

Blood Glucose Level (BGL) Sampling

Point of care (POC) capillary blood glucose level sampling is a common investigation in the paediatric emergency patient. Infants and young children and children have greater glucose requirements and reduced glycogen stores compared with adults. They are also reliant on their caregiver to provide them with adequate fluids and nutrition to keep them hydrated and meet their glucose requirements. Common indications include decreased feeding (particularly neonates and infants), increased thirst, increased urination, decreased output, vomiting, diarrhoea, lethargy, altered level of consciousness, seizure, history of diabetes or metabolic condition. It may be appropriate to measure ketone levels whilst attending the BGL in patients with concerns for diabetic ketoacidosis or in patients who are dehydrated.

1 GATHER EQUIPMENT*



Lancet
(appropriately sized
for patient)



Test strips



Monitor



Gauze ball



Small dressing

*POC BGL monitors must be calibrated according to manufacturer recommendations to ensure the accuracy of the reading

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

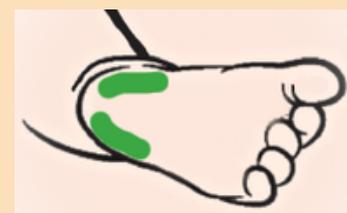
Site Selection

Children (≥ 1 year)

- The finger is the site of choice.
- Avoid the thumb. The thumb has more nerve fibres, therefore pain would be increased at this site.
- Ensure the lancet is sized for the correct depth according to age (refer to manufacturer instructions).

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.
- Older infants and young toddlers may be less distressed with a toe-prick. Ensure that toes are not calloused if using this sample site.



Recommended area for
heel prick puncture



2 PREPARE

Explain the procedure and gain verbal consent.



3

Apply warm pack to improve circulation to the hand/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

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



6

Load BGL test strip into glucometer.



7

Puncture the site with lancet. DO NOT squeeze the lanced site excessively. This may give inaccurate results or may cause bruising.



8

Drop blood sample from fingerprick onto then BGL sample strip. Ensure the glucometer is ready to receive the sample. Take note of the result.



Ketone Testing

Ketone Testing is likely to be required if the BGL is:

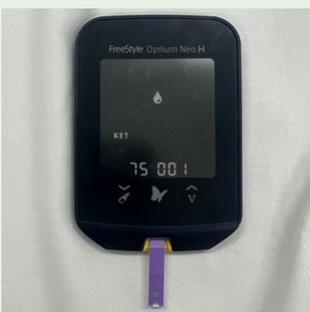
- Less than 3mmol/L
- Greater than 11mmol/L
- A medical officer has requested a ketones test.

Once BGL is completed, remove BGL testing strip and replace with a ketone testing strip.

Normal ketones are zero.

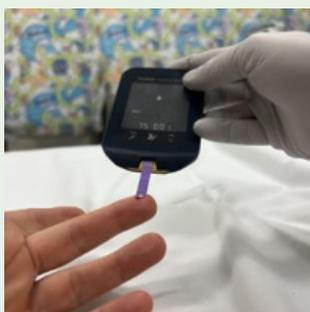
9

If ketone testing is also indicated, replace the BGL test strip with the ketone test strip.



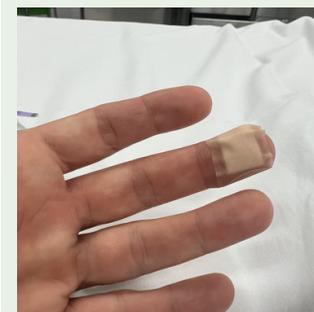
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Drop blood sample from fingerprick onto the ketone sample strip. Ensure the glucometer is ready to receive the sample. Take note of the result.



11

Cover the puncture site with a small dressing.





ALERT - HYPOGLYCEMIA

HYPOglycemia (BGL <3.0 mmol) is a medical emergency. This may read as "LO" on the glucometer. Escalate care to a senior medical officer immediately

A capillary BGL of 3.0mmol or less should be confirmed with a venous sample. These samples should be analysed in a blood gas analyser. Please see the [Guideline: Unexplained hypoglycaemia – Emergency management in children](#) for further management.



ALERT - HYPERGLYCEMIA

HYPERglycemia (BGL >11.0 mmol) is a medical emergency. This may read as "HI" on the glucometer. Escalate care to a senior medical officer immediately.

Diabetic ketoacidosis (DKA) and Hyperosmolar Hyperglycaemic State HHS are life-threatening medical emergencies.

Please see the Guideline: [Diabetic Ketoacidosis \(DKA\) and Hyperosmolar Hyperglycaemic State \(HHS\) Emergency management in children](#) for further management.

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

**This Queensland Paediatric Emergency Skill Sheet was developed and revised
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- Providing care within the context of locally available resources, expertise, and scope of practice.
- 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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