask to stop the procedure at any time.
   - If fasting blood samples are required, participants are informed to avoid eating and drinking except for water for 10-12 hours before coming to the lab for the blood draw.

E. RISKS

1. Participants

- Bruising at site of needle puncture
- Feelings of lightheadedness or fainting
- Excessive bleeding
- Risk of infection

2. Researcher
   - Mucous membrane blood exposure or needle stick injury

F. SAFEGUARDS/SAFETY PROCEDURES

1. Researcher is to have completed:
   - First Aid/CPR training
   - Any required safety training from the UWaterloo Safety Office

2. Universal precautions are to be applied at all times. Refer to the UWaterloo Occupational Health guideline: Universal Precautions | Occupational Health | University of Waterloo (uwaterloo.ca)

3. Researcher must follow UWaterloo Safety Office guidelines on use of personal protective equipment and specifically use of gloves. See Personal Protective Equipment (PPE) | Safety Office (uwaterloo.ca)

4. A new pair of disposable nitrile/vinyl gloves are used with each participant. Gloves are for single procedure use only. Gloves should always be removed using a glove-to-glove/skin-to-skin technique to prevent contaminating the hands. Gloves are to be disposed in an appropriate container.

5. Participant is asked to apply pressure to stop bleeding and reduce the risk of bruising.

6. To reduce risk of injury from fainting and lightheadedness, the participant is to sit or lie down. The Participant can be offered juice if feeling faint or lightheaded.

7. Participants are reminded to avoid heavy lifting for 24 hours.

8. Researcher is to follow emergency procedures for uncontrolled excessive bleeding, unconsciousness, or other unexpected reactions requiring attention.

9. Researcher is to follow the Region of Waterloo posted procedures for post exposure management for blood-borne pathogens in the event of a mucous membrane blood exposure or needle stick injury: https://www.regionofwaterloo.ca/en/health-and-wellness/resources/Documents/Blood_Exposure_Guidelines_EMS.pdf

G. REFERENCES

1. Public Health Ontario (2013). Best Practices for Cleaning Disinfection and Sterilization of Medical Equipment/Devices in all Health Care Settings, 3rd edition. Retrieved March 26, 2025, from bp-cleaning-disinfection-sterilization-hcs.pdf (publichealthontario.ca)

2. Public Health Ontario. (2015). Infection Prevention and Control for Clinical Office Practice. Retrieved on March 27, 2025 from bp-clinical-office-practice.pdf (publichealthontario.ca)

3. University of Waterloo Office of Research Ethics. (2013). Human Participant Research Guidelines: Controlled Acts and the Delegation of Controlled Acts. Retrieved on March 27, 2025 from Controlled acts and medical directives | Research (uwaterloo.ca)

SOP Code	Effective Date	Summary of Changes
SOP ContAct-004-01	07-FEB-2017	Original
SOP ContAct-004-02	29-AUG-2025	Updates to procedures, description to participants, risk, and safeguards. Updates to links for researchers. Updates to references.