



Clinical Practice Guideline

Guideline coverage includes NICU KEMH, NICU PMH and NETS WA

# Blood Sampling: Capillary, Venepuncture, Peripheral Arterial, UAC, UVC and CVC

This document should be read in conjunction with the [Disclaimer](#)

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## Capillary Blood Sampling

In the absence of arterial access, capillary blood samples can be used where the total sample volume is < 1 mL:

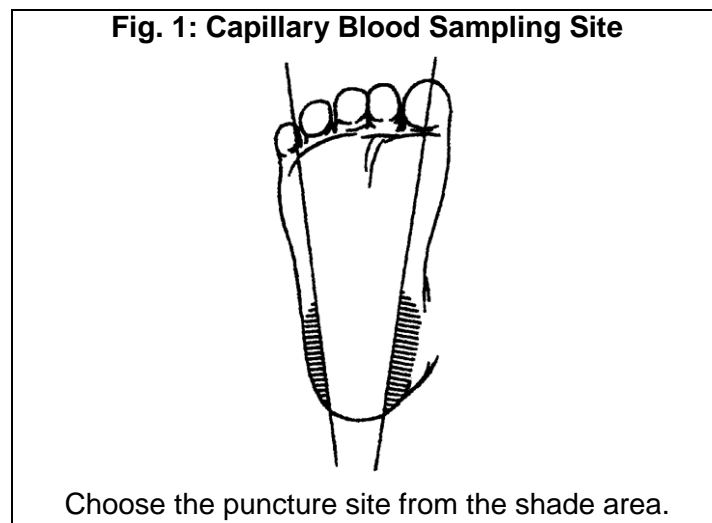
- Blood gas analysis.
- U&E's/FBC/antibiotic assays/caffeine levels/SBR/PGL.
- Newborn screening.
- Blood glucose monitoring.

### Equipment

- 1% Chlorhexidine/20% alcohol swab
- Neonatal approved lancet
- Gauze swabs/cotton wool balls
- Specimen tubes/capillary blood tube

### Procedure

1. Consider sucrose.
2. Check pathology form with infant's identification bands.
3. Check that investigations are correct for that infant.
4. Collect appropriate sample tubes and equipment for blood sampling.
5. Wash hands and wear gloves.
6. Identify the puncture site that you are going to use, as per [Fig.1](#).



7. Clean site and allow to dry for 30 seconds.
8. Lance the skin and wipe away the first drop using a gauze swab.
9. Hold the puncture site downward applying a gentle pumping action and allow blood to flow into the specimen container.
10. Wipe the heel clean with a cotton ball and gently compress the site until bleeding has stopped.
11. Label and check with another person the collected samples are correctly labelled at the bedside.
12. Blood sampling site, the test ordered and the volume of blood taken should be documented in the observation chart.

## Venepuncture Sampling

Venepuncture can be used for blood samples where the total sample volume is > 1mL and there is no arterial access, or where capillary sampling is not advisable. Sick neonates may require frequent intravenous cannulation it is therefore important that when performing a venepuncture the most distal aspect of the hand or the foot is used.

### Equipment

- 1% Chlorhexidine/20% alcohol swab
- Venepuncture needle
- Specimen bottles
- Cotton balls

### Procedure

1. Consider sucrose.
2. Check that the investigations are correct for that infant.
3. Choose area to be punctured.
4. Clean skin as per protocol.
5. Puncture skin with the bevel uppermost.
6. Direct the needle into the vein at a 45° angle.
7. Await blood return and then allow blood to drip into specimen bottle.
8. Maintain pressure on the site until bleeding has stopped.
9. Document sample method, the test ordered and the volume of blood taken on the observation chart.

## Peripheral Arterial Catheter Sampling

Taking a peripheral arterial blood sample is a standard aseptic procedure and can be performed by staff deemed competent in this procedure.

### Key Points

- Blood samples are only to be sent to the laboratory (known as a FORMAL sample) as requested by medical staff. Most blood samples can be analysed within the nursery setting (known as an INFORMAL sample).
- When analysing an informal biochemistry sample, the volume of the specimen is important. To obtain an accurate result, the sample must be 0.1 mL. A smaller sample of 0.05 mL is needed for a blood gas analysis.
- **Flush with 0.9% Sodium Chloride for flushing only.**

### Equipment

- Dressing pack
- 2 mL syringes x2 or 3
- Blood gas syringe
- 1% Chlorhexidine/20% alcohol swab
- Normal saline
- Specimen bottles
- Labels
- Request form

### Procedure

1. Open all syringe packets, leaving the syringes lying within the packets to keep clean.
2. Prime one of the 2 mL syringes with normal saline.
3. Place infusion running on hold. Temporarily suspend arterial line monitoring.
4. Ensure 3-way tap is turned off halfway between ports. Remove and discard red combi-stop and wipe port with alcohol wipe. Connect empty 2 mL syringe. Open 3-way tap and withdraw 1 mL of blood. Turn 3-way tap off halfway between ports (This blood is to be returned to the infant post sampling).
5. Withdraw 0.05-0.1mL of blood with the heparinised blood gas syringe. Observe the infant's vital signs and TcPO<sub>2</sub>, TcPCO<sub>2</sub>. Turn the 3-way tap off midway, remove the gas syringe and immediately apply the filter cap. Gently expel the air from the gas syringe. Do not flick the syringe as this causes air bubbles to mix with the sample. Mix sample well by inverting 4 times and rolling for 20 seconds. Analyse sample within 10 minutes or place in refrigerator for up to 1 hour. Always remix prior to analysis if a delay has occurred.
6. Take further blood samples as required.
7. Return initial blood removed back to the infant. Observe infant's limb for any signs of blanching.
8. Flush catheter with enough solution to clear most of blood from the line. This takes approximately 0.5 mL.
9. Place new red combi-stop in situ. Recommence infusion pumps connected to umbilical arterial catheter. Reactivate alarms on monitor.

### **Umbilical Catheters (UAC/UVC) Sampling**

Taking an umbilical blood sample is a standard aseptic technique and can be performed by staff deemed competent in this procedure.

Refer to [Umbilical Catheters Insertion and Management](#) for sampling procedure.

### **Central Venous Catheter (CVC) Sampling**

Obtaining blood samples from a central venous line is a Standard Aseptic Technique which is to be performed by staff deemed competent in the procedure.

#### **Key Points**

- Sepsis is one of the most common complications of accessing CVC's. Blood sampling from CVC's should be restricted to critically ill infants who have no arterial access, as frequent blood sampling will shorten the life of the central venous catheter. Authorization by medical staff for sampling is to be documented in the infant's notes.
- The decision to take a blood sample from a catheter infusing medications, especially opiates or inotropes must be discussed with medical staff to avoid bolus injections of medications.
- 28G Premicath should NOT be used for sampling.

#### **Equipment**




- Dressing pack and 2% Chlorhexidine swab
- 2 mL syringe x 1
- 10 mL syringe x 2
- Blood gas syringe, specimen bottles (if required)
- Sterile heparinised sodium chloride or heparinised glucose solution - 2 mL

## Procedure

1. All solution being infused into a central venous catheter is to be heparinized.
2. Place central venous line infusion on hold.
3. Thoroughly wipe the needleless bung with 2% Chlorhexidine swab and allow to dry. Place drape from dressing pack under cleaned bung.
4. Using empty 10 mL syringe, withdraw 1 mL of fluid from the CVC to remove infusate from the catheter.
5. Place this syringe on the dressing pack to return to infant after sample is taken.
6. Using 2 mL syringe, withdraw the required blood sample. Take a blood gas first if required. Request assistance from another staff member to perform blood gas analysis.
7. Return the blood from the 10 mL syringe to the infant.
8. NEVER RETURN BLOOD IF A POTASSIUM INFUSION IS IN PROGRESS.
9. Flush the catheter with 0.5-1 mL of heparinised solution in the 10 mL syringe.
10. Recommence central venous line infusion.
11. Transfer blood sample to specimen bottles. Label and verify infant's identification details.

### Related WNHS policies, procedures and guidelines

[Infection Control Manual - Aseptic Technique](#)

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