



Clinical Practice Guideline

Guideline coverage includes NICU KEMH, NICU PMH and NETS WA

Brainz Monitor: Low Impedance Needle Electrodes

This document should be read in conjunction with the [Disclaimer](#)

Low impedance electrodes should be considered when applying OLYMPIC LOW IMPEDANCE MONITOR (OBM).

Advantages

- Improved trace with low impedance
- Ease of application especially if infant not tolerating handling
- Improved connectivity in cooled infants as hydrogel electrodes require warmth for adhesion
- Needles can be used in high humidity environment
- Ease of application in infants with thick hair
- Able to obtain good trace on infants on HFO Ventilation

Exclusions

- Cephalohaematoma
- < 34 weeks gestation, unless requested by the Consultant
- History of a bleeding disorder (i.e. low platelets, DIC)
- The presence of a scalp injury

Olympic Low Impedance Needle Electrodes

- The blue plastic housing is a safety mechanism so the needles can be handled easily and with minimal risk of a needle stick injury.
- Squeezing open the distal end of the blue safety cover (“protective shield”) will allow the needle and black hub to glide out. Pull plastic housing to the end of the cable wire (away from the needle).
- When needles are removed from the baby, the blue housing should be advanced over the needle carefully to avoid needle stick injury and then disposed of in a 'sharps' container.

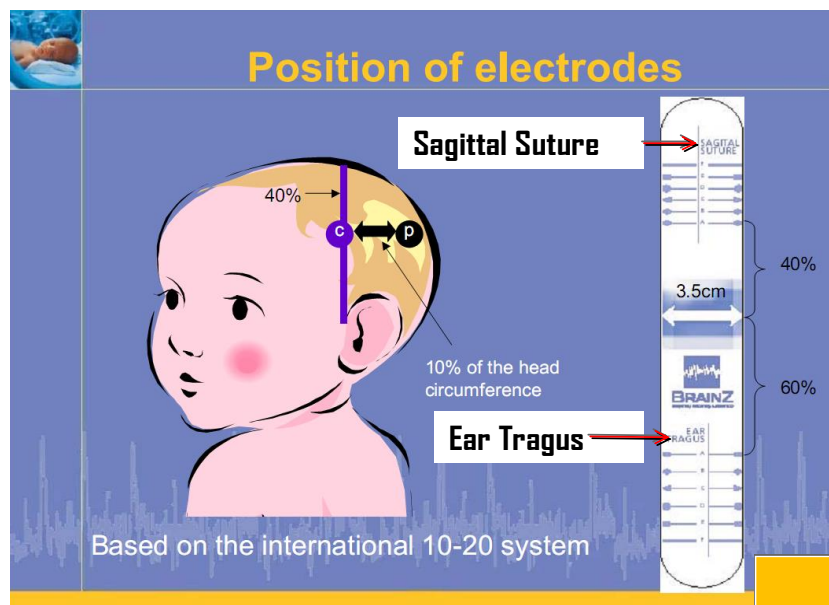
Equipment

- Positioning aid (tape measure) term/preterm
- 4 Needle and 1 Hydrogel electrodes
- Sterile surgical marker pen
- Swab stick (cotton bud) and sterile water to part hair
- 1 x Packet of gauze to dry hair
- 4 x 1% Chlorhexidine/alcohol swabs

- 3 packets Leukostrips
- 4 x Tegaderm
- 2x Skin prep swabs
- Strappit to secure leads
- Sucrose and oral syringe

Application

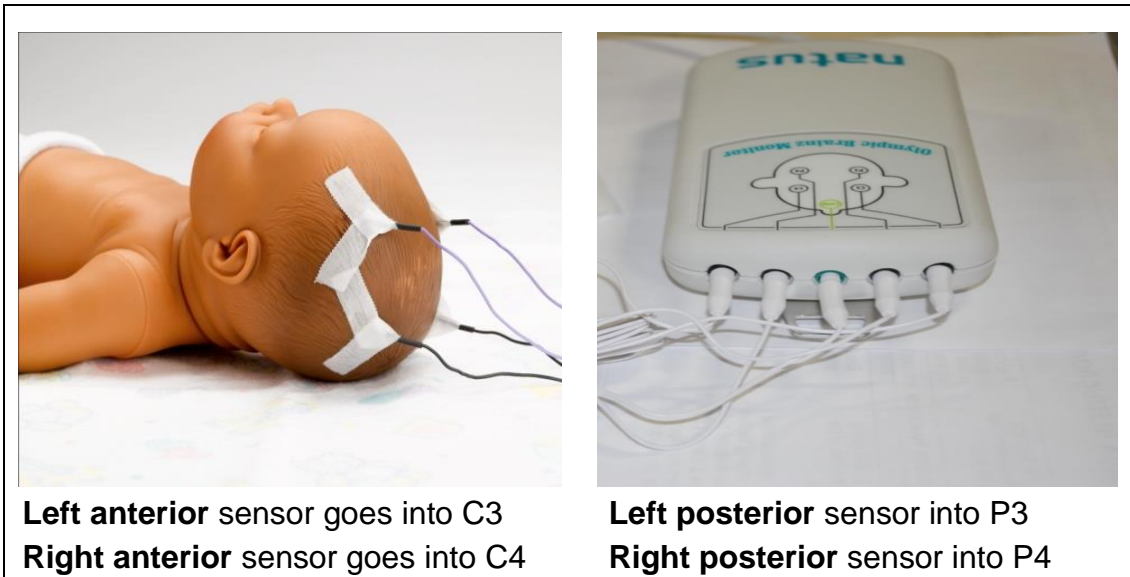
1. Measure and locate the anatomical land marks: Sagittal suture and ear tragus.
2. Align sensor positioning aid (measuring tape) **vertically** on the head and **Parallel** to the face. The forward edge of the measuring aid should touch the ear tragus.
3. Match the letters/symbols on positioning aid until the **same** letter/symbol in both locations.
4. Mark with surgical pen on each side of the tape.



5. Part the hair vertically (or let it part naturally) away from the marked spot by using sterile water and swab sticks. Dry with gauze.
6. Clean skin with 1%Chorhexidine /alcohol swabs and let it dry.
7. Hold skin taught & insert needle at 30° angle, with sensor wire upwards (ensure that all metal of the needle is under the dermal layer).
8. Secure the subdermal needle electrode in place using steristrips and the Chevron method (as for securing IVs).
9. Do not apply Tegaderm over the needles if an EEG is imminent. Needles do not have to be removed when doing an EEG. Needles may have to be removed if too much interference whilst EEG is in progress. Please discuss with CNC or Co-ordinator and EEG technician.
10. Repeat the previous steps for the other needle insertions.
11. Placement of Reference Electrode can be placed on the Chest (anterior or posterior). Back of the shoulder or Nape area of the neck.
12. If the scalp is very hairy, use Skin Prep swabs around needle insertion site and allow drying prior to taping.
13. The wires and needles should **all point in same direction**.

14. To prevent needles dislodging and help minimize movement artifact, secure leads in a small loose loop (**strain relief**). Secure as close to the electrodes as possible. A second strain relief can be applied near **DAB** end secured to bedding.
15. Electrodes must be inspected hourly for displacement and signs of infection. Ensure needle remains inserted to the hub of the electrode. Needles may remain insitu for duration of monitoring but if they dislodge, replace with a new one.
16. Commence monitoring.
17. Needles can be left in place during CT. Replace with new needle if displaced.
18. **To prevent likelihood of needle stick injury** always check impedance signal before removing wrap or touching head.
If at any stage the impedance colour turns amber or red, the needle is likely to be dislodged. Remove wrap with care do not slide your hand under the baby's head and carefully check placement of the four needle electrodes.

Connecting Sensors



When Ceasing Monitoring

1. Turn monitor off.
2. Gently remove tape using adhesive removal wipes if required.
3. Remove needle electrodes pulling sheath over each needle carefully to avoid needle stick injury as it is removed. Place in the sharps bin.
4. Gentle pressure may be required at the site until bleeding stops.
5. Document time monitoring ceased and condition of insertion sites.

References

1. Natus/Education & Support/Clinical Education www.aEEGcoach.com
2. A new neurological focus in neonatal intensive care: Sonia L. Bonifacio, Hannah C. Glass, Susan Peloquin & Donna M. Ferriero Nature Reviews Neurology 7, 485-494 (September 2011)

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