

Capillary Blood Gas Sampling

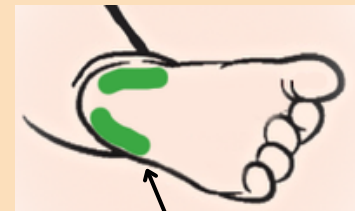
A capillary blood gas is an alternative to a venous or arterial blood gas and is a less invasive sampling method. It involves puncturing the skin in a highly vascular site to obtain a sample of blood. It can be used to assess an infant or child's blood oxygen, carbon dioxide, acid base balance or for specific blood tests such as serum bilirubin. As blood gas machines differ from site to site this skill sheet focuses on the collection process. Please ensure you have undergone user training specific to the blood gas analyser used at your place of work.

Cool extremities make collecting samples difficult and may also give inaccurate results. The site should not be milked. Reduce sampling difficulty by warming the site prior. Capillary blood gas sampling can be an uncomfortable procedure. Consider conducting sampling whilst the baby is breastfeeding or if using 24% Sucrose is appropriate for pain relief.

Site Selection

Neonates and infants

- The heel is the site of choice
- Ensure the correct depth lancet is used for the age of the baby (refer to specific manufacturer instructions)
- The puncture should be no deeper than ~ 2.0 mm and should only be made in the outer aspects of the heel. Penetration of the underlying calcaneus bone can result in necrotising osteochondritis.



recommended area for heel prick puncture

Children (≥1 year)

- The finger is the site of choice
- Ensure the lancet is sized for the correct depth according to age (refer to manufacturer instructions)

1

GATHER EQUIPMENT*



Lancet
(appropriately sized
for patient)



Capillary blood
sample tubes
(one spare)



2% Chlorhexidine
70% Alcohol Swab



Gauze ball



Small dressing

*Additional equipment will be site specific and determined by the blood gas analyser in use. For example, the ABL blood gas machines require a flint, magnet and clot catcher. Please refer to specific equipment instructions prior to use.

Please ensure that hand hygiene is attended to throughout. Personal Protective Equipment (PPE) is used and appropriate for the patient's infection control risk.



2

PREPARE

Explain the procedure and gain verbal consent.



3

Apply warm pack to improve circulation to the foot. It is essential that this pack is not too hot due to the risk of burns.



4

Choose the puncture site. See p1 for guidance on site selection.



5

PROCEDURE

Support leg and foot using a method that promotes the stability of the leg and enables blood flow from the puncture site (ie. foot not elevated)



6

Use 70% Alcohol 2% Chlorhexidine swab to clean site.



7

Puncture the site once and wipe away the first drop of blood with a gauze swab to avoid inaccurate results.



8

Once bleeding, place one end of the capillary tube in the centre of the blood drop. If the blood flow is sluggish, you may need to tilt the bed or leg downwards to enable gravity to assist.



Use of Soft Paraffin

The use of soft paraffin may assist the blood to form a 'bubble' at the collection site. The paraffin must be thinly applied to ensure the integrity of the sample. It is also important not to scrape along the skin when collecting the sample.

This is appropriate for both capillary blood gas collection and for additional bloods that may be required simultaneously.

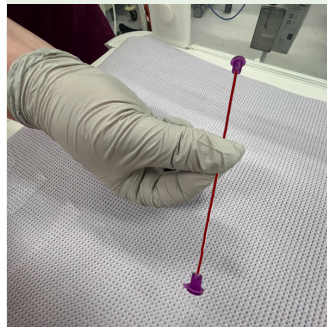
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Adjust the height that the tube is being held at according to the speed of the blood flow. If slow hold the tube more horizontally.



10

Once capillary tube is full immediately seal the open ends with caps (or whatever is appropriate with the collection device available in your workplace).



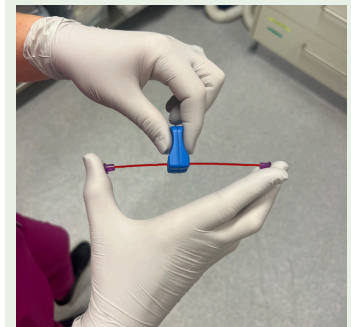
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Apply pressure to puncture using gauze ball.



12

Prevent sample clotting by following site specific practice. e.g. the use of a magnet to move the flint along the length of the tube or holding the capillary tube between 2 fingers.



13

Take the sample to the analyser machine and process the sample as per your local training. Remember to select 'capillary sample'



14

Ask the treating medical officer to review the capillary blood gas results.



Neonatal Tips

- Neonates for bilirubin checks should not be under phototherapy lights at the point of blood collection.
- The Neonatal Screening Test (NNST), also known as the Newborn Screening Test (NBST). Is conducted in the first 72 hours of life. Where this test has been missed, presentation to the ED provides a unique opportunity to complete the testing whilst other tests are also being completed (eg. jaundice screening). Please refer to the Queensland Clinical Guideline: Newborn baby assessment (routine) for more information. A flowchart is found on page 6 of the guideline.

References:

Evans, D.L., Volsko T.A., Capellari, E & Strickland S.L. (2022). AARC Clinical Practice Guidelines: Capillary Blood Gas Sampling for Neonatal and Pediatric Patients. *Respiratory Care*, 67(9) 1190-1204. doi: 10.4187/respcare.10151.

Metro North Hospital and Health Service. (2023). Procedure: Capillary Sampling (heel prick collection for infants) 007316. Retrieved 10 April 2024 from https://qheps.health.qld.gov.au/data/assets/pdf_file/0035/2976119/007316.pdf

Queensland Health. (2022). Queensland Clinical Guidelines. Neonatal Jaundice. Retrieved 10 April 2024 from https://www.health.qld.gov.au/data/assets/pdf_file/0018/142038/g-jaundice.pdf

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- Supporting consumer rights and informed decision making in partnership with healthcare practitioners including the right to decline intervention or ongoing management.

- Advising consumers of their choices in an environment that is culturally appropriate and which enables comfortable and confidential discussion. This includes the use of interpreter services where necessary.
- Ensuring informed consent is obtained prior to delivering care.
- Meeting all legislative requirements and professional standards.
- Applying standard precautions, and additional precautions as necessary, when delivering care.
- Documenting all care in accordance with mandatory and local requirements.

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