Appendix

Targeted needs assessment survey

What is your professional role in the ICU?

ϒ Bedside Nurse ϒ Nurse Clinician ϒ Nurse Educator ϒ Nurse Practitioner

Please indicate the duration you have been working in an ICU. _____ years

For all of the following please indicated 1) your level of comfort (knowledge or skills) and 2) interest in learning more about the following:

The difference between a seizure, epilepsy, and status epilepticus.

ϒ Not comfortable ϒ Somewhat comfortable ϒ Comfortable ϒ Very comfortable

ϒ Not interested ϒ Somewhat interested ϒ Interested ϒ Very interested

Types of seizures and their clinical presentations.

ϒ Not comfortable ϒ Somewhat comfortable ϒ Comfortable ϒ Very comfortable

ϒ Not interested ϒ Somewhat interested ϒ Interested ϒ Very interested

Which patients are at increased risk for non-convulsive seizures.

ϒ Not comfortable ϒ Somewhat comfortable ϒ Comfortable ϒ Very comfortable

ϒ Not interested ϒ Somewhat interested ϒ Interested ϒ Very interested

What an EEG is and what it measures.

ϒ Not comfortable ϒ Somewhat comfortable ϒ Comfortable ϒ Very comfortable

ϒ Not interested ϒ Somewhat interested ϒ Interested ϒ Very interested

Indications/uses for EEGs.

ϒ Not comfortable ϒ Somewhat comfortable ϒ Comfortable ϒ Very comfortable

ϒ Not interested ϒ Somewhat interested ϒ Interested ϒ Very interested

How the EEG signal is recorded and processed.

ϒ Not comfortable ϒ Somewhat comfortable ϒ Comfortable ϒ Very comfortable

ϒ Not interested ϒ Somewhat interested ϒ Interested ϒ Very interested

Causes for and identification of EEG artifacts

ϒ Not comfortable ϒ Somewhat comfortable ϒ Comfortable ϒ Very comfortable

ϒ Not interested ϒ Somewhat interested ϒ Interested ϒ Very interested

Basic EEG waveform interpretation (eg. identifying burst suppression, seizures, periodic discharges, etc.)

ϒ Not comfortable ϒ Somewhat comfortable ϒ Comfortable ϒ Very comfortable

ϒ Not interested ϒ Somewhat interested ϒ Interested ϒ Very interested

What a Color Density Spectral Array is and what it is used for.

ϒ Not comfortable ϒ Somewhat comfortable ϒ Comfortable ϒ Very comfortable

ϒ Not interested ϒ Somewhat interested ϒ Interested ϒ Very interested

How to interpret a Color Density Spectral Array.

ϒ Not comfortable ϒ Somewhat comfortable ϒ Comfortable ϒ Very comfortable

ϒ Not interested ϒ Somewhat interested ϒ Interested ϒ Very interested

Identification and reapplication of loose electrodes/leads.

ϒ Not comfortable ϒ Somewhat comfortable ϒ Comfortable ϒ Very comfortable

ϒ Not interested ϒ Somewhat interested ϒ Interested ϒ Very interested

How to enter text (eg. document medication administration) on an EEG recording.

ϒ Not comfortable ϒ Somewhat comfortable ϒ Comfortable ϒ Very comfortable

ϒ Not interested ϒ Somewhat interested ϒ Interested ϒ Very interested

How to focus the EEGs recording camera.

ϒ Not comfortable ϒ Somewhat comfortable ϒ Comfortable ϒ Very comfortable

ϒ Not interested ϒ Somewhat interested ϒ Interested ϒ Very interested

What to do with the EEG when the patient goes for an MRI, or other test.

ϒ Not comfortable ϒ Somewhat comfortable ϒ Comfortable ϒ Very comfortable

ϒ Not interested ϒ Somewhat interested ϒ Interested ϒ Very interested

Please indicate other relevant areas of interest to you.

Please indicate you preferred methods of learning (check all that apply):

ϒ Didactic lectures

ϒ Small group tutorials/discussions

ϒ Self-directed reading/manuals

ϒ Online modules

ϒ Simulation/Hands on practice

ϒ Other (please indicate

Pre-Curriculum Survey

What is your gender?

- Male
- Female

What is your age?

- Free text entry

What is your nursing role within the ICU?

- Bedside RN
- Nurse Clinician
- Nurse Educator
- Nurse Practitioner
- Other

How long have you been working in an ICU?

- Free text entry

How much time learning about seizures have you done previously?

- None
- 1 – 60 minutes
- 61 – 120 minutes
- 121 – 180 minutes
- > 180 minutes

How much time learning about EEGs have you done previously?

- None
- 1 – 60 minutes
- 61 – 120 minutes
- 121 – 180 minutes
- > 180 minutes

I am confident in my understanding of seizure principles (eg. difference between seizure, epilepsy, and status epilepticus, types of seizures and their presentations, which patients are at increased risk for seizures, etc.)

- Strongly disagree
- Disagree

- Neutral
- Agree
- Strongly Agree

I am confident in my understanding of basic EEG principles (eg. what an EEG measures, indications/uses for EEGs, how an EEG is recorded and processed, what causes EEG artifacts, etc.)

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I am confident at identifying artifacts on EEG

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I am confident at identifying non-convulsive/electrographic seizures on EEG.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I am confident at identifying non-epileptic abnormalities on EEG (eg. burst suppression, periodic epileptiform discharges, intermittent rhythmic delta activity, triphasic waves).

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I am confident at identifying potential non-convulsive/electrographic seizures on Color Density Spectral Array (CDSA).

- Strongly disagree
- Disagree

- Neutral
- Agree
- Strongly Agree

Practicing is required for acquiring EEG interpretation skills.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I expect online tutorials and practice modules for EEG interpretation will be EFFICIENT (good learning for my time spent).

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I expect online practice modules for EEG interpretation will be EFFECTIVE (they will actually work for me)

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

If you have any comments, please tell us:

- Free text entry

EEG Curriculum Overview

Tutorial	Title	Objectives	Associated Practice Module
1	Neuroanatomy	• Distinguish between the central and peripheral nervous system • Define the main functional components of the central and peripheral nervous systems • Distinguish between grey and white matter • List the various functions of each lobe of the brain	Yes
2	Seizures, Epilepsy & Status Epilepticus	• List the 4 elements that make up a seizure • Distinguish between seizures, epilepsy, and status epilepticus • Explain where seizures arise within the brain and define focal versus generalized seizures • Localize clinical seizures based on their manifestations • Describe the two main types of status epilepticus	Yes
3	Introduction to EEG	• Describe what an electroencephalogram measures • List the three ICU indications of EEGs • Appreciate how common non-convulsive seizures are, and what diseases they are likely to occur	Yes
4	Neurophysiology – The Source of the EEG	• Describe the source of the EEG signal • Explain volume conduction	Yes
5	EEG Electrodes	• Describe the international 10-20 system of scalp electrode placement • Correlate electrode letters and numbers with their location on the scalp	Yes
6	EEG Acquisition	• List the four basic elements of the EEG circuit • Describe the two ways to compare EEG electrode signals • Explain the purpose of electrode montages • Identify electrode chains and their corresponding localization • Describe the purpose of amplifiers within the EEG circuit • Describe the purpose of filters within the EEG circuit	Yes

7	EEG Interpretation & Terminology	• Describe the approach to interpreting an EEG • Identify EEG waveforms as beta, alpha, theta, or delta frequencies • Define and identify EEG transients including spikes/polyspikes and sharps • Describe the difference between interictal epileptiform activity and epileptic activity • Localize EEG activity as diffuse/generalized, lateralized, focal, or multifocal	Yes
8	EEG – Physiologic Artifacts	• Describe how an EEG signal is processed in order to remove artifact, and understand that this processing is not perfect • List the two broad categories of artifacts • Describe the two ways in which artifacts can interfere with EEG interpretation. • List the general rules that can help identify artifacts • Identify various physiologic artifacts on EEGs, especially movement, muscle, ECG, pulse, and eye movement artifacts	Yes
9	EEG – Non-Physiologic Artifacts	• Identify various non-physiologic artifacts, especially 60Hz, electrode pop, salt bridge, and other mechanically induced artifacts	Yes
10	EEG – Normal Background Activity	• Appreciate normal EEG background activity so as to prepare them to identify abnormal background activity • Understand that EEG background activity changes with the state (awake, drowsy, asleep) of the patient	Yes
11	EEG Abnormalities – Background	• List the three major categories of EEG abnormalities • List the two major categories of EEG background abnormalities • Describe the underlying reason for focal background abnormalities • Describe the underlying generalized background abnormalities, and explain how the EEG changes as a patient becomes more and more encephalopathic/comatose • Identify an EEG background as normal or abnormal, and if abnormal as focal or generalized • Identify burst suppression and understand its diagnostic and therapeutic connotations	Yes
12	EEG Abnormalities – Non-Epileptic	• List the three main categories of non-epileptic abnormalities. • Describe and identify the three main types of periodic patterns, and provide a differential diagnosis of the cause for each	Yes

		• Describe and identify intermittent rhythmic delta activity, particularly FIRDA and provide a differential diagnosis of the causes for each • Describe and identify triphasic waves, and provide a differential diagnosis of the causes for them	
13	EEG Abnormalities – Seizures	• Describe and recognize sharp waves, spikes, and poly-spikes • Define interictal epileptiform activity • Define ictal epileptic activity (i.e. seizures) • Identify ictal epileptic activity and categorize it as either focal or generalized	Yes
14	Continuous EEG and Color Density Spectral Array	• Describe why continuous EEG is better than routine EEG in patients at risk for r convulsive seizures/status epilepticus • Understand the resource, cost and system implication of performing continuous EEG on patients. • Describe the scientific basis for color density spectral array • Identify potential seizures on an CDSA and define potential mimics	Yes
15	Putting it All Together		No

Example Test Questions

1. For the following EEG



   i. Is there artifact?
      A. Yes
      B. No
   ii. Are electrographic seizures present?
      A. Yes – focal seizures
      B. Yes – generalized seizures
      C. No

Post Curriculum Survey

I am confident in my understanding of seizure principles (eg. difference between seizure, epilepsy, and status epilepticus, types of seizures and their presentations, which patients are at increased risk for seizures, etc.)

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I am confident in my understanding of basic EEG principles (eg. what an EEG measures, indications/uses for EEGs, how an EEG is recorded and processed, what causes EEG artifacts, etc.)

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I am confident at identifying artifacts on EEG.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I am confident at identifying non-convulsive/electrographic seizures on EEG.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I am confident at identifying non-epileptic abnormalities on EEG (eg. burst suppression, periodic epileptiform discharges, intermittent rhythmic delta activity, triphasic waves).

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- Neutral
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I am confident at identifying potential non-convulsive/electrographic seizures on Color Density Spectral Array (CDSA).

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Practicing is required for acquiring EEG interpretation skills.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The online TUTORIALS were EFFICIENT (good learning for my time spent).

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The online TUTORIALS were EFFECTIVE (they actually worked for me).

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

I used the additional resources listed at the end of tutorials.

- Yes
- No

I found the additional resources useful.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

More additional resources would be useful

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Please provide any comments you have about the online TUTORIALS:

- Free text entry

Indicate if you used any of the available PRACTICE MODULES (Note: this does not include the pre or post curriculum tests)

- Yes
- No

Indicate the time you spent practicing via the PRACTICE MODULES (Note: this does not include the pre or post curriculum tests)

- < 1 hour
- 1-2 hours
- 2-3 hours
- 3-4 hours
- 4-5 hours
- > 5 hours

The online PRACTICE MODULES were EFFICIENT (good learning for my time spent).

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree
- Not applicable (Did not complete the practice modules)

The online PRACTICE MODULES were EFFECTIVE (they actually worked for me).

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree
- Not applicable (Did not complete the practice modules)

The instant feedback on the PRACTICE MODULES was useful

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree
- Not applicable (Did not complete the practice modules)

Please provide any comments you have about the online PRACTE MODULES:

- Free text entry