

# AEEG HYDROGEL ELECTRODES

## Indication

The best aEEG reading will be obtained by placing subcutaneous needle aEEG electrodes as outlined in the aEEG Quick Reference. However, if no needle electrodes are available, hydrogel EKG electrodes are an alternative option.

The pros to using hydrogel electrodes include less pain on insertion and less cost. The cons include multiple steps of skin preparation for proper adherence and possible need to shave hair in patches if baby has very thick hair. Poor adherence will interfere with aEEG reading and thus may skew interpretation as well.


## Materials






- Brainz™ aEEG Monitor
- Measurement strip
- Neonatal EKG leads (these are the hydrogel electrodes!) (x 5)
- Marker or pen
- Nu Prep (skin prepping gel, found in baskets of aEEG monitors)
- Cavilon™ skin protector swab sticks (x4)
- Brush from chlorhexidine scrub pack
- Q-tips
- Sterile water
- 2x2 gauze
- Razor (for particularly hairy babies)
- Hypafix or Tegaderm (if baby not too hairy)
- Fabric head wrap (please return dirty wraps to cooling room as they can be washed and reused).



## Key points

- Skin preparation is the key to ensuring good adherence of the electrodes.
- Do marking first, then prep and apply electrode to one spot at a time.
- Normal saline will inactivate the hydrogel electrode – NEVER use NS with hydrogels. Use water to rinse skin and to hydrate electrode if it dries out.

## Procedure – Site Location & Preparation

1. Position infant supine	
2. Ensure head is as clean as possible. The cleaner the hair the better the quality of tracing/impedance. <b>*Infants with vernix or blood present in hair will require a brush/comb to clean hair prior to electrode application.</b> Use the scrub brush that comes in the chlorhexidine scrub pack to wash hair if needed.	
3. Place the head wrap under the baby's head	

<p>4. Use the aEEG lead positioning guide to identify location for the electrodes: position the strip as shown in the photos above. Ensure the end marked “sagittal suture” is near the sagittal suture and the end marked “tragus” is near the ear tragus. Move the strip along the coronal suture until the letter (A-H) aligned with the sagittal suture matches the letter aligned with the ear tragus.</p>	
<p>5. Using a marker or pen, mark the two sensor sites at the ends of the arrows. Sites should be approximately 5-10 cm apart and evenly placed on both sides. Mark the application sites in the same way on the other side of the head. If there is boggiess or swelling on one side of the head, displace the application site onto normal scalp. The site on the other side of the head needs to be displaced so that it is a mirror image of the first.</p>	
<p>6. Using the dry scrub brush (from the chlorhexidine scrub pack), part the baby’s hair at the first electrode site so that the marked skin is exposed.</p>	
<p>7. Use a Cavilon swab stick to keep hair parted (use on hair to hold hair; not on skin exposed by part). <b>NOTE:</b> If infant extremely hairy, it may be necessary to shave a tiny patch at marked spot in order to ensure the electrode can adhere to the skin.</p>	
<p>8. Using a pea-sized dot of NuPrep gel on a Q-tip, gently but firmly scrub the marked skin, working up and down the length of the parted hair. This exfoliates the skin to help decrease impedance caused by dead skin, blood, and vernix, and will also help the electrodes adhere better. Do not over-exfoliate – it is possible to abrade the skin.</p>	
<p>9. Remove NuPrep with a damp gauze with sterile water or alcohol swab (<b>not saline</b> -will deactivate hydrogel sensor), working outwards from the center to keep the hair parted. Gently dry.</p>	

<p>10. Warm electrode in hands. Apply the warmed electrode directly over the clean bald skin spot, with the sensor wire upwards (away from the face) and apply direct light pressure for 10 seconds. Run a finger around the edges of the electrode for an additional 20 seconds to help electrode adhere.</p>	
<p>11. If infant is not too hairy, consider using a small square of Hypafix or Tegaderm applied over electrode to hold electrode firmly in place.</p>	
<p>12. Repeat procedure for 3 other electrodes, and plug each one into appropriate spot on Data Acquisition Box (DAB).</p>	
<p>13. Place ground electrode on back of shoulders of baby and plug into DAB.</p>	
<p>14. Begin recording on aEEG machine. Check impedance. The goal is to have impedance less than 5 Kilo ohms. If impedance reading higher than this, see troubleshooting tips below.</p>	
<p>15. Close head wrap around head to secure all in place.</p>	
<p>16. Refer to aEEG Quick Reference for information about reading and interpreting the aEEG itself.</p>	

## Troubleshooting Tips

- Check the hydrogel sensor from the skin to the DAB - make sure all electrodes are properly placed, are all connected to the DAB, and that the DAB is connected to the monitor.
- If an electrode is lifting, attempt to rehydrate – wet the electrode surface with a drop of water (**do not use saline as it can inactivate hydrogel**)
- Electrodes may need to be replaced q24h as they dry out fairly quickly; skin should be cleaned with water but not necessarily re-prepped with NuPrep (as re-prepping may lead to skin breakdown), in between new electrode applications.