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# Nasal Spray Can Save Lives: Engaging Emergency Department Nurses in the Provision of Naloxone Nasal Spray to High Risk Patients

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Naloxone Nasal Spray to High Risk Patients

Paula Kobelt

Otterbein University

### **Acknowledgements**

I would like to express my most sincere gratitude from my heart to my committee chair and project adviser, Dr. Eva Fried, DNP, WHNP for her unending kindness, encouragement, mentoring and dedication to my project. It would be nearly impossible to describe all that I have learned both academically and professionally from working with Dr. Fried. Through sharing of her expertise in evidence-based practice, Dr. Fried inspired me to transform evidence into practice to help prevent deaths from opioid overdoses. Dr. Fried encouraged me to turn every obstacle and adversity I faced in my project into an opportunity to further convince everyone to support this important practice change.

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care to patients who are at high risk for opioid overdose and embraced the evidence-based practice changes. Dr. William V. Harper was so kind to provide expert statistical instruction and encouragement for my survey development and data analysis. Dr. Krisanna Deppen, provided her expert support, continued review and addiction medicine specialty. Michelle Meyer, PharmD provided her expert review of the pharmacokinetics of heroin and naloxone, and equally importantly adopted two of the 6 feral kittens I rescued while writing this paper. Le-Ann Harris, DNP, mentored me as a transformational leader and shared her executive nursing expertise as a nursing director. Tom Mick, Video Production Specialist, deserves the Academy Award for using his magical expertise to make the final version of the education intervention video a great one.

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### **Dedication**

This project is dedicated to my family, my husband Paul and children Peter, Madeleine and Alex who encouraged me to return to school and cheered, inspired and provided love and support to me from the start to the finish of this journey. Paul, I especially could not have done this without your love, patience and belief in me. I am forever thankful for everything you did to encourage my success, from editing my papers, making the house quiet for me to study, and for taking over cooking dinners for us after a long day. Paul, Peter, Maddie and Alex the pride each of you had in me gave me the confidence to pursue and achieve my lifetime goal.

This project is also dedicated to everyone who has lost a child, loved one or friend from an opioid overdose, for sharing their stories, to help us realize this work is necessary to prevent further loss.

### **Abstract**

The opioid overdose epidemic continues to escalate in the United States. Some of the morbidity and mortality associated with opioid overdose can be prevented with the timely administration of naloxone, an opioid reversal agent. The literature emphasized that the emergency department (ED) venue and registered nurses are well positioned to screen and identify high risk individuals whether they present as a result of an overdose or for other medical reasons. The literature also pointed to the importance of providing naloxone to high risk individuals and those who would be most likely to be at the scene of an overdose. This is critical because most overdoses occur at home. Additionally, negative attitudes and stigmatization towards individuals with substance use disorders (SUD) can result in provision of suboptimal patient care for this population. The literature demonstrated that education can improve knowledge gaps and negative attitudes towards patients with SUD.

The purpose of this evidence-based practice improvement project (EBPI) was to address the knowledge gaps and attitudes of Emergency Department Registered Nurses (EDRNs) about the scope of the opioid overdose epidemic, SUDs as a disease, pathways from prescription opioids to heroin, treatment, recovery, harm reduction education, and nasal naloxone spray. The goal of the EBPI was to use evidence to increase the EDRNs' knowledge and improve attitudes to facilitate delivery of evidence-based care. The clinical question guiding the EBPI was "In EDRNs caring for patients at high risk for opioid overdose, how does providing a standardized education intervention about harm reduction education and naloxone nasal spray (HRENNS), compared to not providing standardized education, affect the EDRNs' knowledge and attitudes about providing HRENNS to patients at high risk for opioid overdose, measured immediately and 30 days following completion of the education intervention." The project framework

included Plan, Do, Study, Act cycles and Appreciative Inquiry. A 60 minute evidence-based education intervention was developed and co-presented by the DNP student and the Attorney General's Office's Director of Drug Abuse Outreach Initiatives and Community Outreach Specialist to four EDs in one hospital system. A survey was developed using items from the Opioid Overdose Knowledge Survey and the Opioid Overdose Attitude Survey to measure change following the education intervention. The Substance Abuse Attitudes Survey was used to design a follow up interview for participants. Fifty seven EDRNs attended the 11 education intervention sessions. Thirty-five surveys were completed of which 27 met criteria for analysis. Findings included improved EDRNs' knowledge related to naloxone and managing an opioid overdose following the intervention. EDRNs' paired t-test mean scores significantly improved in rating of having enough information to manage an overdose ( $p = 0.137$ ). Survey items did not capture negative attitudes and frequently asked questions that were demonstrated during the education intervention pertaining to whether providing naloxone would encourage drug use, or give false reassurance to patients and families. This underscores the importance of providing opportunities for informal stakeholder feedback. Follow up phone interviews revealed EDRNs' willingness to provide evidence-based care. Outcomes of the project were used to inform a system-wide project and revise the education intervention that was posted electronically for ongoing staff education to provide naloxone nasal spray for home use to ED patients at high risk for opioid overdose.

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## I. BACKGROUND

### Problem Identification

The drug overdose epidemic continues to escalate throughout the United States (U.S), including in the State of Ohio where residents are more likely to die from a drug overdose than from a motor vehicle accident (Martins, Sampson, Cerda, & Galea, 2015; Ohio Department of Health [ODH], 2016b; Rudd, Aleshire, Zibbell, & Gladden, 2016a). According to the Substance Abuse and Mental Health Services Administration (SAMSHA), “Since 1999, opiate overdose deaths have increased 265% among men and 400% among women” (Substance Abuse and Mental Health Services Administration [SAMSHA], 2015, p. 1). Additionally, in the year 2015, the 52,404 reported drug overdose deaths in the U.S. increased from 2014 by 11.4%, representing the highest number of deaths ever reported from drug overdoses (Rudd et al., 2016a; Rudd, Seth, David, & Scholl, 2016b). A majority (63.1%) or 33,091 of the 52,404 deaths occurring in 2015 were attributed to opioids (Rudd et al., 2016b). Deaths from opioid overdoses have quadrupled since 1999, and two significant trends have been noted, “a 15-year increase in overdose deaths involving prescription opioid pain relievers and a recent surge in illicit opioid overdose deaths, driven largely by heroin” (Centers for Disease Control and Prevention [CDC], 2016a; Rudd et al., 2016a, p. 1379). More recent data from the CDC shows overdose deaths from opioids were mainly attributed to opioids such as heroin and synthetically manufactured fentanyl (Rudd et al., 2016b).

Opioid overdose deaths have crossed all socio-economic, educational, racial and ethnic boundaries (DeWine, *Ideas that Work, Fighting the Drug Epidemic in Ohio*, January 21, 2016; Hawk, Vaca, & D’Onofrio, 2015; Rudd et al., 2016b; SAMHSA, 2016). Each day in the U.S. the opioid overdose epidemic claims 91 lives, including 7 lives in the State of Ohio (CDC,

2016a; ODH, 2016b). In 2015, the State of Ohio rose to the fourth highest state in the nation for reported death rates from drug overdoses (Centers for Disease Control and Prevention [CDC], 2016b). Opioid overdose results in death when the individual's breathing is severely slowed or stopped, the central nervous system (CNS) depressive sedating effects of opioids are not successfully reversed, and the individual's condition worsens to full cardiac and respiratory arrest (Lavonas et al., 2015; Substance Abuse and Mental Health Services Administration [SAMHSA], 2016; Wermeling, 2013).

### **Substance Use Disorder (SUD) and Addiction**

Historically, a variety of language has been used to describe individuals misusing substances obtained either legally or illegally, such as “using,” “user,” “abusing,” “drug habit,” “junkie,” “addict,” “clean,” “dirty” (The National Alliance of Advocates for Buprenorphine Treatment [NAABT], 2017, p. 1). Some of these terms have negative connotations, imply substance use disorder is not a medical condition and that “will power” is missing to stop the behavior. Instead, use of terminology such as “misuse,” “substance use disorder,” “addictive disease,” “addiction,” facilitate understanding of substance use disorders as a medical condition and help to reduce negative connotation and stigma for this patient population (American Psychiatric Association [APA], 2013; NAABT, 2017, p 2; U.S. Department of Health and Human Services, Office of the Surgeon General [HHSOSG], 2016). These recommendations are followed in this paper.

SUDs range in severity from mild to severe and include a combination of “cognitive, behavioral, and physiological symptoms indicating that the individual continues using the substance despite significant substance-related problems” (APA, 2013, p. 483). Changes in the brain's circuitry are noted in the severe forms of the disorder, where “the behavioral effects of

these brain changes may be exhibited in the repeated relapses and intense drug craving when the individuals are exposed to drug-related stimuli” (APA, 2013, p 483). In 2016, the U.S. Surgeon General released a comprehensive report addressing the opioid epidemic in which health care providers are directed to treat SUDs like any other medical condition, emphasizing they are not a moral, personal weakness or flaw in one’s character (HHSOSG, 2016). The report describes SUDs as “prolonged, repeated misuse of any of these substances can produce changes to the brain that can lead to a substance use disorder, an independent illness that significantly impairs health and function and may require specialty treatment. Disorders can range from mild to severe. Severe and chronic substance use disorders are commonly referred to as addictions” (HHSOSG, 2016, p. 1-5). The surgeon general emphasizes, “Addiction is a chronic brain disease that has the potential for both recurrence (relapse) and recovery” (HHSOSG, 2016, p. 1-6).

### **Pathways to Heroin**

The CDC alerts the public of the hidden use of prescription opioids outside of safe guidelines is fueling the nation’s drug overdose death epidemic. The use of prescription opioids to treat pain is sometimes associated with eventual heroin use (CDC, 2015a). According to the CDC, people addicted to prescription opioid medications have a higher probability than those addicted to alcohol or marijuana to progress to heroin use (CDC, 2015a). Heroin’s effects are very similar to prescription opioid medications and misuse of prescription opioids “may open the door” to heroin, as 80% of persons using heroin have a history of misusing prescription opioids prior to heroin (NIHNIDA, 2017, p. 1).

According to the National Institute on Drug Abuse, “Heroin is an opioid drug made from morphine” (NIHNIDA, 2017, p. 4). In addition, “Heroin enters the brain rapidly and changes



back into morphine. It binds to opioid receptors on cells located in many areas of the brain, especially those involved in feelings of pain and pleasure” (NIHNIDA, 2017, p. 4). Heroin’s intense euphoric effects, ease of accessibility and low cost contribute to its popularity (Cicero, Ellis, Surratt, & Kurtz, 2014; Centers for Disease Control and Prevention [CDC], 2017a).

Heroin is cheaper to purchase at ten cents a milligram compared to prescription opioids sold on the street for one dollar a milligram (J. Biddinger, personal communication, December, 8, 2017). Heroin is considered an illegal substance and is extremely addictive (CDC, 2015a). Prescription opioids and the low cost and easy access to heroin both contribute to the epidemic (CDC, 2017a).

Of note, a shift from use of prescribed opioids to illicit drugs may involve a change in how the drug is used. The individual may select intravenous injection, smoking, or snorting the powder (brown or white), or sticky black tar heroin (NIHNIDA, 2017; Sporer, 1999). Injected intravenously, heroin provides the fastest onset of action within minutes). Over a half a million U.S. citizens, age 12 and older were treated for heroin use in 2013, the rate nearly doubling since 2002 (Substance Abuse and Mental Health Services Administration [SAMHSA], 2016).

### **Individuals at High Risk for Opioid Overdose**

SAMSHA provides a list to help easily identify high risk individuals for opioid overdose. Some individuals will appear more obvious as high risk such a person being treated for an opioid overdose. Individuals who may seem less obvious for being high risk for opioid overdose include those taking long acting opioids for chronic cancer pain, and individuals recently released from prison or rehabilitation (SAMHSA, 2016)(see Table 1).

**Table 1***Individuals at High Risk for Opioid Overdose*

---

**Individuals:**

- Using heroin
- Using opioids for long term treatment of pain; chronic cancer and non-cancer
- Rotating regimens of opioid medication, predisposition to incomplete cross-tolerance
- Discharged from the emergency department following treatment for opioid overdose or intoxication
- In need of analgesia for pain and having a suspected or confirmed SUD
- Using opioids (prescription or illicit) for non-medical reasons
- With lower tolerance and high risk for relapse due to abstinence, following detoxification, incarceration, treatment

---

*Note:* Adapted from “SAMSHA Opioid Prevention TOOLKIT,” by Substance Abuse and Mental Health Services Administration, 2016, [store.samhsa.gov/shin/content//SMA16-4742/SMA16-4742.pdf](https://store.samhsa.gov/shin/content//SMA16-4742/SMA16-4742.pdf), p. 1.

**Prevention**

The opioid epidemic is being addressed by several angles to fight the epidemic including: prevention, law enforcement, criminal justice, treatment, recovery, and opioid reversal (Cong. Rec., 2016; DeWine, *Ideas that Work, Fighting the Drug Epidemic in Ohio*, January 21, 2016; Hawk et al., 2015; Nickel, 2017). This multi-angled approach is necessary due to the complexity and severity of the epidemic (Cong. Rec., 2016; Nickel, 2017). Aggressive primary prevention and mitigation strategies focusing on the sources of the drug epidemic include: education to discourage early exposure to drugs and alcohol, encouraging proper opioid prescribing practices by health care providers, drug take back and disposal programs, prescription drug monitoring programs, reducing drug trafficking and supply; creating abuse-deterrent opioid formulations and safe labeling of opioids; in addition to directing efforts towards improving resources for treatment of SUD and recovery (Califf, Woodcock, & Ostroff, 2016;

Centers for Disease Control and Prevention [CDC], 2015; Centers for Disease Control and Prevention [CDC], 2017b; Nickel, 2017; State of Ohio Board of Pharmacy, 2015; U.S. Food and Drug Administration [FDA], 2016).

### **Harm Reduction**

Harm reduction refers to initiatives aimed at reducing the harmful outcomes and consequences of a behavior without endorsing such activities or placing judgement on the individual (Hawk et al., 2015; HRC, n.d.; Marlatt & Witkiewitz, 2010). A multifaceted harm reduction approach is required to address the opioid overdose epidemic including initiatives by government, healthcare, and the entire community (Hawk et al., 2015; DeWine, *Ideas that Work, Fighting the Drug Epidemic in Ohio*, January 21, 2016). Providing naloxone nasal spray to individuals at high risk for opioid overdose is considered a harm reduction approach to prevent death from overdose (Hawk et al., 2015; Wermeling, 2013).

### **Naloxone Nasal Spray and Harm Reduction Education**

Naloxone hydrochloride is a potent, safe opioid reversal agent commonly used for any type of opioid overdose (U.S. Food and Drug Administration [FDA], 2015b; Hawk et al., 2015; SAMHSA, 2016; Wermeling, 2013). While naloxone reverses the effects of opioids, it does not reverse the effects of other drugs or substances such as cocaine, methamphetamine, alcohol or benzodiazepines (Centers for Disease Control and Prevention [CDC], 2012a; SAMHSA, 2016; Wermeling, 2013). Naloxone has been approved by the United States Food and Drug Administration (FDA) for administration via intramuscular, intravenous and intranasal administration and does not pose risk for abuse (U.S. Food and Drug Administration [FDA], 2015a; State of Ohio Board of Pharmacy [SOBP], 2016; SAMHSA, 2016; Wermeling, 2013).

Naloxone nasal spray can be administered intra-nasally quickly at the scene of a suspected overdose without the need for intravenous access, to reverse the often fatal central nervous system and respiratory depressive effects of opioids (Centers for Disease Control and Prevention [CDC], 2015; FDA, 2015a; FDA, 2015b; Massatti, 2013; SAMHSA, 2016; Wheeler, Jones, Gilbert, & Davidson, 2015;; Wermeling, 2013). Administration of 0.4 to 2 mg of naloxone is recommended for adults suspected of opioid overdose to re-establish breathing, respiratory rate and wakefulness (Wermeling, 2010; Wermeling, 2013; Hawk et al., 2015). The response to naloxone can be seen within minutes in an opioid overdose (FDA, 2015a; FDA, 2015b; Lexicomp, 2017; Massatti, 2013; SAMHSA, 2016). Naloxone works by reversing the deadly effects of respiratory depression and preventing anoxic injury (FDA, 2015a; Hawk et al., 2015; Lavonas et al., 2015).

Training for those who may be involved in providing naloxone includes to summon Emergency Medical Services (EMS) and remain with the individual following administration of naloxone for an overdose, due to the probability the individual may need emergency medical care (SAMHSA, 2016; State of Ohio Board of Pharmacy, 2015; SOBPA, 2016 a). Repeat dosing of naloxone may be required if breathing is not sufficiently improved after naloxone administration, or if after the patient responds to naloxone, respiratory depression reoccurs (FDA, 2015b; Lexicomp, 2017; SAMHSA, 2016). In addition, following naloxone administration, individuals that have developed tolerance or are regularly using high doses of opioids, may exhibit signs of opioid withdrawal such as nausea, abdominal pain, shaking, sweating (FDA, 2015a; FDA, 2015b; SAMHSA, 2016).

The need for greater public access to naloxone is critical when considering the timing of naloxone administration, and the timing of EMS or first responder arrival to the scene of a

suspected overdose (Hawk et al., 2015; Massatti, 2013). Average arrival time by EMS staff to the scene of an overdose is approximately 4.6 minutes in the State of Ohio in 2014 (Massatti, 2013, p 16). EMS arrival times can be longer in rural type settings where longer distances must be traveled to arrive at the scene (Massatti, 2013; Ohio Emergency Medical Services [Ohio EMS], 2016).

The timing of naloxone administration is critical to not only prevent death but to prevent irreversible anoxic injuries (Lavonas et al., 2015; Hawk et al., 2015; Massatti, 2013). In order to prevent delays in naloxone administration, those who would most likely to be at the scene of a suspected overdose should have intranasal naloxone available and be trained to administer it naloxone before EMS arrives (EMS Ohio Emergency Medical Services [EMS], 2014; Rudd et al., 2016b; SAMHSA, 2016; Hawk et al., 2015; Wheeler et al., 2015). Initial harm reduction initiatives in the United States were successful in providing overdose harm reduction education and training to first responders and those who would most likely arrive first at the scene of a suspected overdose (CDC, 2012a; Dwyer et al., 2015; [ems.gov](http://ems.gov), 2016; Hawk et al., 2015; Wheeler et al., 2015). In addition, initiatives have been focused on educating and training those working or interacting with high risk populations at needle exchange programs, community centers, homeless shelters as well as individuals at high risk for overdose (Dahlem, Horstman, & Williams, 2016; Hawk et al., 2015; Bahar, Santos, Wheeler, Rowe, & Coffin, 2015; Wheeler et al., 2015).

### **Harm Reduction Legislation**

Harm reduction can also involve legislation directed towards protecting the individual and those providing assistance to the victim (Davis & Carr, 2015; Hawk et al., 2015). Examples of successful state legislated and federally supported harm reduction initiatives include: Good

Samaritan laws enacted to encourage the public to summons EMS at the scene of an overdose without fear of arrest and legislation allowing EMS, law enforcement officers, and firefighters to provide naloxone (Botticelli, 2013; Davis & Carr, 2015; Hawk et al., 2015; Office of National Drug Control Policy [ONDCP], 2015). In addition to Good Samaritan legislation, there is a growing national trend for states to provide legislation allowing third party prescribing of naloxone for use on someone else, as well laws providing protection from criminal and civil liability for prescribers and lay persons (ONDCP, 2015; SAMHSA, 2016). Currently, thirty five states in the U.S. have Good Samaritan laws, which provide varying levels of criminal immunity for the overdose victim and those responding to an overdose (Davis & Carr, 2015). The State of Ohio is close to passing H.B. 249 referred to as the Good Samaritan 9-1-1 Law (H.B. 249, 2016). H.B. 249 encourages those at the scene of an overdose to summon EMS and emergency care for the drug overdose victim without fear of being arrested or of legal consequences for being under the influence or for drug possession or drug paraphernalia present at the drug overdose scene (H.B. 249, 2016).

### **Financial Impact of the Opioid Overdose Epidemic**

The financial impact and healthcare costs associated with the opioid overdose epidemic are staggering. The State of Ohio ranked number five in the top highest drug overdose death rates in the U.S. and in health care costs due to opioid abuse at \$1,075,753,413; 4.3% comprised “abuse-related health care costs” and \$93 spent “per-capita health care costs from opioid abuse” (Matrix Global Advisors, LLC, 2015, p. 5). In the State of Ohio, “Drug overdoses are associated with high direct and indirect costs. Unintentional fatal drug overdoses cost Ohioans \$2.0 billion in 2012 in medical and work loss costs; while non-fatal, hospital-admitted drug poisonings cost an additional \$39.1 million. The total cost equaled an average of \$5.4

million *each day* in medical and work loss costs in Ohio” (Ohio Department of Health [ODH], 2017a “Cost to Ohio”, para 1)

Some private insurances, Medicare, and Medicaid plans provide coverage for the cost of most formulations of naloxone such as naloxone nasal spray, auto-injector or intramuscular types, if dispensed to the insurance plan’s member (SOBOP, 2016a). The cost of a nasal naloxone spray available at retail pharmacies is approximately \$109.99 if insurance will not cover the cost (CVS Pharmacy, personal communication, March 3, 2017). The cost for 2mg/ml and 2 atomizers for system hospital is \$70.00 and \$115.00 for the newest formulation that does not require assembly (G. Walliser, personal communication, January 20, 2016).

Coffin & Sullivan described the financial savings of providing naloxone to individuals with SUDs using heroin applying a “cost effective analysis comparing distribution of naloxone to 20% of heroin users with no distribution” calculating relative and absolute rates of overdose fatalities, (Coffin & Sullivan, 2013, p. 1). Cost-effectiveness results were reported “in terms of costs, quality adjusted life-years (QALYs), and incremental costs per QALY gained” (Coffin & Sullivan, 2013, p. 1). Providing naloxone to people using heroin was found to be “highly cost-effective” (Coffin & Sullivan, 2013, p. 7). Project Lazarus is an example of a successful overdose prevention program involving naloxone distribution. This program began in Wilkes County, North Carolina to address one of the nation’s highest opioid overdose deaths rates associated with prescription opioids (Albert et al., 2011). Initial results of the Project Lazarus initiative demonstrated a dramatic decrease in overdose fatality rates “from 46.6 per 100,000 in 2009 to 29.0 per 100,000 in 2010” (Albert et al., 2011, p. S77).

### **Increasing Access to Naloxone to Save Lives**

A majority of opioid overdoses happen at home, one's place of residence, or private setting, so the people who would most likely be at the scene or home, should be trained to administer naloxone before EMS arrives (Cerda et al., 2013; Doe-Simpkins et al., 2014; Kim et al., 2009; Siegler, Tuazon, O'Brien, & Paone, 2014; Sporer, 1999; Wheeler et al., 2015). Increased public access to intranasal naloxone for home use is vital as most of the overdoses EMS responded to in the State of Ohio in 2014 occurred in homes and residences (EMS Ohio Emergency Medical Services [EMS], 2014). To help increase access to intranasal naloxone to those who may be present at the scene of an opioid overdose, policymakers nationwide are enacting legislation to provide expanded access to naloxone to first responders and to the general public (Davis, Ruiz, Glynn, Picariello, & Walley, 2014; Davis & Carr, 2015; [ems.gov](#), 2016; Hawk et al., 2015; SAMHSA, 2016). According to Hawk and colleagues, "Increasing the pool of individuals carrying naloxone increases the likelihood that the first person to arrive at the overdose is capable of initiating naloxone reversal" (Hawk et al., 2015, p. 240). Sometimes paramedics do not arrive first at the scene of an emergency, but instead first responders such as firefighters, law enforcement officers, or Emergency Medical Technicians (EMT) will be the first to arrive (Davis et al., 2014; Hawk et al., 2015). According to Davis, "Since nonparamedic first responders are typically the first, and sometimes the only, source of prehospital emergency care, training and authorizing them to administer naloxone under medical direction and as medically indicated is a promising strategy to improve overdose response"(Davis et al., 2014, p. 8).

Historically, a prescription was required to obtain intranasal naloxone. However, because of recent changes in Ohio, individuals can obtain naloxone nasal spray without a prescription at retail pharmacies where insurance coverage may apply, or at no charge at designated Project



DAWN Deaths Avoided With Naloxone community centers (ODH, 2017b; ODH, 2017c). The State of Ohio Board of Pharmacy approved the provision for intranasal naloxone to be dispensed without a prescription if the program is covered under the authority of a physician approved protocol, at retail pharmacies and agencies where standard instruction and counseling are provided to individuals obtaining nasal naloxone spray (State of Ohio Board of Pharmacy, 2015; SOBP, 2016 a).

### **Significance of the Problem to Nursing**

While access to nasal naloxone spray, opioid overdose prevention and harm reduction education and training are increasingly being made available to first responders and the public at risk for overdose, many hospitals and emergency departments are not providing these same services to high risk patients when being discharged from the hospital (J. Moseley, personal communication, February, 25, 2016; EMS Ohio Emergency Medical Services [EMS], 2014; Kestler et al., 2016; ODH, 2017). Visits to EDs in the U.S. for illicit drugs “increased from 2009 to 2011 (1,252,500 visits)” and “involving misuse or abuse of pharmaceuticals increased from 2004 (626,470 visits) through 2011 (1,428,145 visits)” (Substance Abuse and Mental Health Services Administration [SAMSHA], 2013, p. 1). In response to the opioid overdose epidemic, overdose-related ED visits continue to increase in the U.S. (Albert, McCaig, & Uddin, 2015; Dwyer et al., 2015; EMS, 2014; Ohio EMS, 2016; ODH, 2016b; SAMSHA, 2013; Spies et al., 2016).

Registered nurses in the Emergency Department (EDRNs) have the opportunity to contribute to national, state and community efforts to further prevent morbidity, mortality associated with the opioid overdose epidemic. The ED venue and EDRNs are well positioned to screen and identify high risk individuals whether they present as a result of an overdose or for

other medical reasons (Albert, McCaig, & Uddin, 2015; Dwyer et al., 2015, Hawk et al., 2015; Kestler et al., 2016; Mersy, 2003; Muhrer, 2010; SAMHSA, 2016). But EDRNs may not have received education pertaining to SUDs and therefore may not be prepared to screen for high risk patients and provide harm reduction education and naloxone patient education before discharging a patient from the ED (Bystrek, 2010; Centers for Disease Control and Prevention [CDC], 2012b; Ford, Bammer, & Becker, 2009; Kestler et al., 2016). As with any other medical condition, the EDRN is also well positioned to provide evidence-based care to patients with SUDs, including after visit instructions for home care including naloxone harm reduction education and naloxone nasal spray to high risk ED patients for opioid overdose, and to refer patients to treatment and recovery resources (Hawk et al., 2015; HHS, 2016; Kestler et al., 2016).

The Doctor of Nursing Practice Essential VII calls nurses to address and advocate for population health and clinical prevention (American Association of Colleges of Nursing, 2006). The health needs assessment conducted by the hospital system at which this doctoral student is employed, revealed that opioid overdose was one of the top five concerns of the majority of communities served by the hospital system (personal communication, O. Jackson, March, 2016). The needs assessment results reflect the severity of opioid overdose death epidemic in the State of Ohio, effecting every county and community (Ohio Department of Health [ODH], 2016a; ODH, 2016b).

### **Nursing Attitudes**

During a recent state wide conference attended by health care providers, first responders, law enforcement officers, firefighters, public officials, legislators and the public, sponsored by the state's Attorney General's Office, first responders voiced concerns regarding the ED nurses'

and staff's negative attitudes when they transport an overdose patient to the ED, (DeWine, *Ideas that Work, Fighting the Drug Epidemic in Ohio*, January 21, 2016). The first responders shared that some ED staff will verbalize "why did you bring him here, why did you bother rescuing him?" following their work to respond to and successfully rescue an individual at the scene of an opioid overdose. Negative attitudes and stigmatization by health care professionals directed towards individuals with SUDs were identified as a major concern by members of the County's Opiate Crisis Task Force representing the county's health care, addiction, law enforcement, legislative, treatment, recovery and community resource leaders (Franklin County Opiate Crisis Task Force, personal communication, August, 2016).

## **II. PROJECT**

### **Review of Literature**

The PICOT question used to guide the review of literature was: In EDRNs caring for patients at high risk for opioid overdose, how does providing a standardized staff education intervention about harm reduction education and naloxone nasal spray (HRENNS), compared to not providing a standardized education program, affect the EDRNs' knowledge and attitudes about providing HRENNS to patients at high risk for opioid overdose; measured immediately and 30 days following completion of the education intervention

P-population- EDRNs providing care for patients at high risk for opioid overdose and their families

I- intervention- providing standardized staff HRENNS

C- comparison- not providing standardized education

O-outcomes- effect EDRNs knowledge and attitudes about providing HRENNS to patients at high risk for opioid overdose

T-time frame- immediately and 30 days following completion of the education intervention

Table 2

*Literature Search Strategies*

Search Date	Key word	Database	# Listed	#Reviewed	# Used
6/7/16	Nurse, opioid, overdose, patient education, naloxone	PubMed	1	1	0
6/7/16	Nurse, opioid, overdose, naloxone	PubMed	5	3	1
6/8/16	Nurses*, emergency department, SBIRT	PubMed	4	2	1
Identified through PubMed “similar articles”		PubMed	6	6	3
6/7/16	Overdose education and emergency room nurses	Clinical Key	294		2
6/7/16	Substance abuse, attitudes or perceptions, patients, emergency department	CINAHL	2		1
6/28/16	Emergency room, nurse*, overdose, naloxone, training or education, prevention, attitudes and perceptions	One Search	26		1
6/28/16	Nursing or nurses or health	One Search	21	9	2

	care professional, overdose, naloxone, attitudes or perceptions, not pain, not HIV, not sedation, not death, not coma				
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Initially the literature search was limited to the last 5 years but needed to be broadened to the last 10 years due to few or no articles produced from the searches (see Table 2).

International articles were accepted for inclusion as SUDs exist internationally and the opioid overdose death epidemic is impacting many countries worldwide in addition to the U.S. (Martins et al., 2015). More recent research studies with larger sample sizes of nurses, specifically EDRNs, providing care to patients with SUDs were preferred. Articles including the use of Screening, Brief Intervention and Referral to Treatment (SBIRT) and the financial and cost effectiveness of providing harm reduction education and provision of naloxone were also retained. Search strategies included working with a librarian at a medical center to search PubMed, CINAHL and Clinical Key databases on June 7, 2016 for articles in peer reviewed journals, in English and in the past 10 years. Boolean operator terms “and,” “or,” and “not” were used along with “mesh terms” to both broaden and specialize the search. Articles were also found by hand searching the reference list of selected articles and the “similar articles” in PubMed (see Table 2).

Since few articles were found pertaining to the knowledge and attitudes of nurses towards patients with SUDs, naloxone and opioid overdose prevention education, on June 28, 2016, a university librarian helped to conduct an additional search, to ensure thoroughness of the initial literature searches. A comprehensive search under “OneSearch” which searches multiple

formats for all health and medical databases, in addition to Cochrane and systematic reviews, produced 3 additional articles plus articles already located from previous searches.

## **Findings**

### **ED Nurses' Attitudes and Perceptions of Patients with SUDs**

Stigmatization and negative attitudes towards patients with SUDs by health care professionals including nurses, were found in the literature (Ford, Bammer, & Becker, 2008; Ford, Bammer, & Becker, 2009; Ford, 2011; Gilchrist et al., 2011; Happell & Taylor, 2001; Haug, Bielenberg, Linder, & Lembke, 2016; McLaughlin, McKenna, Leslie, Robinson, & Moore, 2006; Rao et al., 2009; Van Boekel, Brouwers, Van Weeghel, & Garretsen, 2013). In one article, a nursing student shared her desperate experience when she was a nursing assistant working in the hospital where her cousin was admitted following an overdose (Cramer, 2014). As a hospital employee and family member she witnessed her cousin's disrespectful treatment by health care professionals as a patient in critical condition in the Intensive Care Unit (ICU) (Cramer, 2014). The nursing student who was in the role of a family member, listened as the RN caring for her cousin in the ICU was very callous, accusatory and disrespectful (Cramer, 2014). The ICU RN described the overdose patient's actions as stupid regarding mixing alcohol with muscle relaxants, and explained to the family, if he did recover he would more than likely repeat this action again (Cramer, 2014).

Van Boekel et al., 2013 concluded from an eleven year systematic review of literature from 2000 to 2011, that "negative attitudes of healthcare professionals towards patients with substance use disorders are common and contribute to suboptimal health care for these patients" p. 23. Health care professionals referred to patients with SUDs as difficult, lacking motivation, violent, irresponsible, draining to care for and nurses reported less satisfaction when providing

care to them (Ford et al., 2008; Ford, 2011). Nurses felt substance abusing and misusing patients were unsafe and challenging emotionally to care for (Ford, 2011). Nurses depicted providing care to patients with SUDs as unsafe, as patients have erratic behaviors, become violent and nurses often find themselves in compromising situations in order to avoid confrontation (Ford, 2011). Nurses described the inability to form therapeutic nurse patient relationships with patients with SUDs since they are thought of as dishonest, lying, and sneaky (Ford, 2011).

Therapeutic attitude is considered how well the nurse engages or connects with the patient as well as how committed, motivated and satisfied the nurse is in his or her present role (Cartwright, 1980). Therapeutic attitude also takes into consideration the nurses' self-esteem and how adequate and legitimate they feel in their roles (Ford et al., 2009; Cartwright, 1980). When the members of the patient's health care team display negative and stigmatizing attitudes towards patients, this prevents therapeutic, respectful relationships from developing and can lead to harmful or negative outcomes for the patient (Ford et al., 2009; Van Boekel et al., 2013).

Patients with a SUD that experience adverse attitudes from the nurses, physicians, and others on the health care team have difficulty developing effective communication with them (Palmer, Murphy, & Ball, 2009; Van Boekel et al., 2013; Thornicroft et al., 2007). A trusting and therapeutic relationship is difficult to form when a patient feels ignored, disrespected and cannot communicate effectively with the health care providers (Palmer et al., 2009; Thornicroft et al., 2007). Patients that do not trust their health care providers are less likely to share pertinent medical history and health information or seek appropriate medical treatment, thus contributing to poor outcomes (Thornicroft et al., 2007; Thornicroft, Rose, & Mehta, 2010)).

Negative attitudes and stigmatization of health care professionals can lead to health care professionals' misdiagnosing patients as presenting symptoms of the patient can be ignored,

over-looked or incorrectly attributed to the SUD (Thornicroft et al., 2007; Thornicroft, Rose, & Mehta, 2010; Van Boekel et al., 2013). Patients with SUDs may also avoid seeking medical care (HHSOSG, 2016 p. ES-2; Thornicroft et al., 2007). One patient with a history of irritable bowel syndrome, when seeking appropriate treatment and medical workup for her abdominal pain was told by her providers instead that her symptoms most likely due to her depression or phobia (Thornicroft et al., 2007). A patient admitted to the ED for overdose found the ED staff to be so rude, she will not return to seek treatment in the future (Thornicroft et al., 2007).

### **Effects of Educational Interventions on Therapeutic Attitudes and Knowledge**

Education, supportive work environments and processes can improve the negative attitudes of health care professionals towards individuals with SUDs (Ford et al., 2009). Education about SUDs and training have been shown to positively affect the attitudes and knowledge of health care professionals who provide care for patients with SUDs (Happell & Taylor, 2001; Howard & Holmshaw, 2010). Interestingly, health care professionals with more training, education in addiction and or behavioral health, and have personal experience or experience working with patients with SUDs tend to have more positive attitudes towards working with patients with SUDs (Pinikahana, Happell, & Carta, 2002; Gilchrist et al., 2011; Ford, Bammer, & Becker, 2008).

In addition to knowledge, role support was noted throughout the literature to be an essential element contributing to improving the attitudes of health care providers for caring for patients with SUDs (Albery et al., 2002; Ford, Bammer, & Becker, 2009; Howard & Holmshaw, 2010; Van Boekel et al., 2013; Wilstrand, Lindgren, Gilje, & Olofsson, 2007). Role support is defined as the “availability of others with whom the nurse could readily and easily discuss personal difficulties, clarify professional responsibilities and formulate the best response to



clinical issues” (Ford et al., 2009, p. 114-115). Nurses in general expressed the importance of having policies and procedures to provide guidance and a health care team member with specialized knowledge of SUDs to be available to answer clinical questions in order for the nurse to provide safe and effective care for the patient (Albery et al., 2002; Ford, Bammer, & Becker, 2009; Howard & Holmshaw, 2010; Van Boekel et al., 2013; Wilstrand, Lindgren, Gilje, & Olofsson, 2007).

Several studies either surveyed health care team members or used a mixed method of survey, to measure prior educational preparation and attitudes of the health care member, followed by an interview or use of open ended questions to obtain further clarifying information (Albery et al., 2002; Ford et al., 2008; Ford et al., 2009; Ford, 2011; Happell & Taylor, 2001; Howard & Holmshaw, 2010; Kelleher & Cotter, 2008; May, Warltier, & Pagel, 2002; Pinikahana et al., 2002). Nurses’ and health care professionals’ previous education about SUDs and their subsequent therapeutic attitudes, negative attitudes and stigmatization were frequently noted themes (Albery et al., 2002; Ford et al., 2008; Ford et al., 2009; Ford, 2011; Happell & Taylor, 2001; Howard & Holmshaw, 2010; Kelleher & Cotter, 2008; May, Warltier, & Pagel, 2002; Pinikahana et al., 2002). Ford, Bammer, & Becker (2008) found in their descriptive study of Australian RNs’ therapeutic attitudes towards patients with SUDs, role support and the relationship between education and role support were most important. These two relationships were strongest of those independent variables that were statistically significant (Ford et al., 2008). Twenty five percent of the nurses surveyed (n=1605) reported that they had adequate education to care for patients with SUDs, 30% of the nurses were motivated to provide care for their patients, and only 15% of the nurses expressed satisfaction in their roles (Ford et al., 2008).

Since the use of illicit drugs is a major problem in Australia, any nurse could potentially at some time provide care for a patient with a SUD (Ford, 2010). Nurses therefore are in an ideal situation to impact the patient's outcomes positively with harm reduction initiatives (Ford, 2010). A sample of participants from the Ford et al., 2008 descriptive study, were surveyed using open ended questions to determine barriers for nurses from providing care to patients with SUDs (Ford, 2011). Nurses reported three categories of barriers to providing care to patients with SUDs: violence on part of the patients or patients' visitors; manipulative behavior of the patients; and the nurses' feelings that the patients lacked responsibility for their health care needs placing greater demands on the how nurses spent their time (Ford, 2011).

In general, healthcare professionals were found to lack specialized education and training to provide patient-centered care to patients with SUDs (McLaughlin et al., 2006; Deans & Soar, 2005; Munro, Watson, & McFadyen, 2007). RNs have not been provided with the same education and training regarding naloxone nasal spray and harm reduction strategies provided to first responders and EMS (CDC, 2012b; Ford et al., 2009; Kelleher & Cotter, 2008; Wheeler et al., 2015). Six studies were found that pertained to the PICOT question, (see Table 3 and Table 4). Each of these studies contributed to measuring the effects of an education intervention provided to impact health care professionals' knowledge and attitudes for patients with SUDs, with one study addressing naloxone use for opioid overdoses (Howard & Holmshaw, 2010; Lawson, Littlefield, & Erikson, 2004; Mayet, Manning, Williams, Loaring, & Strang, 2011; Munro, Watson, & McFadyen, 2007; Tran, Stone, Fernandez, Giffiths, & Johnson, 2008; Tsai et al., 2011).

Using the hierarchy of evidence provided by Fineout-Overholt, Melnyk, Stillwell, & Williamson, (2010, p. 48), two studies were described as Level II or randomized control trial

studies, three studies as Level III or control trials without randomization, and one study as Level VI or a descriptive study (Melnik et al., 2010, p. 48; Howard & Holmshaw, 2010; Lawson, Littlefield, & Erikson, 2004; Mayet, Manning, Williams, Loaring, & Strang, 2011; Munro, Watson, & McFadyen, 2007; Tran, Stone, Fernandez, Giffiths, & Johnson, 2008; Tsai et al., 2011) (see Table 2).

Mayet et al. (2011) studied the effects on clinician's knowledge and attitudes of a group educational, training intervention done in cascading steps, for naloxone administration and opioid overdose management for drug treatment clinicians in England. The training included the use of slides, DVD, questionnaires, and group discussions and demonstrations of how to assess and provide care to an individual experiencing an opioid overdose (Mayet et al., 2011). Trained clinicians were then encouraged to train more clinicians and individuals misusing drugs (Mayet et al., 2011). A combination of 219 health care providers which were predominantly nurses (37%), doctors (14%), drug workers (31%), and others took part in the training of which 100 were trained first and then provided training to 119 other clinicians (Mayet et al., 2011). The respondents pre and post questionnaire mean score results demonstrated a statistically significant improvement in knowledge ( $p < 0.001$ ) for risk factors, identifying and managing an opioid overdose (Mayet et al., 2011). In addition, post survey responses measuring attitudes pertaining to administering naloxone for an overdose demonstrated improvement in both confidence and 'willingness to administer naloxone' (Mayet et al., 2011, p. 14).

Tran et al. (2008) measured the effects of an educational intervention for RNs working on medical and surgical units in two Sydney, Australia hospitals. RNs were surveyed immediately before the intervention and three months following the intervention and compared to mental health nurses' knowledge scores (Tran et al., 2008). The intervention included a half day

educational workshop using handouts, Power Point slides, discussion pertaining to the care of the patient experiencing withdrawal, overdose and intoxication for alcohol and substance misuse (Tran et al., 2008). The nurses that received education scored significantly higher in overall knowledge ( $p = 0.001$ ), than the nurses that did not receive education, although several educational gaps were identified for further education (Tran et al., 2008). Following the education workshop, nurses were significantly more competent in: screening for alcohol and substance misuse ( $p = 0.035$ ), referring patients for treatment ( $p = 0.035$ ), providing motivational counseling ( $p = 0.024$ ), preventing relapses ( $p = 0.043$ ), and detoxification management ( $p = 0.027$ ). Limitations in the study included the small sample size and turnover of staff, noting the need for more case studies and ongoing staff education (Tran et al., 2008).

Munro et al. (2007) emphasized the importance of the nurses' therapeutic attitudes towards patients with SUDs and mental health disorders in predicting helpful engagement in the nurse patient relationship, and highlighted the fact that nurses lack education in patients with SUDs. This randomized controlled trial found that this education intervention positively affected both the knowledge of and attitudes of registered nurses ( $n=49$ ) that provide care for patients in "generic mental health and addiction services" (Munro et al., 2007, p. 1432). The results of a questionnaire completed before, immediately after the educational intervention and six months later, found a four day long educational training was effective in improving the nurses' knowledge and attitudes (Munro et al., 2007). The education intervention used lecture and small group work pertaining to co-existing mental health and SUD problems, illicit drugs, attitudes towards patients with SUD, evidence-based care, policies, and referral (Munro et al., 2007). Nurses had significantly improved mean therapeutic attitude scores ( $p < 0.001$ ) immediately following the education intervention and six months later ( $p < 0.001$ ), than the control group that

did not receive education (Munro et al., 2007). Knowledge improved significantly for the nurses that received the educational intervention ( $p = 0.002$ ), from pre-survey to six months following training ( $p = 0.005$ ) but not immediately following training (Munro et al., 2007).

The randomized control study conducted by Tsai et al. (2011) demonstrated the effectiveness of a brief alcohol educational intervention in improving the “knowledge, self-efficacy and clinical practice” of nurses working in the ED, and other settings providing care for patients with an alcohol use disorder, in six hospitals in Taiwan (Tsai et al., 2011, p.978). The 90 minute education intervention used demonstration, discussion, and lecture to cover content including “an introduction to alcohol, factors influencing alcohol drinking, impacts of high-risk drinking on a person” (Tsai et al., 2011, p. 976). Questionnaires completed pre intervention and one and three months post intervention demonstrated knowledge increased significantly in the 191 nurses in the experimental group at one month ( $p < 0.01$ ) and three months ( $p < 0.01$ ) post intervention that received the education, than the 204 nurses in the control group that did not receive education (Tsai et al., 2011). Clinical performance and “self-efficacy” ratings of nurses reflecting assessment, intervention and documentation proficiencies also increased at three months for the experimental group (Tsai et al., 2011, p. 980). The author postulated that increased scores in clinical skills and efficacy were not seen until three months post intervention because these skills often take longer to develop following education (Tsai et al., 2011).

Lawson et al. (2004) demonstrated the effectiveness of a three or six hour workshop for treatment professionals ( $n=1241$ ), which included health care professionals such as nurses, attending workshops offered in the United States and Puerto Rico, which included topics such as accurate definitions and terms, “basic neurochemistry of addiction and the anatomy and function of the mesolimbic dopamine system,” and “how new neurobiological knowledge will affect the

treatment of addictions in the future” (Lawson et al., 2004, p.1238). Pre and post survey results demonstrated significant improvement in knowledge ( $p < 0.001$ ) about SUDs. Belief scores significantly ( $p < 0.001$ ) increased overall from pre to post test for subscales of “neurobiology/physiology,” “personality/environment,” and “policy” (Lawson et al., 2004, p.1247). Healthcare professionals’ belief scores improved but not significantly for subscale “neurobiology of addiction/physiological process” (Lawson et al., 2004, p.1248).

Howard and Homshaw et al. (2010) collected both quantitative data via a questionnaire and qualitative data via interviews to identify what influenced perceptions and what helped or prevented multidisciplinary staff, which included RNs, from providing care to patients with co-existing mental health and SUD problems. Staff with more training and education pertaining to SUD had fewer negative attitudes. Recommendations included providing ongoing implementation of support processes, staff education and training for this patient population (Howard & Holmshaw, 2010).

In summary, both the non-interventional studies, and interventional studies which utilized an educational intervention demonstrated that health care providers with varying backgrounds in working with patients with SUDs; such as addiction treatment staff, mental health; or general medical surgical and ED nurses, had improved attitudes and less stigma with education about caring for patients with SUDs (Howard & Holmshaw, 2010; Lawson et al., 2004; Mayet et al., 2011; Munro et al., 2007; Tran et al., 2008; Tsai et al., 2011) (see Table 2). Education provided in the studies varied but pertained to SUDs, opioid overdose prevention, screening, treatment and addiction (Lawson et al., 2004; Mayet et al., 2011; Munro et al., 2007; Tran et al., 2008; Tsai et al., 2011). Beliefs, therapeutic attitudes and competency related to patients with SUDs also were positively affected by educational interventions (Howard & Holmshaw, 2010; Lawson et al.,

2004; Mayet et al., 2011; Munro et al., 2007). In addition, nurses expressed the importance of having support for example in having policies and procedures, a resource staff member to provide guidance and answer clinical questions, time to care for these complex patients and ongoing education when caring for patients with SUDs (Howard & Holmshaw, 2010).

### **Emergency Nurses Association's use of Screening, Brief Intervention and Referral to Treatment (SBIRT)**

While EDRNs may have negative attitudes towards patients with SUDs, the Emergency Nurses Association (ENA) demonstrated professional support of providing evidence-based care to individuals with SUDs, specifically, to patients with an alcohol use disorder. The ENA created an initiative to enhance the care and communication with the patient and help address alcohol use disorders through integration of the use of Screening, Brief Intervention and Referral to Treatment (SBIRT) in the ED (Emergency Nurses Association ENA Injury Prevention Institute/EN Care [ENA], 2008). SBIRT is described as a “comprehensive, integrated, public health approach to the delivery of early intervention and treatment services for persons with substance use disorders, as well as those who are at risk of developing these disorders” (Substance Abuse and Mental Health Services Administration [SAMSHA], 2015, p. 1). SBIRT entails a quick screening, use of motivational interviewing and brief intervention to increase the individual's awareness of motivation to change and participation in a referral to treatment (SAMSHA, 2015).

While the literature reviewed did not provide reference to how the use of SBIRT affects EDRNs attitudes towards patients with substance used disorders, the literature did show the use of referral to recovery can be effective (SAMSHA, 2015) . The primary focus in the ED was to identify patients with inappropriate alcohol use, and utilize motivational interviewing techniques

to increase successful referral to treatment and recovery (ENA, 2008). The use of SBIRT demonstrated the EDRN's evidence-based approach to patients with substance abuse behaviors (ENA, 2008). SBIRT has been successfully integrated into an electronic documentation system to screen patients for at risk use of drugs, tobacco and alcohol (Johnson, Woychek, Vaughan, & Steale, 2013).



Table 3

*Level of Evidence for References*

Hierarchy of Evidence	Rating of References					
	1	2	3	4	5	6
Level I: Systematic review or meta-analysis						
Level II: Randomized controlled trial		x	x			
Level III: Controlled trial without randomization				x	x	x
Level IV: Case-control or cohort study						
Level V: Systematic review of qualitative or descriptive studies						
Level VI: Qualitative or descriptive study	x					
Level VII: Expert opinion or consensus						

Table 4

*Synthesis of References Pertinent to PICOT Question*

References	Education affected attitude	Education affected knowledge
1	↑	↑
2	↑	↑
3	-	↑
4	-	↑
5	↑	↑
6	↑	↑

Legend: ↑ = increased, ↓ = decreased, - = not addressed. Adapted from: “Making the Case for Evidence-Based Practice and Cultivating a Spirit of Inquiry,” by B. M. Melnyk and E.

Fineout-Overholt, 2015, in *Evidence-Based Practice in Nursing & Healthcare: A Guide to Best Practice*, 3<sup>rd</sup> edition, p.10-11, 553 Copyright 2015 by Wolters Kluwer Health.

1. Howard, V., & Holmshaw, J. (2010)
2. Munro, A., Watson, H. E., & McFadyen, A. (2007)
3. Tsai, Y., Tsai, M., Lin, Y., Weng, C., Chou, Y., & Chen, C. (2011)
4. Tran, D. T., Stone, A. M., Fernandez, R. S., Giffiths, R. D., & Johnson, M. (2008, April)
5. Mayet, S., Manning, V., Williams, A., Loaring, J., & Strang, J. (2011)
6. Lawson, K. A., Littlefield, J. H., & Erikson, C. K. (2004).

### III. SCAFFOLDING THE PROJECT

The Doctor of Nursing Practice (DNP) role includes advocating for “improving the health status of the population of the United States” including high risk populations through implementing “clinical prevention” which is defined as “health promotion and risk reduction/illness prevention for individuals and families” (American Association of Colleges of Nursing, 2006, p. 15). EDRNs provide care for patients at high risk for or presently being treated for opioid overdose, yet may not recognize this risk due to lack of education and training on SUD (Mersy, 2003; Van Boekel, Brouwers, Van Weeghel, & Garretsen, 2013).

As patient advocates, EDRNs play a major role in identifying and linking high risk individuals for opioid overdose to harm reduction and recovery efforts to prevent further morbidity and mortality in this population. Since one role of the RN is to provide patient education, and teaching to patients, families and significant others (American Nurses Association [ANA], 2016), it is relevant to the profession of nursing for the nurse as a leader to support the development and implementation of evidence-based patient educational materials for RNs to provide unbiased and effective patient education to this high risk population for opioid overdose.

#### **Problem Statement**

Currently, EDRNs do not provide HRENNS to high risk patients before patients are at discharged from the ED. Evidence shows negative attitudes and stigma towards individuals with

SUD are likely to be present in EDRNs and can contribute to providing suboptimal patient care. Historically, education pertaining to SUD has been missing in nursing and medical school curricula. Education has been shown to address the knowledge gaps and negative attitudes towards individuals with SUD. This DNP student project will provide an education intervention to address the gap in knowledge and attitudes of EDRNs towards patient with SUD.

### **Theoretical Framework**

The theoretical framework for this project was a combination of Appreciative Inquiry (AI) (Cooperrider, Whitney, & Stavros, 2005), and W. Edwards Deming's theory of management including Plan, Do, Study, Act (PDSA) (Deming, 2000; Institute for Healthcare Improvement [IHI], 2015). Both AI and PDSA are familiar to the EDRNs at the health care system where the project took place and emphasize the importance of empowering and engaging stakeholders by integrating their input and feedback to facilitate a successful change (Cooperrider et al., 2005; IHI, 2015; Varkey & Antonio, 2010). Appreciative Inquiry was selected in order to engage EDRNs, nursing administration and other stakeholders in placing a positive emphasis on the proposed change (Cooperrider, Whitney, & Stavros, 2005). Efficient EDs are streamlined environments where quality, safety, efficacy and patient flow or throughput are all vital processes needed to provide care for large volumes of individuals seeking emergency medical care. AI encouraged building change upon successful processes engrained in the work place culture (Cooperrider et al., 2005).

To provide initial and ongoing process and quality improvement for the education intervention, the "PDSA Cycle (Plan-Do-Study-Act)" was selected from Deming's work (The W. Edwards Deming Institute, 2016, para 1). W. Edward Deming credits Walter A. Shewhart, as the author of the PDSA Cycle (Deming, 2000, p. 88; The W. Edwards Deming Institute, 2016,

para 1). The use of the PDSA Cycle includes starting with “the Plan step” (WEDI, 2016, para. 2). The Plan step “involves identifying a goal or purpose, formulating a theory, defining success metrics and putting a plan into action” (WEDI, 2016, para 2). Deming explains, “These activities are followed by the Do step, in which the components of the plan are implemented, such as making a product. Next comes the Study step, where outcomes are monitored to test the validity of the plan for signs of progress and success, or problems and areas for improvement. The Act step closes the cycle, integrating the learning generated by the entire process, which can be used to adjust the goal, change methods or even reformulate a theory altogether” (WEDI, 2016, para. 2). Ongoing repetition of the PDSA cycle steps would provide continuous process improvement (WEDI, 2016). Through use of the PDSA cycles, improvements were made to the education intervention based on the feedback from each education intervention session and tested or validated in subsequent sessions (WEDI, 2016; IHI, 2015). Final changes were made to the education intervention and audio-visually taped presentation that was downloaded into the hospital system’s electronic learning system for implementation.

Deming’s theory of management involves fourteen steps or points which improve effectiveness, and are transformational (Deming, 2000) (see Appendix A). Many of the fourteen steps were considered when designing the education intervention. Providing the EDRNs with background information about the opioid overdose epidemic as well as the naloxone product and patient teaching in the education intervention created an engaged and informed stakeholder group, essential for successful change (Deming, 2000). The actual product and patient teaching materials were provided in the education intervention for the EDRNs to handle, inspect, ask questions or express concerns to “drive out fear” (Deming, 2000, p. 23). Seeking feedback and collaboration from the ED administration, pharmacists, information technologists as well as the

EDRNs about the workflow, use of the automated order set and behind the scenes pharmacy process “put everybody in the company to work to accomplish the transformation” and “break down barriers between departments” (Deming, 2000, p. 24). The ED leadership, nurses and others through this education intervention took a proactive approach to addressing the epidemic by providing this intervention before it is required by a standard or accreditation body demonstrated the EDs’ dedication to “create constancy of purpose toward improvement of product and service” and “adopt a new philosophy” (Deming, 2000, p. 23).

Following the work with stakeholders to plan the education intervention, a gap analysis was conducted to identify needed resources, budgets, approvals and process changes in order to be successful with the intervention (Cooperrider et al., 2005). Approvals for the education intervention were obtained the ED Clinical Guidance Council comprised of physicians, department directors, information services and nursing leadership, and the ED Peer Group which is comprised of the hospital system’s nursing leadership. A budget was created to reflect expenses. A list of resources needed for the presentation was created.

### **Internal Process**

AI and PDSA were used through the 11 presentations to improve the presentation itself based on feedback. A multi-disciplinary team of stakeholders from pharmacy, nursing, informatics, and medicine from four hospital campuses were involved in the initial and ongoing discussions of the larger project of provision of naloxone and harm reduction education to high risk ED patients. The team decided to emulate aspects of a successful similar project, provision of inhalers in the ED. The project goals of provision of a naloxone nasal spray product in the ED and an effective delivery process were developed by the team.

A system-wide response to the opioid epidemic included a pilot project involving four EDs to evaluate the efficacy of screening ED patients for high risk for opioid overdose and for providing them with naloxone nasal spray, patient education and treatment and recovery resources. An education intervention was planned to inform the EDRNs of the pilot project. The education intervention also provided background on the opioid overdose epidemic, information about SUDs as a medical condition, and addressed negative attitudes and stigma which may exist towards patients with SUDs. The education intervention also included content on primary prevention and harm reduction strategies, provision of naloxone and harm reduction education, and information about providing treatment resources and recovery resources. In order to obtain support for change, it was important to understand where the informal and formal leadership processes and structure existed for this project. For example, the larger proposal involving the provision of naloxone nasal spray to high risk ED patients included the EDRNs' education component and required initial approval at the health system's ED Clinical Guidance Council. This team provides guidance and approval to support initiatives that reflect the mission, vision and values of the organization. The ED Clinical Guidance Council granted approval of the larger project March 17, 2016.

Next, the larger proposal was presented by the ED Nursing Outcomes Manager to the ED Peer Group, a group of nurse leaders from each of the hospital system's ED campuses. The project received approval from the ED Peer Group on March 24, 2016. A stakeholder group formed, consisting of nursing leadership and educators from the four EDs involved in the pilot. EDRN education was discussed and planned using an AI approach based on each hospital ED's unique preferences for staff education times and formats. These were all considered when developing the intervention. The nursing team and nurse educators provided ongoing guidance

regarding their preferences for in-services, planning, content, support in obtaining contact hours and marketing. Due to the large number of nurses, varying resources, patient acuity and staffing practices in the four EDs, the ED nursing administrators and clinical educators recommended the development of a learning module that could be accessed through the hospital system's electronic education system. This would be made available to EDRNs who could not attend the live education intervention sessions.

### **III. PROJECT IMPLEMENTATION**

#### **Project Objective**

In response to the opioid overdose epidemic, and to support the hospital system's larger project, an education intervention was created for EDRNs to address gaps in knowledge and attitudes. Project surveys and EDRN feedback provided at the education intervention were used to revise the intervention and measure the effects of the education intervention on the knowledge and attitudes of the EDRNs regarding caring for patients with SUD and providing HRENNs to ED patients at high risk for opioid overdose death.

#### **Methods**

A quantitative method with a qualitative element was used in this project. Quantitative data was collected by inviting EDRNs to complete a 21 item survey comprised of items scored using true or false and Likert-type scale scoring. Demographics were also collected on the pre-intervention survey. The survey was completed by participants immediately prior to and immediately following the 60 minute education intervention. The survey measured both the EDRNs knowledge of the care of patients with SUDs, HRENNs; and their attitudes towards patients with SUDs and towards providing HRENNs to the high risk ED patients for opioid overdose (see Appendix B).

A 60 minute education intervention was presented in a designated room arranged by each of the four EDs administrative nurse manager or clinical educator. The content of the education in-service included: the scope and seriousness of the opioid overdose death epidemic, SUDs as a disease, pathway from prescription opioids to heroin, treatment and recovery, and HRENNS to prevent opioid overdose death.

The Doctor of Nursing Practice (DNP) student collaborated with the Director of Drug Abuse Outreach Initiatives and Community Outreach Specialist from the Office of the Attorney General to provide high level, law enforcement community outreach content expertise for the ED education intervention. The content experts work with high risk communities and residents throughout the state counties hosting town hall meetings and providing resources to address the opioid epidemic. Sharing their exclusive expertise, first hand insight, data and evidence with a hospital system was a new collaboration. The education intervention was co-developed and co-presented using Power Point slides, video clips and the opportunity for returned demonstration and discussion. Return demonstration on a manikin head provided the participants the opportunity to become familiar with the two available naloxone nasal spray products. Examples of patient teaching sheets were also provided to participants. The education intervention was audio-visually taped for use for future ongoing staff education to support the larger hospital system project.

Thirty days following the education intervention, qualitative data was collected in the form of a phone interview, offering the RNs an opportunity to provide further information regarding the education intervention and their experiences applying the education to providing patients with HRENNS in the ED clinical setting (see Appendix C). The DNP student ideally preferred to interview four or more EDRNs, from each of the four EDs, of which attended the education



intervention, to participate in a 20 minute phone interview. The RNs were contacted by email by the DNP student to set up a mutually agreeable time to conduct the interview by phone.

### **Sample**

All RNs who work in the four EDs either full-time, part-time or contingent were invited to participate in the project. Inclusion criteria included EDRNs consenting to participate in the pre and post survey, who attended the education intervention (see Appendix D). Participation in completing the pre and post survey as well as the option to be interviewed in 30 days were optional. Exclusion criteria for the project included EDRNs attending the education in-service but not providing consent to participate in the project. Participants were recruited through invitation provided by flyers posted in the department and through communication by the ED nursing leadership and clinical educators. Before each education intervention session, ED nurses were given the option to provide consent to participate in the pre and post survey.

### **Instruments**

A 21 item survey was created with the assistance of a content expert Family Practice physician with an Addiction Medicine specialty. Eleven true or false items that covered the primary knowledge content of the education intervention were selected from the 61 items of the Opioid Overdose Knowledge Scale (OOKS) (Williams, Strang, & Marsden, 2013a; Williams, Strang, & Marsden, 2013b). Nine items also pertinent to the content from the education intervention, were selected from the 28 items of the Opioid Overdose Attitudes Scale (OOAS) which uses a five point Likert scale scoring method ranging from “completely agree” to “completely disagree” (Williams et al., 2013a; Williams et al., 2013b, “Table S2”). One additional statement that was not included found in either the OOKS or OOAS was developed by the DNP student, a content expert Family Practice physician with a specialty in Addiction

Medicine and one content expert in survey development. This additional item was added to the OOAS portion of the survey using Likert scale scoring. The additional item was “People keep using drugs because they lack the will power and desire to stop using.” The DNP student changed the word methadone to oxycodone in the OOKS statement to read “The effect of naloxone is shorter than the effect of heroin and oxycodone” because oxycodone is seen more often in our patient population.

The OOKS and the OOAS were used for the development of the survey in this project because they were directly related to HRENNNS and were developed to measure the knowledge and attitudes of individuals trained to administer “take-home naloxone” for individuals suspected of an opioid overdose (Williams et al., 2013, p. 383a). A modified version of the OOKS and the OOAS was proposed for use in this DNP project instead of using the OOKS and the OOAS in their complete format due to the limited time available for participants to complete the survey before and after the education intervention in this project.

The OOKS consists of 61 true false items “grouped into four sub-scales labelled: *risks*, *signs*, *actions* and *naloxone use*” (Williams et al., 2013a, p. 384, Williams et al., 2013b). Participants select true statements by placing a check mark in the box beside each true statement (Williams et al., 2013a; Williams, et al., 2013b). The OOAS consists of 28 items with “a five point Likert- type scale (completely disagree, disagree, unsure, agree and completely agree), scored 1-5” (Williams et al., 2013a, 384). Sub-scales of the OOAS pertained to managing an overdose including: “*competence*, *concerns* (about intervening) and *readiness* (willingness to intervene)” to an overdose (Williams et al., 2013a, p. 384). Overall, the OOKS and the OOAS both had good internal reliability demonstrating that each measured either knowledge for the OOKS or attitudes for the OOAS; OOKS (Cronbach’s alpha= 0.83) and OOAS (Cronbach’s

alpha= 0.90) (Salkin, 2016; Williams et al., 2013a). Overall, the OOKS and OOAS test-retest reliability scores demonstrated good to high reliability that variables were measured reliably for the OOKS with an ICC= 0.90 and for OOAS with an ICC=0.82 (Salkin, 2016; Williams et al., 2013a). Permission was obtained by email correspondence from the author of the OOKS and OOAS, Anna V. Williams on August 16, 2016 to use selected items from the OOKS and the OOAS, for the modifications to change one word from methadone to oxycodone, and to include the one additional statement.

The 21 survey items were printed on side one of a sheet of white paper for the pre-survey and the same survey items were printed on side two of the paper for the post survey (see Appendix B). Demographic information was collected on side one of the survey. Demographics included: “Sex” with choices for “male,” “female,” “other,” “prefer not to respond,” “Age” with choices for ranges of “20 to 30,” “31 to 40,” “41 to 50,” “51 to 75,” “Years of ED experience” with choices for “less than 5 years” or “greater than 5 years,” “Prior naloxone nasal spray education or training” with choices for “yes” or “no,” “Prior professional or other experience with opioid overdose” with choices for “yes” or “no,” “Prior professional or other experience with SUDs” with choices for “yes” or “no,” the “ED where the EDRN currently works” with choices for “urban,” “rural,” “suburban” and “Role” including “RN,” “Advanced Practice RN” and “other.” The participants were given five minutes before and five minutes following the education intervention to complete the survey questions. Informed consent was provided to the nurses before the education intervention began. All staff were welcome to attend the education intervention but survey data was only collected from RNs that provided informed consent (see Appendix D).

Five statements from the Substance Abuse Attitude Survey (SAAS) were used to design an open ended format interview for participants (Chappel, Veach, & Krug, 1985; Head Start, 2015). The interviews were intended to help the RNs explore their personal perspective and attitudes towards individuals with SUDs following the education intervention (Chappel, et al., 1985; Head Start, 2015). The SAAS was selected because it is an accepted scale to measure the attitudes of medical students and other healthcare professionals including nurses, regarding alcohol and drug SUDs (Chappel, et al., 1985; Foster & Onyeukwu, 2003; Happell & Pinikahana, 2002; May et al., 2002; Pinikahana et al., 2002). The five domains of “Permissiveness, Treatment Intervention, Nonstereotypes, Treatment Optimism and Nonmoralism” were determined following repeated factor analysis and administration of the scale (Chappel, et al., 1985, p. 48). The internal consistency of the of the “factor structure” was validated by repeated survey completion by “criterion clinicians” and “noncriterion clinicians” (Chappel, et al., 1985, p. 48). The SAAS uses “Likert (agree-disagree)” scoring for each statement (Chappel et al., 1985, p. 49). The SAAS has been used to generate discussion to explore health care providers’ opinions regarding individuals with alcohol and drug SUDs (Head Start, 2015). The tool was developed using “Career Teachers in alcohol and drug abuse,” “clinicians with diverse backgrounds in the professional management of substance misuse patients,” “clinicians from diverse geographic locations in the United States” and then a sample of “noncriterion clinicians who did not specialize in substance misuse treatment,” (Chappel, et al., 1985, p. 49 (Chappel, et al., 1985; Foster & Onyeukwu, 2003; Happell & Pinikahana, 2002; May et al., 2002; Pinikahana et al., 2002).

The follow up interview statements were selected from the SAAS with the assistance of a content expert Family Practice physician with a specialty in Addiction Medicine (Chappel, et al.,

1985) (see Appendix C). The statements selected from the Treatment optimism section included: “Drug addiction is a treatable illness,” “An alcohol- or drug-dependent person who has relapsed several times probably cannot be treated,” “Most alcohol- and drug-dependent persons are unpleasant to work with,” “An alcohol- or drug-dependent person cannot be helpful until he/she has hit “rock bottom” (Chappel, et al., 1985, p. 51). A statement from the Non-moralism section included: “Angry confrontation is necessary in the treatment of alcoholics or drug addicts.” (Chappel, et al., 1985, p. 51). The statements were used to illicit conversation by asking the nurses to share their opinions or thoughts about each of the statements during the 20 minute interview (Head Start, 2015). Permission to use the SAAS as described in the follow up interview was obtained on August 31, 2016 from Paul Candon, Managing Editor, Journal of Studies on Alcohol and Drugs, Center of Alcohol Studies, Rutgers, The State University of New Jersey. A fee of \$30.00 was paid to Rutgers, The State University for New Jersey, for a copy of the scale, instructions and scoring per standard procedure.

### **Project Budget and Resources**

The DNP student paid 30.00 to the Ralph G. Connor Alcohol Research Reference Files through Rutgers, the State University of New Jersey for the permission to use the SAAS. The DNP student had minimal expenses for the education intervention to cover water, snacks and plain white envelopes for the education intervention sessions. The DNP student provided donuts and water at early morning in-services and pizza and water at the afternoon and evening education intervention sessions estimated to cost \$200.00. Speakers did not charge a fee for their time, gas or travel. Project resources needed for each education session included: handouts of the presentation and patient teaching, sign in sheet, new naloxone nasal spray product to be used in the actual intervention, the older version of naloxone nasal spray for comparison, a manikin

head for return demonstration of administering, syringes filled with water with an atomizer for return demonstration and seeing the atomization of the water, a projector and a laptop computer, and a few pens.

### **Data Collection**

The 21 survey items were printed on side one of a sheet of white paper for the pre-survey and the same survey items were printed on side two of the paper for the post survey.

Demographic information was collected on side one of the survey. The participants were given five minutes before and five minutes following the education intervention to complete the survey questions.

Each of the 57 EDRNs that participated in the education intervention were sent an email inviting them to participate in a 20 minute phone interview and asking them to reply with dates and times they would be available for the interview. Two nurses replied to the invitation to participate. These two EDRNs were each called by phone and the DNP student read each of the five SAAS statements, and five questions referring to providing care to high risk ED patients, changes to the presentation and negative attitudes towards patients with SUD, to the nurse providing them time to respond. The DNP student took notes during the interview and provided the EDRN an opportunity to offer additional comments. The responses to the statements were recorded by the DNP student during the interview and transcribed immediately following the interview (see Appendix C).

## **IV. PROJECT FINDINGS**

### **Data Analysis**

Only surveys with both pre and post survey item results were used in the final data analysis and surveys with only pre data or only post data were eliminated. Data from participant

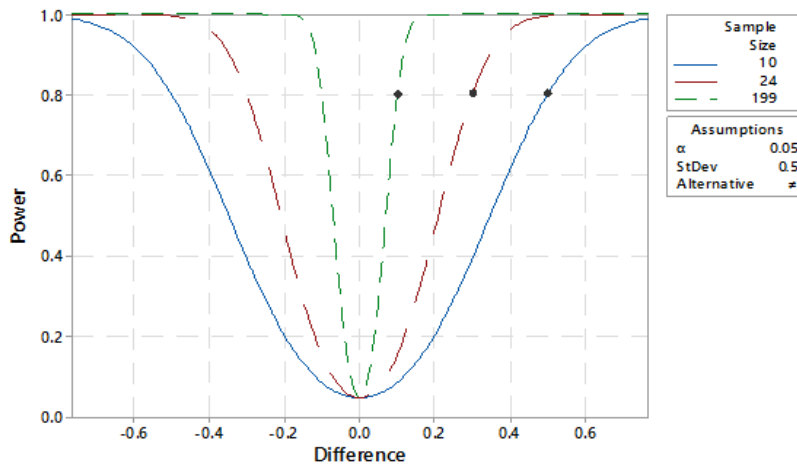
surveys were entered into Excel® and copied into Minitab® 17 statistical software (Microsoft, 2017; Minitab, 2017). Pre and post survey results were tabulated from Minitab® 17 statistical software and converted into Table 7 showing pre and post survey mean proportion results for each item using true or false responses resulting in binomial data (Minitab, 2017). Inferential statistics were used to determine statistical significance from proportion of participants selecting correct answers in the pre-survey compared to post survey results (Glantz, 2009; Salkin, 2016). A paired t-test was used to test items using Likert scale scoring comparing the averages for statistically significant differences between the pre and post survey items (Salkin, 2016). Since the paired t-test uses each subject as their own control, it is more sensitive and powerful than treating the data as being two independent samples (Glantz, 2009; Salkin, 2016; Sylvia & Terhaar, 2014). True or false items from the OOKS were converted to True =1 and False = 0, and binomial proportion tests were performed to determine proportion of participants selecting the correct score (Salkin, 2016). Other survey items that use the one to five point Likert scale of the OOAK were treated as interval data for statistical analysis comparing pre and post mean scores (Salkin, 2016).

A power analysis for pre and post survey results using a paired t-test was performed using the Minitab® 17 statistical software (Minitab, 2017; Salkin, 2016). Due to the small sample size the survey data was considered a pilot project (W. Harper, personal communication, September 7, 2016). This was performed with an alpha = 0.05 (corresponding to a 95% confidence level) and a power of 0.80 (corresponding to a beta = 0.20) (W. Harper, personal communication, September 7, 2016). Differences between the population means of 0.1, 0.3 and 0.5 were used as they covered the scope of practical important mean differences between the post-test and pre-test (W. Harper, personal communication, September 7, 2016). For alpha =

0.05 (corresponding to a 95% confidence level) and power of 0.80 (corresponding to a beta = 0.20) a sample size of 199 was required, to detect a mean difference of 0.1, a sample size of 24 to detect a mean difference of 0.3, and a sample size of 10 to detect a mean difference of 0.5 (Minitab, 2016) (see Figure 1).

Figure 1

## Power Curve for Paired T-Test



## Significance

Items from the pre and post surveys were analyzed to detect and measure change in knowledge and attitudes of EDRNs towards patients with SUDs, opioid overdose prevention, and naloxone nasal spray following the education intervention (see Tables 6 and 7). P-values were included for all items. Items with statistically significant change with p-values for 80% confidence level or greater are seen in bold on Table 5. While statistical significance was difficult to establish in the sample size of 27, clinically significant findings from pre and post survey mean proportion scores reflected how EDRNs in general understood the 11 items scored from the OOKS which used yes or no binomial scoring. In addition, pre and post paired t-test



mean scores were used to reflect EDRNs level of agreement and attitudes to the 8 items scored from the OOAS and one additional item using Likert Scale scoring. Interview data from two EDRNs were used to examine trends and to further examine nurses' opinions and experiences of providing care for the patient at high risk for opioid overdose, and patient education about naloxone and naloxone nasal spray post intervention.

### **Participants**

Seventy-five health care professionals attended one of the 11 education intervention sessions. The majority of the participants or 57 were EDRNs, and 17 others working in various related roles including physician, paramedic, Behavioral Health or social worker, and administrative assistant. A total of 35 surveys were collected during the 11 education interventions. Three surveys were eliminated because they were outside of the EDRN role (one social worker and two paramedics). Five surveys were eliminated due having only the pre or only the post survey items completed. From the remaining 27 surveys, two were eliminated after the first six post survey item responses were recorded because the post survey items were not completed after this point. The survey sample was comprised of 27 EDRNs with the majority or (18/27) 67% EDRNs being female, (18/27) 67% were between 31 and 50 years of age, (11/27) 41% worked in an urban ED, (13/27) 48% with more than 5 years of experience, (22/27) 81% with either professional or other prior experience with SUDs and a majority of the EDRNs (18/27) or 67% had not had prior experience outside of the hospital with opioid overdose, and (14/27) 52% of the EDRNs had received prior naloxone nasal spray education or training (see Table 5).

**Table 5***Demographics of EDRN Participants*

Demographics of EDRNs participating in the Education Intervention	Responses of EDRNs
Role	RN: 27 Other: 2 Paramedics, 1 Social Worker
Age (Years)	Ages 20 to 30: 5 respondents Ages 31-50: 18 respondents Ages 41-50: 0 respondents Ages 51 years or older: 3 respondents
Sex	Male: 2 Female: 18 Other: did not mark Prefer not to respond: did not mark
Hospital- (Urban, Suburban, Rural)	Urban: 11 Suburban: 6 Rural: 7
Years of ED experience	Less than 5 years: 12 Greater than 5 years: 13
Prior experience (professional or other) with SUD	Yes: 22 No: 4
Prior experience (professional or other) outside of the hospital with opioid overdose	Yes: 8 No: 18
Prior education and or training of nasal naloxone spray	Yes: 14 No: 12

**Survey Item Results**

Table 6 is a summary of pre and post intervention mean proportion scores of survey items from the OOKS using true or false scoring (Williams et al., 2013). The responses to the survey items reflected the EDRNs knowledge about the content. In general, mean proportion scores to the OOKS survey item, **“Which of the following factors increase the risk of a heroin (opioid) overdose?”** indicated the majority of EDRNs had good understanding of the factors that would increase an person’s risk for overdosing before the intervention, but fewer identified risk factors following the intervention. Although not statistically significant, fewer participants identified

the survey item risk factors “using heroin when no one else is present” and “using heroin after a detoxification” following the education intervention (Williams et al., 2013). Statistically significantly ( $p = 0.183$ ) fewer EDRNs identified the survey item risk factor pertaining to lowered tolerance when “using heroin after not using for a while” (Williams et al., 2013). Although these risk factors were included in the education intervention, this is an area that may need to be addressed further or differently.

Overall, the mean proportion scores for the OOKS survey item **“Which of the following are indicators of an opioid overdose?”** indicated most EDRNs already knew the symptoms indicative of an overdose based on the very high general agreement with this content in the pre survey scores. There was a typo in the pre survey for the option of “Unresponsiveness” that prevented the participant from selecting “Unresponsiveness” in the pre survey. While the option “Unresponsiveness” was correctly selected by 24 out of 25 EDRNs in the post survey, measuring change from the pre to the post survey is not possible. The term “agitation” remained a knowledge gap pre and post survey. Since “agitation” was not mentioned as an indicator of overdose in the literature, it was not covered in the presentation and will not be revised in the education intervention. This content is important since the EDRN will be providing patient teaching pertaining to identifying the signs and symptoms of an overdose. This information is consistent with the content on the patient education handouts.

Most EDRNs already knew what to do in response to a heroin overdose as indicated by the high agreement for the correct responses in both of the pre and post survey responses to the OOKS item, **“Which of the following should be done when managing a heroin (opioid) overdose?”** There was high agreement from the EDRNs to correctly identify the need for calling an ambulance, staying with the patient, administering naloxone and checking for

breathing as important steps in managing an overdose, and key to the intervention to provide naloxone to high risk patients. These are important steps to be reinforced by the EDRN in the patient teaching and are consistent with the intervention steps presented in the education intervention and the patient education handouts.

Overall the EDRNs demonstrated a high agreement and very good knowledge of naloxone based on the survey responses. For the OOKS item **“What is naloxone used for”** while the EDRNs understood naloxone reverses opioid overdoses, there were statistically significantly ( $p = 0.072$ ) more EDRNs who selected correct post survey responses that naloxone does not reverse cocaine overdose and fewer nurses incorrectly selected naloxone reverses any overdose.

Following the education intervention EDRNs demonstrated statistically significantly improved knowledge pertaining to three OOKS survey items. The OOKS item **“How long do the effects of naloxone last for?”** more EDRNs indicated on the post survey that naloxone lasts longer than 20 minutes ( $p = 0.038$ ) yet less than one hour ( $p = 0.080$ ) and significantly ( $p = 0.140$ ) fewer EDRNs scored they did not know how long naloxone lasted. The education intervention was effective in providing the pharmacokinetics of naloxone. The EDRNs improved knowledge of the duration of action of naloxone is important because it is part of the patient teaching that ties to the possibility for needing to administer an additional dose of naloxone, there are two doses of naloxone provided in the product and the need to call 911 to summon EMS.

The EDRNs had good pre intervention knowledge of OOKS survey item **“How long does it take to start having an effect?”** as all EDRNs selected the correct answer of two to five minutes. EDRNs responses improved significantly ( $p = 0.178$ ) to the OOKS item, **“If the first**

**dose of naloxone has no effect a second dose can be given”** from pre to post intervention scores indicating this content was presented well in the education intervention. In addition, the OOKS survey item, **“There is no need to call for an ambulance if I know how to manage an overdose”** was answered correctly unanimously in both the pre and post surveys. On the following OOKS items EDRNs chose the correct response more often following the education intervention, but this difference was not statistically significant: **“Someone can overdose again even after having received naloxone,” “The effect of naloxone is shorter than the effect of heroin and oxycodone,”** and **“Naloxone can provoke withdrawal symptoms.”** Since the duration of action of heroin and prescription opioids are longer than naloxone, the second dose of naloxone may need to be administered to prevent overdosing again, and reinforces the importance of staying with the patient and summoning emergency first responders in response to this medical emergency.

Following the intervention, the EDRNs demonstrated good existing or improved knowledge of risk factors, signs and symptoms of overdose, the pharmacokinetics of naloxone, and the naloxone product. All of these are required in order to provide effective patient teaching to the patient, family member, or those who will most likely be administering the naloxone to the patient. The EDRNs’ knowledge of the duration of action of naloxone compared to heroin and prescription opioids is important and ties into the instructions to summon EMS, stay with the patient, and administer a second dose of naloxone if needed.

**Table 6**

Summary of Pre and Post Intervention Mean Proportion Scores from the OOKS Survey

Items Reflecting how the EDRNs' Knowledge changed following the Intervention.

	<b>Pre-Survey Proportion Mean</b>	<b>Post-Survey Proportion Mean</b>	<b>Significance</b>
<b>Check each correct answer.</b>			
<b>Which of the following factors increase the risk of a heroin (opioid) overdose?</b>			
Using heroin with other substances, such as alcohol or sleeping pills	24/27= 0.888	22/27=0.814	Most respondents identified this risk factor initially although not statistically significant, fewer identified it following the intervention (p = 0.441)
Using heroin again after not having used for a while	23/27= 0.851	19/27= 0.703	<b>Most respondents identified this risk factor initially but significantly (p = 0.183) fewer respondents identified this risk factor following the intervention. It is not clear why there was more of a knowledge deficit on this item following the intervention.</b>
Using heroin when no one else is present around	19/27= 0.704	16/27= 0.592	Most respondents identified this risk factor initially although not statistically significant, fewer identified this risk following the intervention (p = 0.389).
Using heroin again after a detoxification treatment	21/27= 0.778	17/27= 0.630	Most respondents identified this risk factor initially although not statistically significant, fewer identified this risk factor following the

			intervention (p = 0.227).
<b>Which of the following are indicators of an opioid overdose?</b>			
Slow or shallow breathing	25/27= 0.926	25/27= 0.926	Most respondents identified this indicator of opioid overdose both pre and post intervention (p = 1.00).
Lips, hands or feet turning blue	24/27= 0.889	23/27= 0.852	Most respondents identified this risk factor initially, although not statistically significant, fewer identified this indicator of opioid overdose (p= 0.685) post intervention.
Unresponsive	Not available	24/25= 0.960	Unable to measure change in this indicator of overdose since the pre survey was missing a box to score the response. Post survey results indicated most respondents identified this indicator of overdose.
Deep snoring	23/25= 0.920	23/25= 0.920	Most respondents identified this indicator of opioid overdose (p = 1.00) pre and post survey.
Agitated behavior	10/25= 0.400	8/25= 0.320	Fewer respondents although not statistically significant, identified this indicator of opioid overdose following the intervention (p = 0.769).
<b>Which of the following should be done when managing a heroin (opioid) overdose?</b>			
Call an ambulance	25/25= 1.00	25/25= 1.00	All respondents correctly indicated to call an ambulance

			pre and post intervention.
Stay with the person until an ambulance arrives	24/25=0.960	24/25= 0.960	Most respondents correctly indicated pre and post intervention, to stay with the person until the ambulance arrives (p = 1.00).
Give naloxone	23/25= 0.920	24/25= 0.960	More respondents although not statistically significant, correctly indicated giving naloxone to manage a heroin overdose (p = 0.550) post intervention.
Put the person in a bath of cold water	4/25= 0.160	4/25= 0.160	Few respondents although not statistically significant, selected this incorrect distractor following the intervention both pre and post intervention (p = 1.00).
Check for breathing	24/25= 0.960	23/25= 0.920	Most respondents identified this step to manage an overdose but fewer RNs although not statistically significant, identified checking for breathing post intervention (p = 0.550)
<b>What is naloxone used for?</b>			
To reverse the effects of an opioid overdose	25/25= 1.00	23/23= 1.00	<b>All respondents identified the correct purpose of naloxone in reversing opioid overdoses initially and following the intervention.</b>
To reverse the effects of a cocaine overdose	5/25= 0.200	1/25= 0.040	<b>Few respondents initially indicated naloxone reverses cocaine overdoses but</b>



			<b>significantly more respondents (p = 0.072) responded correctly following the intervention that naloxone does not reverse a cocaine overdose.</b>
To reverse the effects of any overdose	3/25= 0.120	1/25= 0.040	More respondents, although not statistically significant, responded correctly post intervention that naloxone does not reverse any overdose (p = 0.292).
<b>How long do the effects of naloxone last for?</b>			
Less than 20 minutes	9/25= 0.360	3/25= 0.120	<b>Significantly (p = 0.038) fewer respondents selected the incorrect duration of time of naloxone following the intervention.</b>
About 1 hour	10/25= 0.40	16/25= 0.640	<b>Significantly (p = 0.080) more respondents correctly selected the duration effect time for naloxone following the intervention.</b>
1 to 6 hours	4/25= 0.160	5/25= 0.200	Overall few respondents selected this incorrect duration of effect of naloxone time but one more respondent selected it post intervention, although not statistically significant (p = 0.712)
6 to 12 hours	1/25= 0.040	1/25= 0.040	Few respondents selected this incorrect duration of effect of naloxone time (p = 1.00) initially and post intervention.
Don't know	2/25= 0.080	0/25=0.000	<b>Significantly fewer respondents (p = 0.140) indicated they did not know</b>

			<b>the duration of effect of naloxone following the intervention.</b>
<b>How long does it take to start having an effect?</b>			
2-5 minutes	25/25= 1.00	25/25= 1.00	All respondents selected the correct onset time of naloxone pre and post intervention.
6-10 minutes	0/25= 0.000	0/25= 0.000	No respondents selected this incorrect onset of naloxone time.
11-20 minutes	0/25= 0.000	0/25= 0.000	No respondents selected this incorrect onset of naloxone time
21-40 minutes	0/25= 0.000	0/25= 0.000	No respondents selected this incorrect onset of naloxone time
Don't know	0/25= 0.000	0/25= 0.000	No respondents selected this incorrect onset of naloxone time
<b>Check each correct statement:</b>			
If the first dose of naloxone has no effect a second dose can be given	17/25= 0.680	21/25= 0.840	<b>Following the intervention, significantly (p = 0.178) more respondents correctly indicated that a second dose of naloxone can be given.</b>
There is no need to call for an ambulance if I know how to manage an overdose	0/25= 0.000	0/25= 0.000	All respondents indicated this statement is incorrect pre and post intervention.
Someone can overdose again even after having received naloxone	19/25= 0.760	22/25= 0.880	More respondents responded correctly to this statement post intervention, although

			not statistically significant (p = 0.264).
The effect of naloxone is shorter than the effect of heroin and oxycodone	18/25= 0.720	20/25= 0.800	Most respondents although not statistically significant, correctly indicated that the effect of naloxone is shorter than heroin and oxycodone (p = 0.506).
<b>Naloxone can provoke withdrawal symptoms</b>	12/25= 0.480	15/25= 0.600	More respondents although not statistically significant, correctly indicated that naloxone provokes withdrawal symptoms following the intervention (p = 0.391).

*Note:* Survey items adapted from “Development of opioid overdose knowledge (OOKS) and attitudes (OOAS) scales for take-home naloxone training evaluation” by A.V. Williams, J. Strang, & J. Marsden, 2013, *Drug and Alcohol Dependence*, 132, 383-386. <http://dx.doi.org/org/10.1016/j.drugalcdep.2013.02.007>. Supplementary material for the article “Development of opioid overdose knowledge (OOKS) and attitudes (OOAS) scales for take-home naloxone training evaluation” by A.V. Williams, J. Strang, & J. Marsden, 2013, *Drug and Alcohol Dependence*. <http://dx.doi.org/http://dx.doi.org/10.1016/j.drugalsdep>.

Additional survey items from the OOAS were used to measure EDRNs’ attitudes before and after the education intervention using a Likert Scale of Completely Agree-5, Agree-4, Unsure-3, Disagree-2, and Completely Disagree-1 (Williams et al., 2013b). All but one of these items was from the OOAS (Williams et al., 2013b). One item was added pertaining to the use of will power in relation to SUDs. The results of these items are summarized (in Table 7). For each item the sample size is included, indicating items where both the pre and post survey items were scored by each EDRN. Paired t-test mean scores were used to determine clinical significance and level of agreement for each of the items.

Only one of the items, pertaining to having sufficient information to manage an overdose, was statistically significantly (p = 0.137) increased following the intervention (see Table 7). The

EDRNs' mean scores reflect initial uncertainty about feeling informed to manage an overdose, and less uncertainty post intervention. The education intervention provided information to increase their knowledge about management of an overdose.

Statistically significant changes in the EDRNs' responses from the pre survey to the post survey following the education intervention were not present in the other eight items. Instead, mean pre and post scores indicated EDRNs' level of agreement, uncertainty and disagreement to their level of preparedness, training to provide help to an individual overdosing, who should be prepared to help, who should be provided with a supply of naloxone and why people continue to use drugs (see Table 7) (Williams et al., 2013a; Williams et al., 2013b). EDRNs' mean scores pre and post reflected they agreed they wanted to be able to help someone that was overdosing, they felt confident with their training to intervene for someone who has overdosed, and they would know how to help that person. EDRNs were not afraid to administer naloxone to a patient due to the patient either becoming aggressive or experiencing withdrawal symptoms. EDRNs felt confident they would not accidentally harm someone they tried to help. EDRNs were uncertain if everyone at risk for witnessing an overdose should be provided with the naloxone product, but agreed that family and friends of a person at risk for overdose should be prepared to respond to an overdose. EDRNs disagreed that people keep using drugs due to lack of desire or will power to stop using.

In general, survey data from EDRNs did not indicate negative attitudes toward individuals using drugs and overdosing. They wanted to help someone overdosing and felt confident they could intervene in the event of an overdose. EDRNs indicated recognition of SUD as a medical condition requiring medical treatment and naloxone to reverse opioid overdose.

**Table 7**

*Paired T-Test Means Scores of Matched Pre and Post Survey Responses for Survey Items*

*from the OOAS scored using a Likert Scale*

Likert Scale : Completely Agree-5, Agree-4, Unsure-3, Disagree-2, Completely Disagree-1	Pre Mean	Post Mean	Significance
I already have enough information to manage an opioid overdose n=22	3.500	3.773	Respondent scores changed significantly ( $p = 0.137$ ) although still uncertain, closer to agreeing that they have enough information to manage an overdose, following the intervention.
I am going to need more training before I feel confident to help someone who has overdosed n=21	2.095	1.905	Respondents felt confident initially and post intervention to help someone who has overdosed although not statistically significant ( $p = 0.463$ ).
If someone overdoses, I would know what to do to help them n=22	4.500	4.636	In general, respondents initially and post intervention felt trained and knowledgeable knowing what to do to help if someone overdosed ( $p = 0.329$ ) although not statistically significant.
I would be afraid of giving naloxone in case the person becomes aggressive afterwards n=22	1.591	1.409	Respondents initially were not afraid initially and following the intervention, although not statistically significant to administer naloxone due to the patient becoming aggressive ( $p = 0.257$ )
I would be reluctant to use naloxone for fear of precipitating	1.591	1.500	Respondents were not reluctant initially and post intervention although not

withdrawal symptoms n=22			statistically significant, to administer naloxone for fear of precipitating withdrawal (p = 0.427).
If I tried to help someone who has overdosed, I might accidentally hurt them n=22	1.273	1.318	Respondents disagreed that they might hurt someone who has overdosed if they tried to help (p = 0.576) although not statistically significant.
Everyone at risk of witnessing an overdose should be given a naloxone supply n=22	3.318	3.591	Respondents initially were uncertain initially and post intervention if everyone at risk for witnessing an overdose should be given a supply of naloxone (p = 0.315) although not statistically significant.
Family and friends of drug users should be prepared to deal with an overdose n=23	4.217	4.261	Respondents agreed initially and post intervention that friends and families should be prepared to deal with an overdose (p = 0.803) although not statistically significant.
If someone overdoses, I want to be able to help them n=23	4.565	4.565	Respondents agreed initially and post intervention if someone overdoses, I want to be able to help them (p = 1.00) although not statistically significant.
People keep using drugs because they lack the will power and desire to stop using n=23	2.565	2.478	Respondents initially and post intervention disagreed that people keep using drugs because they lack the will power and desire to stop using (p = 0.539) although not statistically significant.

*Note.* Survey items adapted from “Development of opioid overdose knowledge (OOKS) and attitudes (OOAS) scales for take-home naloxone training evaluation” by A.V. Williams, J. Strang, & J. Marsden, 2013, *Drug and Alcohol Dependence*, 132, 383-386.

<http://dx.doi.org/10.1016/j.drugalcdep.2013.02.007>. Supplementary material for the article

“Development of opioid overdose knowledge (OOKS) and attitudes (OOAS) scales for take-home naloxone training evaluation” by A.V. Williams, J. Strang, & J. Marsden, 2013, *Drug and Alcohol Dependence*. <http://dx.doi.org/http://dx.doi.org/10.1016/j.drugalsdep>.

The two twenty minute phone interviews provided the EDRNs with an opportunity to share any change in perspective or ability to provide care since the intervention. Interviewees were also given open-ended time to reflect on having taken part in the intervention. One interviewee chose to share that she lost a family member to the opioid epidemic (see Appendix C). Both EDRNs agreed to the SAAS statement pertaining to drug addiction is a treatable medical condition (Chappel et al., 1985). Likewise, in response to the SAAS statements used in the interview, both EDRNs disagreed that a person who has relapsed cannot be treated, disagreed they cannot be helped until hitting rock bottom, disagreed that they are unpleasant to provide care to, and disagreed that angry confrontation is needed to treat them (Chappel et al., 1985). The EDRNs shared responses including “perhaps they did not have a good support system or maybe it was their environment which caused them to fail,” “your status in society doesn’t matter, it can happen to anybody,” “a friend just went to rehab after using prescription drugs after surgery,” “I can see it in a patients eyes even the nurse with an attitude walks into a room of a patient who just overdosed with heroin,” “how you respond to them can change their lives,” “when you see the parents or children of the patient on a ventilator or especially of those we can’t bring back, in disbelief, despair, asking how did this happen, the impact on the family is great.” Both EDRNs separately expressed the need for nurses to be non-judgmental as the epidemic is affecting everyone, sharing “people are not born to be a heroin addict, they just don’t once day decide to become one.”

There was opportunity for informal feedback throughout each of the education intervention sessions. Questions and casual conversation that took place before, during and after

each session also provided valuable information about the education intervention and the EDRNs' knowledge and attitudes. The live education intervention sessions allowed participants to provide feedback regarding the presentation content, acceptance and struggles with the intervention, and express varying opinions about SUDs. While most feedback was supportive, some participants expressed negative opinions and attitudes at the education intervention about providing naloxone to patients, SUDs, and whether providing naloxone would encourage drug use or give false reassurance to patients and families. The live sessions also provided the opportunity for the co-presenters to provide immediate feedback to participant responses and concerns, to answer questions and to clarify content in the presentation.

The live education intervention sessions also provided the EDRNs an opportunity for return demonstration of nasal spray and to handle the actual product. The EDRNs were able to practice spraying a syringe filled with water attached to an atomizer into the air to see the atomization and to simulate administration into a manikin nostril. Both the newer naloxone nasal spray product which does not require any assembly and the older product with requires assembly were available for the EDRNs to practice and for return demonstration.

Table 8

### Significant Findings

- |  |
|--|
| <ul style="list-style-type: none"> <li>The education intervention was effective in improving EDRNs knowledge related to naloxone and management of an opioid overdose: that naloxone does not reverse the effects of a cocaine overdose (<math>p = 0.072</math>); naloxone's duration of action (<math>p = 0.080</math>) and repeating dosing of naloxone may be required (<math>p = 0.178</math>).</li> </ul> |
| <ul style="list-style-type: none"> <li>EDRNs' paired t-test mean scores were significantly improved (<math>p = 0.137</math>) post survey in rating of having sufficient information to manage an overdose following the</li> </ul>   |



education intervention.

- Although not statistically significant the paired t-test overall mean scores for the following did reflect clinically significant EDRNs' attitudes tendency toward agreement, uncertainty and disagreement for the following items. EDRNs agreed that they wanted to intervene for someone that was overdosing, they felt confident intervening for someone who has overdosed, they would know how to respond to help, they were not afraid to administer naloxone to a patient due to the patient either becoming aggressive or experiencing withdrawal symptoms, nor did they feel they may accidentally harm someone they tried to help. EDRNs were uncertain if everyone at risk for witnessing an overdose should be provided with the naloxone product, but agreed that family and friends of a person at high risk for overdose should be prepared to respond to an overdose. EDRNs disagreed that people keep using drugs due to lack of desire or will power to stop using.
- Follow up interviews revealed EDRNs' non-judgmental attitudes toward evidence-based care.
- During live sessions, EDRNs revealed opinions, attitudes and barriers to providing nasal naloxone to ED patients at high risk for overdose. These were not captured in survey data.

## **V. DISCUSSION**

### **Limitations**

Attendance by the EDRNs at the education intervention sessions was limited mainly due to staffing demands and unpredictable patient acuity. It was difficult to reduce the education

session to less than 50-60 minutes to cover the content and provide time for dialogue. Each ED had its own process for providing education and training to their associates. It was difficult to accommodate each of the education styles. For example, two of the EDs asked for a handout with bullet points to cover the content, and did not have a room near the clinical area where an education intervention could be held. Yet, one nurse manager provided dates and times where there were extra nurses on the schedule to accommodate attendance at the education intervention. Another manager scheduled the sessions to be held in an empty patient room to accommodate staff attending.

Nurses' attitudes towards SUD may have impacted participation. The administrative nurse managers stated ahead of time that it may be difficult to obtain buy in from the EDRNs. Some EDRNs expressed negativity about allocation of resources to naloxone because other medications, such as epinephrine auto-injectors are not routinely distributed at no cost.

The survey may have had too many items to answer before and after the education intervention. The survey when pilot tested took approximately two to three minutes to complete. In one location, the education intervention was held in the trauma room for convenience of the nursing staff, which worked well for attendance but made it difficult for participants to complete the survey without a table or hard surface to write on. In addition, it took the first five to 10 minutes to allow the nurses to arrive and get settled into the room prior to beginning the presentation. It is possible that some participants felt rushed due to wanting to get back to work, and therefore did not answer the survey items as thoughtfully had they been given other circumstances. Since not all participants completed the survey a highly motivated nurse may have skewed the data either positively or negatively.

Clinical significance was difficult to determine with a small sample in this project as noted in the power analysis explanation provided in the Data Analysis section of this paper. Only two RNs agreed to be interviewed by telephone to provide further information about providing care to patients with SUD.

### **Project Barriers**

Even though the pilot received support, some negative attitudes were shared with the DNP student in initial conversations with stakeholders from the four pilot EDs prior to the implementation of the education intervention sessions. Initially, the DNP student did not anticipate the opposition or mixed feelings regarding providing naloxone to patients, since additional resources were being made available to help address the epidemic and patients with SUDs. Several nurse managers stated it was difficult to sell the topic of provision of naloxone to high risk patients for several reasons. One reason expressed by the nurses was that the cost of the epinephrine auto-injector recently escalated making it unaffordable to many parents and families of children with severe allergies. Some EDRNs voiced concern that resources were being allocated to patients with SUD, and not to patients with life-threatening allergies.

The DNP student was not fully prepared for the negative responses expressed by some nurses during the education intervention, pertaining to providing naloxone to patients, SUDs, and concerns whether providing naloxone would encourage drug use or give false reassurance to patients and families. The DNP student discussed the experiences with the Director of Drug Abuse Outreach Initiatives co-presenting the intervention, the family practice Addiction Medicine physician and DNP advisor. The DNP student ultimately saw the negative attitudes as a result of lack of evidence-based education about SUDs and as a key opportunity to further influence change. The DNP student learned to carefully listen and welcome the nurses sharing

their honest opinions and concerns during the discussions pertaining to the intervention. The negativity was consistent with negative attitudes reported in the literature and anecdotal data from first responders. This barrier was also regarded as an opportunity to provide ongoing evidence-based education to influence change in attitudes and perception of patients with SUDs.

Patient teaching materials required revisions for opioid overdose, naloxone and harm reduction strategies. The DNP student worked the hospital system's Manager of Patient Education to revise the teaching sheets. The Manager of Patient Education also revised the Department of Health's Project DAWN brochure with links to community resources as well as the new Crisis Text Line service from the Department of Mental Health and Addiction Services, to make them available for patient education and teaching.

### **Project Facilitators**

While support for the larger project was obtained by hospital administration, the greatest support was obtained from the clinical educators, an administrative nurse manager and nursing directors from the ED. This support was obtained following individual and small group discussions about the project, initial resistance to the intervention, sharing personal experiences and reviewing the depth of the content that would be presented. The state's Attorney General's Office staff also provided great support of the education intervention by sharing resources to develop the intervention and by providing their time in presenting the education intervention. The Director of Drug Abuse Outreach Initiatives and the Community Outreach Specialist from the state's Attorney General's office are expert in meeting with community leaders and holding town hall meetings throughout the state to draw attention to the opioid epidemic and share initiatives that work to address the epidemic. They had not partnered with a hospital system in

the past, and saw this as an outstanding opportunity to extend their outreach work and resources to impact an even greater population of health care providers, patients and families.

The DNP student is a member of the county's opioid crisis task force, a multi-disciplinary team of treatment, prevention, law enforcement, religious, health care professionals, legislators, officials and community members, led by the county's coroner to develop and coordinate initiatives to address the opioid overdose epidemic. The regional hospital council, representing the collaboration of the presidents of the main hospital systems in the region, convened a committee of which the DNP student was a member. The committee developed a standard of care for the treatment of ED patients with SUDs, which included the provision of naloxone, which was approved by the regional hospital council, February, 2017. The larger project and the DNP student's project are aligned with the goals of the county's task force as well as the regional hospital council's goals.

### **Lessons Learned**

The survey used to measure change from pre to post intervention needed to be completely free of errors. The DNP student thoroughly reviewed the pre and post survey for errors and pilot tested it to estimate the amount of time it would take to complete. While analyzing the data, a box was found to be missing in the pre survey that prevented the participants from completing that item. Line for line review with another stakeholder is recommended to help identify any errors in the survey.

The content of the survey items used to measure change from pre to post intervention needed to be addressed in the education intervention or removed from the survey. In general all of the survey content was addressed in the education intervention except for one indicator of overdose, agitation. Since this indicator was not included in the education intervention, and is

not discussed in the literature, it will not be addressed further or differently. The item “agitation” should have been eliminated from the survey before implementation. The DNP student would recommend taking each survey item and aligning it with the education intervention content to ensure thoroughness.

The education intervention content was intended to provide education to improve knowledge and to address negative attitudes and stigma towards patients with SUD. A delicate balance needed to be maintained in the education intervention in order to present enough content in a timely manner while allowing time for discussion during and following the education intervention. It was difficult to predict the feedback that was given before, during and following some of the education intervention sessions. While most of the feedback was positive, some of the feedback reflected very strong feelings, beliefs and opinions opposing the provision of naloxone to high risk ED patients. The DNP student was not prepared for this level of negativity and was grateful to have a content expert present to help handle these opposing views. While welcoming and respecting the honesty of the EDRNs, the DNP student needed to realize that one education intervention may not change everyone. The education intervention was limited to an introductory level of the content, and further ongoing education would be needed to provide more in depth information to address gaps in knowledge that can dispel negative attitudes. The richness of the feedback was used to plan for EDRN ongoing education, development of resources to support the EDRN and opportunities for stakeholders to provide ongoing feedback in order to identify and address barriers to the project.

With a project involving multiple departments it is essential to understand each of their priorities and build on processes in place that are effective in order to create successful change. For example, the pharmacy department is both clinical and process focused. The pharmacy

helped to ensure accurate processing and labeling of the naloxone product, and the order set was linked to the clinical process and was built accurately with the information services department. In contrast, prescribers were interested in the evidence supporting the initiative, in the patient screening and selection, workflow and ease of use of the order set.

### **Key Points for Future Projects**

- Provide live as well as electronic versions of the education intervention for the participants to have an opportunity to verbally express opinions and concerns. Electronic versions of the education can be made available for convenience as staffing and acuity demands may make it difficult for staff to attend.
- Work with expert stakeholders to support improved patient teaching materials.
- Provide ongoing education pertaining to SUD as well as related topics.  
Encourage ongoing dialogue with the EDRNs to identify ongoing needs.

### **Dissemination of Findings**

The DNP student submitted an abstract for a poster presentation which includes a ten minute oral presentation if the poster is selected. The project was submitted and accepted to the 2017 National Emergency Nurses Association Conference, September, 13-16, 2017. An abstract for oral presentation was submitted and was accepted to the 2017 National American Society for Pain Management Nurses Conference, September 13-16, 2017. An abstract will be submitted for publication in *The American Nurse*, journal of the American Nurses Association, in order to reach nurses of all specialties to inform them of this harm reduction initiative to save lives from the opioid overdose epidemic facing our nation.

### **Summary**

EDRNs have the opportunity to contribute to harm reduction efforts to prevent further morbidity, mortality and the devastating personal, community and financial losses associated with the opioid overdose epidemic. The ED venue and RNs are well positioned, yet are not adequately prepared to identify high risk individuals whether they present as a result of an overdose or for another medical reasons. EDRNs need to be trained to provide individuals at high risk for overdose with naloxone and harm reduction education. Evidence shows that education can increase knowledge and address negative attitudes and stigma among nurses. An education intervention was used to improve the knowledge and address the attitudes of EDRNs in four different ED settings providing care to patients with SUD. EDRNs were provided with education and improved patient teaching resources. Outcomes of the project were used to inform a system-wide project and revise the education intervention that was posted electronically for ongoing staff education to provide naloxone nasal spray for home use to ED patients at high risk for opioid overdose.



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## Appendix A

### W. Edwards Deming's Condensation of the 14 Points for Management

1. Create constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs.
2. Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.
3. Cease dependence on inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.
4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust.
5. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.
6. Institute training on the job.
7. Institute leadership (see Point 12 and Ch.8). The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.
8. Drive out fear, so that everyone may work effectively for the company (see Ch.3).
9. Break down barriers between departments. People in research, design, sales, and production must work as a team, to foresee problems of production and in use that may be encountered with the product or service.
10. Eliminate slogans, exhortations, and targets for the work force asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.
- 11 a. Eliminate work standards (quotas) on the factory floor. Substitute leadership.  
b. Eliminate management by objective. Eliminate management by numbers, numerical goals. Substitute leadership.
- 12 a. Remove barriers that rob the hourly worker of his right to pride of workmanship. The responsibility of supervisors must be changed from sheer numbers to quality.  
b. Remove barriers that rob people in management and in engineering of their right to pride of workmanship. This means *inter alia*, abolishment of the annual or merit rating and of management by objective (see Ch. 3).
13. Institute a vigorous program of education and self-improvement.
14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job.

*Note.* Adapted from: *Out of the crisis*. Deming, W. E. (2000). MA: MIT, p. 23-24.

## Appendix B

Page 1

### Pre-Survey

After completing the pre and post surveys, please place your survey in an unmarked envelope, seal it and place it in the box. The envelopes will not be opened until all of the in-services are completed.

**Please complete the following:** Role:  RN  Advanced Practice RN  Other \_\_\_\_\_

<b>Age:</b> <input type="checkbox"/> 20-30 <input type="checkbox"/> 31-40 <input type="checkbox"/> 41-50 <input type="checkbox"/> 51 and older	<b>Sex:</b> <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other <input type="checkbox"/> Prefer not to respond	<b>Hospital:</b> <input type="checkbox"/> Urban <input type="checkbox"/> Suburban <input type="checkbox"/> Rural	<b>Years of ED experience:</b> <input type="checkbox"/> less than 5 years <input type="checkbox"/> greater than 5 years
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I have had prior experience (professional or other) with substance use disorders  yes  no  
 I have had prior experience (professional or other) outside of the hospital with opioid overdose  yes  no  
 I have had prior education and/or training of nasal spray naloxone  yes  no

**Check each correct answer**

**1. Which of the following factors increase the risk of a heroin (opioid) overdose?**

- Using heroin with other substances, such as alcohol or sleeping pills
- Using heroin again after not having used for a while
- Using heroin when no one else is present around
- Using heroin again after a detoxification treatment

**2. Which of the following are indicators of an opioid overdose?**

- Slow or shallow breathing
- Lips, hands or feet turning blue
- Unresponsive
- Deep snoring
- Agitated behavior

**3. Which of the following should be done when managing a heroin (opioid) overdose?**

- Call an ambulance
- Stay with the person until an ambulance arrives
- Give naloxone (opioid overdose antidote)
- Put the person in a bath of cold water
- Check for breathing

**4. What is naloxone used for?**

- To reverse the effects of an opioid overdose (e.g., heroin, methadone)
- To reverse the effects of a cocaine overdose
- To reverse the effects of any overdose

**5. How long do the effects of naloxone last for?**

- Less than 20 minutes
- About 1 hour
- 1 to 6 hours
- 6 to 12 hours
- Don't know

**Check each correct statement**

If the first dose of naloxone has no effect a second dose can be given

There is no need to call for an ambulance if I know how to manage an overdose

Someone can overdose again even after having received naloxone

The effect of naloxone is shorter than the effect of heroin and oxycodone

Naloxone can provoke withdrawal symptoms

**6. How long does it take to start having an effect?**

- 2-5 minutes
- 6-10 minutes
- 11-20 minutes
- 21-40 minutes
- Don't know

**Score the following: Completely Agree =5, Agree =4, Unsure =3, Disagree =2, Completely Disagree =1**

I already have enough information to manage an opioid overdose	5 4 3 2 1
I am going to need more training before I would feel confident to help someone who has overdosed	5 4 3 2 1
If someone overdoses, I would know what to do to help them	5 4 3 2 1
I would be afraid of giving naloxone in case the person become aggressive afterwards	5 4 3 2 1
I would be reluctant to use naloxone for fear of precipitating withdrawal symptoms	5 4 3 2 1
If I tried to help someone who has overdosed, I might accidentally hurt them	5 4 3 2 1
Everyone at risk of witnessing an overdose should be given a naloxone supply	5 4 3 2 1
Family and friends of drug users should be prepared to deal with an overdose	5 4 3 2 1
If someone overdoses, I want to be able to help them	5 4 3 2 1
People keep using drugs because they lack the will power and desire to stop using	5 4 3 2 1

**Check each correct answer**

**1. Which of the following factors increase the risk of a heroin (opioid) overdose?**

- Using heroin with other substances, such as alcohol or sleeping pills
- Using heroin again after not having used for a while
- Using heroin when no one else is present around
- Using heroin again after a detoxification treatment

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- 6-10 minutes
- 11-20 minutes
- 21-40 minutes
- Don't know

**Check each correct statement**

If the first dose of naloxone has no effect a second dose can be given

There is no need to call for an ambulance if I know how to manage an overdose

Someone can overdose again even after having received naloxone

The effect of naloxone is shorter than the effect of heroin and oxycodone

Naloxone can provoke withdrawal symptoms

**Score the following: Completely Agree =5, Agree =4, Unsure =3, Disagree =2, Completely Disagree =1**

I already have enough information to manage an opioid overdose	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1
I am going to need more training before I would feel confident to help someone who has overdosed	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1
If someone overdoses, I would know what to do to help them	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1
I would be afraid of giving naloxone in case the person become aggressive afterwards	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1
I would be reluctant to use naloxone for fear of precipitating withdrawal symptoms	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1
If I tried to help someone who has overdosed, I might accidentally hurt them	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1
Everyone at risk of witnessing an overdose should be given a naloxone supply	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1
Family and friends of drug users should be prepared to deal with an overdose	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1
If someone overdoses, I want to be able to help them	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1
People keep using drugs because they lack the will power and desire to stop using	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1

*Note.* Survey items adapted from “Development of opioid overdose knowledge (OOKS) and attitudes (OOAS) scales for take-home naloxone training evaluation” by A.V. Williams, J. Strang, & J. Marsden, 2013, *Drug and Alcohol Dependence*, 132, 383-386. <http://dx.doi.org/10.1016/j.drugalcdep.2013.02.007>. Supplementary material for the article “Development of opioid overdose knowledge (OOKS) and attitudes (OOAS) scales for take-home naloxone training evaluation” by A.V. Williams, J. Strang, & J. Marsden, 2013, *Drug and Alcohol Dependence*. <http://dx.doi.org/http://dx.doi.org/10.1016/j.drugalsdep>.

**Appendix C**

**20 Minute Follow-up Interview Survey Questions from the SAAS and EDRNs’ Responses**

Acknowledge the participant has read the informed consent and ask if they have any questions or concerns. Thank them for agreeing to participate in the interview.

Please indicate your degree of agreement or disagreement for the following statements. There are no right or wrong answers.

**1. Drug addiction is a treatable illness**

Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
			x	x

**Is there anything else you would like to share about why you chose that answer?**

**Participant #1:** *I do know it is difficult for the person abusing drugs but there are success stories*

**Participant #2:** *Mostly because I come from a long family history of alcoholics, it all comes down to if they choose to. A family member died a few years ago from the epidemic.*

**2. An alcohol- or drug-dependent person who has relapsed several times cannot be treated**

Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
xx				

**Is there anything else you would like to share about why you chose that answer?**

**Participant #1:** *They can be treated. Perhaps they have not had a good support system to see them through, maybe it was their environment that caused them to fail*

**Participant #2:** *Many times they relapse before they become sober, very rarely do they get treatment on the first time.*

**3. An alcohol or drug-dependent person cannot be helped until he/she has hit “rock bottom”**



Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
	xx			

**Is there anything else you would like to share about why you chose that answer?**

**Participant #1:** *I don't think they would need to get that far before seeking serious help*

**Participant #2:** *Not completely true, some people can be given help sooner.*

**4. Most alcohol and drug-dependent persons are unpleasant to work with**

Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
	xx			

**Is there anything else you would like to share about why you chose that answer?**

**Participant #1:** *You can abuse alcohol and drugs and be the happiest person on the earth. It affects everyone to different degrees. You may have a smile on your face all the time*

**Participant #2:** *Some of these patients are very pleasant and good at hiding it*

**5. Angry confrontation is necessary in the treatment of alcoholics or drug addicts**

Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
x	x			

**Is there anything else you would like to share about why you chose that answer?**

**Participant #1:** *If you do that they will totally shut down offers to help or suggestions. Seriously not necessary*

**Participant #2:** *Because angry confrontation puts them on the defense and they cannot see their drug addiction, anger does not help them to see their problem and they need help.*

**6. Now that it is about 5 weeks following attending the Ohio's Opioid Epidemic: Naloxone Provision in the Emergency Department what changes come to mind in how you perceive patients with SUD or high risk for opioid overdose?**

**Participant #1:** *I think it can happen to any person, your status in society doesn't matter, it doesn't have any favorites*

**Participant #2:** *Being able to give naloxone to people to save lives*

**7. And do any changes come to mind in providing care and discharge teaching for patients at risk for opioid overdose?**

**Participant #1:** *No*

**Participant #2:** *For me being more open and stressing the facts they might not be so lucky next time, they need to go get treatment, you are not being judgmental but are remaining neutral, no judgement, and here is the information*

**8. What changes to make the presentation better come to mind or any additional topics you would recommend to address the care of the patient with a SUD?**

**Participant #1:** *The statistics were overwhelming, perhaps include more on the adolescents, we have 21 year olds and younger coming here 3 to 4 times for overdose, we treat them, send them out and bring them back*

**Participant #2:** *No, I thought it was good, relevant information, and information people did not know about including the stats of the state. The testimony of the two girls put a human being there to their stories.*

**9. In your career as a nurse what are your thoughts on any negative attitudes you have encountered towards patients with SUD?**

**Participant #1:** *When you check the patient in and there are 4 or more pages of OD you think, why hasn't this sunk in for the patient, that this is a disease, it's a habit you've got to break*

**Participant #2:** *Honestly, I have seen quite a bit of it, people are getting numb to it. I know it tends to bother me when they are referred to as junkie. People are not born to be a heroin addict, they just don't one day decide to become one. A friend just went to rehab after using prescription drugs after surgery. We live in a community with \$200,000 plus homes, so it is not inner city, poverty, but it happened to her, she is not a junkie, so many people start out that way. I can see it in the patient's eyes when the nurse with an attitude walks in to a room of a patient who just overdosed on heroin. One patient overdosed two times in one day and then the next day. How you respond to them can change their lives. As a nursing profession we need to be more aware of our attitudes towards the patient. Our behavior toward them can help them change their lives versus being judged won't help them. You can see it in a patient. I hate to say this, but some of the younger nurses that have not gone through life experiences, don't see this side of the patient and don't seem to have as much compassion.*

**10. What other thoughts, perspectives or experiences would you like to share?**

**Participant #1:** *When you see the parents or children of the patient on ventilators or especially of those we can't bring back, in disbelief, despair, asking how did this happen, the impact on the family is great. We need more public awareness of the subtle signs since most are not going to leave their stuff out to see. It could be your child, need to intervene early, have a family intervention and get them help.*

**Participant #2:** *My husband is against naloxone because he says it enables them to continue doing heroin without getting help. But I say they are alive and able to get help. I see it from both angles it is a double edge sword, but it is better to have some alive. I don't want anyone else to lose a family member.*

Note. Survey adapted from: "The substance abuse attitude survey: an instrument for measuring attitudes," J. N. Chappel, T. L. Veach, & R.S. Krug, 1985, *Journal of Studies on Alcohol and Drugs*, 46, 48-52. <http://dx.doi.org/org/10.15288/jsa.1985.46.48>

## Appendix D

### Consent

#### Informed Consent

The Department of Nursing at Otterbein University supports the practice of protection for human subjects participating in evidence-based practice projects and research. The following information is provided for you to decide whether you wish to participate in the present project/study by completing the pre and post in-service surveys and if you are selected, agree to be contacted by email in 30 days to participate in a 20 minute phone interview. You should be aware that even if you agree to participate, you are free to withdraw at any time without penalty and you may choose not to answer specific questions.

We are interested in studying the knowledge and attitudes of nurses regarding patients with substance use disorders and provision of harm reduction strategies to prevent morbidity and mortality from opioid overdose.

Your participation is solicited although strictly voluntary. We assure you that your name will not be associated in any way with the project/research findings.

If you would like additional information concerning this study before or after it is complete, please feel free to contact me by phone or mail.

Sincerely,

Eva M. Fried, DNP, MS, RN, WHNP-BC, Principal Investigator

439 East Science Center, Westerville, Ohio 43081

614-905-1329- Cell phone

efried@otterbein.edu

**My signature on this line indicates my agreement to participate:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**With my signature I affirm that I am at least 18 years of age.**

## Appendix E

### Project Timeline

<b>Timeline</b>
<p><b>August 1<sup>st</sup></b> met with the 2 ED clinical educators to review proposed educational intervention and receive feedback. Obtained permissions for the OOKS, OOAS and SAAS.</p> <p>Revised the survey and the outline of the education intervention.</p>
<p><b>August 12<sup>th</sup></b> presented the revised education intervention to the larger Naloxone multidisciplinary team and physician champion for review and feedback. Made further revisions to the survey and the education intervention.</p>
<p><b>August 19<sup>th</sup></b> Created pre and post survey two sided paper. Pilot tested survey to determine amount of time needed to complete it. Revised layout of paper</p>
<p><b>September:</b> Developed draft of education intervention presentation, Power Point slides, video clips, discussion points, etc. with the Attorney General's Office co-presenters. Prepared handouts, and obtained supplies (manikin head and naloxone spray) for the return demonstration of nasal naloxone spray for the education intervention, and patient teaching materials</p>
<p><b>October:</b> Finalized content with the Attorney General's Office co-presenters, revised Power Point presentation and talking points. Obtained contact hours for the education intervention through hospital system with ED Clinical Educator. Coordinated with administrative managers and clinical educators to customize and schedule times and days to hold education intervention sessions at each of the four EDs.</p>

**November:** Revised education intervention content with the Attorney General's Office staff. Finalized schedule for the education intervention sessions to share with all of the EDs.

**December:** Presented education intervention to ED Peer Group to obtain feedback of education session and plan for educating the ED staff. Planned for audio-visual recording of the education intervention for an electronic learning module.

Conducted education intervention sessions, evaluated feedback from participants, used PDSA cycles, and made revisions.

**Schedule for 11 Education Intervention Sessions:**

**Urban hospital:** 12/8/16 at 2-3:00 pm; 12/15/16 at 10-11am, 2-3:00 pm and 6-7:00pm; 12/19/16 at 2-3:00pm

**Rural hospital:** 12/7/16 at 9-10 am, 11-12 noon;  
12/19/16 at 9-10 am, 11-12 noon

**Suburban hospital:** 12/13/16 at 6:00-7:00 pm

**Suburban hospital:** 12/7/16 at 6:00-7:00 pm

Items needed for in-service: projector, laptop computer, handouts, manikin head, Nasal Naloxone Spray- two versions (demos of each), plain envelopes, box for sealed surveys, water, and snacks.

1/2017 Invited EDRNs participating in the education intervention sessions to participate in a 20 minute phone interview by email. Conducted interviews

1/2017- 3/017 Worked with the Video Production Specialist to revise the education intervention live recording into an electronic learning module

