



CLINICAL PRACTICE GUIDELINE

Newborn Bloodspot Screening

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

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Newborn Blood screening test QRG

1. **Test** between **48-72hours**.
2. **Check** baby's identity matches consent & medical record.
3. **Explain** to parent and confirm **consent**.
4. Collect **equipment & document** all details on the Newborn blood screening test card. Follow instructions on the reverse of the card.
5. **Wash hands** & put on gloves.
6. **Identify** correct site as per [KEMH Clinical Guideline, O&M, Neonatal Care: Capillary Blood Collection \(Heel Stab\)](#)
7. **Swab** site with alcohol swab & dry with gauze.
8. **Hold** foot firmly & **lance** to puncture skin.
9. **Wait** 5 seconds, then **wipe** away first blood drop.
10. **Collect** sample from back of NBST card until the 3 circles are filled.
 - A second lancet may be required.
 - Avoid laying new blood over old blood from a previous attempt.
11. **Place** cotton wool over site when circles filled.
12. **Dry** card on drying rack horizontally for >4hrs then send to QEII Clinical Biochemistry Lab in designated envelopes.
13. **Discard equipment** appropriately and **wash hands**.
14. **Document** in medical records (Neonatal MR 410, MR 425.10 & Stork).

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

Aim

To enable early detection and prompt treatment of phenylketonuria, congenital primary hypothyroidism, galactosaemia, cystic fibrosis and a range of disorders of amino, organic and fatty acid metabolism.¹

Background

Robert Guthrie in the 1960's began the work on neonatal metabolic screening, which has now grown to worldwide neonatal screening for an array of life threatening or long term disorders. The Newborn Bloodspot Screening Test (NBST) aims to provide early screening detection for newborns, identifying newborns that need further testing.²⁻⁴ Screened disorders are diagnosed before symptoms emerge leading to earlier treatment with the possibility of reduced morbidity and mortality in affected

Newborn bloodspot screening is a highly effective public health measure that in Western Australia helps identify infants at increased risk of approximately 25 rare,

genetic conditions which, with early detection, can be treated or managed, preventing intellectual or physical disability, even death. Delayed or missed diagnosis impacts the family and health system and may have serious consequences e.g. significant intellectual or physical disability or death and increased healthcare costs.

A new [e-learning tool](#) has been launched to help midwives and nurses improve their understanding/update their knowledge on newborn bloodspot screening. This tool has been developed by midwives and provides an interactive and engaging experience for both new and experienced healthcare providers. It offers practical advice on providing information to expectant parents and guidelines on the collection and transportation of blood samples. Healthcare providers involved in bloodspot screening are strongly encouraged to take the short refresher, which can be completed within 30minutes.

The tool is available free on the Women and Newborn Health Service website at http://www.wnhs.health.wa.gov.au/development/education/WNHS_education_hub/Newborn_bloodspot_screening/story.html

Key points

1. Offer testing for ALL neonates⁵ between 48 - 72 hours of age.^{3, 6-8} This is the ideal time when the conditions screened can be reliably detected in the baby's blood.
 - False negative results can occur if sample taken too late,⁸ early,³ neonate is premature, or receives blood transfusions.^{2 8}
 - All neonates that are transferred home prior to 48 hours of age must have follow up arranged to complete a NBST with the Visiting Midwifery Service. If there is a concern that the NBST may not be collected or might be delayed, document this on the card in case follow up is required. All feeding types must be recorded on the card. Blood is tested according to how the baby is being fed.
 - All neonates that require a blood transfusion or exchange transfusion prior to 48 hours of age are to have a NBST collected prior to commencement of the transfusion (in addition to the routine NBST).^{8, 9}
2. It may be useful, where possible, to collect NBST prior to anticipated neonatal death.^{8, 9} Mark card "Neonatal death".⁹
3. About 1-2% of newborns screened will require follow up testing, whilst 0.1% of newborns screened result in being diagnosed with a condition.⁶ The screening test does not replace investigation of symptoms, as screening does not detect all cases.⁶
4. The family will be contacted only if results require further investigation.
5. Correct sampling is the key. It is critical the sample is collected and transported correctly the FIRST time to ensure the timely detection of screened conditions.

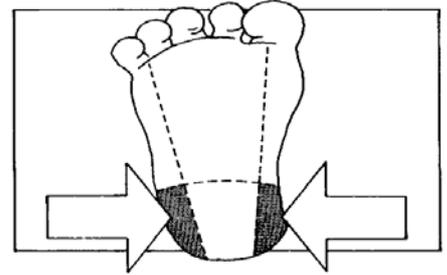
Equipment^{3, 10, 11}

- Documentation
 - Consent Form
 - Bloodspot card
 - Child Health Record
 - Neonatal History
- Automated lancet (max tip length 2.4mm)
- 70% Alcohol swab
- 3 Gauze swabs / cotton balls
- Disposable gloves
- Sucrose¹² if required and consented available

Procedure

1. Identify when the neonate is due for the test, prepare equipment and ensure that the timing of collection is appropriate.^{3, 8} Check baby's identification against the medical record and consent form.⁸
2. Ensure parents have been provided with the information pamphlet '[Your Newborn Baby's Screening Test](#)' prior to collection (this pamphlet is available in other languages, see [CAHS WA Newborn Screening Program Information for Healthcare Professionals](#)).^{3, 4, 7, 8} Discuss the procedure with parents,^{5, 6, 8} obtain verbal consent⁷ and record/check their written consent to collection and testing on MR216 (KEMH Information & Consent for Newborn Care).^{4, 8} The record must also show the date of consent, who consented and who obtained the consent.
 - Where parents do not give consent for the test:
 - Do not perform the test. Discuss the parent's concerns & document reason.⁴ Ensure parents document & sign if they have declined (on neonatal consent [MR216](#)), including that they are fully informed of the test and consequences of not testing.¹³
 - Write REFUSED and the NEONATES DETAILS on the neonatal screening card and send to QEII Department of Clinical Biochemistry.⁹ Document in baby's medical record and purple child health record and sign.⁹
 - Parents are advised to seek medical advice if their baby is unwell and to ensure their GP knows that NBS was not collected.
3. Clearly print ALL the required information on the NBST card prior to sample collection.^{2-4, 8}
4. When handling the card, ensure the collection circles are not touched or contaminated by oils or sweat.³
5. Refer to the procedure instructions on reverse of card. Collect blood as per [KEMH Clinical Guideline, O&M, Neonatal Care: Capillary Blood Collection \(Heel Stab\)](#).

6. Universal precautions must be observed when collecting all blood samples. Wash hands, put on gloves,^{4,8} clean site with water and gauze if dirty, wipe site with an alcohol wipe and allow to dry. Do not leave any alcohol on the skin as this may dilute the sample and adversely affect the test results.³ Never use Vaseline or any other material on the collection site¹¹.
7. Use comfort measures such as skin to skin, breastfeeding, sucrose,^{4,8} or finger feeding of EBM.
8. Hold foot firmly to expose the collection site. Use only the inner or outer aspects of the plantar surface of the heel to avoid damaging the heel bone (see Figure¹¹ opposite).
9. Avoid applying excessive pressure to the lower limb or foot as this can cause bruising¹¹. and use automated lance to puncture skin^{3,4} at the edge of the plantar surface avoiding any previous puncture holes. Only puncture once and do not twist or slice the lancet in the skin. The puncture depth should be no more than 2.4 mm¹¹.
10. Wait 5 seconds to avoid initial vasoconstriction.³ Use the gauze to wipe away the first diluted blood drop.
11. Gently apply, wait for another large drop of blood to form and then drop onto the centre of the first circle on the back of the sample card. Place the next drop of blood in a blank part of the first circle until the circle is full. Examine both sides of the sample card to ensure that blood has penetrated and saturated the paper. Blood must soak completely through the card¹¹.
12. Ensure all three circles are completely filled² and that blood has penetrated both sides of the card. Do not rush the procedure and allow sufficient time for the blood drops to collect. Do not layer new blood over partially dry blood from a previous attempt.^{3,8} Avoid contaminating the sample area on the card with talc from your gloves¹¹.
13. When circles are completed, place cotton wool over lancet site³ using gentle pressure.⁴ It is not advisable to place adhesive bandages over skin puncture sites in newborns.
14. Place the neonates' addressograph on the back of the NBST card and check against neonates' identity band. Check that all required information is correctly documented on the NBST card.
15. Place the NBST card horizontally on the drying rack and allow to dry for ≥ 4 hours at room temperature before sending to QEII Department of Clinical Biochemistry in the designated envelopes.³
 - Store the cards separately and avoid touching or smearing the blood.³
 - Avoid excess heat or direct sunlight and store cards in ventilated areas, not in closed areas such as drawers/ refrigerator.³
 - It is important to wait until the samples is completely dry before placing it into the envelope.³



16. Discard equipment appropriately and wash hands.
17. Document⁸ the NBST card number, sample collection date and time in the following places:
- Neonatal History – MR 410 (Visiting Midwifery Service do not need to document here),
 - Care of the Well Neonate – MR 425.10 (Box provided on the front page)
 - Perinatal Database (Stork).
 - Ensure that all the required information is documented on the card.
 - Additional details¹⁰ which are assessed during analysis and may affect the results include:
 - i. Meconium plug/meconium ileus
 - ii. Family history of cystic fibrosis in siblings
 - iii. Pre/post blood/exchange transfusion
 - iv. IV TPN
 - For neonatal deaths NBS may be used to collect a sample. Mark the card “neonatal death”.

Transport of NBST¹⁰

Place the completely dry sample inside a protective paper cover before it is placed in the designated envelope and post via external mail to the WA NBS Program at QEII Biochemistry on the day of collection or within 24 hours (including weekends).

Care in the Home (Visiting Midwifery Service)

- Confirm verbally that the parents have provided written consent by signing the KEMH Information & Consent for Newborn Care form (MR216) in pregnancy or prior to discharge
 - Check the baby's identity with the parent/ carer
 - Mother to offer a breast / BMS feed or skin to skin contact during the procedure
 - Ensure the foot is warm before proceeding with the test
 - Document the NBST card number, sample collection date and time in the following places;
 - Care of the Well Neonate pathway (MR 425.10)
 - Perinatal database STORK
 - CHN Summary sheet
 - Samples collected off-site need to be dried on a storage rack within a cooler bag¹⁰.
 - The NBST card is then sent directly to QEII Department of Clinical Biochemistry in the designated envelopes
- OR
- Placed in the NBST tray within the VMS office. The coordinator is then responsible for dispatching them to QEII Biochemistry as soon as possible.

Special Circumstances

Syringe samples¹¹

Samples can be applied to the card from a syringe if collected from arterial or venous lines, as long as the standard procedure for sampling from lines is followed. Avoid mixing the sample with anticoagulant (e.g. heparin or EDTA) as this may interfere with some screening tests.

Refer to the [Simple Spot Check guide by GE Healthcare](#)

References and resources

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Related policies

[WA Newborn Screening Program](#)

[Newborn Bloodspot National Policy Framework](#)

Related WNHS policies, procedures and guidelines

[WNHS e-learning package](#)

Information for Parents- [Healthy WA website](#)

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