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REPORT:Impact of Educational Modules on Knowledge among Neuroscience Nurses Working in the Epilepsy Monitoring Unit (EMU)

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Impact of Educational Modules on Knowledge among Neuroscience Nurses Working in the Epilepsy Monitoring Unit

by

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Executive Summary

Nurses working on a neuroscience floor and epilepsy-monitoring unit (EMU) at a Midwestern Children's Hospital raised questions about surgery as a treatment modality for epilepsy. The basics of the testing involved in the surgical evaluation process, anti-seizure medications and rescue medications are topics that neuroscience nurses must understand. Questions regarding these topics demonstrate that the nurses are unfamiliar with intractable epilepsy or surgical treatment options. Lack of understanding translates to uncertainty in care, potentially compromising patient care and patient safety. Sentinel events on EMUs are relatively infrequent however, there have been reported injuries and death among the population of electively admitted patients on EMUs (Dworetzky et al., 2015). Nursing education is key to ensuring nursing knowledge, competence and optimal patient outcomes. Focusing on the unique patient population cared for on the EMU, nurses must be educated on the specific needs of the specialized population undergoing epilepsy surgery evaluations and epilepsy surgery.

Patricia Benner's (1982) novice to expert theory focuses on the development of nursing skills through situational experiences through a nurses' career to achieve a level of expertise. Providing nurses with the opportunity to gain experiences and knowledge will improve their understanding and confidence in providing care. Application of Benner's theory to develop educational resources benefits nurses in the workforce. Educational interventions developed specifically for EMU nurses utilizing evidence-based practice (EBP) and current hospital protocols/procedures, with the objectives to (1) improve nursing knowledge; (2) increase nursing confidence in providing care for the specialized patient population on the EMU; (3) improve nursing competence in educating patients and families undergoing care for intractable epilepsy.

To address the educational needs of all nurses working on the EMU, education is required for all nurses on the neuroscience floor. Based on a rotating schedule the neuroscience nurses are assigned to work on the EMU. Thus, all neuroscience nurses are the target population in which to identify needs, initiate changes, and incorporate evidence-based practice (EBP) to optimize patient safety and outcomes related to intractable epilepsy and epilepsy surgery.

A convenience sample of nurses working on a pediatric neuroscience floor was recruited for the study. Incentives, including light refreshments and continuing education units (CEU), encouraged nurses to participate in the educational modules. A pre-test and post-test design was utilized with the implementation of three educational interventions: intractable epilepsy, pre-surgical evaluations and epilepsy surgery. Participants completed a demographics questionnaire and module evaluations. The educational modules offered several opportunities on day shift and night shift for nurses to attend. The pre-test and post-test consisted of ten multiple-choice questions to evaluate knowledge gained, and the evaluation form will use Likert scale questions to rate the impact on nursing knowledge and nursing confidence.

Each participant had an assigned identification (ID) number, which participants will report on all completed surveys. The ID number provided a way to compare pre-test and post-test scores. Upon collection of completed Pre-test-post-test surveys, a paired t-test facilitated the analysis of the data to determine the impact of the educational interventions on the knowledge and confidence of neuroscience nurses caring for patients undergoing epilepsy surgery evaluations and epilepsy surgery.

Problem Identification

Neuroscience nurses working on the EMU at a Midwestern children's hospital have posed questions regarding patient care related to intractable epilepsy and epilepsy surgery on the EMU including topics such as, the frequency of seizures, determination of surgical candidacy, the need for surgical interventions, the basics of the various testing involved in the evaluation process, anti-seizure medications and rescue medications. Questions regarding these topics demonstrate neuroscience nurses on the EMU lack sufficient understanding of intractable epilepsy and epilepsy surgery as a treatment for intractable epilepsy. Lack of nursing knowledge and confidence can negatively impact patient care, patient safety, and patient outcomes. Studies in different specialty areas have found that educational programs can have a positive impact on nursing knowledge and confidence, resulting in improved patient care.

The lack of knowledge among nurses working on the EMU regarding intractable epilepsy, pre-surgical evaluations and epilepsy surgery is a problem. Thus, educators need to determine the specific topics for an educational program to address the clinical concern on the EMU. A scheduled meeting with the nurse educator on the neuroscience floor provided an improved understanding of the educational needs of neuroscience nurses based on the different educational opportunities available over the year. A unit-based educational series targeted the specific educational needs of nurses on the neuroscience floor.

Current Situation

Literature suggests quality of care and patient safety are dependent on the competency and skills of the nurses caring for the patients (Stecker & Stecker, 2012). Focusing on the unique patient population cared for on the EMU; nurses must be educated on the specific care for these patients. To address the needs on the EMU, nursing staff on the neuroscience floor need

educational opportunities to improve knowledge and incorporate evidence-based practice to optimize patient safety and outcomes.

"The Institute of Medicine (IOM) defines quality as: 'care that is safe, effective, patient centered, timely, efficient and equitable...' The IOM goes on to state 'Safety is the foundation upon which all other aspects of quality are built.'" (Mitchell, 2008, p.1). Patients admitted to the EMU have a unique hospital experience, often requiring seizures to be captured on the electroencephalogram (EEG) to appropriately identify and treat specific types of epilepsies and epilepsy syndromes. For the purpose of monitoring and collecting data, seizure-provoking methods may be utilized, including withdrawal of anti-seizure medications (ASMs) and implementation of sleep deprivation protocol. These measures can increase the frequency and severity of seizures experienced by patients during their admission, thus increasing the risks of injury and complications (Fahoum, Kipervasser, Bar-Adon, & Neufeld, 2016). The increased risk is a health concern for the type of testing and for the specific patient population. Nursing education is necessary to address the concerns, provide optimal patient care and to maximize patient safety on the EMU (Blair, Chhabra, Belonick, and Tacket, 2018; Bonkowski, Gagne, Case, and Bulla, 2018; Brady, Milligan, and Christensen,2017; Crowe, Ewart and Derman; 2018; Kim and Chang, 2019; Williams, Hemphill and Knowles 2017; and Wright, 2017).

Nurses on the EMU conduct event testing to facilitate identification of clinical seizures. Event testing is an important aspect of data collection on the EMU, in conjunction with the EEG. Event testing can help identify level of consciousness and differentiate between seizure types or even facilitate identification of non-epileptic events. Nurses are often the first to respond to seizures and if they are properly trained in event testing, they can provide valuable information (Mackey, 2013). Fung et al. (2018) found that of pre-surgical evaluations for epilepsy involving

anti-seizure medication tapering, 33% of patients exhibited seizure clusters (more than three seizures in 24 hours), and 20% of these patients have prolonged seizures (lasting five minutes or longer). Seizure clusters and prolonged seizures increase the risk of adverse events. In the case of prolonged seizures or status epilepticus, nurses must use clinical judgement, respond quickly and implement the rescue medication plan if necessary. The appropriate use of rescue medication is dependent on identification of seizure type and event testing. Nurses must be able to quickly identify seizures, conduct event testing, and implement interventions appropriate to ensure patient safety.

Sentinel events on EMUs are relatively infrequent. However, there have been reported injuries and death among the population of electively admitted patients on EMUs (Dworetzky et al., 2015). There is no consensus regarding best practice guidelines for ensuring patient safety nor are there recognized guidelines for training personnel working on EMUs (Dworetzky et al., 2015). Heterogeneity in EMU composition, access to technology, and human health resources further complicate the progress of developing standardized care. Variations in EMU care from one center to another within one country negatively impacts the development of standardized care (DeVries-Rizzo, 2016). Although there is a lack of standardized practice guidelines for EMUs across the nation, basing EMU practice on evidence and tailoring the education of nursing staff according to EBP is one step toward improved patient safety and optimal patient outcomes.

Lindsay, Oelschlegel, and Earl (2017) identified that nurses at magnet hospitals are interested in improving understanding and incorporating EBP into practice. For effective implementation, nurses need to have continuing education opportunities to ensure they are prepared with the tools and knowledge to provide the best patient care. Nurses want to access the best evidence quickly and effectively to implement the changes into practice to improve patient

care (Lindsay et al., 2017). The quest for improving knowledge about EBP among nurses, illustrates a need, and provides a foundation for creating a streamlined education process for EMU nurses.

Literature Review

Studies have evaluated the impact of educational programs on nursing knowledge and patient care, however there is very limited information regarding EMUs and standardized nursing education for EMUs. “Little has been published about nursing care on EMUs” (Stecker & Stecker, 2012, p. 23). Due to the limited information available on EMUs, a review of literature within parallel specialty areas provided evidence supporting the use of educational interventions to improve nursing knowledge.

Hospitals with magnet accreditation have higher expectations for nurses and the use of EBP. For effective implementation of evidence-based practice, continuing education opportunities for nurses are crucial. Education is a key aspect to implementing EBP. Friesen, Brady, Milligan, and Christensen (2017) evaluated the EBP education among nurses at various hospitals. The findings affirm that nurses benefit from education about EBP, and that implementation of EBP education increases the likelihood of nurses utilizing EBP in their clinical role.

Nursing education not only contributes to nursing knowledge, nursing education also improves nurses' reports of self-efficacy in providing care for patients they were previously unsure about caring for. Blair, Chhabra, Belonick, and Tacket (2018) utilized an educational model on suicide prevention to non-psychiatric nurses evaluating nurses' perceived efficacy. Statistically significant findings of improved report of self-efficacy demonstrated impact of an

educational intervention. Bonkowski, Gagne, Case, and Bulla (2018) identified a lack of nursing knowledge in pain management among surgical oncology nurses. Bonkowski et al. (2018) utilized patient surveys and chart evaluations, and determined that after the educational intervention, there was a statistically significant improvement in pain management and patient care. Crowe, Ewart and Derman (2018) evaluated the effectiveness of utilization of simulation to educate nurses on their confidence, knowledge and patient outcomes. After the simulation education intervention, nurses reported an increase in their confidence and improvement in their knowledge identified via surveys. The increase in their confidence and improvement in their knowledge translated to overall better patient outcomes. Wright (2017) evaluated the impact of an educational program on vascular access management among nurses. The findings demonstrated improved knowledge and skills, suggesting that the educational program was valuable to improve patient outcomes (Wright, 2017). Similarly, Kim and Chang (2019) evaluated the impact of an educational program on critical care nurses and the use of enteral nutritional support. Kim and Chang (2019) found that after the educational intervention, there was a significant improvement in the knowledge and perception of nurses regarding enteral nutrition. Providing nurses with education, can affect their confidence in providing care. Williams, Hemphill and Knowles (2017) implemented an evidence-based educational intervention and assessed the impact on the confidence of nurses in understanding the psychological impact of prostate cancer. The findings helped identify educational needs of nursing personnel providing care for the patient population (Williams, Hemphill, Knowles, 2017). Cook et al. (2013), utilized a similar approach, and implemented an educational intervention for nurses caring for children with traumatic brain injury. The findings demonstrated the educational intervention was successful in increasing the knowledge and confidence of

nurses providing care for these patients (Cook et al., 2013). Although there is limited data for EMU nursing education, many other specialty areas have demonstrated the positive impact of educational intervention as evidence by the literature review.

Implementation of education occurs in many ways, but studies have shown the preference and effectiveness of unit-based education in improving nursing knowledge and patient outcomes (Lindsey et al., 2017). Based on the data available, implementation of an education program for nurses can improve nurses' knowledge and their confidence in providing care for a specialized population, such as the EMU.

Theoretical Framework

Patricia Benner's (1982) novice to expert theory focuses on the development of nursing skills through situational experiences through a nurses' career to achieve a level of expertise. Utilizing Fawcett's *if-then determinations,* "*If* the purpose of the work is to describe, explain or predict a concrete and specific phenomenon, *then* the work is probably a middle range theory;" and *"If* three steps are required, *then* the work is probably a middle-range theory," (Butts & Rich, 2018, p. 99). Thus, Benner's theory is a middle range theory. Benner (1982) adopted the Dreyfus model of skill acquisition to develop Benner's novice to expert theory. Benner (1982) defines each level proficiency from novice to expert.

Major concepts in Benner's (1982) novice to expert theory are levels of proficiency attained through knowledge acquisition, caring and nursing practice. Benner identified that nursing cannot exist without caring and defined six qualities of nurses' caring: transformative power, integrative caring, advocacy, healing power, participative/affirmative power, and problem solving (Butts & Rich, 2018, p. 522). Benner's (1982) theory highlights that nursing practice is a

combination of clinical guidelines and growth within nursing occurs through experience. Benner introduced the idea that nurses undergo growth through situational experiences that enable them to pass five levels of proficiency to achieve a level of expertise (Benner, 1982).

Benner (1982) further identifies expert competencies, classified into seven domains of nursing practice: helping role, mentoring, diagnostic and monitoring, interventions and quality of care and nursing role competencies. Benner's (1982) theory highlights three aspects of change as the nurse passes through the five levels of proficiency, moving from novice to expert. (Butts & Rich, 2018). Benner focuses not on what nurses do, but rather how nurses acquire skills and achieve growth through clinical practice and situational experiences.

Benner's (1982) theory plays a significant role in nursing education. The idea that situational experiences translate into knowledge is important when it comes to mentorships, nursing education and continuing education for nurses. Application of Benner's theory to develop educational resources for nurses in the workforce has proven to be beneficial. Benner's (1982) work focuses on nursing care in the clinical setting, but her theory is applicable to the changing world of nursing and nursing education. Benner's (1982) theory emphasizes that nursing is a continuous realm of learning. The theory provides an understanding of the varying levels of proficiency and can guide the development of mentorships, unit-based education, nursing programs, to facilitate progression from novice to expert for nurse and nurse educators.

Project Purpose

The project focuses on the impact of unit-based education and the impact of training on the care provided by nurses on the EMU. Neuroscience nurses rotating onto the EMU are novices in their nursing roles on a specialized unit. Unit based educational series, consisting of

three educational modules covering intractable epilepsy, pre-surgical evaluations and epilepsy surgery can help improve the nurses understanding of the surgical interventions, specialized care for these patients and specific expectations on the EMU. The purpose of these educational interventions is to improve nurses' understanding of intractable epilepsy and epilepsy surgery. Specifically, the objectives for the project are: (1) improve nursing knowledge; (2) increase nursing confidence in providing care for the specialized patient population on the EMU; (3) improving nursing competence in education patients and families undergoing care for intractable epilepsy.

Method

The project utilized a pre-test and post-test design. A Pre-test-post-test design assesses the outcomes of interest before an intervention and after an intervention. Although the type of project does not incorporate randomization or control group, the Pre-test and post-test design was appropriate to assess the impact of a specific intervention (Terry, 2018). The Pre-test and post-test assessed the nurses' knowledge, competence, and confidence in providing care for patients on the EMU before and after the educational intervention. The pre-test and post-test were completed for each of the three educational interventions.

With serious consideration given to using the Solomon four group design, the Solomon four group design administers the Pre-test to one of the four groups, while all groups will complete the post-test. The advantage would be to assess the Pre-test sensitizations (Terry, 2018). However, due to the requirement of many participants for the design, the design is not feasible for a single, inpatient neuroscience floor. Therefore, the project used a traditional Pre-test-post-test design to assess the impact of the educational interventions.

The study involved mixed qualitative and quantitative results. The pre-test and post-test will each consisted of 10 multiple-choice questions regarding epilepsy and epilepsy surgery. Scoring of the questionnaires required the calculation of the number of correct responses out of 10 possible points. The module evaluation forms asked the nurses to rate the module content, as well as their knowledge gained and confidence using a Likert scale. Both provided a quantitative measure of the impact of the educational intervention. The post-test provided participants with the opportunity to respond to open ended questions regarding the most helpful aspect of the modules as well as future presentation topics. These responses provided a qualitative measure of the impact of the educational intervention.

Target Population & Sample

A convenience sample of 38 nurses participated on the neuroscience floor, out of a total of 48 neuroscience nurses, at a Midwestern children's hospital. The majority of participants were female nurses, with one to over 15 years of nursing experience and varying levels of education (see Table 1).

The nurses participated in three, one-hour educational modules over the span of three months. Any interested neuroscience nurse on the neuroscience floor, including float nurses, contingent, part-time and full-time nurses was encouraged to participate. Flyers for educational modules as well as email reminders for days and times of educational opportunities. Participants received CEU credit upon completion of each educational module, participants could earn three CEU credits for participating in the modules were not required to participate in the study in order to obtain CEU credit.

The stakeholders responsible for the neuroscience nurse education day encouraged the author to present the first module. The neuroscience nurse education day audience comprised all the neuroscience nurses from the unit. The education day module ensured all neuroscience nurses were aware of the upcoming educational opportunities as well as the option to participate in the study. The remaining two educational modules were offered several times a month on both day shift and night shift to ensure availability to all neuroscience nurses.

Instruments and Tools

The study utilized a Pre-test-post-test design. The tools utilized to collect data in the study will be surveys administered before and after the educational interventions. The Pre-test-post-test design provided a way to determine the impact of an educational intervention among neuroscience nurses. The Pre-test and post-test surveys were with the three attending physicians including the director of the epilepsy surgery program and three advanced healthcare providers on the EMU to ensure content validity. The educational modules included the current EMU protocol and procedures. The director of the epilepsy surgery program and EMU, 2 EMU attendings, and the AHP team reviewed the content of the modules prior to dissemination among neuroscience nurses. The author's academic advisor, a certified nurse educator, reviewed each questionnaire to ensure test validity.

Data

The pre-test and post-test design facilitated the collection of data from neuroscience nurses participating in the educational interventions. The Pre-test and post-test surveys evaluated the knowledge of nurses before and after the educational intervention. The evaluation used a Likert scale to assess the knowledge gained by nurses, with the item "I learned something new

regarding the patient population from the module" with "1" being no knowledge gained and "5" being knowledge gained. The same format assessed nursing confidence, with the item "I feel more confident in the care I provide to my patients after attending the module" with "1" not confident and "5" being very confident (see table 3). Nurses knowledge was also assessed using a ten multiple-choice question Pre-test and post-tests regarding the presented content (see table 2). The evaluations completed by participants demonstrated several recurring themes regarding most helpful information and future topics of interest (see table 4 and table 5).

The Pre-test administration began prior to the educational interventions with a time limit of 15 minutes for completion and submission. Following the Pre-test, a 60-minute educational module and discussion took place. Upon completion of the educational module, the participants completed a post-test related to the content covered. The participants received CEUs upon submission of the hospital-provided module evaluation.

Data Analysis

Upon completion of all three educational interventions, the questionnaires were scored. The scores of the Pre-test and post-test were compared to determine if the educational interventions had an impact on the post-test results. A paired t-test analyzed the test scores. Utilizing the paired t-test takes into account the Pre-test and post-test scores of each individual participant. A paired t-test eliminates variability in test scores due to the fact that each participant started with different knowledge. This data analysis demonstrated the impact on nursing knowledge after the intervention was completed.

The mean scores for the Pre-test were 5.86 (SD 1.4), 6.0 (SD 1.75), and 5.9 (SD 0.79), respectively for Module I (n = 37), Module II (n = 29), and Module III (n=22). The post-test

scores demonstrated a statistically significant difference in the scores with the mean scores as follows: 9.08 (SD 1.16, $p < 0.0001$), 9.44 (SD 0.91, $p < 0.0001$), and 9.5 (SD 0.67, $p < 0.0001$) respectively for Modules I, II, and III (see table 2).

Evaluation

The Pre-test and post-test scores were scored before and after each educational module. The scores demonstrate a statistically significant improvement in nursing knowledge and confidence in providing care for the specialized population on the Epilepsy Monitoring Unit (EMU). The Pre-test and post-test provided the investigator a quantitative measure of assessment of knowledge before and after the educational modules. The data collected indicated the educational modules significantly improved post-test scores. Ideally, attendance to all three educational interventions would have the most impact on nursing knowledge, however, the hope is that each educational intervention with contribute important information to nursing knowledge and patient care.

Barriers and Limitations

Patient acuity and staffing were the biggest barriers for the study. Many off service patients were on the unit due to the time of year (flu and respiratory virus season). A limited number of nurses were able to attend during day shift modules, due to short staffing and patient care needs.

Facilitators

The educational modules occurred on then neuroscience floor, allowing easy accessibility for nurses that are working on the unit to attend without having to leave the unit. The presenter is an AHP on the EMU and works with all of the nurses rotating through the EMU. The familiarity

of nursing staff with the provider may facilitate and encourage attendance and participation in the educational interventions. The presenter also provides direct care to epilepsy surgery patients and understands the expectations of the attendings covering patients on the EMU. The close working relationship with the director of the epilepsy surgery program and attending physicians enabled the presenter to tailor the evidence-based information to meet the specific needs of the unit and the expectations of attending physicians and director of the epilepsy surgery program. The director of the epilepsy surgery program provided guidance and input during the study for educational interventions and assessment tools.

The opportunity to conduct the first module at a scheduled nurse education day for neuroscience nurses provided a platform to introduce the study, CEU opportunity and encourage participation for all nurses. Additionally, offering modules on night shift, facilitated participation, enabling night shift nurses to attend during their lunch instead of coming in for an educational opportunity either before or after their scheduled shift.

Timeline

Creation of the educational interventions, Pre-test, and post-test surveys, along with the module of each of the educational interventions required a great deal of time. The presenter attended conferences, completed educational modules, attended patient clinic appointments with a surgical epileptologist and neurosurgeon and met with members of the multidisciplinary team involved in caring for epilepsy surgery patients to prepare for the educational interventions for the study. These activities occurred from January 2019 – August 2019 to ensure the presenter had all of the necessary information needed to begin creating the educational modules.

Beginning in July 2019, the presenter created the Pre-test, post-test and evaluations for each module will take approximately two hours each to ensure use of appropriate and clear items to evaluate of the impact of the educational interventions. The presenter then created three educational modules titled: 1) Intractable Epilepsy; 2) Phase I – Epilepsy Surgery Evaluation: Is Surgery an Option; 3) Intracranial Monitoring and Epilepsy Surgery. Each of these modules required collection of resources, articles and evidence-based guidelines to prepare. The presenter has been collected all resources and guidelines prior to creating the educational module using PowerPoint. Completion of all module presentation occurred by the end of October 2019.

While creating the educational modules, the presenter scheduled to meet with a nurse practitioner in the neurology department to learn how to obtain CEUs for the modules. In preparation for the modules, the author completed an informational session with the nurse to learn the process for applying for CEUs. The modules were divided into three months. The author reserved neuroscience conference rooms for each of the modules. Flyers for each module provided dates and times for the scheduled modules. Flyers displayed in the neuroscience floor break room and locker room provided a reminder for the nurses.

The implementation of the project required nine weeks to administer all three modules. Analysis of the Pre-test, post-test, and evaluation forms required three weeks to consolidate and organize data.

Budget

The presenter provided printed handouts for each of the modules to share with the participants; the presenter also printed flyers, Pre-test, post-test, demographics forms and evaluation forms for the study. The utilization of printers on the neuroscience unit eliminated the

direct cost of the printing supplies. The presenter provided light refreshments and snacks during each of the modules as an incentive to participate. Due to limited resources and lack of funding/scholarships/grants, the presented opted to offer refreshments that were not from the bakery/cafe located on the campus of the hospital, but instead purchased at a local grocery store.

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Table 1

Demographics

	n	%
Gender		
Male	3	7.8%
Female	35	92.1%
Age	14	36.8%
20-25	9	23.7%
25-30	5	13.2%
30-40	6	15.8%
40-50	4	10.5%
50+		
Years of Nursing Experience		
<1	10	26.3%
1-5	12	32.6%
5-10	6	15.8%
10-15	4	10.5%
15+	6	15.8%
Years of Neuro Nursing Experience		
<1	11	28.9%
1-5	13	34.2%
5-10	5	13.2%
10-15	4	10.5%
15+	5	13.2%
Highest Degree		
ADN	7	18.4%
BSN	28	73.7%
MSN	3	7.8%
DNP	0	0%

Table 2

Pre-test and Post-test Scores

Sample	n	Mean	SD	p value
Module 1				
Pre-test	37	5.86	1.42	<0.0001
Posttest	37	9.08	1.16	
Module 2				
Pre-test	29	6.07	1.75	<0.0001
Post-test	29	9.45	0.91	
Module 3				
Pre-test	22	5.86	0.99	<0.0001
Post-test	22	9.55	0.67	

Table 3

Confidence and Knowledge Gained (Scored 0-5)

Module	n	Mean
Module 1		
Knowledge	37	5
Confidence	37	5
Module 2		
Knowledge	29	5
Confidence	29	5
Module 3		
Knowledge	22	4.95
Confidence	22	4.95

Table 4

Participant Feedback: Most Helpful Information

Module/Common Themes	Number of Responses
Module 1 (n=37)	
SUDEP	10
Terminology/Definitions	5
Treatment Options	3
EEG	3
Other	9
Module 2 (n=29)	
Understanding Testing of Phase I	22
RN Role/Patient or Parent Education	5
No Comment	2
Module 3 (n=22)	
RN Role/Patient or Parent Education	3
Surgical Options	10
SEEG vs Grid/Strips	6
Other	1
No Comments	4

Table 5

Participant Feedback: Future Topics of Interest

Module/Common Themes	Number of Responses
Module 1 (n = 37)	
Phase 2	6
Surgery	6
Seizures Types	2
Role of RN	2
Other	21
Module 2 (n= 29)	
Phase 2/Surgery	16
Other	4
No Comment	9
Module 3 (n=22)	
Patient Outcomes	3
Case Studies	5
Medications	2
Other	2
No Comment	10

Appendix A

IRB Protocol

Impact of Educational Interventions about Intractable Epilepsy on Knowledge Among Neuroscience Nurses

Shivani Bhatnagar MS, RN, CPN, CPNP-PC
Doctor of Nursing Practice Candidate at Otterbein University

1. Introduction/Objectives:
    a. The proposed study will assess the impact of educational presentation on the knowledge of neuroscience nurses caring for patients with intractable epilepsy, undergoing pre-surgical evaluations, and epilepsy surgery.
    b. The project will provide educational opportunities for bedside nurses on the neuroscience floor to meet the following objectives:
        I. Session I: Intractable Epilepsy
            1. Define Intractable Epilepsy
            2. Identify risks associated with Intractable Epilepsy
            3. Understand the role of the bedside nurse in caring for patients with Intractable Epilepsy

        ii. Session II: Intractable Epilepsy Evaluation
            1. Identify the importance of seizure capture during monitoring
            2. Identify the importance/rationale for each of the tests involved in an intractable epilepsy evaluation.
            3. Identify the risks versus the benefits of an intractable epilepsy evaluation.
            4. Understand the role of the bedside nurse in caring for patients undergoing intractable epilepsy evaluations

        iii. Session III: Intracranial Monitoring and Surgery
            1. Identify criteria for intracranial monitoring
            2. Identify the difference between intracranial EEG versus scalp EEG
            3. Identify the risks versus the benefits of intracranial monitoring
            4. Identify palliative versus curative surgery versus implanted devices
            5. The role of the bedside nurse in caring for patients admitted for intracranial monitoring and post-operative care.
2. Subject/Methods
    a. The study will be conducted on H10A/H10B with a sample of current registered nurses working at the bedside on this unit.
    b. The instruments utilized will consist of pretest and posttest questionnaire for each presentation, along with a demographics form.

c. The instrument was reviewed by 4 epileptologists and 3 advanced practice providers on the Epilepsy monitoring unit for content validity, and by a certified nurse educator for clarity of questions.
d. All data collection will be on paper. Nurses will be recruited to partake in the educational presentations, which will be offered several times a month during both day shift and night shift to ensure ample opportunity for attendance.
e. No identifying information will be collected, the surveys will be coded by assigning each participant a number, and a letter will correspond with which presentation they are attending A, B, or C to allow for evaluation of the data obtained from those who attending 1 versus 2 versus all 3 presentations.
f. The presentations will be approximately 1 hour, and the surveys will take approximately 10-15 minutes to complete.

3. Data Analysis
   a. Data will be analyzed using quantitative methodologies, using descriptive statistics. A paired t-test will be used to compare the pre-test scores with the posttest scores to determine the impact of the educational intervention on nursing knowledge.

4. Risks
   a. The study is voluntary and the survey is designed to collect data to determine the impact of educational interventions on nursing knowledge.
   b. The project presents minimal risk.
   c. Consent will occur if the participants choose to attend the presentation, complete and submit the questionnaires.
   d. Answering the questionnaires should not adversely impact participants.
5. Benefits
   a. Participants will benefit from presentations and be provided with an opportunity to learn more about the specific patient population/disease process, and treatment options.
   b. Participants will have the opportunity to provide feedback to the presenter and suggest future topics to discuss, thus enhancing future educational opportunities
   c. Participants will be awarded continuing education hours upon completion of each educational presentation and questionnaire.

Appendix B
Participant Informational Handout

What is the Study?

Impact of Educational Interventions about Intractable Epilepsy and Epilepsy Surgery on Knowledge among Neuroscience Nurses, lead by Shivani Bhatnagar as part of a DNP Final Scholarly Project.

- You are asked to be in the study to determine the impact of educational interventions on knowledge among neuroscience nurses
    - The study will involve a series of presentations with pretests and posttests for each presentation.
        - Session I: Intractable Epilepsy
        - Session II: Phase I- Intractable Epilepsy Evaluation
        - Session III: Phase II- Intracranial Monitoring and Epilepsy Surgery
- You can decide whether or not to take part in this study. Even if you join the study, you may stop at any time.
- The reason we are conducting this study is to improve understanding of nursing knowledge regarding intractable epilepsy and epilepsy surgery.
- This study will provide an opportunity to earn CEU and improve your knowledge.
- You do not have to submit the surveys to earn CEU, however you must attend at least 80% of the presentation to earn CEU credit.

What will happen in this study?

- If you decide to take part in this study, you will be asked to complete a demographics form, a presentation evaluation form, a 10 question pretest and a 10 question posttest for each presentation.
- If you attend multiple presentations, you will only complete the demographics form once.
- Answering these questions will take you about 10 minutes.

Confidentiality

- Your answers will be linked to your identification number but your identification number will not be shared with anyone outside the study staff.
- Collection of data and survey responses using paper forms involves no risk to the participants.
- Your answers will not be seen by your employer or manager.
- Your name, initials, or any other identifying information will not be used in any part of the study or discussion following the study.

What if I have questions or concerns?

If you have questions about the study, feel free to contact Shivani Bhatnagar or study team at 614-530-1042 or bhatnagar1@otterbein.edu.

How do I agree to be in the study?

If you would like to take part in this study, you will attend an educational presentation and complete the pretest and posttest, along with a demographics form and evaluation of the presentation. Submission of the completed pretest and posttest surveys will be considered your consent to participate.

Thank you for taking time to consider taking part in this research study.

Appendix C
Teaching Plan

Session	Content	Goal/Objective	Method	Outcome
Session I: Intractable Epilepsy	- Introduction - Consent Forms (if required) - Definitions of epilepsy and intractable epilepsy - Risks of intractable epilepsy - Medications - Bedside nursing care and patient education for intractable epilepsy	- Defining Intractable Epilepsy - Identifying risks associated with uncontrolled epilepsy/intractable epilepsy - The role of the bedside nurse in caring for patients with intractable epilepsy	- PowerPoint Presentation - Discussion - Pre-test/Post-test - Handouts	To be evaluated at the end of the project.
Session II: Intractable Epilepsy Evaluation	- Goal of Intractable Epilepsy Evaluations - Testing involved in Intractable Epilepsy evaluation and purpose of each test - Understanding role of the bedside nursing care and education for the patient population - Medications and seizure capture during intractable epilepsy evaluation.	- Identifying the importance of seizure capture - Identifying the importance of testing, including PET, MRI, SPECT in Intractable Epilepsy Evaluations - Identifying the risks versus the benefits of intractable epilepsy evaluations - The role of the bedside nurse in caring for patients admitted for epilepsy surgery evaluations	- PowerPoint Presentation - Discussion - Pre-test/Post-test - Handouts	To be evaluated at the end of the project.
Session III: Phase II and Epilepsy Surgery	- Criteria for intracranial monitoring - Types of Epilepsy Surgeries - Palliative vs Curative Surgery - Implanted devices - Bedside nursing care and patient education for Phase II and post operative care.	- Identifying the criteria for intracranial monitoring - Identifying the difference importance of seizure capture during intracranial EEG monitoring vs scalp EEG - Identifying the risks versus the benefits of phase 2 intracranial monitoring - The role of the bedside nurse in caring for patients admitted for phase 2 intracranial monitoring	- PowerPoint Presentation - Discussion - Pre-test/Post-test - Handouts	To be evaluated at the end of the project.

Appendix D
Identification Number/Sign-in Sheet

ID Number	Name/Initials of Participant
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Appendix E

Demographic Information

Age

20-25 years ☐

25-30 years ☐

30-40 years ☐

40-50 years ☐

50+ years ☐

Gender

Male ☐

Female ☐

How many years have you been a nurse?

Less than 1 year☐

1-5 years☐

5-10 years☐

10-15 years☐

15+ years ☐

How many years have you been a neuroscience nurse?

Less than 1 year ☐

1-5 years☐

5-10 years☐

10-15 years ☐

15+ years ☐

Highest Degree

Associate's Degree ☐

Bachelor's Degree ☐

Master's Degree ☐

Doctorate Degree ☐

Appendix F

What is Intractable Epilepsy?

Interested in participating in a study on H10A?

Learn more about Intractable Epilepsy

Earn 1 CEU

Light refreshments will be provided

WHO: Shivani Bhatnagar

WHAT: Educational Presentation on Intractable Epilepsy

WHEN: Plenty of opportunities to attend on Dayshift and Nightshift!

WHERE: RN Education Day

WHY: Earn CEUs! Help evaluate the impact of unit-based educational interventions and learn something new about epilepsy!

FRIDAY
OCTOBER 25th
9:00 AM

MONDAY
OCTOBER 28TH
9:00 AM

Appendix G

Intractable Epilepsy

Pretest

1. The prognosis of intractable epilepsy may be the most (when appropriate) improved by:
    a. Ketogenic Diet
    b. Epilepsy Surgery
    c. Anti-seizure medications (ASMs)
    d. Drug Trials

2. Patients with drug resistant epilepsy have a low likelihood of seizure freedom with additional medications.
    a. True
    b. False

3. ___% of people with epilepsy will be well controlled with the use of AEDs.
    a. 50%
    b. 20%
    c. 40%
    d. 70%

4. All people with epilepsy have abnormal interictal (in between seizures) EEGs.
    a. True
    b. False

5. Predictors for intractability among children with epilepsy include: (select all that apply)
    a. High initial seizure frequency
    b. Developmental Regression
    c. Intellectual disability
    d. Genetic Epilepsy Syndrome

6. Epilepsy can potentially be **cured** by which of the following interventions?
    a. Anti-seizure medications (ASMs)
    b. CBD oil
    c. Ketogenic diet
    d. Epilepsy surgery

7. The International League Against Epilepsy (ILAE) **defines drug resistant** or **intractable epilepsy** as a failure of _____.
    a. 3 AEDs used for treating generalized epilepsy
    b. 2 or more tolerated and appropriately chosen AEDs
    c. Any AED used as monotherapy
    d. 4 AEDs, only if seizures have not decreased in frequency.

8. Patients with these types of seizures are at a higher risk for Sudden Unexpected Death in Epilepsy (SUDEP). Select all that apply.
    a. Nocturnal seizures
    b. Absence Epilepsy
    c. Myoclonic Epilepsy
    d. Generalized Tonic Clonic Seizures

9. Please answer both parts of this question.

    a. The International League Against Epilepsy defines Epilepsy as:
    At least ___ unprovoked seizures occurring greater than 24 hours apart;
        a. 2
        b. 3
        c. 4
        d. 5

    b. Or ____ unprovoked (or reflex) seizure and a probability of further seizures similar to the general recurrence risk (at least 60%) after two unprovoked seizures, occurring over the next 10 years.
        a. 1
        b. 3
        c. 2
        d. 4

10. The most common psychiatric comorbidity in patients with epilepsy is:
    a. Depression
    b. Anxiety
    c. ADHD
    d. ADD

Appendix H

Intractable Epilepsy

Posttest

1. The prognosis of intractable epilepsy may be the most (when appropriate) improved by:
    e. Ketogenic Diet
    f. Epilepsy Surgery
    g. Anti-seizure medications (ASMs)
    h. Drug Trials

2. Patients with drug resistant epilepsy have a low likelihood of seizure freedom with additional medications.
    i. True
    j. False
3. ____% of people with epilepsy will be well controlled with the use of AEDs.
    a. 50%
    b. 20%
    c. 40%
    d. 70%

4. All people with epilepsy have abnormal interictal (in between seizures) EEGs.
    a. True
    b. False

5. Predictors for intractability among children with epilepsy include: (select all that apply)
    a. High initial seizure frequency
    b. Developmental Regression
    c. Intellectual disability
    d. Genetic Epilepsy Syndrome

6. Epilepsy can potentially be **cured** by which of the following interventions?
    a. Anti-seizure medications (ASMs)
    b. CBD oil
    c. Ketogenic diet
    d. Epilepsy surgery

7. The International League Against Epilepsy (ILAE) **defines drug resistant** or **intractable epilepsy** as a failure of _____.
    a. 3 ASMs used for treating generalized epilepsy
    b. 2 or more tolerated and appropriately chosen AEDs
    c. Any ASM used as monotherapy
    d. 4 ASMs, only if seizures have not decreased in frequency.

8. Patients with these types of seizures are at a higher risk for Sudden Unexpected Death in Epilepsy (SUDEP). Select all that apply.
    a. Nocturnal seizures
    b. Absence Epilepsy
    c. Myoclonic Epilepsy
    d. Generalized Tonic Clonic Seizures

9. Please answer both parts of this question.

    a. The International League Against Epilepsy defines Epilepsy as:
    At least ___ unprovoked seizures occurring greater than 24 hours apart;
        e. 2
        f. 3
        g. 4
        h. 5

    b. Or ____ unprovoked (or reflex) seizure and a probability of further seizures similar to the general recurrence risk (at least 60%) after two unprovoked seizures, occurring over the next 10 years.
        a. 1
        b. 3
        c. 2
        d. 4

10. The most common psychiatric comorbidity in patients with epilepsy is:
    a. Depression
    b. Anxiety
    c. ADHD
    d. ADD

11. What information from this presentation was most helpful?

12. What would you like to learn about in the future?

Appendix I

Is Epilepsy Surgery an Option? Intractable Epilepsy Evaluation

Please indicate your rating of the presentation in the categories below by circling the appropriate number, using a scale of 1 (strongly disagree) through 5 (strongly agree).

This presentation met the stated objectives of:

Identifying the importance of seizure capture.
1 2 3 4 5
Identifying the tests included in an Intractable Epilepsy Evaluation (Phase I)
1 2 3 4 5
Identifying the risks versus the benefits of phase I epilepsy surgery evaluations
1 2 3 4 5
The role of the bedside nurse in caring for patients admitted for epilepsy surgery evaluations
1 2 3 4 5

The Speaker

Was knowledgeable in content areas
1 2 3 4 5
Presented content consistent with objectives
1 2 3 4 5
Clarified content in response to questions
1 2 3 4 5

Teaching Methods

Visual aids, handouts, and presentation clarified content
1 2 3 4 5
Teaching methods were appropriate for subject matter
1 2 3 4 5

Content

Content was appropriate for the intended audience
1 2 3 4 5
Content was consistent with stated objectives
1 2 3 4 5
I feel more confident in the care I provide to my patients after attending this presentation.
1 2 3 4 5
I learned something new regarding this patient population from this presentation.
1 2 3 4 5

Additional Comments:

Appendix J

Epilepsy Surgery Evaluation (Phase I): Is Epilepsy Surgery an Option?

Interested in participating in a study on H10A?

Learn more about Epilepsy Surgery Evaluations

Earn 1 CEU

Light refreshments will be provided

WHO: Shivani Bhatnagar

WHAT: Educational Presentation on Epilepsy Surgery Evaluations

WHEN: Plenty of opportunities to attend on Dayshift and Nightshift!

WHERE: H10A Conference Room

WHY: Earn CEUs! Help evaluate the impact of unit-based educational interventions and learn something new about epilepsy!

DAYSHIFT PRESENTATIONS

Monday November 11th 2pm

Tuesday November 12th 2pm

Monday November 25th 2pm

Tuesday November 26th 2pm

NIGHTSHIFT PRESENTATIONS

Monday November 11th 2am

Tuesday November 12th 2am

Monday November 25th2am

Tuesday November 26th 2am

Appendix K

Intractable Epilepsy Evaluation (Phase I)

Pretest

1. Patients who are admitted for an Intractable epilepsy evaluation (Phase I) are agreeing to undergo epilepsy surgery.
    a. True
    b. False

2. An ictal (during a seizure) SPECT scan:
    a. Will show hypometabolism (decreased consumption) of glucose in areas of abnormal tissue/seizure foci.
    b. Will show hypermetabolism (increased consumption) of glucose in normal, healthy brain cells.
    c. Will show increased perfusion (blood flow) to the area of seizure onset.
    d. Will show decreased perfusion (blood flow) to abnormal areas/seizure foci

3. At NCH, for patients who are weaned off of AEDs, rescue medication (IN Versed) should be ordered to be given at ____ minutes for any seizure, followed by a 2nd dose ____ minutes after the first if seizure continues.
    a. 5; 5
    b. 2; 10
    c. 5; 10
    d. 2; 5

4. Surgical interventions for epilepsy require a craniotomy.
    a. True
    b. False

5. For an ictal (during a seizure) SPECT scan to be the most accurate, the isotope must be injected no later than ____ seconds after seizure onset and the scan can be acquired up to ____ hours after the injection.
    a. 20; 8
    b. 30; 6
    c. 10; 6
    d. 15; 8

6. If a patient is actively seizing on H10A, to ensure appropriate seizure capture (after addressing patient safety) the bedside nurse(s) should (select all that apply):
    a. Make sure the patient is covered
    b. Make sure the patient is in clear view of the camera
    c. Obtain rescue medication
    d. Ask family member to leave the room to allow room for providers
    e. Time duration of the seizure

7. The following seizure provocation methods may be utilized during an epilepsy surgery evaluation (select all that apply):
    a. Sleep deprivation
    b. Blood draws
    c. Medication Wean
    d. Hyperventilation
    e. Photic Stimulation
    f. Walking in the hallways
    g. Exercising/Activities in the patient room

8. Neuropsychological testing is utilized to:
    a. Help families understand psychiatric comorbidities
    b. To determine the presence of verbal/non-verbal learning and memory deficits
    c. To determine the likelihood of seizure remission after surgery
    d. To evaluate how the patient will tolerate epilepsy surgery

9. An FDG-PET scan:
    a. Will show hypometabolism (decreased consumption) of glucose in areas of abnormal tissue/seizure foci.
    b. Will show increased perfusion (blood flow) to area of seizure onset.
    c. Will show hypermetabolism (increased consumption) of glucose in normal, healthy brain cells.
    d. Will show decreased perfusion (blood flow) to the area of seizure onset.

10. At NCH which of the following is true for patients scheduled for a sedated test: The patient can have solid foods up to _____ hours before a scheduled test, clear liquids up to _____ before scheduled test and PO medications _____.
    a. 12; 4; should be given before testing with a small amount of water.
    b. 8; 6; should be held before testing.
    c. 8; 4; should be given with small amount of water.
    d. 8; 2; should be given with a small amount of water.

Appendix L

Intractable Epilepsy Evaluation (Phase I)

Post-test

1. Patients who are admitted for an Intractable epilepsy evaluation (Phase I) are agreeing to undergo epilepsy surgery.
   a. True
   b. False

2. An ictal (during a seizure) SPECT scan:
   a. Will show hypometabolism (decreased consumption) of glucose in areas of abnormal tissue/seizure foci.
   b. Will show hypermetabolism (increased consumption) of glucose in normal, healthy brain cells.
   c. Will show increased perfusion (blood flow) to the area of seizure onset.
   d. Will show decreased perfusion (blood flow) to abnormal areas/seizure foci

3. At NCH, for patients who are weaned off of AEDs, rescue medication (IN Versed) should be ordered to be given at ____ minutes for any seizure, followed by a 2nd dose ____ minutes after the first if seizure continues.
   a. 5; 5
   b. 2; 10
   c. 5; 10
   d. 2; 5

4. Surgical interventions for epilepsy require a craniotomy.
   a. True
   b. False

5. For an ictal (during a seizure) SPECT scan to be the most accurate, the isotope must be injected no later than ____ seconds after seizure onset and the scan can be acquired up to ____ hours after the injection.
   a. 20; 8
   b. 30; 6
   c. 10; 6
   d. 15; 8

6. If a patient is actively seizing on H10A, to ensure appropriate seizure capture (after addressing patient safety) the bedside nurse(s) should (select all that apply):
   a. Make sure the patient is covered
   b. Make sure the patient is in clear view of the camera
   c. Obtain rescue medication
   d. Ask family member to leave the room to allow room for providers
   e. Time duration of the seizure

6. The following seizure provocation methods may be utilized during an epilepsy surgery evaluation (select all that apply):

a. Sleep deprivation
b. Blood draws
c. Medication Wean
d. Hyperventilation
e. Photic Stimulation
f. Walking in the hallways
g. Exercising/Activities in the patient room

7. Neuropsychological testing is utilized to:

a. Help families understand psychiatric comorbidities
b. To determine the presence of verbal/non-verbal learning and memory deficits
c. To determine the likelihood of seizure remission after surgery
d. To evaluate how the patient will tolerate epilepsy surgery

8. An FDG-PET scan:

a. Will show hypometabolism (decreased consumption) of glucose in areas of abnormal tissue/seizure foci.
b. Will show increased perfusion (blood flow) to area of seizure onset.
c. Will show hypermetabolism (increased consumption) of glucose in normal, healthy brain cells.
d. Will show decreased perfusion (blood flow) to the area of seizure onset.

9. At NCH which of the following is true for patients scheduled for a sedated test:

The patient can have solid foods up to _____ hours before a scheduled test, clear liquids up to _____ before scheduled test and PO medications _____.

a. 12; 4; should be given before testing with a small amount of water.
b. 8; 6; should be held before testing.
c. 8; 4; should be given with small amount of water.
d. 8; 2; should be given with a small amount of water.

10. What information from this presentation was most helpful?

11. What would you like to learn about in the future?

Appendix M

Is Epilepsy Surgery an Option? Intractable Epilepsy Evaluation

Please indicate your rating of the presentation in the categories below by circling the appropriate number, using a scale of 1 (strongly disagree) through 5 (strongly agree).

This presentation met the stated objectives of:

Identifying the importance of seizure capture.
1 2 3 4 5
Identifying the tests included in an Intractable Epilepsy Evaluation (Phase I)
1 2 3 4 5
Identifying the risks versus the benefits of phase I epilepsy surgery evaluations
1 2 3 4 5
The role of the bedside nurse in caring for patients admitted for epilepsy surgery evaluations
1 2 3 4 5

The Speaker

Was knowledgeable in content areas
1 2 3 4 5
Presented content consistent with objectives
1 2 3 4 5
Clarified content in response to questions
1 2 3 4 5

Teaching Methods

Visual aids, handouts, and presentation clarified content
1 2 3 4 5
Teaching methods were appropriate for subject matter
1 2 3 4 5

Content

Content was appropriate for the intended audience
1 2 3 4 5
Content was consistent with stated objectives
1 2 3 4 5
I feel more confident in the care I provide to my patients after attending this presentation.
1 2 3 4 5
I learned something new regarding this patient population from this presentation.
1 2 3 4 5

Additional Comments:

Appendix N

Intracranial Monitoring and Epilepsy Surgery

Interested in participating in a study on H10A?

Learn more about Epilepsy Surgery Evaluations

Earn 1 CEU

^Light refreshments will be provided^

WHO: Shivani Bhatnagar

WHAT: Intracranial Monitoring (Phase 2) and Epilepsy Surgery

WHEN: Plenty of opportunities to attend on Dayshift and Nightshift!

WHERE: H10A Conference Room

WHY: Earn CEUs! Help evaluate the impact of unit-based educational interventions and learn something new about epilepsy and epilepsy surgery!

HOW: Just show up! (dates on right) Be sure to fill out the questionnaires to get CEU credit!

DAYSHIFT PRESENTATIONS

Monday December 2nd 2pm

Thursday December 12th 2pm

Wednesday December 18th 2pm

Thursday December 19th 2pm

NIGHTSHIFT PRESENTATIONS

Monday December 2nd 2am

Thursday December 12th 2am

Wednesday December 18th 2am

Thursday December 19th 2am

Appendix O

Intracranial Monitoring and Epilepsy Surgery

Pretest

1. A phase I epilepsy surgery evaluation is able to identify the epileptogenic zone in ___% of surgical candidates.
    a. 20%
    b. 60%
    c. 70%
    d. 40%

2. The primary indication for cortical stimulation (delivery of small amounts of electric current to portions of the brain in patients with implanted grid or strip electrodes) is:
    a. To provoke seizures to be recorded on EEG
    b. Identification of the eloquent cortex (areas critical for sensory, motor or language function)
    c. Identification of focal versus generalized seizures
    d. Identification of subclinical seizures (seizures only seen on EEG)

3. Placement of stereotactic EEG for a Phase 2 evaluation require a patient to undergo a craniotomy.
    a. True
    b. False

4. The following surgical interventions are considered palliative interventions (select all that apply):
    a. Vagus Nerve Stimulator
    b. Corpus Callosotomy
    c. Focal Cortical Resection
    d. Responsive Neuro Stimulator

5. Patients who become seizure free from epilepsy surgery have:
    a. A risk of seizure recurrence in 5 years
    b. Improved quality of life
    c. Cognitive decline
    d. Have no risk of seizure recurrence

6. The most common and successful resective surgery performed is:
    a. Temporal Lobe
    b. Frontal Lobe
    c. Parietal Lobe

d. Occipital Lobe

7. Some patients are not candidates for resective epilepsy surgery due to (select all that apply):
    a. The location of the lesion
    b. Developmental delay
    c. risk of post-surgical deficits
    d. Comorbidities
    e. Current deficits
    f. Multifocal or generalized onset

8. The most common psychiatric comorbidity in patients with epilepsy is:
    a. Depression
    b. Anxiety
    c. ADHD
    d. ADD

9. Successful epilepsy surgery has shown to reduce common psychiatric comorbidities and eliminate the need for psychiatric medications in _____% of patients
    a. 25%
    b. 85%
    c. 45%
    d. 65%

10. A seizure occurring in the immediate post-operative period (30 days) after epilepsy surgery indicates that the surgical intervention was unsuccessful.
    a. True
    b. False

Appendix P

Intracranial Monitoring and Epilepsy Surgery

Posttest

1. A phase I epilepsy surgery evaluation is able to identify the epileptogenic zone in ___% of surgical candidates.
    a. 20%
    b. 60%
    c. 70%
    d. 40%

2. The primary indication for cortical stimulation (delivery of small amounts of electric current to portions of the brain in patients with implanted grid or strip electrodes) is:
    a. To provoke seizures to be recorded on EEG
    b. Identification of the eloquent cortex (areas critical for sensory, motor or language function)
    c. Identification of focal versus generalized seizures
    d. Identification of subclinical seizures (seizures only seen on EEG)

3. Placement of stereotactic EEG for a Phase 2 evaluation require a patient to undergo a craniotomy.
    a. True
    b. False

4. The following surgical interventions are considered palliative interventions (select all that apply):
    a. Vagus Nerve Stimulator
    b. Corpus Callosotomy
    c. Focal Cortical Resection
    d. Responsive Neuro Stimulator

5. Patients who become seizure free from epilepsy surgery have:
    a. A risk of seizure recurrence in 5 years
    b. Improved quality of life
    c. Cognitive decline
    d. Have no risk of seizure recurrence

6. The most common and successful resective surgery performed is:
    a. Temporal Lobe
    b. Frontal Lobe
    c. Parietal Lobe
    d. Occipital Lobe

7. Some patients are not candidates for resective epilepsy surgery due to (select all that apply):

a. The location of the lesion
b. Developmental delay
c. risk of post-surgical deficits
d. Comorbidities
e. Current deficits
f. Multifocal or generalized onset

8. The most common psychiatric comorbidity in patients with epilepsy is:

a. Depression
b. Anxiety
c. ADHD
d. ADD

9. Successful epilepsy surgery has shown to reduce common psychiatric comorbidities and eliminate the need for psychiatric medications in _____% of patients

a. 25%
b. 85%
c. 45%
d. 65%

10. A seizure occurring in the post-operative period (30 days) after epilepsy surgery indicates that the surgical intervention was unsuccessful.

a. True
b. False

11. What information from this presentation was most helpful?

12. What would you like to learn about in the future?

Appendix Q

Intracranial Monitoring – Epilepsy Surgery Presentation Evaluation

Please indicate your rating of the presentation in the categories below by circling the appropriate number, using a scale of 1 (strongly disagree) through 5 (strongly agree).

This presentation met the stated objectives of:

Identifying the rationale for intracranial monitoring
1 2 3 4 5
Identifying the importance of seizure capture scalp vs intracranial EEG
1 2 3 4 5
Identifying the risks versus the benefits of phase 2 intracranial monitoring
1 2 3 4 5
The role of the bedside nurse in caring for patients admitted for intracranial monitoring
1 2 3 4 5

The speaker:

Was knowledgeable in content areas
1 2 3 4 5
Presented content consistent with objectives
1 2 3 4 5
Clarified content in response to questions
1 2 3 4 5

Teaching Methods:

Visual aids, handouts, and presentation clarified content
1 2 3 4 5
Teaching methods were appropriate for subject matter
1 2 3 4 5

Content:

Content was appropriate for the intended audience
1 2 3 4 5
Content was consistent with stated objectives
1 2 3 4 5
I feel more confident in the care I provide to my patients after attending this presentation.
1 2 3 4 5
I learned something new regarding this patient population from this presentation.
1 2 3 4 5

Additional Comments: