10 CARE OF NEONATE

10.3 NEONATAL SCREENING

10.3.3 BLOOD – COLLECTION FROM A NEONATE

10.3.3.2 NEWBORN SCREENING TEST (GUTHRIE)

Keywords: Guthrie, neonatal blood collection, neonatal metabolic screening, newborn screening

AIM

• To enable early detection of phenylketonuria, congenital primary hypothyroidism, galactosaemia, cystic fibrosis and a range of disorders of amino, organic and fatty acid metabolism.1, 2

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 disorders.3 The Newborn Blood Screening Test (NBST) aims to provide early screening detection for newborns,4 identifying newborns that need further testing.3, 5, 6 This can enable earlier diagnosis and treatment of the screened disorders, than would waiting for symptoms to emerge.3 With earlier treatment of these rare life threatening or long term health disorders there may be reduced morbidity and mortality in the affected individuals.3, 4, 7-9

KEY POINTS

• Offer testing for ALL neonates10 between 48 - 72 hours of age.2, 5, 7, 11
  ➢ False negative results can occur if sample taken too late,11 early,5 neonate is premature, or receives blood transfusions.3, 11

NEWBORN BLOOD SCREENING TEST QRG

1. Test between 48-72 hours.
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 Section B Capillary Blood Collection Procedure: 10.3.3.1
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.
    o A second lancet may be required.
    o 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 PMH Clinical Biochemistry in designated envelopes.
13. Discard equipment appropriately and wash hands.
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.

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).11, 12

- It may be useful, where possible, to collect NBST prior to anticipated neonatal death.11, 12 Mark card "Neonatal death".12
- About 1-2% of newborns screened will require follow up testing, whilst 0.1% of newborns screened result in being diagnosed with a condition.7 The screening test does not replace investigation of symptoms, as screening does not detect all cases.7
- The family will be contacted only if results require further investigation.2, 7

**EQUIPMENT**5, 11

- Newborn screening card
- Automated lancet
- Alcohol swab
- Gauze/cotton ball
- Disposable gloves
- Sucrose13 if available

**PROCEDURE**

1. Identify when the neonate is due for the test, prepare equipment and ensure that the timing of collection is appropriate.5, 11 Perform collection prior to a feed. Check baby's identification against the medical record and consent form.11

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).2, 5, 6, 11 Discuss the procedure with parents,2, 5, 6, 11, obtain verbal consent2 and record/check their written consent to collection and testing on MR216 (KEMH Information & Consent for Newborn Care).6, 11 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.7 Discuss the parent's concerns7 & document reason.6 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.4
  - Write REFUSED and the NEONATES DETAILS on the neonatal screening card and send to Princess Margaret Hospital (PMH) Department of Clinical Biochemistry.12 Document in baby's medical record and purple child health record and sign.12

3. Clearly print ALL the required information on the NBST card.3, 5, 6, 11

4. When handling the card, ensure the collection circles are not touched or contaminated by oils or sweat.5

5. Refer to the procedure instructions on reverse of card. Collect blood as per KEMH Clinical Guideline Section B Capillary Blood Collection Procedure: 10.3.3.1.

6. Wash hands, put on gloves,6, 11 clean site with water and gauze if dirty, wipe site with an alcohol wipe and dry with new gauze so that no alcohol is left on the surface as it may affect the sample.5

7. Use comfort measures such as skin to skin, breastfeeding, sucrose,6, 11 or finger feeding of EBM.

8. Hold foot firmly and use automated lance to puncture skin.5, 6

9. Wait 5 seconds as vasoconstriction occurs initially.5 Use the gauze to wipe away the first diluted blood drop.5, 11

10. Collect the sample from the back of the card.11 Ensure all three circles are completely filled3 and that blood has penetrated both sides of the card. Do not layer new blood over partially dry blood from a previous attempt.5, 11
11. When circles are completed, place cotton wool over lancet site\textsuperscript{5} using gentle pressure.\textsuperscript{6}

12. 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.

13. Place the NBST card horizontally on the drying rack and allow to dry for $\geq$4 hours at room temperature before sending to PMH Department of Clinical Biochemistry in designated envelopes.\textsuperscript{5}

   - Store the cards separately and avoid touching or smearing the blood.\textsuperscript{5}
   - Avoid excess heat or direct sunlight and store cards in ventilated areas, not in closed areas such as drawers/ refrigerator.\textsuperscript{5}
   - It is important to completely dry the sample before placing in the envelope.\textsuperscript{5}

14. Document\textsuperscript{11} 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,
   - Perinatal Database (Stork).

**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

The NBST card is then

   - Sent directly to PMH Department of Clinical Biochemistry in the designated addressed envelopes (stamps required)

   **OR**

   - Placed in the NBST tray within the VMS office. The coordinator is then responsible for dispatching them to PMH as soon as possible.

*Note: Once dry, NBST cards should be sent to PMH without delay / within 24 hours of collection (as per the department). However this may be delayed on a weekend or public holiday*
REFERENCES (STANDARDS)


8. Ng SM, Anand D, Weindling AM. High versus low dose of initial thyroid hormone replacement for congenital hypothyroidism (Review). Cochrane Database of Systematic Reviews. 2010 (1).


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 Section B Capillary Blood Collection Procedure: 10.3.3.1

RESPONSIBILITY

Policy Sponsor
Nursing and Midwifery Director OGCCU

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