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Reducing Pain Associated with Intravenous Catheter Placement

Daniel L. Calma, Michael J. Davidson, Lani A. Kuhlow

Daniel K. Inouye Graduate School of Nursing

Uniformed Services University of the Health Sciences

Naval Medical Center Camp Lejeune and Naval Hospital Jacksonville

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Lani Kuhlow Digitally signed by Lani Kuhlow Date: 2022.01.24 12:52:03 -05'00'

LCDR Lani Kuhlow
Daniel K. Inouye Graduate School of Nursing
Uniformed Services University

Michael Davidson Digitally signed by Michael Davidson Date: 2022.01.24 13:18:45 -05'00'

LCDR Michael Davidson
Daniel K. Inouye Graduate School of Nursing
Uniformed Services University

Daniel Calma Digitally signed by Daniel Calma Date: 2022.01.24 19:29:54 -05'00'

LCDR Daniel Calma
Daniel K. Inouye Graduate School of Nursing
Uniformed Services University

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Abstract

Background: The pain that patients experience can lead to poor outcomes and decrease the level of satisfaction with their healthcare. Peripheral Intravenous Catheter (PIVC) insertion is painful and is one of the most common invasive procedures performed in the healthcare setting. Naval Hospital Jacksonville (NHJAX) and Naval Medical Center Camp Lejeune (NMCCL) do not have a standardized policy aimed at the reduction of pain experienced during PIVC insertion.

Purpose: The purpose of this project is to implement an evidence-based solution aimed at increasing patient satisfaction and reducing pain with PIVC insertion.

Project Design: The Evidence-Based Project (EBP) team used the Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) model to guide this process improvement project. Evidence from a literature review suggested that intradermal lidocaine placed prior to PIVC insertion reduces pain and increases satisfaction. An educational hands-on intervention was delivered to nurses and corpsmen detailing intradermal lidocaine administration. Pre- and post-intervention data, utilizing a numeric rating scale (NRS) for pain and a Likert scale for satisfaction, was collected for analysis.

Analysis of Results: The Wilcoxon rank sum test was used to analyze the pre- and post-implementation data. The pre- and post- intervention mean pain scores were 1.33 and 0.88, which was statistically significant ($P<0.05$). The pre- and post-intervention mean patient satisfaction scores were 4.71 and 4.74, which was not statistically significant ($P>0.05$). The outcomes of this evidence-based project suggest that decreasing the pain that patients experience during PIVC insertion can be accomplished by using intradermal lidocaine.

Organizational Impact: Implementation of intradermal lidocaine training would provide sustainable, standardized, evidence-based skills to reduce pain during PIVC insertion, as well as enhance competency of nurses and hospital corpsmen in skills that they may later utilize on the battlefield.

Reducing Pain Associated with Intravenous Catheter Placement

Peripheral Intravenous Catheters (PIVC) are the most widely used of all invasive devices in hospitals, with 150 million being inserted in the United States every year (Zingg & Pittet, 2009). Pain upon insertion of PIVCs remains a major complaint among patients, and it can negatively affect their perceptions regarding their entire healthcare experience (Bond et al., 2016). Consequently, practitioners should prioritize (Mace, 2017) and standardize (Cook et al., 2018) pain prevention for PIVC placement. There is no standard pain-reduction strategy for PIVC placement across military treatment facilities, including Naval Hospital Jacksonville and Naval Medical Center Camp Lejeune. The project team sought an evidence-based approach to reduce pain that patients encounter during PIVC placement.

Problem Synthesis

Approximately 50% of adults describe PIVC placement as being painful (Cook et al., 2018), and preemptive analgesia has been recommended (Bond et al., 2016). Such pain may lead to long term fear and anxiety, and ultimately cause patients to avoid seeking necessary medical care in the future (Bond et al., 2016). Even minor pain during PIVC placement can cause anxiety, negatively impact the patient experience, and decrease patient satisfaction.

Relevance to Military Nursing

The Defense Health Agency (DHA) has published a goal for "providing a care experience that is patient and family centered, compassionate, convenient, equitable, safe and always of the highest quality" (Defense Health Agency, 2019). The mission statements for Naval Hospital Jacksonville and Naval Medical Center Camp Lejeune discuss their desire to provide safe, high quality care. Implementing a standard method to reduce pain experienced by patients undergoing PIVC placement aligns with those missions and is at the heart of providing better

care, ensuring medical readiness, and improving health. Healthcare personnel, such as nurses and Hospital Corpsmen within the DHA are regularly called to serve in operational roles. Empowering hospital personnel with the skills to decrease pain experienced with PIVC placement not only has an immediate benefit to the patients treated at military treatment facilities, but also translates to integrated health solutions for the forward-deployed warfighter.

Clinical Question

Since the patient experience is negatively altered by painful procedures, and PIVC placement is one of the most common procedures in healthcare, is there an intervention that will decrease the pain of PIVC insertion and increase the patient's satisfaction with their care? The EBP team developed the question: "In adult patients requiring peripheral intravenous (IV) access, what intervention with an onset of 15 minutes or less will decrease patient pain experienced during IV placement, as compared to usual practice of no analgesia, in order to decrease pain and increase patient satisfaction scores?"

Search Strategy / Results

The Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed Central, and MEDLINE databases were utilized to collect articles for a review of the literature. Search keywords for all databases were "pain AND intravenous catheter" or "pain AND peripheral intravenous placement" or "pain AND local anesthetic AND peripheral venous catheterization" or "pain AND venous catheter placement" or "patient satisfaction AND peripheral venous catheterization" or "pain AND venous cannulation" or "peripheral IV AND pain" or "pain AND IV AND insertion" or "pain AND IV catheter AND insertion." Results were limited to the past ten years, and English language. A search conducted between 30 August 2020 and 06 September 2020 yielded a total of 2761 articles of which 604 duplicates were removed.

Title and abstract screening was performed on the remaining 2157 articles, to include articles that evaluated an intervention to reduce pain and increase patient satisfaction associated with PIVC placement. Exclusion criteria included pediatric populations, interventions with an onset greater than 15 minutes, and studies exploring arterial access or venous access other than PIVCs. Screening resulted in 26 articles for full text review. The EBP team utilized the Johns Hopkins Nursing Quality of Evidence-Based Practice tool to evaluate the level of evidence and assign a quality rating (Dang & Dearholt, 2018, pp. 277-280). Low quality evidence for this project was any article not meeting the IA, IB, or IIA rating criteria. Thirteen articles were excluded for low quality evidence, wrong patient population, and interventions with an onset of greater than 15 minutes. Thirteen articles were selected for use in the literature appraisal and synthesis (Appendix A), of which six articles were level IA, six articles were level IB, and one article was level IIA (Appendix B).

Solution Synthesis

Alleviating pain caused by PIVC placement is a topic that is well-researched. Multiple pharmacologic and non-pharmacologic interventions have been noted to decrease pain and improve patient satisfaction scores. Important considerations in choosing such an intervention include: effectiveness, time of onset, adverse effects, access to necessary equipment, and ease of administration.

Non-Pharmacological Interventions

Non-Pharmacological methods to reduce pain include a variety of techniques such as distraction, lavender oils, and thermomechanical stimulation on the PIVC insertion site. Non-pharmacological analgesic techniques are non-invasive and generally do not cause pain. Video-based distraction (Basak et al., 2019), lavender aromatherapy (Karaman et al., 2016), have been

shown to decrease pain and anxiety in adults. Thermomechanical stimulation using the "Buzzy" device, manufactured by MMJ Labs, demonstrated decreased pain and anxiety in one study (Pakis Cetin & Cevik, 2019), yet no such differences were detected in another study (Redfern et al., 2018). These interventions have an onset of less than 15 minutes with no adverse effects noted in any of the studies. These interventions require equipment purchase approvals at each facility, a substantial barrier to sustained implementation. Military operational requirements also frequently limit supplies that may be carried on-hand, so the EBP team determined that logistical concerns made these approaches incompatible with the goal of standardizing care at military facilities.

Pharmacological Interventions

Topical

Topical analgesics are widely used to alleviate PIVC placement pain in a variety of healthcare settings. Commonly used creams and patches take 30-60 minutes for their peak action to take effect (Bond et al, 2016). The only topical intervention to meet the goal of a 15-minute or less onset was vapocoolant, which had not shown an analgesic effect for PIVC insertion in one review (Hogan et al., 2014), but was deemed effective in a later meta-analysis (Zhu et al., 2018). Topical analgesics often have unwanted side effects such as blanching, cold or burning sensation on skin, erythema, and swelling (Hogan et al., 2014). Although vapocoolant is easy to apply and is widely available, its adverse effects and contradictory evidence led the EBP team to disregard this intervention.

Intradermal

Patients who receive intradermal lidocaine prior to PIVC insertion report significantly lower pain than patients who receive vapocoolant spray (Page & Taylor, 2010) or ethyl chloride

topical spray (Winfield et al., 2013). Intradermal lidocaine is also more effective at decreasing PIVC insertion pain than topical analgesics (Bond et al., 2016). Two meta-analyses comparing lidocaine to other intradermal analgesics found that lidocaine produced the greatest decrease in pain experienced during PIVC insertion (Bond et al., 2016; Oman et al., 2014). When lidocaine was compared to bacteriostatic normal saline, Deguzman et al. (2012), Ganter-Ritz et al. (2012), and Winfield et al. (2013) found that intradermal lidocaine provided superior analgesia. It decreases pain intensity felt during PIVC placement as early as 30 seconds after administration (Page & Taylor, 2010). This rapid effect is beneficial when time is limited, as is often the case in the healthcare setting. Although pain upon injection and tissue distortion from the intradermal wheal are a possibility with a lidocaine injection (Mace, 2017), these adverse effects do not negate intradermal lidocaine's superiority in the reduction of PIVC placement pain (Bond, 2016). The supplies to administer lidocaine intradermally are readily found in hospital and operational settings and, while the ease of administration of intradermal lidocaine is not as simple as a topical analgesic, healthcare professionals are often trained in intradermal injection before entering practice.

Intradermal lidocaine has been compared to multiple adjuncts through extensive research, and the evidence clearly supports its use for this indication. The project team recommends implementing intradermal lidocaine for PIVC insertion at military treatment facilities. This effort supports Naval Hospital Jacksonville and Naval Medical Center Camp Lejeune's shared goal for better care and improved patient satisfaction.

Focus Areas

The primary focuses of this evidence-based project are to decrease pain experienced by patients and to improve patient satisfaction with PIVC placement. The EBP team discovered,

through a systematic review of the literature, that utilizing intradermal lidocaine as an analgesic prior to PIVC insertion best accomplishes this goal. The correct administration of intradermal lidocaine requires education and training which the EBP team developed and administered. After providing training, the goal was maximum employment of intradermal lidocaine to determine if the findings of the systematic review of the literature are substantiated. In order to conclude the efficacy of the intervention, post-implementation data was collected and compared to pre-implementation data.

Business Case Analysis

Focusing on the goals of decreasing pain with PIVC insertion and increasing patient satisfaction, the EBP team conducted a business case analysis for implementing the use of intradermal lidocaine with PIVC insertion. Understanding that patients avoid care due to pain and anxiety, the team focused on the increased hospital costs associated with delays in care. Factoring in the cost of implementation, the team exposed a significant annual cost avoidance of nearly $70,000.00 if NMCCL and NHJAX were to utilize intradermal lidocaine with each PIVC placement (Appendix C).

Organizing Framework

The EBP team chose the Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) model as the framework to guide this process improvement project (Appendix D). The JHNEBP model encompasses the following steps: developing a practice question, conducting a thorough search of evidence, and translating evidence into clinical practice. It was initially designed to be linear but allows for iterations as clinical situations can be dynamic and relies on practice and learning to refine the question and reevaluate the solution's effectiveness (Melnyk & Fineout-Overholt, 2019, pp. 413-416). The EBP team was presented with the clinical problem of

increased pain and decreased satisfaction associated with PIVC insertion. The team then developed and redefined a clinical question pertaining to the problem, conducted a systematic review of current literature, and appraised the level and quality of the evidence discovered. Level I and Level II evidence pointed to the utilization of intradermal lidocaine prior to PIVC insertion.

The next step is to translate a solution into practice. The development of a plan for implementation, and securing support to implement it, is crucial to the success of this project. As the team navigates these last steps, internal and external factors have the potential to impact the direction of the project. The ability to reevaluate the solution and its implementation is invaluable to the ultimate goal of translating evidence into practice. For this reason, the JHNEBP model was chosen. It is a nurse-developed, linear approach that is uniquely designed to be iterative and best supports the incorporation of evidence-based solutions into safe, quality patient care.

Project Design

General Approach

This is an evidence-based practice project designed to decrease pain and improve patient satisfaction during PIVC placement. To achieve this the EBP team implemented the use of intradermal lidocaine for patient's requiring PIVC placement. The team provided education and training to hospital corpsmen and nurses in the correct administration of intradermal lidocaine prior to inserting a PIVC. During the pre-implementation phase, the team collected baseline pain and patient satisfaction data. In the implementation phase, the team collected patient pain and satisfaction data after they had received intradermal lidocaine and a PIVC was placed. The team compared the post-implementation data to the baseline data to determine the efficacy of the intervention.

Setting and Population

Naval Hospital Jacksonville is a military treatment facility that provides medical support for DoD operational missions around the globe. It is located in northeast Florida and is comprised of active-duty and civilian staff. Naval Hospital Jacksonville includes a hospital and five branch health clinics across Florida and Georgia that serve 72,000 enrolled patients. Each year, it accounts for over 500,000 medical visits, 5,000 surgeries, 3,000 admissions, and 700 babies delivered ("Naval Hospital," n.d.).

Naval Medical Center Camp Lejeune is a military treatment facility located in eastern North Carolina and is comprised of active-duty and civilian staff. It serves approximately 50,000 enrolled patients across multiple branch medical clinics and Marine Corps Medical Homes. Typically, Naval Medical Center Camp Lejeune accounts for 657,000 clinic visits, 5,475 surgeries, 7,300 admissions, and 1,825 babies delivered annually ("Naval Medical," 2019).

The EBP team will target adult patients (>18 years) that require a PIVC in the pre-operative holding areas and the labor and delivery units during the implementation phase of this project. In total, across four units at both military treatment facilities, the staffing make-up comprises 83 registered nurses and 70 hospital corpsmen.

Procedural Steps

Given the problem of pain and decreased patient satisfaction with PIVC placement, the EBP team developed a clinical question that guided the systematic review of the literature. The evidence was synthesized and evaluated, and intradermal lidocaine was determined to be the most appropriate solution to this problem. To translate this solution into evidence-based practice the team developed a plan, communicated with leadership and staff in the designated clinical

areas, trained personnel implementing the intervention, carried out the intervention, evaluated for effectiveness, and developed a plan for sustainment.

An integral part of this plan is data collection and staff training. First, the team developed a tool in order to capture patient pain and satisfaction data with each PIVC insertion. The primary data points collected were patient pain with each successful attempt, and patient satisfaction with IV placement. Data included an 11-point numeric rating scale (0-10) where each patient rated the pain of PIVC insertion, along with a 5-point Likert scale rating patient satisfaction. Additional data points collected were: number of attempts, whether or not ultrasound was utilized, and level of training of healthcare personnel attempting PIVC insertion (Appendix E). These additional data points were included in the tool because NHJAX and NMCCL were in the process of implementing ultrasound assisted PIVC placement, and these may have been confounding variables to the primary measured outcomes. Second, the EBP team developed training regarding the data collection tool, as well as the correct administration of intradermal lidocaine. The training was a combination of didactic learning, practical application, and testing which established staff competency in correct execution of the intervention.

Next, the EBP team met with stakeholders in the clinical areas in which the intervention was planned to be utilized. Establishing relationships and consistent communication was paramount to the success and sustainment of this project. In this meeting the team discussed the problem, the evidence discovered, and the training and implementation plan in order to receive feedback and garner buy-in. Additionally, the team collaborated with the leadership to establish a training timeline and create a schedule that maximized staff attendance and participation.

The EBP team then met with the staff of the units that would be implementing the intervention. The meeting served to introduce the staff to the EBP team, introduce the purpose

and goals of the project, and educate staff on how to correctly utilize the tool to collect baseline data. The staff were instructed to collect all information using the printed data collection tool and place all completed forms in a folder at the charge nurse station. The EBP team was responsible for daily collection of these forms.

After a two-month baseline data collection period, the EBP team conducted in-service training to the unit staff. The training consisted of a 10-question multiple choice pre-test that measured baseline knowledge. This was followed by a 10-minute PowerPoint slide presentation addressing intradermal lidocaine administration procedures for PIVC insertion and the lidocaine medication profile. Elsevier Clinical Skills and Lexicomp were used as the framework for this presentation. An interactive training session (15 minutes) followed the verbal slide presentation and concluded with the same 10-question multiple-choice test to measure efficacy of training and competency of staff. The team also reinforced to the staff the proper utilization of the data collection tool for the implementation phase.

The implementation phase began in the designated clinical units after completion of all training sessions. The clinical staff administered intradermal lidocaine to adult patients (>18 years) within the preoperative and labor and delivery units prior to PIVC insertion for two months. Post-implementation data was collected utilizing the same data collection tool and in the same manner as in the baseline collection period. The EBP team members collected these scores daily and recorded them into a digital spreadsheet for later analysis (Appendix F).

Data Analysis Plan

The EBP team evaluated the effects of intradermal lidocaine on pain (NRS) and patient satisfaction (Likert scale) with PIVC placement. The team compared pre- and post-implementation non-parametric data with respect to pain and patient satisfaction scores utilizing

the Wilcoxon rank sum test. A P value <0.05 was considered statistically significant and a 1.39-point change in median pain score (Kendrick & Stout, 2005) or a half-point change in median patient satisfaction score as clinically significant (Appendix G).

Potential Barriers

It is expected that there may be some resistance with any change in practice. A potential barrier to this plan includes opposition from staff to administer the intervention. One commonly cited problem associated with intradermal analgesic use is the discomfort experienced during the placement of an intradermal anesthetic wheal (Anderson et al., 2010). Adding an injection solely to numb the pain of a second needle seems counterintuitive to some providers and patients. A lack of knowledge regarding intradermal lidocaine's efficacy on PIVC placement pain may lead to resistance of implementation (Brown, 2002). However, when comparing the pain of the intradermal injection to the pain experienced during an unmitigated IV cannulation, the pain of the intradermal injection was significantly lower (Bond et al., 2016). The EBP team highlighted the efficacy of intradermal lidocaine prior to PIVC placement during the training sessions in order to decrease staff resistance to the evidence-based intervention.

An additional barrier to this project may include bedside staff not willing, or unable, to attend training sessions. In order to achieve maximum training attendance, the EBP team provided training at hours convenient for military healthcare providers and ensured the training sessions were succinct and respected the staff's time.

Finally, the level of proficiency required for the administration of intradermal analgesics for PIVC placement pain relief is often a barrier to its use (Bond et al., 2016). Unlike the simple application of a topical analgesic, an intradermal lidocaine injection requires skill and expertise to administer, however, this relatively minor drawback is easy to overcome. The education plan,

consisting of a slide presentation and interactive training, addressed the correct placement of intradermal lidocaine. This training was targeted towards nurses and corpsmen in order to expand their skillsets and improve confidence. The positive aspects of intradermal lidocaine support widespread administration and overcoming the barriers to make this standard practice are simple and achievable.

Sustainment and Dissemination Plan

The EBP team anticipated the outcome of the data collected to favor continued usage of intradermal lidocaine with PIVC placement after the project was completed. In order to sustain this intervention, the EBP team continuously involved and updated the key stakeholders, such as department heads and clinical nurse specialists, of the project's status. Additionally, the team identified champions that would continue to educate new staff members and perform annual competency verification for staff that were previously trained. The EBP team gave all training material utilized for this project to these champions, allowing for longevity and sustainment.

Dissemination of the project findings is essential to the progression of military healthcare. Not only will this educate healthcare professionals about the efficacy of evidence-based interventions, but also provide an avenue for standardization of care delivered to the patient. Initially, the EBP team shared results with the nursing leadership and Phase II faculty at NHJAX and NMCCL to increase awareness and to decrease threats to sustainment. Furthermore, the team submitted the findings of this project for inclusion in peer-reviewed publications. Lastly, the team will present the project's final outcomes during the USU research week via an oral presentation, slide presentation, and project poster.

HIPPA Concerns / Ethical Considerations

The goal of this project is to reduce pain experienced during PIVC insertion and improve patient satisfaction. Although this is an evidence-based project and is not considered research, the project has undergone IRB review and has received an exemption. All data collected by the project team did not contain any Personally Identifiable Information (PII). The EBP team created a common access card (CAC) protected share-drive folder, stored all project data within this folder, and authorized access of this information to the team members only.

Project Results

In the baseline data collection period, records included 307 PIVC insertion attempts. At NHJAX a total of 181 PIVC insertion attempts were recorded, 30 from the labor and delivery unit and 151 from the preoperative holding. NMCCL collected information from 126 PIVC insertion attempts, 44 from the labor and delivery unit and 82 from the preoperative holding area. Twenty-nine percent of the 82 baseline data points collected from the NMCCL pre-op area included the use of intradermal lidocaine prior to PIVC insertion. No intradermal lidocaine was utilized prior to PIVC insertion in the other three locations during the baseline data collection period.

The pre-implementation training for intradermal lidocaine was given to 107 staff members: 35 from NHJAX labor and delivery, 28 from NHJAX preoperative holding, 34 from NMCCL labor and delivery, and 10 from NMCCL preoperative holding. During the training, 107 pre- and post-training knowledge assessments were administered. Across all four units the pre-test mean score was 70% and the post-test mean score was 94%.

The EBP team collected information from 242 PIVC insertion attempts during the post-implementation data collection period. NHJAX collected information from 106 PIVC insertion

attempts, 10 from the labor and delivery unit and 96 from the preoperative holding area. NMCCL collected information from 136 PIVC insertion attempts, 11 from the labor and delivery unit and 125 from the preoperative holding area. During the post-implementation period, the utilization of lidocaine with PIVC insertion across all four environments was 65%.

Analysis of the Results

The EBP team analyzed the pain scores using a Wilcoxon rank sum test, descriptive statistics, and RStudio (version 1.4.1717). The pre-intervention mean pain score was 1.33 and the post-intervention pain score was 0.88, which was statistically significant ($P<0.05$). This mean pain score delta of 0.45 did not meet the clinically significant threshold the EBP team set at 1.39 or greater. The EBP team also analyzed the satisfaction scores from the Likert scale using a Wilcoxon rank sum test, descriptive statistics, and RStudio (version 1.4.1717). The pre-intervention mean patient satisfaction score was 4.71 and the post-intervention mean patient satisfaction score was 4.74, which was not statistically significant ($P>0.05$). The patient satisfaction score delta of 0.03 did not meet the clinically significant threshold the EBP team set at 0.5 or greater.

Organizational Impact / Implications to Practice and Policy

The results of the EBP team's project did not meet the predetermined threshold of clinical significance for pain or satisfaction; however, they did trend in the same direction that the literature described. Overall, the mean pain score decreased and the mean patient satisfaction score increased. These outcomes demonstrate the potential for translation to areas outside the labor and delivery and pre-operative holding area environments at NHJAX and NMCCL.

The training expanded staff knowledge of evidence-based techniques to provide analgesia for a PIVC insertion. Broadening the capabilities of the healthcare providers improves the

autonomy of the medical force working at the MTFs and using evidence based practice to decrease the pain a patient experiences during medical procedures aligns with the mission statements of both NHJAX and NMCCL as well as the Defense Health Agency's goal of providing high quality care.

Future Directions for Research and Practice

After implementation of this project, the EBP team noted several opportunities for improvement. Although the final data collected trended in the direction the literature stated, it failed to meet the EBP team's criteria for clinical significance. There were several reasons for this due to the barriers the team faced during implementation.

One barrier the EBP team encountered was lack of utilization of intradermal lidocaine. The team held multiple meetings with the unit staff, as well as department heads and clinic managers, to promote this project and garner buy-in. While the team gained the support of the leadership in each unit and the utilization of intradermal lidocaine prior to PIVC insertion increased from 29% to 65%, the staff did not use intradermal lidocaine for every patient requiring a PIVC during the implementation phase. A strategy to overcome this, instead of singling out one or two units for a temporary trial, may be through command level leadership instituting a facility wide policy change that supports the utilization of intradermal lidocaine and aligns this policy with the staff's individual professional goals.

Another barrier involved data collection and the data collection tool. Spot checks conducted by the EBP team revealed that staff filling out the data collection forms did not reliably read the pre-defined script. The staff on these units also voiced discomfort in asking patients to rate what was viewed as their performance of the task. This led to a low number of implementation data points collected. In addition, some patients may not have been completely

honest with their answers. Patients may have experienced hesitancy to give a low rating and potentially upsetting someone who was continuing with their care. These issues could have possibly skewed the post-implementation data. An approach to combat this barrier would be to develop a data collection tool designed to be anonymously filled out by the patient which could alleviate any judgment felt by the staff and patients.

Conclusion

The project team implemented the utilization of intradermal lidocaine prior to PIVC insertion with the primary focus on decreasing a patient's pain and increasing satisfaction with the procedure. The training delivered to nurses and hospital corpsmen was successful in expanding their knowledge base and provided them an opportunity to learn and perform an evidenced based skill. The trend of the data collected at both NHJAX and NMCCL corresponded to the findings in the literature review. The outcomes of this evidence based project suggest that decreasing pain and increasing satisfaction can be accomplished with the utilization of intradermal prior to PIVC placement and has the potential to translate to areas outside of the two environments in which this project focused.

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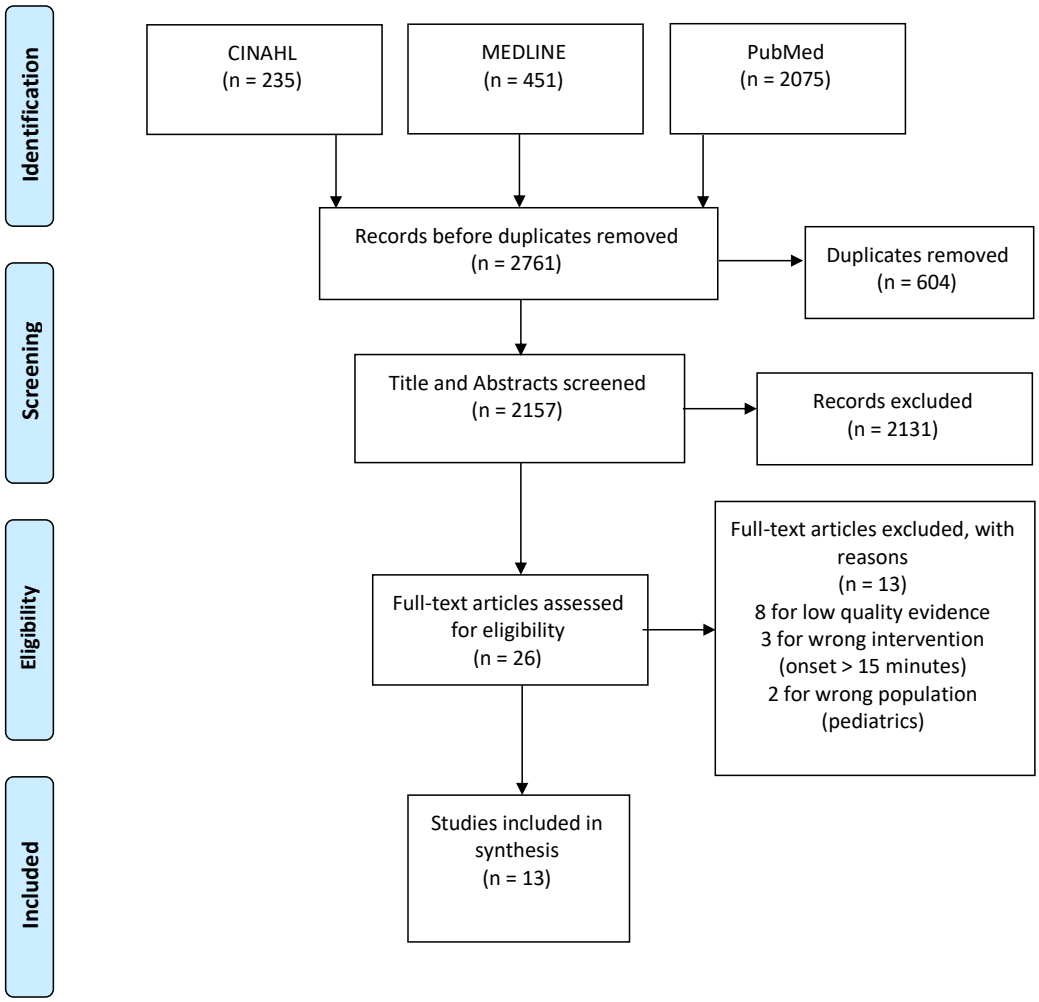
Appendix A

PRISMA 2009 Flow Diagram



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

Appendix B

1st Author Name (Publication Yr)	Study Purpose/Aims	Research Questions/Hypotheses	Study Design	Total Sample Size	Sampling Plan	Independent Variables
Basak et al. (2019)	To determine the effect of methods of distraction to relieve pain associated with the PIC insertion procedure and to improve patient satisfaction.	Showing pictures with optical illusions and 3D video display with VR goggles to patients will reduce pain and improve patient satisfaction associated with PIC insertion procedure compared with the control group.	Randomized controlled single-blind experimental study	120 patients aged between 18 and 65 years, who ranked as 4 (less urgent) and 5 (nonurgent) based on Canadian ED Triage, and who had no visual, audio, or lingual disabilites and no mental disorder. **Inclusion**: Being a volunteer, planned to have PIC insertion, being suitable for PIC insertion at antecubital location us 20g cannula, being applied without any analgesics within 24 hours, first attempt to apply PIC.	Convenience sample	**IV**: Distraction Technique **Level of Measurement**: Nominal **Group 1**: Control **Group 2**: Optical Illusion Cards **Group 3**: 3D Video goggles.
	Dependent Variables	**Statistical Analysis**	**Results**	**Strengths (how promoted internal/external validity)**	**Weaknesses (biases; poorly controlled threats to internal/external validity)**	**LEVEL OF EVIDENCE - using JHNEBP tool (Strength and Quality)**
	DV: Pain Scores & Patient Satisfaction **Level of Measurement**: Ordinal Pain was measured using a Visual Analog Scale (VAS). A 1-10 scale was used to evaluate levels of satisfaction with the procedure with 1 being least satisfied and 10 indicating highest satifaction level.	T-tests were performed to test differences between the combined distraction group and control group. A $p < 0.5$ was accepted as an indication of significant difference in statistical decisions.	The pain average was 4.72 ± 3.15 in the control goup, 3.32 ± 2.81 in the distractive cards group, and 3.50 ± 2.84 in the 3D video group. The mean pain level was 4.72 ± 3.15 in the control group and 3.41 ± in the distraction group, and the difference was found to be statisically significant (t[118] = 2.23; p = .02). The mean satisfaction level between the groups was 5.12 ± 3.41 in the control group and 8.07 ± 2.67 in the distraction group. The difference between them was statiscally significant (t[118] = 6.26; p = .01).	RCT, power analysis performed	Study consisted of entirely young adults and cannot be generalized to children or older adults. The participants were not injured or high risk and the efficacy of the distraction methods on other groups in the ED could not be evaluated.	Level I - A
1st Author Name (Publication Yr)	**Study Purpose/Aims**	**Research Questions/Hypotheses**	**Study Design**	**Total Sample Size**	**Sampling Plan**	**Independent Variables**
Bond et al. (2016)	To discover the most effective local anaesthetic for adult peripheral venous cannulation and to find out how the pain of local anaesthetic application compares with that of unattenuated cannulation.	What is the most effective local anaesthetic for reducing the pain of PVC in adults in routine (non-emergency) settings? How does the pain of local anaesthetic application compare with that of routine (non-emergency) unattenuated PVC in adults?	Meta-analysis	37 primary research studies were used. 32 of these studies were Randomized controlled trials, 4 were controlled trials, and 1 was a survey **Inclusion**: Controlled trials and observational studies that compared the use of a local an-aesthetic prior to PVC with no local anaesthetic prior to PVC in adults in secondary care receiving routine PVC (non-emergency). The primary outcome measure was self-reported pain.	Studies were found utilizing the following bibliographic resources: MED- LINE, MEDLINE-IN-Process, EMBASE, PsycINFO, Health Management Information Consortium (HMIC), Social Policy and Practice (all via OVID), Applied Social Sciences Index and Abstracts (ASSIA), Sociological Abstracts (via ProQuest), Cumulative Index to Nursing and Allied Health Literature (CINAHL) (via Ebsco Host), British Nursing Index (via NHS Evidence), Web of Science (via Thomson Reuters) and the Cochrane library.	**IV**: Analgesia adjunct **Level of Measurement**: Nominal A variety of anesthetics interventions were delivered: Dichlorotertafluoroethane spray Iontocaine + placebo cream Diclofenac patch Placebo patch Lidocaine + methylparaben EMLA cream Ametop cream Buffered saline Rapydan patch Iontocaine Saline Placebo cream Buffered lidocaine 1% Lidocaine 1% Lidocaine gel Ethlylchloride spray Lidocaine 2% Bupivicaine Lidocaine + NACHO3
	Dependent Variables	**Statistical Analysis**	**Results**	**Strengths (how promoted internal/external validity)**	**Weaknesses (biases; poorly controlled threats to internal/external validity)**	**LEVEL OF EVIDENCE - using JHNEBP tool (Strength and Quality)**
	DV: Pain scores after analgesia placement **Level of Measurement**: Ordinal **DV**: Pain scores after IV catheter placement **Level of Measurement**: Ordinal A variety of scales were utilized throughout the studies (Wong Baker, Visual Analog Scale - VAS, Numerical rating scale).	To allow analysis all estimates were transformed to means and standard deviations. A network meta-analysis (NMA) was undertaken to compare multiple treatments directly and indirectly, within and across trials. Both a fixed effects and a random effects NMA model were run, but as the deviance information criteria suggested a better fit to the random effects model, only the results from the random effects model are reported here.	1 - When 2 % lidocaine is compared with all the other local anaesthetics in a NMA they suggest 2 % lidocaine to be more effective than any other agent. However, the evidence also suggests that iontocaine, lid + methyl, Lid + NaCHO3, Bupivacaine, 1 % lid, Rapydan, Ametop and buffered lidoacine could be as effective as 2 % lidocaine 2 - For all comparisons, the pain of anaesthetic application was less than that of unattenuated PVC.	A meta-analysis utilizing 32 RCT's	Multiple pain models in a variety of participants, different cannula sizes, different anatomical locations, different indications to IV start, no within-participant comparisons of pain intensity, unspecified experience of the cannulator, different ages, genders and unspecified concurrent cognitive behavioural intervention, variance in analgesic interventions, variance in the control interventions.	Level II-A

1st Author Name (Publication Yr)	Study Purpose/Aims	Research Questions/Hypotheses	Study Design	Total Sample Size	Sampling Plan	Independent Variables
Deguzman et al. (2012)	To determine whether there was a significant difference in patients' intradermal and IV pain levels when comparing the numbing effect of intradermally injected bacteriostatic normal saline with buffered 1% lidocaine before IV catheter insertion.	None specified	Prospective, randomized, double-blind	376 patients **Inclusion**: 18 years or older, schedueled for surgery, patients who were able to speak, read, and write English, were able to rate and express the level of pain, received no pain medication within 4 hours before IV catheter insertion and performed in the upper extremity. **Exclusion**: known allergy to lidocaine or any ''caine'' medications, unsuccessful IV catheter insertion on first attempt, known history of needle phobia, anxiety, panic attacks, or neuropathy, and the presence of cognitive impairments.	Convenience sample	**IV**: Analgesia adjunct **Level of Measurement**: Nominal **Experimental group**: bacteriostatic normal saline **Control group**: buffered 1% lidocaine
	Dependent Variables	**Statistical Analysis**	**Results**	**Strengths (how promoted internal/external validity)**	**Weaknesses (biases; poorly controlled threats to internal/external validity)**	**LEVEL OF EVIDENCE - using JHNEBP tool (Strength and Quality)**
	DV: Pain score post intradermal injection **Level of Measurement**: Ordinal **DV**: Pain score post IV catheter insertion **Level of Measurement**: Ordinal A numeric rating scale (NRS) was use to quantify patients' pain.	Two-sided Student t-test compared pain scores reported and compared between groups and also compared gender differences on levels of self-reported pain for both the intradermal and IV pain scores for bacteriostatic normal saline and buffered 1% lidocaine. Chi-square or Fisher exact test was performed for comparing group differences based on IV placement side, site, IV within 30 days, needle gauge, previous IV experience or problems, vein visibility, and study nurse.	It was determined that buffered 1% lidocaine was more effective than bacteriostatic normal saline in reducing pain during IV catheter insertion. A statistically significant difference was found in the IV pain scores, with subjects who received buffered 1% lidocaine reporting less pain than those who received bacteriostatic normal saline (P=0.025). However, no significant difference was found in the intradermal pain scores (P=0.792). The study ultimately suggested that implementing the use of intradermal injected local anesthetic to reduce pain during IV placement could be not only be a benefit for presurgical patients but to all patients admitted to the hospital needing IV therapy and should be encorporated into practice.	Power analysis performed, randomized, double blinded study design, same staff administering intervention	Insertion method, IV gauge variability, amount of injection, speed of insertion, and gentleness of the research data collector	Level I-A
1st Author Name (Publication Yr)	**Study Purpose/Aims**	**Research Questions/Hypotheses**	**Study Design**	**Total Sample Size**	**Sampling Plan**	**Independent Variables**
Ganter-Ritz et al. (2012)	To determine the tolerability, efficacy, and cost-effectiveness of 3 intradermal anesthetics for IV site preparation.	The 3 intradermal anesthetic IV site preparations would be equal in tolerability, efficacy, and cost-effectiveness.	Prospective, randomized, doubleblind, parallel design	256 patients **Inclusion**: Patients having SDS; preoperative anesthetic order on admission; visible or palpable veins in the hand or arm, allowing for an IV cannulation attempt; age of 18 years or older; and provision of signed informed consent. **Exclusion**: Inability to communi- cate in the English language; known allergy to lidocaine, buffered lidocaine, or benzyl alcohol preservative; and current experience or history of a comorbidity or condi- tion that might affect the patient's ability to provide the patient pain ratings conducted in the research study	Convenience sample	**IV**: Analgesic adjunct **Level of Measurement**: Nominal Patients were randomly divided into three groups **Group 1**: 1% Lidocaine **Group 2**: 1% Buffered Lidocaine **Group 3**: BNS
	Dependent Variables	**Statistical Analysis**	**Results**	**Strengths (how promoted internal/external validity)**	**Weaknesses (biases; poorly controlled threats to internal/external validity)**	**LEVEL OF EVIDENCE - using JHNEBP tool (Strength and Quality)**
	DV: Pain score post intradermal injection **Level of Measurement**: Ordinal **DV**: Pain score post IV catheter insertion **Level of Measurement**: Ordinal A numeric rating scale (NRS) was use to quantify patients' pain.	A single-factor analysis of variance (ANOVA) was performed to evaluate pain perceived and reported by study subjects from intradermal needlestick and venipuncture procedures.	There were no statistically significant differences between the groups regarding subjects' average overall pain reported with past IV insertions. Regarding tolerability, although subjects in Group 1 reported significantly lower IV insertion pain, they reported significantly higher intradermal needlestick pain. Subjects in Groups 1 and 2 reported significantly lower average pain scores for IV cannulation than Group 3.	Power analysis performed, randomized, double blinded study design	The results may not be generalizable to patients outside the surgical setting in a rurual community.	Level I-A

1st Author Name (Publication Yr)	Study Purpose/Aims	Research Questions/Hypotheses	Study Design	Total Sample Size	Sampling Plan	Independent Variables
Hogan et al. (2014)	To systematically review the literature regarding the analgesic effectiveness of vapocoolants in children and adults.	None specified	Systematic Review and Meta-analysis	12 studies were used which included 1266 patients. **Inclusion**: Randomized or quasirandomized design in adults or children; healthy volunteers or patients requiring venipuncture or peripheral IV cannulation for therapeutic reasons; treatment groups to included application of a vapocoolant; control groups included placebo or no treatment; pain was self reported on a visual analog scale, numerical rating scale, or validated pictorial scale, or for preverbal children, a validated observer reported tool. **Exclusion**: Studies that included an additional analgesic or sedative in the intervention group and not in the control group (e.g., vapocoolant and another analgesic vs. placebo or usual care) or if both children and adults and did not report outcomes separately. Unpublished studies or those published as abstracts or letters.	Studies were found utilizing the following bibliographic resources: MEDLINE, EMBASE, CINAHL (Cumulative Index to Nursing and Allied Health Literature), and Cochrane Central Register of Trials.	**IV**: Analgesia adjunct **Level of Measurement**: Nominal Vapocoolants were compared to placebo spray, no treatment and both placebo and no treatment. Vapocoolants studied included ethyl chloride, 1,1,1,3,3-pentafluoropropane/1,1,1,2-tetrafluoroethane, dichlorotetrafluoroethane, and propane, butane, and pentane blend)
	Dependent Variables	**Statistical Analysis**	**Results**	**Strengths (how promoted internal/external validity)**	**Weaknesses (biases; poorly controlled threats to internal/external validity)**	**LEVEL OF EVIDENCE - using JHNEBP tool (Strength and Quality)**
	DV: Pain scores from venipuncture or IV cannulation **Level of Measurement**: Ordinal **DV**: Pain scores after vapocoolant or placebo **Level of Measurement**: Ordinal Both outcomes were measured using a variety of validated methods, including 100-mm visual analog scale, 0 to 10 numerical rating scale, validated pictorial scale (e.g., Faces Pain Scale-Revised, Wong Baker Faces Pain Scale), or, for preverbal children, validated observational tools.	Data were combined using a random-effects model, which assumes that intervention effects differ among studies. Heterogeneity between studies was assessed using the I-squared statistic and by qualitatively examining forest plots of the meta-analyses.	Vapocoolants were ineffective in children and adults when compared to placebo. Vapocoolant was found to be effective in adults only when compared to no treatment. Vapocoolants were significantly more painful to apply than placebo spray in adults Vapocoolants cannot be recommended for routine use in children or adults.	Comprehensive search strategy was performed with inclusion of only randomized or quasi-randomized controlled trials. Search was clearly identified; method of analysis was done a priori and a validated pain assessment outcome. Quality was assessed using the risk of bias tool by the Cochrane Collaboration. Sensitivity analysis was done to analyze only studies with lowest risk of bias.	Reviewers were not blinded to the study authors, locations of the studies, author funding, or study acknowledgments. Some factors could not be controlled in the analyses, such as population characteristics, type of vapocoolant or duration of administration, type of placebo, data handling, and outcome measurement, etc.	Level I-A
1st Author Name (Publication Yr)	**Study Purpose/Aims**	**Research Questions/Hypotheses**	**Study Design**	**Total Sample Size**	**Sampling Plan**	**Independent Variables**
Karaman et al. (2016)	To evaluate the effectiveness of lavender aromatherapy on pain, anxiety, and level of satisfaction associated with peripheral venous cannulation in patients undergoing surgery.	None specified	Prospective, randomized, single-blind, parallel-group, placebo-controlled study.	106 patients undergoing surgery, but 101 completed the study. Three patients in the control group were excluded because of protocol violations **Inclusion**: ASA 1 and 2, ages 18 to 65 who were scheduled for elective surgery **Exclusion**: history of anxiety disorders, preoperative pain, asthma, COPD, poor sense of smell, allergies to lavender essential oil and anxiolytic or analgesic curgs, or who were pregnant or breastfeeding. If cannulation was not achieved at the first attempt, the patient was excluded from the study.	Convenience sample	**IV**: Lavendar Aroma Therapy **Level of Measurement**: Nominal Patients were randomized into two groups: a lavender and a control group, on a 1:1 ratio using a computer generated random table.
	Dependent Variables	**Statistical Analysis**	**Results**	**Strengths (how promoted internal/external validity)**	**Weaknesses (biases; poorly controlled threats to internal/external validity)**	**LEVEL OF EVIDENCE - using JHNEBP tool (Strength and Quality)**
	DV: Pain Scores, patient anxiety, and patient satisfaction levels **Level of Measurement**: Ordinal Pain and anxiety were measured using the Visual Analog Scale (VAS). Patient satisfaction was measured using the 5-point Likert scale.	The normally-distributed continous variables were evaluated using the independent sample t-tests. The continous variables that were not normally distribued were compared using Mann-Whitney U tests. The categorical variables were anaylzed using Pearson's chi-square or Fischer's exact tests. Analysis of the correlation among the variablewas conducted using Spearman's correlation coefficients. The Wilcoxon's test was used to evaluate the pre-treatment and post-treatment data. P values < 0.05 were considered statisically significant.	The patients' mean pain score was 1.94 (1-4) in the lavender group and 2.48 (1-5) in the control group with a p = 0.01. Anxiety scores of the patients were similar with both groups at the preoperative care room. However, after aromatherapy with lavender essential oil, the anxiety scores in the lavender group were significantly lower than the control group with a p = 0.001. The mean satisfaction level of the patients was 2.29 (1-4) in the lavender group and a 1.82 (0-3) in the control group with a p = 0.003.	RCT, power analysis performed	Could not be conducted as a double blind study due to the odor of lavender. Patients could not be blinded to the use of essential oil, and the patients in the control group only inhaled pure water as a placebo. The evaluation time, and other factors like education that unsought this study might influence satisfaction.	Level I - B

1st Author Name (Publication Yr)	Study Purpose/Aims	Research Questions/Hypotheses	Study Design	Total Sample Size	Sampling Plan	Independent Variables
Mace (2017)	To ascertain if peripheral IV cannulation pain would be significantly decreased using a vapocoolant versus sterile water placebo spray.	Pain of PIV would be at least 1.8 points lower after vapocoolant spray compared to placebo spray and that there would be no permanent visible changes associated with the uses of the vapocoolant spray.	Prospective, double-blind, randomized controlled efficacy and safety trial.	300 adult patients ages 18-80 undergoing PIV cannulation in the ED. **Inclusion**: patient undergoing PIV, mentally competent patient able to understand consent form, and clinically stable. **Exclusion**: allergy to spray components, critically ill or unstable, extreme ages (less than 18 or greater than 80), pregnant, previous experience with any vapocoolant, PIV site located in an area of compromised blood supply, insensitive skin, patient tolerant of cold or with hypersensitivity to cold, and unwilling to give consent	Convenience sample	**IV**: Analgesic adjunct **Level of Measurement**: Nominal Patients were randomized into two groups: a sterile water placebo spray or vapocoolant spray.
	Dependent Variables	**Statistical Analysis**	**Results**	**Strengths (how promoted internal/external validity)**	**Weaknesses (biases; poorly controlled threats to internal/external validity)**	**LEVEL OF EVIDENCE - using JHNEBP tool (Strength and Quality)**
	DV: Pain Scores **Level of Measurement**: Ordinal Pain was measured using the Numeric Rating Scale (NRS)	Tests for differences of continous variables were done using Welch 2-sample t-tests or Wilcoxon's rank-sum tests. Tests on categorical variables were done using either Pearson's chi-squared tests with Yates continuity correction or Fischer's exact test for count data. Significance was at p <0.05 and the results of testing were given by P-values and/or confidence intervals.	Over one-third of the patients in the vapocoolant group reported no pain for their IV start compared with 8.7% for the placebo group Topical vapocoolant spray is not only effective in significantly relieving the pain of PIV cannulation in adults in the ED, but was also well tolerated with a majority of patients indicating they would use the vapocoolant spray in the future.	RCT, double blinded study design, power analysis performed	Did not evaluate children or older geriatric patients, only evaluated one needlestick procedure and used only one formulation of vapocoolant spray. Patients could only be enrolled once in the study to avoid previous experience.	Level I - B

1st Author Name (Publication Yr)	Study Purpose/Aims	Research Questions/Hypotheses	Study Design	Total Sample Size	Sampling Plan	Independent Variables
Oman et al.(2014)	To determine which agent, lidocaine or BaNS, is more effective in reducing pain associated with peripheral IV catheter cannulation in adults.	None specified	Meta-analysis	13 studies were evaluated. The mean sample size for the 13 RCTs included in this meta-analysis was 119.9 (682.0), and the combined N was 1,559.	Studies were found utilizing the following bibliographic resources: PubMed, EMBASE, CINAHL, ProQuest Dissertation, and the Cochrane Library **Inclusion**: The selection criteria included published randomized controlled trials where: intradermal lidocaine was compared to BaNS during IV cannulation with adults.	**IV**: Intradermal lidocaine and BaNS **Level of Measurement**: Nominal
	Dependent Variables	**Statistical Analysis**	**Results**	**Strengths (how promoted internal/external validity)**	**Weaknesses (biases; poorly controlled threats to internal/external validity)**	**LEVEL OF EVIDENCE - using JHNEBP tool (Strength and Quality)**
	DV: Pain Scores **Level of Measurement**: Ordinal 7 studies utilized the Visual Analogue Scale (VAS) 3 studies utilized a 0-10 numeric rating scale (NRS) 3 studies utilized the modified Wong- Baker Faces pain scale	Fisher's z for summary analyses. Q statistic was computed to examine heterogeneity between studies Data synthesis and analysis were performed using the Meta-Win program. Effect sizes were extracted from the original articles as odds ratios, correlations, or Cohen's d statistics, then converted to a standardized Fisher's z metric for analysis.	Small to moderate effect size favoring intradermal lidocaine to reduce the patient's pain experience before IV insertion and no differences in lidocaine's advantage over BaNS based on type of lidocaine used.	Only RCTs were included in this meta-analysis	Although all studies included were randomized controlled trials (RCTs), not all reported means and standard deviations. While most studies was comprised of patients one study included nurses as subjects.	Level I-A

1st Author Name (Publication Yr)	Study Purpose/Aims	Research Questions/Hypotheses	Study Design	Total Sample Size	Sampling Plan	Independent Variables
Page et al. (2010)	To compare the efficacy, acceptability, and safety of a topical vapocoolant alkane spray and 1% plain subcutaneous lidocaine in reducing pain from IV cannulation.	Although lidocaine would be more effective in decreasing IV cannualtion pain, vapocoolant spray would be quicker, easier to use, and a viable alternative.	Unblinded, randomized, controlled, clinical trial	220 patients were enrolled in the study. **Inclusion**: 18 years old or more and required venous cannulation **Exclusion**: Those who refused participation, were unable to provide informed consent or complete a visual analogue scale (non-English speaking, significantly impaired vision, altered mental state, significant illness, urgent cannulation), had a known allergy to vapocoolant spray or lidocaine, suffered from skin disease associated with cold intolerance (e.g. Raynaud's disease), had moderate–severe pain, peripheral neuropathy, parenteral analgesia in the previous 4 hours, or the use of other local anaesthetics	Convenience sample	**IV**: Vapocoolant or subcutaneous lidocaine **Level of Measurement**: Nominal **Group 1**: Vapocoolant **Group 2**: Subcutaneous lidocaine
	Dependent Variables	**Statistical Analysis**	**Results**	**Strengths (how promoted internal/external validity)**	**Weaknesses (biases; poorly controlled threats to internal/external validity)**	**LEVEL OF EVIDENCE - using JHNEBP tool (Strength and Quality)**
	DV: Patient perception of: Pain with anesthetic administration Pain with IV cannulation **Level of Measurement**: Ordinal Pain and anxiety were measured using VAS and a Likert scale questionnaire.	The two patient groups were compared using Student's t-test (parametric continuous data), the Mann–Whitney U-test (non-parametric and ordinal data), and the x2 test (with Yates' continuity correction) for categorical data. The Kolmogorov–Smirnov test was used to compare the age distributions. Complications were reported descriptively. SPSS statistical software (version 17.0) was used for all analyses, and the level of significance was 0.01.	Vapocoolant administration pain scores were significantly less than lidocaine scores. However, the proportions of patients with administration pain scores >30 were similar. Vapocoolant cannulation pain scores and the proportion of patients with pain >30 were significantly greater than lidocaine values. Notably, median lidocaine administration pain and vapocoolant cannulation pain were comparable in magnitude. Vapocoolant was associated with significantly less administration time, more staff convenience, and a greater cannulation success rate. Although more patients in the lidocaine group agreed/strongly agreed that they were satisfied with the anaesthetic administered, patient satisfaction did not differ significantly between the two groups. They concluded that vapocoolant spray was significantly less painful to administer but less effective in decreasing cannulation pain.	RCT, power analysis performed	Convenience sample and unblinded design. Size and placement, and staff performing cannulation of IV's were not controlled.	Level I - B
1st Author Name (Publication Yr)	**Study Purpose/Aims**	**Research Questions/Hypotheses**	**Study Design**	**Total Sample Size**	**Sampling Plan**	**Independent Variables**
Pakis et al. (2019)	To determine the effects of vibration and cold gel pack application on pain and anxiety levels of patients undergoing IV catheterization.	None specified	Randomized control study.	100 patients from cardiology, internal medicine, chest diseases, and neurology departments of a university hospital in Turkey. **Inclusion**: patients age 18- to 64-years old who underwent IV catheterization for the study. Patients that were conscious, had appropriate vascular structure, were able to understand and speak Turkish, were able to understand the visual analog scale (VAS) and agreed to participate in the study. **Exclusion**: patients who had an IV catheter from a previous hospitalization, patients who had a psychiatric problem.	Convenience sample	**IV**: Analgesia adjunct that combines two nonpharmacologic methods (cold and vibration). **Level of Measurement**: Nominal **Group 1**: Experimental group (Buzzy group) **Group 2**: Control group
	Dependent Variables	**Statistical Analysis**	**Results**	**Strengths (how promoted internal/external validity)**	**Weaknesses (biases; poorly controlled threats to internal/external validity)**	**LEVEL OF EVIDENCE - using JHNEBP tool (Strength and Quality)**
	DV: Pain Scores after IV placement **Level of Measurement**: Ordinal **DV**: Satsifaction Scores after IV placement **Level of Measurement**: Ordinal VAS scale was used for pain and satisfaction score.	To analyze the data, number-percentage distribution, arithmetic mean, c2 test, Fisher's exact test, and Mann-Whitney U test were used. Spearman's correlation analysis was used to examine the relationship between the mean scores for pain, anxiety, and satisfaction. Patient Identification Form used which showed there was no statistically significant differences in sociodemographic characteristics between the experimental and control groups.	The results from the experimental group found that the level of the pain experienced was less than the expected level in 88% of the patients. In the control group the level of the procedure-related pain was the same as the level they expected in 74% of the patients. The difference between the experimental and control groups in terms of their mean pain and satisfaction scores was significant ($P < 0.001$). During IV catheterization the pain score decreased, and the satisfaction score and state anxiety level increased, but the trait anxiety level did not change. The results the study suggest that vibration and cold application are effective in reducing the pain felt during IV catheterization in adults.	RCT, power analysis performed, only one size (20ga) IV was used.	The total number of participants at the conclusion of the study was not provided. Study was only conducted at one hospital so results cannot be generalized.	Level I - B

1st Author Name (Publication Yr)	Study Purpose/Aims	Research Questions/Hypotheses	Study Design	Total Sample Size	Sampling Plan	Independent Variables
Redfern et al. (2018)	To determine whether the Buzzy thermomechanical system could reduce procedural pain, as measured by a 10cm visual analog scale, during IV catheter insertion, without affecting insertion success rates in adults undergoing preoperative insertion. To evaluate whether Buzzy affects preprocedural anxiety in patients, to determine whether characteristics of individual subjects are related to postprocedural pain ratings, and to compare the satisfaction of patients who received no intervention versus those who used Buzzy.	None specified	Prospective, randomized controlled trial	120 patients were consented to participate, but 8 were excluded because they met exclusion criteria, 4 patients cancelled surgery and did not reschedule during the study, 1 patient was not included because of a staff oversight, and 2 patients withdrew consent. **Inclusion**: Patients aged 18 years or older who were undergoing IV insertion before a scheduled, elective orthopedic surgical procedure and had a previous catheter insertion and were Buzzy naive. **Exclusion**: Raynaud's syndrome, sickle cell disease, extreme sensitivity to cold, break or an abrasion on the skin where the device would be placed, nerve damage affecting the extremity where the catheter would be placed, or neurodevelopmental delays or verbal difficulty	Convenience sample	**IV**: Buzzy **Level of Measurement**: Nominal Patients were randomly divided (1:1) into two groups **Group 1**: No intervention (Control) **Group 2**: Buzzy
	Dependent Variables	**Statistical Analysis**	**Results**	**Strengths (how promoted internal/external validity)**	**Weaknesses (biases; poorly controlled threats to internal/external validity)**	**LEVEL OF EVIDENCE - using JHNEBP tool (Strength and Quality)**
	DV: Pain Scores, anxiety **Level of Measurement**: Ordinal VAS scale was used to measure pain, anxiety and satisfaction.	Chi-square and Student t tests were used to investigate categorical and continuous variables, respectively. A p value of < 0.05 was considered significant.	Patient reported anxiety before IV placement did not differ by treatment group. Those receiving Buzzy during insertion rated anxeity similarly to the control group. Subjects in the experimental group did not expect to experience significantly less pain than those in the control group (2.66 vs 3.20; P = .31). Subjects who received the study device during insertion did not rate postprocedural pain lower than the control group (2.52 vs 2.43; P = .86). There was no significant impact on patient satisfaction with the use of the device. Patients who received the study device did not rate their satisfaction higher during insertion than those in the control group (P= .36)	RCT, power analysis performed	Results not be generalizable to the use with patients outside a surgical setting. Mean age of the population was high, and it's possible that the results would not be replicable in younger adult patients. Single site of study in a dedicated orthopedic and spine hosptial. The instrument used for the measurement of anxeity and pain in adults could be a limitation since previous reports suggest that older patients may have difficulty with VAS because of cognitive impairments or motor skill suuses. No placebo or sham device used as control.	Level I - B
1st Author Name (Publication Yr)	**Study Purpose/Aims**	**Research Questions/Hypotheses**	**Study Design**	**Total Sample Size**	**Sampling Plan**	**Independent Variables**
Winfield et al. (2013)	To compare current practice of injecting 1% Lidocaine intradermally (standard practice) before insertion of an IV at an academic medical center with two alternative methods: intradermally injected 0.9% BNS and topically applied ethyl chloride spray	Noninvasive anesthetic topical spray ethyl chloride will have less pain with both application and IV insertion as compared with intradermal 1% lidocaine and intradermal 0.9% BNS.	Randomized, control study that contained three groups.	100 patients were enrolled and assigned to each group by choosing a color-coded (Blue, Red, White) chip that was placed in a bag. **Inclusion**: adults 18 years or older, who were admitted to to the perioperative setting on the day of surgery and received a 16g IV in the hand or wrist. **Exclusion**: any condition that limited their sensation (DM, quadraplegia, burns), non-english speaking, unsuccessful IV placement on first attempt, required any lab work at the same time as the IV insertion	Convenience sample	**IV**: Analgsia adjunct **Level of Measurement**: Nominal **Blue Chip**: 1% Lidocaine **Red Chip**: 0.9% BNS **White Chip**: ethyl chloride topical anesthetic spray
	Dependent Variables	**Statistical Analysis**	**Results**	**Strengths (how promoted internal/external validity)**	**Weaknesses (biases; poorly controlled threats to internal/external validity)**	**LEVEL OF EVIDENCE - using JHNEBP tool (Strength and Quality)**
	DV: Pain Scores **Level of Measurement**: Ordinal Pain was measured using a verbal Pain Analog Scale (PAS)	Kruskal-Wallis, Chi-square, and Pearson correlation were used as appropriate to compare the groupings. A p level of 0.5 was considered statistically significant in all analyses.	Most of the patients (55%) rated their anxiety level as 0 before the IV insertion. Most patients (56%) were pleased with the IV anesthetic method used before IV insertion, rating the discomfort with the numbing method as a 0 or 1. Most patients (80%) rated discomfort of the actual IV insertion below 5 with ratings of 0-4 respectively. The overall IV insertion process was described as better than expected by 52% of the participants. Furthermore, there was no correlation with anesthetic method and the discomfort associated with the numbing experience (P=0.25). However patient who received ethyl chloride topical spray had the most pain and those those who received lidocaine had the least pain (P < 0.01). Patients who received lidocaine and BNS felt that their overall experience was either the same or better than they expected.	RCT, power analysis performed One clinicican who had 25 years experience placed all the IVs.	Clinician's experience may have impacted patient experience and anxiety. The clinician was new to the topical ethyl chrloide technique.	Level I - B

1st Author Name (Publication Yr)	Study Purpose/Aims	Research Questions/Hypotheses	Study Design	Total Sample Size	Sampling Plan	Independent Variables
Zhu et al. (2018)	To compare the effectiveness of vapocoolant spray and placebo spray/no treatment for pain reduction during IV cannulation.	None specified	Meta-analysis	11 primary research studies were used. All 11 of these studies were Randomized controlled trials **Inclusion**: Randomized controlled trials (RCTs), vapocoolant compared with no treatment or placebo, pain as a primary outcome **Exclusion**: Quasi-randomized controlled trials, systematic reviews, meta-analysis, case reports, reviews, or observational studies, studies which had descriptive outcomes with no numerical values; and data which had been previously published elsewhere.	Studies were found utilizing the following bibliographic resources: Web of Science, PubMed, Cochrane Central Register of Controlled Trials, China National Knowledge Infrastructure, and Wanfang Data. No language restrictions were placed on the search. Keywords used were injection, intravenous, vein, fluro-ethyl, pentafluoropropane, 1,1,1,2-tetrafluoroethane, random, control and trial, placebo, or prospective, and RCT or RCTs.	**IV**: Analgesia adjunct **Level of Measurement**: Nominal Vapocoolant vs Placebo/No treatment
	Dependent Variables	**Statistical Analysis**	**Results**	**Strengths (how promoted internal/external validity)**	**Weaknesses (biases; poorly controlled threats to internal/external validity)**	**LEVEL OF EVIDENCE - using JHNEBP tool (Strength and Quality)**
	DV: Pain scores during IV cannulation **Level of Measurement**: Ordinal **DV**: Patient anxiety due to spray **Level of Measurement**: Ordinal **DV**: First attempt success rate **Level of Measurement**: Nominal **DV**: Adverse events **Level of Measurement**: Nominal **DV**: Participants' satisfaction **Level of Measurement**: Ordinal	Meta-analyses, regression analysis, the Begg test, and the Egger test were performed. Categorical data was represented with the standardized mean difference, OR, and a 95% confidence interval. The heterogeneity among the results was analyzed by the Chi-square test. Heterogeneity was assessed using I-square tests. The I-square statistic was interpreted as lower if heterogeneity if I-square was <50%. Then, they sued a fixed effects model. Heterogeneity was though to exist and a random effects model was used when I-square was >50%. Sensitivity analysis assessed the effect of study quality. The statisically significant level was set at $p < 0.05$.	Vapocoolant spray significantly decreased pain during IV cannulation when compared with placebo spray/no treatment. No difference in anxiety due to spray was observed between vapocoolant spray and placebo spray/no treatment. There were no significant differences in first attempt success rates between vapocoolant spray and placebo spray/no treatment. There were no significant differences in adverse events between vapocoolant spray and placebo spray/no treatment. Vapocoolant significantly increased patient satisfaction	A meta-analysis utilizing 11 RCTs	Not all studies were blinded RCTs. Studies used different indicators to evaluate pain from IV cannulation. Heterogeneity may be caused by the amount of time the spray was on the skin after spraying and the different treatment centers. Number of samples in some studies was small. Lack of literature from Asian, African, and South American countries.	Level I-A

Appendix C

BUSINESS CASE with VALUE BASED CARE ASSESSMENT

Proposed Title for Project/Initiative/Opportunity to Improve

Reducing Pain Associated with Intravenous Catheter Placement

Opportunity Statement

Utilization of an evidence-based intervention prior to PIVC insertion will decrease pain associated with this procedure, improve patient satisfaction with their care, and ultimately result in fewer patients delaying necessary screenings and treatment and increase patient retention within the healthcare system.

Business Opportunity/Objectives

1. **Macro objective**: To deliver a high-quality, evidence-based, patient-centered intervention in order to meet the DHA's Quadruple Aim of Better Care.
2. **Micro objective**: Administer an evidence-based intervention so that patients experience less pain and have increased satisfaction with a PIVC insertion.

Potential Impact of the Initiative/Project

The goal of this project is to deliver high quality care to the patient which aligns with both MTF's (NHJAX and NMCCL) and DHA's missions. We can accomplish this through the reduction of patient pain, measured using a numerical rating scale, and an increase in patient satisfaction, measured using Likert scale. Addressing these two outcomes can substantially impact military healthcare. Patients treated with high-quality evidence-based care and who are satisfied with their care are more likely to seek necessary treatment and remain in the military healthcare system. Delays in care and loss of patients to outside facilities increases healthcare costs.

Alternatives (courses of action) chosen for Analysis

1. Utilization of intradermal lidocaine with PIVC insertion

2. Utilization of topical analgesic with PIVC insertion

3. *"Status Quo"*: Continue current practice of no analgesic administered with PIVC insertion

Analysis of Alternatives

Alternative 1: Intradermal lidocaine administered prior to PIVC insertion

Pros	Cons
Most efficacious Quick onset of action Able to standardize in all environments No new equipment necessary Reduced overall pain experienced by patient Low cost	Some pain with administration Staff training required

Alternative 2: Topical analgesic administered prior to PIVC insertion (Vapocoolant)

Pros	Cons
Easy to administer Quick onset of action Little to no staff training required	Conflicting data on effectiveness Requires refrigerated storage Some pain with administration Unpleasant side effects

Alternative 3: *"Status Quo"*: Continue current practice of no analgesic with PIVC insertion

Pros	Cons
No additional cost No training required	Patients experience pain Decreased patient satisfaction Forgoing evidence-based care

Assumptions

- Up to 80% of patients require PIVC access during their hospital stay (Zingg & Pittet, 2009).
- The number of patients admitted annually at NHJAX and NMCCL are 10,300 ("Naval Hospital," n.d. & "Naval Medical," 2019).
- The hourly wage of an RN is $29.90 (Average Registered, 2020)
- The hourly wage of an HM is $15.27 (Average Medical, 2020)
- The cost of a 2% lidocaine per mL is $0.09 (Lexicomp, 2020)
- The cost of an intradermal needle is $4.79 (BD SafetyGlide, 2020)

- The cost of a box of 200 alcohol pads is $2.40 (Dynarex, 2016)
- The average cost of 1-day admission is $9,700.00 (Pfunter et al., 2010)
- The healthcare cost increase for delay of care is 1.9% (Kraft et al., 2009)
- Patients delay seeking necessary medical care due to fear of pain (Taber et al., 2014)

Recommendation and Rationale

Recommendation

The EBP team recommends the utilization of intradermal lidocaine prior PIVC insertion.

Rationale

The reason the EBP team chose this intervention is multifactorial. First, the evidence is clear that intradermal lidocaine is superior in decreasing the pain experienced by patient's during PIVC placement. Second, there is no new procurement of medication or supplies for this intervention as they are readily available in most healthcare settings. Finally, the quick onset of intradermal lidocaine and the availability of supplies needed to administer make this option easily translatable to a multitude of healthcare environments.

Value Based Care - Investment Required by the Organization and the Associated "VALUE" or $ GAINED.

In the *International Journal of Antimicrobial Agents,* it was reported that PIVCs are the most frequently used invasive devices in the healthcare setting, with up to 80% of patients receiving a PIVC during their hospital stay (Zingg & Pittet, 2009).

I. *Patient Volume*

Number of patients admitted per year at NMCCL & NHJAX.	10,300
80% patients require PIVC insertion	8,240
Total PIVCs inserted annually	**8,240**

The average cost for a hospital stay is $9,700.00 (Pfunter et al., 2013). On average hospital cost can increase as much as 1.9% when there is a delay in seeking care (Kraft et al., 2009).

II. *Increased cost of patient care*

Average cost of hospital stay	$9,700.00
Average cost of hospital stay if care was delayed. 1 patient x $9,700.00 x 101.9%	$9,884.30
Total increase in cost per 1 patient	**$184.30**
Annual cost increase if 5% of 8,240 patients delay seeking care. 412 patients x $184.30.	**$75,931.60**

III. *Cost of supplies and personnel*

Variable Costs:

Miscellaneous supplies (paper, pencils…)	$250.00
Annual cost of ½ hour training for 83 RNs and 70 HMs	$1,775.30
Annual variable costs	**$2,025.30**

Average cost of 20ml vial of 2% Lidocaine ($0.09 per ml) = $1.80 (Lexicomp, 2020)

Fixed Costs:

Annual cost of 2% Lidocaine. 2% lidocaine comes in a 20ml vial. Administer 0.2ml per patient, therefore 1 vial covers 100 patients. Purchase 83 vials.	**$149.40**
Annual cost of intradermal needles (SafetyGlide Syringe). Purchase 83 boxes.	**$3,979.85**
Annual cost of alcohol pads. Purchase 42 boxes.	**$100.08**
Annual cost of training. 4 RNs set up and conduct training. Total time consist of 1 hour per year.	**$119.60**

Annual fixed costs	**$4,348.93**

IV. *Forecasted cost avoidance*

Potential annual cost avoidance with implementation of intradermal lidocaine with PIVC placement	**$75,931.60**
Annual cost of implementing intradermal lidocaine administration with PIVC placement (Variable + Fixed costs)	**$6,374.23**
Total annual cost avoidance	**$69,557.37**

Risks and Mitigation Plan

Risks	Plan
1. Staff Adherence	1. Standard operating procedures (SOP's) created to follow standing orders for use of intradermal lidocaine for PIVC insertion.
2. Staff Training	2. Mandated training with command orientation or departmental orientation will be instituted. Additionally, annual training will be conducted to verify staff is current with policy and procedures.
3. Leadership Challenges	3. Utilize command structure to involve leadership and key stakeholders to support compliance in following SOP's, standing orders, and training requirements.
4. Training staff	4. Initial training delivered by EBP team. Identify departmental champions for sustainment. These personnel will be the point of contact for that department and will be responsible for training new staff and tracking annual training of staff for their respective department.
5. Supply shortage	5. Coordinate with pharmacy and supply department to ensure sufficient amount of lidocaine and supplies are readily available. Contingency plan will be developed in case of medication shortage to utilize different lidocaine mixture.

Implementation Plan

Phase 1:	Conduct a Systematic Review of the Literature
Milestone Description:	Explore and examine the available literature with EBP team members to determine the efficacy of intradermal lidocaine in reducing patient's pain and satisfaction with PIVC insertions.

Deliverables	Due Date	Accountable Person
Measurable Goal: Organization, categorization, and critique of at least 10 systematic reviews, meta-analyses, appropriate well-designed studies as well as an evidence-based table and synthesis table	September 2020	All members of the EBP team

Resources Needed
Access to research data bases and time to conduct literature review and analysis. Mitigate any difficulties with finding literature by utilizing USUHS Learning Resource Center.

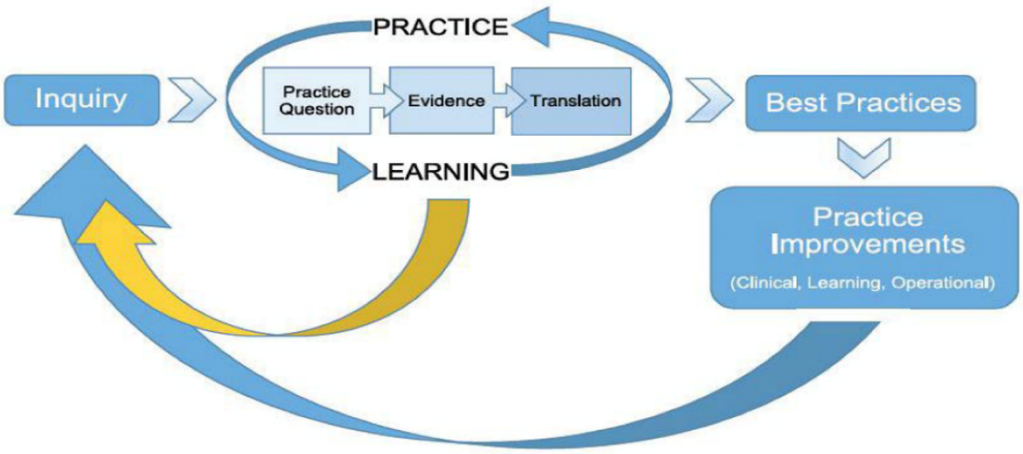
Expected Level of Benefit
Examining the literature is the foundation of this EBP project. Failure to find any conclusive evidence will not allow this project to progress.

Phase 2:	Translate the evidence into a solution/intervention and disseminate findings to key stakeholders and leadership.
Milestone Description:	Meet with stakeholders in the clinical areas in which the solution is planned to be utilized.

Deliverables	Due Dates	Accountable Person
Measurable Goal: Produce a professional presentation reviewing the benefits to using intradermal lidocaine with PIVC insertion.	September 2020	Site POC/Investigator

Resources Needed		
Access to computer resources, time for presentation preparation, work scheduling based on department (i.e. department head availability). Mitigate risks by collaborating with colleagues and clinical experts to ensure presentation quality and accuracy.		
Expected Level of Benefit		
Approval of clinical leadership will allow us to proceed with the project proposal. Dissemination to leadership allows for departmental investment and involvement. Allows leadership to see the project's importance and viability.		
Phase 3:	Develop a data collection tool and perform baseline pre-implementation data collection	
Milestone Description:	Pre-implementation data will be collected as a baseline to current PIVC insertion practices. Will be used as a comparison to measure effectiveness of intradermal lidocaine.	
Deliverables	Due Dates	Accountable Person
Measurable goals: Produce baseline data to compare effectiveness of intradermal lidocaine when intervention is implemented.	October 2020	Site POC/Investigator
Resources Needed		
Access to computer resources to create an easy-to-use and reliable data collection tool, departmental buy-in to assist with data collection with all PIVC insertions, and time to collect pre-implementation data. Mitigate risks by engaging department leadership to stress the importance of accurate baseline data collection.		
Expected Level of Benefit		
A reliable data collection tool allows for ease of use. Baseline data collection will provide the information necessary to decide whether or not the project is beneficial in decreasing pain and improving patient satisfaction with intradermal lidocaine use with PIVC insertion.		
Phase 4:	Training and implementation	
Milestone Description:	To create and implement the training in the labor and delivery and peri-op departments. Intradermal lidocaine insertion training must be provided to all staff that are expected to comply with the change in practice.	
Deliverables	Due Dates	Accountable Person
Measurable goal: 100% personnel exposure to the training and 100% compliance with PIVC insertion practice	Mid-November 2020	Site POC/Investigator
Resources Needed		
Time for all personnel to attend training, audio/visual equipment (TV/projector, laptop), training room/area, printed quizzes and training material, intradermal lidocaine administration supplies, IV training models. Utilization of department's training officer. Mitigate risks by engaging department leadership to stress mandatory training.		
Expected Level of Benefit		
Department-wide adoption and compliance with new PIVC insertion practice.		
Phase 5:	Project evaluation	
Milestone Description:	Track results on patient pain and satisfaction with PIVC insertion with intradermal lidocaine using data collection tool.	
Deliverables	Due Dates	Accountable Person
Measurable Goal*:* Significant decrease in pain and increase in satisfaction with PIVC insertion with the use of intradermal lidocaine. Status report of results will be sent to leadership at 6 months.	April/May 2021	Site POC/Investigator
Resources Needed		
Reliable data collection tool, departmental buy-in to assist with data collection with all PIVC insertions, and time to collect and analyze post-implementation data. Mitigate risks by meticulous data collection, retraining personnel as necessary, and continually engaging staff for compliance.		
Expected Level of Benefit		
Provides the information necessary to decide whether or not the implementation of intradermal lidocaine is cost-effective and beneficial.		

Appendix D



Appendix E

NO PHI--**DO NOT** PLACE IN MEDICAL RECORD

DATE:_____ IV Insertion Quality Improvement Tracker

Attempt	Inserter Role			Technique Used			Pain (0-10)
	HM	RN	Prov.	Ultrasound	Palpation only	Lidocaine used?	
1.							
2.							
3.							
4.							
5.							

1. Patient satisfaction scale (1 not satisfied, 5 extremely satisfied)

   Circle: 1 2 3 4 5

2. Was the procedure aborted Y / N? Remarks: _____

   _____

   _____

NO PHI--**DO NOT** PLACE IN MEDICAL RECORD

DATE:_____ IV Insertion Quality Improvement Tracker

Attempt	Inserter Role			Technique Used			Pain (0-10)
	HM	RN	Prov.	Ultrasound	Palpation only	Lidocaine used?	
1.							
2.							
3.							
4.							
5.							

1. Likert patient satisfaction scale (1 not satisfied, 5 extremely satisfied)

   Circle: 1 2 3 4 5

2. Was the procedure aborted Y / N? Remarks: _____

   _____

   _____

IV insertion project: ultrasound and lidocaine

Instructions:

Please fill out this tracker sheet for every adult patient requiring a new IV insertion.

Use a new sheet:

For every IV needed, ending in successful placement or no further attempts.

If a second IV is needed, use a second/different sheet for that site.

If an IV was tested to be successful/fully functional but later fails and needs to be replaced.

Inserter training and documenting the technique used (check all that apply):

If the inserter was not trained in Ultrasound IV placements, then write "not trained" in the "ultrasound" column.

Similarly, if the inserter was not trained in intradermal lidocaine for IV placements, write "not trained" in the "lidocaine used?" box.

Patient satisfaction: "How did you feel about that IV placement, if 1 was the worst it could have been and 5 is the best it could have been, then what number would you rate it?"

*******Please read above script*** *and stress the point to the patient that this satisfaction rating is not an evaluation of the person performing the procedure. This rating is designed to focus on the patient's satisfaction with the IV placement by itself. If necessary another staff member can collect this data (for example if a HM places the IV, the RN working with the patient can ask that patient about their satisfaction with the IV placement). This approach may decrease a patient's feeling that they are "judging" the staff and decrease skew in the data collected.****

Pain: record only for the final/successful attempt.

Put the sheets in the department head's designated box when complete. NO PHI, Do not put in record!

Appendix F

Project Year 1 (2020)												
Activity/Month	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
USUHS VPR Submission and Approval								X				
Site IRB Submission and Approval										**X**		
Project Planning												
-Task 1: Develop PICOT Question				X								
-Task 2: Literature Review					X	X	X	X	X			
-Task 3: Develop Intradermal Training									X	X		
-Task 4: Meet with stakeholders										X		
Project Implementation/Data Collection												
-Task 1: Train staff on data collection tools										X		
-Task 2: Collect baseline data										X	X	
-Task 3: Train staff on intradermal lidocaine administration and review data collection tools												
-Task 4: Collect post-implementation data												
Data Analysis												
-Task 1: Develop data analysis plan								X	X			
-Task 2: Utilize SPSS to evaluate efficacy of intervention												
Dissemination												
-Task 1: Deliver results to Phase II faculty and local leadership												
-Task 2: Deliver project results during USU Research Days												

Project Year 2 (2021)												
Activity/Month	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
USUHS VPR Submission and Approval												
Site IRB Submission and Approval												
Project Planning												
-Task 1: Develop PICOT Question												
-Task 2: Literature Review												
-Task 3: Develop Intradermal Training												
-Task 4: Meet with stakeholders												
Project Implementation/Data Collection												
-Task 1: Train staff on data collection tools												
-Task 2: Collect baseline data												
-Task 3: Train staff on intradermal lidocaine administration and review data collection tools	X											
-Task 4: Collect post-implementation data	X	X										
Data Analysis												
-Task 1: Develop data analysis plan												
-Task 2: Utilize SPSS to evaluate efficacy of intervention			**X**									
Dissemination												
-Task 1: Deliver results to Phase II faculty and local leadership						X						
-Task 2: Deliver project results during USU Research Days												

Project Year 3 (2022)												
Activity/Month	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
USUHS VPR Submission and Approval												
Site IRB Submission and Approval												
Project Planning												
-Task 1: Develop PICOT Question												
-Task 2: Literature Review												
-Task 3: Develop Intradermal Training												
-Task 4: Meet with stakeholders												
Project Implementation/Data Collection												
-Task 1: Train staff on data collection tools												
-Task 2: Collect baseline data												
-Task 3: Train staff on intradermal lidocaine administration and review data collection tools												
-Task 4: Collect post-implementation data												
Data Analysis												
-Task 1: Develop data analysis plan												
-Task 2: Utilize SPSS to evaluate efficacy of intervention												
Dissemination												
-Task 1: Deliver results to Phase II faculty and local leadership												
-Task 2: Deliver project results during USU Research Days					X							

Appendix G

Unit of Analysis	Variable Type	Variable Name	Variable Description and Type of Measure	Data Source	Possible Range of Values	Level of Measurement	Time Frame for Collection	Statistical Test	Decision Rule
Population	**IV**	Intradermal Lidocaine	Variable Description: Analgesic adjunct administered prior to PIVC placement. Measure Type: Process	Post-intervention survey	0 = No intradermal lidocaine 1 = Use of intradermal lidocaine	Dichotomous	Baseline collection of data 05 Oct 20 – 03 Dec 20 Intradermal Lidocaine implementation 04 Dec 20 – 28 Feb 21	None	None
Population	**DV**	Pain Scores	Variable Description: Patient's pain experienced during PIVC placement. Measure Type: Outcome	Post-intervention survey	0 – 10 using Numeric Pain Rating Scale	Ordinal	Baseline collection of data 05 Oct 20 – 03 Dec 20 Intradermal Lidocaine implementation 04 Dec 20 – 28 Feb 21	Wilcoxon rank sum test	A change in median pain scores of 1.39 or more from baseline using the Numeric Pain Rating Scale
Population	**DV**	Patient Satisfaction	Variable Description: Patient's satisfaction with PIVC placement. Measure Type: Outcome	Post-intervention survey	1 – 5 using a Likert Scale	Ordinal	Baseline collection of data 05 Oct 20 – 03 Dec 20 Intradermal Lidocaine implementation 04 Dec 20 – 28 Feb 21	Wilcoxon rank sum test	A change in median satisfaction scores of 0.5 or more from baseline using the Likert Scale

Appendix H

Appendix C: Daniel K. Inouye Graduate School of Nursing
DNP Project Team Mentor (Committee Membership) Agreement Form

DOCTOR OF NURSING PRACTICE PROJECT
DNP Project Clinical Question and Team Mentor (Committee Membership) Agreement Form

Graduation Year: 2022 **Phase 2 Site(s) Name:** NMCCL & NHJAX

Name(s) of DNP Project Student Team:

1.	LCDR Lani Kuhlow	AGCNS ☐	FNP ☐	PMHNP ☐	RNA ■	WHNP ☐
2.	LCDR Michael Davidson	AGCNS ☐	FNP ☐	PMHNP ☐	RNA ■	WHNP ☐
3.	LT Daniel Calma	AGCNS ☐	FNP ☐	PMHNP ☐	RNA ■	WHNP ☐
4.		AGCNS ☐	FNP ☐	PMHNP ☐	RNA ☐	WHNP ☐
5.		AGCNS ☐	FNP ☐	PMHNP ☐	RNA ☐	WHNP ☐
6.		AGCNS ☐	FNP ☐	PMHNP ☐	RNA ☐	WHNP ☐

The tentative title of the DNP Project Proposal for this student group is:

Reducing Pain Associated with Intravenous Catheter Placement

Committee Approved DNP Project Clinical Question:

Is there an intervention that will decrease the pain of PIVC insertion and increase the patient's satisfaction with their care?

Names of DNP Project Team Mentors *(type the name and obtain digital signatures)*:

I agree to serve as a member of the DNP Project Team (Team Mentors) for the above DNP Student Project Team. As a Project Team Mentor, I agree to the duties and responsibilities outlined within the DNP Project Manual which include but are not limited to the provision of consultation and guidance supporting the entire DNP project journey and to ensure the DNP project is of sufficient rigor and demonstrates doctoral level scholarship to meet the requirements for USUHS GSN graduation.

NOTE: You may have 3-4 DNP Team Mentors [committee members including your DNP Senior Mentor (Chair)]. The Phase II Site Director may also be a member of the group, as well as other USUHS faculty or others who may serve as content experts. All non-USUHS faculty selected as a Team Mentor must be approved by the DNP Project Director.

Senior Mentor (Chair):	LCDR Hefley	Signature:	Justin Hefley Digitally signed by Justin Hefley Date: 2020.12.11 11:15:53 -05'00'	Date: 12/11/20
Team Mentor (Member):	LCDR Kuhlow, Lani	Signature:	Lani Kuhlow Digitally signed by Lani Kuhlow Date: 2020.12.11 10:30:49 -05'00'	Date: 12/11/20
Team Mentor (Member):	LCDR Davidson, Michae	Signature:	Michael Davidson Digitally signed by Michael Davidson Date: 2020.12.11 10:35:35 -05'00'	Date: 12/11/20
Team Mentor (Member):	LT Daniel Calma	Signature:	CALMA.DANIEL.L.1125750156 Digitally signed by CALMA.DANIEL.L.1125750156 Date: 2020.12.11 10:39:40 -05'00'	Date: 12/11/20

Form Version: 4 December 2020

Appendix I

CITI PROGRAM

Completion Date 31-Mar-2020
Expiration Date 31-Mar-2023
Record ID 35972092

This is to certify that:

Daniel Calma

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

OUSD P&R Human Research
(Curriculum Group)
Social and Behavioral Investigators and Research Study Team
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w1e20f812-2dc9-46ae-8dda-7b38ae5807ab-35972092

CITI PROGRAM

Completion Date 31-Mar-2020
Expiration Date 31-Mar-2023
Record ID 35972098

This is to certify that:

Daniel Calma

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

GCP – Social and Behavioral Research Best Practices for Clinical Research
(Curriculum Group)
GCP – Social and Behavioral Research Best Practices for Clinical Research
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wc28dc4f9-edc4-4d85-aeb5-5f9a01c8a287-35972098

CITI PROGRAM

Completion Date 31-Mar-2020
Expiration Date 31-Mar-2023
Record ID 35972097

This is to certify that:

Daniel Calma

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Responsible Conduct of Research (RCR)
(Curriculum Group)
Responsible Conduct of Research (RCR)
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w2e3ee248-b588-4895-a533-2892ab04fe73-35972097

CITI PROGRAM

Completion Date 31-Mar-2020
Expiration Date 31-Mar-2023
Record ID 35972094

This is to certify that:

Daniel Calma

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

OUSD P&R Human Research
(Curriculum Group)
Biomed Research Coordinators, Clinical Coordinators, Study Coordinators & Research Administrators
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wa7aea529-43aa-4a5f-9eda-2e0035e63836-35972094

CITI PROGRAM

Completion Date 31-Mar-2020
Expiration Date 31-Mar-2023
Record ID 35972091

This is to certify that:

Daniel Calma

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

OUSD P&R Human Research
(Curriculum Group)
Biomedical Investigators and Research Study Team
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w4fd9aca6-3d86-42a1-a998-c803acb9f0f2-35972091

CITI PROGRAM

Completion Date 31-Mar-2020
Expiration Date 31-Mar-2023
Record ID 35972093

This is to certify that:

Daniel Calma

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

OUSD P&R Human Research
(Curriculum Group)
Biomedical Research Support Staff
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w2ef33c87-7771-4fd6-b0e5-f5351a914108-35972093

CITI PROGRAM

Completion Date 30-Mar-2020
Expiration Date 30-Mar-2023
Record ID 35972096

This is to certify that:

Daniel Calma

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Good Clinical Practice (U.S. FDA Focus)
(Curriculum Group)
GCP for Clinical Trials with Investigational Drugs and Medical Devices (U.S. FDA Focus)
(Course Learner Group)
1 - GCP
(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w98e632c0-2e7c-43ee-a47f-79bfcb43cb4e-35972096

CITI PROGRAM

Completion Date 17-Mar-2020
Expiration Date 17-Mar-2023
Record ID 35964932

This is to certify that:

Michael Davidson

Has completed the following CITI Program course:

OUSD P&R Human Research (Curriculum Group)
Social and Behavioral Investigators and Research Study Team (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

Verify at www.citiprogram.org/verify/?wed9f99e8-057c-47b2-81ad-ad622f0da2a0-35964932

CITI PROGRAM

Completion Date 17-Mar-2020
Expiration Date 17-Mar-2023
Record ID 35964937

This is to certify that:

Michael Davidson

Has completed the following CITI Program course:

GCP – Social and Behavioral Research Best Practices for Clinical Research (Curriculum Group)
GCP – Social and Behavioral Research Best Practices for Clinical Research (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w40c8c05b-52e9-4e4a-8ad2-40e5bd155508-35964937

CITI PROGRAM

Completion Date 17-Mar-2020
Expiration Date 17-Mar-2023
Record ID 35964936

This is to certify that:

Michael Davidson

Has completed the following CITI Program course:

Responsible Conduct of Research (RCR) (Curriculum Group)
Responsible Conduct of Research (RCR) (Course Learner Group)
1 - Basic Course (Stage)

CITI Collaborative Institutional Training Initiative

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

Verify at www.citiprogram.org/verify/?w7a5a6afe-eb01-4d5f-a8a8-0c0089c759a3-35964936

CITI PROGRAM

Completion Date 16-Mar-2020
Expiration Date 16-Mar-2023
Record ID 35964934

This is to certify that:

Michael Davidson

Has completed the following CITI Program course:

OUSD P&R Human Research (Curriculum Group)
Biomed Research Coordinators, Clinical Coordinators, Study Coordinators & Research Administrators (Course Learner Group)
1 - Basic Course (Stage)

CITI
Collaborative Institutional Training Initiative

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

Verify at www.citiprogram.org/verify/?w9a17c54b-a683-48be-bf9b-ffc633e34255-35964934

CITI PROGRAM

Completion Date 16-Mar-2020
Expiration Date 16-Mar-2023
Record ID 35964931

This is to certify that:

Michael Davidson

Has completed the following CITI Program course:

OUSD P&R Human Research (Curriculum Group)
Biomedical Investigators and Research Study Team (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w7beae627-49cf-4ce4-b400-67bfa7a7c54d-35964931

CITI PROGRAM

Completion Date 16-Mar-2020
Expiration Date 16-Mar-2023
Record ID 35964933

This is to certify that:

Michael Davidson

Has completed the following CITI Program course:

OUSD P&R Human Research (Curriculum Group)
Biomedical Research Support Staff (Course Learner Group)
1 - Basic Course (Stage)

CITI Collaborative Institutional Training Initiative

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

Verify at www.citiprogram.org/verify/?wb987502f-06aa-491e-825b-0f3db1d46dd0-35964933

CITI PROGRAM

Completion Date 16-Mar-2020
Expiration Date 16-Mar-2023
Record ID 35964935

This is to certify that:

Michael Davidson

Has completed the following CITI Program course:

Good Clinical Practice (U.S. FDA Focus) (Curriculum Group)
GCP for Clinical Trials with Investigational Drugs and Medical Devices (U.S. FDA Focus) (Course Learner Group)
1 - GCP (Stage)

CITI
Collaborative Institutional Training Initiative

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

Verify at www.citiprogram.org/verify/?w41b3072a-635a-4679-8ddb-8fde2f89d9ee-35964935

CITI PROGRAM

Completion Date 17-Mar-2020
Expiration Date 17-Mar-2023
Record ID 35974794

This is to certify that:

Lani Kuhlow

Has completed the following CITI Program course:

OUSD P&R Human Research (Curriculum Group)
Social and Behavioral Investigators and Research Study Team (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

Verify at www.citiprogram.org/verify/?w3f96e959-0b37-4c8d-acb9-4aa717f08581-35974794

CITI PROGRAM

Completion Date 17-Mar-2020
Expiration Date 17-Mar-2023
Record ID 35964954

This is to certify that:

Lani Kuhlow

Has completed the following CITI Program course:

GCP – Social and Behavioral Research Best Practices for Clinical Research (Curriculum Group)
GCP – Social and Behavioral Research Best Practices for Clinical Research (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w8ebeb8d9-3742-4c30-9e58-4b87507a66ea-35964954

CITI PROGRAM

Completion Date 17-Mar-2020
Expiration Date 17-Mar-2023
Record ID 35964953

This is to certify that:

Lani Kuhlow

Has completed the following CITI Program course:

Responsible Conduct of Research (RCR) (Curriculum Group)
Responsible Conduct of Research (RCR) (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w7d13bd0c-8414-4cf3-9967-0d65c4462dc8-35964953

CITI PROGRAM

Completion Date 16-Mar-2020
Expiration Date 16-Mar-2023
Record ID 35964952

This is to certify that:

Lani Kuhlow

Has completed the following CITI Program course:

OUSD P&R Human Research (Curriculum Group)
Biomed Research Coordinators, Clinical Coordinators, Study Coordinators & Research Administrators (Course Learner Group)
1 - Basic Course (Stage)

CITI
Collaborative Institutional Training Initiative

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

Verify at www.citiprogram.org/verify/?w11fed3dd-e91f-4102-bdca-8ba5c960596b-35964952

CITI PROGRAM

Completion Date 16-Mar-2020
Expiration Date 16-Mar-2023
Record ID 35964950

This is to certify that:

Lani Kuhlow

Has completed the following CITI Program course:

OUSD P&R Human Research (Curriculum Group)
Biomedical Investigators and Research Study Team (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wec28d47b-9f81-4185-ada3-947371916fe2-35964950

CITI PROGRAM

Completion Date 16-Mar-2020
Expiration Date 16-Mar-2023
Record ID 35964951

This is to certify that:

Lani Kuhlow

Has completed the following CITI Program course:

OUSD P&R Human Research (Curriculum Group)
Biomedical Research Support Staff (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wb1286d03-a9d9-4328-be17-f51959a0e912-35964951

CITI PROGRAM

Completion Date 17-Mar-2020
Expiration Date 17-Mar-2023
Record ID 35975001

This is to certify that:

Lani Kuhlow

Has completed the following CITI Program course:

Good Clinical Practice (U.S. FDA Focus) (Curriculum Group)
GCP for Clinical Trials with Investigational Drugs and Medical Devices (U.S. FDA Focus) (Course Learner Group)
1 - GCP (Stage)

CITI
Collaborative Institutional Training Initiative

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

Verify at www.citiprogram.org/verify/?wd3aae149-8864-4ad8-a03c-d6df415b53e1-35975001

Appendix J

USUHS FORM 3202N
DANIEL K. INOUYE GRADUATE SCHOOL OF NURSING
EVIDENCE-BASED PRACTICE/PERFORMANCE IMPROVEMENT PROPOSAL

VPR Date Stamp

Project Number: _____ (VPR will assign)

Project Title: **Reducing Pain Associated with Intravenous Catheter Placement**

SECTION A: STUDENT POC INFORMATION

1. Name (Last, First, MI): **Kuhlow, Lani, A.** Student E-mail: [redacted]
2. Home Address: [redacted]

SECTION B: COMMITTEE CHAIR / SENIOR MENTOR INFORMATION

3. Name (Last, First, MI): Hefley, Justin B
4. Telephone: [redacted] Fax: E-mail: [redacted]
5. USUHS Building/ Room No.: NW291

SECTION C: PROJECT INFORMATION

6. Attach the Abstract for the proposal, including the following sections: Site Location of the Project, Title, Authors, Background or Problem/Issue, Clinical Question/Purpose, Project Design, Anticipated Organizational Impact/Implications for Practice and also include the Proposed Timeline. Single space the abstract and use Times New Roman font, size 12.
7. Is this proposal related to an active research project of the Chair/Senior Mentor identified in Section B? ☐ Yes ☒ No
   If yes, complete below; if no, proceed to Part 8.
   Project Number: _____
   Project Title:
   Project Start Date: _____ Project End Date: _____
8. Anticipated period of performance: Project Start Date: **15 DEC 2020** Project End Date: **30 APR 2020**
9. Performance Site(s): **Naval Medical Center Camp Lejeune, Naval Hospital Jacksonville**
10. Does this project involve any classified information? (Contact the USUHS Security Office for guidance) ☐ Yes ☒ No
11. Do you have a funding source for this project? ☐ Yes ☒ No ☐ NA
    If yes, specify the funding agency and the amount provided:

SECTION D: SIGNATURES

The following signatures attest to the validity of the above information:

[redacted] 05 Nov 2020	[redacted] 11/15/2020
Student (Project Point of Contact for the Group) (Signature and Date)	Chair/Senior Mentor (Signature and Date)
CDR Ken Radford Digitally signed by CDR Ken Radford Date: 2020.11.16 09:24:01 -05'00'	
Chair/Program Director (Signature and Date)	Chair/Program Director (Signature and Date)
CDR Ken Radford Digitally signed by CDR Ken Radford Date: 2020.11.16 09:23:27 -05'00'	SEIBERT.DIANE.C.1084932279 Digitally signed by SEIBERT.DIANE.C.1084932279 Date: 2020.11.16 10:39:49 -05'00'
DNP Project Director or PhD Director (Signature and Date)	Associate Dean for Academic Affairs, GSN (Signature and Date)
WASSERMAN.JOAN.E.1551061066 Digitally signed by WASSERMAN.JOAN.E.1551061066 Date: 2020.11.16 11:24:00 -05'00'	ROMANO.CAROL.A.1032050294 Digitally signed by ROMANO.CAROL.A.1032050294 Date: 2020.11.16 12:18:18 -05'00'
Associate Dean for Research, GSN (Signature and Date)	Dean, DKI Graduate School of Nursing (Signature and Date)

In light of the above signatures, the project is approved.

_____ _____
USUHS Vice President for Research Date

USUHS Form 3202N (VPR) - Revised Sep 2015 v1.2
Previous versions are obsolete

Appendix K

October 23, 2020

MEMORANDUM

From: Vice Chair, Institutional Review Board
To: Justin Hefley, USN

Subj: INSTITUTIONAL REVIEW BOARD REVIEW DETERMINATION

Ref: (a) NMCCL Human Research Protection Program (HRPP) Standard Operating Procedure (SOP), October 3, 2019
(b) DASD (HRP&O) Operating Instruction, 2019
(c) 32 CFR 219

Encl: (1) Institutional Review Board Determination Application

1. Per the reference, an administrative review of your application, "*Evidence-based ultrasound education for vascular access using a portable ultrasound system*," was completed by the Vice Chair of the Institutional Review Board (IRB).

2. After reviewing your application, the project described does not meet the criteria of activities subject to federal regulations at 32 CFR 219. Based on the materials submitted, it has been determined that IRB oversight is not required at this time.

3. Although IRB oversight is not required, all activities proposed in the submission should be conducted in a responsible and ethical manner, and held to standards required by your field and your responsibilities at Naval Medical Center Camp Lejeune.

4. This determination applies only to the activities described in the determination submission and does not apply should any changes be made. If changes are being considered and there are questions about whether IRB review is needed, please contact the IRB Administrator.

5. If you have any questions or concerns, please contact the IRB Administrator at (910)450-3013 or stephanie.l.dysonelms.ctr@mail.mil.

L.R. Allen
CDR, MC, USN

DEPARTMENT OF THE NAVY
NAVAL HOSPITAL JACKSONVILLE
2080 CHILD STREET
JACKSONVILLE, FLORIDA 32214

05NOV20

MEMORANDUM FOR Director, Nurse Anesthesia Program, Chad Moore CDR, NC, USN

SUBJECT: NHJX ACCEPTANCE ON NMCCL INSTITUTIONAL REVIEW BOARD DETERMINATION MEMO

1. Research Project Details:

a. Title: "Evidence based ultrasound education for vascular access using a portable ultrasound system."

2. Naval Hospital Jacksonville Research Department accepts the signed memo from Naval Medical Center Camp Lejeune (NMCCL) indicating that IRB oversight is not required. NHJX has confirmed with Mrs. Kersten Wheeler at NMCP that no other action is necessary.

3. POC for this action is Mr. Almer Mendoza, he can be reached at: [redacted]

[redacted]

Brenda R. Hamilton, CAPT, DC, USN
Research Director, Clinical Investigations Department
Naval Hospital Jacksonville

Appendix L

USU
Uniformed Services University

Kuhlow, Lani <lani.kuhlow@usuhs.edu>

Approval for "Reducing Pain Associated with Intravenous Catheter Placement"

Pub Clearance, USU <usupubclearance@usuhs.edu> Tue, Mar 8, 2022 at 11:09 AM
[redacted]

Good morning LCDR Kuhlow,

The attached presentation, "Reducing Pain Associated with Intravenous Catheter Placement" has been approved by the Public Affairs office at USU.

Please let us know if anything else is needed.

Very Respectfully,
Sarah Marshall

50TH 1972 2022 ANNIVERSARY
USU Uniformed Services University

Sarah Marshall
Media Affairs Officer
Uniformed Services University
301-295-3955

NMCCL_NHJAX - All Documents.pdf
8264K

Appendix M

Appendix G: Daniel K. Inouye Graduate School of Nursing
DNP Project Completion Verification Form

DOCTOR OF NURSING PRACTICE PROJECT
Completion Verification Form

The DNP Project titled: Reducing Pain Associated with Intravenous Catheter Placement

was completed at NH JAX and NMCCL by the following student(s):

(Student Name)	*(Digital Signature)*
LCDR Lani Kuhlow	Lani Kuhlow Digitally signed by Lani Kuhlow Date: 2022.01.28 13:26:18 -05'00'
LCDR Michael Davidson	Michael Davidson Digitally signed by Michael Davidson Date: 2022.01.28 13:28:50 -05'00'
LCDR Daniel Calma	Daniel Calma Digitally signed by Daniel Calma Date: 2022.01.28 16:08:23 -05'00'

The DNP Practice Project Team verifies that the following components of the DNP project, accomplished by the above students, is of sufficient rigor and demonstrates doctoral level scholarship to meet the requirements for USUHS GSN graduation:

- Presentation of DNP project to the leadership/stakeholders at the Phase II Site,
- Abstract/Impact Statement (*Appendix F*), and
- DNP Project written report (*Appendix E)*.

Verified by:

(type name)	*(Digital Signature)*	
LCDR Justin Hefley	Justin Hefley Digitally signed by Justin Hefley Date: 2022.01.30 15:11:36 -05'00'	Senior Mentor
CDR Chad Moore	Chad Moore 1155349634 Digitally signed by Chad Moore 1155349634 Date: 2022.01.30 16:24:26 -05'00'	Team Mentor
		Team Mentor
		Team Mentor & Phase II Site Director

For RNA Students only *- add the following additional signature for final verification of project completion:*

LCDR Kenneth Barber	BARBER.KENNETH.DOUGLAS.1177263644 Digitally signed by BARBER.KENNETH.DOUGLAS.1177263644 Date: 2022.03.09 11:42:38 -05'00'
RNA Project Director *(type name)*	*(Digital Signature)*

Form Version: 4 December 2020