GUIDELINE

Blood Sampling: Capillary, Venepuncture, Peripheral Arterial, UAC, and CVAD

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this disclaimer

Contents

Aim

This guideline is to help enable a safe, standardised sampling technique by credentialled clinicians to reduce pain trauma and complications.

Risk

Failure to adhere to recommended sampling techniques may lead to pain, trauma and adverse complications.

Capillary Blood Sampling

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

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

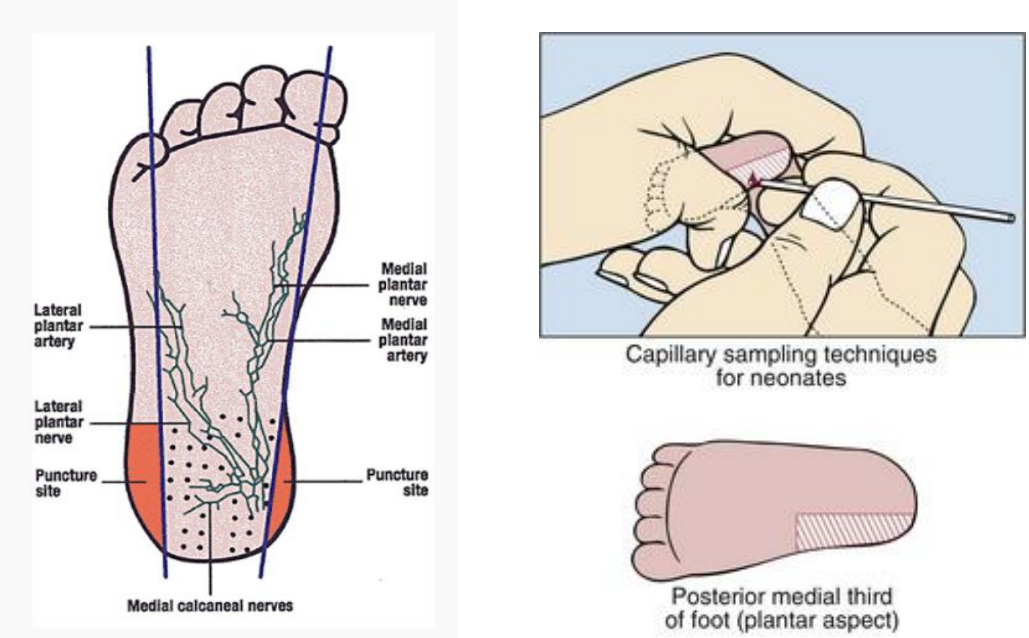
Equipment

- Blue tray, specimen tubes/capillary blood tube
- Neonatal approved lancet and sharps only disposal container/bin
- 1% Chlorhexidine/70% alcohol swab
- Gauze swabs/cotton wool balls

Procedure

1. Consider pain relief such as sucrose, skin to skin holding by parents or breastfeeding.
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. Double Check patient ID, Label and check with a second staff member the collected samples to ensure all samples collected are correctly labelled at the bedside.
12. Blood sampling site, the test/s ordered, and the volume of blood taken should be documented on the patient observation chart.

Fig. 1: Capillary Blood Sampling Site



Choose the puncture site from the shade area.

Venepuncture Sampling

- Venepuncture in neonates can be performed by nursing staff deemed competent in the procedure after completion of the learning package.
- 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/70% alcohol swab >27week gestation or Povidine iodine swab for <27wk gestation
- Venepuncture needle of appropriate size for neonate
- Blue tray/sharps container
- Specimen bottles/tubes
- Cotton balls
- Sucrose (if appropriate)

Procedure

1. Wash/Perform hand hygiene
2. Consider sucrose.
3. Check pathology form with infant's identification bands.
4. Check that investigations are correct for that infant

5. Collect appropriate sample tubes and equipment for blood sampling
6. Wash/Perform hand hygiene, and don non gloves
7. Choose area to be punctured.
8. Clean skin as per protocol.
9. Puncture skin with the bevel uppermost.
10. Direct the needle into the vein at a 45^{o} angle.
11. Await blood return and then allow blood to drip into specimen bottle.
12. Gently remove the needle and dispose sharp into sharps container
13. Place cotton ball over puncture area and apply pressure and maintain pressure until bleeding is stopped
14. Complete labelling of samples and double check with patient ID bands/Request form with second staff member, by the bedside
15. Place samples and request form into specimen bag and send to the laboratory for testing
16. Remove gloves and perform hand hygiene
17. Document sample method, area of sample taken, the test ordered, and the volume of blood taken on the observation chart.

Peripheral Arterial Catheter Sampling

Taking a peripheral arterial blood sample from a Peripheral Arterial Catheter (PAC) 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 0.1mL. A smaller sample of 0.05mL is needed for a blood gas analysis.
- **Flush with 0.9% Sodium Chloride only.**

Equipment

- Blue tray
- 2 mL syringes (2 or 3)
- Blood gas syringe
- 2% Chlorhexidine/70% alcohol swab
- 0.9% Sodium Chloride (for flush)
- Red combi stop
- Specimen bottles
- Labels
- Request form

Procedure

1. Perform hand hygiene.
2. Clean blue tray and gather equipment.
3. Perform hand hygiene.
4. Prepare equipment. Open all syringe packets, leaving the syringes lying within the packets to keep clean.
5. Prime one of the 2 mL syringes with 0.9% NaCl.
6. Place infusion pump on hold. Temporarily suspend arterial line monitoring.
7. Perform hand hygiene.
8. Don gloves.
9. Ensure 3-way tap is turned off halfway between ports. Remove and discard red combi-stop and wipe port with chlorhexidine/alcohol swab and allow to dry. Connect empty 2 mL syringe. Open 3-way tap and gently withdraw 1 mL of blood. Observing Limb including fingers and toes for perfusion for any signs of blanching dependent on insertion location of PAC. Turn 3-way tap off halfway between ports (This blood is to be returned to the infant post sampling).
10. Withdraw 0.05-0.1mL of blood with the heparinised blood gas syringe. Observe the infant's vital signs and $TcPO_2$, $TcPCO_2$. Turn the 3-way tap off midway, remove the gas syringe and immediately apply the filter cap. Gently expel the air form 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. Always remix prior to analysis if a delay has occurred.
11. Take further blood samples as required.
12. Return initial blood removed back to the infant slowly using a gentle pulsing technique to avoid spasm of the vessel. Observe infant's limb for any signs of blanching.
13. Flush catheter with enough solution to clear most of blood from the line. This takes approximately 0.5mL.
14. Place new red combi-stop in situ. Recommence infusion pumps connected to umbilical arterial catheter. Reactivate alarms on monitor.
15. PAC Blood pressure monitoring Transducer may require to be reset post sampling – Refer to Umbilical Catheters Insertion and Management

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. **Authorisation** by medical staff for sampling is to be documented in the infant's notes.
- Carefully consider the risks (i.e. small calibre devices, occlusion, infection) versus benefits (avoid venipuncture/heel prick and associated risks, anxiety and distress) before deciding to use a CVAD for obtaining blood samples.
- The decision to take a blood sample from a catheter being used to administer medications by infusion, especially opiates or inotropes must be discussed with medical staff to avoid bolus infusion of medications.
- In neonates CVAD's must have one continuous infusion of heparinied fluids infusing via each lumen of the CVAD unless the lumen is being accessed regularly i.e. at least 12hrly for medication administration and flush.
- Locking the CVAD with heparin is not done in neonates. If the lumen is not being accessed regularly a continuous infusion of heparinized fluids should be infused. Consider need for line if all lumens not being used. If a patient returns from another ward with a locked CVAD see Appendix 7 in the paediatric CVAD midline insertion and management guideline: CVAD guideline (health.wa.gov.au)
- No small gauge neonatal long lines should be used for sampling.
- Common CVAD's found in neonates are Femoral/Jugular CVC, Paediatric PICC, Tunneled Broviac CVAD.

Equipment

- Cleaned blue tray or dressing trolley +/- dressing pack.
- 2% Chlorhexidine/ 70% Isopropyl Alcohol swab
- 10 ml luer lock syringe x 2
- Blunt plastic cannula
- Blood gas syringe, specimen bottles (if required)
- Normal Saline 0.9% prefilled syringe (3ml or 10ml)
- Appropriate PPE

Procedure

1. Ensure correct patient against blood specimen request form and check volume of blood required for specimen/s.
2. Place central venous line infusion on hold and clamp the line.
3. Perform hand hygiene, don PPE as required and prepare equipment using aseptic technique. A dressing pack can be used to place your sterile items on ready for accessing the line.

4. Vigorously scrub the needle free access device or hub with 2% CHG/70% Alcohol Swab for 20 seconds and allow to dry. Maintain asepsis of this line during sampling.
5. Holding the end of the CVAD lumen with a new swab or sterile gauze attach a sterile 10ml luer lock syringe to hub or needle free device and unclamp line.
6. Slowly retract the plunger to withdraw blood (3-5mls in most cases). Clamp the line and set aside the syringe maintaining asepsis as this blood will be returned to the patient.
7. Attach a new syringe and gently withdraw the required volume of blood.
8. Return the blood from the 10 mL syringe to the infant.
9. NEVER RETURN BLOOD IF A POTASSIUM INFUSION IS IN PROGRESS**.**
10. Flush the catheter with 0.5-1 mL of normal saline using a pulsatile positive pressure technique.
11. Recommence central venous line infusion.
12. Transfer the blood using a blunt plastic cannula into the blood gas syringe if a blood gas is required. Request assistance from another staff member to perform blood gas analysis if required.
13. Transfer blood sample to specimen bottles. Label and verify infant's identification details. Send specimens to the lab.

Related CAHS internal policies, procedures and guidelines *(if required)*

CAHS*:* Infection Prevention and Control

- Aseptic Technique
- Umbilical Catheters Insertion and Management
- CVAD guideline (health.wa.gov.au)

References and related external legislation, policies, and guidelines *(if required)*

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