



GUIDELINE

Brainz Monitor: Low Impedance Needle Electrodes

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this [disclaimer](#)

Aim

This guideline outlines the application and nursing management of the BRAINS monitor for patients in the neonatal unit. Low impedance electrodes should be considered when applying OLYMPIC LOW IMPEDANCE MONITOR (OBM).

Risk

Inaccurate placement of electrodes can lead to poor readings/trace which may impact information needed for diagnosis and patient management.

Improper handling of the equipment can also increase the risk of sharps injuries for staff, patients and parents.

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

Key Points for Olympic Low Impedance Needle Electrodes

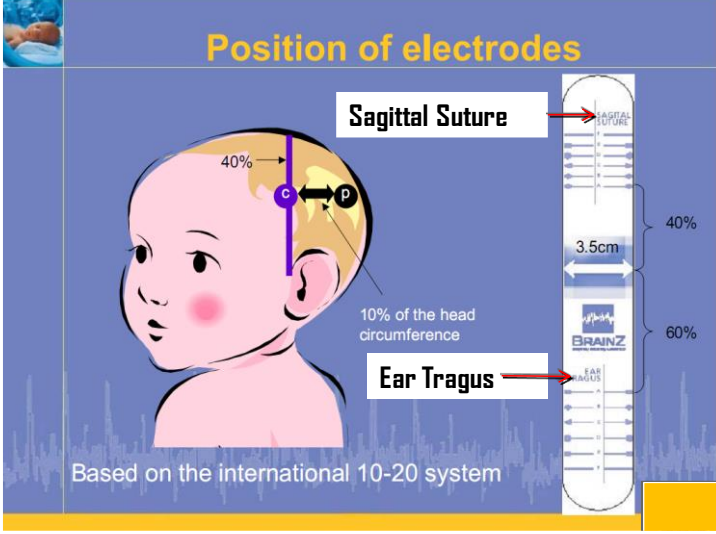
- The low impedance needle electrodes are unsheathed and there is an increased risk of a needle stick injury.
- Care needs to be taken when caring for a patient with needle electrodes insitu. Heightened awareness of the needle placement, extra vigilance when moving the patients head, and ensuring the electrodes are checked hourly and secured well is important.
- Removal of needles is a **two person** procedure to minimize the risk of needle stick injury. When needles are removed from the baby they should be placed directly into a sharps bin. The electrodes should be unplugged and removed from the patients scalp. The electrodes can then be cut at the tip and dropped into a sharps bin to minimize the risk of injury. The remaining cable can be placed in a normal bin.



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

Steps	Additional Information
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.

Steps	Additional Information
<p>3. Match the letters/symbols on positioning aid until the same letter/symbol in both locations.</p>	 <p>Position of electrodes</p> <p>Sagittal Suture</p> <p>40%</p> <p>3.5cm</p> <p>40%</p> <p>60%</p> <p>10% of the head circumference</p> <p>Ear Tragus</p> <p>Based on the international 10-20 system</p>
<p>4. Mark with surgical pen on each side of the tape.</p>	
<p>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.</p>	
<p>6. Clean skin with 1%Chorhexidine /alcohol swabs and let it dry.</p>	
<p>7. Hold skin taught & insert needle at 30° angle, with sensor wire upwards</p>	<p>Ensure that all metal of the needle is under the dermal layer</p>
<p>8. Secure the subdermal needle electrode in place using steristrips and the Chevron method</p>	<p>The same as securing peripheral IVs</p>
<p>9. Do not apply Tegaderm over the needles if an EEG is imminent</p>	<p>Needles do not normally need to be removed when doing an EEG. Please discuss with CNC or Co-ordinator and EEG technician</p>
<p>10. Repeat the previous steps for the other needle insertions.</p>	

Steps	Additional Information
<p>11. Placement of Reference Electrode can be placed on the Chest (anterior or posterior) the back of the shoulder or Nape area of the neck.</p>	
<p>12. If the scalp is very hairy, use Skin Prep swabs around needle insertion site and allow drying prior to taping</p>	
<p>13. The wires and needles should all point in same direction.</p>	
<p>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.</p>	
<p>15. Connect Sensors</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>Left anterior sensor goes into C3 Right anterior sensor goes into C4</p> </div> <div style="text-align: center;">  <p>Left posterior sensor into P3 Right posterior sensor into P4</p> </div> </div>	
<p>16. Commence monitoring</p>	

Nursing Considerations

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
- Needles can be left in place during CT. Replace with new needle if displaced.
- 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.

Ceasing Monitoring and Removal of Needle Electrodes



This is a **two person** procedure

1. Turn monitor off.
2. Unplug the needle electrodes from the monitor.
3. **Second person** holds baby to prevent sudden movement during needle removal.
4. Gently remove tape using adhesive removal wipes if required.
5. Remove needle electrodes from the scalp carefully ensuring extra care is taken to reduce risk of needlestick injury. Hold the needle electrode over sharps bin and using scissors cut the tip so the needle drops into the sharps bin. Place the remaining electrode into the normal bin.
6. Gentle pressure may be required at the site until bleeding stops.
7. Document time monitoring ceased and condition of insertion sites.

References and related external legislation, policies, and guidelines

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)

This document can be made available in alternative formats on request.

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