

**Question:**

In PICU nurses who have undergone EEG interpretation training, how will this training facilitate seizure recognition in a timely manner?

**Summary:**

It is hoped that nurses who receive training in continuous electroencephalogram (EEG) interpretation will be able to detect seizures more quickly and improve patient outcomes. I looked into many different articles to see if this is proven to be true. Physicians or experienced electroencephalographers are usually the ones who gather EEG data and interpret the results. Getting a hold of them and getting them to see the patients in a timely manner isn't always possible. If only nurses had the proper training to interpret the EEGs on their own then patients could be treated faster. One article I found mentioned compressed spectral arrays (CSAs) as a way to gather the most critical data from continuous EEGs and quickly condense it. Because nurses are at the bedside, they expected this would help catch seizures and alert the physicians sooner. This study proved three key findings. First being, using compressed spectral arrays, nurses were able to detect seizures in adults with intermediate sensitivity after only having a one-hour training session. These results aren't specific to PICU nurses or the pediatric population, however it goes to show that with a little training, nurses might actually be able to help interpret EEGs. Another key finding had to do with accuracy of the nurse's interpretations. The study found that compared to neurophysiologists, nurses had a false-positive rate that was roughly twice as high. The last key finding was that nurse review of spectrograms may provide earlier seizure detection. So although there may be some false interpretations, nurses receiving training could help detect seizure activity and get the physician to see the patient quicker. In this study, they mentioned there is a high chance of alarm fatigue. Alarm fatigue is already very common in the PICU because most of the patients are hooked up to some sort of monitor or pump. This article brings up the point that adding the CSA could just add another alarm to the mix. This can have a negative impact on patient safety and might make the CSA idea not worth it to some. Another study was done by utilizing many different teaching methods on people who were not considered EEG experts such as nurses and medical students, etc. The study found that

a variety of bedside personnel can be trained to conduct and monitor adult EEG for the purpose of diagnosing non-convulsive seizures.

### **Conclusion:**

Although there is a high risk for incorrect readings, nurses are at the patient's bedside more often than the neurophysiologists so they would be able to catch something, such as a seizure, in a more timely manner. These investigations also identified other risks such as alarm fatigue which could potentially lead to patient endangerment. I believe more studies will need to be done in the future but in conclusion, there is enough evidence proving that if PICU nurses undergo EEG interpretation training it will lead to patient seizure recognition in a timely manner.

### **Works Cited:**

#### **Primary Article:**

Amorim, E. , Williamson, C. , Moura, L. , Shafi, M. , Gaspard, N. , Rosenthal, E. , Guanci, M. , Rajajee, V. & Westover, M. (2019). Performance of Spectrogram-Based Seizure Identification of Adult EEGs by Critical Care Nurses and Neurophysiologists. *Journal of Clinical Neurophysiology*, 34 (4), 359-364. Retrieved November 13, 2022, from <https://advances.massgeneral.org/neuro/journal.aspx?id=1213>

#### **Secondary Article:**

Dewan, M., Cipriani, L., Boyer, J., Stark, J., Seger, B., & Tegtmeyer, K. (2019). Reducing Redundant Alarms in the Pediatric ICU. *Multimodal Technologies and Interaction*, 3(1), 11. Retrieved November 13, 2022, from <https://doi.org/10.3390/mti3010011>

**Tertiary Article:**

Kromm, J., Fiest, K.M., Alkhachroum, A. *et al.* Structure and Outcomes of Educational Programs for Training Non-electroencephalographers in Performing and Screening Adult EEG: A Systematic Review. *Neurocrit Care* 35, 894–912 (2021).

<https://doi.org/10.1007/s12028-020-01172-2>