6.6 Specimen collection

6.6.3 Newborn screening test (Guthrie)

Aim

To obtain a blood sample from an infant for the early detection of treatable metabolic disorders.

Background

Newborn screening involves testing babies who are not known to have a disease so that they can be identified and treated before problems occur. The range of diseases which are tested for are not clinically obvious at birth, but unless treated early, they can cause damage to the baby. Screening is the first step in a two-step process. The first screening test indicates a problem MAY be present, and then a second diagnostic test confirms whether or not the problem or disease is truly present.¹

If the screening test is abnormal, follow-up testing must be done to confirm a diagnosis. Most infants with abnormal screening results have normal follow-up testing. Initial screening results can be abnormal because the blood was taken too early, the baby is premature and many other reasons. If a baby truly has a disease, treatment is started immediately.

Key points

- To be performed only by staff with appropriate training.
- The recommended time for first screen is between forty eight (48) and seventy two (72) hours after birth to facilitate prompt intervention where diagnosis is confirmed.
- Recall for a second sample occurs usually when the results are marginal or the clinical condition is not likely to need urgent treatment.
- Samples collected under 24 hours of age are unsuitable for analysis.¹
- Collection of blood sample should be performed as per '6.6.1.Capillary Blood Collection by heel prick procedure'.
- For infants newly arrived in Australia, screening may be performed up to one year of age.³ The blood sample collection method should be appropriate for the age of the child.
- Multisensory stimulation including massage, rocking, skin contact, voice, eye contact and perfume smelling in conjunction with breastfeeding or alternative sucking are effective strategies in reducing pain responses to heel lancing in infants.⁴

¹ 1
³ 2
⁴ 3
• Automated and in particular, fully retractable lancets are superior for this procedure due to need for less repeat punctures, less time required, increased volume of blood collected, reduction in haemolysis of blood samples and less pain for the infant.4

• Use of topical anaesthesia, paracetamol, or warming the heel are ineffective pain relieving measures as heel squeezing is the most painful part of the procedure.4

• Community Health staff should follow the organisation’s overarching infection prevention and management policies and perform hand hygiene in accordance with WA Health guidelines at all appropriate stages of the procedure.

Equipment

• As for 6.6.1 Capillary blood collection by heel prick, including:
  o Sterile disposable lancet or automated lancet device (tip length ≤ 2.4mm)
  o Warm water and sterile cotton wool balls or gauze swabs
  o Disposable gloves
  o Correct specimen collection receptacle(s) for purpose.

• Information pamphlet for parent/carer consent
• Newborn Screening card for blood collection
• Baby’s medical record and/or personal health record.

The Newborn Screening Test pamphlet can be used to provide parent information, enable discussion and to obtain verbal consent for collection and testing.2

Procedure

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<thead>
<tr>
<th>Steps</th>
<th>Additional information</th>
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<tbody>
<tr>
<td>1. Provide relevant information to the parent/carer, and opportunity for discussion.</td>
<td>Participation in a newborn screening program is not mandatory. Parents should be informed of the availability of testing.</td>
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<tr>
<td>2. Obtain consent from the parent/carer to perform the procedure.</td>
<td>If after discussion the parents refuse to have their newborn tested, they should sign a statement to indicate that they are fully informed about the test and the consequences of not testing.</td>
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<tr>
<td>Steps</td>
<td>Additional information</td>
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<tr>
<td>2. Continued</td>
<td>In the event of refusal, it is acceptable for the empty screening test card (with demographic information but no blood sample) to be returned to the laboratory with the documented refusal.¹</td>
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| 3. Complete all details on Newborn screening card using ballpoint pen, prior to blood collection. | Both the date and time of specimen collection and the date and time of birth must be known in order to determine the age of the baby, in hours at the time of specimen collection.¹  
Do not touch the sample area of the card at any stage. |
| Collect blood sample as per procedure 6.6.1 *Capillary blood collection by heel prick.* |                                                                                         |
| 4. Soak up blood from the back of the Newborn screening card only using the following guide: | An unsuitable sample is one that cannot be assayed reliably, because it is too small, not soaked through the paper, is contaminated with another substance, or other problem. |
| • Collect each drop onto a blank space on the circle.            |                                                                                         |
| • Take care not to overlap new blood over partly dry blood.     |                                                                                         |
| • Continue collection until the front side of all three circles are completely covered.⁵ |                                                                                         |
| 5. Clean heel, apply cotton wool ball or gauze swab and gentle pressure until bleeding stops, and settle baby. | Encourage parent/carer to be present to assist with support for the infant. |

¹: Additional information
### Steps

| 6. Place Newborn screening card to dry using the following considerations:  
- non-humidified/non sunlit area  
- room temperature  
- non-absorbent surface  
- preferably in a horizontal position  
- dry for at least four hours.⁵  
| Additional information  
| All samples to be received by the laboratory within four days of collection. |
| 7. When dry, card is to be sealed inside a dedicated envelope which is routinely supplied with the Newborn screening cards, and forwarded to the address supplied on the envelope. |

### Referral pathway

Refer any child for review by specially trained staff or medical officer, where adequate sample is unable to be easily obtained.

### Related policies, procedures and guidelines

| 1.0 Infection control (Section 1.11)  
6.6.1 Capillary blood collection by heel prick  
6.6.2 Collection of blood specimen by finger prick |

### Useful resources


### Policy Owner

| Policy Owner | Portfolio |
| Director - Statewide Policy Unit. | Birth to School Entry |
References


3. Princess Margaret Hospital. WA Newborn Screening Program [Internet]. Perth (WA): Department of Health; 2012. [cited 2013 April 14].
