



Clinical Practice Procedures: Assessment/Blood analysis – Ketones

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| Policy code | CPP_AS_BAT_0223 |
| Date | February, 2023 |
| Purpose | To ensure a consistent procedural approach to blood analysis – ketones. |
| Scope | Applies to Queensland Ambulance Service (QAS) clinical staff. |
| Health care setting | Pre-hospital assessment and treatment. |
| Population | Applies to all ages unless stated otherwise. |
| Source of funding | Internal – 100% |
| Author | Clinical Quality & Patient Safety Unit, QAS |
| Review date | February, 2026 |
| Information security | UNCLASSIFIED – Queensland Government Information Security Classification Framework. |
| URL | https://ambulance.qld.gov.au/clinical.html |

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Blood analysis – Ketones

February, 2023

Point of care (POC) B-hydroxybutyrate (BHB) assessment is a quick and convenient, quantitative assessment of a patient's blood ketone level used to identify diabetic ketoacidosis.

'Normal' blood ketone levels are under 0.6 mmol/L, with levels 1.6–3.0 mmol/L indicating a risk of diabetic ketoacidosis. Levels greater than 3.0 mmol/L are considered a medical emergency and require urgent transport to medical care.

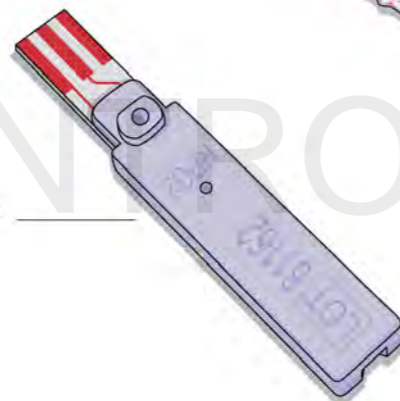
Freestyle Optium Neo H

The FreeStyle Optium Neo H is a commercial hospital grade glucometer used to measure POC glucose and BHB ketone levels in fresh whole blood.^[1]



Freestyle Optium Neo H meter

Calibration strip



Foil wrapped Ketone test strip

Indications

- POC ketone assessment

Contraindications

- Routine use unless clinically indicated.

Complications

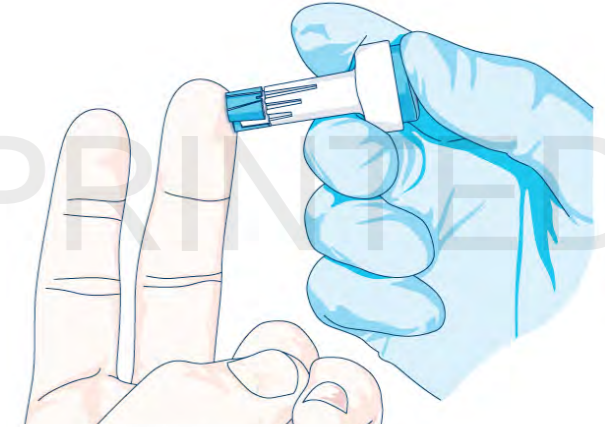
- Nil in this setting



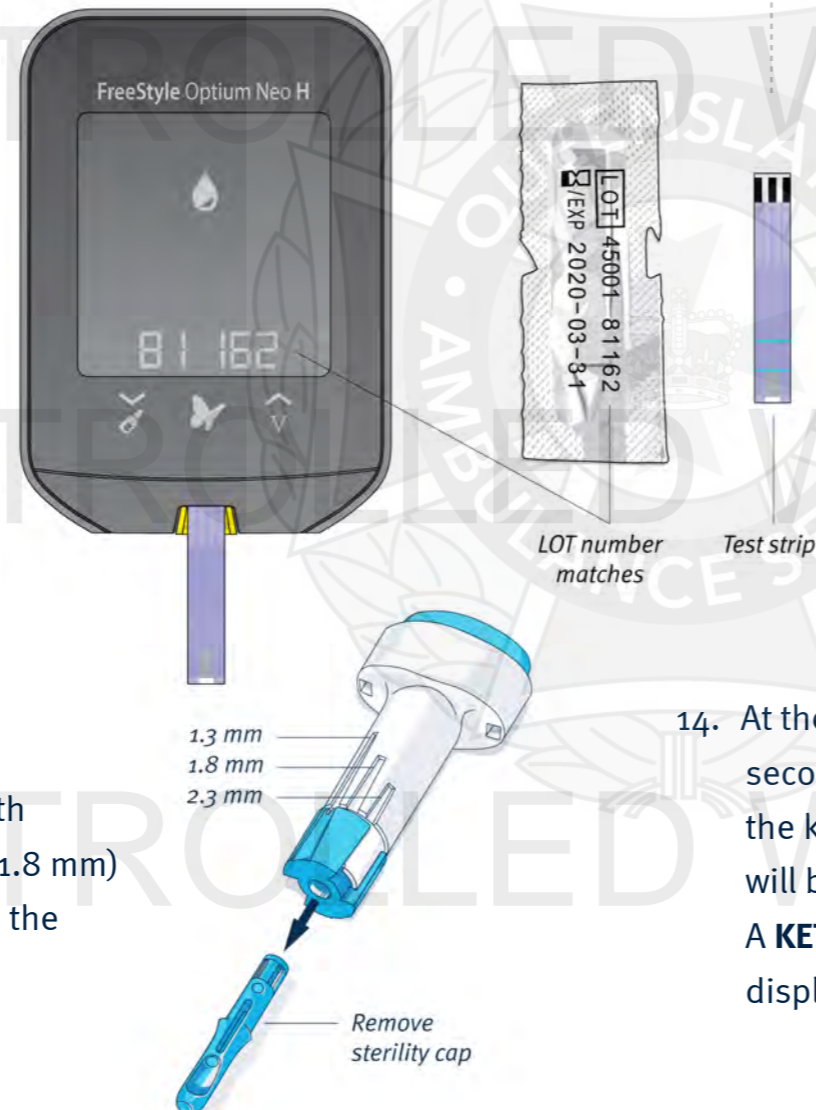
Procedure – Blood analysis – Ketones

1. Apply required infection control measures (refer to the *QAS Infection Control Framework*).
2. Insert the supplied ketone calibration strip.
3. Confirm the LOT number (printed on the “Blood β -ketone” test strip packaging) is the same as the LOT number shown on the screen.
4. Remove the calibration strip and retain for future use.
5. Identify an appropriate sample site (distal lateral aspect of any of the middle three fingers) – confirm it is clean, dry and warm.
6. Open the individually foil wrapped “Blood β -ketone” test strip.
7. Gently Insert the test strip into the FreeStyle Optium Neo H meter – the meter will turn on automatically.
8. The blinking  will indicate the meter is ready for testing.
9. Twist and remove the sterility cap from the Accu-Chek® Safe-T-Pro® Plus lancet.
10. Set the desired penetration depth setting (*low* (1.3 mm), *medium* (1.8 mm) or *high* (2.3 mm)) depending on the skin softness and location. [2]

11. Press the lancet device firmly against the desired sample site.
12. Depress the lancet’s blue activation button to deploy (and retract) the lancet – dispose of the shielded lancet immediately into a sharps container.




13. Hold the blood capillary sample to the white target area on the test strip until 3 short lines are displayed on the screen (indicating that an adequate amount of blood has been applied).



14. At the end of the 10 second countdown, the ketone result will be displayed. A **KET** icon will be displayed on the screen.



Additional information

- The meter will turn off after 3 minutes of inactivity. Remove and insert the unused test strip to restart the meter.
- If testing ketones on venous blood, press  to mark the test until **V** appears indicating that the meter is ready for venous blood sampling.
- Weekly Quality Control testing is required. (refer to *CPP: Assessment/Blood analysis – Glucose*)
- The measurement of ketones is only authorised for ACP2/CCP ambulance clinicians working within the Metro South Region, Weipa station catchment or LARU officers state-wide.



Error messages (if errors continue, contact Customer Care)

| MESSAGE | MEANING | TROUBLE SHOOTING GUIDE |
|-----------|---|--|
| E-1 | The temperature is too hot or too cold for the meter to operate. | <ol style="list-style-type: none"> 1. Move meter and test strips to a location where the temperature is within the acceptable range. 2. Wait for the meter and test strips to adjust to the new temperature. 3. Repeat the test using a new strip |
| E-2 | Meter error | <ol style="list-style-type: none"> 1. Turn the meter off. 2. Repeat the test using a new test strip. |
| E-3 | Blood drop is too small; OR Incorrect test procedure; OR a problem has been identified with the test strip. | <ol style="list-style-type: none"> 1. Review testing instructions. 2. Repeat the test using a new test strip. |
| E-4 | The BGL may be too high to be read by the meter; OR a problem has been identified with the test strip. | <ol style="list-style-type: none"> 1. Repeat the test using a new test strip. |
| E-5 | Blood sample was applied to the test strip too soon. | <ol style="list-style-type: none"> 1. Review testing instructions. 2. Repeat the test using a new test strip. |
| E-6 | Calibration; OR Test strip error | <ol style="list-style-type: none"> 1. Check the date setting on the meter. 2. Check the expiration date on the test strips foil packet. 3. Repeat the calibration using the calibration strip that was supplied with the test strips in use. |
| E-7 | Test strip may be damaged, used or not recognised by the meter. | <ol style="list-style-type: none"> 1. Check that the correct test strips are being used. 2. Repeat the test using a new test strip. |
| E-7 / E-8 | Meter error | <ol style="list-style-type: none"> 1. Turn off the meter 2. Repeat the test using a new test strip. |