



NEONATAL CARE

NEONATAL SCREENING

BLOOD – COLLECTION FROM A NEONATE

CAPILLARY BLOOD COLLECTION FROM A NEONATE (HEEL STAB)

Keywords: Neonatal blood collection, capillary blood collection, blood sampling neonates, neonatal blood tests, heel stab, heel prick

NEONATAL CAPILLARY BLOOD COLLECTION (HEEL STAB) QRG:

1. **Explain** procedure to parent & gain verbal **consent**.
2. **Check** baby's identity matches request form.
3. Collect **equipment**, **wash hands** & put on gloves.
4. **Identify** correct skin puncture site (lateral section of plantar heel surface).
5. **Provide pain relief** measures for neonate by involving mother (e.g. breastfeeding, skin to skin, swaddle) if available. **Administer sucrose** if appropriate. **Position** neonate's foot lower than body.
6. **Clean** site if soiled, swab site with alcohol swab & allow to dry.
7. **Hold** foot firmly with palm & index finger & **lance** to puncture skin.
8. **Wait** 5 seconds, then **wipe** away first blood drop with gauze.
9. **Collect** blood as required. **Gently "pump"** the heel allowing time for capillary refill; however **avoid squeezing** as tissue fluid dilutes the collection, and bruising, pain & haemolysis may occur.
10. **Place** cotton wool over site with gentle pressure when finished.
11. **Comfort** neonate, **discard equipment** appropriately and **wash hands**.
12. **Document** in medical records.

Note: This QRG represents minimum care & should be read in conjunction with the full guideline. Additional care should be individualised to situation.

AIM

To inform staff on the procedure for neonatal blood collection for diagnostic investigation.

KEY POINTS¹

1. Including environmental, behavioural and non-pharmacological comfort measures is recommended for the procedure.^{1,2} This includes providing a calm relaxing environment with reduced noxious stimuli where possible.^{1,2}
2. Distance from other painful procedures by >2 hours for the neonate to recover.¹
3. It is not necessary to warm the heel to facilitate blood flow to the area prior to lancing.^{1,3-5} Unsafe heel warming practices may lead to skin burns^{3,5,6}, instead dress the infant warmly prior to the blood collection and minimise unwrapping.^{3,7} This increases peripheral blood supply.^{7,8}
4. Whenever possible, invite the mother to be involved in the procedure, using skin to skin contact or breast feeding.^{1,3,9} When this is not possible, sucrose and non nutritive sucking may be used.^{1-3,9,10}
5. Avoid squeezing the heel as this causes unnecessary pain¹, bruising,⁵ and limits perfusion.
6. The use of analgesia or local anaesthetic cream (e.g. EMLA, paracetamol) is not recommended as it is ineffective pain relief for heel lancing.^{1,10}
7. Use an automatic lancet rather than manual lancet.^{1,3,5,10}
8. Soft paraffin solutions should not be used for heel punctures.⁵
9. If a skilled phlebotomist is available venipuncture is the preferred method for obtaining blood in term neonates.^{1,7,10} It causes less pain to the neonate, takes less time⁷ and is associated with less maternal anxiety.¹⁰

EQUIPMENT

- Automated lancet^{1, 3, 5, 10}
- Warm water and gauze⁵
- Cotton ball
- Alcohol wipe⁷
- Disposable gloves
- Correct specimen tubes or Newborn Blood Screening Test card
- Laboratory request form
- Sharps container
- Sucrose¹⁰. See also [KEMH NCCU Clinical Guideline Section 3: Oral Sucrose for procedural pain relief](#) for contraindications/ dosages and further information.

PROCEDURE

PROCEDURE	ADDITIONAL INFORMATION
<p>1 Preparation</p> <p>1.1 Explain the procedure to the mother and obtain verbal consent.¹¹</p> <p>1.2 Collect equipment.⁷ Check the identity of the neonate with the laboratory test request form.^{7, 12} Perform hand hygiene and don gloves.^{7, 12}</p> <p>2 Choosing a site for the heel prick</p> <p>2.1 Use the most medial or lateral portions of the plantar surface of the heel¹² (in diagram below areas indicated by arrows). Limit the depth of the puncture wound by using an automated lancet.³</p>	<p>Advise the mother she may be present while the procedure is done.⁷</p> <p>Using the lateral or medial edges of plantar area of the foot decreases the risk of damage to sensitive areas,³ such as the calcaneus.</p> <p>The recommended maximum lancet depth is 2.4mm when used on the lateral or medial edges of plantar area of the foot.^{7, 13}</p> <p>Serious complications of the heel prick can include necrotising chondritis, calcaneal osteomyelitis, and soft tissue damage.⁷</p>



PROCEDURE	ADDITIONAL INFORMATION
2.2 Only consider using the whole plantar surface of the foot (using automated lancets of 2.2mm in length or less) for neonates over 33 weeks' gestation if they are having multiple/frequent heel pricks. ^{14, 15}	In small or premature neonates, damage can occur as the calcaneus may be <2mm below the plantar surface, and <1mm at the posterior heel area. ¹² Do not use the posterior surface of the foot because the calcaneum is more superficial at this area. ^{5, 12}
3 Preparation of the neonate	
3.1 Methods to reduce pain for the neonate: <ul style="list-style-type: none">· Skin-to-skin contact with the mother²· Swaddling/containment/ rocking^{2, 5, 10} · Breastfeeding^{3, 5, 9} · Administration of oral Sucrose^{3, 5, 10, 16} if available	Skin-to-skin contact for 10-15 minutes prior to heel stab is an effective, easily implemented and safe method to reduce pain in the neonate. Breastfeeding or breast milk should be offered to alleviate procedural pain in neonates. ^{3, 5, 9} Administration of sucrose/ glucose has a similar effect at reducing pain. ^{5, 10} For indications and dosage see KEMH NCCU Clinical Guidelines Section 3: Pain Assessment and Management: Oral sucrose for procedural pain relief .
3.2 Position the neonate: Ensure the foot is lower than the body. ^{3, 5, 17}	Assists with blood flow.
4 Taking the blood sample	
4.1 Choose a puncture site.	Do not use a previous puncture site. ⁷
4.2 Clean the heel site (i.e. gauze and water ⁵) if the foot appears unclean (e.g. faecal material), wipe with alcohol swab* ^{7, 12} and allow to dry. ^{5, 7}	*Alcohol impregnated wipes reduce infection complications ⁷ , however should be wiped off if used before glucose or Newborn Blood Screening Tests ¹⁸ , or not used at all as they can affect these tests accuracy ³ . Alcohol swabs have been associated with chemical burns in premature infants. ⁵
4.3 Encircle the foot with the palm of the hand and the index finger. ¹⁷	
4.4 Make a quick puncture with the automated lancet device. ^{3, 7}	Automated lancets cause less bruising and facilitate faster healing of the foot. Avoid too much pressure when lancing as this deepens puncture depth. ⁷
4.5 Wipe off the first drop of blood with a gauze swab. ^{3, 7, 12, 17}	The first drop of blood may be diluted by interstitial fluid. ⁷
4.6 Allow enough time for capillary refill of the heel and only gently "pump" the heel if necessary to continue the blood flow. ^{7, 17}	Squeezing the heel causes or increases pain for the neonate, dilutes the sample with tissue fluid, and can cause haemolysis and soft tissue damage. ^{3, 7}
4.7 Apply gentle pressure with a gauze swab or cotton ball to puncture site holding until bleeding stops. ^{3, 7}	Avoid adhesive tape or bandaids as they may cause pain and skin damage on removal. ⁷
4.9 Dispose of equipment appropriately ¹² , comfort neonate ⁷ & document as required. ³	Ensure correct labelling of sample against neonate and request form. ¹² Document test and any results in neonatal notes.

CARE IN THE HOME (VISITING MIDWIFERY SERVICE)

- Follow the procedure as documented above
- Document the sample collection date and time in the Care of the Well Neonate pathway (MR 425.10)
- The blood sample must be:
 - Labelled correctly
 - Accompanied by a completed pathology request form (yellow and pre signed in the VMS cars) and a VMS to EC referral form (MR026) with all relevant history details and contact numbers for the parents
 - Sealed in an appropriate specimen bag
 - Be kept cool and out of direct sunlight
 - Taken by the parent/ carer directly to the Emergency Centre at KEMH (within 4 hours)

REFERENCES (STANDARDS)

1. Lago P, Garetti E, Merazzi D, Pieragostini L, Ancora G, Pirelli A, et al. Guidelines for procedural pain in the newborn. **Acta Pædiatrica**. 2009;98:932-9.
2. Pillai Riddell RR, Racine NM, Turcotte K, Uman LS, Horton RE, Din Osmun L, et al. Non-pharmacological management of infant and young child procedural pain (Review). **Cochrane Database of Systematic Reviews**. 2011 (10).
3. Gunn J. Supporting the newborn infant. In: Pairman S TS, Thorogood C, Pincombe J., editor. **Midwifery: Preparation for practice**. Chatswood, NSW: Elsevier Australia; 2010.
4. Cavanagh C, Coppinger C, Franck L. A survey of newborn blood spot screening practices. **British Journal of Midwifery**. 2005;13(3):160-4.
5. UK Newborn Screening Programme Centre. Guidelines for newborn blood spot sampling. UK: **NHS**. 2012. Available from: www.newbornbloodspot.screening.nhs.uk
6. Ray R, Godwin Y, Shepherd A. Convective burn from use of hairdryer for heel warming prior to heel prick test: A case report. **BMC Pediatrics** [Internet]. 2011; 11:30. Available from: <http://www.biomedcentral.com/1471-2431/11/30>
7. World Health Organization. **WHO guidelines on drawing blood: Best practices in phlebotomy**. Geneva: WHO; 2010. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK138650/>
8. Ringer SA, Gray JE. Common neonatal procedures. In: Cloherty JP, Eichenwald EC, Hansen A, Stark AR, editors. **Manual of neonatal care**. 7th ed. Philadelphia: Lippincott Williams & Wilkins; 2012. p. 851-69.
9. Shah PS, Herbozo C, Aliwalas LL, Shah VS. Breastfeeding or breast milk for procedural pain in neonates (Review). **Cochrane Database of Systematic Reviews**. 2012 (12).
10. Shah VS, Ohlsson A. Venepuncture versus heel lance for blood sampling in term neonates (Review). **Cochrane Database of Systematic Reviews**. 2011 (10).
11. Department of Health Western Australia. Consent to treatment policy for the Western Australian health system 2011: **Government of Western Australia**. 2011. Available from: <http://www.health.wa.gov.au/circularsnew/attachments/564.pdf>
12. Niwinski N. Capillary blood collection: Best practices. **BD Labnotes**. 2009;20(1).
13. Naughten F. The heel prick: How efficient is common practice? **Midwives**. 2005;8(3):112-4.
14. Arena J, Emparanza JI, Nogues A, Buris A. Skin to calcaneus distance in the neonate. **Archives of Disease in Childhood: Fetal and Neonatal Edition**. 2005 (90):F328-31.
15. Jain A, Rutter N. Ultrasound study of heel to calcaneum depth in neonates. **Archives of disease in childhood Fetal and Neonatal edition**. 1999 (80):243-5.
16. Stevens B, Yamada J, Lee GY, Ohlsson A. Sucrose for analgesia in newborn infants undergoing painful procedures (Review). **Cochrane Database of Systematic Reviews**. 2013 (1).
17. Joanna Briggs Institute. Neonatal screening test. 2011. In: **Midwifery practice manual** [Internet]. JBI. 2013. [252-6]. Available from: <http://connect.jbiconnectplus.org>
18. Princess Margaret Hospital WA Newborn Screening Program. **Information for healthcare professionals: Specimen collection guidelines** [webpage]. WA: Department of Health WA; n.d. [accessed 18/10/13]. Available from: http://www.pmh.health.wa.gov.au/services/newborn/health_professionals/collection.htm

National Standards – 1- Care provided by the clinical workforce is guided by current best practice

Legislation - Nil

Related Policies - Nil

Other related documents – KEMH Clinical Guideline, O&M, Neonatal Care: [Newborn Screening Test \(Guthrie\)](#); [KEMH NCCU Clinical Guideline Section 3: Oral Sucrose for procedural pain relief](#)

RESPONSIBILITY

Policy Sponsor	Nursing and Midwifery Director OGCCU
Initial Endorsement	August 1999
Last Reviewed	September 2014
Last Amended	February 2015
Review date	September 2017

**Do not keep printed versions of guidelines as currency of information cannot be guaranteed.
Access the current version from the WNHS website.**