Clinical Guideline

CAPILLARY BLOOD SAMPLING IN NEONATES, INFANTS AND CHILDREN

SETTING
All clinical areas in Bristol Royal Hospital for Children (BRHC) and Neonatal Intensive Care Unit (NICU) and Post Natal wards in St Michael’s Hospital.

FOR STAFF
Medical, nursing staff, nursing assistants and midwifery assistants who have been educated and clinically demonstrate the procedure and who have proven competency in this process.

PATIENTS
All neonates, infants and children who require blood sampling and/or blood gas analysis who do not have an indwelling arterial line.

GUIDANCE

Capillary blood samples are used for a variety of investigations including:

- Blood gas evaluation
- Blood glucose
- Neonatal blood spot screen (N.B. heparinised capillary tubes must not be used for blood spot screening as the lithium heparin can affect DNA testing)
- Full blood count (FBC), urea and electrolytes (U&E’s) etc.

Equipment Required.

- Sharps container and tray and/or dressing pack (NICU)
- BD Microcontainer Contact Activated Lancet or lancet approved for use in area
- Chlorhexidine 2% with 70% alcohol wipe NICU (BRHC if appropriate) or soap and water (BRHC only)
- Appropriate heparinised capillary gas tube, blood glucose strip, blood spot screening card or collection bottles
- Sterile gloves if baby has a cannula in situ (NICU); non sterile gloves may be used on babies without cannulas
- Plaster (BRHC)

Sharps container tray

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Capillary Tubes

- ONLY heparinised capillary tubes to be used for blood gases.
- The tube must be at least 2/3 full with a continuous amount of blood. i.e. with NO air bubbles.

Correct

Procedure

- Identify the infant/child by their name band.
- Explain the procedure to child / parent / carer and obtain verbal consent.
- Ensure heel is warm as possible prior to procedure.
- If appropriate give oral glucose for pain relief.
- For neonates
  - If appropriate, give oral glucose for pain relief
  - In NICU: use a sterile technique for patients with intravenous (IV) lines in situ
- Put on apron and wash hands.
- Arrange equipment and place on tray or open sterile pack (NICU). Ensure it is in a safe and stable position.
- Ensure the infant is held securely and comfortably.
- For the finger or toe use the sides and not the pad or tip. Where possible avoid the index finger ensuring whenever possible that it is clean, well perfused and warm.
- For the heel the area that is lanced should be on the plantar surface of the heel i.e. the part of the heel that touches the floor in a standing position and is shaded in the diagram below. Avoid the sides or posterior curve of the heel – Jain 1999 see picture below.

Take the sample from the plantar surface of the heel i.e. the shaded area.

- Wash hands and put on gloves.
- Holding finger, hand or foot firmly, apply puncture device to the selected area and depress firmly.

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• Firmly wipe away the first drop of the blood with the gauze.
• Gentle massage of the digit / heel may be necessary to encourage blood flow.

Trouble Shooting when taking a capillary sample:
• If the capillary sample is a planned procedure – anaesthetic creams such as Ametop, LMX 4 or Emla may be used for pain relief (if appropriate) - it will not change the blood results, however there is no evidence that anaesthetic creams have any effect for this procedure.
• If it is difficult to obtain blood from the initial stab and having followed the above procedure, best practice would be to use another site to obtain the sample. In exceptional circumstances re-stabbing the same site can be undertaken, but is not ideal.
• A small amount of Vaseline may be massaged across the site where the sample is to be taken, to help the blood form into a central ‘droplet’. However a good technique negates the need for this. (Please note: The use of Vaseline can block blood gas machines - therefore please do not use routinely. If it is used, please put the opposite end used to collect the blood into the machine).

Capillary Blood Gas Sampling:
• With the proximal end of the capillary blood tube or bottle close to the puncture site and the tube or bottle held in a slightly downward horizontal position allow the capillary blood tube to fill with blood (Fig 3).
• If using a capillary tube, do not allow air to enter the tubing. If this occurs, invert the capillary tube downward to bring blood already collected to the tube to the proximal end.

Fig 3
• If blood flow ceases to flow, wipe the area firmly with gauze and continue to massage the digit or heel.
• Once the required amount of blood has been obtained, apply direct pressure to the puncture site with gauze, until bleeding stops. Do not use cotton wool as threads can remain in the puncture site.
• Apply a plaster to puncture site if required (not NICU).
• Discard all sharps immediately into sharps container.
• Place the capillary sample on a tray and take it immediately to gas machine and process.
as directed with capillary samples.

Complications:
- Needle-stick injuries.
- Spillage.
- Bruising to area where puncture site occurred.
- Skin break-down over puncture site.

If these occur treat and report according to UHBristol Policy.

Additional Resource within BRHC:
- Phlebotomy team within the Children's Hospital
  - Hours worked: 0730-1730
  - Pager number 3689

References:


Cousins A. (2003) BD Medical System


[www.newbornbloodspot.screening.nhs.uk/bloodspotsampling](http://www.newbornbloodspot.screening.nhs.uk/bloodspotsampling)
RELATED DOCUMENTS
- Care of the newborn, infant and child with an indwelling arterial line
- Newborn and paediatric arterial line assessment algorithm
- Central venous catheter guidelines
- Blood gas evaluation in newborn infants
- Procedure for securing umbilical lines
- Procedure umbilical arterial catheter
- Vascular occlusion in the newborn

SAFETY
None

QUERIES
Contact NICU Ext 21736 / 21737 or PICU Ext 28433 / 28437
**Competency for Capillary Blood Sampling St Michael's Hospital (BRHC to use competency documentation in Clinical Competencies booklet)**

**Aim:** To ensure competent and safe practice

**Entry Criteria:**
Nursing and medical staff working within the Women’s and Children’s Division at University Hospitals Bristol NHS Foundation Trust

**Assessment:**

The following levels will be used to assess practitioners on the standards:

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Knows nothing about the skill.</td>
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<tr>
<td>2</td>
<td>Doubts knowledge and ability to perform the skill safely, without supervision.</td>
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<tr>
<td>3</td>
<td>Could perform the skill safely with supervision.</td>
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<td>4</td>
<td>Confident of knowledge and ability to perform the skill safely.</td>
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<tr>
<td>5</td>
<td>Could teach knowledge and skills to others and can demonstrate initiative and adaptability to special problem situations.</td>
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Assessment will be undertaken by a practitioner who has evidence of reaching competency Level 5 as described above.
### Knowledge and Understanding and Performance Criteria

By the end of the assessment the practitioner should demonstrate knowledge and understanding and be clinically competent in the procedure.

<table>
<thead>
<tr>
<th>Level of achievement</th>
<th>Evidence to support practice</th>
<th>Mentor</th>
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<tr>
<td><strong>PROCESS</strong></td>
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<td>1. Demonstrates effective hand washing technique.</td>
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<td>2. Assemble the equipment needed for the procedure.</td>
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<td>3. Demonstrate correct identification of the patient in accordance with UH Bristol policy.</td>
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<td>4. Obtain verbal consent before the procedure (if appropriate) and ensure the family are aware of procedure (if present).</td>
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<td>5. Prepares patient for the procedure</td>
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<td>6. Gives rationale for selection of site; well perfused digit or heel (heel less painful).</td>
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<td>7. Prepares equipment for use; capillary tube / bottle / gauze / cleaning solution.</td>
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<td>8. Demonstrates correct use of gloves (sterile on NICU).</td>
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<td>10. Administers pain relief if appropriate e.g. oral glucose.</td>
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<td>11. Performs sampling procedure safely: i.e. the side of digits or the plantar surface of the heel.</td>
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<td>12. Covers puncture site with gauze and applies pressure until the bleeding stops.</td>
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<td>13. Applies plaster (not NICU) or dressing if required.</td>
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<td>14. Disposes of all equipment and sharps correctly as per UH Bristol policy.</td>
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<td>15. Documents procedure / results appropriately.</td>
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<td>16. Demonstrates compliance with UH Bristol Infection control and Health and Safety policies.</td>
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<td><strong>TROUBLESHOOTING</strong></td>
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<td>1. Can discuss the importance of having a good flow of blood and what to do if blood flow ceases.</td>
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<td>2. States who to consult with in the event of an unobtainable sample.</td>
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## Direct Observation of Practice Record

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<th>Assessor name</th>
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**Comments**

Further learning objectives identified

### Rating (please circle as appropriate)

1  2  3  4  5

**Signatures:**

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Please print

**Review:**

Date for review of this competency is 3 years from the above date.

Please ensure a copy of this assessment is available for inspection in the clinical area.

Date  

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