

EMERGENCY CARE EDUCATION FOR ADVANCED PRACTICE PROVIDERS IN  
RURAL CRITICAL ACCESS HOSPITALS

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**Title**

Emergency Care Education for Advanced Practice Providers in  
Rural Critical Access Hospitals

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The Supervisory Committee certifies that this *disquisition* complies with North Dakota  
State University's regulations and meets the accepted standards for the degree of

**DOCTOR OF NURSING PRACTICE**

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## **ABSTRACT**

Providing high quality and safe emergency care to patients in rural communities has become a complex and challenging problem. In the face of workforce shortages in emergency medicine, advanced practice providers (APPs) including nurse practitioners (NPs) and physician assistants (PAs) are being utilized to provide emergency care in rural hospitals. Authorities have recommended that APPs have specific experience or specialty training in emergency care (American College of Emergency Physicians [ACEP] Emergency Medicine Practice Committee, 2012). Despite these recommendations, there are few programs in the United States to formally educate APPs to the emergency care setting. This practice improvement project (PIP) identified current methods and gaps in education for APPs new to rural emergency care.

A needs assessment was conducted in critical access hospital (CAH) emergency departments in central Minnesota. APPs were asked about previous experiences, current methods of emergency care education, and to prioritize educational needs. The findings revealed that APPs without previous advanced practice emergency care experience are being employed in rural CAH emergency care settings. Length of orientation varied from less than a week up to three months. Priority education needs identified by APPs in rural emergency care included trauma, cardiopulmonary disorders, fracture management, sepsis, and neurological disorders.

Based on needs assessment results, a self-directed adult and pediatric trauma module was developed as one component of a comprehensive emergency care curriculum. During implementation and evaluation of the module, APPs and stakeholders from one rural CAH offered unanimous positive feedback that the adult and pediatric trauma would be helpful for an APP beginning practice in a rural emergency care setting.

The PIP provided a glimpse into the educational backgrounds and experiences that APPs bring to the rural emergency care role. A wealth of high quality, online, and free material was compiled during the creation of a self-directed learning module for APPs in rural emergency care settings. Continued development of self-directed learning modules as part of the emergency care curriculum is recommended. Other areas that should be explored include providing learning opportunities within a larger volume emergency room, simulation, and periodic workshops or conferences.

## **ACKNOWLEDGEMENTS**

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## **DEDICATION**

This dissertation is dedicated to nurses who strive for excellence in patient care and quest for lifelong learning.

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## CHAPTER ONE. INTRODUCTION

### Background

Providing high-quality and safe emergency care to patients in rural communities has become a complex and challenging problem. In the United States, nearly 20% of the population resides in rural areas (United States Census Bureau, 2010). Unfortunately, only 10% of physicians in the United States practice in rural settings (House Committees on Ways and Means, Energy and Commerce, and Education and Labor, 2010). Other problems for rural America include a growing elderly population, declining reimbursement, unpredictable patient volumes, lack of specialty services, outdated equipment, and a health care workforce nearing retirement (American Hospital Association, 2011). Further, it is anticipated that the Affordable Health Care Act will impact all aspects of health care as millions of uninsured Americans will have increased access to affordable, quality health care coverage (Hoyt & Proehl, 2012). Collectively, these issues can influence the safety and quality of health care in rural America.

In recognition of the problems confronting rural hospitals, Congress enacted the CAH program in 1997 to preserve access to health care for patients living in rural communities (Balanced Budget Act, 1997). Hospitals that convert to CAH designation receive special reimbursement rates based on costs for inpatient and outpatient services. To maintain the CAH designation, a rural hospital must be a not-for-profit hospital, located in a geographically isolated location, provide 24-hour emergency services, and meet certain criteria for inpatient acute care beds and length of stay.

As an approach to the problems facing rural America, health care organizations and hospitals are exploring and utilizing new models for providing rural emergency care. A predominant theme in the literature involved increased utilization of APPs such as NPs and PAs.

Inpatient services, including emergency care, are increasingly being provided by non-physician providers such as NPs and PAs (Minnesota Department of Health, 2011). In 2009, representatives of leading emergency medicine organizations met for the Future of Emergency Medicine Summit (Schneider et al., 2010). Attendees agreed that physician supply shortages will continue to contribute to a situation where providers, including NPs, PAs, and physicians outside of emergency medicine, will be a necessary part of the workforce. The American Hospital Association (2011) stated, “many rural hospitals depend heavily on nurse practitioners and other midlevel health professionals to provide primary care” (p. 10). In a recent study of emergency departments in Washington and Oregon, Abbott, Schepp, Zierler, and Ward (2010) noted that 58% of hospitals used either NPs or PAs in the emergency department. A ten year national study sampling emergency departments from 1995 to 2004 found that physicians were still seeing the majority of patients; however, the percentage seen by PAs had more than doubled (Hooker, Cipher, Cawley, Herrmann, & Melson, 2008). Casey, Wholey, and Moscovice (2008) discovered that hospitals with lower emergency department volumes were more likely to utilize NPs and PAs with a physician on call. The Center for Disease Control and Prevention (2013) reported an increase in emergency department visits in which a patient was seen by NPs or PAs without a physician present from 7% in 2000 to 17% in 2010.

In 2012, the ACEP Emergency Medicine Practice Committee created an information paper as a resource to emergency physicians and hospitals on the use of NPs and PAs in emergency medicine. The committee recognized that APPs are being utilized to fulfill a need for emergency medicine providers in the face of significant workforce shortages in emergency medicine. While a policy statement by the ACEP Board of Directors (2013) has clearly stated that PAs and advanced practice registered nurses do not replace the medical care and expertise

provided by emergency physicians, they acknowledged that APPs serve a valuable purpose in meeting the needs of the population. The ACEP Board of Directors (2013) recommended that PAs and advanced practice registered nurses “have or acquire specific experience or specialty training in emergency care, and should receive continuing education in providing emergency care” (p. 1). Successful completion of education and certification as a PA or advanced practice registered nurse “does not guarantee competency in emergency care” (ACEP Emergency Medicine Practice Committee, 2012, p. 2). Additionally, this opinion was voiced in the consensus document from the Future of Emergency Medicine Summit in 2009:

One potential safeguard to help ensure an optimal level of patient care would be the establishment of guidelines or standards for basic procedural and cognitive skills for all emergency providers. Training and competency assessment programs could be established, ensuring a basic level of care for communities without access to emergency medicine residency-trained/board certified emergency physicians. (Schneider et al., 2010, p. 333)

Williams, Ehrlich, and Prescott (2001) advised that academic health centers develop regional training and educational programs to meet the needs of rural emergency practitioners including NPs and PAs.

Despite recommendations to establish educational programs for APPs, there are few educational programs in the United States that formally educate APPs to the emergency care setting. For NPs, there are currently only seven emergency care nurse practitioner programs available (Emergency Nurses Association [ENA], 2015). In 2002, a study by Cole and Ramirez found that the majority of NPs practicing in emergency care were family nurse practitioners (FNPs). While the study is over ten years old, a similar study is yet to be done. While some

FNP programs include a clinical experience in emergency medicine, the focus is primary care. In 2008, the ENA developed a list of competencies and skills for NPs beginning practice in an emergency care setting. The competencies could be achieved through completion of an academic course, continuing education, and on-the-job instruction. In 2013, the American Nurses Credentialing Center developed an Emergency Nurse Practitioner Certification through portfolio and peer review. The portfolio includes resume, professional development record, exemplar narratives, and evaluations. The certification is for those already practicing successfully in emergency care.

For PAs, the training is focused on primary care with a four to six week clinical rotation in emergency medicine (Bednar, Atwater, & Keough, 2007; Cawley & Hooker, 2013). Additionally, postgraduate programs for emergency care have been developed (ACEP Emergency Medicine Practice Committee, 2013; Salyer, 2008). Currently, there are 26 postgraduate programs for PAs in emergency medicine listed on the Society of Emergency Medicine Physician Assistants (SEMPA) website (2013a). In the armed services, PAs will typically receive specialty training in emergency care (Salyer, 2002). In the air force, one-year fellowships are offered in emergency care. SEMPA has listed scope of practice examples for PAs in emergency medicine dependent upon state regulations, facility policy, expertise of the PA, and determination of the supervising physician (2013b). PAs with advanced knowledge and experience in emergency care can earn a certificate of added qualification (CAQ) through the National Commission on Certification of Physician Assistants (n.d., Emergency medicine CAQ). The CAQ is for those PAs who have developed advanced knowledge in emergency medicine. Ways to develop qualifications include ongoing emergency medicine training and continuing education, experience in emergency medicine, or graduating from an emergency medicine PA

residency (SEMPA, 2013b). The CAQ is not an entry level certificate. With increasing use of APPs in rural emergency care settings and few formalized educational programs in emergency care, it is important to identify what type of education APPs are receiving in order to provide safe, high-quality emergency care.

### **Problem Statement**

APPs may not be adequately prepared to practice safe and competent emergency care in a rural setting.

### **Significance of Project**

A comprehensive and critical evaluation of the literature demonstrated the need for emergency care education for APPs in rural emergency departments. There were few formalized educational programs and residency programs for APPs in emergency care. Despite the lack of educational programs, rural hospitals have utilized APPs to meet patient needs in an era of provider shortages.

### **Purpose**

The purposes of the PIP were to identify current methods and gaps in education for APPs new to rural emergency care and to utilize the information to create a self-directed learning module as one component of a comprehensive educational curriculum for APPs beginning practice in rural emergency care settings.

### **Project Objectives**

The primary objectives of the project were to:

- assess previous experiences of APPs prior to beginning practice in emergency care;
- identify current methods of APP education or training to emergency care;

- summarize and prioritize recommendations for education and potential areas for improvement from APPs practicing in emergency care; and
- create, implement, and evaluate a self-directed learning module as one component of a comprehensive educational curriculum for APPs beginning practice in rural emergency care settings.

## **CHAPTER TWO. LITERATURE REVIEW AND THEORETICAL FRAMEWORK**

### **Overview**

Surprisingly little information can be found about the educational preparation of APPs beginning practice in rural emergency care settings. Further, because certification in emergency care is not a mandatory requirement, ascertaining exact numbers of APPs who practice in emergency care is very difficult. The few articles that exist clearly identify a need for developing specialized education and training for APPs in emergency care.

ACEP has strongly recommended that advanced practice registered nurses and PAs have specific experience or specialty training in emergency care (ACEP Board of Directors, 2013; ACEP Emergency Medicine Practice Committee, 2012). Other than ACEP, perhaps the strongest recommendation in the literature for specialized training for NPs in emergency care came from Ramirez, Tart, and Malecha (2006). Their research examined treatment competencies for NPs in emergency care. A total of 582 NPs were surveyed on entry-level competencies in procedures that a practitioner in the emergency care setting should be expected to perform. There were 42 certified emergency nurse practitioners (ENPs) included in the study. Ramirez, Tart, and Malecha (2006) found that family and acute care NPs did not have entry-level competence to perform many invasive emergency care procedures such as intubation, arthrocentesis, lumbar puncture, and needle thoracotomy. The researchers stressed, “Just family training or just acute care training is not a strong enough base for a competent NP in the ED” (Ramirez, Tart, & Malecha, 2006, p. 357). They further stated, “the essence of emergency care is being prepared for any possible presentation” (p. 357). Three educational options for emergency care were given including (1) on-the-job training for the specialty of emergency care, (2), a post-masters educational program specialized in emergency care, or (3) a family or acute

care NP program incorporating emergency competencies above and beyond the baseline education focus.

In a 2006 United Kingdom (UK) study, Griffin and Melby surveyed emergency nurses, general practitioners, and senior house officers in the emergency department regarding use of NPs. Griffin and Melby (2006) found that 91% of respondents thought there should be a standardized course for practicing in emergency medicine. In general, the NP role in the UK differs from the US in regards to marked variability in training, role definition, responsibilities, and a lack of formal recognition (Morgan, 2010). Further, the UK has no formal preparation, formal qualifications, or continuing professional development for NPs in emergency care. The findings by Griffin and Melby (2006) reinforced the importance of educating APPs specifically to emergency medicine.

“Baptism by fire!” was how two NPs described their orientation process experience to trauma care in a small study by McKay in 2006. In conducting the literature review, the author was not able to find any articles about the orientation process for NPs providing trauma care. McKay (2006) found that certifications in Advanced Trauma Life Support and Trauma Nursing Core Courses were part of the orientation process in half of the respondents. The length of orientation was variable from 2 to 90 days. No respondents had a formal checklist. There were concerns with the wide variability in orientation potential contributing to a liability risk. McKay (2006) strongly recommended a formal orientation program to trauma care.

A qualitative study by Henry and Hooker (2007) utilized interviews to determine factors of retention for PAs in remote locations. Henry and Hooker (2007) found that, in order to increase retention rates, PAs would benefit from additional training, particularly in emergency medicine. The sample was small using interviews with eight PAs.

One study was specific to CAHs in one Midwestern state (Barneson & Morris, 2011). The authors noted that 40.5% of the 37 CAHs utilized NPs. The 19 NPs surveyed in the same study identified topics that would have been useful in their education which included management of chest pain, heart failure, pneumonia, and diabetes. Barneson and Morris (2011) recommended that NPs receive education and training to manage health care needs in rural hospitals.

Wilbeck (2013) cautioned medical directors to hire only NPs who are adequately prepared, both with education and certification credentials, for ENP practice. Her specific recommendations were to create more ENP specific programs.

With the increasing use APPs in rural emergency care, it was important to identify current methods of education and training to this setting. Few specific orientation programs were mentioned in the literature. Other educational themes identified included building on previous experiences, preparation in formal educational programs, emergency certifications, on-the-job training, regionalized models of care, and residency programs.

## **Emergency Care Education**

### **Orientation programs**

There was a paucity in the literature regarding actual orientation programs for APPs in emergency care. No orientation programs for PAs were found in the literature. A few studies relating to NP orientation were found. One hospital in the UK implemented a “training package” when NPs were introduced to the hospital in 1992 (Bache, 2001). The orientation consisted of lecture days on a variety of topics with a concluding post-test. The new NP would attend the teaching sessions regardless of experience. Topics included anatomy and physiology, wound care, suturing, and fracture care. They also incorporated an annual update. Bache (2001)

identified a wide variation in experience and training in the UK literature going back to the 1990's.

In 2010 Yeager published a complete orientation program for NPs for a trauma service. The site for the program was a tertiary hospital inpatient setting with availability of specialists and residents. While parts of the program could be adapted to an emergency care setting, many aspects would not apply to sole APP coverage in a rural setting (Yeager, 2010). A recent article from Canada recommended a 12-week minimum orientation period for a NP in an urban emergency department (Dimeo, 2012). To achieve competency, the new NP would begin with a defined subset of patients. The content included in the orientation was not mentioned. The NP was not a sole provider in the urban emergency care setting, but rather providing care in peak hours of high-volume days (Dimeo, 2012).

There were two small pilot studies examining competence levels in NPs in emergency care prior to and after an educational program. The pilot studies were not actually orientation programs but included intensive educational sessions in areas of emergency care. Mason, Fletcher, McCormick, Perrin, and Rigby (2005) implemented a small pilot study of 17 NPs in the UK to identify competence levels of NPs in emergency care prior to and after an educational program. The researchers found significantly improved performance between assessment periods after an educational program which included two study days, a series of weekly 30 minute NP peer teaching sessions, and one-to-one teaching sessions with senior emergency department staff including specialist physicians and nurse consultants. The assessment included written tests and clinical skill stations. The NPs had highlighted areas of need through the use of an Objective Structured Clinical Examination (OSCE) assessment prior to program development (Mason et al., 2005).

Another pilot study by Chang et al. (1999) was undertaken in Australia to investigate whether NPs were able to provide blunt limb trauma and open wound care in rural and isolated settings. The NPs were experienced emergency nurses. An educational program was administered from experienced medical staff, nurses, and academic faculty from a university. The program included intensive series of lectures coupled with supervised practice for four months in the selected competencies. Outcomes were compared with resident medical officers. There were no differences between the NPs and resident medical officers when comparing clinical outcomes, client satisfaction, and perceived self-evaluations of competence levels. Excluded were children under the age of 10, unstable patients with vital sign alterations, multiple trauma, high mechanism of injury, clients with concurrent health problems, and clients requiring resuscitation. There are limitations in applying the study to NPs practicing in the United States because the role differs from Australia. The study by Chang et al. (1999) represented an early exploratory pilot of the feasibility for nurses to provide emergency care in rural Australia. The first NP in Australia was appointed in 2001 to practice in a remote area that did not have a physician (Australian Nursing Federation, 2012). While several years old, the study is helpful in demonstrating the importance of emergency care education in gaining competence in emergency care.

### **Previous experience**

There has been a focus on previous work experiences that may prepare an APP to practice successfully in emergency care. Cole and Ramirez (2000) found that 73.6% of 72 NPs in emergency care had worked in the emergency department prior to becoming a NP. Of the 72 NPs, 65.3% were certified FNPs. Cole and Ramirez (2002) surveyed another group of 113 NPs in a predominantly urban or suburban setting. All but two of the 81 NPs were FNPs. The

average NP had less than five years of experience in the role. Overall, the NPs had 13.77 years of experience as a registered nurse (RN). Griffin and Melby's 2006 UK study mentioned earlier noted that 79% of respondents felt that the NP should have at least five years of experience in emergency care. Candidates with emergency care experience have transferable skills for the NP role and have better "buy-in" from staff nurses and physicians (Dimeo, 2012). Ramirez and Cole (2004) recommend drawing from NPs with extensive experience as an emergency nurse. While building upon previous RN experience sounds ideal, Wilbeck (2013) cautioned "prior nursing experience, while valuable, is not equivalent to advanced practice nursing education" (p. 29).

Similarly, PAs working in emergency medicine have been more likely to have previous experience as an emergency medical technician (EMT) or paramedic (Warner, Booth Lord, Zayas, Ruback, & Chandler, 2004). A study by Warner et al. (2004) surveyed a cohort of 283 PA graduates from four master's degree programs. PAs with at least six months of experience as an EMT or paramedic were more likely to be initially employed in emergency medicine.

### **Program education**

There are few programs that offer emergency care specific training for NPs or PAs (Schneider et al., 2010). For NPs, there are currently only eight ENP programs available (American Academy of Emergency Nurse Practitioners [AAENP], 2015, ENP program info). In 2007, there were five postgraduate programs for PAs in emergency medicine (Jones, 2007). Today, that number has increased to 26 (SEMPA, 2013a). There is one doctoral program for PAs in emergency medicine offered through a joint venture between the Army and Baylor University in Texas (Baylor University, n.d.; Cornell & Schaefer, 2008; Jones, 2007). Obviously, the present and future shortages in rural emergency care will far exceed the number of graduates from educational programs.

A review of the literature suggests that graduating FNPs are at least partly prepared by their respective programs to perform some of the competencies outlined by the ENA in 2008. In a 2003 study of 178 FNP program directors, ten procedures were found to be taught by more than 50% of the programs (Cole & Ramirez, 2003). Six of the ten procedures are on the emergency care competency list including suturing, interpreting 12-lead electrocardiogram, fluorescein staining of eyes, local infiltration of anesthetics, splinting of extremities, and interpretation of arterial blood gases. Another large study of 562 NPs in 2006 found that only 10% felt very well prepared for practice after completing basic NP education (Hart & Macnee, 2007). Further, 51% perceived that they were only somewhat or minimally prepared (Hart & Macnee, 2007). Some of the areas for which they felt least prepared included coding and billing, microscopy, casting, electrocardiograph interpretation, simple office procedures, splinting, suturing, management of mental health disease, and radiograph interpretation. In the study, the respondents desired a focus in their education on clinical competencies and relevant clinical experiences. Many of the weakness areas identified by Hart and Macnee (2007) can be found on the ENA (2008) entry-level competency list. In follow up to the 2006 study by Hart and Macnee, Hart (2012) sampled 723 NPs in 49 of 50 states. Only 3.1% of respondents felt very well prepared after completion of the initial NP education for practice as a NP (Hart, 2012). Over 17% of NPs surveyed either disagreed or strongly disagreed with the statement of “I was prepared for entry level NP practice” (Hart, 2012). Further, during the first year of practice, 48.75% of respondents felt that they were practicing outside of their competence level. While results from Hart (2012) are a sneak preview with the final study pending publication, it is evident Hart’s findings have significant implications for graduate NPs who hope to practice in rural emergency care settings.

There were no studies found that correlated PA program experiences with being prepared for practice in emergency care. In their review of PA education, Bednar et al. (2007) concluded that PA education is modeled after physician training with anatomy, physiology, pathophysiology, general medicine, skills and procedures, and similar clinical hour requirements.

### **Emergency certifications**

A study by Casey et al. (2008) surveyed nursing managers from 408 hospitals across the nation with 100 or fewer beds. A variety of methods were used to staff these hospitals including contracted emergency physicians, family physicians and internists on the medical staff, NPs and PAs with physician on-call, or a combination of several methods. Hospitals with lower emergency department volumes were more likely to use NPs and PAs. Training in Advanced Cardiac Life Support (ACLS) was the most common among all providers. Considerably fewer providers attended Pediatric Advanced Life Support (PALS), Advanced Trauma Life Support (ATLS), and team-based courses of Rural Trauma Team Development Course or Comprehensive Advanced Life Support (CALS). The authors concluded that staff in rural emergency departments would benefit from additional continuing education opportunities in trauma care, pediatric emergency care, and working effectively in teams. The Casey et al. (2008) study only focused on specialized certification programs and did not include other types of orientation or education in emergency care.

In a previously mentioned study of 19 NPs in one Midwestern state, 57% were certified in ATLS, 100% were certified in ACLS, and 42.9% were certified in PALS (Barneson & Morris, 2011). The majority of the NPs sampled practiced in a CAH. Ramirez and Cole (2004) strongly encourage NPs in emergency care to have certifications in ACLS, PALS, ATLS, and Certified Emergency Nurse Certification.

One certification that has been designed specifically for health care providers in rural emergency settings is the CALS program (CALS Rural Emergency Medical Education, 2012). CALS was developed in Minnesota in 1996 to provide knowledge, hands-on skills training, and a universal team approach to care for rural patients (CALS Rural Emergency Medical Education, 2011). To date, the course has expanded to include eight states, two Canadian provinces, and other countries including Haiti and Kenya (CALS Rural Emergency Medical Education, 2012).

### **On-the-job training**

Several studies have demonstrated that the primary learning method for APPs in nontraditional settings, such as emergency care, is on-the-job training. A recent study by Keough, Stevenson, Martinovich, Young, and Tanabe (2011) examined NP certification and practice sites. Of the 1,216 NPs surveyed, 5% of FNPs practiced in nontraditional settings such as intensive care units or emergency departments. An expert panel was used to classify the nontraditional settings. The researchers found that of the 5% in nontraditional settings, 75% practiced in high acuity emergency departments. Differentiations between what constituted low versus high acuity emergency departments were not given in the article. Keough et al. (2011) noted that the educational preparation for working in nontraditional settings was on-the-job training and formal continuing education programs. Some of the training areas were caring for critically ill patients, trauma resuscitation, suturing superficial lacerations, 12 lead-electrocardiogram interpretation, radiograph interpretation, and central line insertion. Regardless of setting, more than 50% of NPs reported that on-the-job physician mentoring was an important source of continuing education. The implications of the study are significant in identifying and addressing gaps in formal education of NPs with continuing education programs and on-the-job training for emergency care.

Campo, McNulty, Sabatini, and Fitzpatrick (2008) highlighted the procedures and education being used by NPs in the emergency care setting and levels of confidence and independence. Campo et al. found that 71% of 423 NPs sampled were RNs in the emergency department prior to becoming a NP. NPs performed 71 procedures in the emergency care setting with the majority being performed independently with somewhat to extreme confidence. The researchers stated, “on-the-job training was the means of obtaining the majority of education to perform the procedures” (Campo et al., 2008, p. 165). Not surprisingly, the more frequently the procedure was performed, the more independent and confident the NP felt. The findings were not unlike a study by Cole and Ramirez (2000) who found that the majority of NPs learned to perform emergency care activities and procedures through on-the-job training and continuing education courses.

Ramirez and Cole (2004) recommended that clinical experience for a new emergency provider begin in a fast track setting in which a person can learn to manage patients with non-urgent conditions and time management skills. The stepwise learning process recommended by Ramirez and Cole (2004) would transition to a moderate flow of patients with urgent presentations ultimately culminating in emergent medical problems and trauma.

### **Regional models for emergency care**

Many hospitals have utilized a network of collaboration between APPs and emergency physicians within larger academic medical centers to provide rural emergency care (Beuning, 2011; Henderson, 2006; Martinez & Carr, 2013; Schneider et al., 2010). Smaller rural hospitals can benefit from the expertise of emergency medicine residency-trained, board-certified physicians through telemedicine, regional educational programs for APPs, distance learning technologies, or periodical rotation through the rural sites (Handel & Hedges, 2007; Schneider at

al., 2010; Williams, Ehrlich, & Prescott, 2001). In a survey of 1,555 professionals across the nation in 2006, rural and small rural providers of all professions indicated training constraints for increasing skills and abilities, keeping up-to-date, and the time to get additional training (Brems, Johnson, Warner, & Weiss Roberts, 2006). Brems et al. (2006) recommended bringing training closer to home through flexible delivery methods. Collaboration with distant specialists, telemedicine, partnerships, and having an adequate network of providers to fill rural needs in emergency care were recommendations to reduce barriers. Handel and Hedges (2007) urged the development of federally-funded pilot programs to modify the delivery of rural emergency care. One model advocated by Handel and Hedges (2007) utilized physicians at an academic medical center to oversee APPs in rural emergency departments. The model would couple recruitment and procedural training of APPs with technology to promote early recognition of critical illness and facilitate transfers to tertiary centers.

### **Residency programs for APPs**

A fairly new concept in emergency care education is that of residency programs. The first NP residency program began in 2007 in Connecticut for newly graduated FNPs (Boyer, 2012). For PAs, the first residency began in 1971 in general surgery (Anick, Carlson, & Knott, 2003). Today, a multitude of residency programs exist across the nation for NPs and PAs in primary and specialty care areas. Residency programs accept NPs, PAs, or both. The AAENP website has listed seven emergency care postgraduate fellowship programs (2015, Fellowship programs). As mentioned previously, there are 26 postgraduate programs available for PAs in emergency medicine (SEMPA, 2013a). Programs such as Carilion Clinic in Virginia, Mayo Clinic in Minnesota, and St. Luke's University in Pennsylvania have programs which accept both NPs and PAs (Carilion Clinic, 2015; Mayo Foundation for Medical Education and

Research, 2015; St. Luke's University Health Network, 2012). The emergency care residencies are postgraduate programs with a focus on clinical experience, mentoring, didactic teaching, and skills training specific to the area of focus (Wolfgang, 2013). Residency programs typically last a 12 to 18-month period and some provide a salary to the APP resident.

APPs have become an important solution to the shortage of providers in rural emergency care. While there are some recommendations for educating APPs to emergency care, considerable gaps still exist.

### **Adult Learning Theory**

Newly hired APPs are adult learners. As such, they are no longer students relying on a passing course grade. The risk of losing a job or failing is not part of the adult learning process (Clapper, 2010). Adult learners are colleagues and partners in the educational process (Lambert, 2012). The goal for the new APP is to practice safely, confidently, and independently in a rural emergency care setting. The role of the educator is to facilitate learning experiences and supply the tools necessary for the APP to be successful (Knowles, Holton, & Swanson, 2011). Learning experiences must be relevant, meaningful, and fit into the social life context (Clapper, 2010).

### **Core principles**

There were several core principles of adult learning theory that influenced the implementation of the emergency care educational curriculum. Adult learning theory, first introduced by Malcolm Knowles in the 1970's, was developed to explain the multifaceted phenomenon of adult learning (Knowles et al., 2011). Core principles of adult learning represent a detailed assessment of adult learner needs. The first principle is the learner's need to know (Knowles et al., 2011). A major task of the facilitator is to help learners "become aware of the need to know" (Knowles et al., 2011, Chapter 4, Section "The Andragogical Model," para. 1). A

study by Eva, Cunnington, Reiter, Keane, and Norman (2004) found that recognizing and communicating one's own learning deficiencies is extremely difficult. While it is generally assumed that a new APP will inherently desire to learn the new position, relying purely on a self-assessment may not be accurate. Self-ratings are generally reliable but cannot be trusted as valid (Knowles et al., 2011). Sargent et al. (2011) noted that learner self-assessment is augmented by the level of preparation and engagement of supervisors and peers. Following the expressed needs of the adult learner may not be sufficient as adult learners may tend to stay within their comfort zone (Beckman & Birney, 2012). Adult learners need resources and strategies to assist in self-evaluating progress toward personal learning objectives and goals (Birney, Beckman, & Wood, 2012).

The second principle is the self-concept of the learner. Adult learners have a strong sense of personal responsibility for their own lives (Knowles et al., 2011). In planning an online educational program for adult learners, Schultz (2012) noted that adult learners valued ownership in course design and the evaluation process. Previous negative learning experiences can foster mistrust, insecurity, and withdrawal (Clapper, 2010). It is imperative the learning environment be positive, nonthreatening, flexible, and informal.

The third principle, the role of learner experiences, is highly discussed in the literature. Because adults have a wider range of individual differences, motivating factors, and experiences, a heavy emphasis of adult education should be on individualizing teaching and learning strategies (Knowles et al., 2011). When an educational experience fails to build on the learners previous history, material can be repeated which markedly diminishes learner effectiveness and efficiency (Goldman, 2009). Adult learners prefer to create their own "version" of a course (Cornelius, Gordon, & Ackland, 2011). The plan for the emergency care educational curriculum

was to offer the APP choices of learning experiences to instill a sense of ownership and personal responsibility.

Fourth, readiness to learn, is influenced by the immediate relevance of learning to the work or personal life (Knowles et al., 2011; Schultz, 2012). Meyer, Lees, Humphris, and Connell (2007) found that poor learning transfer occurred when critical care nurses perceived a lack of relevant course content. Training should be easily implemented into a job role and address the most present needs (Meyer et al., 2007). When negotiating educational experiences for new APPs, a vital component is matching experiences to the demands of the new position. A study of medical students revealed a strong link between learning activities which built on previous experiences and positive outcomes (McNeil, Hughes, Toohey, & Dowton, 2006).

The fifth core principle of adult learning is orientation to learning. Learning is most effective when applied to real-life situations (Knowles et al., 2011). Simulation and lab environments can enhance learning based on real-life situations (Clapper, 2010; Mahan & Stein, 2014). For the emergency care curriculum, the self-directed learning module will complement clinical experiences and simulation based on the self-identified needs of the new APP. As best described by Mahon and Stein (2014), adult learners do not want to listen to others tell them how important the information is, they want to live it.

Motivation is the final core principle. While external rewards such as praise and pay can motivate the adult learner, internal rewards are the most important (Knowles et al., 2011; Mahon & Stein, 2014). Some learners highly value the social nature of learning experiences (McNeil et al., 2006). Knowles et al. (2011) noted that the most potent motivators are increased job satisfaction, quality of life, and self-esteem.

The six core principles of adult learning theory represent a comprehensive assessment of adult learner needs. When assessing the needs of a newly hired APP for the emergency care curriculum, inclusion of the core principles of adult learning represents a vital first step.

### **Self-directed learning**

While not a new learning concept, self-directed learning has become a recommended educational method for nursing and medical professionals. Self-directed learning is an “approach to learning whereby the structure, planning, implementation, and evaluation of learning are initiated by the learner” (Institute of Medicine [IOM], 2009, p. 42). Self-directed learning is an inherent theme throughout adult learning theory (Knowles et al., 2011). In the 2009 report *Redesigning Continuing Education in the Health Professions*, the IOM advocated that continuing education be designed for health care providers incorporating areas of adult learning, experiential learning, self-directed learning, and critical reflection. Further, the IOM Report suggested utilizing technology including computer-based and internet-based learning modes to maximize learning for health care professionals. In 2010 the American Association of Colleges of Nursing (AACN), in joint collaboration with the Association of American Medical Colleges, recommended educational curricula that promotes self-directed learning and emphasizes information and communication technology to prepare learners throughout their careers.

Self-directed learning has been shown to be an effective method for enhancing knowledge and skill development in health care professionals (Cibulka, 2011; McCrystle, Murray, & Pinheiro, 2010; Murad, Coto-Yglesias, Varkey, Prokop, & Murad, 2010). When developing a learner-centered geriatrics curriculum utilizing adult learning theory for medical students and residents, McCrystle et al. (2010) discovered that medical students and residents

were able to prioritize learning needs and identify needs beyond the list offered by faculty. By allowing adult learners to focus on their own priority needs and use a variety of resources, McCrystle et al. (2010) were able to meet the needs of several levels of adult learners without increasing faculty resources or costs. Cibulka (2011) created a web-based course on research ethics for RNs in an ambulatory care settings. A clinical experience followed the research ethics course. Cibulka (2011) found the continuing education program to be highly effective for knowledge acquisition, satisfaction with learning activities, and increasing confidence in the RNs. Murad et al. (2010) conducted a comprehensive meta-analysis of twenty-five studies evaluating the effect of self-directed learning activities on the learning domains of knowledge, skills, and attitudes. The researchers compared the impact of self-directed learning activities to traditional didactic teaching methods. They concluded that self-directed learning activities in health professional education were associated with moderate improvement in the knowledge domain compared with traditional teaching methods. Self-directed learning was as effective in the skills and attitudes domains. Moreover, consistent with the core principles of adult learning, self-directed learning was more effective in advanced learners in their later years of education and when learners could choose their own learning resources (Murad et al., 2010).

### **Evaluating the adult learner**

There are a multitude of different ways to evaluate learning in an adult. In adult learning theory, the main purpose of evaluation is to improve teaching and learning, not to justify actions (Knowles et al., 2011). There were several themes of adult learning evaluation in the literature.

#### ***Reactive evaluation***

Reactive evaluation is obtaining data from the participants regarding likes, dislikes, positive, and negative feelings (Knowles et al., 2011). Reactive evaluation can utilize written

forms, interviews, or group discussions (Knowles et al., 2011). Unfortunately, liking the content, educator, or learning opportunity does not correlate with learning. Lambert (2012) called these types of evaluations “happy sheets” (p. 1). Obtaining numeric data through happy sheets will not capture meaningful data about the learning experience (Lambert, 2012). When reviewing articles about evaluation of adult learning, several researchers utilized the reactive evaluation approach (Landry, Markert, Kahn, Lazarus, & Krane, 2007; Olson, Stedman-Smith, & Fredrickson, 2005; Ruiz et al., 2012).

### ***Learning contracts***

A learning contract is advocated by Knowles et al. (2011) to plan learning experiences, formulate personal objectives, choose learning strategies, and evaluate accomplishments. The first step in developing a learning contract is to construct a model of competencies (Knowles et al., 2011). Different organizations have developed competencies based on the expectations for professional roles. An example is the competencies for NPs in emergency care outlined by the ENA (2008). Other steps of developing a learning contract are to:

- specify learning objectives in specific, meaningful terms;
- outline learning resources and strategies to assist in accomplishing objective;
- specify evidence that will be collected to demonstrate accomplishment;
- determine the criteria for which the objective will be judged;
- review contract with peers, supervisors, or other experts;
- carry out the contract; and
- evaluate learning, often with the assistance of a peer or supervisor (Knowles et al., 2011, Chapter 15).

An adult learning contract differs from those in higher-education in that it is driven by the learner. Learning contracts can be used to bridge the gap between current functioning and future possibilities (Chen, 2014). Learning contracts provide a mechanism for negotiating the external needs of an organization and the internal interests of the learner (Knowles et al., 2011).

### ***Critical incident questionnaire***

A critical incident questionnaire (CIQ) focuses on specific, significant events which impacted the learner (Brookfield, 1995; Glowacki-Dudka & Barnett, 2007). Developed by Brookfield in 1995, the CIQ is a short questionnaire designed to promote learner reflection and avert potentially poor learning experiences. The questionnaire asks the learner to reflect on moments of feeling engaged, puzzled, surprised, and distant (Brookfield, 1995). The CIQ has not been tested for validity or reliability (Glowacki-Dudka & Barnett, 2007).

### ***Educational Kanban***

The Educational Kanban (EK) is a personal log of what the learner has accomplished and what must be mastered in the future (Goldman, 2009). The EK is a continuous, self-appraisal tool that travels with the learner across educational experiences (Goldman, 2009). The EK is owned and accessed by the learner. Inherent in the EK is a collaboration between the learner and teacher; there are periodic meetings to review progress. As described by Goldman (2009), “The EK builds on principles of adult learning and cycles from self-assessment to goal setting to developing mastery, and ultimately returns to evaluation, and self-assessment” (p. 932). Re-diagnosis of learning needs is a fundamental concept of adult education (Knowles et al., 2011).

### ***Portfolios***

As a tool used on higher education, portfolios have been a successful method to evaluate adult learning (Candela, 2012; McMullan et al., 2003; McNeil et al., 2006). In nursing

education, portfolios can serve several purposes including highlighting achievements for future employers, personal reflection, and communicating learning to instructors for summative evaluation (Cooke, Walker, Creedy, & Henderson, 2009; Ryan, 2011). It was difficult to find articles describing the use of portfolios in adult learners who have already graduated from a formal educational program. As an evaluation tool, they are typically graded (McMullan et al., 2003; McNeil et al., 2006). For an adult learner, the portfolio may be beneficial to highlight personal and career aspirations, identify strengths and areas for improvement, and reflect on achieved competencies (Joyce, 2005).

Evaluation tools to capture adult learning are difficult to find. Tools that are typically utilized in formal education such as written tests and OSCEs are not discussed in adult learning articles. Knowles et al. (2011) noted that evaluation in adult learning theory is fraught with controversy and challenge. A multitude of variables and uncertainties can influence adult learning (Knowles et al., 2011). According to Clapper (2010), the focus of adult learning is “not on evaluation, but instead on assessment that improves practice” (p. e8). Written tests and generic quantitative evaluation forms may not capture information that adds value to the learning process (Lambert, 2012). There is a movement toward utilizing qualitative methods to identify what learners are thinking, feeling, and doing (Knowles et al., 2011).

## **CHAPTER THREE. PROJECT DESIGN**

### **Needs Assessment Implementation**

#### **Needs assessment instrument**

The first phase of the PIP was a needs assessment to enhance understanding of APP emergency care educational needs. The needs assessment instrument was created incorporating elements from previously developed questionnaire by Ann Marie Hart in 2004 (Hart & Macnee, 2007). Permission to adapt the questionnaire was obtained (see Appendix A). Hart's questionnaire evaluated perceived preparedness of NPs to practice after completing basic NP education. Areas that were utilized from the questionnaire included the educational program information, previous experiences, preparation to practice in specific clinical areas, and suggestions for improvement. Hart's questionnaire was initially reviewed by a panel of NP faculty at the University of Wyoming and two external expert advanced practice educator researchers for content and validity (Hart & Macnee, 2007). Early in the process of the needs assessment instrument adaptation, a table of competencies was created to evaluate similarities and differences between ENA competencies and SEMPA competencies (see Appendix B). CAQ qualifications for PAs were included in the competency table. The clinical areas from the Hart questionnaire were adapted to more clearly define emergency care competencies outlined by the ENA and SEMPA. Additional questions were added to include (a) details about the emergency care education provided when hired to the position; (b) certifications such as CALS, ACLS, and ATLS; (c) identifying and ranking the top five areas of need based on ENA and SEMPA competencies; and (d) preferred methods of learning. The final part of the needs assessment instrument included open-ended, write-in questions soliciting suggestions that would have improved preparedness to practice in the emergency care setting. See Appendix C for the final

needs assessment instrument. Qualtrics software was selected as the method for data collection. Qualtrics, an online survey program, was selected because it was readily and freely available to the researcher through the North Dakota State University system. Questions from the needs assessment instrument were inserted into the Qualtrics software and logic was added to avoid duplication of questions and to individualize questions for either a NP or PA respondent.

### **Data sources**

Ten CAHs were selected for the needs assessment based on location in central Minnesota and proximity to the researcher's primary workplace setting of St. Cloud Hospital. The Minnesota CAHs selected included:

- Albany Area Hospital and Medical Center, Albany;
- CentraCare Health, Long Prairie;
- CentraCare Health, Melrose;
- CentraCare Health, Monticello;
- CentraCare Health, Sauk Centre;
- Glacial Ridge Health System, Glenwood;
- Lakewood Health System, Staples;
- Meeker Memorial Hospital, Litchfield;
- Paynesville Area Health Care System, Paynesville; and
- St. Gabriel's Hospital, Little Falls.

One challenge noted early in the needs assessment process was identifying NPs or PAs who were employed in Critical Access Hospital emergency departments in Minnesota. Unfortunately, there are no reporting requirements, formal databases, or required certifications that would aid in the process of identifying NPs or PAs who work in Minnesota emergency care settings. Further,

in many rural locations, the role of the APP is multifaceted and may include clinic, nursing home, hospital, and emergency care. A decision was made to utilize emergency department directors in the selected CAHs to distribute the needs assessment instrument via email. Contact information regarding the emergency department directors was provided by the Director for Emergency and Ambulatory Services at St. Cloud Hospital, St. Cloud, Minnesota. Prior to any collection of data, Institutional Review Board approval was obtained from North Dakota State University (see Appendix D). Institutional Review Board approval was not required from CentraCare Health as the needs assessment did not involve interviewing or collecting information from patients or reviewing medical records (see Appendix E). Details regarding the project, confidentiality, anonymity, and participant rights were included in the email letter to the emergency department directors (see Appendix F) and on the introduction page of the Qualtrics needs assessment (see Appendix C). Completion of the survey was an indication of the APP's consent to participate in the needs assessment.

#### **Data collection procedures**

On July 1, 2014 an email letter was sent to nine emergency department directors of the selected CAHs (see Appendix F). For the CentraCare Health, Long Prairie site, email letters were sent directly to the APPs employed in the emergency department (see Appendix G). Information about the Long Prairie site was known because the researcher was employed within the CAH emergency department. An anonymous link to the Qualtrics needs assessment was included in the emails. Emergency department directors were asked to forward the email to any NP or PA who worked at least 12 hours a month in the emergency department. A request was also made to respond by email if the CAH did not utilize NPs or PAs in the emergency

department. A follow up reminder was sent on July 16, 2014. Data were collected through July 31, 2014. As part of the Qualtrics program, data results were easily categorized and interpreted.

### **Educational Curriculum for Emergency Care**

The second phase of the PIP was the creation and implementation of a self-directed learning module as one component of a comprehensive educational curriculum for APPs beginning practice in rural emergency care settings. A critical need to establish educational programs for APPs in emergency care was identified through the review of the literature. Utilizing the competencies defined by the ENA and SEMPA, an outline of the emergency care curriculum for APPs was developed (see Appendix H). The three primary categories of the emergency care educational curriculum included:

- emergent clinical condition categories such as cardiopulmonary, gastrointestinal, metabolic, musculoskeletal, trauma, anaphylaxis, and ingestion/overdose;
- emergency care considerations of patient satisfaction, Emergency Medical Treatment and Active Labor Act (EMTALA), core measures and quality metrics, availability of hospital resources, transitions in care, palliative care, emergency medical services overview, and culture care; and
- diagnostic and therapeutic procedures as outlined by Emergency Nurses Association Competencies for NPs in Emergency Care (2008) and Society of Emergency Medicine Physician Assistants (2013b).

Additionally, instructional planning worksheets for the curriculum were developed (see Appendix I). Learning activities and methods of competency assessment were planned utilizing the instructional planning worksheets.

The second phase of the PIP built on recommendations from the needs assessment to create a self-directed learning module. The second phase served the purposes of creation, implementation, and evaluation of the module. Another purpose was to disseminate results of the needs assessment and the self-directed learning module. As part of the second phase, the self-directed learning module was shared with stakeholders at CentraCare Long Prairie, Long Prairie, Minnesota. Prior to the implementation of the second phase, an amendment to the initial Institutional Review Board approval was obtained (see Appendix J). CentraCare Health, Long Prairie was selected for three reasons. First, the researcher was currently employed within the CentraCare Health, Long Prairie CAH emergency department. Because of a preexisting relationship, there was inherent collegial and personal interest in the project. Second, the nursing administrator verbalized that information gained from the module could improve the educational process for new APPs and serve the purpose of benefiting the organization. Third, there were two APPs within the organization who had joined the CAH emergency department within the previous year.

### **Congruence to organization’s mission, values, and strategic goals**

The mission of CentraCare Health is “to improve the health of every patient, every day” (CentraCare, 2013, About CentraCare Health, para. 3). Additionally, core values of the organization include:

- patient centered: serving patients above all;
- integrity: adhering to honest and ethical practices;
- collaboration: working jointly with others to improve health and health care;
- compassion: serving all who seek our care with kindness, dignity, and respect; and

- stewardship: ensuring responsible use of all resources to best serve our communities (CentraCare, 2013, About CentraCare Health, para. 5).

Improving care for patients in rural emergency settings while utilizing resources to serve rural communities is consistent with the core values and mission of CentraCare. Creation of an emergency care curriculum for new APPs practicing in rural sites will enhance patient care and safety. The objectives for the project are congruent with CentraCare Health's mission and values.

### **Data sources**

For the second phase of the PIP, an invitation to a one-hour presentation on the self-directed learning module was sent to stakeholders within CentraCare Health, Long Prairie. Stakeholders were identified as people within the organization who play an instrumental role in the success of a new APP beginning practice in a CAH emergency department. Those invited included APPs employed in the emergency department, physicians, emergency department nurses, hospital administrators, nursing leaders, nurse educators, pharmacists, and EMTs. Similar to the first phase, details regarding the project, confidentiality, anonymity, and participant rights were included in the letter to the stakeholders (see Appendix K). The informed consent letter was given to stakeholders who attended the presentation. Any verbal and/or written input shared during the presentation would represent consent to participate. Input would be categorized and grouped anonymously.

### **Evaluation form**

An evaluation form was created to solicit information about the self-directed learning module (see Appendix L). Information asked from the participants included (a) the most helpful aspect of the module, (b) the least helpful aspect of the module, (c) potential effectiveness for a

new APP, (d) ways to improve the module, (e) likelihood of use in the next two months, and (f) other suggestions or comments. The only personal information requested on the form was the role of the stakeholder and the number of years of practice.

### **Data collection procedures**

On January 28, 2015, a one-hour presentation on the self-directed learning module was given. Twenty-one stakeholders participated. The breakdown of participants was one NP, four PAs, a certified nurse midwife, one physician, a nurse administrator, a nurse educator, a medical resident, three EMTs, two pharmacists, and six emergency department nurses. Qualitative data were collected during the presentation by taking notes of verbal data and through completed written evaluation forms.

## **CHAPTER FOUR. EVALUATION**

The focus throughout the evaluation process was to collect data with the overall goal of developing and improving a self-directed learning module as one component of an emergency care curriculum for APPs in rural emergency care settings. Quantitative information gathered from the first phase of the project, the Qualtrics needs assessment, was utilized to evaluate the first three objectives of the project which were:

- assess previous experiences of APPs prior to beginning practice in emergency care;
- identify current methods of APP education or training to emergency care; and
- summarize and prioritize recommendations for education and potential areas for improvement from APPs practicing in emergency care.

Descriptive analyses, complemented by graphs, were used to summarize Qualtrics data. The data from the needs assessment were instrumental in (a) reinforcing the need demonstrated in the literature review, (b) identifying local patterns of APP education and training in emergency care, and (c) prioritizing the development of the self-directed learning modules.

### **Fourth Generation Evaluation**

The fourth objective of the PIP, the creation and implementation of a self-directed learning module, was evaluated through fourth generation evaluation. Guba and Lincoln (1989) have described fourth generation evaluation as an evaluation method that moves beyond measuring pure facts to negotiating meaning and understanding. A myriad of variables should be considered in the evaluation process including human, social, political, cultural, and contextual variables (Guba & Lincoln, 1989). Two main tenets outlined in the process of fourth generation evaluation were negotiation and responsive focusing. Negotiation has been defined as an interactive process through which people make sense of situations, explore complex

situations, and achieve mutual consensus (Guba & Lincoln, 1989; Koch, 2000). Responsive focusing solicits the input of stakeholders in order to determine what information to collect (Guba & Lincoln, 1989). In assessing adult learning, fourth generation evaluation has a major advantage for using qualitative methods to understand the strengths and weaknesses of a program (Sauter, Gillespie, & Knepp, 2012). Fourth generation evaluation has been recommended by Malcolm Knowles, the forerunner in adult learning theory, to capture adult learning (Knowles et al., 2011).

### **Methodology**

Guba and Lincoln (1989) have outlined four general phases of fourth generation evaluation. According to Guba and Lincoln (1989), the four phases may be repeated or overlap.

What follows are the four general phases:

1. Stakeholders are identified and solicited for any “claims, concerns, and issues” pertaining to the topic being evaluated (Guba & Lincoln, 1989, p. 42). Claims, concerns, and issues may include favorable assertions, unfavorable assertions, or areas where reasonable people might disagree (Koch, 1994). Importantly, any person involved in the evaluation process should be included. Stakeholder involvement is a critical element that distinguishes fourth generation evaluation from other qualitative evaluation methods (Mahara, 1998). Any person who can be affected directly or indirectly by the evaluation has an equal stake in the evaluation process (Guba & Lincoln, 1989). The stakeholders come to the evaluation with differing opinions on knowledge, issues, concerns, and needs. Failure to identify stakeholders who have an interest in the evaluation results can lead to future dissatisfaction and poor outcomes (Walsh, Duke, Foureur, & Macdonald, 2007). Clendon (2003) initiated a fourth

generation evaluation to evaluate effectiveness of a new nurse-managed clinic. A key reason for utilizing fourth generation evaluation was a concern that low income patients of ethnic minority groups would be underrepresented in the evaluation process (Clendon, 2003). A conscious effort was made to include a variety of patient populations in the evaluation. Clendon (2003) was able to comprehensively determine that appropriate and effective health care was being provided to the clinic population.

2. In the second phase, claims, concerns, and issues from each stakeholder group are introduced to the other groups (Guba & Lincoln, 1989). The stakeholder groups may refute, agree, or comment as they desire on the data presented. Many concerns and issues are often resolved in the second phase (Guba & Lincoln, 1989). Haleem et al. (2010) employed fourth generation evaluation to evaluate a nursing program with unsatisfactory NCLEX-RN pass rates. Issues and concerns were voiced by faculty members at biweekly meetings. Ground rules were created in the beginning which assured that each faculty member had an equal voice (Haleem et al., 2010). Koch (2000) found the second phase particularly difficult when bringing nursing home resident concerns to the nursing home staff. One significant concern was the imbalance of power between nursing home residents and nursing staff. Nursing staff did not want to change routines to accommodate resident requests. The resident group felt more vulnerable after the process. Power inequities and lack of time to fully establish trust can be limitations in fourth generation evaluation (Koch, 2000).
3. The third phase investigates claims, concerns, and issues that have not yet been resolved (Guba & Lincoln, 1989). Further information is gathered by the evaluator or

stakeholders. Information may be qualitative or quantitative (Guba & Lincoln, 1989). In the earlier example of NCLEX-RN pass rates, Haleem et al. (2010) organized a faculty retreat. Each faculty member was assigned courses to review, conducted literature searches for best practices, and presented findings to the group. A second retreat was planned one week later to re-visit the information (Haleem et al., 2010). Information collected in the third phase is highly depended on the nature of the claim, concern, or issue (Guba & Lincoln, 1989).

4. Finally, negotiation occurs on each disputed item in an effort to reach consensus (Guba & Lincoln, 1989). Negotiation in fourth generation evaluation is not always an easy process. In review of the literature, the fourth phase is one of the most difficult. One criticism for fourth generation evaluation is the inherent problems of asymmetry in power and competing concerns among stakeholders (Billings, 2000). Power inequity was a significant problem for Koch (2000) when implementing a career ladder for nurses in Australia. Koch (2000) found that members from senior management dominated the negotiation process. The outcome was not embraced by staff nurses who felt alienated in the process. Potential reasons for the negotiation problems were (a) greater negotiation experience in senior managers, (b) insufficient time for the negotiation process, and (c) failure to include all appropriate stakeholder. Koch (2000) cited power imbalance problems during the negotiation phase in two other studies of geriatric patients in elderly care settings. The power struggles were not caused by the fourth generation evaluation, but only made them more obvious and transparent (Koch, 2000). In some circumstances, full consensus is not possible and practical compromise must be reached instead (Guba & Lincoln, 1989). A situation

where consensus is not reached may raise questions for future evaluation activity (Guba & Lincoln, 1989).

### **Stakeholder evaluators**

There are many stakeholders in an emergency care curriculum. Most obvious are the educators and the APPs. Other stakeholders in the process are:

- administrators and managers at the critical access hospitals where the APPs practice,
- physicians and APPs who will be orienting and working with the APPs,
- nurses,
- patients,
- quality assurance and performance improvement personnel, and
- other members of the healthcare team.

Each stakeholder has a differing opinion of what is needed for the APP to practice successfully in a rural emergency setting. For the initial presentation of the self-directed learning module, patients were not included. Patient input is valuable in any process that affects safety and quality of care. The venue for the presentation of the module was not felt to be an appropriate setting in which to include patients. In the future, perhaps a focus group or one-to-one meetings might be a more appropriate way to solicit patient input in the curriculum. For the current evaluation, the researcher explored the differing concerns, claims, and issues of the stakeholders within CentraCare Health, Long Prairie.

### **Application of theory**

In selecting fourth generation evaluation as an approach to evaluation of the self-directed learning module, a few things were considered. First, the environment of a rural CAH was felt to be an appropriate setting. Stakeholders involved in the process should have the physical,

emotional, and cultural capacity to follow through with the process (Walsh et al., 2007). In the situation of the geriatric patients who lacked a voice and felt vulnerable in the evaluation process, perhaps another method would have been more appropriate. Fourth generation has been highly successful in giving stakeholders a sense of control in the process (Koch, 2000). This was especially true in the study by Haleem et al. (2010) where faculty were empowered to change the program to improve NCLEX-RN pass rates. Fourth generation evaluation is “suited to evaluation within the nursing context because it may be able to capture the emerging cultural shift in many health organisations that is more inclusive of practitioners and of consumers” (Walsh et al., 2010, p. 139).

Second, the researcher was willing to engage with the stakeholders, identify questions and concerns, interpret data, and be open to change (Boody, 2009). Inherent with any healthcare evaluation, outcomes can be expected and unexpected (Guba & Lincoln, 1989; Koch, 1994; Walsh et al., 2007). Rather than serving as a force looming over the process, the evaluator is open to possibilities as a participant in the process (Boody, 2009). There were several findings in the presentation of the self-directed module that were unexpected. The presentation was not only a way to adapt and revise the self-directed module, but also served as an enriching learning experience. Evaluators should be able to commit to the process, recognize the political nature of evaluation, and understand power differentials (Boody, 2009; Koch, 2000; Walsh et al., 2007). In order for stakeholders to feel free to share their concerns in a safe environment, a decision was made to collect data both verbally and written. The anonymous evaluation form was one method for a stakeholder to express concerns or negative feedback without having to voice concerns aloud or fear of repercussion.

Finally, it is important to establish rigor in the evaluation process. The terms reliability and validity have not been felt to adequately represent the nature of qualitative research (Golafshani, 2003; Guba & Lincoln, 1989; Lennie, 2006; Long & Johnson, 2000). Guba and Lincoln (1989) have used the term *dependability* instead of reliability. Dependability ensures that data is collected consistently and refers to the stability of data collection measures (Long & Johnson, 2000). Dependability can be influenced by bored, exhausted, or stressed evaluators (Guba & Lincoln, 1989).

Validity refers to “whether the means of measurement are accurate and whether they are actually measuring what they are intended to measure” (Golafshani, 2003, p. 599). Terms such as *trustworthiness* and *credibility* have been used in place of validity in qualitative evaluation (Golafshani, 2003; Guba & Lincoln, 1989; Long & Johnson, 2000). Trustworthiness utilizes parallel criteria of goodness and quality to establish worth of fourth generation evaluation (Guba & Lincoln, 1989).

While there is considerable debate in the literature regarding terms to define the adequacy of fourth generation evaluation, there are methods that are felt to increase the strength or rigor of the process. Rigor is established through:

- self-description or reflective journals to examine personal beliefs (Lennie, 2006; Long & Johnson, 2000; Mahara, 1998);
- member checks in which data is confirmed with stakeholders during data collection and at the completion of the evaluation (Guba & Lincoln, 1989; Lennie, 2006; Long & Johnson, 2000);

- assuring effective representation of stakeholders through personal invitation, multiple methods of communication, gathering appropriate demographic data, and establishing trust (Guba & Lincoln, 1989; Lennie, 2006);
- auditing the decision trail by documenting all aspects of the process including sources of data, collection techniques, meanings interpreted, and decisions made (Guba & Lincoln, 1989; Lennie, 2006; Long & Johnson, 2000);
- triangulation, using multiple methods and sources to collect data (Golafshani, 2003; Lennie, 2006; Long & Johnson, 2000);
- prolonged observation and involvement (Guba & Lincoln, 1989; Long & Johnson, 2000); and
- peer debriefing, engaging a colleague to explore findings and perspectives (Guba & Lincoln, 1989; Long & Johnson, 2000).

While not all inclusive, the list represents a variety of methods to assure rigor and trustworthiness of a fourth generation evaluation. Of the outlined methods to establish rigor, four were incorporated into the evaluation process. First, Mykell Barnacle, Supervisory Committee Chair served as a colleague to offer her perspective and evaluate the module for completeness. Second, stakeholders were invited by email and paper flyer by the nurse educator to the self-directed learning module presentation. Additionally, two email reminders were sent during the month prior to the presentation. Third, during the presentation, data collection occurred through verbal communication and/or the written evaluation form. Notes were collected by the researcher during the presentation. Finally, input obtained from the stakeholders was carefully considered and applied toward revision of the module. The module was adapted and resubmitted via email to all stakeholders for further review and input. Utilizing fourth

generation evaluation is especially suited for the PIP as “many programs are never finished in the sense that a curriculum is finished when it is published” (Boody, 2009, p. 50).

## CHAPTER FIVE. RESULTS

### Characteristics of the Sample

A total of six Qualtrics needs assessments were completed and used in the analysis. One assessment was opened but none of the questions were answered. The emergency department director from St. Gabriel's Hospital in Little Falls responded by email that APPs were not employed within the CAH emergency department. It is not known how many APPs practice for at least 12 hours a month in the selected CAH emergency departments so it was not possible to determine the response rate. Of the six needs assessments completed, one was from a NP and five were from PAs. All of the APP respondents were the sole emergency care provider with a physician on call. The NP completed a FNP and had been employed in the emergency department for three to five years. Of the five PAs respondents, two of the PAs were employed in the emergency department for less than a year, one PA was employed in the emergency department between one and two years, and two were employed in the emergency department between three and five years. All PAs had completed a generalist PA program and none had completed a post-graduate residency.

A key facilitator in achievement of first three objectives was the Director for Emergency and Ambulatory Services at St. Cloud Hospital, St. Cloud, Minnesota. He provided email addresses of the emergency department directors in the sample facilities. Without that information, finding email addresses would have been difficult. The researcher relied on emergency department directors to forward the email letter containing the Qualtrics link. Reliance on the emergency department directors may have been a facilitator or barrier in the process depending on whether the email letter was forwarded or not. Finally, a significant

barrier to the needs assessment was the lack of a database for APPs practicing in Minnesota CAH emergency departments.

### **Previous Experiences**

The first objective of the PIP was to assess previous experiences of APPs prior to beginning practice in emergency care. Of all six respondents, none had previous emergency care experience as an APP prior to beginning employment in their current position. Prior to beginning in the emergency department, the NP had eight years of NP experience with five in family practice and three in urgent care. Previous experience for the NP included 18 years as a RN. Two of the 18 years were as a RN in an emergency department.

For the PAs, three of the five respondents had been hired to the emergency care setting as new graduates from a PA program. One of the new graduate PAs had been an EMT for 12 years. The other two new graduates had no previous experience other than PA education. Of the two PAs with previous experience, one had practiced in family practice or urgent care for 10 years and the other had been in surgery for six years. None of the PAs had previous military training, a CAQ, or nursing experience.

### **Current Methods of Emergency Care Education**

The second objective of the project was to identify current methods of APP education or training to emergency care. Three of the six APPs had less than one week of orientation prior to starting their role. Of the three APPs with less than one week of orientation, one was the NP with previous NP and RN experience, one was the PA who had practiced in family practice or urgent care for 10 years, and one was the new graduate PA with 12 years of previous EMT experience. The other two new graduate PAs received two to three months of orientation. The

PA who had practice in a surgical care setting for six years prior to the emergency care position had one to two weeks of orientation.

Five of the six APPs had orientation or training that was specific to the emergency care role. The other APP had also received orientation to urgent care. The predominant method of orientation was shadowing with another NP or PA; shadowing was listed by four of the six APPs. Two of the APPs had shadowed with a physician. Other methods identified in the sample group were mentoring and being assigned a preceptor. One PA marked *none of the above* for the question of emergency care specific education included in orientation process.

A variety of certifications were included in the APP orientation. The majority, five of six APPs, had attended CALS as part of their orientation. Only one of the six APPs attended ATLS. See Figure 1 for a graph of the certifications that were included in the emergency care orientation process. One of the APPs renewed Basic Life Support (BLS) and ACLS in preparation for the emergency care role but they were not included as part of the actual orientation.

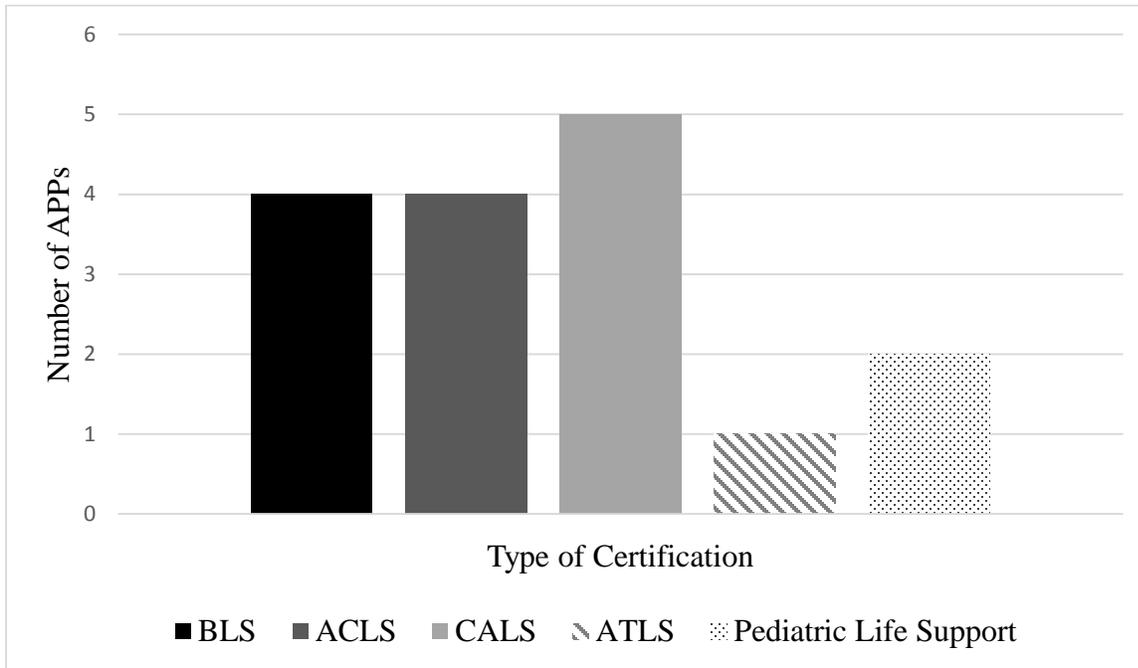


Figure 1. Certifications included in the APP orientation process.

In a write-in area of the needs assessment, APPs were asked about ways in which they prepared for the emergency care role that were not provided by the place of employment. The themes of write in responses were:

- electrocardiogram review mentioned by two APPs with one APP specifically naming *Rapid Interpretation of EKGs* by Dubin;
- a 26-hour audio course of *Emergency Medicine Boot Camp* (2014); and
- self-study on *UpToDate* website mentioned by two APPs.

### Recommendations for Emergency Care Education

The third project objective was to summarize and prioritize recommendations for education and potential areas for improvement from APPs practicing in emergency care. This information was felt to be instrumental in the process of choosing a topic and developing a self-

directed learning module. Additionally, information gleaned from the third objective would provide direction for the remaining curriculum components.

Two questions from the needs assessment were helpful in determining APP emergency care educational needs. The first question was the preparation to practice. APPs were asked about how prepared they thought they were in 28 different clinical areas corresponding to the ENA and SEMPA competencies. Some areas included were electrocardiograph interpretation, computed tomography (CT) scan interpretation, managing a pediatric patient in cardiopulmonary arrest, endotracheal intubation, laceration repair, procedural sedation, lumbar puncture, EMTALA, and sexual assault. APPs felt very unprepared in the areas of lumbar puncture, continuous positive airway pressure/bilevel positive airway pressure (CPAP/BIPAP), needle thoracostomy, thoracentesis, sexual assault, and CT scan interpretation (see Figure 2).

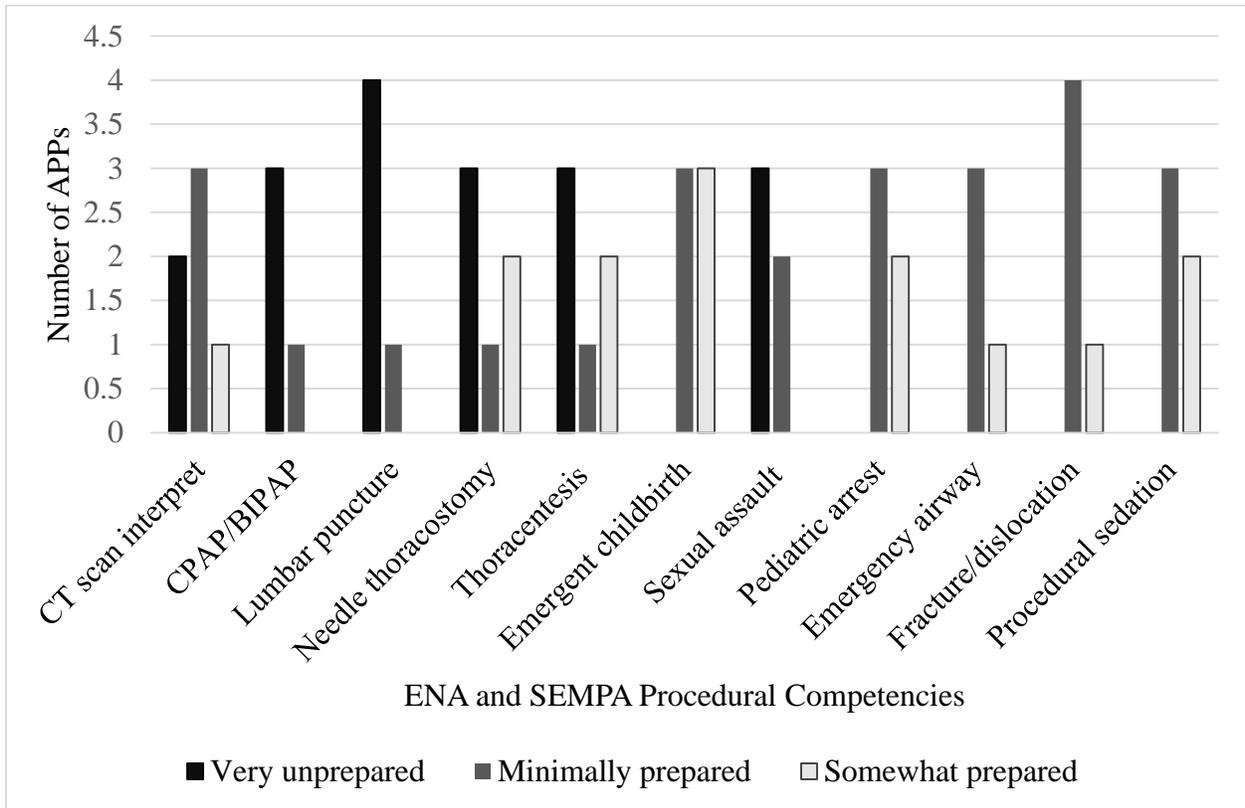


Figure 2. APP perceived preparedness to perform emergency procedures.

Other areas in which APPs felt least prepared included emergent childbirth, pediatric arrest, emergency airway, fracture/dislocation, and procedural sedation. At least four of the six APPs felt well prepared in the areas of local/regional anesthetics, simple laceration, cervical spine management, intraosseous access, complex wound closure, splints/casts, abscess incision and drainage, nail injury, and EMTALA (see Figure 3).

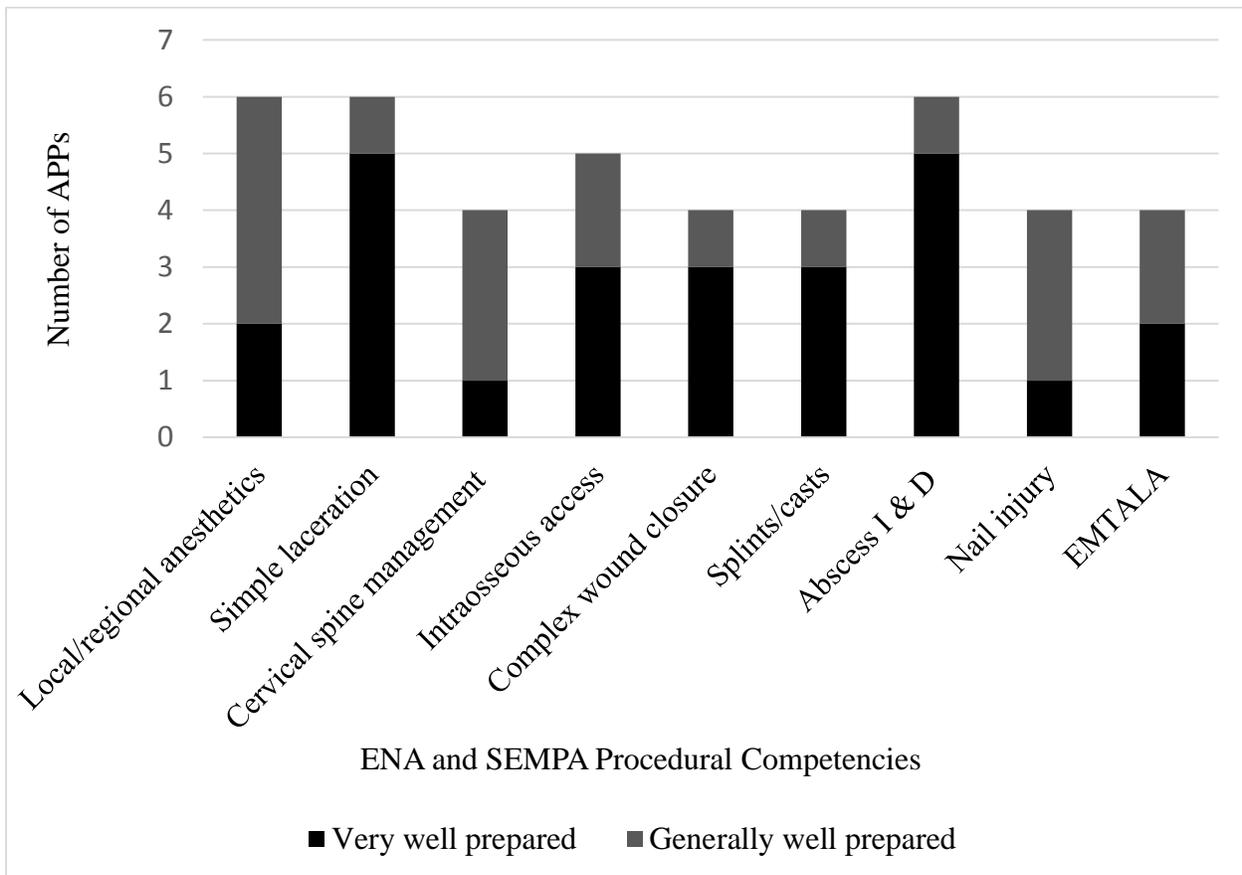


Figure 3. Procedures APPs reported being well prepared to perform.

The second question was prioritizing needs. APPs were asked to rank the top five clinical areas of need based on overall clinical categories such as anaphylaxis, burn care, cardiopulmonary disorders, EMTALA, endocrine disorders, gastrointestinal problems, palliative care, shock, sexual assault, and trauma. Trauma was listed as the top area of need with three APPs ranking trauma as the first priority and two other APPs ranking trauma in the top five categories (see Figure 4). The next category which scored high in the ranking was cardiopulmonary disorders. Two APPs ranked cardiopulmonary disorders as the top priority and all six APPs selected it as one of the top five categories. Other areas of need ranked for APPs

were electrolyte/acid base, fracture/dislocation, head/eyes/ears/nose/throat (HEENT) problems, mental health, neurological disorders, sepsis, and shock (see Figure 4).

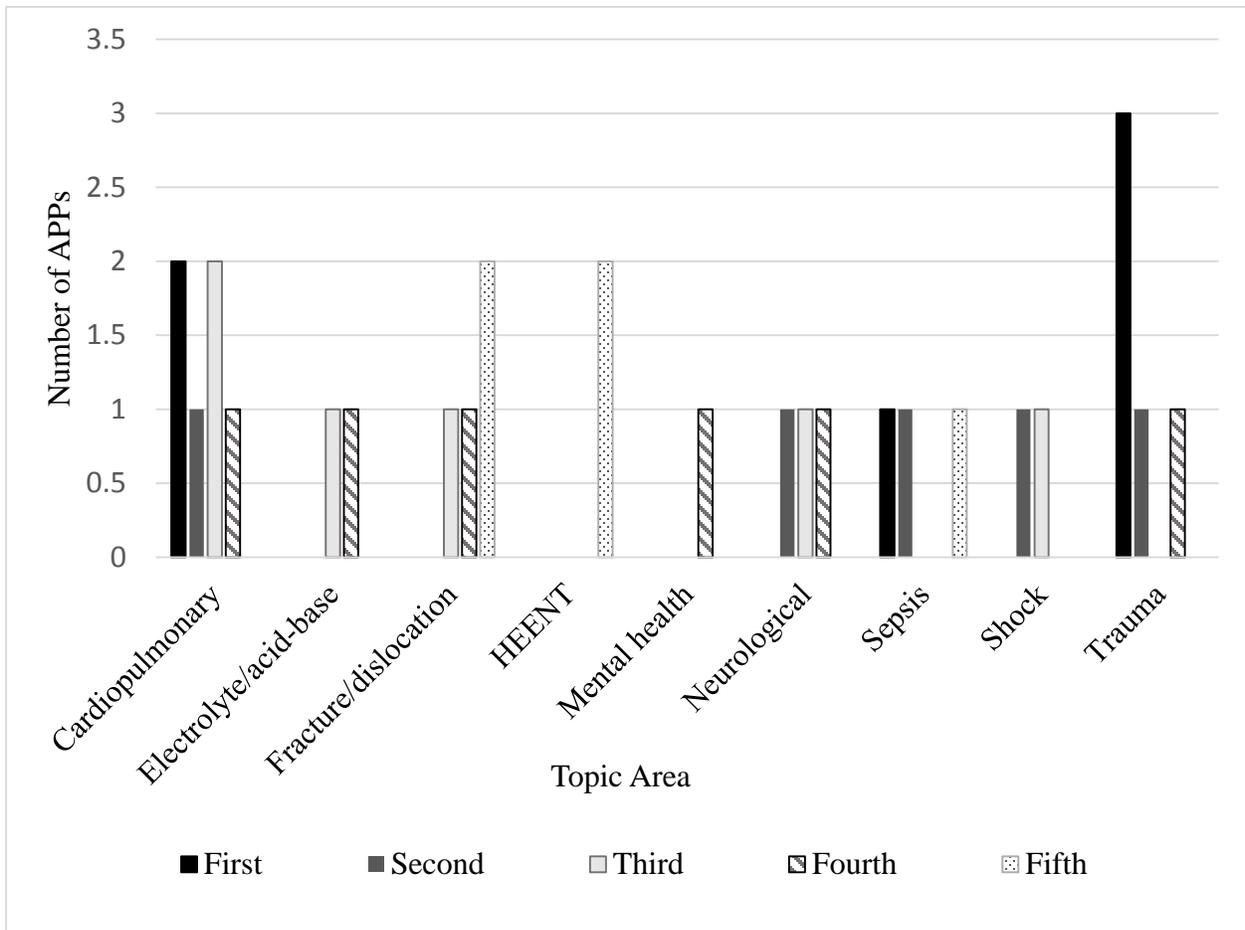


Figure 4. Rank of the top five areas of need reported by APPs in the sample.

When asked the preferred method of learning the emergency care role, APPs selected a variety of methods. APPs were asked to rank the preferred method of learning in order of preference from one through three. Three of the six APPs ranked learning on-the-job with another NP or PA as their first preference. Five of six APPs preferred training opportunities within a larger volume emergency room. Other preferences were on-the-job with a board certified emergency medicine physician, self-study with internet instruction and modules, simulation, conference or regional meetings, and monthly or quarterly workshops.

At the conclusion of the needs assessment, APPs were asked to write-in any suggestions or changes to the orientation process that would have improved their preparedness to practice.

The write-in suggestions were:

- review protocols;
- formalized mentoring process;
- case review of patients that had been seen by the APP;
- shadowing in a higher volume facility;
- focused assessment with sonography for trauma (FAST) course;
- airway course; and
- evaluation of early intrauterine pregnancies.

The final write-in section of the needs assessment included other preferences or thoughts regarding learning the emergency care role. Final recommendations from APPs were (a) requiring PALS and trauma courses; (b) annual recertification for CALS; and (c) spending time in a larger volume emergency room in order to see more patients, improve skills, and become more confident. One concern voiced in the write-in section was “Only seeing <10 patients per shift on average a couple of days a week isn’t seeing enough!”

### **Self-Directed Learning Module**

The final project objective was to create and implement a self-directed learning module as one component of a comprehensive educational curriculum for APPs beginning practice in rural emergency care settings. After a comprehensive review of the needs assessment results, adult and pediatric trauma was chosen as the topic for the first self-directed learning module. There were several reasons why adult and pediatric trauma was selected. First, trauma was identified by five of six APPS as an area of need. Further, three APPs prioritized trauma as the

top area of need. Second, two procedures in which APPs felt very unprepared to perform, CT scan interpretation and needle thoracostomy, could be easily incorporated into a trauma module. Third, adult and pediatric trauma was felt to be amenable to a self-directed method of learning. Through the course of the doctoral program and PIP, the researcher collected and critiqued a multitude of emergency care teaching-learning materials and methods. A substantial number of online trauma materials were found. Through review of the needs assessment results, it was noted that APPs were already utilizing self-directed methods of the *UpToDate* website and audio courses. *UpToDate* is an evidence-based resource for medical information authored by physicians and experts in health care (Wolters Kluwer Health, 2015). Self-study with internet instruction and modules was identified as a preferred method of learning the emergency care role in the needs assessment. Further, the AACN (2010) and the IOM (2009) have recommended educational curricula that promotes self-directed learning and utilizes technology including computer-based and internet based learning modes to maximize learning for health care professionals.

On January 9, 2015, the adult and pediatric trauma module was completed (see Appendix M). During the predesign phase of module development, the researcher recognized that the trauma module would blend competencies from the ENA (2008) and SEMPA (2013b). The module could complement clinical learning experiences on-the-job or be utilized by a newly hired APP before the first day of orientation. In keeping with adult learning theory principles, the module design incorporated elements of flexibility, accessibility, portability, and self-pacing (Knowles et al., 2011). An APP could select and prioritize areas of need. As other modules are developed, the APP would freely move back and forth among modules. There were several key elements of the self-directed learning module.

### **Course title, description, and course objectives**

The first part of the trauma module is an introduction to the module and course objectives. The objectives are written to reflect proficient APP emergency care practice. The description and course objectives set the stage for the self-directed nature of the module.

### **Textbook**

The one textbook required for the course was the *Tintinalli's Emergency Medicine: A Comprehensive Study Guide* (Tintinalli et al., 2011). *Tintinalli's* was selected for a few reasons. First and foremost, *Tintinalli's* was extensively reviewed for content and applicability to the emergency care curriculum. Second, several emergency medicine websites highly recommended the *Tintinalli's* textbook (ACEP Educational Publications Department, 2010; EMCrit, 2015; Emergency Medicine Residents' Association, 2015; Life in the Fast Lane, 2015). Finally, several APPs had personally recommended *Tintinalli's* to the researcher. There were no research articles found in the area of selecting an emergency care textbook.

### **Certification courses**

Two certification courses, CALS and ATLS, were required for the trauma module. Courses were selected based on the recommendations from the review of the literature and relevance to the area of trauma. As mentioned previously, CALS was developed for health care providers in rural emergency settings with a focus on the universal team approach (CALS Rural Emergency Medical Education, 2011). Rural trauma care is a large focus of the CALS certification (CALS Rural Emergency Medical Education, 2011). ATLS is a certification offered through the American College of Surgeons. ATLS teaches participants how to manage a trauma patient and evaluate whether the patient's medical needs warrant transfer to a higher level of care (American College of Surgeons, 2015). CALS and ATLS recommend recertification every four

years (American College of Surgeons, 2015; CALS Rural Emergency Medical Education, 2011). Through attending CALS and ATLS certification courses, the researcher strongly felt that both courses were excellent resources in the acquisition of knowledge, skills, and attitudes necessary for rural emergency care.

In an effort to improve competency in emergency care, two organizations have developed courses for APPs in emergency care. *Emergency Medicine Boot Camp* is offered as a 26-hour live conference or self-study dividing the topic of urgent and emergent care into thirty-minute evidence-based lectures (Center for Medical Education, 2015). The *Emergency Medicine Boot Camp* self-study option includes the conference materials along with videos and audio-taped recordings of the thirty-minute sessions (Center for Medical Education, 2015). The Center for Medical Education has subsequently developed an advanced course with workshops in imaging and electrocardiogram interpretation.

The *Emergency Medicine Academy* is a joint project of ACEP and SEMPA created for APPs new to emergency care (ACEP, n.d.). The first phase is a four and one-half day conference introducing a new APP to the emergency care role. Future conferences will include simulation, procedural training, and small-group case scenarios (ACEP, n.d.). The *Emergency Medicine Academy* does not offer a self-study program.

It was decided that the *Emergency Medicine Boot Camp* and the *Emergency Medicine Academy* would be highly recommended courses for the emergency care APP. An APP could choose either course based on personal areas of need. Smaller rural hospitals may not have the resources in time and money to send new APPs to a conference or to purchase the self-study package. Further, it is hoped that the self-directed learning modules would serve an important purpose of bringing quality emergency care education to the rural setting.

### **Learning experiences**

It is essential that adult learners have the freedom to choose their learning strategy (Knowles et al., 2011). Learning experiences for the module were designed recognizing that adult learners have individual differences and preferences. As such, a variety of strategies were employed in the development of the module including reading assignments, videos, interactive websites, audiocasts, a completion checklist, and post module examination.

### **Module instructions**

With the exception of the required textbook and the required courses, the entire module utilizes online material and programs which are free to the public. Adult learners may not be proficient in web-based programs such as YouTube or iTunes. The final module was converted to an Adobe Systems Portable Document Format (PDF). Benefits of a PDF file are that it has standardized formatting, security features, and clickable links to videos and podcasts (Adobe Systems, 2015). An instruction section on how to use the module was included along with email links for questions or concerns to be sent to the researcher. A key piece, often overlooked, in the development of self-directed learning modules is providing clear, detailed, and specific instructions (Jenkins, Carlson, & Herrick, 1998).

### **Body of the module**

The self-directed module divides topics of adult and pediatric trauma into manageable sections. Major trauma topics were organized within a table. Each row represents a trauma topic with reading assignments, recommended websites, management videos, a pediatric section, radiology videos, and audiocasts. Other recommended articles or articles that were mentioned within videos and audiocasts were divided by topic and included in a separate section of the module. Articles within the module were listed in American Psychological Association (APA,

2010) format. Online material and websites were categorized by title, author or creator, year, and a link to the material. Online learning materials within the module were carefully and consistently evaluated by the researcher using criteria of:

- the creator of the video or audiocast was a health care organization, university, APP, physician, or nurse;
- the topic was clearly presented and covered the topic outlined in the title;
- recent evidence was incorporated within the content of the material;
- information applied to an APP and not a patient or layperson;
- the date of the material was recent and within five years when possible;
- there were no doubts about copyright and creator of the material;
- the images or sounds were clear, easily heard, and free from background noise;
- information could be applied to a rural emergency care setting; and
- procedures were consistent with *Tintinalli's*, *CALS*, or *ATLS* teaching.

The criteria utilized for screening online content for the module was consistent with evaluation criteria found in the literature (Azer, AlGrain, AlKhelaif, & alEshaiwi, 2013; Duncan, Yarwood-Ross, & Haigh, 2013). In some circumstances, two videos or audiocasts had overlapping material but were very high quality with different speakers or teaching approaches. When two high quality resources were found, both were included in the module. Material that was felt to be more applicable to a large trauma setting was excluded. Several exceptional procedural videos that appeared to be from the *New England Journal of Medicine* were found; however, it was evident that the individual uploading the content was not the creator of the video nor a representative of the *New England Journal of Medicine*. The same videos were found on the

New England Journal of Medicine website and were available for a fee. Material, such as the New England Journal of Medicine videos, where there were copyright concerns were excluded.

One significant advantage considered in the module design was that APPs would not need to go to a website and sift through an abundance of material to find something appropriate for learning. Azer et al. (2013) evaluated the educational value of YouTube videos on physical examination of the cardiovascular and respiratory systems. A problem identified by Azer et al. (2013) was that, despite precautions to target search results in YouTube, over 1800 videos were delivered that were not related to the search terms. In a study of physician preferences for online continuing medical education, Young, Kim, Yeung, Sit, and Tobe (2011) noted that physicians preferred being able to navigate through relevant content with a minimal number of “clicks”. Other findings desired by physicians were (a) utilizing source material from known and trusted organizations, (b) identifying resources from a table of contents, and (c) having content available in a variety of formats such as text, audio, video and PowerPoint (Young et al., 2011). A study by Lau (2011) noted that hospital nurses were more likely to adopt web-based tools if they perceived tools to be easy to use and would enhance job performance. In creating the trauma module, all content within the module was screened by the researcher. There were only a couple exceptions. If there were several videos within a series, 50% to 75% of the videos were screened. One example is a YouTube series of 10 video lectures by Strong (2013) on chest radiograph interpretation. The content was judged as exceptional after screening over 50% of the chest radiograph videos. As such, all videos in Strong’s series were included within the appropriate section of the module.

### *Video learning*

Technology has become a mechanism for teaching people of all ages, settings, and professions. Video technology has the benefit of being easily accessible and convenient, offering a learner the ability to replay and repeat material (Hansen & Erdley, 2009). Technology has not been universally embraced by educators because of uncertainty with learning outcomes, lack of comfort, and outright fear (Bonnell, Wambach, & Connors, 2005; White & Sharma, 2012). Technology has been described as a toy, desired by learners, that lacks solid evidence of true learning (Zanussi, Paget, Tworek, & McLaughlin, 2012). On the other hand, White and Sharma (2012) have likened video technology to an “educational smorgasbord” catering to busy students with a variety of learning styles (p. 602).

Within health care education, video technology has clearly emerged as an important teaching approach. Shantikumar (2009) conducted a study of 211 medical students incorporating PowerPoint slideshow presentations with voice-over narrative. The medical students unanimously agreed that the PowerPoint presentations with voice-over narrative were easy to access and useful to supplement learning. Medical students requested that (a) the PowerPoint method of teaching with voice-over narrative be expanded to other areas, (b) clinical examination videos be added, and (c) a quiz be created to test post-presentation learning (Shantikumar, 2009). Shah et al. (2012) created an educational program for EMTs in the area of geriatric care utilizing online video podcasts. EMTs highly valued and supported the modality of learning. Barriers identified were challenges with technology and not being able to engage in discussion (Shah et al., 2012).

A study by Schreiber, Fukuta, and Gordon (2010) employed a crossover randomized trial of 100 medical students. Medical students were placed into two groups; one group received

traditional lecture and the other received a video podcast on the same topic. Schreiber et al. found no significant difference in post educational multiple choice test scores. Medical students in the study enjoyed the convenience of the video podcast but found it less engaging and clearly preferred the live lecture format (Schreiber et al., 2012). Bhatti et al. (2011) compared two groups of medical students with one receiving education via interactive website and the other receiving traditional lecture. Knowledge was assessed through a questionnaire before and after the intervention. While both groups of medical students were equally satisfied with the educational method, the interactive website group scored significantly higher in the post intervention questionnaire (Bhatti et al., 2010). Clearly, there are advantages for video learning identified in the health care literature. No single educational intervention is perfect as adult learners are a diverse group with differing interests, motivations, and learning styles. A significant benefit in utilizing video learning in rural settings is that APPs will lack routine access to traditional classroom lectures. Pre-screened interactive websites and YouTube videos were incorporated as one learning strategy in the adult and pediatric trauma module.

### ***Audiocast learning***

An audiocast is an audio recording of course-related content saved to a file which can be downloaded on a computer or portable device for listening (Marrocco, Kazer, & Neal-Boylan, 2014). Nurse educators have integrated audiocast learning into graduate nursing education as it efficiently utilizes research, enhances learning, provides flexibility, and spans geographic barriers (Marrocco et al., 2014). Several studies have suggested that audiocasts are a useful tool but should be limited to supplementing course material (Daniel & Woody, 2010; Forbes & Hickey, 2008; Meade, Bowskill, & Lymn, 2009; Walls et al., 2010). Daniel and Woody (2010) found that psychology students liked the idea of audiocasts but scored lower on multiple choice

testing compared to psychology students who read the material. Findings were similar in a study by Vogt, Schaffner, Ribar, and Chavez (2010). Vogt et al. (2010) compared traditional lecture to audiocasts between two groups of junior-level nursing students. The nursing students were satisfied with the audiocast format offering positive feedback related to flexibility and portability. In the audiocast group, the first examination scores were better than the traditional lecture group. Vogt et al. (2010) noted that in subsequent examinations, scores in the audiocast group progressively worsened with scores on the last examination being markedly lower than the traditional lecture group.

Other studies have shown podcasting to be an effective learning method. Abate (2013) conducted a randomized study of baccalaureate nursing students. Thirty-five students were divided into three groups: a traditional lecture group, a single non-stop audiocast group, and a group that received the audiocast divided into shorter time segments. Abate (2013) found that students in the segmented audiocast group scored higher on a multiple-choice test and case study assignment than those in the other two groups. Meade et al. (2009) noted that pharmacology students who were offered an audiocast in addition to the traditional course scored higher on examination scores than those who did not have access to audiocasts.

The intent in incorporating audiocasts within the adult and pediatric trauma was to supplement the learning experiences. During the screening process, the audiocasts included in the module were determined to be high quality and content rich. They were selected to augment the module and appeal to the adult learner who prefers auditory learning.

Learning experiences incorporated within the trauma module were determined to represent a comprehensive and current body of knowledge in the area of adult and pediatric

trauma. Further, the majority of resources utilized were freely and readily available from the internet.

### **Post module examination**

A post module examination was created to serve the goal of a self-check for the APP. Post module examination questions were written from the reading assignments and videos. General principles used when writing the post module multiple choice questions followed the recommendations of Haladyna, Downing, and Rodriguez (2002) and included:

- creating only one correct answer;
- homogenous appearance among options in length, grammatical structure, and content;
- plausible distractors;
- avoiding the phrase *all-of-the-above*;
- careful use of *none-of-the-above*;
- not giving away clues;
- refraining from negative options beginning with *not*; and
- varied location of the correct answer among choices.

When possible, the questions were phrased in a way to promote critical thinking. Several questions asked the APP to discern among plausible alternatives by selecting the *first* or *highest priority* choice from a group of options with varying degrees of correctness. Discerning among plausible alternatives stimulates higher-level thinking as the learner reasons through the choices (McDonald, 2014). Prioritizing patient health needs was a key course objective and reflected in the question development.

Another way in which questions were written to promote critical thinking and increase difficulty of the questions was to utilize multiple-response questions. Similar to a multiple-

choice question, a multiple-response question presents a problem and several options. The major difference is that one or more options are correct (Wendt, Kenny, & Keeping, 2010). In the multiple-response testing approach, the APP would *select all that apply* (McDonald, 2014; Twigg, 2012). The answer is correct if the true options are selected and the false options are left unmarked (Verbic, 2012). Most of the post module examination questions were written in the multiple-response format.

### **Post module examination answers**

Writing rationale for test questions increases the validity of the examination (McDonald, 2014). An important element of the post module examination was giving the source for the answer and a rationale. For most questions, there were two or more sources given. Providing rationale is especially important for a self-directed learning module in which the researcher or teacher is not available to explain the answer.

### **Checklist**

A checklist was the final element of the adult and pediatric trauma module. For the purpose of the trauma module, the checklist is a way for the APP to visually track learning progress. Checklists allow learners to spend time exploring available resources prior to narrowing their learning focus (Watkins, Curry, & Mynard, 2014). When videos, audiocasts, and readings are completed, the APP can date and mark the material on the checklist. As more modules are developed, an APP will have the freedom of move between and among modules based on learning needs. The checklist corresponds to the material in the body of the trauma module. Times of the videos and podcasts, as well as anticipated time to complete the interactive online programs, are included on the checklist.

Creation of the self-directed learning module on adult and pediatric trauma was the first part of the fourth objective in the PIP. Implementation and evaluation of the adult and pediatric trauma module occurred on January 28, 2015 in the form of a one-hour presentation for stakeholders at CentraCare Health, Long Prairie.

### **Evaluation of the Adult and Pediatric Trauma Module**

Evaluation of a curriculum or educational program is an ongoing process (Sauter, Gillespie, & Knepp, 2012). Implementation and evaluation was the second part of the final objective. While it was recognized that evaluation of the module would be ongoing, an important step was to begin the process of fourth generation evaluation.

Prior to the one-hour stakeholder presentation, input on the trauma module was solicited from Mykell Barnacle, the Supervisory Committee Chairperson. Mykell suggested that instructions for use of the module and a completion checklist would be beneficial additions to the module. The module was adapted to include instructions and the checklist.

There were two key facilitators in the evaluation process. The first key facilitator was the nursing administrator who voiced interest in the project and requested assistance from nurse educator to coordinate the one-hour trauma module presentation. The second facilitator was the nurse educator who arranged the date and location, sent the email invitations and reminders to stakeholders, arranged refreshments, requested one-hour of continuing education for the nursing staff, tested the module on her computer to assure that links opened, and assisted in the technology for the presentation. Key barriers were that the presentation occurred mid-day so that some of the physicians and nurses couldn't attend because they were caring for patients.

Qualitative data, both verbal and written, were collected and categorized based on elements from the evaluation form (see Appendix L). Stakeholders were asked to describe the

most helpful aspects of the module. Common themes were:

- learning in a convenient location and with flexibility;
- categorized, prescreened videos to access;
- comprehensive nature of the module;
- information available in one location;
- information on topics and procedures not often seen; and
- a checklist available for completion.

Technology concerns were the predominant theme as the least helpful aspect of the module. Several stakeholders voiced concerns with audiocasts and using iTunes media player including the physician and several nurses. When previewing the module before the presentation to assure that the links would open and play, the nurse educator was able to open the iTunes files and play them on another media player. During the presentation, the iTunes files would not play on the computer utilized for the presentation. Further, one discovery in the implementation process was that iTunes media player could not be universally downloaded on the CentraCare Health system. There was fear in downloading iTunes in the home setting because of a finite amount of memory on personal computers. Many questions were answered about audiocasts and iTunes. All four PAs at the module presentation had already been using iTunes and were comfortable with the program. Additionally, one PA suggested other audiocasts in iTunes that she found particularly helpful in beginning her role in the emergency department.

Stakeholders were asked if they felt that the module would be helpful for a provider who is new to rural emergency care. Write in answers on the form were *yes*, *most definitely*, and *absolutely*. The question was unanimously affirmative during the presentation.

There were several suggestions for how the module could be improved. The most frequent suggestion voiced was having a table of contents in the beginning to aid in navigating the module. The suggestion to add a table of contents was voiced by several stakeholders and was written on one evaluation form. The second suggestion was to create hyperlinks from the table of contents to the desired module content. Finally, during the presentation the formatting of the trauma module was altered slightly due to a different version of Microsoft Word. One PA recommended converting the file to an Adobe Systems PDF for ease of use and for maintaining the format. By converting the file to PDF, the hyperlinks would be maintained and could not be accidentally disturbed by typing over or deleting them.

Two write-in comments on the evaluation form for how the module could be improved related more to the presentation style of the researcher. They were (a) “I think it was presented nicely” and (b) “Slow down and go through several examples more thoroughly”. Both comments were from nurses with five to 10 years of experience.

The next theme in the evaluation of the module was likelihood of use. All four PAs voiced that they were highly likely to use the module in the next two months. Additionally, one PA stated, “I can’t wait to begin using”. Her comment brought verbal agreement from the majority of the stakeholder group. When reviewing the evaluation forms, there were several different answers to the question of likelihood of use. One nurse with over 10 years of experience wrote, “I will if I can get this downloaded”. Other write in responses to the likelihood of use question varied greatly and included *very*, *somewhat likely*, and *not very likely*.

Time was given at the end of the presentation for other suggestions and comments. Additionally, the last question on the evaluation form solicited other suggestions or comments. One comment from a pharmacist was, “It looks like a lot of hard work went into your program”.

One PA stated, “I love it, but what made you choose trauma?” He voiced that his clinical skills in trauma were more solid than other areas such as complex “internal medicine-type patients”. Further, he looked forward to the development of more modules that would help him in his personal areas of need. Final comments were related to offering congratulations and “great job!” to the researcher on the trauma module.

Suggestions and data from the evaluation were reviewed and considered by the researcher. In keeping with fourth generation evaluation, stakeholders were solicited for “claims, concerns, and issues” pertaining to the trauma module (Guba & Lincoln, 1989, p. 42). Stakeholders had differing opinions about the module when considering responses from the APPs, physicians, and nurses. Having two different mechanisms of collecting qualitative data created an environment in which stakeholders felt safe to voice opinions. Data obtained from stakeholders were carefully considered and applied toward revision of the module. The module was adapted with inclusion of a table of contents, hyperlinks, and PDF format. The adapted module was then resubmitted via email to stakeholders for further review and input. The process of evaluation for the adult and pediatric trauma module is an ongoing process that will continue beyond the PIP. An anticipated goal is to expand the evaluation process to include APPs in other settings.

## **CHAPTER SIX. DISCUSSION AND RECOMMENDATIONS**

### **Interpretation of Results**

#### **Needs assessment**

APPs practicing in central Minnesota rural emergency care settings participated in the needs assessment. Despite the small sample size of six, one key finding was that APPs are being hired into the emergency care role without previous emergency care experience. None of the APPs sampled had previous emergency care experience as an APP. Further, three of the six APPs sampled were new graduate APPs. A significant concern voiced throughout the review of the literature is that the completion of education and certification as a NP or PA does not correlate to competency in emergency care (ACEP Emergency Medicine Practice Committee, 2012; Ramirez et al., 2006; Schneider et al., 2010). Findings from the literature review and the needs assessment reveal that rural hospitals in central Minnesota are relying on APPs to fill a void in rural emergency care.

APPs in the sample were the sole emergency care provider with a physician on call. This is consistent with findings from Casey et al. (2008) in that hospitals with lower emergency department volumes were more likely to utilize NPs and PAs with a physician on call. In situations such as major trauma or cardiopulmonary arrest, an APP would need to manage the problem until the physician arrives. Under EMTALA, the physician has thirty minutes from the time of the phone call to arrive at the patient's bedside (Frew & Giese, 2012). For an APP lacking experience to manage complex emergency care problems, waiting thirty minutes for a physician to respond may not represent an ideal situation for patient safety.

Along with the finding that none of the APPs sampled had previous emergency care experience as an APP, three of the APPs sampled had less than a one week orientation. This

included one new graduate APP who only had previous EMT experience. The other two new graduate APPs reported a two to three month orientation program. Of note, one APP marked *none of the above* when asked the question about emergency care specific education included in orientation process. One possible reason for marking *none of the above* was that the PA did not receive any emergency care specific orientation. Findings from the needs assessment are consistent with a study by McKay (2006) which found that the orientation process for trauma NPs varied greatly with the length ranging from two to 90 days. Details about process and time for APP orientation to the emergency care role are sparse in the literature review. Dimeo (2012) recommended a 12-week minimum orientation period for a NP in an urban emergency department. In the Yeager (2010) article about NP orientation to a trauma role in a large academic center, the NP orientation calendar was at least two months. Articles from Dimeo, McKay, and Yeager pertained to NP roles in larger emergency departments or academic centers. The rural APP emergency care role differs from larger emergency care settings as a physician and specialty services are not always immediately available. The current needs assessment found that four out of the six APPs sampled spent time shadowing another APP. On-the-job training has been a method of learning the emergency care role in the literature (Campo et al., 2008; Cole & Ramirez, 2000; Keough et al., 2011). With strong recommendations for emergency care specific education for APPs, the needs assessment revealed that some APPs continue to have less than a week of orientation to the emergency care role.

A variety of certification courses were included during the APP orientation to emergency care. Of these, CALS was the most frequent with five of the six APPs reporting attending CALS during their orientation. As mentioned previously, CALS is a two-day course designed for rural emergency care providers with a curriculum that includes classroom lectures, hands-on skills

training, and a universal team approach to care for rural patients (CALs Rural Emergency Medical Education, 2012). The needs assessment findings confirmed that CALs is being utilized as part of the orientation to rural emergency care. BLS and ACLS were offered for four of the six APPs sampled. Other certifications included in the orientation process were ATLS and PALS. In the literature review, a number of different certifications were recommended including ACLS, PALS, and ATLS (Casey et al., 2008; Ramirez and Cole, 2004). Other than CALs, the needs assessment findings were similar to the literature review regarding other certifications included during orientation.

Consistent with findings from Candela (2012), adult learners were self-directed and chose learning activities that were relevant and immediately useful. APPs in the needs assessment prepared for their emergency care role through self-directed, independent methods including reading on *UpToDate*, reviewing electrocardiogram resources, and utilizing a 26-hour audio course. The self-directed activities selected by APPs were of particular interest to the researcher in the ultimate development of the adult and pediatric trauma module.

Perhaps the most important information gleaned from the needs assessment related to the third objective, summarizing needs and prioritizing recommendations. APPs indicated feeling very unprepared in the competency areas of lumbar puncture, CPAP/BIPAP, needle thoracostomy, thoracentesis, sexual assault, and CT scan interpretation. Along with level of preparation, APPs were asked to prioritize areas of need. Trauma ranked as the topic of greatest need and was selected for the first self-directed learning module. Based on the needs assessment results, subsequent modules in approximate order of importance would be:

- cardiopulmonary disorders;
- airway and breathing including CPAP/BIPAP and emergency airway;

- sexual assault;
- neurological disorders including the procedure of lumbar puncture;
- musculoskeletal disorders including fracture, dislocation, and procedural sedation;
- adult and pediatric cardiopulmonary arrest;
- sepsis;
- electrolyte disorders;
- emergent childbirth and pregnancy concerns; and
- mental health problems.

Identified areas of need were incorporated into the adult and pediatric trauma module and included CT scan interpretation, needle thoracostomy, thoracentesis, shock, and FAST emergency ultrasound. Further, when categorizing other competency areas from the ENA (2008) and SEMPA (2013b), cervical spine management and EMTALA guidelines were also included. The adult and pediatric trauma module encompassed several areas of need within the one module. An outline (see Appendix H) and instructional planning worksheets (see Appendix I) have been created with the goal of incorporating learning experiences into self-directed learning modules as well as utilizing other methods of learning for the APP.

There were a variety of preferred learning methods that APPs selected in the needs assessment. Information about preferred learning methods will be included in future modules and curriculum development. Areas that were ranked highest in order of preference were training opportunities within a larger emergency room and learning on-the-job with another APP. Several APPs utilized self-directed methods which may have reflected a preferred learning style or the absence of other opportunities available in a rural setting. Adults have differences in their preferred learning styles and developing learning opportunities should allow for differences

(Candela, 2012; Knowles et al., 2011). Future learning experiences should incorporate a variety of APP preferences when possible including opportunities in a larger emergency department, shadowing with another APPs, self-study with internet instruction and modules, mentoring, simulation, case reviews, conferences or regional meetings, and monthly or quarterly workshops.

APPs in rural emergency care settings were able to recognize personal areas of need and make comprehensive recommendations for future learning experiences. Eva et al. (2004) cautioned that adult learners may have difficulty recognizing and communicating learning deficiencies. Results from the needs assessment were consistent with findings from McCrystle et al. (2010) showing that medical students and residents had no difficulty prioritizing needs and competency levels. Despite the small sample of six APPs, a wealth of information was amassed.

#### **Evaluation of adult and pediatric trauma module**

Stakeholders within CentraCare Health, Long Prairie offered unanimous positive written and verbal feedback that the adult and pediatric trauma would be helpful to a new APP in the rural emergency care setting. Two APPs who had been in their positions for one year or less voiced a desire to begin using the module immediately. Many suggestions were offered by stakeholders to make the module more user-friendly including a table of contents, hyperlinks, and a PDF format. Strengths of the module were the convenience of being able to use in different settings, comprehensive nature, prescreened videos in one location, and having information available for topics and procedures rarely seen in the rural setting. The module was designed to appeal to adult learners. Many of the strengths of the module voiced by stakeholders were consistent with adult learning theory; adults desire useful information that can be readily adapted and expands beyond the workplace to other settings (Candela, 2012). Similar to the

study by Young et al. (2011), stakeholders preferred navigating through relevant content without needing to search for information.

Stakeholders attending the module presentation were an appropriate representation of people who contribute to the success of an APP in the rural emergency care setting. From the perspective of some of the nurses, the adult and pediatric trauma module would be something that they would find useful in their roles of emergency care nurses. Several nurses voiced an interest in reviewing the module for applicability to the professional nursing role.

Technology was a significant barrier perceived by some of the stakeholders. Not only was there a fear of using iTunes, but the organization did not have ready access to the iTunes program. Some nurses voiced concern about downloading the program on home computers. Further, audiocast links that could be opened on the nurse educator's computer were not easily opened on the computer used for the presentation. Technical difficulties when learning how to play audiocasts were noted in previous studies of nursing and pharmacology students (Marrocco et al., 2014; Meade et al., 2011). Marrocco et al. (2014) found that, once assistance had been gained to use audiocasts, students were able to access the audiocasts and appreciated having the audiocasts to augment their learning. All four of the PAs attending the presentation voiced proficiency using iTunes to download songs or audiocasts. One recommendation from a stakeholder was to show more examples of the videos and audiocasts during the preview. The presentation to stakeholders was followed by an adaptation of the module to incorporate suggestions. The module was subsequently sent back to stakeholders with the updated recommendations.

Stakeholder feedback was a vital aspect in evaluation of the adult and pediatric trauma module. For the adult and pediatric module, the evaluation plan was put into action

simultaneously with implementation of the module. As declared by Iwasiw, Goldenberg, and Andrusyszyn (2009), “Ongoing evaluation results in small refinements that smooth implementation, fill identified gaps, and/or remove redundancies” (p. 10). The process of curriculum development is an iterative and dynamic process. Subsequent feedback from stakeholders will be a necessary component to assess whether the learning activities meet the needs of APPs in rural emergency care settings.

### **Limitations**

Through the course of the PIP, several limitations were identified. Project limitations represented areas for further learning and consideration for the researcher. The project limitations were:

1. Perhaps the most significant limitation was assuming that the roles of an NP or PA are similar enough to group into one category of APPs. For the purpose of the PIP, the overarching theme was to improve care for patients in rural emergency care settings. In many rural CAH emergency departments, the roles are being used interchangeably. In truth, the roles are very different. NPs are RNs who have advanced clinical training with a “unique emphasis on the health and well-being of the whole person” (American Association of Nurse Practitioners, n.d., Unique approach section, para. 1). PAs are health care providers who “practice medicine in partnerships with doctors and bring a breadth of knowledge and skills to patient care” (National Commission on Certification of Physician Assistants, n.d., For the public, “What is a certified PA,” para. 1). NP programs build on a baccalaureate nursing education framework while PA programs tend to follow a medical model (Bednar et al., 2007). When comparing NP and PA educational curriculums, Bednar et al.

(2007) discovered that content was very similar in both programs. The PIP was created to supplement APP education and experience for the purpose of improving care for patients in rural America. Learning opportunities developed within the emergency care curriculum and the adult and pediatric trauma module were designed for APPs but could also benefit RNs, family practice physicians, and other advanced practice nurses. While clearly the roles of NPs and PAs are quite different, the purposes of the project encompassed both roles.

2. The needs assessment sample size was small with only six respondents. There were several possible reasons for the small sample size. First, the needs assessment relied on emergency room directors to forward the email. The needs assessment may not have been forwarded to the APPs. Second, the needs assessment occurred in the summer month of July. Emergency department directors and APPs may have been on vacation during the one-month assessment period. Third, it is not known how many APPs were practicing in the ten selected hospitals. One emergency department director responded that APPs were not employed within her emergency department. There may be several other CAH emergency rooms that do not use APPs. Calling all of the CAH emergency departments to collect information about APPs utilized in the emergency department would be one way to determine the response rate. In the future, one might consider including a small incentive for respondents, expanding the needs assessment to all NPs and PAs in the state, or utilizing a venue such as a regional conference to implement the needs assessment. Despite the small sample size, the information collected in the needs assessment contained a wealth of information. Additionally, a need for emergency care education was previously

- identified in the literature review. The purpose of the needs assessment was to prioritize needs. Results from the small sample of six served the purpose of summarizing and prioritizing needs.
3. The needs assessment was adapted from a previous survey by Hart (Hart & Macnee, 2007). Altering the survey to include emergency care competencies may have affected the original reliability and validity of Hart's tool. Reliability and the validity of the adapted needs assessment tool was not established.
  4. The selection of the adult and pediatric trauma may have involved personal bias of the researcher. All six of the APPs considered cardiopulmonary disorders to be an area of need. While only five APPs ranked trauma as an area of need, it was ranked first by three of the APPs. The number of APPs ranking the module as first priority, along with the ease of incorporating other areas of need, were the reasons for selecting the first topic of trauma topic. As subsequent modules are developed based on the needs assessment findings, selection of the first module topic becomes less important. Development of subsequent modules will open up further opportunities for APPs to tailor learning to individual needs.
  5. Technology barriers were a substantial limitation. The inability to access iTunes within CentraCare Health, Long Prairie was a concern of several stakeholders. A major stakeholder discovered in the evaluation process was an information technology (IT) resource person. Involving the IT resource person early in the process of module development and during preparation of the presentation would have been immensely helpful. Permission to install iTunes on the hospital computers could have been obtained ahead of time. After the presentation of the evaluation, the

researcher explored the technology concerns with the IT resource person. The IT resource person expressed willingness to assist in future technology concerns. This will be imperative when introducing the module to other hospitals and healthcare organizations. The most commonly voiced concern of stakeholders was in regards to the audiocasts. The addition of audiocasts within the adult and pediatric trauma was to complement learning opportunities and to appeal to the auditory adult learner.

Without the audiocasts, the trauma module could stand alone. Audiocasts were added to enrich and expand the opportunities for learning.

6. The final limitation was related to time. Creation of the adult and pediatric trauma module took nearly three months. While a systematic process has been established for the development of future modules, creating high quality, future modules will take time. Additionally, evaluation of one module is an ongoing process that may take years. Not only is it important to evaluate module content, but also the learning that occurs from the module.

## **Recommendations**

Without question, further development, implementation, and evaluation of the emergency care curriculum and self-directed learning modules is highly recommended. Within the context of CentraCare Health, Long Prairie, continuing the process of fourth generation evaluation is important. The next step is to investigate claims, concerns, and issues that have not yet been resolved (Guba & Lincoln, 1989). Further qualitative information will need to be gathered with suggested follow up at three months, six months, and one year. Especially helpful would be implementation of the module for a new hire APP. One potential PIP arising from this project is evaluation of actual learning and achievement of emergency care competencies. The module

includes a post-module examination; however, other methods of assessing learning such as procedural skills evaluation and patient satisfaction should be explored. In keeping with fourth generation evaluation, ongoing negotiation and responsive focusing should occur. The emergency care curriculum will continue to be congruent with the organizational core values of (a) patient centered by improving emergency care for patients in rural CAHs, (b) collaboration in working jointly with stakeholders and APPs within CentraCare health to improve health care, and (c) stewardship through creating an emergency care curriculum utilizing a variety of easily accessible resources (CentraCare, 2013, About CentraCare Health, para. 5).

In relationship to the adult and pediatric trauma module, new information is found on a daily basis. Keeping the module up to date with recent evidence and newly discovered learning experiences is essential. At the time of project completion, the researcher plans to continue updating the adult and pediatric trauma module.

A key recommendation is to continue creating self-directed learning modules as part of the emergency care curriculum. Additionally, other recommendations from the needs assessment should be explored. Other recommendations were to (a) provide learning opportunities within a larger volume emergency room, (b) simulation, and (c) periodic workshops or conferences. The researcher has already started investigating and inquiring within CentraCare Health regarding learning opportunities at the St. Cloud Hospital emergency department and use of the simulation lab. Early inquiries have been positive.

The researcher has begun self-directed learning modules in the areas of cardiopulmonary disorders, airway and breathing, and sexual assault. The topics for subsequent modules in approximate order of importance were mentioned previously. While the development of

subsequent self-directed learning modules is planned by the researcher, other interested APPs and nurse educators could certainly be summoned to continue the project.

A wealth of online materials are available for APPs, nurses, physicians, and health care providers. The adult and pediatric trauma module was designed for APPs in any rural emergency care setting. One final goal of the PIP is to disseminate findings and sharing the self-directed learning module with other rural hospitals.

The adult and pediatric trauma module is easily adaptable for other health care providers and settings. For instance, the chest radiograph video series by Strong (2013) may be utilized by NPs or PAs in a clinic, home care, or hospital setting. Videos on learning to apply a cervical collar are also useful for EMTs, nurses, and physicians. Some parts of the trauma module would be helpful for an APP in a larger trauma center. While designed for a rural emergency department, the adult and pediatric trauma module would be an advantageous learning tool for health care providers in other settings providing that content is adapted where appropriate.

### **Implications for Practice**

This PIP provided a glimpse into the educational backgrounds and experiences that APPs bring to a role in rural emergency care. APPs were able to recognize gaps in their experience and education. Consistent with adult learning theory, APPs utilized self-directed learning methods to learn the emergency care role. In creating a self-directed learning module for APPs in rural emergency care settings, a wealth of high quality, online, and free material was discovered.

Dissemination of the PIP, including results from the needs assessment and the adult and pediatric trauma module, will be an ongoing process. The first step planned for dissemination is sharing the PIP with APPs within the larger organization of CentraCare Health. The researcher

will be sharing the needs assessment results, adult and pediatric trauma module, and any subsequently developed modules during an educational session for APPs within CentraCare Health on July 21, 2015. The second planned area for dissemination is a poster presentation for NPs attending the American Association of Nursing Practitioners national conference on June 11, 2015. Finally, an inquiry has been sent to the board of the AAENP for consideration of including the adult and pediatric trauma module to their website. Depending on the response from the AAENP, another planned outlet for dissemination of the PIP would be the Advanced Emergency Nursing Journal. Dissemination will include local and regional conferences within Minnesota and North Dakota in the coming year.

### **Implications for Future Research**

It is hoped that similar research can be conducted in rural CAH emergency departments to further clarify the orientation process that new APPs are receiving. It would be interesting to find how many CAH emergency departments are utilizing APPs as the sole provider with a physician on call. Moreover, if a rural CAH is not utilizing an APP, identifying the reasons would be immensely helpful. With the workforce shortages of physicians, APPs are being asked to fill needed roles including rural emergency care (American Hospital Association, 2011).

Further research should include outcome studies to assess learning and competency after completion of the self-directed learning modules. Moreover, having access to the self-directed learning module does not guarantee that it will be used. A utility study several months after implementation of a module would be of great benefit in module revision and evaluation. For some organizations, there may be a way to integrate the module into the orientation process to assure completion by new APPs. The overarching goal in the emergency care curriculum development was to improve the quality of care for patients in rural settings, enhance the

effectiveness and competency of the APP, and provide a framework for self-directed learning for the APP in rural emergency care settings.

### **Application to Doctor of Nursing Practice (DNP) Roles**

Attaining the DNP is a transformational experience which encompasses enhanced knowledge of health care issues and complex roles within the nursing profession (Moran, 2014). DNP roles incorporated within the PIP were scientist, organizational leader, educator, and informatics expert.

The DNP graduate blends scientific knowledge of nursing practice with knowledge from other disciplines to improve health care delivery (AACN, 2006). The PIP incorporates concepts from adult learning theory to ultimately improve health care delivery in rural emergency care settings. Further, by incorporating fourth generation evaluation, the DNP graduate considered behaviors of the adult learner in the context of learning the emergency care role.

Nursing leadership is critical in improving patient safety and excellence in nursing practice (AACN, 2006). The PIP was designed with the goal of improving care for patients in rural emergency care settings. Implementation of the adult and pediatric trauma module within CentraCare Health, Long Prairie utilized leadership skills in the areas of mobilizing organizational stakeholders, identifying systems' issues, cost effective approaches to the orientation process, and focusing on emergency care needs for the rural population.

In some circumstances, experienced gained from the DNP will enable the DNP graduate to educate the next generation of nurses (AACN, 2006). The PIP serves several complementary purposes of (a) improving the quality of care for patients in rural CAH emergency care settings, (b) identifying gaps in the evidence and practice of APP orientation in rural emergency care settings, (c) developing partnerships with other professionals to facilitate optimal care, and (d)

incorporating teaching strategies and learning principles related to adult learning theory into the DNP project. Information gained from the needs assessment and teaching strategies developed within the adult and pediatric trauma module will serve as a valuable resource for nurse educators.

Technology has become an integral part of providing quality patient care and transforming health care systems (AACN, 2006). Perhaps the greatest impact made by the PIP is in the realm of information technology. The PIP uses readily available online resources to improve patient care and the orientation process for APPs in rural emergency care settings. Standards for utilizing online resources were incorporated within the adult and pediatric trauma module. Further, an essential component of the needs assessment was implementing an assessment through the computerized data collection program of Qualtrics. DNP graduates must demonstrate technical skills and conceptual ability to extract data instrumental in improving patient care (AACN, 2006).

## **Conclusion**

Advanced practice providers have become an important solution to the health care crisis in rural communities. Increasingly, the role of advanced practice providers has expanded and evolved in order to meet the health care needs of patients in a variety of settings. One of these settings is emergency care. In several ways, the PIP reflected findings from the literature review. First, new graduate APPs and APPs without previous advanced practice emergency care experience are being hired into rural emergency care settings. Second, APPs are utilized as the sole emergency care provider with a physician on call. Third, it is not unusual for an APP to have less than a week of orientation to a rural emergency care setting. Finally, a variety of educational methods and time frames are employed when orientating APPs to rural emergency

care settings. Through a needs assessment, APPs recommended and prioritized desired strategies for learning the emergency care role. By incorporating recommended learning strategies with adult learning theory, a self-directed adult and pediatric trauma module was developed. It is hoped that the adult and pediatric module will be relevant and useful tool for APPs learning the emergency care role.

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## APPENDIX A. PERMISSION TO ADAPT SURVEY TOOL

**From:** Ann Marie Hart [mailto:AnnMHart@uwyo.edu]  
**Sent:** Thursday, September 19, 2013 4:00 PM  
**To:** Christine Olson  
**Subject:** RE: Request to see questionnaire

Hello –Thank you for your interest in the survey we did several years ago. You might be interested to know that I revised and re-administered the survey in 2012 and am getting ready to submit the results for publication now. –So, I’ve attached two documents: 1) a copy of the original 2004 survey (which was delivered by pen/paper) and 2) a copy of the 2012 survey (which was actually delivered electronically through Keysurvey – which is why the formatting is “off”. It looked much better electronically than it does in the attached PDF version!).

You are welcome to adapt either the 2004 or 2012 surveys to your needs. I just ask that you credit my survey in any publications.

Best wishes – Ann Marie  
Ann Marie Hart, PhD, FNP-BC  
Associate Professor  
NP Program Coordinator  
Fay W. Whitney School of Nursing  
University of Wyoming  
307-766-6564 - phone  
307-766-4294 - fax  
[annmhart@uwyo.edu](mailto:annmhart@uwyo.edu)

**From:** Christine Olson [mailto:chrolson@arvig.net]  
**Sent:** Thursday, September 19, 2013 1:56 PM  
**To:** Ann Marie Hart  
**Subject:** Request to see questionnaire

Dr. Hart,

I am a family nurse practitioner currently working in central Minnesota in a rural emergency room and hospital setting. I am also a DNP student at North Dakota State University, Fargo, North Dakota. I am looking at current practices for orientation of nurse practitioners in rural critical access hospital emergency rooms in Minnesota for my DNP scholarly project.

I was very interested in your article “How well are nurse practitioners prepared for practice: Results of a 2004 questionnaire study” published in the *Journal of the American Academy of Nurse Practitioners* in 2007.

I wanted to request, if possible, a copy of your developed questionnaire. I am interested in a few aspects related to how prepared nurse practitioners felt regarding the clinical areas; some of those

areas are also competencies for nurse practitioners in emergency care outlined by the Emergency Nurses Association in 2008.

Would this be possible?

Sincerely,  
Christine Olson, MS, FNP-BC  
320-815-0715  
13429 County Highway 42  
Parkers Prairie, MN 56361

**APPENDIX B. BREAKDOWN OF COMPETENCIES FOR NPS AND PAS**

<p align="center"><b>NURSE PRACTITIONER COMPETENCIES</b> Emergency nurses association, 2008   <a href="http://www.ena.org/practice-research/Practice/Quality/Documents/NPCompetencies.pdf">http://www.ena.org/practice-research/Practice/Quality/Documents/NPCompetencies.pdf</a></p>	<p align="center"><b>PHYSICIAN ASSISTANT COMPETENCIES</b> <b>SEMPA (Pas in the ED) and Emergency Medicine CAQ (italicized)</b>   <a href="http://www.sempa.org/resources/pas-in-the-ed/#sthash.RSQwjpFj.dpuf">http://www.sempa.org/resources/pas-in-the-ed/#sthash.RSQwjpFj.dpuf</a>  <i>(CAQ—advanced knowledge above and beyond entry level generalist; 3000 hours already logged as PA in emergency medicine within 6 years)</i></p>
<b>Management of patient health/illness status</b>	
	Membership on medical staff, including hospital privileges and voting privileges
	Active and ongoing involvement in the quality improvement activities in the department of emergency medicine
Triage patients' health needs/problems.	
Completes EMTALA-specified medical screening examination	Performing a medical screening exam
Responds to rapidly changing physiologic status of emergency care patients.	
Uses current evidence-based knowledge and skills in emergency care for the assessment, treatment, and disposition of acute and chronically ill and injured (e.g., physiologic, psychological, socio-economic, cultural) emergency patients.	Instructing and counseling patients regarding mental and physical health, including but not limited to the following: diet, disease, prevention, treatment and normal development
Specifically assesses and initiates appropriate interventions for violence, neglect, and abuse (e.g., physical, psychological, sexual, substance).	
Specifically assesses and initiates appropriate interventions and disposition for suicide risk.	
Assesses patient and family for levels of comfort (e.g., pain, palliative care, end of life, bad news) and initiates appropriate interventions.	

Recognizes, collects, and preserves evidence as indicated (e.g., forensic evidence).	
Orders and interprets diagnostic tests.	Ordering and interpreting diagnostic laboratory tests, radiological studies or various other therapies. Performing diagnostic and therapeutic studies
Orders pharmacologic and non-pharmacologic therapies.	Ordering medications.
Orders and interprets electrocardiograms.	Ordering of EKGs with interpretation <i>CAQ—electrocardiogram interpretation</i>
Orders and interprets radiographs.	Ordering and initial interpretations of radiological studies <i>CAQ—plain films (bone, soft tissues, abdominal series, etc)</i>
Assesses response to therapeutic interventions.	
Documents assessment, treatment, and disposition.	Taking patient histories and performing physical examinations of a patient and recording or dictating the history and physical in the medical record. Orders may be written or verbal Establishing diagnostic decision-making
	Administration of medications and injections <i>CAQ—peripheral venous access</i>
	<i>CAQ—CT scans, MRI's.</i>
<b>Professional role</b>	
	Performing diagnostic/therapeutic procedures, subject to state regulation and PA training/experience. Performing such other tasks, not prohibited by law, in which the physician assistant has been trained and is proficient to perform
Functions as a direct provider of emergency care services.	
Directs and clinically supervises the work of nurses and other health care providers.	
Participates in internal and external emergencies, disasters, and pandemics.	
Maintains awareness of known causes of mass casualty incidents and the treatment modalities required for emergency care.	

Acts in accordance with legal and ethical professional responsibilities (e.g., patient management, documentation, advance directives).	
	Writing admission orders as requested by the accepting or admitting physician per hospital and department policy
<b>Airway, breathing, circulation, and disability procedures</b>	
Assesses and manages a patient in cardiopulmonary arrest (e.g., neonatal resuscitation, leads code team, rapid response team).	Advanced Trauma Life Support including all procedures Advanced Cardiac Life Support including all procedures Advanced Pediatric Life Support including all procedures <i>CAQ—cardiac pacing, defibrillation/cardioversion, resuscitation cardiopulmonary, fluid resuscitation</i>
Assesses and manages airway (e.g., endotracheal intubation, ventilated patients).	Intubation - Endotracheal/Nasal <i>CAQ—intubation, mechanical ventilation, capnometry, non-invasive ventilator management.</i>
Assesses and obtains advanced circulatory access (e.g., intraosseous).	Interosseous needle placement Venous access, peripheral/cutdown Central line placement <i>CAQ—central venous access, intraosseous infusion</i>
Assesses and manages patients with disability (e.g., neurologic).	
Assesses and manages procedural sedation patients.	Procedural sedation management <i>CAQ—procedural anesthesia, conscious sedation</i>
	Arterial puncture and blood gas sampling <i>CAQ—arterial access for diagnostics and placement of arterial lines</i>
<b>Skin and wound care procedures</b>	
Performs ultraviolet examination of skin and secretions (e.g., Woods Lamp).	
Treats skin lesions (e.g., foot callus, skin tag, plantar lesion, decubitus care).	Wound care
Injects local anesthetics.	<i>CAQ—local anesthesia</i>

Performs nail trephination.	Nail trephination/removal
Removes toe nail(s) (e.g., partial or complete removal for ingrown toe nail).	
Performs a nail bed closure	
Performs closures (e.g., single layer, multiple, staple, adhesive).	Laceration repair - simple intermediate, complex <i>CAQ—superficial/deep wound closure</i>
Revises a wound for closure.	
Debrides minor burns (e.g., non-adhering blister).	Debridement of burns, abrasions and abscesses
Incises, drains, irrigates, and packs wounds.	Abscess incision and drainage <i>CAQ—incision and drainage, wound debridement, soft tissue aspiration</i>
<b>Head, eye, ear, nose, and throat procedures</b>	
Dilates eye(s).	
Performs fluorescein staining.	
Performs tonometry to assess intraocular pressure.	Tonometry, ocular <i>CAQ—tonometry</i>
Performs Slit lamp examination.	Slit lamp diagnostic and rust ring removal <i>CAQ—slit lamp examination</i>
Performs cerumen impaction curettage.	
Controls epistaxis.	Epistaxis management <i>CAQ—control of epistaxis</i>
<b>Chest and abdomen</b>	
	Emergency ultrasonography
	Paracentesis
Performs a needle thoracostomy for life-threatening conditions in emergency situations (e.g., tension pneumothorax).	Thoracentesis Thoracostomy tube insertion <i>CAQ—thoracentesis, thoracostomy</i>
Replaces a gastrostomy tube.	Nasogastric/Orogastric tube placement, lavage and management
<b>Neck, back, and spine procedures</b>	
Clinically assesses and manages cervical spine.	<i>CAQ—clearing a cervical spine</i>
Performs lumbar puncture	Lumbar puncture <i>CAQ—lumbar puncture</i>

<b>Gynecologic, genitourinary, and rectal procedures</b>	
Incises and drains a Bartholin's cyst.	
Assists with imminent childbirth and post-delivery maternal care.	Obstetrical patient evaluation
Removes fecal impactions.	
Incises thrombosed hemorrhoids.	
Performs sexual assault examination.	
	Anoscopy
	Urethral catheter placement and management
<b>Extremity procedures</b>	
	Regional block anesthesia including double cuff method/bier block
Performs digital nerve block.	<i>CAQ—digital anesthesia</i>
Reduces fractures of small bones (e.g., fingers, toes).	Fracture Reduction Immobilization techniques (spine, long bone, etc.) <i>CAQ—fracture/dislocation management</i>
Reduces fractures of large bones with vascular compromise (e.g., traction splint).	Fracture Reduction Immobilization techniques (spine, long bone, etc.) <i>CAQ—fracture/dislocation management</i>
Reduces dislocations of large and small bones.	Dislocation reduction management <i>CAQ—fracture/dislocation management</i>
Applies immobilization devices (e.g., splint).	Cast and Splint application
Bivalves/removes casts.	
Performs arthrocentesis (e.g., knee, elbow).	Arthrocentesis <i>CAQ—joint aspiration</i>
Measures compartment pressure.	
	Extensor tendon repair
<b>Other</b>	
Performs radio communication with prehospital units.	
Interprets patient diagnostics (e.g., vital signs, 12-lead ECGs) as communicated by prehospital personnel.	Ordering of EKGs with interpretation <i>CAQ—electrocardiogram interpretation</i>
Removes foreign bodies (e.g., from orifices and soft tissue).	Foreign body removal: ears, nose, rectum, soft tissue, throat, vaginal
	Other interventions or procedures as directed by the supervising physician -

	Referring patients to appropriate specialists, health facilities, agencies and resources. Also referring and conversing with appropriate consultants in regard to patient management.
--	---

## APPENDIX C. NEEDS ASSESSMENT INSTRUMENT

Block 1: Introduction Letter Block Options

Q43 Settings

Department of Nursing  
Sudro Hall 136  
Fargo, ND 58108-6050  
701.231.5692

Title of Practice Improvement Project: Emergency Care Education for Advanced Practice Providers in Rural Critical Access Hospitals

Dear Colleague,

My name is Christine Olson. I am currently a family nurse practitioner and post master's doctoral student at North Dakota State University. I am asking for your help with a practice improvement project exploring current methods of education for advanced practice providers to emergency care settings in rural Critical Access Hospital Emergency Departments in Minnesota. This project includes both nurse practitioners and physician assistants. If you currently practice in a Critical Access Hospital Emergency Department, I hope you will take a few minutes to answer the needs assessment questionnaire. With this information, I plan to create an interprofessional educational curriculum for advanced practice providers in this setting.

All questionnaire responses will be kept confidential. The questionnaire is anonymous and contains no personal identifying items. Your participation is entirely voluntary and your completion of the online survey implies your consent to participate. You may change your mind or quit participating at any time, with no penalty. IRB approval from North Dakota State University has been obtained.

Thank you in advance for your participation in this needs assessment. I believe that this information will be vital for identifying best practices for education to rural emergency care and determining potential areas for improvement. The questionnaire should take less than 10 minutes to complete. Completion of the survey will constitute your consent to participate in the survey.

The survey will be available from July 1, 2014 through July 31, 2014.

If you have any questions or comments, please feel free to contact me at christine.m.olson@my.ndsu.edu or call me at 320.815.0715. You may also contact my advisor, Dr. Mykell Barnacle by email at mykell.barnacle@ndsu.edu or by phone at 701.231.7730. You have rights as a research participant. If you have questions about the rights of human participants in research, or to report a problem, contact the North Dakota State University IRB Office by telephone at 701.231.8045, by e-mail at NDSU.IRB@ndsu.edu, or by mail at NDSU Sponsored Programs Administration, 1735 NDSU Research Park Drive, NDSU Dept 4000, PO Box 6050, Fargo, ND 58108 -6050.

Thank you again for your participation in this practice improvement project.

Sincerely,

Christine M. Olson, MS, RN, FNP-BC  
Family Nurse Practitioner and Doctoral Student

Copy Items From... Create a New Item

Minimize Block Add Block

Block 8: CAH ER Question Block Options

Q1 Settings

Do you currently practice at least 12 hours a month in a Critical Access Hospital emergency department in Minnesota?

Yes  
 No

Q41 Settings

**Display This Question:**  
If Do you currently practice at least 12 hours a month in a Critical Access Hospital emergency department in Minnesota? font-size: 16px; is Selected [Edit](#)

This is to confirm your choice. Selecting "No" will end the survey.

Do you currently practice at least 12 hours a month in a Critical Access Hospital emergency department in Minnesota?

Yes  
 No

If No is Selected, Then Skip To End of Survey Skip Logic

Block 2: NP or PA Question
Block Options

**Q2**

Are you a nurse practitioner or physician assistant?

Nurse Practitioner (NP)  
 Physician Assistant (PA)  
 Neither of the above choices

**Q42**

**Display This Question:**  
 If Are you a nurse practitioner or physician assistant? Neither of the above choices is Selected [Edit](#)

This question is to confirm your answer.  
 Are you a nurse practitioner or physician assistant? Selecting "Neither" will exclude you from the survey.

Nurse Practitioner (NP)  
 Physician Assistant (PA)  
 Neither of the above choices.

If Neither of the above choices. is Selected, Then Skip To End of Survey Skip Logic

---

Block 3: NP Program Details
Block Options

**Q3**

What type of program did you complete? (select all that apply)

Acute Care Nurse Practitioner  
 Adult Nurse Practitioner  
 Emergency Nurse Practitioner  
 Family Nurse Practitioner  
 Geriatric Nurse Practitioner  
 Pediatric Nurse Practitioner  
 Other, please list

---

Q13
+

How long have you been employed in your current emergency care position?

Less than a year  
 1-2 years  
 3-5 years  
 6-9 years  
 Over 9 years

-  
  
+

---

Q9

Prior to starting your NP education, did you have previous healthcare experience as a registered nurse (RN)?

Yes  
 No

**Q10**  

**Display This Question:**  
 If Prior to starting your NP education, did you have previous healthcare experience as a registered nurse (RN)?  
 <span style="font-size: 16px;">Yes</span> Is Selected [Edit](#)

How many years did you spend as a **practicing RN** in each of the following settings? (if none, please enter zeroes; if less than a year, please report as fractions.)

Critical Care	<input type="text" value="0"/>
Emergency department	<input type="text" value="0"/>
Home health care	<input type="text" value="0"/>
Inpatient maternity	<input type="text" value="0"/>
Inpatient medical/surgical unit	<input type="text" value="0"/>
Inpatient pediatrics	<input type="text" value="0"/>
Other inpatient setting	<input type="text" value="0"/>
Outpatient clinic	<input type="text" value="0"/>
Public health	<input type="text" value="0"/>
Residential or long term care facility	<input type="text" value="0"/>
School/college clinic	<input type="text" value="0"/>
School/college teaching	<input type="text" value="0"/>
Other (please specify) <input type="text"/>	<input type="text" value="0"/>
<b>Total</b>	<input type="text" value="0"/>

**Q12**  

Prior to starting your NP education, did you have previous experience as an Emergency Medical Technician or paramedic?

Yes (specify number of years)

No

Page Break

**Q14**  

Did you have previous experience as a NP in **emergency care**?

Yes  
 No

**Q15**  

**Display This Question:**  
 If Did you have previous experience as a NP in emergency care? <span style="font-size: 16px;">Yes</span> Is Selected [Edit](#)

How many years of experience as a NP in **emergency care** did you have prior to your current position?

Less than a year  
 1-2 years  
 3-5 years  
 6-9 years  
 Over 9 years

Page Break

**Q16**  

Did you have previous experience as a NP in settings **other** than emergency care?

Yes  
 No

Q17

**Display This Question:**  
 If Did you have previous experience as a NP in settings other than emergency care? <span style="font-size: 16px;">Yes</span> Is Selected Edit

How many years did you practice as a nurse practitioner in each of the following settings? (if none, please enter zeros: if less than a year, please report as fractions.)

Adult health/internal medicine clinic	<input type="text" value="0"/>
Family practice or primary care	<input type="text" value="0"/>
Hospital medicine	<input type="text" value="0"/>
Intensive care or critical care	<input type="text" value="0"/>
Long term care	<input type="text" value="0"/>
Pediatric clinic	<input type="text" value="0"/>
Public or community health	<input type="text" value="0"/>
School or college health	<input type="text" value="0"/>
Urgent care or walk-in clinic	<input type="text" value="0"/>
Women's health	<input type="text" value="0"/>
Other specialty care area(s), please list <input type="text"/>	<input type="text" value="0"/>
Total	<input type="text" value="0"/>

Q18

Have you received specialized training in a military field?

Yes  
 No

Minimize Block Add Block

Block 9: PA Details Block Options

Q33

How long have you been employed in your current emergency care position?

Less than a year  
 1-2 years  
 3-5 years  
 6-9 years  
 Over 9 years

Page Break

Q28

What type of program did you complete? (select all that apply)

Generalist or primary care  
 Specialty care (please describe)   
 Post-graduate residency or fellowship program (please describe)

Page Break

Q29

Prior to starting your PA education, did you have previous healthcare experience as a registered nurse (RN)?

Yes  
 No

**Q30**    
▶ **Display This Question:**   
 If Prior to starting your PA education, did you have previous healthcare experience as a registered nurse (RN)?   
▶ Yes  Selected Edit

How many years did you spend as a practicing RN in each of the following settings? (if none, please enter zeroes. if less than a year, please report as fractions.)

Critical Care	<input type="text" value="0"/>
Emergency department	<input type="text" value="0"/>
Home health care	<input type="text" value="0"/>
Inpatient maternity	<input type="text" value="0"/>
Inpatient medical/surgical unit	<input type="text" value="0"/>
Inpatient pediatrics	<input type="text" value="0"/>
Other inpatient setting	<input type="text" value="0"/>
Outpatient clinic	<input type="text" value="0"/>
Public health	<input type="text" value="0"/>
Residential or long term care facility	<input type="text" value="0"/>
School/college clinic	<input type="text" value="0"/>
School/college teaching	<input type="text" value="0"/>
Other (please specify) <input type="text" value=""/>	<input type="text" value="0"/>
<b>Total</b>	<input type="text" value="0"/>

Page Break

**Q31**    
▶ Prior to starting your PA education, did you have previous experience as an Emergency Medical Technician or paramedic?

- Yes (specify number of years)
- No

**Q34**    
▶ Did you have previous experience as a PA in **emergency care**?

- Yes
- No

**Q35**    
▶ **Display This Question:**   
 If Did you have previous experience as a PA in emergency care?   
▶ Yes  Selected Edit

How many years of experience as a PA in **emergency care** did you have prior to your current position?

- Less than a year
- 1-2 years
- 3-5 years
- 6-9 years
- Over 9 years

Page Break

**Q37**    
▶ Did you have previous experience as a PA in settings **other** than emergency care?

- Yes
- No

**Q38**  +

**Display This Question:**  
 If Did you have previous experience as a PA in settings other than emergency care? Yes is Selected [Edit](#)

How many years did you practice as a physician assistant in each of the following settings?  
 (If none, please enter zeros; if less than a year, please report as fractions.)

Adult health/internal medicine clinic	<input type="text" value="0"/>
Family practice or primary care	<input type="text" value="0"/>
Hospital medicine	<input type="text" value="0"/>
Intensive care or critical care	<input type="text" value="0"/>
Long term care	<input type="text" value="0"/>
Pediatric clinic	<input type="text" value="0"/>
Public or community health	<input type="text" value="0"/>
School or college health	<input type="text" value="0"/>
Urgent care or walk-in clinic	<input type="text" value="0"/>
Women's health	<input type="text" value="0"/>
Other specialty care area(s), please list <input type="text"/>	<input type="text" value="0"/>
<b>Total</b>	<input type="text" value="0"/>

**Q41**

Have you completed a CAQ (certificate of added qualification) for PAs in emergency care?

Yes  
 No

**Q39**

Have you received specialized training in a military field?

Yes  
 No

Minimize Block Add Block

---

Block 4: Orientation Details Block Options

**Q19**

What is the model of care within your facility?

Sole provider with physician on call  
 Additional provider during busier times of the day/week  
 Second provider for less urgent problems or walk-in clinic  
 Other (please specify)

**Q20**

In your current position, how long was your current orientation or training to emergency care?

Less than a week  
 1-2 weeks  
 3-4 weeks  
 5-6 weeks  
 7-8 weeks  
 2-3 months  
 3-4 months  
 Over four months

**Q21**

Was your orientation or training specific to emergency care?

Yes  
 No (other areas were included)

**Q22**

▼

**Display This Question:**

If Was your orientation or training specific to emergency care? No (other areas were included) </span> Is Selected [Edit](#)

What other areas were included in your orientation? (check all that apply)

- Family practice or other outpatient clinic
- Inpatient care
- Long term care
- Urgent care or walk-in clinic
- Other (please specify)

---

**Q23**

▼

What certifications were included in your orientation or training? (check all that apply)

- BLS-Basic Life Support
- ACLS-Advanced Cardiac Life Support
- CALS-Comprehensive Advanced Life Support
- ATLS-Advanced Trauma Life Support
- PALS-Pediatric Advanced Life Support or other pediatric life support course
- Other (please specify)

---

**Q24**

▼

What emergency care specific education was included in your orientation or training? (check all that apply)

- Classroom or class meetings
- Internet instruction or modules
- Videos or other audiovisual modality
- Shadowing with another NP or PA
- Shadowing with a physician
- Assigned a preceptor
- Mentoring
- Telemedicine instruction
- Simulation
- Ultrasound course
- Airway course
- Regional conference (please specify)
- National conference (please specify)
- Other (please specify)
- None of the above

---

**Q29**

▼

Did you prepare for your current position in other ways that were not provided by your place of employment?

---

**Q30**

▼

Can you suggest any changes to your orientation or training to emergency care that would have improved your preparedness to practice?

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Q25



Considering your experiences from your educational program, previous work experiences, and your orientation or training in your current position, how prepared were you for actual practice in the following clinical areas?

	Very unprepared	Minimally prepared	Somewhat prepared	Generally well prepared	Very well prepared
Electrocardiogram interpretation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radiograph interpretation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CT scan interpretation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Manage adult patient in cardiopulmonary arrest	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Manage pediatric patient in cardiopulmonary arrest	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emergency airways (e.g. King, Combitube, LMA)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Endotracheal intubation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CPAP/BIPAP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Very unprepared	Minimally prepared	Somewhat prepared	Generally well prepared	Very well prepared
Rapid sequence intubation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local and regional anesthetics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Single layer laceration repair	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Complex or deep wound closure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Minor burn debridement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Abscess incision, drainage, and wound packing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nail injury (regeneration, removal, or nail bed closure)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Immobilization devices-management of splints or casts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Very unprepared	Minimally prepared	Somewhat prepared	Generally well prepared	Very well prepared
Procedural sedation or anesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fracture or dislocation reduction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eye care: dilatation, tonometry, slit lamp, foreign body removal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Epistaxis control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cervical spine management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lumbar puncture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Needle thoracostomy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thoracentesis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Very unprepared	Minimally prepared	Somewhat prepared	Generally well prepared	Very well prepared
Intraosseous access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EMTALA-specified medical screening exam	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Imminent childbirth and post-delivery maternal care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sexual assault exam	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Block 6: Educational Needs Block Options

**Q26**

In considering educational needs for a nurse practitioner or physician assistant beginning practice in rural emergency care, please rank the top five areas of need (1 through 5 in order of importance). Rank only the top five areas.

- Anaphylaxis
- Burn care
- Cardiopulmonary disorders
- Disaster and mass casualty incidents
- Drug and alcohol problems
- Electrolytes and acid/base disorders
- EMTALA and medical screening exam
- Endocrine emergencies (diabetes and thyroid)
- Fracture and dislocation
- Gastrointestinal problems
- Genitourinary problems
- HEENT (Head, Eyes, Ears, Nose, Throat) problems
- Kidney injury and disorders
- Mental health emergencies
- Neurological problems
- Oncology emergencies
- Palliative and end-of-life care
- Sepsis
- Septic joint
- Sexual Assault
- Shock
- Toxin exposure
- Trauma

Page Break

**Q27**

What is your preferred method of learning the emergency care role?

Please rank 1 through 3 in order of preference. Select only three.

- Classroom or class meetings
- On the job with another NP or PA
- On the job with a family physician at your facility
- On the job with a board certified emergency medicine physician
- Training opportunities within a larger volume emergency department
- Mentoring
- Self-study with Internet instruction and modules
- Simulation exercises
- Conference or regional meetings
- Monthly or quarterly workshops
- Residency specific to emergency care

**Q28**

Please specify any other preferences or thoughts regarding learning the emergency care role.

Block 7: Comments Block Options

**Q38**

Thank you so much for your time and answers.

**Q31**

Do you have any further comments?

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## APPENDIX D. NDSU IRB APPROVAL



May 2, 2014

FederalWide Assurance FWA00002439

Mykell Barnacle  
Dept. of Nursing  
118B Sudro Hall

**Re:** IRB Certification of Exempt Human Subjects Research:  
Protocol #PH14263, "Emergency Care Education for Advanced Practice Providers in Rural  
Critical Access Hospitals"

Co-investigator(s) and research team: **Christine Olson**

Certification Date: 5/2/2014      Expiration Date: 5/1/2017  
Study site(s): **Online survey**  
Funding: n/a

The above referenced human subjects research project has been certified as exempt (category # 1, 2) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, *Protection of Human Subjects*). This determination is based on revised materials (received 5/2/2014).

Please also note the following:

- If you wish to continue the research after the expiration, submit a request for recertification several weeks prior to the expiration.
- Conduct the study as described in the approved protocol. If you wish to make changes, obtain approval from the IRB prior to initiating, unless the changes are necessary to eliminate an immediate hazard to subjects.
- Notify the IRB promptly of any adverse events, complaints, or unanticipated problems involving risks to subjects or others related to this project.
- Report any significant new findings that may affect the risks and benefits to the participants and the IRB.
- Research records may be subject to a random or directed audit at any time to verify compliance with IRB standard operating procedures.

Thank you for your cooperation with NDSU IRB procedures. Best wishes for a successful study.  
Sincerely,

A handwritten signature in black ink, appearing to read "Teryl Grosz".

Teryl Grosz, MS, CIP  
Manager, Human Research Protection Program

INSTITUTIONAL REVIEW BOARD  
NDSU Dept 4000 | PO Box 6050 | Fargo ND 58108-6050 | 701.231.8995 | Fax 701.231.8098 | ndsu.edu/irb

Shipping address: Research 1, 1735 NDSU Research Park Drive, Fargo ND 58102

NDSU is an EO/AA university.

## APPENDIX E. IRB APPROVAL FROM CENTRACARE HEALTH

**From:** Schmidt, Tiffany  
**Sent:** Friday, May 30, 2014 9:03 AM  
**To:** Christine Olson (Nurse Practitioner)

**Subject:**

Good morning Christine!

This email is to confirm that your project does not need to go to the SCH IRB as you will not be enrolling any patients nor will you be reviewing medical records. If this were to change in the future please let me know and we can work on the IRB application together.

Please let me know if you have any additional questions. Good luck on your project!

Thank you,

Tiffany

*Tiffany Schmidt, CCRP  
Research Operations Officer  
Centracare Health System  
(320) 251-2700 ext. 54536*

**From:** Olson, Christine (Nurse Practitioner)  
**Sent:** Thursday, May 29, 2014 12:29 PM  
**To:** Schmidt, Tiffany  
**Cc:** Olson, Christine (Nurse Practitioner)  
**Subject:**

Tiffany,

I just wanted to follow up after our phone conversation earlier this week about my DNP project for North Dakota State University (NDSU), Fargo, ND.

My project is "Emergency Care Education for Advanced Practice Providers in Rural Critical Access Hospitals". I will be completing a needs assessment among rural advanced practice providers in the region. The project includes creating an educational curriculum for new providers who begin practice in rural hospital emergency rooms. IRB approval has been obtained from NDSU.

The project **will not** involve interviewing or collecting any information from patients or reviewing medical records.

If you could respond back to this email that St. Cloud Hospital IRB approval is not needed for this project, that would be very much appreciated.

Christine Olson, MS, RN, FNP-BC, DNP-S  
Nurse Practitioner--CentraCare Health  
Doctor of Nursing Practice student--NDSU

## **APPENDIX F. EMAIL LETTER TO EMERGENCY DEPARTMENT DIRECTOR**

Dear Emergency Department Director or Administrator,

My name is Christine Olson. I am currently a family nurse practitioner and post master's doctoral student at North Dakota State University. I am asking for your help with a practice improvement project exploring current methods of education for advanced practice providers, both nurse practitioners and physician assistants, to emergency care settings in rural Critical Access Hospital Emergency Departments in Minnesota. With this information, I plan to create an interprofessional educational curriculum for advanced practice providers in this setting.

I am asking for your help in distributing my needs assessment tool to nurse practitioners (NPs) and physician assistants (PAs) who work at least 12 hours a month in your emergency department. **This would be distributed by forwarding this email to those NPs and PAs in your organization who work at least 12 hours a month in your emergency department.** All questionnaire responses will be kept confidential. The questionnaire is anonymous and contains no personal identifying items. All procedures for the study have been approved by the Institutional Review Board at North Dakota State University. **An anonymous link to the survey is below.**

If you do not currently utilize nurse practitioners or physician assistants in your emergency room, it would be very helpful if you would email me with that information.

If you have any questions or comments, please feel free to contact me at christine.m.olson@my.ndsu.edu or call me at 320.815.0715. You may also contact my advisor, Dr. Mykell Barnacle by email at mykell.barnacle@ndsu.edu or by phone at 701.231.7730. You have rights as a research participant. If you have questions about the rights of human participants in research, or to report a problem, contact the North Dakota State University IRB Office by telephone at 701.231.8045, by e-mail at NDSU.IRB@ndsu.edu, or by mail at NDSU Sponsored Programs Administration, 1735 NDSU Research Park Drive, NDSU Dept 4000, PO Box 6050, Fargo, ND 58108-6050.

Thank you again for your participation in this practice improvement project.

Sincerely,

Christine M. Olson, MS, RN, FNP-BC  
Family Nurse Practitioner and Doctoral Student

**Follow this link to the Survey:**

[\\${1://SurveyLink?d=Get Started on Needs Assessment for Emergency Care Education}](#)

Or copy and paste the URL below into your internet browser:

[\\${1://SurveyURL}](#)

## APPENDIX G. EMAIL LETTER TO APP

NDSU North Dakota State University  
Department of Nursing  
Sudro Hall 136  
Fargo, ND 58108-6050  
701.231.5692

Title of Practice Improvement Project: Emergency Care Education for Advanced Practice Providers in Rural Critical Access Hospitals

Dear Colleague,

My name is Christine Olson. I am currently a family nurse practitioner and post master's doctoral student at North Dakota State University. I am asking for your help with a practice improvement project exploring current methods of education for advanced practice providers to emergency care settings in rural Critical Access Hospital Emergency Departments in Minnesota. This project includes both nurse practitioners and physician assistants. If you currently practice in a Critical Access Hospital Emergency Department, I hope you will take a few minutes to answer the needs assessment questionnaire. With this information, I plan to create an interprofessional educational curriculum for advanced practice providers in this setting.

All questionnaire responses will be kept confidential. The questionnaire is anonymous and contains no personal identifying items. Your participation is entirely voluntary and your completion of the online survey implies your consent to participate. You may change your mind or quit participating at any time, with no penalty. All procedures for the study have been approved by the Institutional Review Board at North Dakota State University.

Thank you in advance for your participation in my needs assessment. I believe that this information will be vital for identifying best practices for education to rural emergency care and determining potential areas for improvement. The questionnaire should take less than 10 minutes to complete. Completion of the survey will constitute your consent to participate in the survey.

The survey will be available from July 1, 2014 through July 31, 2014. ***To complete the survey, please click on the link below.***

If you have any questions or comments, please feel free to contact me at christine.m.olson@my.ndsu.edu or call me at 320.815.0715. You may also contact my advisor, Dr. Mykell Barnacle by email at mykell.barnacle@ndsu.edu or by phone at 701.231.7730. You have rights as a research participant. If you have questions about the rights of human participants in research, or to report a problem, contact the North Dakota State University IRB Office by telephone at 701.231.8045, by e-mail at NDSU.IRB@ndsu.edu, or by mail at NDSU Sponsored

Programs Administration, 1735 NDSU Research Park Drive, NDSU Dept 4000, PO Box 6050,  
Fargo, ND 58108-6050.

Thank you again for your participation in this practice improvement project.

Sincerely,

Christine M. Olson, MS, RN, FNP-BC  
Family Nurse Practitioner and Doctoral Student

**Follow this link to the Survey:**  
Emergency Care Education Needs Assessment

Or copy and paste the URL below into your internet browser:  
[https://ndstate.co1.qualtrics.com/SE/?SID=SV\\_0we81xr5XQI3si1&Preview=Survey&\\_=1](https://ndstate.co1.qualtrics.com/SE/?SID=SV_0we81xr5XQI3si1&Preview=Survey&_=1)

## APPENDIX H. EMERGENCY CARE EDUCATION CURRICULUM OUTLINE

### CLINICAL CONDITIONS

#### 1. CARDIOPULMONARY

- a. Cardiac source: acute coronary syndrome, arrhythmia
- b. Heart failure
- c. Aortic dissection
- d. Pulmonary embolism
- e. Pneumonia
- f. Non-cardiac chest pain
- g. Cardiac arrest
- h. Pneumothorax
- i. Pediatric respiratory illness
- j. Asthma
- k. Chronic obstructive pulmonary disease

#### 2. METABOLIC

- a. DKA and HONK
- b. Hypoglycemia
- c. Hyper/hypokalemia
- d. Hyper/hypocalcemia
- e. Hyper/hyponatremia
- f. Thyroid storm/Myxedema coma

#### 3. NEUROLOGY

- a. Stroke/TIA
- b. Seizure
- c. Spinal emergencies—spinal epidural abscess, cauda equina
- d. Meningitis
- e. Migraines
- f. Bell's Palsy
- g. Vertigo

#### 4. HEENT

- a. Peritonsillar abscess
- b. Epiglottitis
- c. Mastoiditis
- d. Epistaxis
- e. Ludwig's angina
- f. Dental emergencies
- g. Acute angle closure glaucoma
- h. Periorbital cellulitis
- i. Herpes zoster ophthalmicus

- j. Foreign bodies
- 5. MUSCULOSKELETAL
  - a. Fracture management
  - b. Dislocations
  - c. Tendon lacerations
  - d. Compartment syndrome
- 6. GASTROINTESTINAL AND GENITOURINARY
  - a. Bleed
  - b. Pancreatitis
  - c. Abdominal aortic aneurysm
  - d. Appendicitis
  - e. Testicular/Ovarian torsion
  - f. Mesenteric ischemia
  - g. Bowel obstructions, volvulus, intussusception
  - h. Biliary disorders
  - i. Tuboovarian abscess
- 7. RENAL
  - a. Acute kidney injury
  - b. Stones
  - c. Pyelonephritis
- 8. INFECTIOUS DISEASE
  - a. Sepsis
  - b. Febrile neutropenia
  - c. Septic joint
  - d. Cellulitis
  - e. Abscess
  - f. PID
  - g. Tick-borne illnesses
- 9. ANAPHYLAXIS
- 10. INGESTION
  - a. Drug overdose
  - b. Alcohol intoxication
  - c. Other ingestions
  - d. Farm accident exposures
- 11. TRAUMA
  - a. Hypo/hyperthermia
  - b. Burns
  - c. Shock
  - d. Thoracic trauma

- e. Abdominal and pelvic trauma
  - f. Head trauma
  - g. Spine and spinal cord trauma
  - h. Musculoskeletal
  - i. FAST ultrasound
12. ACUTE PSYCH
- a. Excited delirium and psychosis
  - b. Chemical dependency/withdrawal

#### EMERGENCY CARE CONSIDERATIONS

1. Patient satisfaction
2. EMTALA and Medical Screening Examination
3. Core measures and quality metrics
4. Hospital resources and specialty availability
5. Transitions in care
  - a. Transfers
  - b. Handoffs
  - c. Admissions
6. Care of dying patient/palliative care
7. Emergency Medical Services—overview, prehospital care, etc.
8. Culture care

#### PROCEDURES

1. HEENT: Slit lamp, epistaxis (nasal cautery, packing, or balloon placement), foreign body (nose, ear, eye), peritonsillar abscess drainage, dental blocks, and tonometry.
2. Endotracheal intubation, direct and videolaryngoscopy
3. Rapid sequence intubation
4. Procedural sedation and analgesia
5. Transtracheal needle ventilation
6. Cricothyrotomy
7. Difficult airway algorithm
8. Chest tube thoracostomy
9. Cardiopulmonary resuscitation
10. Cardiac defibrillation and synchronized cardioversion
11. Transthoracic pacemaker use
12. Intraosseous access
13. Lumbar puncture
14. Burn care and debridement
15. I & D of subcutaneous abscess

16. Wound exploration and evaluation
17. Nail trephination
18. Laceration repair
19. Interpretation of electrocardiograms
20. Regional and local anesthesia
21. Excision of thrombosed hemorrhoids
22. Childbirth, emergent
23. Arthrocentesis
24. Joint injection
25. Reduction of extremity fracture
26. Reduction of joint dislocations
27. FAST (ultrasound)
28. Placement and removal of PEG tubes—Mickey

## APPENDIX I. INSTRUCTIONAL PLANNING WORKSHEETS

Table I.1. Emergency Care Core Competencies—Clinical Conditions

Topic Area	Learning Activities									Assessment Procedures/ Competency				
			Certification Courses											
	Self-directed learning modules	Conferences/Courses	ACLS	CALS	ATLS	PALS/or other	Simulation	CALS Lab			Checklist/Clinical Practice	Simulation	CALS Lab	
1. CARDIO-PULMONARY	X	X	X	X							X			
2. METABOLIC	X							X			X			
3. NEUROLOGY	X							X			X			
4. HEENT	X							X			X			
5. MUSCULO-SKELETAL	X							X			X			
6. GASTRO-INTESTINAL AND GENITO-URINARY	X							X			X			
7. RENAL	X							X			X			
8. INFECTIOUS DISEASE	X							X			X			
9. ANAPHYLAXIS	X							X			X			
10. INGESTION-OVERDOSE	X							X			X			
11. TRAUMA	X	X						X			X			
12. ACUTE PSYCH	X													

Table I.2. Emergency Care Considerations

	Learning Activities									Assessment Procedures/Competency				
	Self-directed learning modules	Conference/Courses	Certification Courses				Simulation	CALs Lab			Checklist/ Clinical Practice	Simulation	CALs Lab	
			ACLS	CALS	ATLS	PALS/or other								
1. Patient satisfaction	X													
2. EMTALA and Medical Screening Examination	X			X										
3. Core measures and quality metrics	X													
4. Hospital resources and specialty availability	X				X									
5. Transitions in care a. Transfers b. Handoffs c. Admissions	X													
6. Care of dying patient/palliative care	X													
7. Emergency Medical Services—overview, prehospital care	X			X	X									
8. Culture care	X							X		X				

Table I.3. Emergency Care Core Competencies—Diagnostic and Therapeutic Procedures

	Learning Activities									Assessment Procedures/Competency			
			Certification Courses										
	Self-directed learning modules	Conferences/Courses	ACLS	CALS	ATLS	PALS/or other	Simulation	CALS Benchmark Lab		Checklist/Clinical	Simulation	CALS Lab	
1. HEENT: Slit lamp, epistaxis, foreign body, peritonsillar abscess, dental blocks, and tonometry.	X	X					X	X		X			
2. Endotracheal intubation, direct and video	X	X	X	X	X	X	X	X		X	X	X	
3. Rapid sequence intubation	X	X		X			X	X		X	X	X	
4. Procedural sedation and analgesia	X	X					X	X		X	X		
5. Transtracheal needle ventilation	X	X		X			X	X			X	X	
6. Cricothyrotomy	X	X		X			X	X			X	X	
7. Difficult airway algorithm	X	X		X			X	X			X		
8. Chest tube thoracostomy	X			X	X		X	X		X	X	X	
9. Cardiopulmonary resuscitation	X	X	X	X	X	X	X	X		X	X	X	

Table I.3. Emergency Care Core Competencies—Diagnostic and Therapeutic Procedures

(continued)

	Learning Activities									Assessment Procedures/Competency				
			Certification Courses											
	Self-directed learning modules	Conferences/Courses	ACLS	CALS	ATLS	PALS/or other	Simulation	CALS	Benchmark Lab	Checklist/Clinical	Simulation	CALS Lab		
10. Cardiac defibrillation and synchronized cardioversion	X	X	X	X	X	X	X	X	X		X	X	X	
11. Transthoracic pacemaker use	X		X	X		X	X	X		X	X	X		
12. Intraosseous access	X		X	X	X	X	X	X		X	X	X		
13. Lumbar puncture	X						X				X			
14. Burn care and debridement	X	X									X			
15. I & D of subcutaneous abscess	X									X				
16. Wound exploration and evaluation	X	X								X				
17. Nail trephination	X									X				
18. Laceration repair	X	X					X			X				
19. Interpretation of electrocardiograms	X	X	X	X		X	X	X		X	X	X		
20. Regional and local anesthesia	X									X				

Table I.3. Emergency Care Core Competencies—Diagnostic and Therapeutic Procedures

(continued)

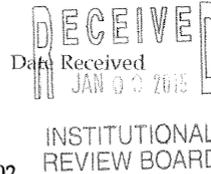
	Learning Activities									Assessment Procedures/Competency				
			Certification Courses											
	Self-directed learning modules	Conferences/Courses	ACLS	CALS	ATLS	PALS/or other	Simulation	CALS	Benchmark Lab	Checklist/Clinical	Simulation	CALS Lab		
21. Excision of thrombosed hemorrhoids	X									X				
22. Childbirth, emergent	X			X				X			X	X		
23. Arthrocentesis	X									X				
24. Joint injection	X									X				
25. Reduction of extremity fracture	X	X					X			X				
26. Reduction of joint dislocations	X	X					X			X				
27. FAST ultrasound	X	X		X			X	X		X	X	X		
28. Placement and removal of PEG tubes—Mickey	X									X				

## APPENDIX J. NDSU AMENDMENT TO PREVIOUS IRB APPROVAL



### INSTITUTIONAL REVIEW BOARD

office: Research 1, 1735 NDSU Research Park Drive, Fargo, ND 58102  
mail: NDSU Dept. #4000, PO Box 6050, Fargo, ND 58108-6050  
p: 701.231.8995 f: 701.231.8098 e: [ndsuirb@ndsud.edu](mailto:ndsuirb@ndsud.edu) w: [www.ndsu.edu/irb](http://www.ndsu.edu/irb)



IRB Protocol #:

PH14263

### Protocol Amendment Request Form

Changes to approved research may not be initiated without prior IRB review and approval, except where necessary to eliminate apparent immediate hazards to participants. Reference: [SOP 7.5 Protocol Amendments](#).

Examples of changes requiring IRB review include, but are not limited to changes in: investigators or research team members, purpose/scope of research, recruitment procedures, compensation strategy, participant population, research setting, interventions involving participants, data collection procedures, or surveys, measures or other data forms.

#### Protocol Information:

Protocol #: **PH14263** Title: **Emergency Care Education for Advanced Practice Providers in Rural Critical Access Hospitals**

Review category:  Exempt  Expedited  Full board

Principal investigator: **Mykell Barnacle** Email address: [mykell.barnacle@ndsud.edu](mailto:mykell.barnacle@ndsud.edu)  
Dept: **Nursing**

Co-investigator: **Christine Olson** Email address: [christine.m.olson@ndsud.edu](mailto:christine.m.olson@ndsud.edu)  
Dept: **Nursing, DNP student**

Principal investigator signature, Date: Mykell Barnacle (email) 1/9/15

 In lieu of a written signature, submission via the Principal Investigator's NDSU email constitutes an acceptable electronic signature.

#### Description of proposed changes:

- Date of proposed implementation of change(s)\*: **1-19-2015**  
\* Cannot be implemented prior to IRB approval unless the IRB Chair has determined that the change is necessary to eliminate apparent immediate hazards to participants.
- Describe proposed change(s), including justification:  
**An online, self-directed learning module has been created in the area of adult and pediatric trauma. This was part of my previous IRB request. I would like to present the module to CentraCare Health hospitals with the goal of disseminating my project but also to elicit anonymous verbal and written input about the module for the purposes of evaluation and module improvement. The amendment will involve presenting the module with the purpose of dissemination and for obtaining input for**

evaluation and improvement of the module. As such, I have prepared a consent form that will be given to the participants prior to my presentation which will include verbal input during the presentation and a post-presentation evaluation form. These documents are attached. Verbal input will be aggregated preserving anonymity of individual participants. The written evaluation will be anonymous without asking for names. I have asked for the title of the participant and number of years of practice as this information will demonstrate the variety of stakeholders and years of experience of those stakeholders. CentraCare Health is the location of the previous IRB approval and the previous approval did include utilizing self-directed learning module(s) within CentraCare Health. Additionally, approval of the project was already obtained through CentraCare Health previously (attached email).

3. Will the change involve a change in principal or co- investigator?

No - skip to Question 4

Yes:

- *Include an Investigator's Assurance (last page of protocol form), signed by the new PI or co-investigator*
- *Conflict of Interest disclosure. Does any investigator responsible for the design, conduct or reporting of the project (including their immediate family members) have a financial, personal or political interest that may conflict with their responsibility for protecting human participants in NDSU research? (SOP 6.2 Conflict of Interest in Human Research, Investigator and Research Team)*

No - As PI, I attest that I have conferred with my co-investigators and key personnel and confirmed that no financial, personal or political interests currently exist related to this research.

Yes - Describe the related financial, personal or political interests, and **attach documentation of COI disclosure and review (as applicable).**

Financial, personal or political interests related to the research (the sponsor, product or service being tested, or a competing product or service) may include:

- compensation (e.g., salary, payment for services, consulting fees)
- intellectual property rights or equity interests
- board memberships or executive positions
- enrollment or recruitment bonus payments

(Refer to NDSU Policy 151.1, *External Activities and Conflicts of Interest*, and NDSU Policy 823, *Financial Disclosure - Sponsored Projects* for specific disclosure requirements.)

*Note: If the change is limited to addition/change in research team members, skip the rest of this form.*

4. Will the change(s) increase any risks, or present new risks (*physical, economic, psychological, or sociological*) to participants?

No

Yes: *In the appropriate section of the protocol form, describe new or altered risks and how they will be minimized.*

5. Does the proposed change involve the addition of a vulnerable group of participants?

Children:  no  yes - include the *Children in Research* attachment form

Prisoners:  no  yes - include the *Prisoners in Research* attachment form

Cognitively impaired individuals:  no  yes\*

Economically or educationally disadvantaged individuals:  no  yes\*

*\*Provide additional information where applicable in the revised protocol form.*

6. Does the proposed change involve a request to waive some or all the elements of informed consent or documentation of consent?

no

yes -  Attach the *Informed Consent Waiver or Alteration Request*.

7. Does the proposed change involve a new research site?

no

yes



**If information in your previously approved protocol has changed, or additional information is being added, incorporate the changes into relevant section(s) of the protocol. Highlight (e.g. print and highlight the hard copy, or indicate changes using all caps, asterisks, etc) the changed section(s) and attach a copy of the revised protocol to this form. (If the changes are limited to addition/change in research team members, a revised protocol form is not needed.)**

**Impact for Participants (future, current, or prior):**

1. Will the change(s) alter information on previously approved versions of the recruitment materials, informed consent, or other documents, or require new documents?

No

Yes -  attach revised/new document(s)

2. Could the change(s) affect the willingness of *currently* enrolled participants to continue in the research?

No

Yes - describe procedures that will be used to inform current participants, and re-consent, if necessary:

3. Will the change(s) have any impact to *previously* enrolled participants?

No

Yes - describe impact, and any procedures that will be taken to protect the rights and welfare of participants:

-----FOR IRB OFFICE USE ONLY-----

Request is: <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Not Approved	
Review: <input checked="" type="checkbox"/> Exempt, category #: <u>2</u> <input type="checkbox"/> Expedited method, category # ____ <input type="checkbox"/> Convened meeting, date: ____ <input type="checkbox"/> Expedited review of minor change	
IRB Signature: <u>Kristy Shuley</u>	Date: <u>4/2/15</u>
Comments:	

## **APPENDIX K. INFORMED CONSENT TO USE EVALUATION DATA**

Title of Practice Improvement Project: Emergency Care Education for Advanced Practice Providers in Rural Critical Access Hospitals

Dear colleague,

I have created an online, self-directed learning module on adult and pediatric trauma for advanced practice providers who practice in rural emergency care settings. This is part of my practice improvement project at North Dakota State University in Fargo, North Dakota.

I would like your feedback on whether this module will be useful to you in learning about adult and pediatric trauma. Specifically, I would like to ask for your input both verbally during the presentation on the trauma module and as part of a post-presentation written evaluation. I may eventually publish the trauma module and I ask for permission to use your answers as part of my final project and any potential publication.

Your verbal input about the trauma module will be utilized to make improvements or adjustments as needed. Verbal input will be grouped anonymously with others who are attending this educational session. Additionally, the post-presentation written evaluation is anonymous, meaning that I do not want your name on the form. I would like to know your role such as nurse practitioner, physician assistant, nurse, or physician and years of experience in order to demonstrate that a variety of stakeholders involved in rural emergency care attended the educational session. The evaluation form should take less than 5 minutes to complete.

You are free to leave the educational session at any time. If desired, you may simply attend the educational session without providing any verbal or written input. By providing any verbal and/or written feedback, you are agreeing to consent in this educational intervention.

If you have any questions or comments, please feel free to contact me at [christine.m.olson@my.ndsu.edu](mailto:christine.m.olson@my.ndsu.edu) or call me at 320.815.0715. You may also contact my advisor, Dr. Mykell Barnacle by email at [mykell.barnacle@ndsu.edu](mailto:mykell.barnacle@ndsu.edu) or by phone at 701.231.7730. If you have questions about the rights of human participants in research, or to report a problem, contact the North Dakota State University IRB Office by telephone at 701.231.8908 or toll-free at 1.855.800.6717, by e-mail at [NDSU.IRB@ndsu.edu](mailto:NDSU.IRB@ndsu.edu), or by mail at NDSU Sponsored Programs Administration, 1735 NDSU Research Park Drive, NDSU Dept 4000, PO Box 6050, Fargo, ND 58108-6050.

Sincerely,

Christine M. Olson, MS, RN, FNP-BC  
Family Nurse Practitioner and Doctoral Student

**APPENDIX L. ADULT AND PEDIATRIC TRAUMA MODULE EVALUATION FORM**

1. What do you think will be the ***MOST HELPFUL*** aspect of the module?
  
2. What do you think will be the ***LEAST HELPFUL*** aspect of the module?
  
3. Will this module be an effective form of education for a provider who is new to rural emergency care?
  
4. How could the module be improved?
  
5. How likely are you to use the module for self-directed learning in the next two months?

Are there any other suggestions or comments?

<p><b><i>Role</i></b></p> <p><input type="checkbox"/> Nurse practitioner</p> <p><input type="checkbox"/> Physician assistant</p> <p><input type="checkbox"/> Nurse</p> <p><input type="checkbox"/> Physician</p> <p><input type="checkbox"/> First Responder or EMT</p> <p><input type="checkbox"/> Administrator or manager</p> <p><input type="checkbox"/> Other _____</p>	<p><b><i>Years of Practice:</i></b></p> <p><input type="checkbox"/> &lt; 1 year</p> <p><input type="checkbox"/> 1-3 years</p> <p><input type="checkbox"/> 5-10 years</p> <p><input type="checkbox"/> &gt; 10 years</p>
--	--

## APPENDIX M. ADULT AND PEDIATRIC TRAUMA MODULE

Adult and Pediatric Trauma Module

1

### Emergency Care Education for Advanced Practice Providers in Rural Critical Access Hospitals

**Course Title:** Adult and Pediatric Trauma

**Course Description:** This course is a self-directed learning module for emergency care settings on the topic of adult and pediatric trauma.

**Course Objectives:**

Upon completion of this course, the advanced practice emergency care provider will:

1. Identify and prioritize patient health needs and problems in a rural emergency care setting.
2. Use current evidence-based knowledge and skills in emergency care for the assessment, treatment, and disposition of acutely injured emergency patients.
3. Perform diagnostic and therapeutic procedures in life-threatening emergency situations.
4. Lead an interdisciplinary team in acute trauma care.
5. Follow EMTALA guidelines in the transfer of acute trauma patients to a higher level of care.

**Required:**

**Textbooks:**

Tintinalli, J. E., Stapczynski, J. S., Ma, O. J., Cline, D. M., Cydulka, R. K., & Meckler, G. D. (2011). *Tintinalli's emergency medicine: A comprehensive study guide, 7<sup>th</sup> Edition*. New York: McGraw-Hill. (referenced as "Tintinalli's" in recommended readings)

Committee on Trauma American College of Surgeons (2014). *Resources for the optimal care of the injured patient*. Retrieved from

<https://www.facs.org/~media/files/quality%20programs/trauma/vrc%20resources/resources%20for%20optimal%20care%202014%20v11.ashx>

**Courses:**

Advanced Trauma Life Support for Doctors (ATLS).

Website Link: <https://www.facs.org/quality-programs/trauma/atls>

Comprehensive Advanced Life Support (CALs).

Website Link: <https://calsprogram.org/>

**Highly recommended:**

Emergency Medicine Boot Camp—The Center for Medical Education

Website Link: <http://www.ccme.org/embootcamp/>

Option for audio and visual self-study program

Advanced Emergency Medicine Boot Camp

Website Link: [http://www.ccme.org/embootcamp\\_V2/](http://www.ccme.org/embootcamp_V2/)

Will have option for audio and visual self-study program after first program

OR

ACEP SEMPA Emergency Medicine Academy—Phases I, II, and III

Website Link: <http://www.acep.org/whatisthemacademy/>

**Learning Experiences:** This is a learner-centered course designed for advanced practice providers new to emergency care. Based on adult learning needs, the self-study module may be complemented by clinical experiences and simulation.

- Self-study materials include text readings, interactive websites, online videos, audiocasts, online evidence-based articles, and a post-module examination.
- Learning experiences and strategies will be based on the self-identified needs of the adult learner.

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<b>Instructions on How to Access Module</b>	
Links to resources	<ul style="list-style-type: none"> <li>▪ Links may be accessed by               <ul style="list-style-type: none"> <li>➤ Holding the mouse pointer (or panning hand) over the link and left click once. The link will open.</li> </ul> </li> </ul>
iTunes links to videos and podcasts	<ul style="list-style-type: none"> <li>▪ You may choose to download iTunes for free for saving podcasts or videos to your computer. Link: <a href="http://www.apple.com/support/itunes/">http://www.apple.com/support/itunes/</a></li> <li>▪ Once iTunes is downloaded               <ul style="list-style-type: none"> <li>➤ Right click mouse on the link and choosing 'open hyperlink' or Ctrl + left click mouse when hovered over link</li> <li>➤ iTunes will open to podcast selected (top of page)</li> <li>➤ Podcast may be played by selecting the blue arrow that lights up in front of the podcast title</li> <li>➤ If you would like to save podcasts and videos to your computer to play on a iPod or other Apple device, select 'View In iTunes' in the last column where the podcast is highlighted                   <ul style="list-style-type: none"> <li>✓ Scroll down to the highlighted podcast (highlighted in blue)</li> <li>✓ Click 'Get' and the podcast will save to your iTunes library. From there you can learn how to load your Apple device to play when away from the computer.</li> </ul> </li> </ul> </li> <li>▪ For additional tutorials and iTunes support: <a href="http://www.apple.com/support/itunes/">http://www.apple.com/support/itunes/</a></li> </ul>
QuickTime player	<ul style="list-style-type: none"> <li>▪ Two videos may require installation of QuickTime player which is available for download free from <a href="http://www.apple.com/quicktime/">http://www.apple.com/quicktime/</a></li> <li>▪ The videos are Evaluation and Management of Pediatric Trauma: Part 1 and 2 by Richard Falcone MD in the Introduction to Trauma Section</li> </ul>

**For questions and comments related to this module, please contact:**

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<b>Trauma Sections</b>
<b>Introduction to Trauma</b>
<p><b>Tintinalli's</b>            Chapter 250—Trauma in Adults            Chapter 251—Trauma in Children            Chapter 252—Geriatric Trauma</p> <p><b>Readings</b></p> <ul style="list-style-type: none"> <li>▪ American College of Surgeons Committee on Trauma. (2011). <i>Resources for the optimal care of the injured patient</i>. Retrieved from <a href="https://www.facs.org/~media/files/quality%20programs/trauma/vrc%20resources/resources%20for%20optimal%20care%202014%20v11.ashx">https://www.facs.org/~media/files/quality%20programs/trauma/vrc%20resources/resources%20for%20optimal%20care%202014%20v11.ashx</a> <ul style="list-style-type: none"> <li>○ Chapter 5—Hospital Organization and the Trauma Program</li> <li>○ Chapter 13—Rural Trauma Care</li> </ul> </li> <li>▪ Calland, J., Ingraham, A., Martin, N., Marshall, G., Schulman, C., Stapleton, T., &amp; Barraco, R. (2012). Evaluation and management of geriatric trauma: An East Association for the Surgery of Trauma practice management guideline. <i>Journal of Trauma and Acute Care Surgery</i>, 73(5), S345-S350. Retrieved from <a href="http://www.east.org/resources/treatment-guidelines/geriatric-trauma,-evaluation-and-management-of">http://www.east.org/resources/treatment-guidelines/geriatric-trauma,-evaluation-and-management-of</a></li> <li>▪ McGonigal, M. (n.d.). What to do? Small hospital, unstable patient [Web log article]. Retrieved from <a href="http://regionstraumapro.com/page/54?route=%2Fpage%2F%3Apage">http://regionstraumapro.com/page/54?route=%2Fpage%2F%3Apage</a></li> <li>▪ McFayden, J., Ramaiah, R., &amp; Bhananker, S. (2012). Initial assessment and management of pediatric trauma patients. <i>International Journal of Critical Illness &amp; Injury Science</i>, 2(3). Retrieved from <a href="http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3500003/">http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3500003/</a></li> </ul> <p><b>Management Videos</b></p> <ul style="list-style-type: none"> <li>▪ ABC's of Trauma—University of Miami Health System (2011): <a href="https://www.youtube.com/watch?v=kv8dV-1PTww">https://www.youtube.com/watch?v=kv8dV-1PTww</a></li> <li>▪ Primary Survey ATLS Video—Sparky Spacy (2014): <a href="https://www.youtube.com/watch?v=NIYt4rO1B8k">https://www.youtube.com/watch?v=NIYt4rO1B8k</a></li> <li>▪ Secondary Survey ATLS—Sparky Spacy (2014): <a href="https://www.youtube.com/watch?v=NzP-xM9J-Xk">https://www.youtube.com/watch?v=NzP-xM9J-Xk</a></li> <li>▪ 2013 Trauma and Falls in the Elderly—University of Medicine and Dentistry of New Jersey (2013): <a href="https://www.youtube.com/watch?v=5K67IAjEiag">https://www.youtube.com/watch?v=5K67IAjEiag</a></li> <li>▪ 27-2006 Emergency Medicine &amp; Acute Care Series-Trauma Lab Tests—William Mallon MD, Center for Medical Education (2013): <a href="https://www.youtube.com/watch?v=Pakk8ujEvkQ">https://www.youtube.com/watch?v=Pakk8ujEvkQ</a></li> <li>▪ ATLS: Rural Medicine and Advanced Trauma Life Support—John Bielinski PAC, CME4LIFE (2010): <a href="https://www.youtube.com/watch?v=69jvJngnq-Y&amp;index=1&amp;list=PL567774FF848CFA8D">https://www.youtube.com/watch?v=69jvJngnq-Y&amp;index=1&amp;list=PL567774FF848CFA8D</a></li> </ul> <p style="text-align: right;"><a href="#">Return to Table of Contents</a></p>

**Pediatrics**

- Evaluation and Management of Pediatric Trauma: Part 1—Richard Falcone MD, Cincinnati Children’s Pediatric EMS Collaborative (2009): [http://www.peds-ems-online.com/Videopodcast/Entries/2009/4/15\\_Evaluation\\_and\\_Management\\_of\\_Pediatric\\_Trauma\\_Part\\_1.html](http://www.peds-ems-online.com/Videopodcast/Entries/2009/4/15_Evaluation_and_Management_of_Pediatric_Trauma_Part_1.html)
- Evaluation and Management of Pediatric Trauma: Part 2—Richard Falcone MD, Cincinnati Children’s Pediatric EMS Collaborative (2009): [http://www.peds-ems-online.com/Videopodcast/Entries/2009/4/15\\_Evaluation\\_and\\_Management\\_of\\_Pediatric\\_Trauma\\_Part\\_2.html](http://www.peds-ems-online.com/Videopodcast/Entries/2009/4/15_Evaluation_and_Management_of_Pediatric_Trauma_Part_2.html)

**Podcasts**

- Severe Pediatric Trauma with Michael McGonigal—Scott Weingart MD, Emergency Department and Critical Care Resuscitation, EMCrit Podcast (2012): <https://itunes.apple.com/us/podcast/severe-pediatric-trauma-michael/id314020330?i=117286244&mt=2>
  - Lecture notes: <http://emcrit.org/podcasts/severe-pediatric-trauma/>
- Episode 12-New Trauma Guidelines: ATLS and Spine—Scott Weingart MD, Emergency Department and Critical Care Resuscitation, Practical Evidence (2013): <https://itunes.apple.com/us/podcast/episode-12-new-trauma-guidelines/id720291490?i=168879230&mt=2>
  - Lecture notes: <http://emcrit.org/practicalevidence/atls-and-spine/>
- EMCrit Podcast 49-The Mind of a Resus Doc: Logistics over Strategy—Scott Weingart MD, Emergency Department and Critical Care Resuscitation, EMCrit Podcast (2011): <https://itunes.apple.com/us/podcast/emcrit-podcast-49-mind-resus/id561164203?i=134321825&mt=2>
  - Lecture notes: <http://emcrit.org/podcasts/mind-resus-doc-logistics/>
- Effects of Obesity in the Care of the Traumatically Injured—Levi Procter MD, The Eastern Association for the Surgery of Trauma, EAST Traumacast (2013): <https://itunes.apple.com/us/podcast/effects-obesity-in-care-traumatically/id464280790?i=327738301&mt=2>
- Trauma Resuscitation Part 1-the evaluation—Steve Carroll DO, EM Basic (2012): <https://itunes.apple.com/us/podcast/trauma-resuscitation-part/id453647774?i=113459164&mt=2>
  - Lecture notes: <http://embasic.org/wp-content/uploads/2012/04/19-trauma-resuscitation-part-1-the-evaluation1.pdf>
- Trauma Resuscitation Part 2-the interventions—Steve Carroll DO, EM Basic (2012): <https://itunes.apple.com/us/podcast/trauma-resuscitation-part/id453647774?i=114678304&mt=2>
  - Lecture notes: <http://embasic.org/wp-content/uploads/2012/05/20-trauma-resuscitation-part-2-interventions.pdf>

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### Prehospital

#### Tintinalli's

Chapter 2—Prehospital Equipment and Adjuncts

#### Management Videos

- EMT 6-1: Trauma Overview—Waukesha County Technical College, Wisconsin (2013): <https://www.youtube.com/watch?v=9-mSCeO2ozw>
- 2013 Spinal Immobilization—Tidewater EMS Council, Chesapeake, Virginia (2013): <https://www.youtube.com/watch?v=NA3fPD8Lq18>
- Board to Tears: Selective Spinal Immobilization—County of Orange Fire and EMS, Virginia (2013): <https://www.youtube.com/watch?v=a4-o5mZKOv0>
- Fitting a Cervical Collar—laurathamtube (2012): <https://www.youtube.com/watch?v=cYxnp6ml8mE>
- Applying a Miami J Collar—Regions Trauma Center, St. Paul, Minnesota (2010): [https://www.youtube.com/watch?v=m\\_YU6Mdyzw8](https://www.youtube.com/watch?v=m_YU6Mdyzw8)
- Trauma Day Away 2012-Miami J & Miami Jr. by Lindsay Weikart, ATC, Cfo—UCSDTraumaBurn, Division of Trauma/Surgical Critical Care/Burns, UC San Diego Health System (2012): <https://www.youtube.com/watch?v=A5NoYcn6EK8>
- Helmet Removal—New York State EMT (2011): <https://www.youtube.com/watch?v=geKGLez5ga4>
- Motorcycle Helmet Removal—MedicSkills, North Wales Recovery (2010): <https://www.youtube.com/watch?v=zeQEY59ql3g>
- Spinal Immobilization—Puckett EMS, Georgia (2009): <https://www.youtube.com/watch?v=nHVqa86hBFc>
- 05-2008 Emergency Medicine & Acute Care Series-Prehospital Trauma Care—Jerome Hoffman MD, Center for Medical Education (2013): <https://www.youtube.com/watch?v=ZUyWT38gqzc>

#### Podcasts

- The prehospital episode—Steve Carroll DO, EM Basic (2012): <https://itunes.apple.com/us/podcast/the-prehospital-episode/id453647774?i=110732314&mt=2>

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## Head Trauma

### Tintinalli's

Chapter 254—Head Trauma in Adults and Children

Chapter 256—Trauma to Face

Chapter 257—Trauma to Neck

### Required Reading

- Kuppermann, N., Holmes, J., Dayan, P., Hoyle, J., Atabaki, S., Holubkov, R.,... Wootten-Gorges, S. (2009). Identification of children at very low risk of clinically-important brain injuries after head trauma: A prospective cohort study. *Lancet*, 374, 1160-1170.  
[http://www.pecarn.org/documents/Kuppermann\\_2009\\_The-Lancet.pdf](http://www.pecarn.org/documents/Kuppermann_2009_The-Lancet.pdf)

### Websites

- Glasgow Coma Scale: <http://www.glasgowcomascale.org/>
- California American College of Emergency Physicians--PECARN Head Trauma Prediction Rules (*Pocket Reference Cards*): <http://californiaacep.org/public-health/pecarn/>

### Radiology Videos

- Introduction to Head CT—University of Virginia Health Sciences Center, Department of Radiology (2013): <http://www.med-ed.virginia.edu/courses/rad/headct/index.html#> (through the Trauma section)
- Introduction to the CT Brain—Dr. Charif Sidani, Radiology Residency Jackson Memorial Hospital, University of Miami (2014): <https://www.youtube.com/watch?v=RB7tfXFMwrc>

### Management Videos

- Glasgow Coma Scale at 40: The new approach to Glasgow Coma Scale Assessment—GSC at 40, Glasgow, Scotland (2014): <https://www.youtube.com/watch?v=v6qpEQxJQO4>
- Basic Trauma Workshop: Head Trauma & Spinal Cord Injury—Division of Trauma/Surgical Critical Care/Burns, UC San Diego Health System (2012) (*both head and spine, nursing interventions*): <https://www.youtube.com/watch?v=RlvDdSLdLo0>
- Head and Spinal Injuries—Center for Maritime Medicine, ShipsMed, Maine (2013): <https://www.youtube.com/watch?v=aIXghKWhegA>
- 07-2006 Emergency Medicine & Acute Care Series-Sequelae of Minor Head Trauma—Jerome Hoffman MD, Center for Medical Education (2013): <https://www.youtube.com/watch?v=jUSk34FoYas>
- Penetrating Neck Trauma—Lois Nwakanma MD, UCSDTraumaBurn, Division of Trauma/Surgical Critical Care/Burns, UC San Diego Health System (2012) (*up to 26:24 minutes most appropriate for rural*): <https://www.youtube.com/watch?v=GrBneF4MYQc>

### Pediatrics

- Heads Up To Clinicians: Addressing concussions in Sports among Kids and Teens—CDC and NFL (2011): <http://www.cdc.gov/concussion/HeadsUp/clinicians/index.html>

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- Review of a Clinical Prediction Rule for Pediatric Minor Head Trauma—Thomas Dalton MD, Department of Emergency Medicine, Hennepin County Medical Center HQMedEd (2012): <http://hqmeded.com/review-of-a-clinical-prediction-rule-for-pediatric-minor-head-trauma-2/>
- Pediatric Head Neck and Spine Trauma Part 1—University of New Mexico Health Sciences Center Division of Pediatric Emergency Medicine: <https://hscssl.unm.edu/EM/PED/education/pedsTrauma/headNeckI/intro.html>
- Pediatric Head Neck and Spine Trauma Part 2—University of New Mexico Health Sciences Center Division of Pediatric Emergency Medicine: <https://hscssl.unm.edu/EM/PED/education/pedsTrauma/headNeckII/intro.html>

#### Podcasts

- Decision Rules for Peds Minor Head Injury—Annals of Emergency Medicine August 2014 Literature Review (2014): [http://podcasts.elsevierhealth.com/ymem/aug2014/05\\_08\\_2014\\_Decision\\_Rules\\_for\\_Peds\\_Minor\\_Head\\_Injury.mp3](http://podcasts.elsevierhealth.com/ymem/aug2014/05_08_2014_Decision_Rules_for_Peds_Minor_Head_Injury.mp3)
- Vomiting as a predictor of TBI—Annals of Emergency Medicine June 2014 Literature Review (2014): [http://podcasts.elsevierhealth.com/ymem/june2014/02\\_06\\_2014\\_Vomiting\\_as\\_a\\_predictor\\_of\\_TBI.mp3](http://podcasts.elsevierhealth.com/ymem/june2014/02_06_2014_Vomiting_as_a_predictor_of_TBI.mp3)
- Episode 1-Penetrating Neck Trauma Guidelines—Scott Weingart MD, Emergency Department and Critical Care Resuscitation, Practical Evidence (2012): <https://itunes.apple.com/us/podcast/episode-1-penetrating-neck/id720291490?i=168879232&mt=2>
  - Lecture notes: <http://emcrit.org/practicalevidence/penetrating-neck-trauma-guidelines/>
- Screening for Blunt Cerebrovascular Injury—Martin Croce MD, The Eastern Association for the Surgery of Trauma, EAST Traumacast (2012) (*CT angiogram information*): <https://itunes.apple.com/us/podcast/screening-for-blunt-cerebrovascular/id464280790?i=327738290&mt=2>
- Observation for minor head injury in kids—Annals of Emergency Medicine December 2013 Literature Review (2013): [http://podcasts.elsevierhealth.com/ymem/dec2013/08\\_12\\_2013\\_Observation\\_for\\_minor\\_head\\_injury\\_in\\_kids.mp3](http://podcasts.elsevierhealth.com/ymem/dec2013/08_12_2013_Observation_for_minor_head_injury_in_kids.mp3)
- Cranial CT for Minor Head Injury—Emergency Medicine and Pediatric Emergency Medicine, empem.org (2011): <https://itunes.apple.com/us/podcast/cranial-ct-for-minor-head/id376198402?i=92875733&mt=2>
- Minor Head Injury: Who Has The Badness?—David Newman MD, SMART EM, smartem.org: <https://itunes.apple.com/us/podcast/minor-head-injury-who-has/id512413488?i=111907141&mt=2>
- D is for Disability (part 1 of 2)—Emergency Medicine and Pediatric Emergency Medicine, empem.org (2010): <https://itunes.apple.com/us/podcast/d-is-for-disability-part-1-of-2/id376198402?i=88043818&mt=2>

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- D is for Disability (part 2 of 2)—Emergency Medicine and Pediatric Emergency Medicine, empem.org (2010): <https://itunes.apple.com/us/podcast/d-is-for-disability-part-2-of-2/id376198402?i=88351590&mt=2>

### Spine and Spinal Cord Trauma (see also videos under head trauma section)

#### Tintinalli's

Chapter 255—Spine and Spinal Cord Trauma

#### Reading

- Ahn, H., Singh, J., Nathens, A., MacDonald, R., Travers, A., Tallon, J.,... Yee, A. (2011). Pre-hospital Care Management of a Potential Spinal Cord Injured Patient: A Systematic Review of the Literature and Evidence-Based Guidelines. *Journal of Neurotrauma*, 28(8), 1341-1361. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3143405/>

#### Radiology Videos

- Imaging Evaluation of the Cervical Spine—University of Virginia Health Sciences Center, Department of Radiology (2013): <http://www.med-ed.virginia.edu/courses/rad/cspine/index.html>
- Radiology of Spine Trauma—IMedMedia (2012): <https://www.youtube.com/watch?v=skLoiQgzi5s>
- Podcast 11 Cervical Spine Trauma—William Herring MD, Albert Einstein Medical Center, Philadelphia, PA, LearningRadiology.com (2013): <https://www.youtube.com/watch?v=S5Dqo0h0fAY>
- Podcast 14 Thoraco Lumbar Spine Trauma— William Herring MD, Albert Einstein Medical Center, Philadelphia, PA, LearningRadiology.com (2013): [http://www.youtube.com/watch?v=\\_TsFnkns12E](http://www.youtube.com/watch?v=_TsFnkns12E)

#### Management Videos

- Cervical Spine Assessment and Clearance—Matthew Hamonko MD, [www.wildernessmed.org](http://www.wildernessmed.org) (2013): [https://www.youtube.com/watch?v=\\_meLYqvn\\_bU](https://www.youtube.com/watch?v=_meLYqvn_bU)
- Clinical Clearance of the Cervical Spine—Regions Hospital, St. Paul, MN, [regionstrauma](http://regionstrauma.com) (2010): <https://www.youtube.com/watch?v=NhjF9kDOcjE>
- How to Use the Canadian C-Spine Rule—Physiotherapy Association of British Columbia (2014): <http://www.youtube.com/watch?v=muD1fVpVnoc>
- Cervical Spine Clearance—Robert Morgan MD, Director of Center for Spine and Spinal Cord Injury, Regions Hospital, St. Paul, MD, [regionstrauma](http://regionstrauma.com) (2013): <https://www.youtube.com/watch?v=myYIFqvCytK>
- 07-2009 Emergency Medicine & Acute Care Series-Cervical Spine Injuries—Neal Little MD, Center for Medical Education (2013): <https://www.youtube.com/watch?v=Rj-zNTZt0GU>
- Head and Spinal Injuries—Center for Maritime Medicine, ShipsMed, Maine (2013): <https://www.youtube.com/watch?v=aIXghKWhegA>

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- Predicting the Need for Intubation in Patients with Spinal Cord Injury—Jared Jones MD, Department of Emergency Medicine, Hennepin County Medical Center HQMedEd: <http://hqmeded.com/predicting-the-need-for-intubation-in-patients-with-spinal-cord-injury-2/>

**Pediatrics (see also videos under head trauma section)**

- Pediatric Cervical Spine Injuries—Thomas Dalton MD, Hennepin County Medical Center HQMedEd (2011): <http://hqmeded.com/pediatric-cervical-spine-injuries-2/>

**Podcasts**

- Cervical Spine Assessment in Children—Emergency Medicine and Pediatric Emergency Medicine, empem.org (2011): <https://itunes.apple.com/us/podcast/cervical-spine-assessment/id376198402?i=94181584&mt=2>
- Clearing the Paediatric C-Spine—Emergency Medicine and Pediatric Emergency Medicine, empem.org (2011): <https://itunes.apple.com/us/podcast/clearing-paediatric-c-spine/id376198402?i=94541272&mt=2>
- EM Basic Essential Evidence-The NEXUS Study—Steve Carroll DO, EM Basic (2012): <https://itunes.apple.com/us/podcast/em-basic-essential-evidence/id453647774?i=120786780&mt=2>
- EM Basic Essential Evidence-PECARN Head CT Rule—Steve Carroll DO, EM Basic (2012): <https://itunes.apple.com/us/podcast/em-basic-essential-evidence/id453647774?i=123247347&mt=2>
- Podcast 63-A Pain in the Neck-Part 1—Scott Weingart MD, , Emergency Department Critical Care and Resuscitation, EMCrit Podcast (2011): <https://itunes.apple.com/us/podcast/podcast-63-pain-in-neck-part/id314020330?i=114949382&mt=2>
  - Lecture notes: <http://emcrit.org/podcasts/cervical-spine-injuries-i/>
- More on a Diagnostic Strategy for C-Spine Injuries—Scott Weingart MD, Emergency Department Critical Care and Resuscitation, EMCrit Podcast (2012): <https://itunes.apple.com/us/podcast/more-on-diagnostic-strategy/id314020330?i=114949381&mt=2>
  - Lecture notes: <http://emcrit.org/podcasts/why-should-we-kill-off-plain-films-c-spine/>
- EMCrit Wee-More on C-Spine Imaging—Scott Weingart MD, Emergency Department Critical Care and Resuscitation, EMCrit Podcast (2012): <https://itunes.apple.com/us/podcast/emcrit-wee-more-on-c-spine/id314020330?i=114949391&mt=2>
  - Lecture notes: <http://emcrit.org/wee/more-on-c-spine-imaging/>

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### Chest Trauma

#### Tintinalli's

Chapter 258—Pulmonary Trauma

Chapter 259—Cardiac Trauma

#### Radiology Videos

- Introduction to the Chest Xray—Dr. Humberto Martinez, Radiology Residency Jackson Memorial Hospital, University of Miami (2014):  
<https://www.youtube.com/watch?v=jU5rYvGJBbM>
- Eric Strong MD, Eric's Medical Lectures, Stanford University School of Medicine. Series of lectures *How to Interpret a Chest X-Ray* (2013):
  - Lesson 1-An Introduction: <https://www.youtube.com/watch?v=PDaRNPUNc10>
  - Lesson 2-A Systematic Method and Anatomy: <https://www.youtube.com/watch?v=L6bnD2wOEmg>
  - Lesson 3-Assessing Technical Quality: <https://www.youtube.com/watch?v=iEjTY5PeVTg>
  - Lesson 4-Airways, Bones, and Soft Tissue: <https://www.youtube.com/watch?v=9J8rcmCVoes>
  - Lesson 5-Cardiac Silhouette and Mediastinum: <https://www.youtube.com/watch?v=bU0Nm7JFJtU>
  - Lesson 6-Diaphragm and Pleura: <https://www.youtube.com/watch?v=wOpDvUO5sD8>
  - Lesson 7-Diffuse Lung Processes: <https://www.youtube.com/watch?v=mNLd4DKtGs4>
  - Lesson 8-Focal Lung Processes: <https://www.youtube.com/watch?v=fiGgpY2GXsk>
  - Lesson 9-Atelectasis, Lines, Tubes, Devices, and Surgeries: <https://www.youtube.com/watch?v=OcIxL56an3c>
  - Lesson 10-Self Assessment Part 1: <https://www.youtube.com/watch?v=rOzyJwH7szE>
  - Lesson 10-Self Assessment Part 2: <https://www.youtube.com/watch?v=EaB1n3ptPMo>
- Pneumothorax (*by ultrasound*)—UCSDTraumaBurn USCDTraumaBurn, Division of Trauma/Surgical Critical Care/Burns, UC San Diego Health System (2012):  
<https://www.youtube.com/watch?v=Ec2pRYOQ2II>
- LearningRadiology 43 (Chest Trauma)-- William Herring MD, Albert Einstein Medical Center, Philadelphia, PA, LearningRadiology.com (2010):  
<https://www.youtube.com/watch?v=ggOezJj3ayU>

#### Management Videos

- ITLS Ch 6 Thoracic Trauma—Southern Union State Community College (2013):  
<https://www.youtube.com/watch?v=SgtxfTsinKc>

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- MD311 Thoracic Trauma—Center for Maritime Medicine, ShipsMed, Maine (2013): <http://www.youtube.com/watch?v=lx2IKTYMOiQ>
- Chapter 29 Chest and Abdominal Trauma—Southern Union State Community College (2013) (*caution on volume when videos showing within presentation*): <https://www.youtube.com/watch?v=PhxGE4z5wWQ>
- Chest Tube Insertion—Dennis Kim MD, UCSDTraumaBurn USCDTraumaBurn, Division of Trauma/Surgical Critical Care/Burns, UC San Diego Health System (2012): <https://www.youtube.com/watch?v=xwp57E9NJjg&index=53&list=UURB5EumenkaDJenXQghom7w>
- Needle Decompression of the Chest—Regions Trauma (2010): <https://www.youtube.com/watch?v=UvHJ4pjNh2Q>
- Finger Thoracostomy—Cliff Reid MD, Resuscitation Medicine Education, resus.me (2014): <https://www.youtube.com/watch?v=zrUASl8onPY>

#### **Pediatric**

- Pediatric Abdomen and Chest Trauma Part 1—University of New Mexico Health Sciences Center Division of Pediatric Emergency Medicine: <https://hscssl.unm.edu/EM/PED/education/pedsTrauma/abdChestI/intro.html>
- Pediatric Abdomen and Chest Trauma Part 2—University of New Mexico Health Sciences Center Division of Pediatric Emergency Medicine: <https://hscssl.unm.edu/EM/PED/education/pedsTrauma/abdChestII/intro.html>
- Pediatric Abdomen and Chest Trauma Part 3—University of New Mexico Health Sciences Center Division of Pediatric Emergency Medicine: <https://hscssl.unm.edu/EM/PED/education/pedsTrauma/abdChestIII/intro.html>

#### **Podcasts**

- Episode 9-Blunt Cardiac Injury from EAST—Scott Weingart MD, Emergency Department Critical Care and Resuscitation, Practical Evidence (2012): <https://itunes.apple.com/us/podcast/episode-9-blunt-cardiac-injury/id720291490?i=168879231&mt=2>
  - Lecture notes: <http://emcrit.org/practicalevidence/blunt-cardiac-injuries/>
- Podcast 62-Needle vs. Knife II: Needle Thoracostomy—Scott Weingart MD, Emergency Department Critical Care and Resuscitation, EMCrit Podcast (2011) (*procedure on finger thoracostomy*): <https://itunes.apple.com/us/podcast/podcast-62-needle-vs.-knife/id314020330?i=114949378&mt=2>
  - Lecture notes: <http://emcrit.org/podcasts/needle-finger-thoracostomy/>

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### Abdominal and Pelvic Trauma

#### Tintinalli's

Chapter 260—Abdominal Trauma

Chapter 261—Penetrating Trauma to Flank and Buttocks

Chapter 262—Genitourinary Trauma

#### Radiology Videos

- Podcast 22 Pelvic Trauma 1—William Herring MD, Albert Einstein Medical Center, Philadelphia, PA, LearningRadiology.com (2013):  
<https://www.youtube.com/watch?v=cXOMRC7Sisw>
- Podcast 23 Pelvic Trauma 2—William Herring MD, Albert Einstein Medical Center, Philadelphia, PA, LearningRadiology.com (2013):  
[https://www.youtube.com/watch?v=abs7RE66Gow&list=UUj6wX6pG8crz2Oqyyd\\_5yrw](https://www.youtube.com/watch?v=abs7RE66Gow&list=UUj6wX6pG8crz2Oqyyd_5yrw)

#### Management Videos

- MD311 Abdominal Trauma—Center for Maritime Medicine, ShipsMed, Maine (2013):  
<https://www.youtube.com/watch?v=WqLK6-ajTZE>
- Trauma Day Away 2012-Pelvic Fractures: A Complicated Injury by Vishal Bansal MD—USCDTraumaBurn, Division of Trauma/Surgical Critical Care/Burns, UC San Diego Health System (2012): <https://www.youtube.com/watch?v=yIkPy-Ik6O8&list=UURB5EunenkaDJenXQghom7w>

#### Pediatrics (see also videos under chest trauma section)

- Evidence-based Emergency Department Evaluation of Pediatric Blunt Abdominal Trauma—Dr. Nathan Kuppermann, Western Pediatric Trauma Conference, San Diego, California (2014): <http://www.pedtrauma.org/wp-content/uploads/2014/07/27.Kuppermann.-Pediatric-Abdominal-Trauma.pdf>
- Pediatric Abdominal Trauma—Dr. Stephen Bickler, USCDTraumaBurn, Division of Trauma/Surgical Critical Care/Burns, UC San Diego Health System (2012):  
<https://www.youtube.com/watch?v=xopGFuhog6c>

#### Podcasts

- Severe Pelvic Trauma—Scott Weingart MD, Emergency Department Critical Care and Resuscitation, EMCrit Podcast (2012): <https://itunes.apple.com/us/podcast/severe-pelvic-trauma/id314020330?i=114334096&mt=2>
  - Lecture notes: <http://emcrit.org/podcasts/severe-pelvic-trauma/>
- Indications for abdominal CT in blunt trauma—Josh Broder MD, Duke Emergency Medicine (2011) (*extensive information on evidence*):  
<https://itunes.apple.com/us/podcast/indications-for-abdominal/id464432678?i=215050869&mt=2>

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- PECARN abdominal trauma—Annals of Emergency Medicine August 2013 Literature Review (2013): [http://podcasts.elsevierhealth.com/ymem/aug2013/02\\_08\\_2013\\_PECARN\\_abd\\_trauma.mp3](http://podcasts.elsevierhealth.com/ymem/aug2013/02_08_2013_PECARN_abd_trauma.mp3)
- Pelvic Trauma—Thomas Scalea MD, AAEM Scientific Assembly Trauma, Free Emergency Medicine Talks (2008): <http://freemergencytalks.net/2010/04/thomas-scalea-pelvic-trauma/>

### **Musculoskeletal**

#### **Tintinalli's**

Chapter 263—Penetrating Trauma to the Extremities

Chapter 269—Pelvis Injuries

#### **Management Videos**

- Fractures and Fracture Dislocations—Center for Maritime Medicine, ShipsMed, Maine (2013): [http://www.youtube.com/watch?v=c6KSNGA\\_YsA&index=29&list=UUof7a-vtFFpGYmOS0K-UTOQ](http://www.youtube.com/watch?v=c6KSNGA_YsA&index=29&list=UUof7a-vtFFpGYmOS0K-UTOQ)
- Musculoskeletal Injuries Splinting—Center for Maritime Medicine, ShipsMed, Maine (2013): [http://www.youtube.com/watch?v=ffc-g6f\\_ztQ&index=30&list=UUof7a-vtFFpGYmOS0K-UTOQ](http://www.youtube.com/watch?v=ffc-g6f_ztQ&index=30&list=UUof7a-vtFFpGYmOS0K-UTOQ)
- Hare Traction Splint—EMS Skills Video (2013): <https://www.youtube.com/watch?v=pW58yqEKTZI>
- Sager Traction Splint—Penn Care Inc. (2011): <https://www.youtube.com/watch?v=liWFODOFKn8>
- Hare Traction Splint & Clavicle Fractures—Peter Cole MD, HealthPartners Institute for Medical Education, HealthPartnersMedEd: <https://www.youtube.com/watch?v=6R0SG2DS6hk>

#### **Pediatrics**

- Pediatric Musculoskeletal Trauma Part 1—University of New Mexico Health Sciences Center Division of Pediatric Emergency Medicine: <https://hcssl.unm.edu/EM/PED/education/pedsTrauma/musculoSkeletalI/intro.html>
- Pediatric Musculoskeletal Trauma Part 2—University of New Mexico Health Sciences Center Division of Pediatric Emergency Medicine: <https://hcssl.unm.edu/EM/PED/education/pedsTrauma/musculoSkeletalIII/intro.html>

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### Hypothermia/Hyperthermia

#### Tintinalli's

Chapter 202—Frostbite and Other Localized Cold Injuries

Chapter 203—Hypothermia

Chapter 204—Heat Emergencies

#### Reading

Li, J., Silverberg, M., Decker, W., & Edelstein, J. (2014). Hypothermia. *Medscape*. Retrieved from <http://emedicine.medscape.com/article/770542-overview>

#### Management Videos

- Cold Illness and Injury—Center for Maritime Medicine, ShipsMed, Maine (2013): [https://www.youtube.com/watch?v=aNV\\_QJxpoNs&index=49&list=UUof7a-vtFFpGYmOS0K-UTOQ](https://www.youtube.com/watch?v=aNV_QJxpoNs&index=49&list=UUof7a-vtFFpGYmOS0K-UTOQ)
- Frostbite and Cold-Related Injury—David Ahrenholz MD, Regions Hospital Trauma Conference, regionstrauma (2013): [https://www.youtube.com/watch?v=6stW31t\\_IKI](https://www.youtube.com/watch?v=6stW31t_IKI)
- Heat Emergencies—Center for Maritime Medicine, ShipsMed, Maine (2013): <https://www.youtube.com/watch?v=4HHkVZjKHGs>
- EMS Lecture: Hypothermia Case—Michael Schwemm MD, University of Iowa Hospitals & Clinics Department of Emergency Medicine (2007): <https://itunes.apple.com/us/podcast/em-lecture-hypothermia-case/id123429715?i=17064176&mt=2>

#### Podcasts

- Hypothermia—Eric Nilles MD, University of Iowa Hospitals & Clinics Department of Emergency Medicine (2006): <https://itunes.apple.com/us/podcast/hypothermia/id123429715?i=4507147&mt=2>
- Podcast 66-...Until they are warm and dead: Severe Accidental Hypothermia—Scott Weingart MD, Emergency Department Critical Care and Resuscitation, EMCrit Podcast: <https://itunes.apple.com/us/podcast/podcast-66-...until-they-are/id314020330?i=114949379&mt=2>

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## Burns

### Tintinalli's

Chapter 210—Thermal Burns  
 Chapter 211—Chemical Burns  
 Chapter 212—Electrical Injuries  
 Chapter 217—Carbon Monoxide

### Readings

- Latenser, B. (2009). Critical care of the burn patient: The first 48 hours. *Critical Care Medicine*, 37(10), 2819-2826. Retrieved from <http://www.medscape.com/viewarticle/711438>  
 (You will need to sign up for a free account to access this article in Medscape)
- Sheridan, R. (2013). Initial evaluation and management of the burn patient. *Medscape*. Retrieved from <http://emedicine.medscape.com/article/435402-overview>
- Sheridan, R. (2014). Thermal injury management. *Medscape*. Retrieved from <http://emedicine.medscape.com/article/1277941-overview#aw2aab6b3>
- Cushing, T. (2014). Electrical injuries in emergency medicine. *Medscape*. Retrieved from <http://emedicine.medscape.com/article/770179-overview>

### Management Videos

- Initial Management of Burns—Bruce Potenza MD, USCDTraumaBurn, Division of Trauma/Surgical Critical Care/Burns, UC San Diego Health System (2012): <https://www.youtube.com/watch?v=oC7uzGrTxG0>
- Module III: Initial Evaluation of the Burn Patient—USCDTraumaBurn, Division of Trauma/Surgical Critical Care/Burns, UC San Diego Health System (2014): <https://www.youtube.com/watch?v=3GfpUM-T5Vk&index=3&list=PL748084746DCAC850>
- Chapter 2 of 4 Smoke Inhalation Injury—Bruce Potenza MD, USCDTraumaBurn, Division of Trauma/Surgical Critical Care/Burns, UC San Diego Health System (2014): <https://www.youtube.com/watch?v=JdC5aeodKIM&index=9&list=UURB5EunenkaDJenXQghom7w>
- Chapter 28-Soft Tissue Trauma—Southern Union State Community College (2013): <https://www.youtube.com/watch?v=rAeXz7ezghA>
- EM Lecture: What's Hot in Burns—Barbara Latenser MD FACS, University of Iowa Hospitals & Clinics Department of Emergency Medicine (2006): <https://itunes.apple.com/us/podcast/em-lecture-whats-hot-in-burns/id123429715?i=9999249&mt=2>
- EM-Electrical Injuries—lynnstai, Western University of Health Science, California (2011) (authors created for physician assistant student project): <https://www.youtube.com/watch?v=ERCJqGLfFKU>

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**Pediatrics**

- Pediatric Trauma 2014 Video 7-Burn Injury-Overview and Initial Care—Robert Sheridan MD, Childress Institute for Pediatric Trauma (2014) (*technical problems near end*): <https://www.youtube.com/watch?v=UQu8qpwhtKM>
- Fluid Resuscitation for Burn Injuries by Dr. Robert Sheridan for OPENPediatrics—Boston Children’s Hospital (2014): <https://www.youtube.com/watch?v=rqXfWwpFEvY>

**Podcasts**

- Dirt Medicine Podcast 002-Burn Resuscitation Part 1—Pete Anderson MD: <https://itunes.apple.com/us/podcast/dirt-medicine-podcast-002/id431104927?i=93040010&mt=2>
- Dirt Medicine Podcast 003-Burn Resuscitation Part 2—Pete Anderson MD: <https://itunes.apple.com/us/podcast/dirt-medicine-podcast-003/id431104927?i=94112439&mt=2>

**Shock****Tintinalli’s**

Chapter 25—Approach to the Patient in Shock

Chapter 26—Fluid and Blood Resuscitation

**Management Videos**

- Understanding Shock—University of Miami Health System (2011): <https://www.youtube.com/watch?v=Eipht99mh0g>
- Eric Strong MD, Eric’s Medical Lectures, Stanford University School of Medicine. Series of lectures *Shock* (2011):
  - Part 1: <https://www.youtube.com/watch?v=3mBRpxJIUx8>
  - Part 2: <https://www.youtube.com/watch?v=Qby4wd2kPrE>
  - Part 3: <https://www.youtube.com/watch?v=3mBRpxJIUx8>
- EM Lecture: The Pathophysiology of Shock—Eric Dickson MD, University of Iowa Hospitals & Clinics Department of Emergency Medicine (2007): <https://itunes.apple.com/us/podcast/em-lecture-pathophysiology/id123429715?i=14002560&mt=2>

**Podcast**

- ACEP Preview-Hemostasis: Stopping the bleeding in a crashing trauma patient—Scott Weingart MD, Emergency Department Critical Care and Resuscitation, EMCrit Podcast (2010): <https://itunes.apple.com/us/podcast/acep-preview-hemostasis-stopping/id314020330?i=161166396&mt=2>
  - Lecture notes: <http://emcrit.org/lectures/hemostasis-acep/>
- C is for Circulation (part 1 of 2)—Emergency Medicine and Pediatric Emergency Medicine, empem.org (2010): <https://itunes.apple.com/us/podcast/c-is-for-circulation-part-1-of-2/id376198402?i=91205669&mt=2>

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<ul style="list-style-type: none"> <li>▪ Circulation (part 2 of 2)—Emergency Medicine and Pediatric Emergency Medicine, empem.org (2010): <a href="https://itunes.apple.com/us/podcast/circulation-part-2-of-2/id376198402?i=91205670&amp;mt=2">https://itunes.apple.com/us/podcast/circulation-part-2-of-2/id376198402?i=91205670&amp;mt=2</a></li> </ul>
<b>Traumatic Cardiac Arrest</b>
<p><b>Readings</b></p> <ul style="list-style-type: none"> <li>▪ American Heart Association. (2005). Part 10.7: Cardiac arrest associated with trauma. <i>Circulation</i>, 112, IV-46-IV-149. Retrieved from <a href="http://www.circ.ahajournals.org/content/112/24_suppl/IV-146.full.pdf+html">http://www.circ.ahajournals.org/content/112/24_suppl/IV-146.full.pdf+html</a></li> <li>▪ National Association of EMS Physicians and American College of Surgeons Committee on Trauma. (2013). Withholding of resuscitation for adult traumatic cardiopulmonary arrest. <i>Prehospital Emergency Care</i>, 17, 291. Retrieved from <a href="http://www.naemsp.org/Documents/Position%20Papers/POSITION%20Withholding%20of%20Resuscitation%20for%20Adult%20Traumatic%20Cardiopulmonary%20Arrest.pdf">http://www.naemsp.org/Documents/Position%20Papers/POSITION%20Withholding%20of%20Resuscitation%20for%20Adult%20Traumatic%20Cardiopulmonary%20Arrest.pdf</a></li> </ul> <p><b>Management Videos</b></p> <ul style="list-style-type: none"> <li>▪ Traumatic cardiac arrest—Dr. David Wise, College of Emergency Medicine (2014): <a href="https://www.youtube.com/watch?v=ZhmNotiWaKY">https://www.youtube.com/watch?v=ZhmNotiWaKY</a></li> <li>▪ When to Stop Resuscitation—Dr. Cliff Reid, Resuscitation Medicine Education, resus.me (2014): <a href="http://vimeo.com/98300006">http://vimeo.com/98300006</a></li> </ul> <p><b>Podcast</b></p> <ul style="list-style-type: none"> <li>▪ Traumatic Arrest Podcast 36—Scott Weingart MD, Emergency Department Critical Care and Resuscitation, EMCrit Podcast (2010): <a href="https://itunes.apple.com/us/podcast/emcrit-podcast-36-traumatic/id561164203?i=134321837&amp;mt=2">https://itunes.apple.com/us/podcast/emcrit-podcast-36-traumatic/id561164203?i=134321837&amp;mt=2</a> <ul style="list-style-type: none"> <li>○ Lecture notes: <a href="http://emcrit.org/podcasts/traumatic-arrest/">http://emcrit.org/podcasts/traumatic-arrest/</a></li> </ul> </li> <li>▪ An Interview on Severe Trauma with Karim Brohi—Scott Weingart MD, Emergency Department Critical Care and Resuscitation, EMCrit Podcast (2012): <a href="https://itunes.apple.com/us/podcast/interview-on-severe-trauma/id314020330?i=120144007&amp;mt=2">https://itunes.apple.com/us/podcast/interview-on-severe-trauma/id314020330?i=120144007&amp;mt=2</a> <ul style="list-style-type: none"> <li>○ Lecture notes: <a href="http://emcrit.org/podcasts/severe-trauma-karim-brohi/">http://emcrit.org/podcasts/severe-trauma-karim-brohi/</a></li> </ul> </li> <li>▪ EMCrit Podcast-Trauma Thoughts with John Hinds—Scott Weingart MD, Emergency Department Critical Care and Resuscitation, EMCrit Podcast (2014): <a href="https://itunes.apple.com/us/podcast/emcrit-podcast-trauma-thoughts/id314020330?i=320261470&amp;mt=2">https://itunes.apple.com/us/podcast/emcrit-podcast-trauma-thoughts/id314020330?i=320261470&amp;mt=2</a> <ul style="list-style-type: none"> <li>○ Lecture notes: <a href="http://emcrit.org/podcasts/trauma-thoughts-john-hinds/">http://emcrit.org/podcasts/trauma-thoughts-john-hinds/</a></li> </ul> </li> <li>▪ Trauma Arrest-Interview with ED intensivist Scott Weingart MD—Rob Orman MD, ERCast (2012) (<i>caution on profanity</i>): <a href="https://itunes.apple.com/us/podcast/trauma-arrest/id353141357?i=169814475&amp;mt=2">https://itunes.apple.com/us/podcast/trauma-arrest/id353141357?i=169814475&amp;mt=2</a></li> </ul>
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<b>E-FAST</b>
<p><b>Videos</b></p> <ul style="list-style-type: none"> <li>▪ The FAST Exam— Department of Emergency Medicine, Hennepin County Medical Center HQMedEd (2008): <a href="http://hqmeded.com/the-fast-exam/">http://hqmeded.com/the-fast-exam/</a></li> <li>▪ Focused Assessment with Sonography in Trauma—USCDTraumaBurn, Division of Trauma/Surgical Critical Care/Burns, UC San Diego Health System (2012): <a href="https://www.youtube.com/watch?v=jfsLo35aMuU">https://www.youtube.com/watch?v=jfsLo35aMuU</a></li> </ul> <p><b>Free APP</b></p> <ul style="list-style-type: none"> <li>▪ One Minute Ultrasound—Ultrasoundpodcast.com: <a href="http://omus.ultrasoundpodcast.com/">http://omus.ultrasoundpodcast.com/</a></li> </ul>
<b>Trauma in Pregnancy</b>
<p><b>Tintinalli's</b> Chapter 253—Trauma in Pregnancy</p> <p><b>Reading</b></p> <ul style="list-style-type: none"> <li>▪ American College of Emergency Physicians. (2014). <i>Trauma in the Obstetric Patient: A Bedside Tool</i>. Retrieved from <a href="http://www.acep.org/Clinical---Practice-Management/Trauma-in-the-Obstetric-Patient--A-Bedside-Tool/">http://www.acep.org/Clinical---Practice-Management/Trauma-in-the-Obstetric-Patient--A-Bedside-Tool/</a></li> </ul> <p><b>Management Videos</b></p> <ul style="list-style-type: none"> <li>▪ Trauma in Pregnancy, Vishal Bansal MD, USCDTraumaBurn, Division of Trauma/Surgical Critical Care/Burns, UC San Diego Health System (2012): <a href="https://www.youtube.com/watch?v=XoeIos_HH0k">https://www.youtube.com/watch?v=XoeIos_HH0k</a></li> <li>▪ 18-2009 Emergency Medicine &amp; Acute Care Series-Minor Abdominal Trauma in Pregnancy—Peter Viccellio MD, Center for Medical Education (2013): <a href="https://www.youtube.com/watch?v=q4CWrvfWyAg">https://www.youtube.com/watch?v=q4CWrvfWyAg</a></li> </ul> <p><b>Podcast</b></p> <ul style="list-style-type: none"> <li>▪ Trauma in pregnancy—Heather Bailey MD, Duke Emergency Medicine (2011): <a href="https://itunes.apple.com/us/podcast/trauma-in-pregnancy-heather/id464432678?i=215050857&amp;mt=2">https://itunes.apple.com/us/podcast/trauma-in-pregnancy-heather/id464432678?i=215050857&amp;mt=2</a></li> </ul>
<b>Drowning</b>
<p><b>Tintinalli's</b> Chapter 209—Drowning</p> <p><b>Management Video</b></p> <ul style="list-style-type: none"> <li>▪ Drowning—Center for Maritime Medicine, ShipsMed, Maine (2013): <a href="https://www.youtube.com/watch?v=i-dO8t9PiZ0">https://www.youtube.com/watch?v=i-dO8t9PiZ0</a></li> </ul>
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### Trauma Medication Considerations

#### Readings

- Maine Medical Center Department of Emergency Medicine (2007). *Guideline for the management of bleeding on Dabigatran (Pradaxa)*. Portland, Maine. Retrieved from : <http://www.guideline.gov/content.aspx?id=36840>
- McGonigal, M. (n.d.). How to Rapidly Reverse Coumadin in Head-Injured Patients [Web log article]. Available from <http://regionstraumapro.com/post/323809185>
  - Warfarin Reversal for Patients with Known or Suspected TBI (2011)—(*algorithm*): <http://www.regionstrauma.org/blogs/TBI-Warfarin.pdf>
- McGonigal, M. (n.d.). Medication Alert! Dabigatran and Head Trauma [Web log article]. Available from <http://regionstraumapro.com/post/5544225915>
  - Regions Hospital Proposed Dabigatran Guidelines for the Management of Life-Threatening or Major Bleeding—(*protocol*): <http://www.regionstrauma.org/blogs/dabigatran.pdf>

#### Management Videos

- Bleeding in the Patient on Dabigatran—Nathaniel Scott MD, Department of Emergency Medicine, Hennepin County Medical Center, HQMedEd (2011): <http://hqmeded.com/bleeding-in-the-patient-on-dabigatran-2/>
- Anticoagulant Reversal—Kelly Barringer, Emergency Medicine, Regions Hospital, HealthPartnersMedEd (2014): <https://www.youtube.com/watch?v=Mxt-mnRvXTQ>
- Injured Patients and Anticoagulation—David Dries MD, HealthPartners Medical Group, Regions Hospital Trauma Conference, regionstrauma (2013) (*may stop at the case studies which are difficult to hear*): <https://www.youtube.com/watch?v=C7NrWuuWi6s>
- Trauma Day Away 2012-Strategies for Reversal of Anticoagulation in Surgery...by Jay Doucet—Jay Doucet MD, USCDTraumaBurn, Division of Trauma/Surgical Critical Care/Burns, UC San Diego Health System (2012): <https://www.youtube.com/watch?v=v56OLC9PxGQ>

#### Podcasts

- EM Basic Essential Evidence-Admission for patients with minor head injury on Coumadin-Annals of EM—Steve Carroll DO, EM Basic (2012): <https://itunes.apple.com/us/podcast/em-basic-essential-evidence/id453647774?i=120163404&mt=2>
- Anticoagulation Reversal-Interview with hematologist Tom Deloughery MD—Rob Orman MD, ERCAST (2012): <https://itunes.apple.com/us/podcast/anticoagulation-reversal/id353141357?i=116602571&mt=2>
  - Lecture notes and articles: <http://blog.ercast.org/anticoagulation-reversal/>
- Anticoagulation Reversal: Part 2-Interview with ED intensivist Scott Weingart MD—Rob Orman MD, ERCAST (2012): <https://itunes.apple.com/us/podcast/anticoagulation-reversal-part/id353141357?i=118603943&mt=2>
  - Lecture notes and articles: <http://blog.ercast.org/anticoagulation-reversal/>

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<ul style="list-style-type: none"> <li>▪ EMCrit Podcast 17-Reversal of Anti-coagulant and Anti-platelet Drugs in Head Bleeds—Scott Weingart MD, Emergency Department Critical Care and Resuscitation, EMCrit Podcast (2010): <a href="https://itunes.apple.com/us/podcast/emcrit-podcast-17-reversal/id561164203?i=120486715&amp;mt=2">https://itunes.apple.com/us/podcast/emcrit-podcast-17-reversal/id561164203?i=120486715&amp;mt=2</a> <ul style="list-style-type: none"> <li>○ Lecture notes: <a href="http://emcrit.org/podcasts/reversal-head-bleeds/">http://emcrit.org/podcasts/reversal-head-bleeds/</a></li> </ul> </li> </ul>
<b>EMTALA</b>
<p><b>Tintinalli's</b> Chapter 298, pp 2026-2029—Legal Issues in Emergency Medicine, EMTALA section</p> <p><b>Videos</b></p> <ul style="list-style-type: none"> <li>▪ Understanding EMTALA law and how it applies to any clinician—Andrew Nugent MD, University of Iowa Department of Emergency Medicine (2011): <a href="https://itunes.apple.com/us/podcast/undersanding-emtala-law-how/id123429715?i=97232243&amp;mt=2">https://itunes.apple.com/us/podcast/undersanding-emtala-law-how/id123429715?i=97232243&amp;mt=2</a></li> <li>▪ EMTALA Protocol—Baptist Health System (2013): <a href="https://www.youtube.com/watch?v=mkny49BSzME">https://www.youtube.com/watch?v=mkny49BSzME</a></li> <li>▪ EMTALA: Screening, Dumping, and Crossing the 250 Yard Line... Reviewing the Rules and Reducing the Risk—University of Wisconsin Hospital and Clinics (2009): <a href="http://videos.med.wisc.edu/videos/9862">http://videos.med.wisc.edu/videos/9862</a></li> <li>▪ EMTALA: National Perspective on a Local Problem—Larry Weiss MD, University of Iowa Department of Emergency Medicine (2007): <a href="https://itunes.apple.com/us/podcast/emtala-national-perspective/id123429715?i=17064178&amp;mt=2">https://itunes.apple.com/us/podcast/emtala-national-perspective/id123429715?i=17064178&amp;mt=2</a></li> </ul> <p><b>Podcasts</b></p> <ul style="list-style-type: none"> <li>▪ EMTALA: What Every EP Must Know-EP Advocates: Legal and Policy Issues in Emergency Medicine—American Academy of Emergency Medicine (2014): <a href="https://itunes.apple.com/us/podcast/emtala-what-every-ep-must/id610782430?i=242307957&amp;mt=2">https://itunes.apple.com/us/podcast/emtala-what-every-ep-must/id610782430?i=242307957&amp;mt=2</a></li> <li>▪ EMTALA: What Every EP Must Know, Part 2-EP Advocates: Legal and Policy Issues in Emergency Medicine—American Academy of Emergency Medicine (2014): <a href="https://itunes.apple.com/us/podcast/emtala-what-every-ep-must/id610782430?i=249808472&amp;mt=2">https://itunes.apple.com/us/podcast/emtala-what-every-ep-must/id610782430?i=249808472&amp;mt=2</a></li> </ul>

### Highly Recommended Online Resources/References By Topic

Some of these articles were referred to in videos or podcasts

#### Introduction to Trauma

Brenner, D., & Hall, E. (2007). Computed tomography—An increasing source of radiation exposure. *The New England Journal of Medicine*, 357, 2277-2284. Retrieved from <http://www.nejm.org/doi/pdf/10.1056/NEJMra072149>

Lerner, E. & Moscati, D. (2008). The golden hour: Scientific fact or medical “urban legend”? *Academic Emergency Medicine*, 8(7), 758-760. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1553-2712.2001.tb00201.x/pdf>

Nickson, C. (n.d.). Trauma! Are you prepared? [Web log article]. *Life in the Fastlane*. Retrieved from <http://lifeinthefastlane.com/trauma-tribulation-013/>

Nickson, C. (n.d.). Trauma! Initial assessment and management [Web log article]. *Life in the Fastlane*. Retrieved from <http://lifeinthefastlane.com/trauma-initial-assessment-management/>

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## EMTALA

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American Academy of Emergency Medicine. (2015). EMTALA. Retrieved from <http://www.aaem.org/em-resources/regulatory-issues/emtala> (variety of resources for emergency providers on EMTALA).

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### Other Suggestions for Online Emergency Medicine Podcasts and Websites

- EM Basic-- <http://embasic.org/links/>
- EMCrit-- <http://emcrit.org/favorites>

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### Optional Thoracotomy Information

- Pre-hospital thoracotomy—Cliff Reid MD, Resuscitation Medicine Education, resus.me (2011): <http://resusme.em.extrememember.com/?p=5118>
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- Resuscitative Thoracotomy—University of Maryland Department of Emergency Medicine (2012): [https://www.youtube.com/watch?v=A57ZB\\_J4FuY](https://www.youtube.com/watch?v=A57ZB_J4FuY)
- Podcast 83-Crack to Cure ED Thoracotomy—Scott Weingart MD, Emergency Department Critical Care and Resuscitation, EMCrit Podcast (2012): <https://itunes.apple.com/us/podcast/podcast-83-crack-to-cure-ed/id314020330?i=121844477&mt=2>
  - Lecture notes: <http://emcrit.org/podcasts/procedure-of-thoracotomy/>

**Post Module Exam**

1. Which of these risk factors suggest the need for a head CT in a child under age 2 after a head injury: (*choose all that apply*)
  - a. Loss of consciousness greater than 5 minutes
  - b. One episode of vomiting
  - c. Frontal scalp hematoma
  - d. Seizure
  - e. Suspicion of a depressed skull fracture
  - f. Occipital scalp hematoma
2. The diagnostic test of choice for diagnosis of abdominal injury in children and adults is:
  - a. FAST examination
  - b. CT scan with IV contrast
  - c. CT scan without IV contrast
  - d. Diagnostic peritoneal lavage
  - e. Physical examination
  - f. Radiograph examination
3. The IV fluid of choice during the initial resuscitation of a burn patient is:
  - a. Lactated ringers
  - b. Normal saline
  - c. D5 and normal saline
  - d. Albumen or hetastarch
  - e. Packed red blood cells
4. Lactated ringers is *NOT* indicated in a burn patient with:
  - a. Hypothermia

- b. Sepsis
  - c. Facial burns
  - d. Kidney problems
5. Initial wound management for a burn includes: *(choose all that apply)*
- a. Saran or other plastic wrap
  - b. Clean, dry covering
  - c. Ice
  - d. Cool water to entire body
  - e. Copious amounts of Silvadene (silver sulfadiazine)
6. Which of the following represent potential EMTALA violations: *(choose all that apply)*
- a. Admitting a patient with a head bleed and unstable vital signs to the hospital
  - b. Obtaining insurance information as the first step on a trauma patient who just arrived by ambulance
  - c. Transferring a patient with profound hypotension with a traumatic chest injury
  - d. A nurse telling the patient that the wait is long to be seen and perhaps they would be seen sooner at a nearby hospital.
7. A 60-year old man is found lying in the ditch after rolling his car in the winter. On arrival he has pulseless electrical activity. His core temperature is 85 degrees Fahrenheit (29.4 degrees Celsius). Which of the following are *NOT* recommended: *(choose all that apply)*
- a. Warm intravenous fluids.
  - b. Epinephrine
  - c. Defibrillation

- d. Chest compressions
8. A 68-year old woman fell at home after tripping. She is on warfarin and her INR is 3.0. Her initial head CT is negative and her neurological examination is completely normal. The next step for this patient is:
- a. Discharge home with specific instructions of symptoms to watch for
  - b. Admit to observation for 24 hours
  - c. Transfer to a higher level of care
  - d. Call neurosurgeon for advice
9. Strategies for reversal of anticoagulation for a patient on warfarin with an acute traumatic brain injury may include: *(choose all that apply)*
- a. Fresh frozen plasma
  - b. Vitamin K
  - c. Recombinant Factor VIIa
  - d. Prothrombin Complex Concentrate
10. When giving vitamin K, the best route is:
- a. Oral
  - b. IM
  - c. Subcutaneous
  - d. IV
11. Management of bleeding in a trauma patient on Dabigatran may include: *(choose all that apply)*
- a. Vitamin K
  - b. Activated charcoal if taken within 2 hours

- c. Fresh frozen plasma
  - d. Dialysis
  - e. Packed red blood cell transfusion
12. True or False: The two new novel anticoagulants rivaroxaban (Xarelto) and abixaban (Eliquis) have no specific antidote.
13. True or False: Venous blood gases may be used in place of arterial blood gases.
14. Applying a cervical collar for a child does **NOT** include:
- a. Using Broselow tape to identify size
  - b. Maintaining head and neck in proper alignment with two people
  - c. Applying padding under the head and neck to achieve alignment
  - d. Opening the front of the collar and scooping up toward the chin
15. A 65-year old woman falls off of her deck and lands awkwardly on her right leg. There is immediate pain and she cannot bear weight. She arrives via ambulance. The first priority in the management of her injury is:
- a. Provide effective splinting of the limb to reduce further injury
  - b. Provide immediate analgesia for an accurate assessment
  - c. X-ray the limb to evaluate the extent of injury
  - d. Obtain a head CT
  - e. Assess for immediate life threats such as shock and airway
16. Appropriate initial labs for a pediatric trauma patient include: (*choose all that apply*)
- a. Urinalysis
  - b. Prottime
  - c. Troponin

- d. Lactic acid
  - e. Hemoglobin/hematocrit
  - f. Accucheck
17. Which patient should remain in selective cervical spinal immobilization? (*choose all that apply*)
- a. A person who smells of alcohol
  - b. Someone who has a severe burn on the leg
  - c. Altered level of consciousness with a Glasgow Coma Scale < 15
  - d. Someone who was walking around at the scene of an accident
  - e. A person with para-spinal/lateral neck pain on examination
  - f. A child under the age of 8
18. Selective cervical spinal immobilization includes: (*choose all that apply*)
- a. Prehospital immobilization with a cervical collar, head immobilization, and a spine board.
  - b. Keeping patient on the spine board for the duration of the emergency room stay until transferred to another location
  - c. Continuing the cervical collar until CT of the spine is completed.
  - d. Transferring off of a spine board as soon as possible
19. In a 6-year old child with shock secondary to hemorrhage from a femur fracture, which sign indicates late shock?
- a. Sinus tachycardia
  - b. Delayed capillary refill > 2 seconds
  - c. Tachypnea

- d. Cool extremities
  - e. Hypotension
20. When splinting a 6-year old child with a deformed femur indicating probable femur fracture to prepare for a transfer to another facility, the advanced practice provider would:
- (choose all that apply)*
- a. Apply a Hare Traction splint
  - b. Assess neurovascular status at baseline, after splinting, and after moving
  - c. Assure that the splint includes the joints above and below the injury
  - d. Attempt to move the femur back into proper alignment
  - e. Decrease traction or remove the splint if delays in transfer are anticipated.
21. A 34-year old woman just arrived via ambulance after being stabbed in the right chest. She is conscious, restless, and having difficulty breathing. On primary survey, you notice an open chest wound and bubbling blood. Your first action is to:
- a. Begin assisted ventilation with 100% oxygen
  - b. Begin infusing intravenous fluids with pressure bag
  - c. Cover the wound with an air-occlusive dressing and tape on three sides
  - d. Roll the patient to assess for exit wound
22. Are prothrombin complex concentrates or fresh frozen plasma available at your rural emergency room?

**Post Module Exam Answers**

1. a, d, e, f

Sources: Dalton (2012)--Clinical Prediction Pediatric Minor Head Trauma  
empem.org (2011)—Cranial CT for Minor Head Injury  
Kupperman et al. (2009)—PECARN from *Lancet*

2. b

Source: Kuppermann (2014)  
Tintinalli's

3. a

Source: Latenser (2006)—What's Hot in Burns

Rationale: High amounts of normal saline required for burn resuscitation in the Parkland formula can alter the patient's chloride level. Lactated ringers is the solution of choice.

4. a

Source: Latenser (2006)—What's Hot in Burns

Rationale: Patient with profound hypothermia will not metabolize the lactate.

5. a, b

Source: Latenser (2006)—What's Hot in Burns

Rationale: Avoid hypothermia in the patient. Additionally, ice may make a wound worse. Any large amounts of topical medication will need to be removed at the burn center. An exception would be if advised to use by a burn specialist in the event that the patient does not require transfer.

6. b, c, d

Source: Nugent (2011)--Understanding EMTALA law  
Weiss (2007)--EMTALA: National Perspective

Rationale: EMTALA ends when a patient is admitted to the hospital. By admitted the patient to the hospital it represents that the patient is felt to need the high level of care in the hospital. If a patient is transferred to another facility, a medical provider must be able to make a determination with reasonable medical probability that the patient will not deteriorate. If the transferring hospital does not have the capacity to stabilize or care for a patient, then the benefit of transfer may outweigh the risk. In the situation of the chest trauma, are there things that can be done first to stabilize the patient such as a chest tube?

7. b, c

Source: Schwemm (2007)—Hypothermia Case

Li et al. (2014)--Hypothermia

8. b

Source: Carroll (2012)—Admission for patients with minor head

Doucet (2012)—Strategies for Reversal of Anticoagulation

Rationale: Delayed bleeding is highly possible. A second head CT scan will be an important part of managing this patient.

9. a, b, c, d

Source: Dries (2013)—Injured Patients and Anticoagulation

Doucet (2012)—Strategies for Reversal of Anticoagulation

10. a, d

Source: Dries (2013)—Injured Patients and Anticoagulation

Weingart (2010)--Reversal of Anti-coagulant

11. b, d, e

Source: Dries (2013)—Injured Patients and Anticoagulation

McGonigal (n.d.)--Medication Alert! Dabigatran and Head

12. True

Rationale: PCC's may play a role but studies are still being done. Sources still note that these medications have no specific antidote other than conservative management of bleeding.

13. True

Source: Malloon (2013)--Trauma Lab Tests

14. c

Source: Weikart (2012)—Miami J & Miami Jr.

Rationale: Padding would be applied below the scapula to the base of the spine.

15. e

Source: University of Miami Health System (2011)—ABC's of Trauma  
Sparky Spacy (2014)—Primary Survey ATLS

16. a, b, e, f

Source: Mallon (2013)--Trauma Lab Tests

Rationale: Any lab that does not impact the immediate care of the patient is unnecessary. Further, it may be argued that a chemistry panel in a young previously healthy child is not needed.

17. a, b, c, f

Source: Carroll (2012)—EM Basic Essential Evidence-NEXUS Study  
Virginia County of Orange Fire and EMS (2013)  
Hoffman et al. (2000)

18. a, d

Source: Virginia County of Orange Fire and EMS (2013)  
Hoffman et al. (2000)—NEXUS  
Carroll (2012)—EM Basic Essential Evidence-NEXUS Study  
Carroll (2012)—Trauma Resuscitation

Rationale: For patients who cannot be cleared at the scene using the NEXUS rule, selective spinal immobilization includes the cervical collar, head immobilization, and the spinal board. Once at the emergency department, the patient may be logrolled off the spine board to avoid pressure areas. The purpose of the spine board is only for safe transferring. There is no benefit in the board beyond transferring the patient to imaging or another location.

19. e

Source: University of New Mexico--Pediatric Musculoskeletal Trauma Part 1  
Rationale: Hypotension is a very late sign of shock and circulatory collapse.

20. b, c, d

Source: University of New Mexico--Pediatric Musculoskeletal Trauma Part 1  
Center for Maritime Medicine (2013)-- Musculoskeletal Injuries Splinting.

Rationale: Unnecessary movement may increase bleeding of the fracture. Gentle traction may be used after a splint is applied. A Hare Traction splint is not indicated for this age of child due to the size of the splint. When not in the process of transporting a patient, the splint traction should be loosened or removed to avoid tissue ischemia.

21. c

Source: Southern Union State Community College (2013)--Thoracic Trauma  
Center for Maritime Medicine (2013)--Thoracic Trauma

22. Critical access hospitals may not have the resources available typically found in a larger hospital. Vitamin K may be the only available choice. This is a question meant to stimulate discussion about how someone with bleeding on anticoagulants would be managed.

<b>Trauma Module Checklist</b>			
<b>Focus</b>	<b>Assignment</b>	<b>Time</b>	<b>Date Done</b>
<b>Intro</b>	<b>Tintinalli's</b>		
	▪ Chapter 250—Trauma in Adults		
	▪ Chapter 251—Trauma in Children		
	▪ Chapter 252—Geriatric Trauma		
	<b>Readings</b>		
	▪ American College of Surgeons Committee on Trauma		
	○ Chapter 5—Hospital Organization/Trauma Program		
	○ Chapter 13—Rural Trauma Care		
	▪ Evaluation and management of geriatric trauma		
	▪ What to do? Small hospital, unstable patient		
	▪ Initial assessment and management of pediatric trauma		
	<b>Management Videos</b>		
	▪ ABC's of Trauma—University of Miami Health System	14:32	
	▪ Primary Survey ATLS Video—Sparky Spacy	11:02	
	▪ Secondary Survey ATLS—Sparky Spacy	4:03	
	▪ 2013 Trauma and Falls in the Elderly	38:20	
	▪ Emergency Medicine & Acute Care-Trauma Lab Tests	28:42	
	▪ ATLS: Rural Medicine and ATLS	4:18	
	<b>Pediatrics</b>		
	▪ Evaluation and Management of Pediatric Trauma: Part 1	50:00	
	▪ Evaluation and Management of Pediatric Trauma: Part 2	42:00	
	<b>Podcasts</b>		
	▪ Severe Pediatric Trauma with Michael McGonigal	32:00	
	○ Lecture notes		
	▪ New Trauma Guidelines: ATLS and Spine	11:00	
	○ Lecture notes		
	▪ The Mind of a Resus Doc: Logistics over Strategy	9:00	
	○ Lecture notes		
	▪ Effects of Obesity in the Traumatically Injured	17:00	
	▪ Trauma Resuscitation Part 1-the evaluation	24:00	

	○ Lecture notes		
	▪ Trauma Resuscitation Part 2-the interventions	25:00	
	○ Lecture notes		
<b>Prehospital</b>	<b>Tintinalli's</b>		
	▪ Chapter 2—Prehospital Equipment and Adjuncts		
	<b>Management Videos</b>		
	▪ EMT 6-1: Trauma Overview	78:13	
	▪ 2013 Spinal Immobilization	6:34	
	▪ Board to Tears: Selective Spinal Immobilization	20:11	
	▪ Fitting a Cervical Collar	1:23	
	▪ Applying a Miami J Collar	2:57	
	▪ Trauma Day Away 2012-Miami J & Miami Jr.	29:14	
	▪ Helmet Removal	3:34	
	▪ Motorcycle Helmet Removal	1:40	
	▪ Spinal Immobilization	9:49	
	▪ Emergency Med & Acute Care-Prehospital Trauma Care	21:38	
	<b>Podcasts</b>		
	▪ The prehospital episode	14:00	
<b>Head</b>	<b>Tintinalli's</b>		
	▪ Chapter 254—Head Trauma in Adults and Children		
	▪ Chapter 256—Trauma to Face		
	▪ Chapter 257—Trauma to Neck		
	<b>Required Reading:</b>		
	▪ Identification of Children-Important Brain Injuries		
	<b>Radiology Videos</b>		
	▪ Introduction to Head CT (self-paced)		
	▪ Introduction to the CT Brain	6:53	
	<b>Management Videos</b>		
	▪ Glasgow Coma Scale at 40	7:56	
	▪ Basic Trauma Workshop: Head Trauma & Spinal Cord	55:19	
	▪ Head and Spinal Injuries	66:12	
▪ Emergency Med & Acute Care- Minor Head Trauma	24:40		

	▪ Penetrating Neck Trauma	49:52	
	<b>Pediatrics</b>		
	▪ Heads Up To Clinicians: Addressing Concussions	60:00	
	▪ Review of a Clinical Prediction Rule	12:20	
	▪ Pediatric Head Neck and Spine Trauma Part 1	60:00	
	▪ Pediatric Head Neck and Spine Trauma Part 2	60:00	
	<b>Podcasts</b>		
	▪ Decision Rules for Peds Minor Head Injury	5:20	
	▪ Vomiting as a predictor of TBI	3:38	
	▪ Episode 1-Penetrating Neck Trauma Guidelines	9:00	
	○ Lecture notes		
	▪ Screening for Blunt Cerebrovascular Injury	23:00	
	▪ Observation for minor head injury in kids	4:03	
	▪ Cranial CT for Minor Head Injury	45:00	
	▪ Minor Head Injury: Who Has The Badness	98:00	
	▪ D is for Disability (part 1 of 2)	22:00	
	▪ D is for Disability (part 2 of 2)	41:20	
<b>Spine</b>	<b>Tintinalli's</b>		
	▪ Chapter 255—Spine and Spinal Cord Trauma		
	<b>Reading:</b>		
	▪ Pre-hospital Management-Potential Spinal Cord Injured		
	<b>Radiology Videos</b>		
	▪ Imaging Evaluation of the Cervical Spine (self-paced)		
	▪ Radiology of Spine Trauma	20:45	
	▪ Podcast 11 Cervical Spine Trauma	18:10	
	▪ Podcast 14 Thoraco Lumbar Spine Trauma	9:05	
	<b>Management Videos</b>		
	▪ Cervical Spine Assessment and Clearance	5:16	
	▪ Clinical Clearance of the Cervical Spine	3:12	
	▪ How to Use the Canadian C-Spine Rule	5:08	
	▪ Cervical Spine Clearance	49:54	
	▪ Emergency Med & Acute Care-Cervical Spine Injuries	18:38	

	▪ Head and Spinal Injuries	66:12	
	▪ Predicting the Need for Intubation	4:18	
	<b>Pediatrics</b>		
	▪ Pediatric Cervical Spine Injuries	6:26	
	<b>Podcasts</b>		
	▪ Cervical Spine Assessment in Children	35:00	
	▪ Clearing the Paediatric C-Spine	28:00	
	▪ EM Basic Essential Evidence-The NEXUS Study	8:49	
	▪ EM Basic Essential Evidence-PECARN Head CT Rule	11:43	
	▪ Podcast 63-A Pain in the Neck-Part 1	21:00	
	○ Lecture notes		
	▪ More on a Diagnostic Strategy for C-Spine Injuries	17:00	
	○ Lecture notes		
	▪ EMCrit Wee-More on C-Spine Imaging	3:00	
	○ Lecture notes		
<b>Chest Trauma</b>	<b>Tintinalli's</b>		
	▪ Chapter 258—Pulmonary Trauma		
	▪ Chapter 259—Cardiac Trauma		
	<b>Radiology Videos</b>		
	▪ Introduction to the Chest Xray	15:48	
	▪ Eric's Medical Lectures. <i>How to Interpret a Chest X-Ray</i>		
	○ Lesson 1-An Introduction	14:24	
	○ Lesson 2-A Systematic Method and Anatomy	10:11	
	○ Lesson 3-Assessing Technical Quality	16:33	
	○ Lesson 4-Airways, Bones, and Soft Tissue	16:55	
	○ Lesson 5-Cardiac Silhouette and Mediastinum	17:32	
	○ Lesson 6-Diaphragm and Pleura	17:40	
	○ Lesson 7-Diffuse Lung Processes	16:56	
	○ Lesson 8-Focal Lung Processes	18:12	
	○ Lesson 9-Atelectasis, Lines, Tubes...	23:59	
	○ Lesson 10-Self Assessment Part 1	19:18	
	○ Lesson 10-Self Assessment Part 2	17:50	

	▪ Pneumothorax	4:16	
	▪ LearningRadiology 43 (Chest Trauma)	14:46	
	<b>Management Videos</b>		
	▪ ITLS Ch 6 Thoracic Trauma	35:48	
	▪ MD311 Thoracic Trauma	49:46	
	▪ Chapter 29 Chest and Abdominal Trauma	71:35	
	▪ Chest Tube Insertion	7:02	
	▪ Needle Decompression of the Chest	3:38	
	▪ Finger Thoracostomy	1:06	
	<b>Pediatric</b>		
	▪ Pediatric Abdomen and Chest Trauma Part 1	60:00	
	▪ Pediatric Abdomen and Chest Trauma Part 2	60:00	
	▪ Pediatric Abdomen and Chest Trauma Part 3	60:00	
	<b>Podcasts</b>		
	▪ Episode 9-Blunt Cardiac Injury from EAST	8:00	
	○ Lecture notes		
	▪ Needle vs. Knife II: Needle Thoracostomy	17:00	
	○ Lecture notes		
<b>Abd/ Pelvic</b>	<b>Tintinalli's</b>		
	▪ Chapter 260—Abdominal Trauma		
	▪ Chapter 261—Penetrating Trauma to Flank and Buttocks		
	▪ Chapter 262—Genitourinary Trauma		
	<b>Radiology Videos</b>		
	▪ Podcast 22 Pelvic Trauma 1	11:42	
	▪ Podcast 23 Pelvic Trauma 2	11:24	
	<b>Management Videos</b>		
	▪ MD311 Abdominal	18:35	
	▪ Trauma Day Away 2012-Pelvic Fractures	33:52	
	<b>Pediatrics</b>		
	▪ Evaluation of Pediatric Blunt Abdominal Trauma (PowerPoint)		
	▪ Pediatric Abdominal Trauma	37:54	
<b>Podcasts</b>			

	<ul style="list-style-type: none"> <li>▪ Severe Pelvic Trauma</li> </ul>	26:00		
	<ul style="list-style-type: none"> <li>○ Lecture notes</li> </ul>			
	<ul style="list-style-type: none"> <li>▪ Indications for abdominal CT in blunt trauma</li> </ul>	38:00		
	<ul style="list-style-type: none"> <li>▪ PECARN abdominal trauma</li> </ul>	6:13		
	<ul style="list-style-type: none"> <li>▪ Pelvic Trauma</li> </ul>	56:44		
<b>Musculo-skeletal</b>	<b>Tintinalli's</b>			
	<ul style="list-style-type: none"> <li>▪ Chapter 263—Penetrating Trauma to the Extremities</li> </ul>			
	<ul style="list-style-type: none"> <li>▪ Chapter 269—Pelvis Injuries</li> </ul>			
	<b>Management Videos</b>			
	<ul style="list-style-type: none"> <li>▪ Fractures and Fracture Dislocations</li> </ul>	18:33		
	<ul style="list-style-type: none"> <li>▪ Musculoskeletal Injuries Splinting</li> </ul>	11:35		
	<ul style="list-style-type: none"> <li>▪ Hare Traction Splint</li> </ul>	4:33		
	<ul style="list-style-type: none"> <li>▪ Sager Traction Splint</li> </ul>	4:30		
	<ul style="list-style-type: none"> <li>▪ Hare Traction Splint &amp; Clavicle Fractures</li> </ul>	5:44		
	<b>Pediatrics</b>			
	<ul style="list-style-type: none"> <li>▪ Pediatric Musculoskeletal Trauma Part 1</li> </ul>	60:00		
	<ul style="list-style-type: none"> <li>▪ Pediatric Musculoskeletal Trauma Part 2</li> </ul>	60:00		
<b>Hypo/ Hyper Thermia</b>	<b>Tintinalli's</b>			
	<ul style="list-style-type: none"> <li>▪ Chapter 202—Frostbite and Other Localized Cold Injuries</li> </ul>			
	<ul style="list-style-type: none"> <li>▪ Chapter 203—Hypothermia</li> </ul>			
	<ul style="list-style-type: none"> <li>▪ Chapter 204—Heat Emergencies</li> </ul>			
	<b>Reading</b>			
	<ul style="list-style-type: none"> <li>▪ Hypothermia</li> </ul>			
	<b>Management Videos</b>			
	<ul style="list-style-type: none"> <li>▪ Cold Illness and Injury</li> </ul>	40:32		
	<ul style="list-style-type: none"> <li>▪ Frostbite and Cold-Related Injury</li> </ul>	55:41		
	<ul style="list-style-type: none"> <li>▪ Heat Emergencies</li> </ul>	15:57		
	<ul style="list-style-type: none"> <li>▪ EMS Lecture: Hypothermia Case</li> </ul>	29:00		
	<b>Podcasts</b>			
<ul style="list-style-type: none"> <li>▪ Hypothermia</li> </ul>	48:00			
<ul style="list-style-type: none"> <li>▪ Podcast 66</li> </ul>	20:00			
<b>Burns</b>	<b>Tintinalli's</b>			

	▪ Chapter 210—Thermal Burns		
	▪ Chapter 211—Chemical Burns		
	▪ Chapter 212—Electrical Injuries		
	▪ Chapter 217—Carbon Monoxide		
	<b>Readings</b>		
	▪ Critical care of the burn patient: The first 48 hours.		
	▪ Initial evaluation and management of the burn patient.		
	▪ Thermal injury management		
	▪ Electrical injuries in emergency medicine		
	<b>Management Videos</b>		
	▪ Initial Management of Burns	24:04	
	▪ Module III: Initial Evaluation of the Burn Patient	58:21	
	▪ Chapter 2 of 4 Smoke Inhalation Injury	23:58	
	▪ Chapter 28-Soft Tissue Trauma	56:11	
	▪ EM Lecture: What’s Hot in Burns	59:00	
	▪ EM-Electrical Injuries	29:34	
	<b>Pediatrics</b>		
	▪ Pediatric Trauma-Burn Injury-Overview and Initial Care	11:19	
	▪ Fluid Resuscitation for Burn Injuries	10:12	
	<b>Podcasts</b>		
	▪ Dirt Medicine Podcast 002-Burn Resuscitation Part 1	22:00	
	▪ Dirt Medicine Podcast 003-Burn Resuscitation Part 2	23:00	
<b>Shock</b>	<b>Tintinalli’s</b>		
	▪ Chapter 25—Approach to the Patient in Shock		
	▪ Chapter 26—Fluid and Blood Resuscitation		
	<b>Management Videos</b>		
	▪ Understanding Shock	10:32	
	▪ Eric’s Medical Lectures. <i>Shock</i>		
	○ Part 1	13:34	
	○ Part 2	7:52	
	○ Part 3	14:05	
▪ EM Lecture: The Pathophysiology of Shock	44:00		

	<b>Podcast</b>		
	<ul style="list-style-type: none"> <li>▪ ACEP Preview-Hemostasis: Stopping the bleeding</li> </ul>	53:00	
	<ul style="list-style-type: none"> <li>○ Lecture notes</li> </ul>		
	<ul style="list-style-type: none"> <li>▪ C is for Circulation (part 1 of 2)</li> </ul>	33:00	
	<ul style="list-style-type: none"> <li>▪ C is for Circulation (part 2 of 2)</li> </ul>	30:00	
<b>Trauma Arrest</b>	<b>Readings</b>		
	<ul style="list-style-type: none"> <li>▪ Cardiac arrest associated with trauma.</li> </ul>		
	<ul style="list-style-type: none"> <li>▪ Withholding of resuscitation</li> </ul>		
	<b>Management Videos</b>		
	<ul style="list-style-type: none"> <li>▪ Traumatic cardiac arrest</li> </ul>	2:10	
	<ul style="list-style-type: none"> <li>▪ When to Stop Resuscitation</li> </ul>	30:04	
	<b>Podcast</b>		
	<ul style="list-style-type: none"> <li>▪ Traumatic Arrest Podcast 36</li> </ul>	20:00	
	<ul style="list-style-type: none"> <li>○ Lecture notes</li> </ul>		
	<ul style="list-style-type: none"> <li>▪ An Interview on Severe Trauma</li> </ul>	20:21	
	<ul style="list-style-type: none"> <li>○ Lecture notes</li> </ul>		
	<ul style="list-style-type: none"> <li>▪ EMCrit Podcast-Trauma Thoughts</li> </ul>	25:00	
	<ul style="list-style-type: none"> <li>○ Lecture notes</li> </ul>		
	<ul style="list-style-type: none"> <li>▪ Trauma Arrest-Interview with ED Intensivist</li> </ul>	42:00	
<b>E-FAST</b>	<b>Videos</b>		
	<ul style="list-style-type: none"> <li>▪ The FAST Exam</li> </ul>	5:35	
	<ul style="list-style-type: none"> <li>▪ Focused Assessment with Sonography in Trauma</li> </ul>	7:02	
<b>Pregnancy</b>	<b>Tintinalli's</b>		
	Chapter 253—Trauma in Pregnancy		
	<b>Reading</b>		
	<ul style="list-style-type: none"> <li>▪ Trauma in the Obstetric Patient: A Bedside Tool</li> </ul>		
	<b>Management Videos</b>		
	<ul style="list-style-type: none"> <li>▪ Trauma in Pregnancy</li> </ul>	10:41	
	<ul style="list-style-type: none"> <li>▪ Emergency Med &amp; Acute Care-Abd Trauma in Pregnancy</li> </ul>	11:39	
	<b>Podcast</b>		
<ul style="list-style-type: none"> <li>▪ Trauma in pregnancy</li> </ul>	59:00		
<b>Drowning</b>	<b>Tintinalli's</b>		

	<ul style="list-style-type: none"> <li>▪ Chapter 209—Drowning</li> </ul>			
	<b>Management</b>			
	<ul style="list-style-type: none"> <li>▪ Drowning</li> </ul>	15:56		
<b>Trauma Meds</b>	<b>Readings</b>			
	<ul style="list-style-type: none"> <li>▪ Guideline for the management of bleeding on Dabigatran                             <ul style="list-style-type: none"> <li>○ Warfarin Reversal for Patients</li> </ul> </li> </ul>			
	<ul style="list-style-type: none"> <li>▪ Medication Alert! Dabigatran and Head Trauma                             <ul style="list-style-type: none"> <li>○ Dabigatran Guidelines</li> </ul> </li> </ul>			
	<b>Management Videos</b>			
	<ul style="list-style-type: none"> <li>▪ Bleeding in the Patient on Dabigatran</li> </ul>	11:31		
	<ul style="list-style-type: none"> <li>▪ Anticoagulant Reversal</li> </ul>	13:36		
	<ul style="list-style-type: none"> <li>▪ Injured Patients and Anticoagulation</li> </ul>	58:57		
	<ul style="list-style-type: none"> <li>▪ Trauma Day Away 2012-Reversal of Anticoagulation</li> </ul>	35:08		
	<b>Podcasts</b>			
	<ul style="list-style-type: none"> <li>▪ EM Basic -Admission for patients with minor head injury</li> </ul>	8:01		
	<ul style="list-style-type: none"> <li>▪ Anticoagulation Reversal                             <ul style="list-style-type: none"> <li>○ Lecture notes and articles</li> </ul> </li> </ul>	50:00		
	<ul style="list-style-type: none"> <li>▪ Anticoagulation Reversal: Part 2                             <ul style="list-style-type: none"> <li>○ Lecture notes and articles</li> </ul> </li> </ul>	23:00		
	<ul style="list-style-type: none"> <li>▪ Anti-platelet Drugs in Head Bleeds                             <ul style="list-style-type: none"> <li>○ Lecture notes</li> </ul> </li> </ul>	18:00		
	<b>EMTALA</b>	<b>Tintinalli’s</b>		
		<ul style="list-style-type: none"> <li>▪ Chapter 298, pp 2026-2029—Legal Issues Emergency Medicine</li> </ul>		
<b>Videos</b>				
<ul style="list-style-type: none"> <li>▪ Understanding EMTALA law</li> </ul>		24:00		
<ul style="list-style-type: none"> <li>▪ EMTALA Protocol</li> </ul>		9:27		
<ul style="list-style-type: none"> <li>▪ EMTALA: Screening, Dumping, and Crossing</li> </ul>		48:40		
<ul style="list-style-type: none"> <li>▪ EMTALA: National Perspective on a Local Problem</li> </ul>		60:33		
<b>Podcasts</b>				
<ul style="list-style-type: none"> <li>▪ EMTALA: What Every EP Must Know</li> </ul>		36:00		
<ul style="list-style-type: none"> <li>▪ EMTALA: What Every EP Must Know, Part 2</li> </ul>		32:00		

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## **APPENDIX N. EXECUTIVE SUMMARY**

The practice improvement project (PIP), emergency care education for advanced practice providers (APPs) in rural critical access hospitals, included development, implementation, and evaluation of a self-directed learning module in the area of adult and pediatric trauma as the first component to the emergency care curriculum.

### **Needs Assessment**

A needs assessment of APPs in 10 central Minnesota critical access hospitals (CAHs) was conducted using the Qualtrics online survey program. Key objectives of the needs assessment were:

- assess previous experiences of APPs prior to beginning practice in emergency care;
- identify current methods of APP education or training to emergency care; and
- summarize and prioritize recommendations for education and potential areas for improvement from APPs practicing in emergency care.

Needs assessment results revealed that the time of orientation for APPs in emergency care ranged from less than one week to three months. A variety of certifications included within the APP orientation process were Comprehensive Advanced Life Support (CALS), Basic Life Support (BLS), Advanced Cardiac Life Support (ACLS), Pediatric Advanced Life Support (PALS), and Advanced Trauma Life Support (ATLS). Self-study methods utilized by APPs to learn the emergency care role included audio courses, reading books, and online study.

### **Self-Directed Learning Module**

Based on needs assessment results, a self-directed adult and pediatric trauma module was developed, implemented, and evaluated as one component of a comprehensive emergency care curriculum. The module may be utilized for newly hired APPs on or before the first day of

orientation while complementing on-the-job clinical learning experiences. Key elements of the module were established based on a comprehensive review of the literature and included:

- Course title, description, and course objectives;
- A recommended textbook;
- Required and recommended certification courses;
- Learning experiences designed to appeal to adult learners with individual differences for learning including readings, videos, interactive websites, and audiocasts;
- Module instructions;
- A post module examination with answers and rationale; and
- A checklist to follow progress on completion of the module.

A significant advantage considered in the module design was that APPs would not need to go to a website and sift through an abundance of material to find something appropriate for learning.

In creating the trauma module, content within the module was screened by the researcher.

On January 28, 2015, a one-hour presentation on the self-directed learning module was given at one rural Minnesota CAH. Twenty-one stakeholders participated. During implementation and evaluation of the module, APPs and stakeholders from one rural CAH offered unanimous positive feedback that the adult and pediatric trauma would be helpful for an APP beginning practice in a rural emergency care setting. Fourth generation evaluation was the framework for evaluation of the module. Based on stakeholder input, the module was adapted, revised, and resubmitted via email to all stakeholders for further review and input. For the adult and pediatric module, the evaluation plan was put into action simultaneously with implementation of the module.

## **Recommendations**

It is important to continue further development, implementation, and evaluation of the emergency care curriculum and other self-directed learning modules. Goals arising from the PIP include (a) collecting further qualitative data at suggested intervals of three months, six months, and one year; (b) implementing the module for a new graduate APP; and (c) finding ways to evaluate actual learning and achievement of emergency care competencies.

Continued development of self-directed learning modules as part of the emergency care curriculum is recommended. Additionally, other APP suggestions from the needs assessment should be explored which were (a) provide learning opportunities within a larger volume emergency room, (b) simulation, and (c) periodic workshops or conferences. Self-directed learning modules in the areas of cardiopulmonary disorders, airway and breathing, and sexual assault are currently being developed.

## **Implications for Practice**

This PIP provided a glimpse into the educational backgrounds and experiences that APPs bring to a role in rural emergency care. APPs were able to recognize gaps in their experience and education. Consistent with adult learning theory, APPs utilized self-directed learning methods to learn the emergency care role. In creating a self-directed learning module for APPs in rural emergency care settings, a wealth of high quality, online, and free material was discovered.

## **Conclusion**

Advanced practice providers have become an important solution to the health care crisis in rural communities. Increasingly, the role of advanced practice providers has expanded and evolved in order to meet the health care needs of patients in a variety of settings. One of these

settings is emergency care. In several ways, the PIP reflected findings from the literature review. First, new graduate APPs and APPs without previous advanced practice emergency care experience are being hired into rural emergency care settings. Second, APPs are utilized as the sole emergency care provider with a physician on call. Third, it is not unusual for an APP to have less than a week of orientation to a rural emergency care setting. Finally, a variety of educational methods and time frames are employed when orientating APPs to rural emergency care settings. Through a needs assessment, APPs recommended and prioritized desired strategies for learning the emergency care role. By incorporating recommended learning strategies with adult learning theory, a self-directed adult and pediatric trauma module was developed. It is hoped that the adult and pediatric module will be relevant and useful tool for APPs learning the emergency care role.