EEG/SEDLine Monitoring Tips

1) **Swab the forehead twice with alcohol swabs to clean the skin prior to electrode placement.**

2) **Place the EEG and obtain a waveform prior to induction.**

3) **Monitor Setup:**
   a. The default monitor set up should display all of the parameters described below
      
      ![Display Window Diagram](Image)

      **Spectral Edge Frequency (SEF) for the left and right sides**

   b. **EEG alarms:** SEDLine alarm range is set to low/high limits of 25/50 for PSi (Patient State Index) by default.
   c. **Ensure that relevant parameters are being displayed:** The PSi (Patient State Index), ARTF (Artifact), SR (Suppression Ratio), EMG (Electromyographic Strength), SEF (Spectral Edge Frequency 95%) and DSA (Density Spectral Array).

   *EEG waveform reflects changes in patients' hypnotic state much more rapidly that processed EEG parameters*

4) **EEG waveform nomenclature and frequency ranges:**
   - **Delta:** 1 - 4 or 0 - 4 Hz; **Slow delta:** <1 Hz
   - **Theta:** 4 - 8 Hz
   - **Alpha:** 8 - 12 Hz (Mu)
   - **Beta:** 12 - 30 Hz (or 14 - 30 Hz); **Low beta:** <20 Hz; **High beta:** 20 - 30 Hz
   - **Gamma:** >30 Hz (to 100s Hz)
   - **Sigma:** 12 - 14 Hz; frequency band for sleep spindles during physiological sleep
5) **Spectral Edge Frequency (SEF) interpretation:**
   - SEF = frequency below which 95% of the total power of the patient's EEG is located
   - SEF \(\leq\) 12Hz is consistent with general anesthesia and low likelihood of awareness

6) **Density Spectral Array (DSA) interpretation:**

   ![DSA Diagram]

   - Periods of artifact (ARTF) are conveyed by vertical white lines.
   - The "L" and "R" horizontal color graphs represent the activities of the EEG from the left and right frontal scalp regions, respectively.
   - 95% spectral edge frequency (SEF) is displayed on each of the left and right color graphs as a white trend line.
   - Periods of suppression are conveyed by vertical black lines with a blue bar at the 0 Hz timeline for both the left and the right sides. (Periods of no data are conveyed by vertical black lines only.)
   - Asymmetry Graph: Visualizes and quantifies the difference in brain activity between the left and right sides using an asymmetry measurement.

7) **EEG of the awake patient:** Dominated by high frequency (i.e., high beta and gamma) activity, usually of low amplitude, producing a fuzzy-appearing wave on the faster 25-50 mm/s tracing. High-frequency, high-amplitude activity (EMG) and periodic high-amplitude deviations (from blinking) may be observed.
8) **EEG during general anesthesia**: A pattern of slow delta waves (<1 Hz) coupled with alpha spindles (8-12 Hz) is often desired. There should be an absence of high beta (20-30 Hz) waves and absence of any periods of burst suppression.

- Waves in the alpha (8-12 Hz), theta (4-8 Hz) or low beta (12-20 Hz) frequency ranges, often termed spindles, may not be prominent in older patients with cognitive impairment.

The subjects above were administered Propofol and were in a comparable anaesthetic state.

- Zoomed in EEG waveform demonstrating slow waves in the delta range (~1 Hz) and spindle pattern consistent with general anesthesia, the dotted white trace demonstrates waves in the slow delta range:
9) **EEG suppression**: Any flattened interval on the EEG tracing (EEG suppression) indicates excessive anesthetic depth or suggests the presence of other suppressive stimuli (e.g., cerebral ischemia).

10) **Do not throw away the cables**, only the patient sticker is disposable. If this is a THRIVE study patient, please page the study coordinator at: 30227 to pick up the SEDLine monitor.