DEVELOPMENT OF A PEDIATRIC MINIMAL SEDATION RESOURCE FOR EMERGENCY REGISTERED NURSES

by © Candace Frampton

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Abstract

Background: Minimal sedation is commonly implemented during the care of pediatric patients in the emergency department (ED). However, Newfoundland and Labrador Health Services lacks resources for emergency registered nurses regarding best practices with pediatric minimal sedation. **Purpose:** To develop a policy outlining proper procedures for administering minimal sedation in the pediatric emergency department setting. An additional aim was to develop a learning resource on the policy and fundamental topics of pediatric pain and anxiety management. **Methods:** Three main methods were utilized in the development of this pediatric minimal sedation resource: 1) a thorough literature review, 2) an environmental scan of existing available resources, 3) consultations with key stakeholders, such as pediatric emergency registered nurses and physicians. **Results:** The literature concluded that pediatric pain and anxiety associated with medical procedures is high, with many misconceptions existing among registered nurses regarding pediatric pain and anxiety. Researchers emphasized the importance of education for healthcare workers. The environmental scan supported these findings, with many resources existing which outline best practices for minimal sedation in the pediatric population. The consultations showed that81% of RNs and physicians preferred lecture/workshops for resource delivery, and 100% agreed that a pediatric minimal sedation policy and educational resources are essential. **Conclusion:** A pediatric minimal sedation policy and half-day educational resource were both developed to emphasize the importance of providing safe and effective minimal sedation to pediatric patients in the ED.

Keywords*: pediatric minimal sedation, pain and anxiety management, best practice policy, educational workshop, emergency registered nurse*

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Introduction

Minimal sedation or anxiolysis has been defined as "a drug-induced state during which patients respond normally to verbal commands (American Society of Anesthesiologists, 2019, para. 1.). Common medications utilized in the emergency department (ED) when initiating minimal sedation include benzodiazepines such as Midazolam, Nitrous Oxide, and Fentanyl (Stern & Pozun, 2023). Although a patient's cognitive and physical functions are impaired during this type of sedation, reflexes of the airway as well as ventilatory and cardiovascular functions are not impacted by this form of sedation (American Society of Anesthesiologists, 2019). For this reason, minimal sedation has beneficial implications during procedures in the ED among the pediatric (aged 17 or younger) patient group. However, it is important to note that due to various pre-existing conditions and co-morbidities, it is possible that the patient may fall into a deeper level of sedation than is aimed (Benzoni & Cascella, 2019). Therefore, it is critical that healthcare workers who are administering minimal sedation to pediatric patients in the ED are prepared to intervene in the event of an unexpected sedation outcome. While physicians are commonly the procedural sedation provider, nurses can act as the overseer of the sedation and is responsible of monitoring the patient through continuous patient monitoring and documentation (International Committee for The Advancement of Procedural Sedation, 2016). Interestingly, it has been reported that 39% of rural and community EDs in Alberta, Canada do not provide pediatric pain management education to their nurses (Bar Am et al., 2021). It is evident from the research that resources for healthcare providers (HCPs) regarding pediatric pain and anxiety management is lacking. Barriers to implementation of minimal sedation in the ED have been reported as lack of healthcare provider knowledge, healthcare provider shortages, insufficient medical orders, and time constraints (Bar Am et al., 2021; Czarnecki et al., 2011; Peirce et al.,

2018; Sahyoun et al., 2021; Twycross & Collins, 2013). Interventions to address these barriers must be created, as undertreated pain and anxiety during hospitalization can negatively impact a patient's psychological well-being and caregiver satisfaction with care (Chen et al., 2000; Crumm et al., 2020; Hwang et al., 2023; Malia et al. 2019; Noel et al., 2010).

Having worked in the practicum setting for four years, I have informally identified that monitoring of patients who have been given minimal sedation medications is inconsistent. Additionally, documentation of patient disposition, status, and vital signs is often not completed prior to a patient's discharge from the care setting. The organization lacks a policy that supports proper procedures when administering minimal sedation to pediatric patients in the ED, therefore RNs do not have clear practice standards to follow. Especially during painful medical procedures, I feel it is important to implement minimal sedation safely so that patient pain and anxiety is decreased. In collaboration with leadership members of my department, it was determined that a policy which outlines the proper procedures for administering minimal sedation to pediatric patients in the ED is needed in the practice area.

Providing pediatric patients with effective pain and anxiety management during painful procedures is essential, however best practices should be followed to ensure patient safety. As it has been determined that there is inconsistency in monitoring and documentation among RNs working in the practice setting, a policy outlining required interventions and documentation would provide clear expected practices for RNs to abide by during administration of minimal sedation. This practicum project could make valuable contributions to improving patient care not only in the identified practicum setting, but across the entire organization in other EDs that care for pediatric patients.

Objectives

The overall goal of the practicum was to develop a policy outlining proper procedures for administering minimal sedation in the pediatric emergency department setting. To supplement this policy, an identified goal was to develop a learning resource on the policy, the importance of following the guidelines that will be contained in the policy, and fundamental topics of pediatric pain and anxiety management.

The key practicum objectives were:

1. Conduct a literature review to describe and identify factors effecting Registered Nurses' practices when administering minimal sedation to pediatric patients in the ED setting.
2. Identify best practices and procedures for administration of minimal sedation, monitoring of pediatric patients (including choosing appropriate medications, discharge criteria) in Canada and USA.
3. Identify local practice issues related to implementing and upholding minimal sedation best practices in Canada and USA.
4. Establish an understanding of current practices and knowledge level of Registered Nurses regarding minimal sedation administration through consultation with stakeholders.
5. Determine existing policies and published resources regarding minimal sedation administration procedures in the pediatric population through an environmental scan.
6. Develop a policy which outlines best practices and procedures for Registered Nurses when administering minimal sedation to pediatric patients in the ED.
7. Develop a supplemental learning resource for Registered Nurses which describes the importance of the developed policy guided by the Knowles' Adult Learning Theory; and
8. Demonstrate advanced nursing practice competencies.

Overview of Methods

Three methods were utilized to inform the development of this practicum project. The first method included an extensive literature review to identify current practices, issues, and published interventions regarding pediatric pain and anxiety management. Second, an environmental scan was conducted to identify current existing pediatric minimal sedation policies and educational resources, both in the local and external settings. Finally, key stakeholders of this practicum project were consulted via questionnaires to determine their perceptions and needs related to pediatric minimal sedation in the ED.

Summary of the Literature Review

The literature review consisted of an extensive search of the literature utilizing the following databases: Cumulative Index to Nursing and Allied Health (CINAHL), PubMed, Google Scholar, and Cochrane Library. The literature search was limited to include peer-reviewed articles written in the English language. Several key questions helped guide this literature review: "What are the learning needs of Registered Nurses who participate in pediatric minimal sedation?", "What are the current practices of and barriers to administering or following best practices during pediatric minimal sedation?", and "What are the best teaching strategies to help support Registered Nurses when implementing new policy-based procedures for pediatric minimal sedation in the ED?". Keywords utilized during the literature search include: *"sedation", "minimally conscious state", "pediatric nursing", "pediatric emergency nursing", "emergency nursing", "child", "pediatrics", "pain, procedural", "treatment related pain", "anxiety", "midazolam", "antianxiety agents, benzodiazepine", "nursing knowledge", "education", "policy", "professional development", "education".* The Public Health Agency of Canada (PHAC) Critical Appraisal Toolkit was utilized to critically appraise the quantitative

studies (Public Health Agency of Canada, 2014). To critically appraise qualitative research articles, the Lincoln and Guba (1985) framework for trustworthiness was utilized. As limited research was available which reported on certain areas, especially on nurses' practices with pediatric sedation, articles published between 2005 and 2024 were included. Please refer to the summary tables in the Appendix.

Literature Review Key Findings

The overall findings of the literature review were related to the high prevalence of pain and anxiety among pediatric patients during hospitalization, the impacts of undertreated pain and anxiety during hospitalization on pediatric patients and their caregivers, contributing factors and interventions to improve HCP knowledge and implementation of pediatric pain management. Researchers have reported that pediatric patients routinely undergo painful procedures during their hospitalization (Senger et al., 2021; Stevens et al., 2011). Commonly reported painful procedures included venipuncture, phlebotomy, lumbar puncture, and wound care. These findings are not limited to Canadian pediatric hospital settings, with researchers from the USA and Mexico also reporting high reported pain levels in their pediatric patient population (Cummings, 2015; Kozlowski et al., 2014; Ortiz et al., 2012). It was concluded that many misconceptions and negative attitudes exist among the nursing profession in regards to pediatric pain management. Researchers reported that nurses believe many misconceptions in relation to pediatric pain and its management (Peirce et al., 2018; Van Hulle Vincent, 2005). For example, a high number of nurses surveyed felt that children tolerate pain better than adults. However, there are positive reporting's related to nurses' use of and satisfaction with pediatric sedation. Nurses have significantly higher satisfaction with using midazolam (Mdn = 8.0, IQR 7-9) during sedations when compared to other sedative medications, such as ketamine (Mdn = 5.0, IQR 3-7)

(Curatola et al., 2022). Limited research was available regarding nurses' practices during pediatric sedation. Curatola et al. (2022) reported that nurses routinely monitored patients during sedation and recovery as well as initiated intravenous access as necessary.

The consequences of undertreated pain and anxiety during hospitalization are high. Without adequate pain and anxiety management during medication procedures, pediatric patients and their caregivers may be negatively impacted in areas such as satisfaction with care, patient safety and overall well-being and psychological health (Chen et al., 2000; Crumm et al., 2020; Malia et al. 2019; Noel et al., 2010). Additionally, pain-related conditions have been associated with high healthcare expenditures (Canadian Pain Task Force, 2020; Groenewald et al., 2015). Several contributing factors were identified from the literature review. These included lacking healthcare provider knowledge, time constraints, lack of appropriate personnel, and insufficient medication orders (Bar Am et al., 2021; Czarnecki et al., 2011; Peirce et al., 2018; Sahyoun et al., 2021; Thomas et al., 2015; Twycross & Collins, 2013).

Educational interventions were implemented to determine their effectiveness on improving nurses' knowledge and use of pediatric pain assessment and management (Habich & Letizia, 2015; Le May et al., 2009; Smeland et al., 2022). Intervention delivery methods varied between the studies. Both Le May et al., 2009 and Smeland et al., 2022 delivered their educational intervention via in person workshops and capsules. However, Habich and Letizia (2015) delivered their intervention through an online module and supplemented this with a practice protocol to outline best and required practices for pain management. Both in-person interventions resulted in significantly improved knowledge scores among the nurses in the study (Habich & Letizia, 2015; Le May et al., 2009). Specifically, Habich and Letizia (2015) reported that mean pre-test scores significantly improved from 56.8 (SD = 13.7) to 69.4 (SD = 15.9) post-

intervention ($p = 0.000$). Smeland et al. (2022) did not find significant improvements following their intervention. The post-mean scores for the two both the intervention and control groups were equivalent, indicating that no significant improvement in knowledge was observed. However, it is notable that the intervention group initially started with a lower mean baseline score of 27.8 compared to the control group's mean baseline score of 30 (Smeland et al., 2022). This indicates a positive change in nurses' knowledge of pediatric pain management.

An additional study recently implemented a minimal sedation protocol which included a detailed outline of minimal sedation procedures, indications for use, and dosing of midazolam for sedation (Rava et al., 2023). Fifty percent of the participants successfully completed both sedation and the required medical procedure. However, 23.1% of the participants who received sedation as per the protocol were not able to complete the required medical procedure. Although the results of this study are mixed, the majority of participants met the desired outcome of successfully receiving both sedation and ordered medical procedure (Rava et al., 2023).

Following the analysis of these various interventions targeted at improving pediatric pain management, it was determined that educational interventions which focused on in-person learning provided more statistically significant improvements in nurses' knowledge. Also, the implementation of practice guidelines has shown to be effective in increasing use of sedation for pain and anxiety management and facilitating the implementation of necessary medical procedures. For these reasons, my practicum project will focus on two means of topic delivery. First, a practice policy outlining required practices and criteria for pediatric minimal sedation in the ED will be developed. To supplement the implementation of this policy, a pediatric minimal sedation and pain management educational program for Registered Nurses working in the ED will be created.

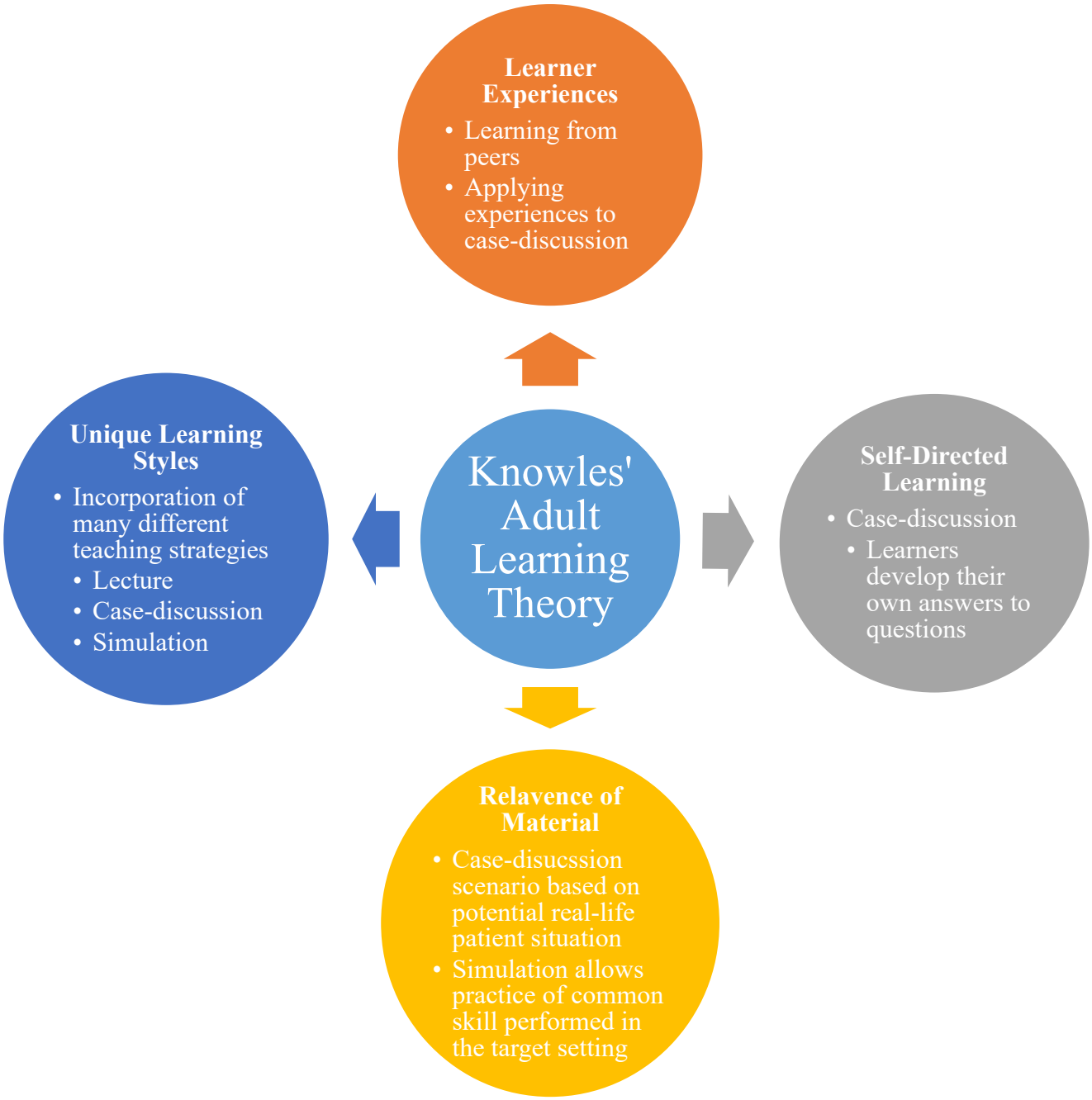
Theoretical Framework

Knowles' Adult Learning Theory

Developed by Malcolm Knowles', The Adult Learning Theory provide fundamental principles for adult learning. Adult education requires different techniques and methods to that of childhood teaching (Collins, 2004) (see Figure 1). Based on Knowles' theory, it is important to acknowledge that adult learners have pre-existing experiences and knowledge levels which enables them to connect these pre-perceptions to new learnings. By including case-based simulations and scenario discussions to this proposed pediatric minimal sedation resource, emergency nurses will have the ability to apply their knowledge and contribute ideas which are sourced from their pre-existing experiences (Collins, 2004; Knowles, 1990). This is also true in the principle of active learning. Knowles' Adult Learning Theory describes how adults learn best when they are able to participate actively in their learning process (Collins, 2004). Case-based discussions enable nurses to actively engage in discussion with their educator and peers, which enables them to focus on their areas of strengths and weaknesses. I will facilitate this by including educational content where learners must engage in discussion of a patient scenario that they may encounter in their working environment. Learners will then be able to discuss their unique approaches to solving the problem presented in the scenario. Adult learners learn best in a variety of ways (Knowles, 1978). Therefore, it is important for educators to provide education through various means (Collins, 2004). Based on this reasoning, this educational resource will include a variety of educational delivery methods, such as lecture, policy practice guidelines and case-based simulations. This will help accommodate for the multiple needs of the learner.

Figure 1

Diagram of Knowles' Adult Learning Theory



Summary of Environmental Scan

The environmental scan focused on identifying existing pertinent resources from two main sources: published literature and credible websites. Each resource was scanned for

relevancy and then reviewed in detail. Pertinent information from the identified resources is organized within a summary table. Such information includes resource type (policy or educational resource), topic and contents, method of delivery, and learning strategies. Searches from the published literature yielded two resources: one practice guideline document and one article which outlined the implementation of a multi-faceted educational intervention (Coté & Wilson, 2019; Ratnapalan & Schneeweiss, 2007). A Google search uncovered five websites which contain both pediatric sedation policies and an educational resource. These websites included: ***1) IWK Health Centre (2019), 2) National Emergency Nurses Association (2019), 3) The Society for Pediatric Sedation (2009), 4) The University of Texas Medical Branch (2023), and 5) Texas Children's Hospital Evidence-Based Outcomes Center (2014).*** All resources obtained during the environmental scan were analyzed for key features such as type of resource, content focus, length of resource, delivery methods, and learning strategies.

Environmental Scan Key Findings

The findings of the environmental scan were based on resources that are pertinent to pediatric minimal sedation in the ED. A total of seven resources were extracted from searching the literature and credible websites. Through the analysis of the resources obtained during this environmental scan, three main themes were identified: 1) *mode of delivery*, 2) *resource content, and 3) scope of practice*. Notably, a scan of the local setting's employee LEARN website and policy portal did not yield any relevant resources. Evidently, the type of resource being proposed within this practicum project is required to encourage positive and patient-focused change within the setting.

Two educational resources pertaining to pediatric procedural sedation were retrieved during the environmental scan. A common mode of delivery between the two resources was

didactic lectures, with lecture length varying between 2-3.5 hours. Both resources also included supplemental strategies to support the delivery of information to HCPs (Ratnapalan & Schneeweiss, 2007; The Society for Pediatric Sedation, 2009). The strategies included the development of a sedation pocket card, small group case-discussions, and simulations (Ratnapalan & Schneeweiss, 2007; The Society for Pediatric Sedation, 2009). The multi-faceted approach to education met the needs of adult learning principles by providing multiple methods of learning to meet the unique needs of the adult learner. Evaluation of the effectiveness of the educational intervention involved both written and multiple-choice examinations. A document published by the National Emergency Nurses Association (2019) emphasized that it is within the scope of a registered nurse to care for patients in the ED who undergo sedation. This emphasizes the need for thorough resources and policies to support this practice. Please refer to the table in the Appendix for a summary of these resources.

Summary of Consultations

Data for the consultation phase of this practicum project was collected via a Microsoft Forms questionnaire. Two different questionnaires were developed for nursing and physician employees. These two questionnaires were developed based on the objectives of the consultation plan and included closed-ended, open-ended, dichotomous, and Likert scale questions. The questionnaire for nurses included 14 closed-ended questions and four open-ended questions. The physician questionnaire consisted of 12 closed-ended questions and four open-ended questions. A recruitment letter containing a link to the questionnaire was distributed to potential participants via email. The employees who agreed to participate via the online questionnaire clicked the online link or scanned the QR code within the email and completed the questionnaire. Furthermore, paper copies of the questionnaires were provided within the Janeway Emergency

Department nursing station for individuals who were unable to complete them online. A total of 45 surveys were distributed to registered nurses and physicians, however only 13 completed to questionnaire. The questionnaire took approximately 10-15 minutes to complete. Aiming to minimize the occurrence of response bias, participants were only able to view their own responses to the questionnaire. The questionnaire was anonymous and did not include any identifiable personal information.

Consultation Key Findings

The consultations with registered nurses and physicians at the Janeway ED obtained insights on current practices and perceptions of pediatric minimal sedation. Additionally, opinions of current standards of education and policy development were collected. As can be seen in Table 1, a total of 13 employees completed the questionnaire. Ratings of current education were mostly good (45%) and fair (27%) among registered nurses and both average (50%) and fair (50%) among Physicians. Notably, 100% of the participants felt that a pediatric minimal sedation policy and educational resource was needed for the healthcare setting. All of the participants reported that they were very likely to participate in an educational session and follow a policy for pediatric minimal sedation in the ED. Preferred modes of delivery were comparable, with registered nurses and physicians preferring lecture/workshop (RNs 81%, physicians 100%), self-directed module (RNs 63%, physicians 100%), and simulation (RNs 81%, physicians 100%). Participants identified several important topics for inclusion, which included types of sedation, indication for use in the ED, medications for sedation and their dosages, monitoring and documentation requirements for pediatric minimal sedation, and discharge teaching instructions for parents and caregivers.

Table 1

Pediatric Minimal Sedation Policy and Education Resource (Registered Nurses and Physicians)

Questions	Registered Nurses n (%)	Physicians n (%)
How would you rate current education of Pediatric minimal sedation at the Janeway Emergency Department?		
Excellent	1 (9%)	0 (0%)
Good	5 (45%)	0 (0%)
Average	1 (9%)	1 (50%)
Fair	3 (27%)	1 (50%)
Poor	1 (9%)	0 (0%)
Do you recall receiving education for pediatric minimal sedation since working at the Janeway ED?		
Yes	3 (27%)	2 (100%)
No	8 (73%)	0 (0%)
Do you feel that a pediatric minimal sedation policy and formal educational resource is needed in the Janeway emergency department?		
Yes	11 (100%)	2 (100%)
No	0 (0%)	0 (0%)
How likely are you to participate in a pediatric minimal sedation educational session and follow a pediatric minimal sedation policy?		
Very likely	11 (100%)	2 (100%)
Somewhat likely	0 (0%)	0 (0%)
Neither likely nor unlikely	0 (0%)	0 (0%)
Somewhat unlikely	0 (0%)	0 (0%)
Very unlikely	0 (0%)	0 (0%)
If participating in this educational resource, which delivery methods would work best for you? Please select all that apply.		
Lecture/workshop	9 (81%)	2 (100%)
Self-learning module	7 (63%)	2 (100%)
Simulation	9 (81%)	2 (100%)
Case discussion	5 (45%)	1 (50%)
Other	0 (0%)	0 (0%)
What topics do you feel would be important to include in a pediatric minimal sedation policy and educational resource? Please select all that		

Questions	Registered Nurses n (%)	Physicians n (%)
apply.		
Pediatric pain assessment	8 (13%)	1 (50%)
Types of sedation and their indications for use in the ED	11 (100%)	2 (100%)
Medications used for sedation and their dosages	11 (100%)	1 (50%)
Monitoring and documentation requirements for pediatric minimal sedation	10 (91%)	1 (50%)
Patient discharge criteria	9 (82%)	1 (50%)
Discharge teaching topics for parents and caregivers	10 (91%)	1 (50%)

Data regarding nurses' current knowledge of important pediatric minimal sedation concepts were collected through self-perceived reporting. As presented in Table 2, indications for minimal sedation in the pediatric ED were rated the lowest overall, with only 18.2% rating their knowledge as expert. Overall, nurses rated their knowledge of pediatric pain assessment highest in comparison to the other concepts.

Table 2

Participants' Self-Perceived Knowledge (Registered Nurses)

Self-perceived knowledge levels of the following pediatric minimal sedation topics	**Expert knowledge n (%)**	**Good knowledge n (%)**	**Adequate knowledge n (%)**	**Limited knowledge n (%)**	**Not knowledgeable n (%)**
Indications for minimal sedation in the pediatric emergency department.	2 (18.2%)	2 (18.2%)	2 (18.2%)	2 (18.2%)	2 (18.2%)
Fundamentals of pediatric pain assessment	4 (36.4%)	5 (45.5%)	2 (18.2%)	0 (0%)	0 (0%)

In addition to the quantitative data, four major themes were identified from the qualitative

data obtained during the consultations. Qualitative data was collected through analysis of the open-ended questions. The identified themes support the findings from the quantitative portion of this consultation. The four major themes are ***1) standardization of care and education, 2) patient safety, 3) current practices, and 4) lack of formal education and workplace resource.*** The need to standardize care and education for pediatric minimal sedation in the ED was commonly identified by the participants. One registered nurse noted that "*Department specific, concrete guidelines are required regarding first line treatment, dosage, monitoring, and discharge criteria post-sedation*." Many participants commented on the importance of ensuring safety during sedation. Registered Nurses described that they routinely perform sedative medication administration, patient monitoring during and after sedation, assistance with medical procedure, and discharge teaching. Physicians reported that their responsibilities with minimal sedation include *"pre-sedation assessment, ordering of sedative medications, management of complications, and medical procedures."*

Summary of the Resource

The development of this resource was informed by the various findings from the literature review, environmental scan, and consultations. This pediatric emergency minimal sedation resource involves two portions 1) a practice policy, and 2) an educational resource manual (see Appendix E). It was important to first develop a practice policy, as the target organization lacks an existing policy to outline best and required practices during pediatric minimal sedation in the ED. To aid in the delivery of this policy and key information, a half-day workshop was created. During consultations with stakeholders, both registered nurses and physicians highly preferred to learn via workshop. Additionally, the literature supports the development of workshops and policies. In-person interventions on pediatric pain management

resulted in significantly improved knowledge scores among the nurses in two studies (Habich & Letizia, 2015; Le May et al., 2009). Specifically, Habich and Letizia (2015) reported that mean pre-test scores improved from 56.8 (SD = 13.7) to 69.4 (SD = 15.9) post-intervention ($p = 0.000$). To accommodate for the various learning needs of each individual, a multi-faceted approach was adopted. The half-day workshop involves lecture, case-discussion, and simulation, all of which are different means to provide education.

Pediatric Minimal Sedation Policy

As indicated in both the environmental scan and consultations, a lack of resources exists in the target setting. Specifically, a policy does not exist regarding pediatric minimal sedation in the ED. To promote best practices and standardization of care, this developed resource includes such policy. The developed policy includes an overview of pediatric minimal sedation, a list of possible indications, roles and responsibilities of healthcare providers, required supplies, medication dosing, and guidelines for discharge criteria. This will ensure that all care during pediatric minimal sedation in the ED is consistent and following best practices. Please refer to the Policy in the Appendix.

Summary of Educational Manual Resources

The developed workshop should be conducted in a meeting space or classroom that is able to accommodate space for hands-on teaching and skills. This workshop has been designed to allow for a minimum of 6 participants and a maximum of 12 participants. The included attendance record must be distributed to participants for recording of education. A registered nurse or other healthcare professional who has knowledge of emergency or critical care of the pediatric patient should deliver this workshop. Potential instructors should attend a workshop

prior to teaching this workshop. This workshop manual contains supporting information to help facilitate the learning activities. The contents within this manual should be reviewed prior to instructing. The clinical educator of the target setting is responsible for facilitating and tracking education of registered nurses, therefore they would be responsible for documenting completion of the education. This workshop should require 3-3.5 hours to implement. As this workshop should be included in the orientation period of emergency room registered nurses, scheduled times will vary. Two 15-minute breaks have been incorporated into this workshop. Both theoretical and practical information included in the resource are taught utilizing various educational strategies. Developing a resource that is multi-faceted in its teaching methods was important, as this follows the principles of Knowles' (1978) adult learning theory. This theory, which acted as the theoretical framework for this practicum project, emphasizes that adult learners are unique and therefore they do not learn the same way. The resource manual included in this report provides detailed explanations of the resource.

Pre-Test/Post-Test Questionnaire

At the beginning of the workshop, learners are required to complete a pediatric minimal sedation pre-test questionnaire. The purpose of this questionnaire is to gather information regarding participant's baseline knowledge of the topic. The questionnaire consists of ten multiple choice and true or false questions which pertain to the topics and information included in the workshop. Participants have 15-minutes to complete the questionnaire. The pre-test questionnaire will not be graded until the post-test is completed. The post-test questionnaire will be completed at the end of all learning activities. Once all learners have completed the post-test, the instructor will read the answers aloud. There is no pass or fail grade. Learners will self-grade their questionnaires and return to the instructor before exiting the workshop. Both questionnaires

include the same questions to determine whether participant knowledge changed following participation in the workshop.

Mode of Delivery

For the educational portion of this resource, a workshop containing multiple teaching strategies was developed. The workshop begins with a lecture presentation. As this type of delivery method does not promote learner engagement, additional teaching strategies were incorporated into the workshop. Following the completion of the lecture, learners will participate in case-discussion and simulation sessions based on the learning objectives and information presented in the lecture.

Lecture

The information derived from the literature review and environmental scan was utilized to develop the PowerPoint lecture that is included in the workshop. This portion of the workshop is important as it provides most of the theoretical information and ensures that participants are given a baseline knowledge of both the principles of pediatric minimal sedation and the developed policy. The lecture takes approximately one hour to complete. Topics include an overview of pediatric minimal sedation, medication dosing, administration of medication via intranasal route, the importance of providing pain and anxiety management during medical procedures, and an introduction to the developed policy, with incorporation of questions from the participants. Several interventional research studies for pediatric pain management included lecture or workshops and noted statistically significant or positive impacts on their setting (Habich & Letizia, 2015; Le May et al., 2009; Smeland et al., 2022). As described by Knowles'

(1978) adult learning theory, adult learners require background knowledge of information in order to determine whether it is relevant to their practices.

Case-Discussion

The incorporation of case-discussion allows registered nurses to apply the theoretical knowledge they have learned to a scenario that they could encounter during their practice. One case study is included in the workshop. Information from the consultations determined that stakeholders valued case-discussion as a form of education. Participants are required to divide into groups of 3-4 people to collaborate and determine the best answers to each question of the case. Once everyone has completed the case, groups will read their answers aloud and receive feedback from their peers and instructor. This portion of the workshop takes approximately 15 minutes to complete. As a major foundation in Knowles' adult learning theory, the case-discussion allows participants to share their experiential knowledge with their peers.

Simulation

As indicated in the literature review, workshops with simulation and practice guidelines have proved to be beneficial in promoting pediatric pain management, improving nurses' knowledge, assessment, management, attitudes, beliefs, and self-reported confidence (Augarten et al., 2006; Corwin et al., 2012; Gagnon et al., 2016; Ramira et al., 2016; Santervas et al., 2010). In addition, consultations with stakeholders determined that hands-on learning was highly rated. The simulation opportunity included in this resource facilitates the development of practical skills. During this simulation, learners will have the ability to practice preparing and administering minimal sedation medication via the intranasal route of administration. The aim of this simulation is to allow registered nurses the opportunity to practice the administration of

medication via the intranasal route. The instructor will monitor practices of each learner and provide feedback as needed. This simulation will take approximately 45 minutes to complete. Applicable to Knowles' adult learning theory, this simulation allows the learner to participate in hands-on learning that is applicable to their practice.

Workshop Evaluation

At the end of the workshop, learners will have the opportunity to evaluate the workshop and provide feedback. This will be helpful in determining the effectiveness and reception of the workshop and whether changes to the resource are needed. The instructor will collect all evaluative materials.

Discussion of Advanced Nursing Practice (ANP) Competencies

During this practicum course, I had the opportunity to the advanced nursing practice (ANP) competencies of research, leadership, and education. Development of these competencies are critical when advancing to advanced nursing roles.

Research

Advanced practice nurses (APNs) incorporate research in their practice by committing to the generation, synthetization, criticism, and application of research evidence (Canadian Nurses Association, 2019). This practicum allowed me to apply the many research utilization competencies that I have learned throughout this MScN program. A literature review was conducted, which required searching and analysis of the applicable published literature within various databases. I performed critical appraisals of the chosen literature utilizing the various critical appraisal tools such as the Public Health Agency of Canada (PHAC) (2014) critical appraisal toolkit and the Lincon and Guba (1985) framework for trustworthiness. These tools

helped me determine whether research articles were appropriate to inform the development of my project. The gathered literature was then synthesized. Consultations were completed with stakeholders. Collection of data during the consultation phase allowed me to practice the APN competency of collecting data to inform changes in patient care. These various research sources helped direct the development of the resource. In the collection of research data in the literature review for this practicum, it is important that data is collected appropriately. Survey responses remained confidential to ensure privacy of the survey respondents. Additionally, it is essential that data utilized is determined to be reliable and of sound quality. The Canadian Nurses Association (2019) have identified that APNs possess the skills to identify, appraise, and apply research in the determination of best practice. I achieved this competency by thoroughly evaluating and researching existing research from numerous sources to develop concrete guidelines for minimal sedation in the pediatric ED which follow best practice evidence.

Leadership

Advanced Practice Nurses (APNs) act as leaders in their practice area by seeking ways to improve practice and embracing changes which improve the effectiveness of care practices (Canadian Nurses Association, 2019). I demonstrated leadership in my practice by identifying the practice issue of non-compliance with minimal sedation best practices and developing a resource which may then be utilized to improve nursing practice and patient safety. As I have identified this practice problem, I developed an intervention to improve upon this problem, with the aim to improve overall patient care and safety. When this resource is implemented in practice, I will act as a mentor in the introduction phase of implementation, furthering my role as a leader for positive practice change.

Education

Advanced Practice Nurses (APNs) commit to furthering their education through professional growth and supporting education of other healthcare providers, students, and patients in relation to their health (Canadian Nurses Association, 2019). Developing this practicum project allowed me to grow professionally, as I applied the various knowledge and skills that I have obtained throughout this MScN program. I developed a resource to support Registered Nurses working in the ED who participate in pediatric minimal sedation. The application of this knowledge has increased my confidence and competence as a professional nurse practicing in an advanced role. This resource will further support my colleagues and others working in different EDs across the province by outlining proper procedures related to minimal sedation. Additionally, I demonstrated this competency by conducting a consultation report which identified the learning needs and preferences of the stakeholders within the organization. The data collected during the consultation phase of the project helped to inform the contents during the educational portion of the resource. To support the uptake of the developed policy, an educational resource was created to promote the importance of following the procedures that are outlined in the policy.

Next Steps

Implementation of the developed resource is beyond the scope of this practicum project. As such, a next step would be to seek approval from the target organization for the implementation of this resource. This would involve collaboration with the organization's clinical educator and other members on the management team. I would provide the organization with important background information and a detailed overview of the developed resource. Additionally, it would be important to identify potential instructors for this resource. As the

clinical educator is knowledgeable in the practice area of pediatric emergency care and is responsible for education of staff members, they could be responsible for the instruction of this resource.

Conclusion

Adequate pain management during hospitalization and painful procedures is an important aspect of holistic nursing care for the pediatric population. Through a review of the relevant literature, consultations with registered nurses and key stakeholders, and the conduction of an environmental scan, it was evident that intervention is necessary to improve practices related to pediatric minimal sedation in the ED. The results from each phase of the initial foundational work of this practicum project has led to the conclusion that knowledge of pediatric pain and its management is lacking among registered nurses and that educational and policy supports are both lacking and inconsistent within the local setting. Consequently, patient outcomes are suboptimal, and interventions should be developed to improve them. The implications from these findings act as a motivator for positive changes with pediatric pain management during painful and anxiety inducing procedures at the local setting. This practicum project encompassed the development of two complementary resources which will help support registered nurses when caring for pediatric patients in the ED who are undergoing medical common medical procedures and require minimal sedation. These resources include the development of a practice policy, outlining required practices when performing minimal sedation, as well as an educational intervention to reinforce important topics of pediatric pain and anxiety management. Additionally, the educational intervention facilitates the introduction and implementation of this developed policy to registered nurses' working in the targeted setting.

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Appendix A: Literature Review

Development of a Pediatric Minimal Sedation Resource for Emergency Registered Nurses

A Literature Review

Minimal sedation or anxiolysis has been defined as "a drug-induced state during which patients respond normally to verbal commands" (American Society of Anesthesiologists, 2019, para. 1.). Common medications utilized in the emergency department (ED) when initiating minimal sedation include benzodiazepines such as Midazolam, Nitrous Oxide, and Fentanyl (Stern & Pozun, 2023). Although a patient's cognitive and physical functions are impaired during this type of sedation, reflexes of the airway as well as ventilatory and cardiovascular functions are not impacted by this form of sedation (American Society of Anesthesiologists, 2019). For this reason, minimal sedation has beneficial implications during procedures in the ED among the pediatric (aged 17 or younger) patient group. However, it is important to note that due to various pre-existing conditions and co-morbidities, it is possible that the patient may fall into a deeper level of sedation than is aimed (Benzoni & Cascella, 2019). Therefore, it is critical that healthcare workers who are administering minimal sedation to pediatric patients in the ED are prepared to intervene in the event of an unexpected sedation outcome.

While physicians are commonly the procedural sedation provider, nurses can act as the overseer of the sedation and is responsible of monitoring the patient through continuous patient monitoring and documentation (International Committee for The Advancement of Procedural Sedation, 2016). Barriers to implementation of minimal sedation in the ED have been reported as lack of healthcare provider knowledge, healthcare provider shortages, insufficient medical orders, and time constraints (Bar Am et al., 2021; Czarnecki et al., 2011; Peirce et al., 2018; Sahyoun et al., 2021; Twycross & Collins, 2013). Undertreated pain and anxiety during hospitalization can negatively impact a patient's psychological well-being and caregiver

satisfaction with care (Chen et al., 2000; Crumm et al., 2020; Hwang et al., 2023; Malia et al. 2019; Noel et al., 2010).

Recently published research supported the implementation of educational interventions for emergency nurses to improve their knowledge of pediatric pain management and procedural sedation during procedures in the ED. Areas of lacking knowledge have been commonly reported as related to pediatric pain and distress assessment and management strategies (Bar Am et al., 2021; Peirce et al., 2018). The following literature review will include the presentation of a proposed practicum project targeting emergency nurses who care for pediatric aged patients receiving minimal sedation in the ED.

Literature Review Methods

This literature review consisted of an extensive search of the literature utilizing the following databases: Cumulative Index to Nursing and Allied Health (CINAHL), PubMed, Google Scholar, and Cochrane Library. The literature search was limited to include peer-reviewed articles written in the English language. Several key questions helped guide this literature review: "What are the learning needs of Registered Nurses who participate in pediatric minimal sedation?", "What are the current practices of and barriers to administering or following best practices during pediatric minimal sedation?", and "What are the best teaching strategies to help support Registered Nurses when implementing new policy-based procedures for pediatric minimal sedation in the ED?". Keywords utilized during the literature search include: *"sedation", "minimally conscious state", "pediatric nursing", "pediatric emergency nursing", "emergency nursing", "child", "pediatrics", "pain, procedural", "treatment related pain", "anxiety", "midazolam", "antianxiety agents, benzodiazepine", "nursing knowledge", "education", "policy", "professional development"*. The Public Health Agency of Canada

(PHAC) Critical Appraisal Toolkit was utilized to critically appraise the quantitative studies (Public Health Agency of Canada, 2014). To critically appraise qualitative research articles, the Lincoln and Guba (1985) framework for trustworthiness was utilized. A literature summary table was utilized to summarize many of the articles, which can be found in Appendix A.

Literature Review

This literature review presents a summary of the main topics of pediatric minimal sedation, while examining the prevalence of pain and painful procedures among the hospitalized pediatric aged population. Subsequently, nurses' knowledge, attitudes, and practices of pediatric minimal sedation is explored. Common contributing factors such as lack of healthcare provider knowledge, time constraints, insufficient medical orders, and staff shortages is discussed. Moreover, interventions and strategies that have been proposed in the literature is explored. Following this review of the literature, gaps in the literature are presented, and connections are drawn between the supporting literature and the development of the proposed policy and educational-based resource.

Overview of Pediatric Minimal Sedation

The International Association for the Study of Pain (IASP) (Raja et al., 2020) has defined pain as an aversive sensory and emotional experience that is often caused by actual or potential tissue injury. Pain can be categorized as either acute or chronic. Acute pain is often associated with a developing disease (i.e. exacerbated pain associated with a known disease or the conduction of an invasive medical procedure). Chronic pain encompasses recurrent, occurring at least three times during a three-month period, and persistent, lasting more than three months, pain (Williams et al., 2016). The Health Standards Organization (HSO) (2023), in collaboration

with Solutions for Kids Pain (SKIP), recently published The Pediatric Pain Management Standard, which is the first Canada-wide standard aiming to guide policies and practices surrounding pediatric pain management. This set of guidelines were developed to help improve pediatric pain in all realms, such as healthcare research and practice, highlighting the importance of providing evidence-informed and person-centered pain management for children (HSO, 2023). These standards further support the need to improve upon pain management interventions for pediatric patients. Strong support, through policy and education development, must therefore be prioritized in the healthcare setting.

The emergency department (ED) at the Janeway Children's Hospital, the targeted setting of this practicum project, provides care to children of the province of Newfoundland and Labrador who require emergency care and interventions. When painful or anxiety inducing procedures are required within this healthcare setting, various levels of sedation are available. Procedural sedation involves the administration of sedatives, dissociative agents, or analgesics to produce a patient state which enables them to tolerate unpleasant procedures while preserving their cardiorespiratory function (American College of Emergency Physicians, 1998). Various levels of sedation exist, each having different indications for use in the pediatric population. Researchers have reported that minimal sedation, otherwise referred to as anxiolysis, is an effective way to treat pain and anxiety in children who undergo minor procedures in the ED (Lane & Schunk, 2008). Minimal sedation has been defined as a drug-induced state that allows patients to respond normally to verbal commands (American Society of Anesthesiologists, 2019; Williams et al., 2020). Common medications utilized in the emergency department (ED) when initiating minimal sedation include benzodiazepines such as Midazolam, Nitrous Oxide, and Fentanyl (Stern & Pozun, 2023). Although a patient's cognitive and physical functions are

slightly impaired during this type of sedation, reflexes of the airway as well as ventilatory and cardiovascular functions are not impacted by this form of sedation (American Society of Anesthesiologists, 2019). For this reason, minimal sedation has beneficial implications during procedures in the ED among the pediatric (aged 17 or younger) patient group. The Canadian Pediatric Society recently published a position statement which supports safe and effective administration of the pharmacologic agents which provide sedation in the ED when necessary (Krmpotic et al., 2021). The main goal of sedation of pediatric patients is to limit pain, discomfort, and distress that can be associated with medical procedures.

Pediatric Pain Prevalence During Hospitalization

Many researchers have reported on the prevalence of pain and anxiety among pediatric aged patients related to hospitalization. While much data has been reported within Canada and internationally, limited research exists from Newfoundland and Labrador.

Two medium quality cross-sectional studies (Senger et al., 2021; Stevens et al., 2011) were conducted which examined the prevalence of pain and painful procedures among children who were hospitalized in Canadian hospitals. Through chart audits, researchers were able to determine when children underwent painful procedures and if their pain was treated effectively. Between October 2007 and April 2008, Stevens et al., (2011) reported that out of the 3822 children included in their study, 2987 (78.2%) had undergone at least one painful procedure during their hospitalization. Senger et al. (2021) reported similar findings, noting that 69 participants of their total sample (n=84), or 82% reported experiencing a painful procedure while hospitalized. Commonly reported painful procedures were venipuncture, phlebotomy, lumbar puncture, and wound care.

International research findings are congruent with Canadian research, as researchers from various countries have also identified a high prevalence of pain and painful procedures among hospitalized pediatric patients. In the USA, researchers have noted a high prevalence of pain-related ED visits. A medium quality cross-sectional study reported that 19.7 million out of 35 million pediatric ED visits (55.6%) in 2017 were related to pain (Anderson et al., 2021). These rates are congruent with an additional cross-sectional study in which researchers surveyed pediatric patients regarding their experiences with pain and its management while hospitalized (Kozlowski et al., 2014). Of the 200 patients included in the study, 86% reported experiencing pain while admitted to the hospital. Of note, 40% of the participants reported their pain as being moderate or severe. To further explore the experiences of pediatric patients who experience procedural pain, Cummings (2015) conducted a high quality ethnocentric qualitative research study. The researcher presented a unique perspective, observing experiences of pediatric patients who were cared for in a non-pediatric ED. Researchers noted that common sources of procedural pain included procedures such as suturing of lactations, venipuncture, peripheral intravenous insertion, surgical sites, and existing medical conditions (Cummings, 2015; Kozlowski et al., 2014).

Similarly, research from other countries such as Mexico (Ortiz et al., 2012) and South Africa (Velazquez Cardona et al., 2019) have reported high prevalence of pain and painful procedures among the hospitalized pediatric population. Both Ortiz et al. (2012) and Velazquez Cardona et al. (2019) employed cross-section study designs which are rating moderate in quality. While Velazquez Cardona et al. (2019) aimed to determine the prevalence and severity of pain among the pediatric inpatient population at a South African tertiary hospital, Ortiz et al. (2012) focused on the ED setting. Furthermore, Ortiz et al. (2012) investigated medical procedures

performed in the ED setting that were likely to cause pain and anxiety in the pediatric aged population.

A total of 63 pediatric aged participants were included in the study by Velazquez Cardona et al. (2019), with 86% of participants reporting that they experienced pain during their admission to the hospital. Patients most commonly reported experiencing their worst pain during medical procedures such as needle pokes (34%) and other medical procedures (14%). These findings are congruent with the study by Ortiz et al. (2012). With a total of 279 children included in the study, the participants reported experiencing a cumulative total of 459 procedures during their time in the ED. Of these procedures, 80.4% and 77.8% of them were rated as painful and stressful respectively. Additional painful and stressful procedures reported in the study include plaster casting and splinting, care of excoriated skin, and clinical examinations (Ortiz et al., 2012). Evidently, researchers have established that pain and anxiety in the pediatric patient population is especially prevalent during common medical procedures. This indicates that interventions to alleviate this practice issue are lacking or are not being implemented adequately.

Although there is a lack of research available from the local setting of Newfoundland and Labrador, existing national and international research that has reported the prevalence of pediatric pain during hospitalization indicates that this is a major practice issues which requires prompt intervention to provide better quality of care to this patient population.

Following the completion of this literature review, it was determined that there is a lack of research concerning nurses' perceptions and practices regarding minimal sedation or other types of procedural sedation in the pediatric population. Only one study was found that specifically focused on procedural sedation. However, there are studies that have examined

nurses' attitudes, knowledge, and practices regarding the use of minimal sedation and pediatric pain management, which will be discussed in the next section.

Nurses' Attitudes, Knowledge, and Practices of Pediatric Minimal sedation

Several studies have been conducted that have reported nurses' attitudes and practices with pediatric pain management and pediatric procedural sedation (Curatola et al., 2022; Peirce et al., 2018; Van Hulle Vincent, 2005). As data specific to pediatric minimal sedation is lacking, articles pertaining to the overall practices of pediatric pain management are included in this literature review.

When considering how best to improve pediatric procedural pain and anxiety management and compliance to minimal sedation guidelines, it is important to understand nurses' attitudes in relation to these practices. Three medium quality cross-sectional studies aimed to describe nurses' attitudes regarding pediatric pain management (Peirce et al., 2018; Van Hulle Vincent, 2005) and pediatric procedural sedation that is performed outside of the operating room (Curatola et al., 2022).

Both Peirce et al. (2018) and Van Hulle Vincent (2005) conducted surveys with nurses, which collected data regarding both pain management knowledge and attitudes. Focusing on the attitudes portion of their findings, overall attitudes from nurses were positive. Peirce et al. (2018) reported that their mean (n=229) attitude score was 72.46 out of a possible 100 (range 33.33- 93.33, SD 11.76). Interestingly, the researchers found that senior nurses, which is a promotional position within the study setting, reported the most positive mean attitude scores (M = 82.4, SD = 6.2) towards pediatric pain management in comparison to clinical nurses (M = 73.77, SD 10.0), registered nurses (M = 71.64, SD 12.6) and enrolled nurses (M = 68.89, SD 8.8). Peirce et al.

(2018) found this difference among nurse designations to be statistically significant ($p<0.05$). Although Van Hulle Vincent (2005) reported that nurses scored positively on the attitudes section of their survey, negativity regarding pediatric pain management was still evident. Over 50% of the respondents in each study agreed with pediatric pain management misconceptions including that children overreport their pain and believed that children can tolerate pain better than adults (Peirce et al., 2018; Van Hulle Vincent, 2005).

Curatola et al. (2022) focused their study specifically on nurses' perceptions of procedural sedation when completed outside of the operating room. The researchers conducted surveys with a total of 51 nurses who had experience with pediatric procedural sedation. Nurses reported significantly ($p<0.005$) higher satisfaction with sedations completed using midazolam (Mdn = 8.0, IQR 7-9) when compared to other sedative medications, such as ketamine (Mdn = 5.0, IQR 3-7). Factors which improved a nurses' perceptions of a successful sedation included quality and timing of patient recovery, type of drug, and route of delivery (Curatola et al., 2022). While no statistically significant findings were reported regarding perceptions of medication safety, nurses rated all included sedative medications, including midazolam, as highly safe for sedation.

Nurses are an integral member of the healthcare team when completing sedations for pediatric patients, therefore their perceptions of medication choices and need for pain management may be influential on the outcomes of their patients (Curatola et al., 2022). Therefore, it is crucial that nurses understand its indications for implementation so that patients receive higher-quality care during painful procedures.

Nurses play a crucial role when completing sedation to pediatric patients. However, much of the existing literature related to sedation roles and processes focuses solely on physicians. The National Emergency Nurses Association (2019) has supported the provision of care of pediatric

patients who receive sedation in the ED by emergency nurses. Specifically, Curatola et al. (2022) conducted a medium quality cross-sectional study exploring nurses' perceptions on the quality of procedural sedation in pediatrics based on type of medication. The researchers also reported that nurses play several pivotal roles during pediatric sedation. Such roles include establishment of intravenous access if necessary, monitoring of patient sedation, and patient recovery (Curatola et al., 2022).

Contributing Factors

Researchers examining pediatric pain management during hospitalization and procedures have reported several contributing factors to this practice issue. Major contributing factors identified from this literature review include a lack of healthcare provider knowledge, time constraints, lack of appropriate personnel, and insufficient medication orders (Bar Am et al., 2021; Czarnecki et al., 2011; Peirce et al., 2018; Sahyoun et al., 2021; Thomas et al., 2015; Twycross & Collins, 2013).

Lack of Healthcare Provider Knowledge

There is a lack of research specifically examining nurses' knowledge of minimal sedation. Therefore, studies on general pediatric pain management knowledge are included. Healthcare providers (HCPs) caring for pediatric patients in the ED should thoroughly understand pediatric pain management. Although a great deal of research exists to aid healthcare providers in understanding pediatric pain management, integration in clinical practice remains suboptimal (Bar Am et al., 2021; Peirce et al., 2018). Two medium quality cross-sectional studies were conducted with the aim to assess current management practices and areas for improvement in pediatric pain management. Bar Am et al. (2021) distributed their survey to 45 healthcare

providers employed at 31 rural or community-based emergency departments (EDs) in Canada, who care for pediatric patients. The researchers found that 33% of the participants reported inadequate knowledge of pediatric pain management. Peirce et al. (2018) disseminated the Pediatric Pain Knowledge and Attitudes Questionnaire (Revised) tool throughout an Australian pediatric hospital, specifically targeting nurses. This survey contained questions targeting nurses' attitudes and knowledge of pediatric pain management. The mean knowledge score among the 201 nurses who participated in Peirce et al. (2018) study was 77.56 out of a possible 100.

A significant barrier to pediatric pain management identified by the participants of both research studies was a lack of education/knowledge (Bar Am et al., 2021; Peirce et al., 2018). Peirce et al. (2018) further identified common knowledge areas regarding pediatric pain management that were most selected incorrectly by their sample of nurses. The most commonly incorrectly answered questions were related to minor procedural pain (64.4% answered incorrectly) and the use of sedative drugs for management of pediatric pain (47.9% answered incorrectly. Furthermore, 51% of respondents incorrectly responded that children tolerate pain better than adults (Peirce et al., 2018). This has important implications for this practicum proposal, as an adequate knowledge level is required so that Registered Nurses can adequately manage and treat pediatric pain during painful and distressing procedures.

Time Constraints

Time constraints are another barrier to effective pediatric pain management identified by researchers. Proper pain assessment and treatment require time and concentration. Registered nurses and other healthcare providers (HCPs) may feel they do not have enough time to manage their patient's pain (Czarnecki et al., 2011; Thomas et al., 2015). One survey was conducted in a pediatric hospital in Wisconsin (Czarnecki et al., 2011), and the other throughout three Canadian

pediatric emergency departments (Thomas et al., 2015). Participants of both studies were nurses caring for pediatric patients. The study by Thomas et al. (2015) focused specifically on the perspective of the triage nurse. Participants in both studies identified their self-perceived barriers to pediatric pain management.

Both groups of nurses identified time as a significant barrier to pediatric pain management. Czarnecki et al. (2011) specifically identified that insufficient time prior to procedures made it difficult for nurses to pre-medicate their patients ($\bar{x} = 4.57$; SD = 2.62; 0 = "not at all a barrier", 10 = "a major barrier"). This has implications for the argument that pain management is inadequate for pediatric patients undergoing painful procedures. Similarly, 92 out of the 125 participants (74%) in the study by Thomas et al. (2015) indicated that time was a barrier to implementing pain management when triaging pediatric patients. This is a significant barrier to prioritize when developing possible strategies to improve pediatric pain management during painful procedures. Nurses are at the forefront of and most commonly facilitate pediatric pain management. Strategies to address the lack of time to provide optimal pain management for pediatric patients would help to improve this common issue.

Lack of Appropriate Personnel

The lack of appropriate personnel was also identified as one of the barriers to pediatric pain management (Sahyoun et al., 2021). Sahyoun et al. (2021) conducted a medium quality, cross-sectional study that examined the current practice for pediatric procedural sedation within Europe. The researchers surveyed personnel from various European emergency departments. Physician and nursing shortages were commonly reported as a barrier to implementing procedural sedation in the ED, with 73% of the sites reporting physician shortages and 72% reporting nursing shortages which hindered their ability to perform pediatric procedural sedation.

Insufficient Medication Orders

Researchers have identified insufficient medication orders as another possible contributing factors to adequate pediatric pain management. Both Czarnecki et al. (2011) and Twycross and Collins (2013) conducted research studies to examine possible contributing factors to inadequate pediatric pain management. As mentioned previously, Czarnecki et al. (2011) conducted a cross-sectional survey with 272 nurses who worked with pediatric patients. Nurses in this study completed the "Barriers to Optimal Pain Management" survey. Twycross and Collins (2013) conducted a qualitative study in England through small focus groups with 30 nurses who cared for pediatric patients. While qualitative research does not allow one to draw conclusions of cause and effect, it provides valuable information to identify a targeted issue. The study by Czarnecki et al. (2011) is considered weak in design and the study had a very low response rate of 28% (PHAC, 2014). Through survey and focus groups, the researchers found similar themes. Many nurses indicated that they perceived insufficient analgesia orders as a barrier to pediatric pain management (Czarnecki et al., 2011; Twycross & Collins, 2013). Czarnecki et al. (2011) found this to be the most reported barrier in their study.

Impacts of Improper Pediatric Minimal Sedation in the ED

Without adequate pain and anxiety management during medication procedures, pediatric patients and their caregivers may be negatively impacted in areas such as satisfaction with care, patient safety and overall well-being and psychological health. Additionally, undertreated pain has created high healthcare costs. These negative impacts are further discussed in this section through presentation of the existing literature.

Impact on Patient Well-Being and Psychological Health

Pain experienced during medical procedures can negatively impact pediatric patients' psychological well-being (Chen et al., 2000; Noel et al., 2010). Both researchers conducted descriptive cross-sectional studies. While Chen et al. (2000) focused on pediatric patients undergoing lumbar punctures (LPs), Noel et al. (2010) studied pediatric patients undergoing venipuncture. Both studies had similar procedures. Chen et al. (2000) assessed their participant's anxiety and pain levels before, during, and immediately after the LP. Differing slightly, Noel et al. (2010) collected data regarding their anxiety and pain levels during and immediately after the venipuncture procedure. Both groups of researchers then conducted memory interviews, either prior to the participant's subsequent LP (Chen et al., 2000) or two weeks following the venipuncture (Noel et al., 2010). Participants were asked to rate their pain and anxiety levels based on their memories of the procedures (Chen et al., 2000; Noel et al., 2010). Both studies had conclusions that indicated high levels of self-reported pain immediately following the needle poke procedure led to increased anxiety associated with the procedure over time (Chen et al., 2000; Noel et al., 2010). Anxiety can have many negative effects on one's health and may be a lasting impact of pediatric pain. Additionally, Chen et al. (2000) concluded that greater negative memories associated with the LP predicted higher levels of distress for subsequent LPs. Evidently, painful memories associated with painful medical procedures may facilitate future negative impacts on the psychological well-being of pediatric patients. This evidence reinforces the need for healthcare providers to prioritize pediatric pain management during procedures so that anxiety associated with these procedures can be managed or possibly prevented.

Impact on Patient and Caregiver Satisfaction with Care

Researchers have noted that when procedural pain and anxiety are adequately treated in the pediatric population, patient and caregiver satisfaction with care improves. Considering this,

nurses and other healthcare providers who care for pediatric patients in the ED should strive to implement interventions to best promote care satisfaction. Two medium quality prospective cohort studies (Crumm et al., 2020; Malia et al. 2019) and a medium quality cross-sectional study (Hwang et al., 2023) were conducted to examine patient and caregiver satisfaction with care during ED procedures and sedation. While Crumm et al. (2020) and Hwang et al. (2023) aimed to determine predictors and facilitators of positive patient and caregiver satisfaction with their ED care, Malia et al. (2019) specifically focused on satisfaction with procedural sedation utilizing intranasal midazolam. A total of 424 participants were enrolled across the three studies. Via caregiver surveys and observations of patient and healthcare provider interactions during treatment, the researchers determined satisfaction levels.

The researchers noted that high levels of satisfaction were observed among caregivers regarding their child's medical procedure and the sedation method utilized (Crumm et al., 2020; Hwange et al., 2023; Malia et al., 2019). Malia et al. (2019) found that 90.4% of parents in their study were highly satisfied with intranasal midazolam usage during their child's medical procedure in the ED. Use of sedation during medical procedures were shown to produce significantly ($p<0.05$) high satisfaction with care among the caregivers in the studies by Crumm et al. (2020) and Hwang et al. (2023). Specifically, caregiver satisfaction with laceration repair was significantly ($p < 0.01$) improved when measures were taken to improve their child's pain and anxiety during the repair procedure. Ensuring that suitable sedation is selected for children during painful and anxiety-inducing procedures is crucial in order to produce high quality of care and caregiver satisfaction with care. As the literature has shown that pediatric sedation and treatment of pediatric pain and anxiety associated with ED procedures produces higher levels of

satisfaction with care, a lack of these types of interventions may negatively impact this patient outcome.

Healthcare Costs

It has been reported that pediatric pain-related conditions have been historically impactful on healthcare costs and expenditures (Canadian Pain Task Force, 2020; Groenewald et al., 2015). It has been estimated that chronic pain has a total direct and indirect cost of approximately $40 billion among the total population in Canada (Canadian Pain Task Force, 2020). In the USA, specific pediatric pain-related conditions are estimated to be associated with healthcare costs of $11.8 billion (Groenewald et al., 2015). These expenditures for pediatric-specific and non-pediatric specific pain conditions have burdensome impacts on healthcare spending, impacting overall resources available for the society. This highlights the importance of limiting pediatric pain when this population presents to the ED, with interventions being necessary to improve this healthcare issue.

Improving Pediatric Minimal Sedation

Following a review of the literature, it is evident that research focusing on improving nurses use and knowledge of pediatric procedural sedation, more specifically minimal sedation, is lacking. The majority of the existing interventional research has focused on physicians. As physicians perform different roles than nurses during procedural sedation in the ED, this limits the transferability of these types of interventions. However, there has been many educational interventions created and implemented which focus on pediatric pain and its management in the ED. As these interventions have targeted emergency nurses and since minimal sedation is a form

of pain management for minor procedures in the ED, these types of educational interventions are explored.

Educational Interventions

Three studies evaluated the effectiveness of educational interventions on improving nurses' knowledge and utilization of pediatric pain management. One was a randomized controlled trial (RCT) conducted in six post anesthesia care units (PACUs) caring for pediatric postoperative patients (Smeland et al., 2022) while the others were uncontrolled before and after (UCBA) studies with nurses caring for pediatric patients in the emergency department (ED) (Habich & Letizia, 2015; Le May et al., 2009). The RCT was conducted in Norway, while the two UCBA studies were conducted in the USA and Canada respectively. Participants in the RCT included PACU nurses who were randomly assigned to the intervention or control group, and pediatric patients undergoing a surgical procedure (Smeland et al., 2022). Both UCBA studies utilized ED nurses caring for pediatric patients (Habich & Letizia, 2015; Le May et al., 2009). All three of the interventions in the research studies were educational interventions focusing on pediatric pain management for nurses, however delivery methods varied between the studies. Habich and Letizia (2015) created a pediatric pain management educational intervention that was delivered through an online module. This module was supplemented with a practice protocol to guide the participants in the clinical setting. This differs from the other two studies, as their educational interventions were delivered via in person workshops and capsules (Le May et al., 2009; Smeland et al., 2022). Le May et al. (2009) tailored their intervention to the participants in the study by offering 3 different short 20–30-minute education capsules that were all offered during working hours. Smeland et al. (2022) chose to deliver their educational intervention over

one day. All three of the interventions included information about pediatric pain management such as assessment and pain management interventions.

The main outcome of the three studies was nurses' knowledge and clinical use of pediatric pain management. Both Le May et al. (2009) and Smeland et al. (2022) utilized the PNKAS/PNKAS-N to measure this outcome. Habich's and Letizia's (2015) data collection tool varied slightly, as they developed their own questionnaire to assess knowledge. Questionnaires were completed before and after the educational intervention, with Le May et al. (2009) and Smeland et al. (2022) also conducting testing at six months following the intervention. In addition, Habich and Letizia (2015) and Le May et al. (2009) conducted chart reviews to determine nurses' use of pediatric pain management in the clinical setting. Smeland et al. (2022) chose clinical practice observations and patient and parent interviews to collect data on this outcome.

All three research studies found statistically significant improvements in nurses' pain knowledge scores. Smeland et al. (2022) found that the mean knowledge scores of the intervention group improved from 27.8 (SD = 4.0) at baseline to 32.7 at six months following the intervention ($p < 0.05$). In the control group, mean knowledge scores improved from 30.1 (SD = 4.2) at baseline to 32.7 at 6 months post intervention. Standard deviation values were not reported by the researchers for the six months mean knowledge scores. The post-mean scores for the two both the intervention and control groups are equivalent, indicating that no significant improvement in knowledge was observed. However, it is notable that the intervention group initially started with a lower mean baseline score of 27.8 compared to the control group's mean baseline score of 30 (Smeland et al., 2022). This indicates a positive change in nurses' knowledge of pediatric pain management. Similarly, mean questionnaire scores in the two

UCBA studies showed statistically significant increases post intervention (Habich & Letizia, 2015; Le May et al., 2009). As for pediatric pain management in practice, all three studies found improvements in nurses' pediatric pain management. All three studies reported improvements in nurses' use and documentation of pain assessment tools. Le May et al. reported a significant improvement in mean knowledge scores from 59.3% at baseline to 89.1% at six months post intervention ($p < 0.001$). Additionally, Habich and Letizia (2015) reported that mean pre-test scores improved from 56.8 (SD = 13.7) to 69.4 (SD = 15.9) post-intervention ($p = 0.000$).

Although the RCT is of strong study design, both UCBA studies are considered weak in design. Additionally, the highest level of quality for the three studies was moderate. The two UCBA studies did not have control groups to compare results, so it cannot be concluded that an educational intervention solely contributed to improved knowledge and use of pediatric pain management. Both the UCBA and RCT studies lacked the use of regression and confounding to control for possible outside influences on the study outcomes. Additionally, the RCT reported a high loss to follow up. Although all three studies reported significant improvements in nurses' knowledge of pediatric pain management, further research that employs stronger design methods, such as RCTs and non-randomized controlled trials (NRCT) would be beneficial in providing evidence for this type of intervention. Until further research of these designs is available, it would be appropriate for other pediatric healthcare settings to implement similar educational interventions to improve nurses' knowledge of pediatric pain and ultimately improve the outcomes and care of pediatric patients undergoing painful procedures.

Pediatric Sedation Policy Protocol Implementation

A recent cross-sectional quality improvement study which involved the implementation of a minimal sedation guideline for patients who experienced anxiety and discomfort during

procedures performed in the outpatient primary care setting was retrieved during the literature review (Rava et al., 2023). This study is unique as it specifically focuses on patients (n=18) who are diagnosed with developmental disabilities and needle phobia. Although this study was not limited to the pediatric aged population, a total of 6 participants (33.3%) were of the pediatric age group. Patients were commonly undergoing lab work, vaccination, or drug monitoring (Rava et al., 2023). Their minimal sedation protocol included a detailed outline of minimal sedation procedures, indications for use, and dosing of midazolam for sedation (Rava et al., 2023). Registered Nurses performed administration of the sedative medication and monitored patients as indicated. 50% of the participants successfully completed both sedation and the required medical procedure. However, 23.1% of the participants who received sedation as per the protocol were not able to complete the required medical procedure. Researchers noted that following administration of the sedation medication, patients experienced sensory overload, and the optimal level of relaxation required to perform the ordered medical procedure was not met (Rava et al., 2023).

Although the results of this study are mixed, the majority of participants met the desired outcome of successfully receiving both sedation and ordered medical procedure (Rava et al., 2023). This intervention had numerous benefits for both the patient and care provider. Patients were able to receive care with a decreased level of distress and anxiety that was commonly associated with their procedures. Additionally, this alleviated the need for increased resources related to performing the medical procedure (Rava et al., 2023). This initial reporting has helped provide insights as to how best care for patients with high levels of distress and anxiety during common medical procedures such as needle pokes.

Summary of Interventions and Gaps in the Literature

Given the findings from the existing literature, I have concluded that the evidence provided in this literature review supports the development of an emergency nursing pediatric minimal sedation policy and procedure educational resource. The intervention by Smeland et al. (2022) is unique in that it includes several knowledge translation strategies to improve nurses' knowledge and practice of pediatric pain management. Strategies such as workshops, coaching, audit and feedback, case-based discussion, and material outreach about age-appropriate pediatric pain assessment, management, and interventions have been utilized in interventions to improve nurses' knowledge and management of pediatric pain (Gagnon et al., 2016). Both Habich & Letizia (2015) and Le May et al. (2009) acknowledged that nurses time is limited. These researchers chose to deliver their in-person educational session over 40-minutes or over 20–30-minute educational capsules. In addition to their educational portion, Habich & Letizia (2015) developed and implemented a practice protocol outlining best practices for pediatric pain assessment and management. Their practice protocol provided nurses with specific guidelines on required frequency of pain assessment, appropriate choice and utilization of age-specific pain rating tools, age-appropriate methods of assessing location and quality of pain, and documentation of pain assessment (Habich & Letizia, 2015).

Habich and Letizia (2015) and Le May et al. (2009) found statistically significant improvements following implementation of their intervention. However, Smeland et al. (2022) did report improvements in nurses' knowledge of pediatric pain, use of appropriate pediatric pain assessment, and less child reporting of moderate to severe pain. These studies indicate that educational interventions with multiple modes of delivery and strategies for implementation can positively influence best-practice changes in the nursing profession. However, a major gap in the

literature is the lack of nurse focused interventions for improving pediatric minimal sedation in the ED setting. Although, since minimal sedation is a method of providing pediatric patients with pain and anxiety treatment, it can be determined that these types of interventions would be beneficial to implement when attempting to improve the use of pediatric minimal sedation in the ED. These interventions and strategies will help inform the development of my proposed pediatric minimal sedation policy and procedure resource for emergency nurses. The following section will include a description of my practicum project and linkages to my chosen conceptual framework.

Pediatric Minimal Sedation Policy and Procedure Resource for Registered Nurses Working in the Emergency Department

A commitment to career-long learning is essential in the nursing profession. As practices in the ED often do not adequately address the pain and anxiety levels of pediatric patients, an intervention to improve this practice issue is indicated (Gagnon et al., 2016). To help facilitate this change in the local practice setting, this practicum project will include the delivery of a one-day workshop and implementation of pediatric minimal sedation guidelines. Several studies support the implementation of one-day pediatric pain management workshops with the addition of practice guidelines and simulation (Augarten et al., 2006; Corwin et al., 2012; Ramira et al., 2016; Santervas et al., 2010). Workshops with simulation and practice guidelines have proved to be beneficial in promoting pediatric pain management, improving nurses' knowledge, assessment, management, attitudes, beliefs, and self-reported confidence (Augarten et al., 2006; Corwin et al., 2012; Gagnon et al., 2016; Ramira et al., 2016; Santervas et al., 2010). Ramira et al. (2016) noted that they completed their educational workshops during convenient times for nursing staff, to facilitate ease of attending education.

This pediatric minimal sedation policy and procedure resource will be based upon the results of the planned consultations, environmental scan, and literature review. Learner principles from Knowles' Adult Learning Theory will be applied during the development of this pediatric minimal sedation resource.

Theoretical Framework

The chosen theoretical framework that will be applied during the development of this pediatric minimal sedation educational resource is Knowles' Adult Learning Theory.

Knowles' Adult Learning Theory

Developed by Malcolm Knowles', The Adult Learning Theory provide fundamental principles for adult learning. Adult education requires different techniques and methods to that of childhood teaching (Collins, 2004). Based on Knowles' theory, it is important to acknowledge that adult learners have pre-existing experiences and knowledge levels which enables them to connect these pre-perceptions to new learnings. By including case-based simulations and scenario discussions to this proposed pediatric minimal sedation resource, emergency nurses will have the ability to apply their knowledge and contribute ideas which are sourced from their pre-existing experiences (Collins, 2004; Knowles, 1990). This is also true in the principle of active learning. Knowles' Adult Learning Theory describes how adults learn best when they are able to participate actively in their learning process (Collins, 2004). Case-based discussions enable nurses to actively engage in discussion with their educator and peers, which enables them to focus on their areas of strengths and weaknesses. Adult learners learn best in a variety of ways (Knowles, 1978). Therefore, it is important for educators to provide education through various means (Collins, 2004). Based on this reasoning, this educational resource will include a variety

of educational delivery methods, such as workshops and case-based simulations. This will help accommodate for multiple learner needs.

Overview of the Pediatric Minimal Sedation Policy and Procedure Resource

This pediatric minimal sedation policy and procedure resource will involve the development of a policy outlining best and required practices for pediatric minimal sedation in the ED. The main goal of this initiative is to improve nurses' practices and implementation of minimal sedation in the pediatric population, with further outcomes of improving pain and anxiety experienced by pediatric patients during procedures in the ED. Contents of the policy will include information such as: indications and contraindications for implementation, medications and dosages, required personnel, required monitoring and documentation, and patient discharge criteria. To support the implementation of this policy, a half-day workshop will be developed. The workshop component of this resource will include topics such as principles of treatment of pediatric pain and anxiety in the ED, levels of sedation, pre-sedation evaluation, monitoring and documentation requirements, indicated medications and their reversal agents, post-sedation monitoring, and patient discharge criteria. Information contained within the workshop will be delivered via education strategies such as lecture, simulation, and case-based learning.

Learners will be given a copy of the lecture PowerPoint presentation for note taking. Questions will be placed throughout the lecture to generate discussion and participation in the education. Following the lecture portion of the workshop, simulation and case-based scenarios will be completed. This will allow the nurses who participate to demonstrate skills, such as medication preparation, and demonstrate critical thinking skills, such as when adverse reaction occurs during a sedation. Case-based scenarios will be facilitated by the educator. This education

plan ensures that a variety of strategies are employed so that the unique learning needs of each individual are met, as prioritized in Knowles' Adult Learning Theory.

Conclusion

The aim of this literature review was to provide evidential support for the development of a policy and procedure resource for emergency nurses who care for pediatric patients undergoing minimal sedation. Researchers have reported alarming evidence which indicates that the prevalence of pediatric patients experiencing procedural pain and anxiety in the ED is high. Pain and anxiety experienced during procedures in the ED can have detrimental impacts on patients' psychological health and caregiver satisfaction with care. Knowledge gaps among nurses and time constraints have been identified in the literature as significant barriers to pain management in the pediatric ED setting. The first step to improving knowledge among nurses is to provide education and practice guidelines which stress the importance of providing safe and effective pain and anxiety management during procedures through minimal sedation. It is essential that educational interventions in the healthcare setting are tailored to the diverse needs of the adult learner. Therefore, the proposed educational and policy resource will include various strategies to promote active learning and critical thinking among emergency nurses. Henceforth, following completion of this intervention, emergency nurses will feel better prepared and supported when considering the unique needs of the pediatric aged patient when requiring minor procedures in the ED.

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Appendix B: Literature Summary Tables

Legend:

Abbreviation	Complete Word
CI	Confidence interval
ED	Emergency Department
EMR	Electronic Medical Record
lvl	Level
M	Mean
PACU	Post anesthesia care unit
PMEE	Pain Management Experience Evaluation
PNKAS	Pediatric Nurses' Knowledge and Attitudes Survey Regarding Pain
PNKAS-N	Pediatric Nurses' Knowledge and Attitudes Survey Regarding Pain: Norwegian Version
Q	Question
RCT	Randomized Controlled Trial
S-CVI/Ave	Scale content validity index average
SD	Standard Deviation
Stats	Statistics
UCBA	Uncontrolled Before and After
V&R	Validity and Reliability

Author	Participants/Methods	Results	Comments
Corwin et al. (2012) UCBA Purpose: impact of a structured educational intervention on pediatric pain management in a pediatric ED	n = 102 pediatric patients aged 0-25 years (pre-intervention) n = 109 pediatric patients aged 0-24 years (post-intervention) Country/Setting: pediatric ED in the United States of America Group: one group Intervention: committee developed pain policy focusing on appropriate analgesia and assessment, pre and periprocedural analgesia. Implemented through provider education Data Collection and Outcome: • Research assistants observed patient interactions 1-month pre and post intervention (triage to discharge) • Chart review following interaction observation Analysis: • Independent t test • X^2 Fisher exact test	**Time to Medication Administration** • Pre-intervention: 97 mins • Post-intervention: 57 mins **Procedural Analgesia Administration** • Pre-intervention: 10% of patients reviewed • Post-intervention: 62% of patients reviewed • Authors state statistically significant **Patients with Pain Score of at Least 4/10 who Received Analgesia** • Pre-intervention: 34% • Post-intervention: 50% Authors state statistically significant	Strength of Design: **Weak** Quality: **Moderate** Issues: • No regression reported • No control group • Chosen p value not identified by the researchers and p values not presented in article Convenience sampling utilized

	No regression or confounding identified by the researchers		
Habich & Letizia (2015) UCBA study <u>Purpose:</u> To develop, implement and evaluate a pediatric pain management program and assessment tool to improve nurse knowledge and develop standardization	n = 63 (main ED nurses) n = 15 (pediatric ED nurses) n = 78 (total) Highest level of education: Bachelor's degree; median ED experience: 4-9 years <u>Country/setting:</u> • Community hospital with lvl II trauma adult and pediatric ED; United States of America <u>Group:</u> One group <u>Intervention:</u> 40-minute pediatric pain management computer module re: pain assessment/management barriers, appropriate pain assessment, pain treatment, patient/family education, and outcome measurement <u>Data Collection and Outcome:</u> • 20 Q multiple choice pre- and post-test based on module • Assessed knowledge • Developed by authors	**Knowledge** • Significant increase in post-test scores, 12.6% or more, when compared to pre-test scores $p < .0001$ **Pediatric Pain Management** • Post-intervention: • 87% (n = 52) had pain assessment documented at triage • Only 32% (n = 11) with pain received treatment • 88% (n = 66) of all pain assessments were appropriate for age	<u>Strength of Design:</u> **Weak** <u>Quality:</u> **Moderate** <u>Issues:</u> • Only 75% of participants completed the study • No control group • Assessors and participants were not blinded • Other HR learning modules distributed concurrently with study intervention • Patient charts were not examined prior to intervention

	• Test assessed by PhD prepared nurse faculty member and pain nurse experts • S-CVI/Ave used to test validity • 60 EMRs reviewed for 2 weeks following education module • Data reviewed: patient demographics, nurse pain-related documentation <u>Analysis:</u> Nonparametric descriptive stats used for categorical variables and patient characteristics		

Le May et al. (2009)
 	
UBCA study
 	
<u>Purpose:</u> to determine if an educational intervention tailored to nurses would improve knowledge and practices of pediatric pain management
	n = 50 (nurses working in the ED)
	
	<u>Country/Setting:</u> Canada, ED in a pediatric university teaching hospital
	
	<u>Intervention Only Group:</u>
	• All nurses attended three 20–30-minute capsules
	• Conducted during working shifts
	• Topics: pain assessment/management, misconceptions, and pain interventions
		Knowledge
		• PNKAS score
		  • Baseline: M = 28.2, SD 4.9
		  • T-2: M = 31, SD, 4.6
		  • p = 0.005
		Nurse Clinical Practice of Pain Management
		• Documentation
		  • Baseline of 59.3% improved to 89.1% at T-3
		  • p < 0.001
		• Nonpharmacological interventions
			<u>Strength of Design:</u>
			Weak
			
			<u>Quality:</u>
			Moderate
			
			<u>Issues:</u>
			• No control group
			High loss in follow up

	• Delivered over 5 months
	
	<u>Data Collection and Outcomes:</u>
	• Patient charts were reviewed retrospectively at baseline, 1-month after intervention (T-2) and 6 months later (T-3) using the PMEE (20 items, not tested for V&R)
	  ○ E.g.: initial pain and painful procedures assessment, type of analgesia and non-pharmacological management administered
	• Baseline data re: nurses knowledge assessed using the PNKAS
	• <u>Analysis:</u>
	No regression or modelling identified by the authors
		• Baseline of 26.7% to 31.9% at T-3
		• $p < 0.01$
		• Administration of analgesics
		  • Baseline of 26.7% improved to 36.1% at T-3
		  • $p < 0.01$	

Ramira et al. (2016) UCBA study <u>Purpose:</u> improve nurses' assessment/documentation of pediatric pain in ED	n = 100 nurses working in an ED and providing direct patient care <u>Country/Setting:</u> ED in United States of America <u>Group:</u> one group	**Time to Analgesia Administration** • Pre-intervention: 88 mins • Post-intervention: 27 mins • $p < 0.001$ **Pain Documentation** • Triage	<u>Strength of Design:</u> **Weak** <u>Quality:</u> **Moderate** <u>Issues:</u> • No regression reported

	<u>Intervention:</u> one time 30-min PowerPoint presentation offered over 1 month <u>Data Collection and Outcome:</u> • EMR review of 3-6 year olds pre and post intervention • Data collected re: documented pain assessment, time to analgesia administration, pain at discharge <u>Analysis:</u> ANOVA, chi square analysis, descriptive statistics	○ Pre: 17% ○ Post: 93% ○ $p < 0.001$ • At/before discharge ○ Pre: 20% ○ Post: 78% ○ $p < 0.001$ **Pain Score at Discharge** • Score < 2 ○ Pre: 88% ○ Post: 97% ○ $p < 0.001$ • Score > 3 ○ Pre: 12% ○ Post: 3% $p < 0.001$	• No control group Control of confounding not described by the researchers
Rava et al. (2023) Cross sectional <u>Purpose:</u> determine feasibility of minimal sedation protocol for outpatients with intellectual disabilities and needle phobia	n = 18 patients with diagnosis of intellectual and development disability and needle phobia <u>Country/Setting:</u> USA <u>Data Collection and Outcome:</u> • Performance of sedation and medical order ○ Information recorded by nurse completing the intervention	**Completion of sedation and medical order** • 50% completed both outcomes • 22.2% completed sedation only 22.2% neither outcome completed	<u>Strength of Design:</u> **Weak** <u>Quality:</u> **Moderate** <u>Issues:</u> • Lack of control group for comparison • Small sample size • Recruitment from a single source (only one outpatient area)

	Analysis: Frequency and descriptive statistics		
Smeland et al. (2022) RCT Purpose: to evaluate if an educational intervention improves nurses' knowledge and management of pediatric postoperative pain	n = 6 (hospitals with PACU caring for children) n = 193 (nurses working in PACU that care for children) • Nurses and PACUs randomly assigned to intervention or control group Country/Setting: • Norway Education/Intervention Group: • 99 nurses at T1 (baseline) • 102/129 nurses allocated participated in an education day, provided with clinical supervision, and reminders • 74 nurses at T2 (at 1 month) • 59 nurses at T3 (at 6 months) Control Group: • 94 nurses had no intervention/training (T1) • 69 nurses at T2 • 48 nurses at T3	**Knowledge** • Baseline (T1) PNKAS-N scores (95% CI) o Education group: o M = 27.8 (69.5% correct), SD = 4.0 o Control group: o M = 30.1 (75.3% correct), SD = 4.2 • T3 PNKAS-N scores (95% CI) o Education group: M = 32.7 o Control group: M = 32.7 o $p < 0.05$ **Pain Management Practices** • Pain assessment children ≤5 years o Education group: improved at T2 $p < 0.05$; 95% CI o Control group: no significant improvement • Comfort/reassurance o Education group: 43% at T1	Strength of Design: **Strong** Quality: **Moderate** Issues: • Intervention only focused on nurses' education; physicians were excluded Response rate of only 75%

	<u>Data Collection and Outcomes:</u> Nurses' Knowledge • Measured using the PNKAS-N (40 items) • Cronbach's alpha = 0.76 • Data collected at T1 (baseline), T2 (1 month after intervention), and T3 (6 months after intervention) Nurses' Clinical Practice Observations • Structured observation tool (checklist) and field notes • Checklist pilot tested Child Interviews • Semi-structured face-to-face interviews <u>Analysis:</u> • Mann-Whitney U tests for continuous variables not normally distributed	improved to 71% at T3 o Control group: 46% at T1 vs. 55% at T3 **Children's Pain Experiences** • T1 interviews o Half of children experienced mod to severe pain (4-10 pain level) in PACU o Felt pain assessment tools rarely used by nurses • T2 interviews o Meds and nonpharmacological pain interventions helped them cope with pain o Fewer reports of mod to severe pain in intervention group More use of pain assessment tool reported in intervention group	

Appendix C: Environmental Scan Report

Background

Sedation and analgesia are commonly administered to patients of all ages in the emergency department (ED) setting (Innes et al., 1999). Pain and anxiety in pediatric aged patients (17 years or younger) is often related to medical procedures that are required during their emergency visit, which can have long term negative consequences on a child's physiological and phycological consequences (Krauss et al., 2016; Noel et al., 2010). Minimal sedation, otherwise referred to as anxiolysis, in the emergency department setting provides patients with the best pain and anxiety management during medical procedures (Sahyoun et al., 2021). Minimal sedation refers to "a drug-induced state during which patients respond normally to verbal commands (American Society of Anesthesiologists, 2019, para. 1.). Common medications utilized in the emergency department (ED) when initiating minimal sedation include benzodiazepines such as Midazolam, Nitrous Oxide, and Fentanyl (Stern & Pozun, 2023). While these medications have been shown to have little to no effect on a patients' respiratory and cardiovascular systems, it is important to acknowledge that due to various patient pre-existing conditions, patients may fall into a deeper level of sedation than desired (Benzoni & Cascella, 2019). For this reason, it is imperative that minimal sedation is performed in a safe environment where healthcare providers are prepared to intervene if necessary. Researchers have reported that numerous barriers to implementing safe and effectives minimal sedation during medical procedures exist, such as lack of education and knowledge among ED staff, healthcare provider shortages, lack of physical space, and availability of sedation agents (Sahyoun et al., 2021).

Conceptualization of this practicum project stems from my current experiences working as a Registered Nurses in the pediatric ED setting and administering and monitoring patients when receiving minimal sedation. I identified a lacking standard of care in my organization, as

there are no policies or educational resources existing related to minimal sedation for pediatric patients in the ED setting. The goal of this practicum project is to develop a policy for Registered Nurses and other healthcare providers who are administering and monitoring patients during minimal sedation. Since policy guidelines do not exclusively effect practices changes, an educational resource will accompany this policy. From my observations and discoveries, my first step in the development of this practicum project was to conduct a thorough literature review to help inform the direction of this project. Following this literature review, the next reasonable step was to conduct an environmental scan. This environmental scan was completed in order to determine whether any existing pediatric minimal sedation in the ED policies and educational resources exist in order to inform the proposed resource and delivery mode.

Specific Objective(s) for the Environmental Scan

The specific objectives for the environmental scan will be:

1. Identify existing policies or educational resources regarding minimal sedation procedures in the pediatric ED setting within the Newfoundland and Labrador Health Services – Eastern Zone organization.
2. Review existing policies and resources which outline best practice guidelines of minimal sedation in the pediatric ED within both provincial, national, and international healthcare organizations through online search.
3. Analyze the data obtained during the environmental scan and utilize to inform the development of a pediatric minimal sedation policy and educational resource.
4. Summarize the key findings of the environmental scan.

Methods

This environmental scan focused on identifying existing pertinent resources from two main sources: published literature and credible websites. Each resource was scanned for relevancy and then reviewed in detail. Pertinent information from the identified resources is organized within a summary table. Such information includes resource type (policy or educational resource), topic and contents, method of delivery, and learning strategies. Details from the extracted data can be found in Appendix B.

Sources of Information

Three sources of information were utilized for this environmental scan: a literature review, various relevant websites, and the internal Intranet and online LEARN Portal of Newfoundland and Labrador Health Services (NLHS). The literature review focused on identifying educational resources related to pediatric sedation in emergency department (ED) settings. Additionally, several websites pertinent to pediatric emergency nursing and pediatric minimal sedation were searched, such as those from 1) IWK Health Centre (2019), 2) National Emergency Nurses Association (2019), 3) The Society for Pediatric Sedation (2009), 4) The University of Texas Medical Branch (2023), and 5) Texas Children's Hospital Evidence-Based Outcomes Center (2014). These websites were chosen as they are credible and established organizations within the pediatric ED healthcare environment. The NLHS Intranet and online LEARN Portal provided access to organizational resources and policies specific to the project's targeted setting. These sources were selected to assess existing gaps in resources available to healthcare providers in the area.

Data Collection

Literature Search

The review of the literature consisted of an extensive search utilizing the following databases: Cumulative Index to Nursing and Allied Health (CINAHL), PubMed, Google Scholar, and Cochrane Library. Key terms which were employed to retrieve relevant literature included: "*minimal sedation", "anxiolysis", "educational resource", "training", "policy", "practice guidelines", "emergency department", "pediatrics", "Registered Nursing", "healthcare providers", "monitoring", "administration", "Canada", "USA*". Resource retrieval was limited to Canada and the USA, as these healthcare settings are similar in standards of care for pediatric patients, meaning that information and best practices can be transferrable. Information pertaining to practice recommendations for pediatric minimal sedation, resource content, recommended dosing of minimal sedation agents, and delivery methods of available resources were retrieved.

Websites

Two main types of resources were scanned: policies and educational resources. Sources of information included organizational websites and google searches. Google searches utilizing key words such as *"minimal sedation", "anxiolysis", "educational resource", "policy", "practice guidelines", "emergency department", "pediatrics", "Registered Nursing", "healthcare providers"*, were utilized during the search for organizational policies and educational resources related to pediatric minimal sedation within credible websites. The Google search engine was chosen for this environmental scan due to its high index of websites and ease of use. Searches on the internal NLHS Intranet and LEARN website involved the utiliziation of key terms such as *"sedation", "pediatrics", "emergency care", "minimal sedation",*

"benzodiazepines". By searching these platforms that are currently accessible to registered nurses working in the local setting, I was able to determine whether any current policies and self-directed educational resources pertaining specifically to pediatric minimal sedation in the ED are available in the organization.

Ethical Considerations

The Health and Research Ethics Board Authority screening tool was completed prior to the commencement of the environmental scan for this proposal (see Appendix A). It was determined that this practicum project meets numbers 1 and 3 of the HREA screening tool, meaning that this project is considered to be a quality improvement initiative. For this reason, this project is exempt from HREA ethical approval. No additional clearances will be required when obtaining information from publicly available resources. There will be no collection of personal or sensitive information during the environmental scan. Therefore, there are no concerns for breach of data security during this environmental scan.

Data Management and Analysis

Data from the literature and website resources obtained during data collection were managed by examining for important aspects, for example minimal sedation monitoring requirements. This involved storing and reviewing each of the resources that were obtained during the environmental scan. The key aspects are highlighted, and all resources were categorized into major themes. The key information was summarized within a summary table. Content analysis was utilized to identify themes from the data (Bengtsson, 2016).

Results

In total, five policies/practice guidelines and two educational resources were obtained via

the environmental scan. These resources were analyzed utilizing content analysis (Bengtsson, 2016) and are summarized in the following section.

Newfoundland and Labrador Health Services Organizational Resources

Following a review of the current employee learning site and policy search engine for Newfoundland and Labrador Health Services, which is the health authority of the targeted setting, it was determined that there are currently no existing policies within the health authority that provide education, guidelines, or processes for pediatric minimal sedation in the ED. This has been determined to be a major gap in the local setting as there are no practice guidelines or education available to healthcare providers (HCPs) who are regularly implementing pediatric minimal sedation in the ED setting. This lack of support and standardization is perceived as a possible patient safety issue which requires the development of such resource.

Literature Review and Website Sources

The environmental scan provided several applicable policies and educational resources. These selected resources are summarized in Appendix B. Several major themes evolved following the completion of the environmental scan. These themes include *modes of delivery, resource content*, and *scope of practice,* all of which will be discussed in the subsequent section.

Educational Resources

Modes of Delivery. Two educational resources pertaining to pediatric procedural sedation were retrieved during the environmental scan. One was developed by The Society for Pediatric Sedation. The other, implemented in The Hospital for Sick Children, was discussed in detail in a published article, however access to the educational resource was not obtained. A common mode of delivery between the two resources was didactic lectures, with lecture length

varying between 2-3.5 hours. Both resources also included supplemental strategies to support the delivery of information to HCPs (Ratnapalan & Schneeweiss, 2007; The Society for Pediatric Sedation, 2009). An interesting additional strategy that was implemented by Ratnapalan and Schneeweiss (2007) was the development of pocket reference cards. As the researchers aimed to improve HCPs knowledge of their newly developed practice guidelines, they implemented this educational strategy so that HCPs had easy access to pertinent sedation information and guidelines. In addition to traditional lectures, organizations also implemented small group case-discussions (Ratnapalan & Schneeweiss, 2007) and simulation-based skills and scenarios (The Society for Pediatric Sedation, 2009).

Resource Content. Lecture contents included in the educational resources were consistent between the two existing resources. Major topics included overview of sedative drugs, types of sedation, possible adverse effects, pre-sedation assessments, intra-sedation monitoring, recovery and discharge (Ratnapalan & Schneewiess, 2007; The Society for Pediatric Sedation, 2009). Ratnapalan and Schneewiess (2007) also included an introduction to their newly implemented practice guidelines in their educational resource.

Policies and Practice Guidelines

Modes of Delivery. Modes of delivery varied based on the type of resource. Policies were exclusively written documents. The five policies and practice guidelines included in this environmental scan contain only written information and instruction on recommended practice for pediatric minimal sedation. While some policies, such as the guidelines from Texas Children's Hospital, include many graphs and charts to aid in their delivery of information, and also include graphic algorithms to aid HCPs in determining patient sedation eligibility, other policies do not contain these graphics. The policy from IWK Health Centre (2019) does include

some graphs in the appendices. However, the UTMB Health policy only contains text information.

Resource Content. After scanning websites for existing educational resources, a limited number were accessible, as many required fee payments or association membership. A of policies and practice guidelines were accessible and retrieved. All of the policies contain pertinent information that could be utilized during the development of my own proposed minimal sedation policy. Notably, most of the policies did not focus solely on minimal sedation, with only one policy by The University of Texas Medical Branch (2023) providing specific information for minimal sedation. During the resource development phase, this will need to be taken into consideration, as not all information contained within these resources will be relevant for the purposes of this practicum project. Overall, guidelines and recommendations for practices were consistent. For instance, all of the policies designate the Registered Nurse as the personnel who is responsible for monitoring of the patient. Additionally, all of the policies require that patients be placed on continuous oxygen saturation monitoring during the procedure. However, intervals for documentation of vital signs and patient status vary between 5-15 minutes (IWK Health Centre, 2019; Texas Children's Hospital Evidence-Based Outcomes Center, 2014). Patient discharge criteria and teaching topics for parents and caregivers is contained within all of the policies and practice guidelines (Coté & Wilson, 2019; IWK Health Centre, 2019; National Emergency Nurses Association, 2019; Texas Children's Hospital Evidence-Based Outcomes Center, 2014; University of Texas Medical Branch (2023). Criteria for discharge was comparable across the resources and include items such as return to pre-sedation alertness, protection of airway, no signs of respiratory distress, and control of nausea. Resources such as these discussed provide standardized guidelines for various levels of sedation, highlighting the importance of

following best practices during nursing care.

Scope of Practice. The position statement published by the National Emergency Nurses Association (2019) highlights the increasing scope of registered nurses working in the ED. Specifically, they describe how it is within the registered nurses' scope of practice to manage the care of patients before, during, and after administration of medications for the purpose of sedation. This emphasizes the importance of developing policies, education, and nursing roles.

Implications

Several implications have been identified following the completion of this environmental scan. First, as it has been determined that there are no pediatric minimal sedation resources available to HCPs who are implementing this pain management intervention, I feel this highlights the critical need of the development of a resource which provides HCPs with standardized guidelines for practice and education on the subject. The policy portion of this project will involve the development of a written policy resource, outlining required practices for RNs when caring for a pediatric patient in the ED who is receiving minimal sedation. Fundamental information regarding pediatric pain management and the use of sedation for pediatric patients in the ED setting will be delivered via a lecture-based workshop. During this workshop, the developed policy will be introduced. Additionally, this environmental scan highlighted the importance of ensuring parents and caregivers receive proper discharge teaching following minimal sedation of their child in the ED. This may cause safety concerns as caregivers may not be given adequate discharge teaching before discharge from the ED. Therefore, I have determined that a discharge resource for caregivers should be included in this policy resource.

Finally, both of the educational interventions contain multiple modes of delivery to aid in the uptake of information contained in the resource. As this is congruent with my conceptual framework, I have determined that my resource will include multiple modes of delivery such as in-person lectures, case-based discussions, and simulations. While lectures provide written information to the learner, it also allows for questions and clarification. This is not possible when employing other modes of delivery, such as self-directed learning. As this practicum project involves the introduction of a new pediatric minimal sedation policy, I feel it is important to allow for discussion of the new policy with learners during a lecture workshop session. The consultation process will aid in determining the best methods to include in my resource.

Conclusion

The environmental scan will help inform the project as to best practice guidelines for minimal sedation during procedures and has provided an overview of existing policies and resources. Through the completion of this environmental scan, I have analyzed various pediatric procedural sedation policies and educational resources for their content, modes of delivery, and evaluation techniques. Through this analysis, I was able to identify the similarities and differences between the included resources. This has demonstrated that a resource such as the one being proposed in this practicum project could feasibly be adapted and introduced to the targeted local setting. It is important that many sources of information are examined when determining practice guidelines so that the information contained within the resource is recent, trustworthy, and accurate. Consulting with local key informants during the consultation phase and examining how other organizations have created similar resources will allow me to tailor my planned resource so that it provides the most support to the Registered Nurses and other HCPs that I have targeted. This environmental scan has added to the information collected during the

literature review phase of this project, further supporting the creation of this pediatric minimal sedation resource for the ED setting. The development of a policy and educational resource requires extensive knowledge and reliable sources of information during the development phase. The resources from this environmental scan will provide me with the required information to develop an evidence-based resource to support best practices when caring for pediatric patients in the ED during minimal sedation.

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Appendix A: Health Research Ethics Authority (HREA) Screening Tool

Student Name: Candace Frampton

Title of Practicum Project: Development of a Minimal Sedation Administration Procedure Policy and Educational Resource for Registered Nurses' working in the Pediatric Emergency Department (ED).

Date Checklist Completed: May 22, 2024

This project is exempt from Health Research Ethics Board approval because it matches item number ___1, 3____ from the list below.

1. Research that relies exclusively on publicly available information when the information is legally accessible to the public and appropriately protected by law; or the information is publicly accessible and there is no reasonable expectation of privacy.
2. Research involving naturalistic observation in public places (where it does not involve any intervention staged by the researcher, or direct interaction with the individual or groups; individuals or groups targeted for observation have no reasonable expectation of privacy; and any dissemination of research results does not allow identification of specific individuals).
3. **Quality assurance and quality improvement studies, program evaluation activities, performance reviews, and testing within normal educational requirements if there is no research question involved (used exclusively for assessment, management or improvement purposes).**
4. Research based on review of published/publicly reported literature.
5. Research exclusively involving secondary use of anonymous information or anonymous human biological materials, so long as the process of data linkage or recording or dissemination of results does not generate identifiable information.
6. Research based solely on the researcher's personal reflections and self-observation (e.g. auto-ethnography).
7. Case reports.
8. Creative practice activities (where an artist makes or interprets a work or works of art).

For more information please visit the Health Research Ethics Authority (HREA) at https://rpresources.mun.ca/triage/is-your-project-exempt-from-review/

Appendix B: Summary Table of Available Policies and Resources

Organization or Author	Resource Type	Name or Topic	Delivery Methods and Teaching Strategies/Policy Structure	Key Policy or Resource Contents	Reference or Link to Resource
Coté and Wilson (2019) The American Academy of Pediatrics	Practice guidelines (Literature)	Guidelines for Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures	Written document outline practice guidelines for providing sedation to pediatric patients outside of the operating room setting	Guidelines for: - Levels of sedation - Sedation candidacy - Personnel requirements - Monitoring and documentation - Medication indications - Discharge criteria	Coté, C. J., & Wilson, S. (2019). Guidelines for Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures. *Pediatrics (Evanston)*, *143*(6), 1-. https://doi.org/10.1542/peds.2019-1000
IWK Health Centre (2019)	Policy (Website)	Procedural Sedation in the Emergency Department	Written document outlining guidelines for pediatric procedural sedation in the ED	Policy outlining: - Sedation candidacy - Pre-sedation assessment - Medication dosing - HCP roles - Monitoring & documentation - Discharge criteria	IWK Policy Link
National Emergency	Position Statemen	Procedural Sedation in	Written document outlining best practices	- It is within the Registered Nurses'	National Emergency Nurses Association Position

Organization or Author	Resource Type	Name or Topic	Delivery Methods and Teaching Strategies/Policy Structure	Key Policy or Resource Contents	Reference or Link to Resource
Nurses Association (2019)	t (Website)	Adults and Children in the Emergency Department	and recommendations for Registered Nurses and organizations where pediatric sedation is being performed in the emergency department setting.	scope of practice to care for patients during procedural sedation in the emergency department - Emergency departments utilizing procedural sedation should have policy which outlines roles, nurse to patient ratio, discharge criteria, patient discharge information, and drug profiles	Statement Link
Ratnapalan & Schneeweiss (2007)	Pediatric Sedation and Education model (Literature)	Guidelines to Practice: The Process of Planning and Implementing a Pediatric Sedation Program	- Focus groups and surveys to determine current practices and knowledge of staff - Didactic lectures (2 hours) - Small group discussions (1.5 hours) - Development of sedation handbook and pocket guide (disseminated to staff before the course)	- Educational program with learner participation and presented relevant/practical information - Information includes principles of sedation, review of sedation guidelines, pharmacological agents for sedation, and possible adverse events	Ratnapalan, S., & Schneeweiss, S. (2007). Guidelines to Practice: The Process of Planning and Implementing a Pediatric Sedation Program. *Pediatric Emergency Care*, *23*(4), 262–266. https://doi.org/10.1097/PEC.0b013e31803f7566

Organization or Author	Resource Type	Name or Topic	Delivery Methods and Teaching Strategies/Policy Structure	Key Policy or Resource Contents	Reference or Link to Resource
			- Multiple choice evaluation post-intervention		
The Society for Pediatric Sedation (2009)	Education Course (Website)	Sedation Provider Course	- Lectures/PowerPoint presentations: 2 main lectures + 3 small group lectures (3.5 hours) - Small group sessions: lecture + hands on stations - Skill and core course simulation sessions (6 hours) - Evaluations included written examination and simulation-based scenario testing	- Provide HCPs with knowledge to provide safe procedural sedation to pediatric patients - Topics include overview of sedative drugs, types of sedation, possible adverse effects, pre-sedation assessments, intra-sedation monitoring, recovery and discharge	Sedation Provider Course Syllabus Link
The University of Texas Medical Branch (2023)	Policy (Website)	Minimal Sedation (Anxiolysis) of Pediatric Patients	Written document outlining recommended procedures for pediatric minimal sedation outside of the operating room (ED, inpatient, or outpatient settings)	Policy outlining: - Personnel requirements - Required equipment - Consent instructions - Dietary restrictions - Pre-procedure assessment - Intra-procedure monitoring - Discharge criteria	UTMB Health Policy Link

Organization or Author	Resource Type	Name or Topic	Delivery Methods and Teaching Strategies/Policy Structure	Key Policy or Resource Contents	Reference or Link to Resource
Texas Children's Hospital Evidence-Based Outcomes Center (2014)	Evidence-Based Guideline (Website)	Procedural Sedation Evidence-Based Guideline	20-page written document providing standardized guidelines for various levels of pediatric sedation occurring outside of the operating room	- Patient evaluation - Types of sedation - Evidence for use of sedative and analgesic medications - Medication dosing - Fasting requirements - Monitoring requirements - Reversal agents - Non-pharmacological pain management interventions - Discharge criteria	TCH Evidence-Based Outcomes Center Guidelines Link

Appendix D: Consultation Report

Background

Sedation is a routinely administered to patients of all ages in the emergency department (ED) (Innes et al., 1999). Required medical procedures are a common source of pain and anxiety in the pediatric aged (17 years or younger) patient population who present to the ED. Undertreated pain and anxiety associated with medical procedures have been reported to have many negative long-term consequences on a child's physiological and psychological well-being (Krauss et al., 2016; Noel et al., 2010). Minimal sedation in the ED setting provides a means to perform minor emergency medical procedures while also treating patient pain and anxiety (Sahyoun et al., 2021). Minimal sedation refers to "a drug-induced state during which patients respond normally to verbal commands (American Society of Anesthesiologists, 2019, para. 1.). Common medications utilized in the emergency department (ED) when initiating minimal sedation include benzodiazepines such as Midazolam, Nitrous Oxide, and Fentanyl (Stern & Pozun, 2023). While these medications have been shown to have little to no effect on a patients' respiratory and cardiovascular system, it is important to acknowledge that due to various patient pre-existing conditions, patients may fall into a deeper level of sedation than desired (Benzoni & Cascella, 2019). For this reason, it is imperative that minimal sedation is performed in a safe environment where healthcare providers are prepared to intervene if necessary. Researchers have reported that numerous barriers to implementing safe and effectives minimal sedation during medical procedures exist, such as lack of education and knowledge among ED staff, healthcare provider shortages, lack of physical space, and availability of sedation agents (Sahyoun et al., 2021).

Conceptualization of this practicum project stems from my current experiences working as a registered nurse in the pediatric ED setting and administering and monitoring patients when

receiving minimal sedation. Through the environmental scan of this practicum project, I identified a lacking standard of care in my organization, as there are no policies or educational resources existing related to minimal sedation for pediatric patients in the ED setting. The goal of this practicum project is to develop a policy for registered nurses and other healthcare providers who are administering and monitoring patients during minimal sedation. Since policy guidelines do not exclusively effect practices changes, an educational resource will accompany this policy. From my observations and discoveries, my first step in the development of this practicum project was to conduct a thorough literature review to help inform the direction of this project. Following this literature, the next reasonable steps are to conduct consultations with stakeholders and execute an environmental scan. In this consultation report, I will discuss the findings from the key stakeholders of this project. Collectively, the information collect at each phase of this practicum proposal will help provide comprehensive guidance for the development of this resource. Furthermore, the specific implications of this resulting data will be discussed within the context of this proposed practicum project.

Specific Objective(s) for the Consultations

1. Understand employee's knowledge and perceptions of current minimal sedation education at the Janeway Emergency Department.
2. Explore employee's (nurses and physicians) current practices with pediatric minimal sedation.
3. Obtain recommendations from employees regarding important topics and features to include in the proposed pediatric minimal sedation policy and educational resource.
4. Determine the various learning needs of nurses.
5. Determine nurses' and physicians' preferred mode of delivery for the educational portion

of the resource.

Methods

Sample and Setting

The sample for the consultations included 32 registered nurses (RNs), one manager, one Nurse Clinical Educator, and 11 Physicians who are all currently working at the Janeway Emergency Department (ED). It was important to include the registered nurses during the consultations, as they are the targeted population of this practicum project. They may help inform about current practices, content for the resource, current self-reported knowledge, and preferred delivery methods. Supervisory staff such as manager, Nursing Clinical Educator are responsible for education delivery and enforcement of practice standards, therefore it would be important to understand their perceptions of the existing resources and how this practicum resource could address any gaps. Additionally, these stakeholders could provide information regarding areas where best practices are not being followed; this would ensure that the proposed resource included issue practice areas. Furthermore, the physician group working at the Janeway Emergency Department has been included in this stakeholder group. It was determined that their input related to policy development is important to consider as they are integral members of the healthcare team when performing minimal sedation in the ED.

Data Collection

Data was collected utilizing two different questionnaires tailored for nurses and physicians who currently work at the Janeway ED. These two questionnaires were developed based on the objectives of the consultation plan using Microsoft Forms and include closed-ended, open-ended, dichotomous, and Likert scale questions. The questionnaire for nurses

included 14 closed-ended questions and four open-ended questions. The physician questionnaire consisted of 12 closed-ended questions and four open-ended questions. A recruitment letter containing information about the project, contact details, and access to the questionnaire was sent to all potential participants via email and attached to the paper-based questionnaires. Two versions of the recruitment letter were created, one distributed to nurses (see Appendix A), and the other sent to physicians (see Appendix B). The employees who agreed to participate via the online questionnaire clicked the online link or scanned the QR code within the email and completed the questionnaire. Furthermore, paper copies of the questionnaires were provided within the Janeway Emergency Department nursing station for individuals who were unable to complete them online. A total of 45 surveys were distributed to registered nurses and Physicians. The questionnaire took approximately 10-15 minutes to complete.

Quality and confidentiality of the data was ensured as I and my practicum supervisor were the only people who had access to the data. This will also help to minimize possible response bias, as individuals would not know what information others have reported. Responses collected during the consultation phase were then available to be extracted from Microsoft Forms. The questionnaires were available for a maximum of 1.5 weeks in consideration to the employees who work shift work.

Data Management and Analysis

Data obtained from this consultation was managed utilizing Microsoft Forms. This allowed for collection of both quantitative and qualitative data. Specifically, Microsoft Forms was used for quantitative analysis, which will include means, percentages, and frequencies (Polit & Beck, 2021). Qualitative data will be analyzed utilizing content analysis. Content analysis has been defined as “the process of organizing and integrating material from documents, often

narrative information from a qualitative study, according to key concepts and themes" (Polit & Beck, 2017, p. 723). Each response was analyzed, paying close attention to identifying meaning units that were then used to identify sub-themes and themes amongst the data (Bengtsson, 2016). All of the emergent and major themes from the open-ended questions are presented within the consultation report.

Results

A total of 13 registered nurses and physicians participated by completing the questionnaire. This represents a low response rate of 29%. Of these participants, 11 (84%) were registered nurses and 2 (15%) were physicians. As noted in Table 1, the most commonly reported education level was a bachelor's degree (69%), followed by doctor of medicine (15%), master's degree (8%), and college diploma (7%). The majority of participants reported their level of experience as more than 10 years (62%) and one to four years (23%). It is notable that there is a wide range of experience levels among the registered nurses and physicians at the Janeway ED. The following discussion will present both the quantitative and qualitative findings from the registered nurses and physicians who are working at the Janeway ED.

Table 1

Participants' Characteristics (N=13)

Participants' Characteristics	**n (%)**
Employment Position with Janeway Emergency Department	
Registered Nurse	11 (84%)
Physician	2 (15%)
Management	0 (0%)
Other	0 (0%)
Level of Education	
PhD	0 (0%)
Master's Degree	1 (8%)

Participants' Characteristics	**n (%)**
Doctor of Medicine (MD)	2 (15%)
Bachelor's Degree	9 (69%)
College Diploma	1 (7%)
Other	0 (0%)
Years of Experience	
Less than 1 year	1 (7%)
1-4 years	3 (23%)
5-10 years	1 (7%)
More than 10 years	8 (62%)

Quantitative Results (Registered Nurses and Physicians)

As presented in Table 2, a larger proportion of the participants (84%) identified as registered nurses, with only 15% being physicians. The majority of the registered nurses (91%) and physicians (100%) have experience with pediatric minimal sedation. Ratings of current education was mostly rated as good (45%) and fair (27%) among registered nurses and both average (50%) and fair (50%) among Physicians. While 100% of the physicians reported that they received education about pediatric minimal sedation since working at the Janeway ED, only 27% of registered nurses shared this experience with education. Although receival of education varied between the disciplines, large proportions of registered nurses (55%) and physicians (100%) reported that they have access to sedation policies and resources in their workplace. Notably, 100% of the participants felt that a pediatric minimal sedation policy and educational resource was needed for the healthcare setting. A very positive finding from the questionnaire was that 100% of the registered nurses and physicians reported that they were very likely to participate in an educational session and follow a policy for pediatric minimal sedation in the ED. Preferred modes of delivery were comparable between both disciplines, with registered nurses and physicians preferring lecture/workshop (RNs 81%, physicians 100%), self-directed module (RNs 63%, physicians 100%), and simulation (RNs 81%, physicians 100%). In regards

to the topics for inclusion in the resource, registered nurses mostly reported that topics should include: types of sedation and indication for use in the ED (16%), medications for sedation and their dosages, monitoring and documentation requirements for pediatric minimal sedation, and discharge teaching instructions for parents and caregivers. Both (100%) physicians who participated felt that types of sedation and indication for use in the ED was an important topic for inclusion in the project resource.

Table 2

Pediatric Minimal Sedation Policy and Education Resource (Registered Nurses and Physicians)

Questions	Registered Nurses n (%)	Physicians n (%)
How would you rate current education of Pediatric minimal sedation at the Janeway Emergency Department?		
Excellent	1 (9%)	0 (0%)
Good	5 (45%)	0 (0%)
Average	1 (9%)	1 (50%)
Fair	3 (27%)	1 (50%)
Poor	1 (9%)	0 (0%)
Do you recall receiving education for pediatric minimal sedation since working at the Janeway ED?		
Yes	3 (27%)	2 (100%)
No	8 (73%)	0 (0%)
Are you aware of any existing pediatric minimal sedation policies or educational resources available to you in your area of employment?		
Yes	6 (55%)	2 (100%)
No	5 (45%)	0 (0%)
Do you feel that a pediatric minimal sedation policy and formal educational resource is needed in the Janeway emergency department?		
Yes	11 (100%)	2 (100%)
No	0 (0%)	0 (0%)

Questions	Registered Nurses n (%)	Physicians n (%)
Do you have current/previous experience with pediatric minimal sedation?		
Yes	10 (91%)	2 (100%)
No	1 (9%)	0 (0%)
How likely are you to participate in a pediatric minimal sedation educational session and follow a pediatric minimal sedation policy?		
Very likely	11 (100%)	2 (100%)
Somewhat likely	0 (0%)	0 (0%)
Neither likely nor unlikely	0 (0%)	0 (0%)
Somewhat unlikely	0 (0%)	0 (0%)
Very unlikely	0 (0%)	0 (0%)
If participating in this educational resource, which delivery methods would work best for you? Please select all that apply.		
Lecture/workshop	9 (81%)	2 (100%)
Self-learning module	7 (63%)	2 (100%)
Simulation	9 (81%)	2 (100%)
Case discussion	5 (45%)	1 (50%)
Other	0 (0%)	0 (0%)
What topics do you feel would be important to include in a pediatric minimal sedation policy and educational resource? Please select all that apply.		
Pediatric pain assessment	8 (13%)	1 (50%)
Types of sedation and their indications for use in the ED	11 (100%)	2 (100%)
Medications used for sedation and their dosages	11 (100%)	1 (50%)
Monitoring and documentation requirements for pediatric minimal sedation	10 (91%)	1 (50%)
Patient discharge criteria	9 (82%)	1 (50%)
Discharge teaching topics for parents and caregivers	10 (91%)	1 (50%)
Please rate your current satisfaction with performing minimal sedation in the Janeway ED.		
Very satisfied	0 (0%)	0 (0%)
Satisfied	8 (72.7%)	1 (50%)
Neutral	2 (18.2%)	1 (50%)
Dissatisfied	1 (9.1%)	0 (0%)
Very dissatisfied	0 (0%)	0 (0%)
Do you feel that minimal sedation is a beneficial intervention for pediatric		

Questions	Registered Nurses n (%)	Physicians n (%)
procedural pain and anxiety management?		
Yes	11 (100%)	2 (100%)
No	0 (0%)	0 (0%)

As presented in Table 3, indications for minimal sedation in the pediatric ED was the knowledge area with the lowest self-perceived knowledge, with 63.6% rating their knowledge of the subject as good, and only 18.2% rating their knowledge as expert. Perceptions of minimal sedation for pediatric patients in the ED were overall positive, with 100% of respondents agreeing that it is a beneficial intervention for procedural pain and anxiety management.

Table 3

Participants' Self-Perceived Knowledge (Registered Nurses)

	Expert knowledge	**Good knowledge**	**Adequate knowledge**	**Limited knowledge**	**Not knowledge able**
Please rate your self-perceived knowledge levels of the following pediatric minimal sedation topics	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**
Indications for minimal sedation in the pediatric emergency department.	2 (18.2%)	2 (18.2%)	2 (18.2%)	2 (18.2%)	2 (18.2%)
Safe doses of minimal sedation medications.	3 (27.3%)	3 (27.3%)	3 (27.3%)	3 (27.3%)	3 (27.3%)
Standard monitoring requirements for minimal sedation.	3 (27.3%)	3 (27.3%)	3 (27.3%)	3 (27.3%)	3 (27.3%)
Patient discharge criteria following minimal sedation.	3 (27.3%)	4 (36.4%)	2 (27.3%)	1 (9%)	0 (0%)
Post-sedation discharge teaching contents for parents and guardians.	3 (27.3%)	3 (27.3%)	3 (27.3%)	2 (18.2%)	0 (0%)
Fundamentals of pediatric pain assessment	4 (36.4%)	5 (45.5%)	2 (18.2%)	0 (0%)	0 (0%)

Qualitative Results

Analysis of the qualitative data was conducted utilizing Bengtesson (2016) content analysis method. There were four themes identified from the qualitative data of this consultation. The identified themes support the findings from the quantitative portion of this consultation. The four major themes are ***1) standardization of care and education,2) patient safety, 3) current practices, and 4) lack of formal education and workplace resource.***

Standardization of Care and Education

The need to standardize care and education for pediatric minimal sedation in the ED was commonly identified by the participants. Many similar responses were reported regarding need to identify best practices, treatments, and the varying degrees of sedation and their indications. It was evident from the responses that there is a lack of standardization during implementation, monitoring, and discharge from the ED. One registered nurse stated "*There are varying levels of understanding of the need for pain control and sedation. Everyone should be on the same page."* Another registered nurse noted that "*Department specific, concrete guidelines are required regarding first line treatment, dosage, monitoring, and discharge criteria post-sedation*." Additionally, both registered nurses and physicians noted that there is a constant influx of new staff in both the nursing and medical disciplines to the department. One physician noted "*We do not have a standardized resource for our need staff to learn from and follow while caring for pediatric patients in our department*." One physician added an additional comment at the conclusion of the questionnaire suggesting that "*policy should also include checklist/outline of non-pharmacological interventions to consider prior to/during sedation."* This suggested topic will be considered during the development of the resource.

Patient Safety

Prioritization of patient safety was a major theme identified from the qualitative data. Many registered nurses and physicians commented on the intricacies of minimal sedation for the pediatric population and acknowledged the implications of unsafe implementation of minimal sedation. One registered nurse stated *"It is important that we consider the possibility of adverse events or reactions occurring when implementing minimal sedation. We require the means to intervene effectively to create better patient safety."* As identified in the literature review, registered nurses are often responsible for monitoring patients during and after minimal sedation. During the monitoring phase of sedation, it would be critical that registered nurses are able to identify when an adverse event is occurring and how to intervene as indicated. Clear policy and educational resources provide a means to first educate staff of safe practices and outline how to implement effectively by following best practices.

Current Practices

Registered Nurses and Physicians who were experienced with minimal sedation described their current roles and practices. These practices varied between the disciplines. Registered Nurses described that they routinely perform sedative medication administration, patient monitoring during and after sedation, assistance with medical procedure, and discharge teaching. Registered nurses commonly reported that they *"perform and assist with patient positioning, urinary catheterization, and medical imaging during minimal sedation of pediatric patients."* Physicians reported that their responsibilities with minimal sedation include *"pre-sedation assessment, ordering of sedative medications, management of complications, and medical procedures."* Additionally, one Registered Nurse described that implementation of best practices were lacking in the department. Of note, there has been an incidence of lacking

documentation of patient status during sedation and at time of discharge. As it has previously been noted that documentation of patient discharge disposition is an important aspect of caring for patients undergoing minimal sedation, this should be reinforced within the resource.

Lack of Workplace Policy and Resource

Many of the participants from both the registered nurse and physician groups described their experiences with minimal sedation education and policy use in their workplace. While several participants identified resources such as medication dosage reference books, no participants identified a policy or formal educational resource that is currently available to them in their workplace. The findings from the quantitative data contradict that of the qualitative data. Although 55% of registered nurses and 100% of physicians selected that they had access to policies and resources in their area of employment, no participants in the qualitative section identified a policy currently available to them. One registered nurse stated *"I have not received any formal education on minimal sedation since starting at the Janeway ED. As sedations are very common at the Janeway ED, I believe I would benefit from such education."* This comment is also consistent with comments from the Physician participants. Specifically, one physician noted *"Physicians are able to access this type of training through CME events like conferences, however not everyone can attend… I did not receive procedural sedation training from Newfoundland and Labrador Health Services or the Janeway ED. I completed education from other sources."*

Ethical Considerations and Confidentiality

Participation in the questionnaire was voluntary. Implied consent will be indicated as participants complete the questionnaire. Confidentiality will be maintained by ensuring

responses are anonymous. For example, no personal information such as names or employee identification numbers were collected as part of the questionnaire. Additionally, online response data was stored in a password-protected file on my personal computer. Paper-based responses were secured and stored in a locked storage drawer. Once all data was extracted from the paper-based questionnaires and stored electronically in a password protected file, all paper-based questionnaires were shredded. The information collected was only utilized for the purposes of this practicum proposal and only shared with my faculty supervisor. On completion of the practicum, information collected will be destroyed. The Health Research Ethics Authority (HREA) screening tool was completed (Refer to Appendix E). Based on the criteria, it has been determined this project is exempt from Health Research Ethics board approval. This project meets the criteria of a quality improvement project, which falls within the normal scope of educational evaluative requirements.

Implications for the Practicum Project

The data obtained from both the quantitative and qualitative data in this consultation consistently supported the need for the development of a policy and educational resource for pediatric minimal sedation in the ED. Evidently, there is a lack of standardized guidelines to help guide registered nurses' practices with minimal sedation in the ED. These findings are consistent with studies by Bar Am et al. (2021) and Peirce et al. (2018). Both studies reported that a significant barrier to pediatric pain management was a lack of education within the workplace. It is evident from the qualitative findings that further resources are needed to support quality and safe care during painful and anxiety inducing medical procedures in the ED.

The implementation of a policy and educational resource will aid in improving registered nurses' knowledge of pediatric minimal sedation and practices when assisting in this

intervention. The findings from the consultations have helped in determining how to best suit this practicum project resource so that it is most beneficial for the registered nurses in this practice area. Specifically, quantitative data suggests that registered nurses most prefer in-person and interactive learning. This can be best addressed by creating an educational resource which incorporate a variety of modes of delivery and strategies, such as workshops, case-discussion, and simulation. Additionally, a major theme from the qualitative data was that standardization of practice when choosing to implement minimal sedation for pediatric patients in the ED was a priority for both registered nurses and physicians. This could be best resolved by developing a practice policy that outlines implications for minimal sedation and best practices. Reports from this consultation are consistent with the findings by Curatola et al. (2022), who noted that nurses have critical roles such as patient monitoring and patient recovery. Standardized guidelines for such responsibilities will be included in the resource. Furthermore, the findings from the consultations will be compared and contrasted from the literature review and environmental scan of this practicum project. All of these sources will aid me to achieve my overall project goal to develop a policy and educational resource for Registered Nurses working in the ED.

Conclusion

Following the completion of the consultations, it was determined that stakeholders feel they do not have adequate resources when caring for pediatric patients who require minimal sedation. This will aid in achieving the overall goal of this practicum, to develop a policy and educational resource for pediatric minimal sedation in the emergency department. Overall findings from the consultations suggest that both registered nurses and physicians who currently work at the Janeway ED are willing to learn more about best practices with pediatric minimal sedation and support the development of a policy and educational resource to support their

practice. The majority of the participants noted that their preferred modes of delivery for education include workshops, simulation, and self-directed learning. As the literature review suggests that a multi-faceted, interactive educational resource promotes best knowledge improvements among Registered nurses, my proposed resource will include workshopping, simulation, and case-discussion (Le May et al., 2009; Smeland et al., 2022). Overall, support for this resource is high among both registered nurses and physicians.

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Appendix A: Sample of Recruitment Letter (Nurses)

Dear participant,

My name is Candace, and I am a student in the Master of Science in Nursing program at Memorial University. I am currently completing a practicum project, which involves the development of a policy and educational resource. I am developing a pediatric minimal sedation policy and accompanying educational resource specifically aimed to Registered Nurses working in the emergency department. It was evident from my literature review that undertreated and undermanaged pain during painful and anxiety inducing procedures in the emergency department can have many negative effects on a child's psychological well-being, as well as negatively affect caregiver's overall satisfaction with care. Consultations with stakeholders such as yourself will allow me to determine the consistencies between the literature and needs of the practice setting.

I am writing to request your participation in my project by completing a short online questionnaire. This questionnaire will enable me to understand the current practices and learning needs of Registered Nurses. Participation in my project is completely voluntary. The questionnaire will be completed online or paper-based and should only require approximately 15 minutes of your time to complete. All responses shared will be anonymous, and the information gathered will only be shared with my practicum supervisor. The results of this analysis will be summarized in my final practicum report. All data collected will be destroyed following the completion of my practicum in December 2024.

I appreciate your consideration, and I thank you for your time. If you have any further questions, please do not hesitate to contact me at any time.

The survey can be accessed online via the following link: https://forms.office.com/r/Ks7gadvExB. In addition, paper-based copies of the questionnaire will be available at the Janeway ED nursing station. Please return your completed paper-based surveys in one of the provided envelopes and seal for confidentiality.

I look forward to hearing from you.

Regards,

Candace Frampton, BNRN

Registered Nurse, Janeway Children's Hospital

MScN Student, Memorial University of Newfoundland

caf238@mun.ca

Appendix B: Sample Recruitment Letter (Physicians)

Dear participant,

My name is Candace, and I am a student in the Master of Science in Nursing program at Memorial University. I am currently completing a practicum project, which involves the development of a policy and educational resource. I am developing a pediatric minimal sedation policy and accompanying educational resource specifically aimed to Registered Nurses working in the emergency department. It was evident from my literature review that undertreated and undermanaged pain during painful and anxiety inducing procedures in the emergency department can have many negative effects on a child's psychological well-being, as well as negatively affect caregiver's overall satisfaction with care. Consultations with stakeholders such as yourself will allow me to determine the consistencies between the literature and needs of the practice setting.

I am writing to request your participation in my project by completing a short online questionnaire. This questionnaire will enable me to understand the current practices about the use of pediatric minimal sedation in the Janeway ED unit. Participation in my project is completely voluntary. The questionnaire will be completed online or paper-based and should only require approximately 15 minutes of your time to complete. All responses shared will be anonymous, and the information gathered will only be shared with my practicum supervisor. The results of this analysis will be summarized in my final practicum report. All data collected will be destroyed following the completion of my practicum in December 2024.

I appreciate your consideration, and I thank you for your time. If you have any further questions, please do not hesitate to contact me at any time.

The survey can be accessed online via the following link: https://forms.office.com/r/KS4kTBWEvc. In addition, paper-based copies of the questionnaire will be available at the Janeway ED nursing station. Please return your completed paper-based surveys in one of the provided envelopes and seal for confidentiality.

I look forward to hearing from you.

Regards,

Candace Frampton, BNRN

Registered Nurse, Janeway Children's Hospital

MScN Student, Memorial University of Newfoundland

caf238@mun.ca

Appendix C: Pediatric Minimal Sedation Questionnaire (Nurses)

This survey has been developed as part of a MScN practicum project. This questionnaire consists of 18 questions regarding your experiences, knowledge, and perceptions of pediatric minimal sedation. It is estimated to be take approximately 15 to 20 minutes to complete.

Please answer the following questions:

1. What is your employment position?

- Registered Nurse
- Management
- Other:

2. What is your highest level of education achieved?

- PhD
- Master's Degree
- Bachelor's Degree
- College Diploma
- Other:

3. How long have you worked at the Janeway Emergency Department (ED)?

- Less than 1 year
- 1-4 years
- 5-10 years
- More than 10 years

4. How would you rate current education of Pediatric minimal sedation at the Janeway Emergency Department?

- Excellent
- Good
- Average
- Fair
- Poor

5. Do you recall receiving education for pediatric minimal sedation since working at the Janeway ED?

- Yes
- No

6. Are you aware of any existing pediatric minimal sedation policies or educational resources available to you in your area of employment?

- Yes
- No

7. If you answered yes to question #6, please identify them.

8. Do you feel that a pediatric minimal sedation policy and formal educational resource is needed in the Janeway emergency department?

- Yes
- No

9. If you answered yes to question 8, please explain your reasoning.

10. Do you have current/previous experience with pediatric minimal sedation?

- Yes
- No

11. If you answered yes to question #10, please describe your practices when participating in pediatric minimal sedation.

12. How likely are you to participate in a pediatric minimal sedation educational session and follow a pediatric minimal sedation policy?

- Very unlikely
- Unlikely
- Neutral
- Likely
- Very likely

13. If participating in this educational resource, which delivery methods would work best for you? Please select all that apply.

- Lecture/workshop
- Self-learning module
- Simulation
- Case discussion
- Other (please specify)

14. What topics do you feel would be important to include in a pediatric minimal sedation policy and educational resource? (Select all that apply)

- Pediatric pain assessment.
- Types of sedation and their indications for use in the ED.
- Medications used for sedation and their dosages.
- Monitoring and documentation requirements for pediatric minimal sedation.
- Patient discharge criteria.
- Discharge teaching for parents and caregivers.
- Other (please specify)

15. How knowledgeable do you feel about the following pediatric minimal sedation topics?

Topics					
	Not knowledgeable	Limited knowledge	Adequate knowledge	Good knowledge	Expert knowledge
1. Fundamentals of pediatric pain assessment.					
2. Indications for minimal sedation in the pediatric emergency department.					
3. Safe doses of minimal sedation medications.					
4. Standard monitoring requirements					

for minimal sedation.					
5. Patient discharge criteria following minimal sedation.					
6. Post-sedation discharge teaching contents for parents and guardians.					

16. Please rate your current satisfaction with performing minimal sedation in the Janeway ED.

- Very satisfied
- Satisfied
- Neutral
- Dissatisfied
- Very dissatisfied

17. Do you feel that minimal sedation is a beneficial intervention for pediatric procedural pain management?

- Yes
- No

18. Please add any additional information that you feel would be important for the development of a pediatric minimal sedation policy and educational resource.

Thank you for your participation

Appendix D: Minimal Sedation Questionnaire (Physicians)

This survey has been developed as part of a MScN practicum project. This questionnaire consists of 15 questions regarding your experiences, knowledge, and perceptions of pediatric minimal sedation. It is estimated to be take approximately 15 to 20 minutes to complete.

Please answer the following questions:

1. What is your highest level of education achieved?

- PhD
- Master's Degree
- Doctor of Medicine (MD)
- Bachelor's Degree
- College Diploma
- Other:

2. How long have you worked at the Janeway Emergency Department (ED)?

- Less than 1 year
- 1-4 years
- 5-10 years
- More than 10 years

3. How would you rate current education of Pediatric minimal sedation at the Janeway Emergency Department?

- Excellent
- Good
- Average
- Fair
- Poor

4. Do you recall receiving education for pediatric minimal sedation since working at the Janeway ED?

- Yes
- No

5. Are you aware of any existing pediatric minimal sedation policies or educational resources available to you in your area of employment?

- Yes
- No

If yes, please identify them.

6. Do you feel that a pediatric minimal sedation policy and formal educational resource is needed in the Janeway emergency department?

- Yes
- No

7. If you answered yes to question #6, please explain your reasoning.

8. Do you have current/previous experience with pediatric minimal sedation?

- Yes
- No

9. If you answered yes to question #8, please describe your practices when participating in pediatric minimal sedation.

10. How likely are you to participate in a pediatric minimal sedation educational session and follow a pediatric minimal sedation policy?

- Very unlikely
- Unlikely
- Neutral
- Likely
- Very likely

11. If participating in this educational resource, which delivery methods would work best for you? (Select all that apply).

- Lecture/workshop
- Self-learning module
- Simulation

- Case discussion
- Other (please specify)

12. What topics do you feel would be important to include in a pediatric minimal sedation policy and educational resource? (Select all that apply).

- Pediatric pain assessment.
- Types of sedation and their indications for use in the ED.
- Medications used for pediatric minimal sedation and their dosages.
- Monitoring and documentation requirements for pediatric minimal sedation.
- Patient discharge criteria.
- Discharge teaching for parents and caregivers.
- Other (please specify)

13. Please rate your current satisfaction with performing minimal sedation in the Janeway ED.

- Very satisfied
- Satisfied
- Neutral
- Dissatisfied
- Very dissatisfied

14. Do you feel that minimal sedation is a beneficial intervention for pediatric procedural pain and anxiety management?

- Yes
- No

15. Please add any additional information that you feel would be important for the development of a pediatric minimal sedation policy and educational resource.

Thank you for your participation

Appendix E: Health Research Ethics Authority (HREA) Screening Tool

Student Name: Candace Frampton

Title of Practicum Project: Development of a Pediatric Minimal Sedation Administration Procedure Policy and Educational Resource for Registered Nurses' Working in the Emergency Department

Date Checklist Completed: June 20, 2024

This project is exempt from Health Research Ethics Board approval because it matches item number _____3_____ from the list below.

9. Research that relies exclusively on publicly available information when the information is legally accessible to the public and appropriately protected by law; or the information is publicly accessible and there is no reasonable expectation of privacy.
10. Research involving naturalistic observation in public places (where it does not involve any intervention staged by the researcher, or direct interaction with the individual or groups; individuals or groups targeted for observation have no reasonable expectation of privacy; and any dissemination of research results does not allow identification of specific individuals).
11. **Quality assurance and quality improvement studies, program evaluation activities, performance reviews, and testing within normal educational requirements if there is no research question involved (used exclusively for assessment, management or improvement purposes).**
12. Research based on review of published/publicly reported literature.
13. Research exclusively involving secondary use of anonymous information or anonymous human biological materials, so long as the process of data linkage or recording or dissemination of results does not generate identifiable information.
14. Research based solely on the researcher's personal reflections and self-observation (e.g. auto-ethnography).
15. Case reports.
16. Creative practice activities (where an artist makes or interprets a work or works of art).

For more information please visit the Health Research Ethics Authority (HREA) at https://rpresources.mun.ca/triage/is-your-project-exempt-from-review/

Appendix E: Pediatric Minimal Sedation Resource for Emergency Registered Nurses

Introduction of the Half-Day Workshop

This half-day workshop "Pediatric Minimal Sedation for Emergency Registered Nurses" was designed for registered nurses working at the Janeway Children's Hospital ED. The workshop was developed based on the principles of Knowles' adult learning theory.

Learning strategies that are utilized throughout the workshop, including:

1. Lecture
2. Case studies
3. Simulation

The overall goal of this workshop is to provide pediatric ED registered nurses with the opportunity to learn about the fundamental ideas of pediatric sedation in an interactive and multi-faceted manner, while introducing a clinical practice policy to guide minimal sedation of pediatric patients in the ED.

Notification of Training

This workshop will be included in general orientation to EDs that provide care to pediatric aged patients. The educator will incorporate this workshop into their existing orientation schedule.

Number of Participants

This workshop has been designed to allow for a minimum of 6 participants and a maximum of 12 participants. The included attendance record (see Appendix A) must be distributed to participants for recording of education.

Workshop Instructor

A registered nurse or other healthcare professional who has knowledge of emergency or critical care of the pediatric patient should deliver this workshop. Potential instructors should attend a workshop prior to teaching this workshop. This workshop manual contains supporting information to help facilitate the learning activities. The contents within this manual should be reviewed prior to instructing.

Time Required for Workshop

This workshop should require 3-3.5 hours to implement. As this workshop should be included in the orientation period of emergency room registered nurses, scheduled times will vary. Two 15-minute breaks have been incorporated into this workshop.

Required Preparation for Workshop Instructor

Prior to the start of the workshop, the instructor is required to:

1. Review the contents of the workshop manual, including PowerPoint slides and accompanying notes.
2. Confirm the attendance list.
3. Book a training space with projection and computer capabilities.
4. Ensure adequate number of tables and chairs for instructor and participants.
5. Ensure simulation mannequins are available for simulation exercise.
6. Ensure PowerPoint file is accessible (via jump drive or cloud storage).
7. Place attendance sheet next to room entrance.
8. Ensure physical copies of workshop resources (pediatric minimal sedation policy, case-discussion questions, and simulation questions) are printed.

Required supplies:

- Pens/pencils
- Blank 8.5 x 11 paper
- Practice medication vials
- Mucosal Atomization Devices
- 18-gauge needles
- Empty 1ml and 3ml syringes
- Alcohol swabs
- Sharps containers
- Medication labels

Workshop Theoretical Framework

The overall theoretical framework which helped inform the development of this workshop and selection of learning activities was Knowles' (1978) Adult Learning Theory.

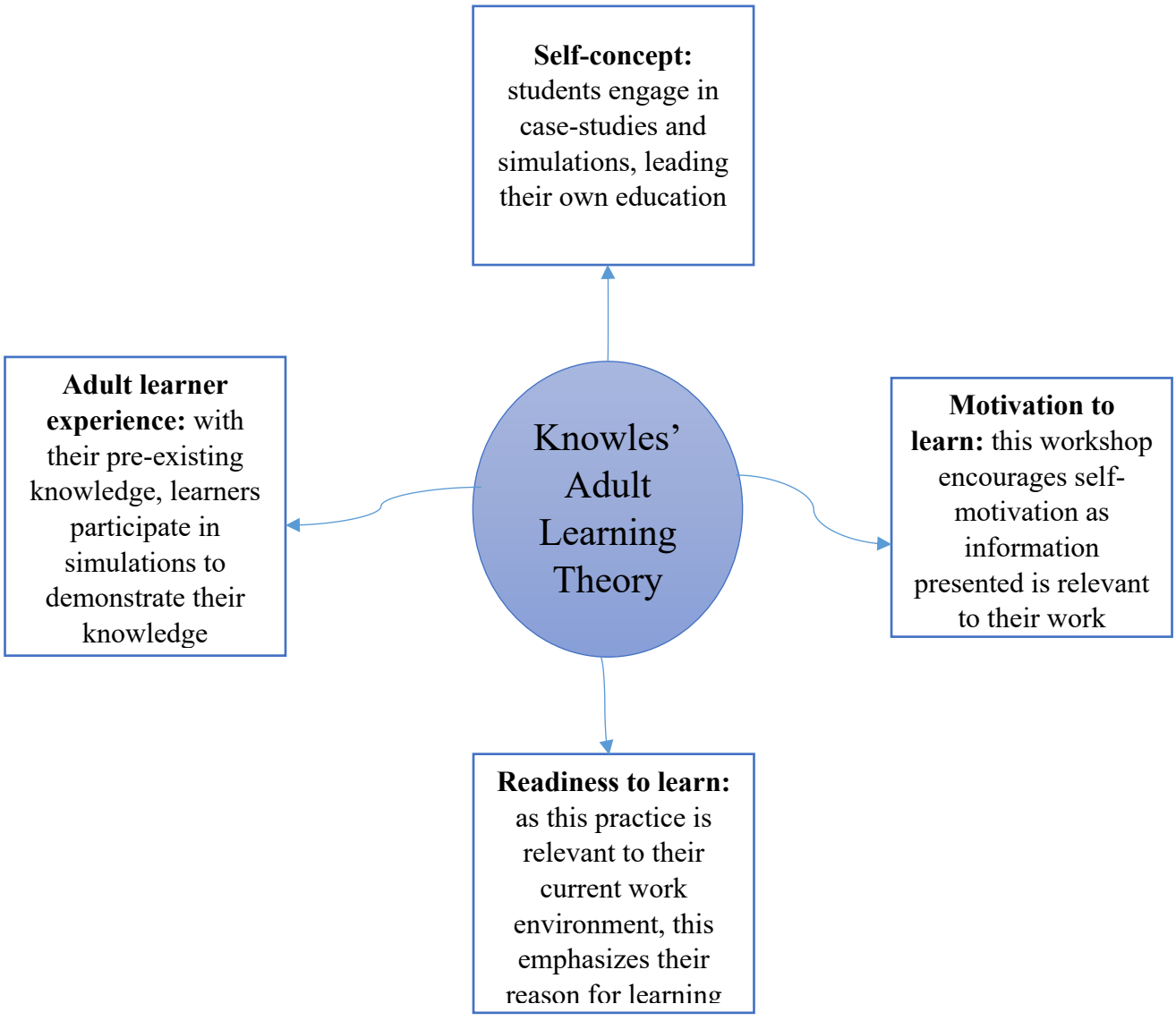
Knowles' Adult Learning Theory

Developed by Malcolm Knowles' (1978), The Adult Learning Theory provide fundamental principles for adult learning (see Figure 1). Based on Knowles' theory, it is important to acknowledge that adult learners have pre-existing experiences and knowledge levels which enables them to connect these pre-perceptions to new learnings. This pre-existing knowledge has been acknowledged by the inclusion of a pre-test questionnaire. Furthermore, this allows learners to self-identify areas of opportunity to further their knowledge. Adult learners learn best in a variety of ways (Knowles, 1978). This educational resource includes a variety of educational delivery methods, such as lecture, discussions, policy practice guidelines and case-

based simulations. Knowles' Adult Learning Theory describes how adults learn best when they can participate actively in their learning process (Collins, 2004). During this workshop, learners are able to engage in discussion of a patient scenario that they may encounter in their working environment. Learners will then be able to discuss their unique approaches to solving the problem presented in the scenario.

Figure 1

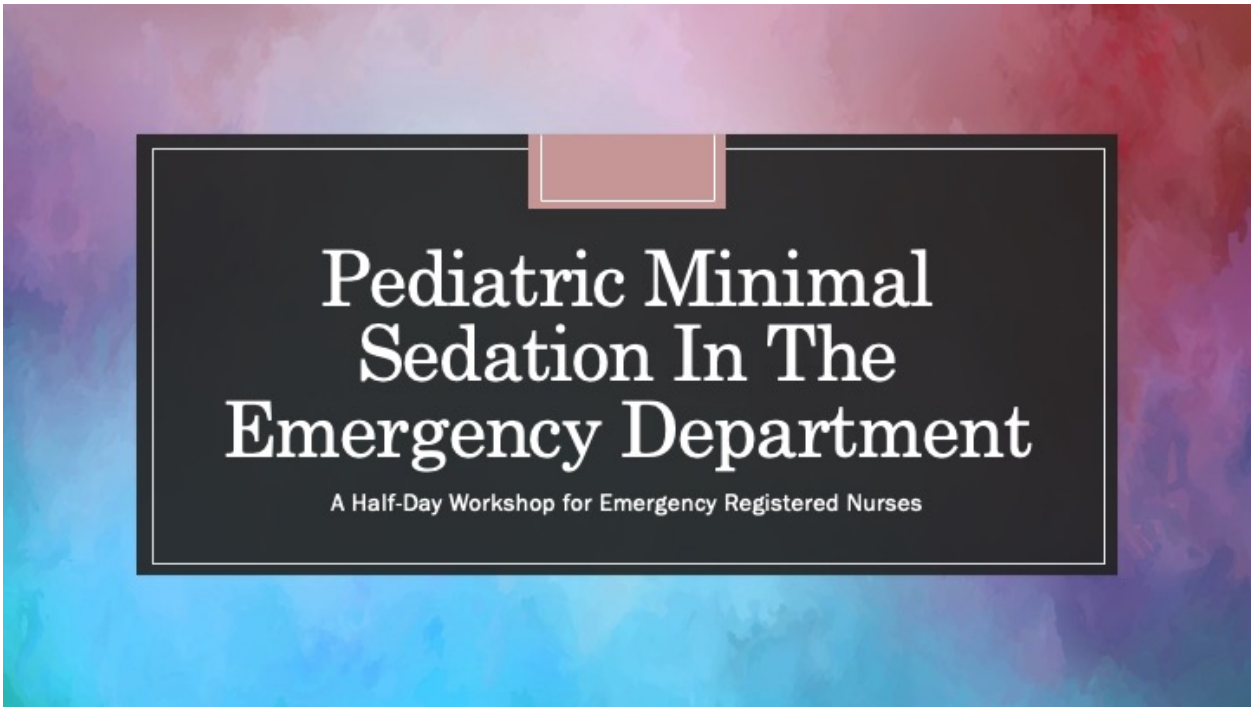
Diagram of Knowles' Adult Learning Theory

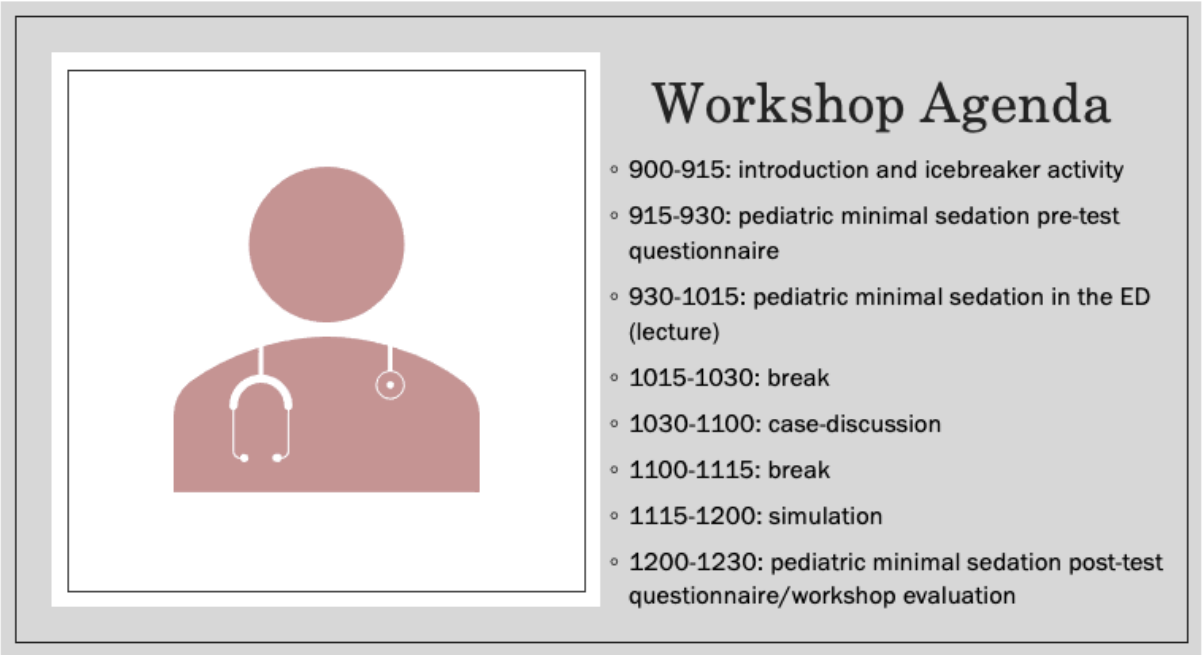


Pediatric Minimal Sedation Workshop

In this workshop, you will have a PowerPoint presentation which contains a lecture, discussion of one case study, and practice of one simulation scenario. Learners will be required to complete a pre-test and post-test questionnaire to determine knowledge levels, as well as a workshop evaluation form which will be completed by learners at the conclusion of the workshop.

Pediatric Minimal Sedation Workshop Instructor Guide/Content




Workshop Agenda
◦ 900-915: introduction and icebreaker activity
◦ 915-930: pediatric minimal sedation pre-test questionnaire
◦ 930-1015: pediatric minimal sedation in the ED (lecture)
◦ 1015-1030: break
◦ 1030-1100: case-discussion
◦ 1100-1115: break
◦ 1115-1200: simulation
◦ 1200-1230: pediatric minimal sedation post-test questionnaire/workshop evaluation

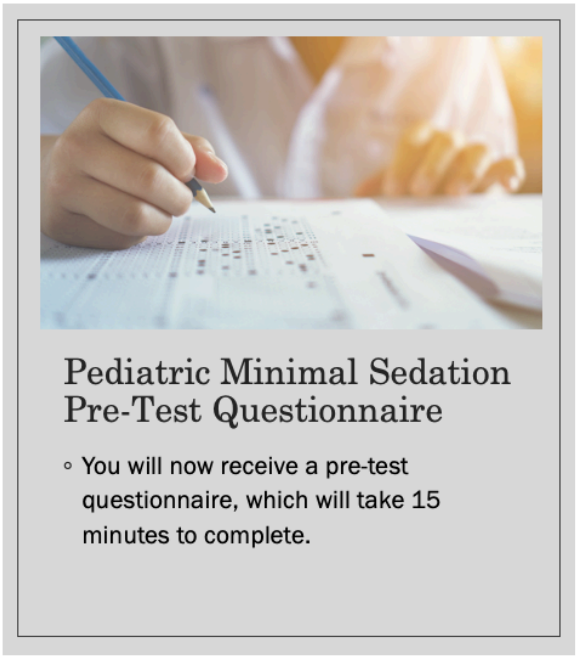
Learning Objectives

By the end of the workshop, Registered Nurses will:

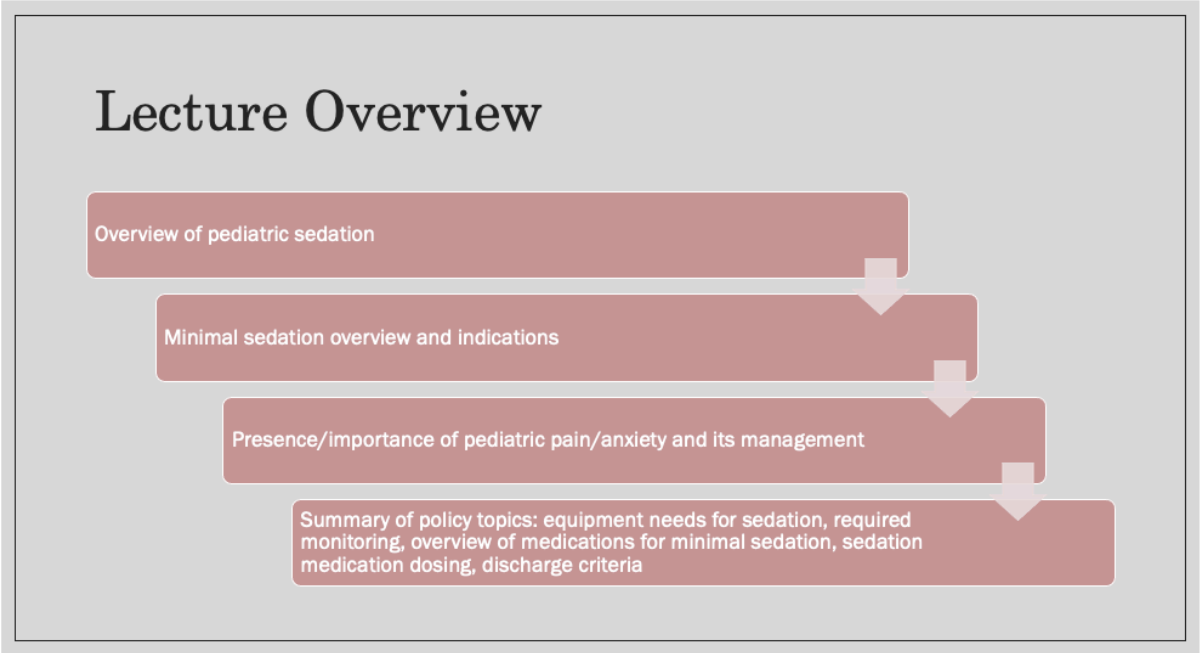
1. Define pediatric minimal sedation.
2. Discuss the importance of providing adequate pain and anxiety management during medical procedures in the pediatric ED.
3. Identify the responsibilities and procedures during pediatric minimal sedation as per policy.
4. Demonstrate knowledge of proper implementation of pediatric minimal sedation (following clinical practice policy guidelines).
5. Recognize appropriate interventions to apply during adverse events during pediatric minimal sedation.

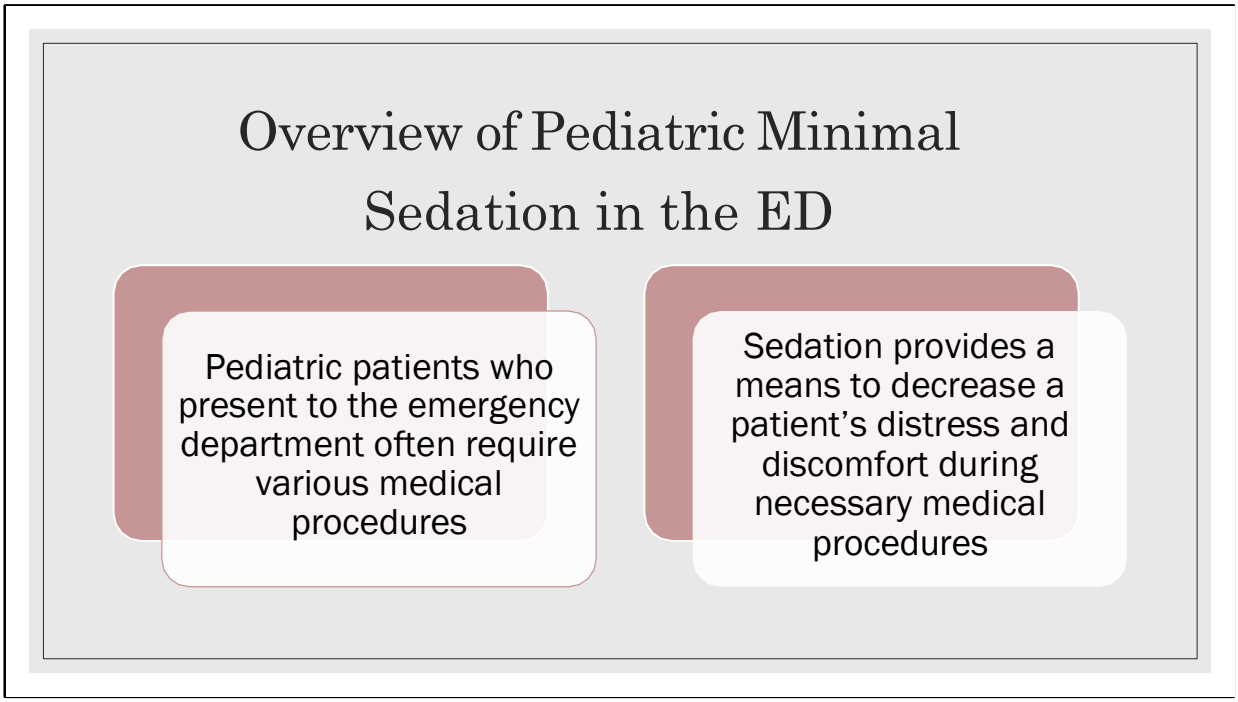
Introductions

- Please share your:
- Name, experience as a registered nurse, and one fun fact about yourself!

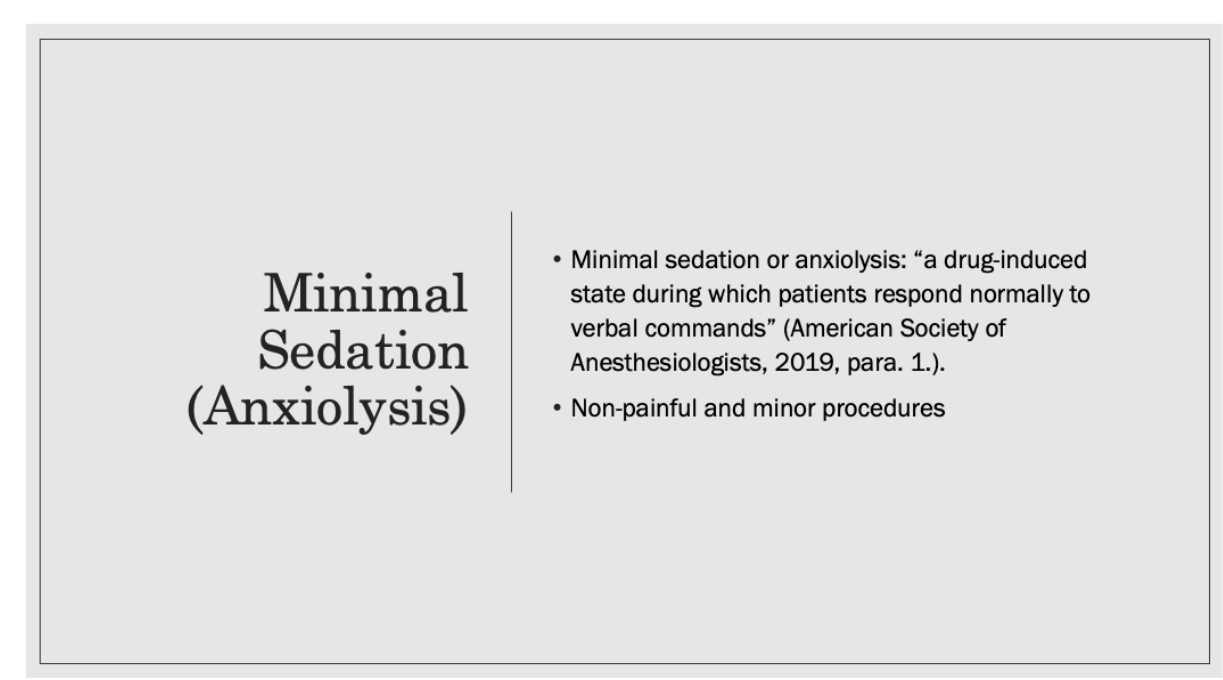


- Distribute paper copies of pre-test questionnaire to each learner.
- Set a timer for 15 minutes for this questionnaire.


Lecture Overview
Overview of pediatric sedation
Minimal sedation overview and indications
Presence/importance of pediatric pain/anxiety and its management
Summary of policy topics: equipment needs for sedation, required monitoring, overview of medications for minimal sedation, sedation medication dosing, discharge criteria



- Pediatric patients who present to the emergency department often require various medical procedures. Research has shown that medical procedures are often a source of pain and anxiety for pediatric patients (Senger et al., 2021; Stevens et al., 2011). Commonly performed procedures include diagnostic imaging, suturing, IV insertion, lumbar puncture, and fracture reduction
- Pediatric procedural sedation (PPS) refers to techniques and medications used to minimize anxiety and pain associated with unpleasant or painful procedures (Stern & Pozun, 2023, para. 1.). Sedation is a continuum. There are varying levels of sedation, all of which have varying indications for use.
- Factors that must be considered when choosing level of sedation include the type of medical procedure, age, and developmental status of the pediatric patient/child (The Society for Pediatric Sedation, 2009).
- It is important that healthcare providers are knowledgeable about interventions to address pain and anxiety during medical procedures in the pediatric ED. Alarmingly, researchers have reported that 39% of rural and community EDs in Alberta do not provide pediatric pain management to their nurses.



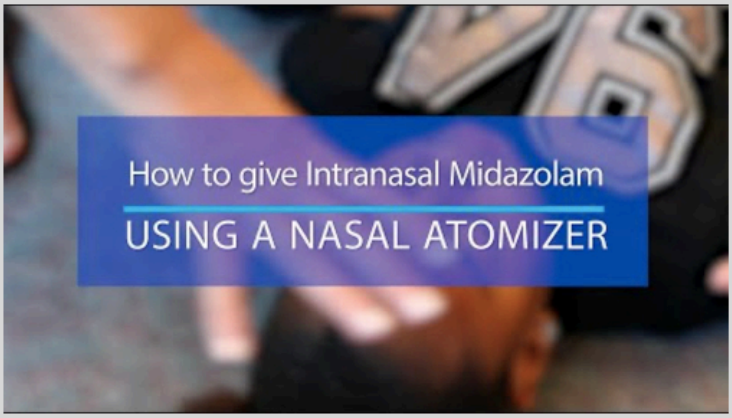
- During minimal sedation, a patient's cognitive and physical functions are slightly impaired, however reflexes of the airway, ventilatory, and cardiovascular systems are not impacted by this form of sedation (American Society of Anesthesiologists, 2019).
- However, it is important to note that due to various pre-existing conditions and co-morbidities, it is possible that the patient may fall into a deeper level of sedation than is aimed (Benzoni & Cascella, 2019). Therefore, it is critical that healthcare workers who are administering minimal sedation to pediatric patients in the ED are prepared to intervene in the event of an unexpected sedation outcome.
- Minimal sedation is indicated in the circumstances of minor and non-painful procedures, such as diagnostic imaging, minor laceration repair, and foreign body removal (Translating Emergency Knowledge for Kids, 2018).

Medications for Pediatric Minimal Sedation

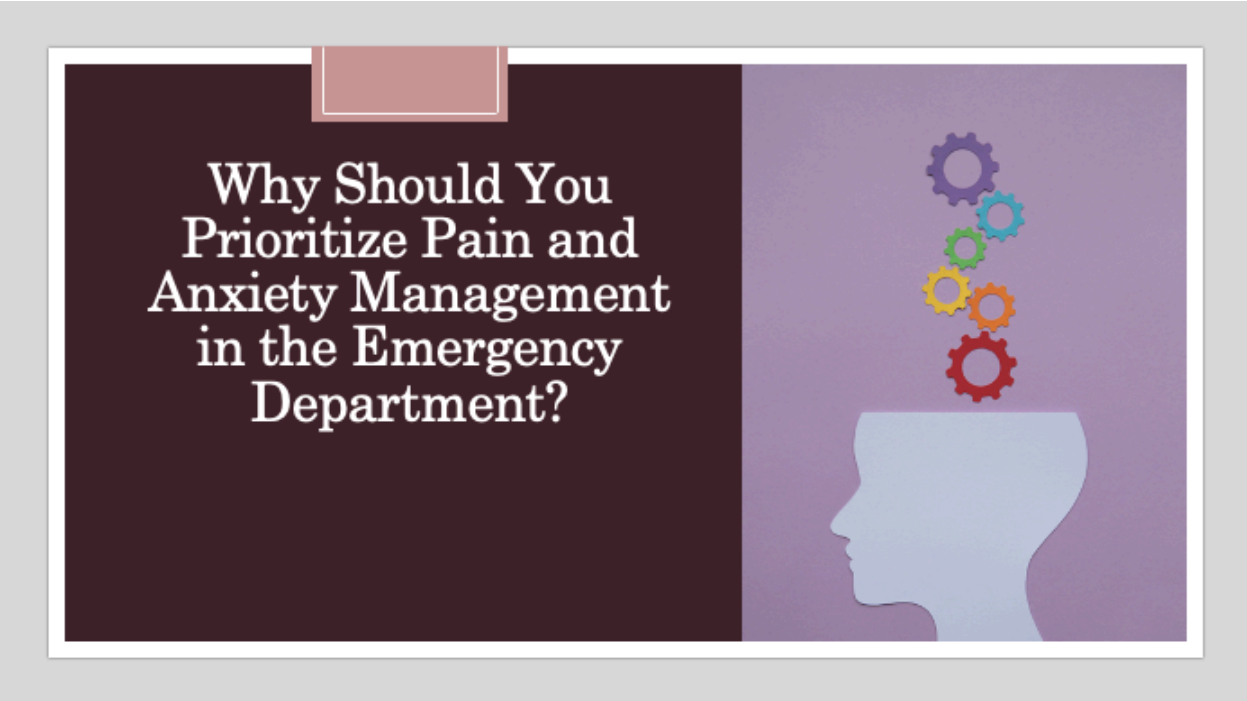
Medication	Midazolam	Fentanyl	Nitrous oxide
Route	Intranasal Route (IN) Or Intravenous Route (IV)	Intranasal Route (IN)	Inhaled
Doses	Intranasal Route (IN): Infants and children: 0.2-0.4 mg/kg/dose Maximum dose: 10 mg (5 mg per nare) Plus 0.1 ml in addition to first dose to account for dead space in the intranasal device Intravenous Route (IV): Infants and children: 0.05-0.1 mg/kg/dose Maximum dose: 5 mg	Intranasal Route (IN): Children > 1 year: 1.5 mcg/kg/dose Plus 0.1 ml in addition to first dose to account for dead space in the intranasal device	Children 4 years or older: minimum 30% oxygen (self-administered via demand valve)

- Nitrous oxide may need to be supplemented with other pain control, such as local anesthetic; indicated for children 4 and older who are cooperative.

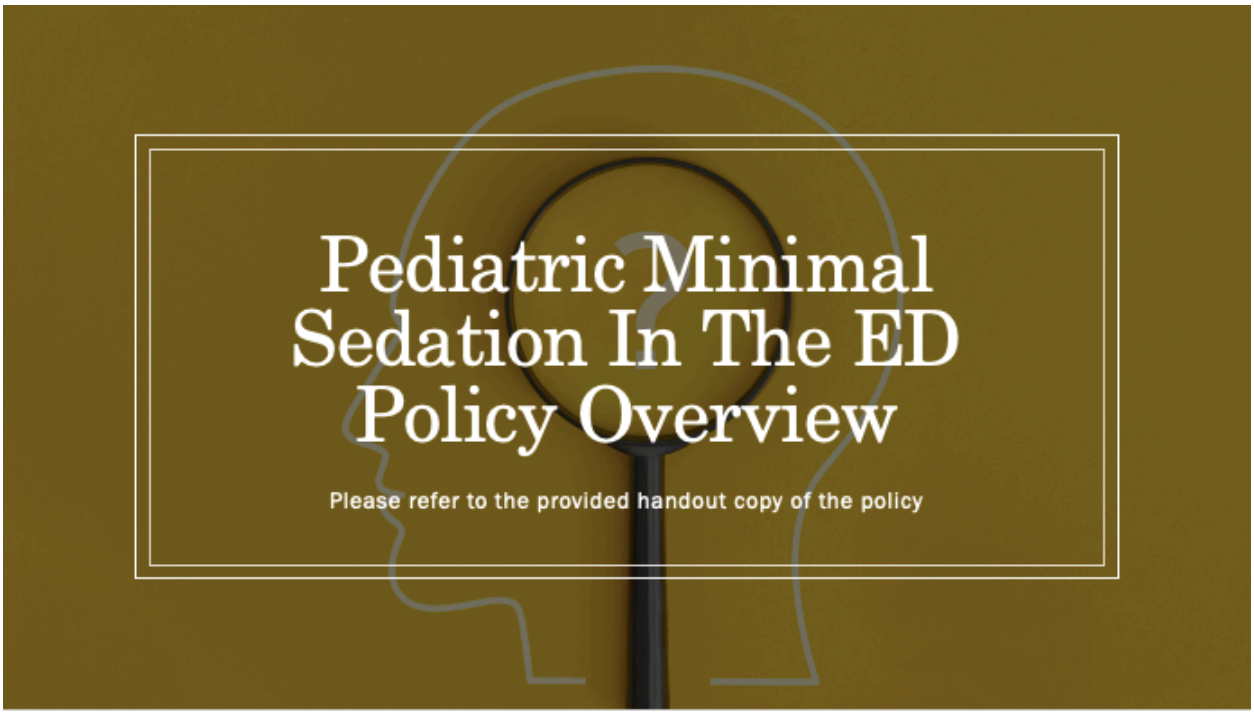
How to Administer Intranasal Medications for Sedation



- This video demonstrates the proper process for administering medications via an atomizer.
- It is important to note that you must draw up 0.1 ml in addition to the medication to account for the dead-space in the atomizer for the first dose.



- Undertreated pain and anxiety during hospitalization can negatively impact a patient's psychological well-being and caregiver satisfaction with care (Chen et al., 2000; Crumm et al., 2020; Hwang et al., 2023; Malia et al. 2019; Noel et al., 2010). Several studies have shown that children commonly have memory of pain experienced during medical procedures. Researchers have found that high levels of self-reported pain immediately following needle poke procedures can lead to increased anxiety associated with the procedure over time (Chen et al., 2000; Noel et al., 2010). Anxiety can have many negative effects on one's health and may be a lasting impact of pediatric pain.
- This evidence reinforces the need for healthcare providers to prioritize pediatric pain management during procedures so that anxiety associated with these procedures can be managed or possibly prevented.



- The remaining section of this lecture will provide you all with an overview of the minimal sedation policy for pediatric patients in the emergency department.
- Distribute physical copies of policy to learners (Appendix D).
- Discuss each section of the pediatric minimal sedation policy.
- Allow for questions/discussion at the end of this section.

Pediatric Minimal Sedation Policy

- This policy will provide guidance to the implementation of minimal sedation in the pediatric ED setting. This policy does not cover guidelines for deeper levels of sedation.
- Minimal Sedation (anxiolysis): a drug-induced state during which a patient can respond normally to verbal commands. While cognitive function and coordination may be impaired, ventilation and cardiovascular functions are unaffected (American Society of Anesthesiologists, 2019).
- Minimal Sedative Medication: medications which cause a minimally sedative effect.
- Patient: any pediatric aged patient in the emergency department setting.

Scope

This policy applies to Registered Nurses working in the pediatric ED.

Purpose

This policy provides guidance to the implementation of minimal sedation in the pediatric ED setting.

Indications for minimal sedation

- Intravenous line placement
- Diagnostic imaging
- Laceration repair
- Foreign body removal
- Lumbar puncture

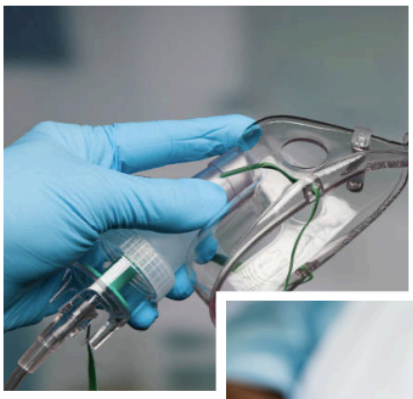
Pediatric Minimal Sedation Policy

- **Required Personnel and Responsibilities**
- *Registered Nurse*

- Obtains a full set of vital signs within **four** hours of sedation.
- Administers sedative medication as orders.
- Places the patient on continuous pulse oximetry when the sedative medication is given and for the entire duration of the sedation.
- Ensure the patient remains with a responsible parent/caregiver.
- Required patient monitoring: the RN will ensure that the patient is checked every **five** minutes following the administration of the sedative medication. During each check the RN will assess level of consciousness, heart rate, respiratory rate, and oxygen saturation. This information will be documented in the patient's health record.
- Notify physician when optimal sedation is achieved to complete medical procedure.

Pediatric Minimal Sedation Policy

- **Supplies**
- Required Equipment:
- Oxygen with age-appropriate mask
- Bag-valve-mask (i.e. Ambu-bag)
- Pulse oximeter
- Suction device
- Reversal agent (as indicated)
- Crash cart/code blue cart readily available on the unit



Pediatric Minimal Sedation Policy

◦ **Discharge Criteria**

- Patient can independently maintain a patent airway.
- Vital signs are stable and return to patient's baseline.
- Patient is alert or at their baseline level of consciousness.
- Pain is well controlled.
- Patient is well hydrated; nausea and vomiting are controlled.
- Patient is accompanied by a responsible caregiver (in cases of discharge home).
- Discharge teaching provided to patient's responsible caregiver (see attached form for written discharge teaching instructions).

Pediatric Minimal Sedation Policy

Pediatric Minimal Sedation Discharge Instructions for Caregivers

Your child received _____ for sedation in the emergency department.

Activities:

Your child may experience episodes of sleepiness, dizziness, or lack of coordination after their sedation.

Your child should be easy to wake from sleep.

Allow your child as much rest as they need. They should not participate in activities that require coordination or balance.

Do not leave your child alone.

Your child cannot drive a motorized vehicle (if applicable).

Diet:

Initially, start giving your child clear fluids only (e.g., water, juice, Gatorade). Encourage them to drink fluids to maintain hydration.

Slowly begin adding solid foods as tolerated.

Vomiting may occur. If your child vomits, wait 30 minutes and begin feeding clear fluids. Then restart feeding solids once clear fluids are tolerated.

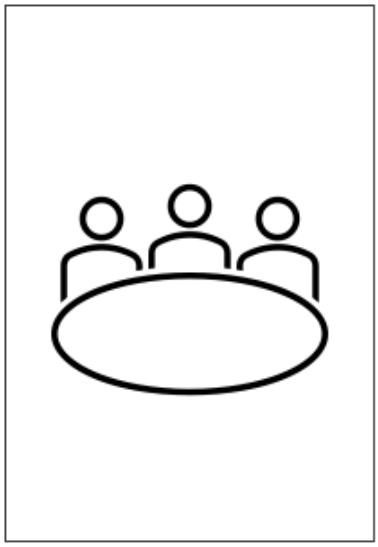
You should return with your child to the emergency department if:

Frequent vomiting and not tolerating fluids by mouth.

Decreased level of consciousness, unable to arouse.

- 15-minute break

- Learners should divide themselves into groups of 3-4 (depending on size of total group). Inform learners that one case will be discussed in this section of the workshop. Give each group a copy of the case for discussion questions. After 15 minutes, one member from each group will share their group's answers for discussion. Facilitate discussion between the groups. Refer to case-discussion answer key to ensure all topic points are discussed.



Case Discussion Learning Objectives

By the end of this portion of the workshop, learners will:

1. Identify proper indications for pediatric minimal sedation
2. Apply theoretical knowledge via critical-thinking and independent decision-making
3. Collaborate with group members to identify alternative solutions to case problems

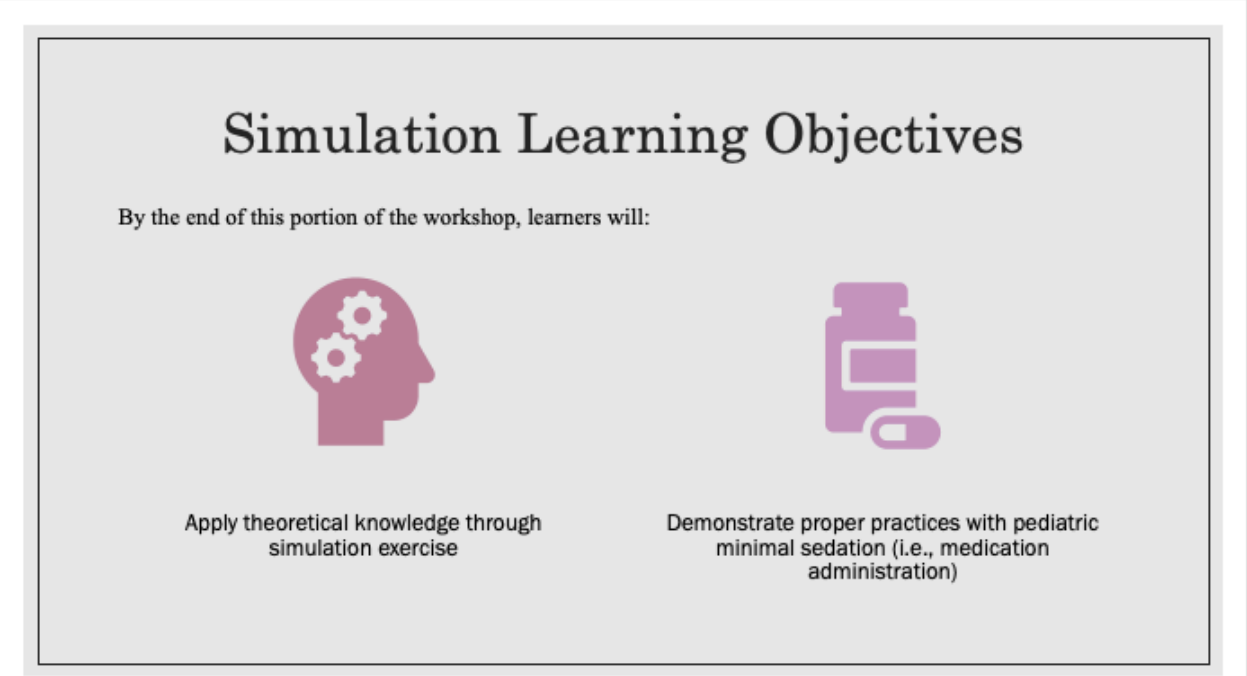
Case Discussion Scenario

- Case for discussion:
- Lilly is a 3-year-old patient presenting to the pediatric emergency department after telling her mother that she stuck a pink bead in her right ear. After being triaged, she is placed in the procedure room to await assessment by the emergency room physician. During the physician assessment, Lilly becomes upset. She does not want to stay still for the foreign body removal and is afraid of the otoscope. The physician orders minimal sedation to aid the removal of the bead.

- Distribute paper copies of the case discussion scenario and questions to the groups (refer to Appendix E).
- Allow 15 minutes for groups to develop answers to the questions.
- Allow 15 minutes for discussion of answers among the groups, each group should introduce at least one question during discussion.

- 15-minute break

- Inform learners that one simulation will be practiced during the workshop. Learners will have the ability to practice preparing and administering minimal sedation medication via the intranasal route of administration. Distribute copies of the simulation activity and supplies for completing the simulation (practice medications and supplies). Instructor should walk around the room to monitor practices and provide guidance/feedback. Simulation guide provided to ensure learners are reaching required outcomes. Provide a simulation mannequin for simulation of medication administration.

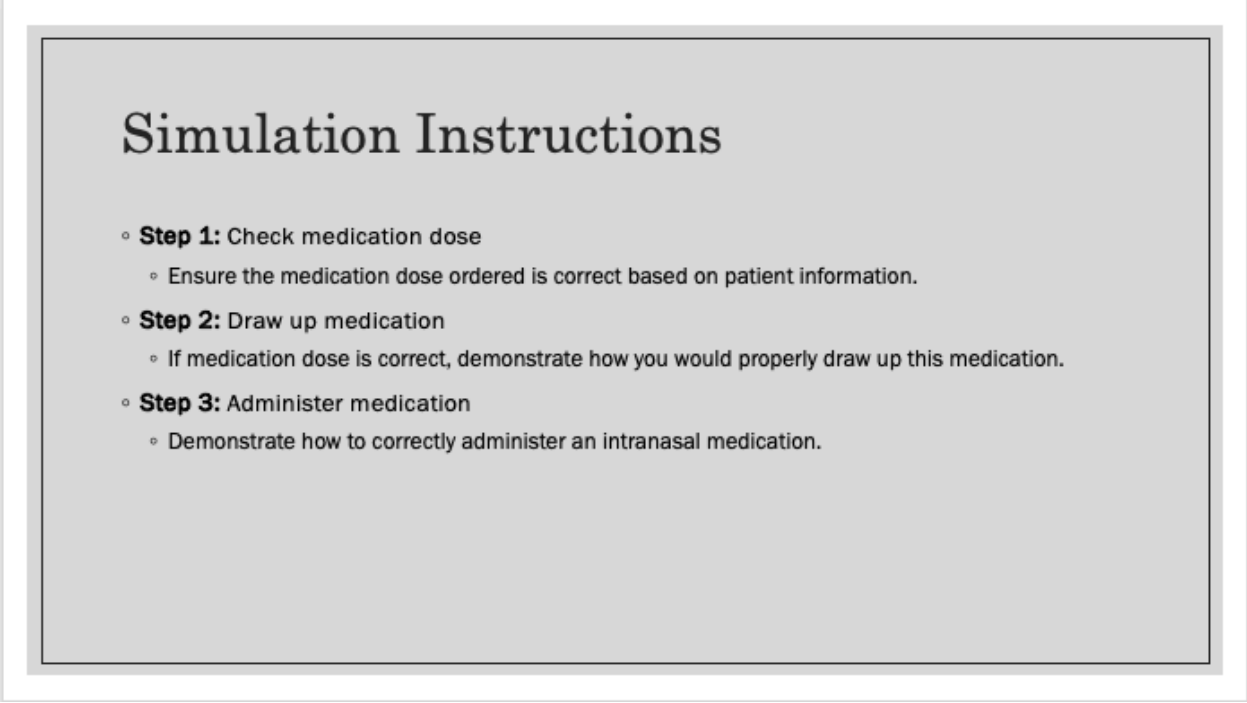

Simulation Learning Objectives
By the end of this portion of the workshop, learners will:
Apply theoretical knowledge through simulation exercise
Demonstrate proper practices with pediatric minimal sedation (i.e., medication administration)

Simulation of Intranasal Medication Administration

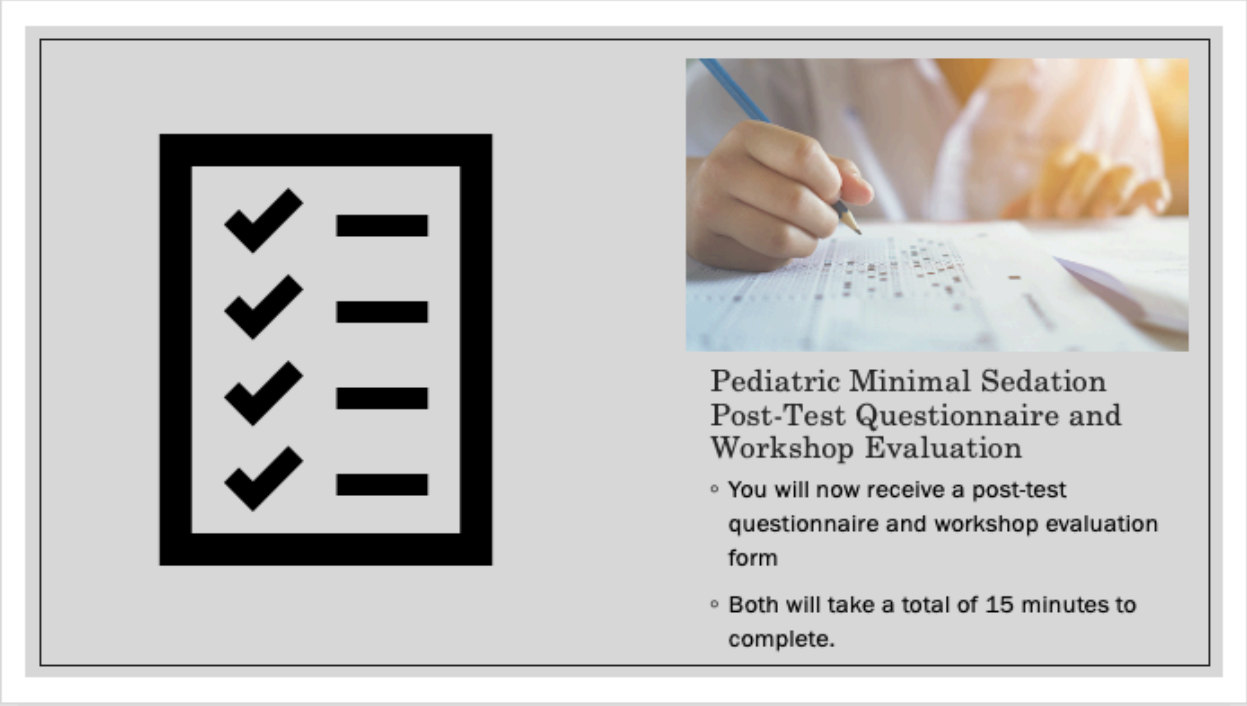
- This simulation is aimed at allowing learners hands-on experience to practice administering medications via the intranasal (IN) route. In this simulation, you are the registered nurse who is caring for Lilly (patient in the case-discussion). You have been given the physician order as shown below:
- Patient Name: Bowden, Lilly
- Date of Birth: 10/04/2021
- Patient Weight: 14 kg

Physician Order:

Midazolam 7 mg IN x 1 dose now



- Read simulation prompt to learners, followed by the required steps for completion of the simulation.
- Allow and facilitate discussion of simulation when everyone has completed the simulation.



- Set a timer for 15 minutes for this questionnaire.
- Remind learners to not stress about this evaluation. Distribute the questionnaire to all learners. You will determine how much they have learned by comparing their pre and post-test results. There is no pass/fail scoring of the test. After 15 minutes have elapsed, instructor to read the answers aloud to the group and learners will self-correct their questionnaires. The course evaluation form should also be handed out with the post-test. Ask participants to complete and to submit their feedback to the instructor before exiting the workshop. Instructor must collect all copies of the pre and post-test questionnaires.

- Thank learners for actively participating in and attending the workshop.

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Appendix A: Workshop Attendance Record

Course Attendance Record

Date	Name	Employee Number	Signature

Appendix B: Pediatric Minimal Sedation in the Emergency Department Questionnaire (Pre-Test and Post-Test)

Pediatric Minimal Sedation in the Emergency Department Questionnaire

Name: _____

Employee Number: _____

Directions: Please reading the following questions and circle your selected answer.

1. **Pulse-oximetry is not required during pediatric minimal sedation.**
    a. True
    b. False
2. **What equipment is required when performing pediatric minimal sedation in the ED? (select all that apply)**
    a. Bag-valve-mask (i.e. Ambu-bag)
    b. Crash cart available
    c. Intravenous access
    d. Pulse oximeter
    e. Suction device
3. **Nitrous oxide is administered at what concentrations during pediatric minimal sedation?**
    a. 10-20%
    b. 20-40%
    c. 40% or higher
    d. 50-70%
4. **Which of the following is an appropriate maximum mg/kg/dose for IV midazolam vs IN (intranasal) midazolam?**

a. IV max mg/kg/dose is the same as IN max mg/kg/dose

b. IV max mg/kg/dose is higher than IN

c. IN max mg/kg/dose is higher than IV

d. Midazolam cannot be administered via IN

5. **Which medical procedure would not indicate the implementation of minimal sedation?**

a. Minor laceration

b. Diagnostic imaging

c. Foreign body removal

d. Fracture reduction

6. **Undertreated pain and anxiety associated with medical procedures can have lasting negative effects on a child's psychological well-being?**

a. True

b. False

7. **Following minimal sedation, patients who have uncontrolled pain are eligible to be discharged from the emergency department.**

a. True

b. False

8. **What is another term used to describe minimal sedation?**

a. Deep sedation

b. Conscious sedation

c. Anxiolysis

d. Sleep

9. **How often is the registered nurse required to document a patient's vital signs during minimal sedation?**
    a. Every 5 minutes
    b. Every 10 minutes
    c. Every 15 minutes
    d. Documentation of patient vital signs is not required
10. **Minimal sedation affects a patient's respiratory and cardiovascular systems.**
    a. True
    b. False

Appendix C: Pediatric Minimal Sedation Questionnaire – Answer Key

1. B
2. A, B, D, E
3. D
4. B
5. D
6. A
7. B
8. C
9. A
10. B

Appendix D: Pediatric Minimal Sedation

Policy

Pediatric Minimal Sedation Policy/Practice Guidelines

Overview

Painful and anxiety-inducing medical procedures commonly occur in the pediatric emergency department (ED). Undertreated pain and anxiety during hospitalization can negatively impact a patient's psychological well-being and caregiver satisfaction with care (Chen et al., 2000; Crumm et al., 2020; Hwang et al., 2023; Malia et al. 2019; Noel et al., 2010). For these reasons, it is important that healthcare providers are knowledgeable in providing safe and effective sedation that is applicable to the patient's unique medical situation. The main goal of sedation of pediatric patients is to limit pain, discomfort, and distress that can be associated with medical procedures (Krmpotic et al., 2021).

Policy

- This policy will provide guidance to the implementation of minimal sedation in the pediatric ED setting. This policy does not cover guidelines for deeper levels of sedation.
- Minimal Sedation (anxiolysis): a drug-induced state during which a patient can respond normally to verbal commands. While cognitive function and coordination may be impaired, ventilation and cardiovascular functions are unaffected (American Society of Anesthesiologists, 2019).
- Minimal Sedative Medication: medications which cause a minimally sedative effect.
- Patient: any pediatric aged patient in the emergency department setting.

Scope

This policy applies to Registered Nurses working in the pediatric ED.

Purpose

This policy provides guidance to the implementation of minimal sedation in the pediatric ED setting.

Indications for minimal sedation

- Intravenous line placement
- Diagnostic imaging
- Laceration repair
- Foreign body removal
- Lumbar puncture

Procedures

Required Personnel and Responsibilities

Physician

- Identify the need for minimal sedation as applicable to the patient situation.
- Pre-sedation assessment of potential risk factors.
- Provide patients/parents/caregivers with explanation of the benefits and risks of minimal sedation; obtain consent.
- Ordering sedative medication.
- Recognizes the development of adverse events and appropriately intervenes.

Registered Nurse

- Obtains a full set of vital signs within **four** hours of sedation.
- Administers sedative medication as orders.
- Places the patient on continuous pulse oximetry when the sedative medication is given and for the entire duration of the sedation.
- Ensure the patient remains with a responsible parent/caregiver.
- Required patient monitoring: the RN will ensure that the patient is checked every **five** minutes following the administration of the sedative medication. During each check the RN will assess level of consciousness, heart rate, respiratory rate, and oxygen saturation. This information will be documented in the patient's health record.
- Notify physician when optimal sedation is achieved to complete medical procedure.

Supplies

- Required Equipment:
- Oxygen with age-appropriate mask
- Bag-valve-mask (i.e. Ambu-bag)
- Pulse oximeter
- Suction device
- Reversal agent (as indicated)
- Crash cart/code blue cart readily available on the unit

Medication Dosing

Medication	**- Midazolam**	**- Fentanyl**	**- Nitrous oxide**
Route	**Intranasal Route (IN)** **Or** **Intravenous Route (IV)**	**Intranasal Route (IN)**	**Inhaled**
Doses	**<u>Intranasal Route (IN):</u>** Infants and children: 0.2-0.4 mg/kg/dose	**<u>Intranasal Route (IN):</u>**	Children 4 years or older: minimum 30% oxygen (self-

	Maximum dose: 10 mg (5 mg per nare) Plus 0.1 ml in addition to first dose to account for dead space in the intranasal device **<u>Intravenous Route (IV):</u>** Infants and children: 0.05-0.1 mg/kg/dose Maximum dose: 5 mg	Children > 1 year: 1.5 mcg/kg/dose Plus 0.1 ml in addition to first dose to account for dead space in the intranasal device	administered via demand valve)

Discharge Criteria

- Patient can independently maintain a patent airway.
- Vital signs are stable and return to patient's baseline.
- Patient is alert or at their baseline level of consciousness.
- Pain is well controlled.
- Patient is well hydrated; nausea and vomiting are controlled.
- Patient is accompanied by a responsible caregiver (in cases of discharge home).
- Discharge teaching provided to patient's responsible caregiver (see attached form for written discharge teaching instructions).

Pediatric Minimal Sedation Discharge Instructions for Caregivers

Your child received _____ for sedation in the emergency department.

Activities:

- Your child may experience episodes of sleepiness, dizziness, or lack of coordination after their sedation.
- Your child should be easy to wake from sleep.
- Allow your child as much rest as they need. They should not participate in activities that require coordination or balance.
- Do not leave your child alone.
- Your child cannot drive a motorized vehicle (if applicable).

Diet:

- Initially, start giving your child clear fluids only (e.g., water, juice, Gatorade). Encourage them to drink fluids to maintain hydration.
- Slowly begin adding solid foods as tolerated.
- Vomiting may occur. If your child vomits, wait 30 minutes and begin feeding clear fluids. Then restart feeding solids once clear fluids are tolerated.

You should return with your child to the emergency department if:

- **Frequent vomiting and not tolerating fluids by mouth.**
- **Decreased level of consciousness, unable to arouse.**

Supporting Documents

- Coté, C. J., Wilson, S., Riefe, J., & Koteras, R. J. (2019). Guidelines for monitoring and management of pediatric patients before, during, and after sedation for diagnostic and therapeutic procedures. *Pediatrics (Evanston)*, *143*(6), 1-. https://doi.org/10.1542/peds.2019-1000
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Key Words

Sedation, pediatrics, emergency, procedure, minimal, midazolam, fentanyl, nitrous oxide, pain and anxiety management, intranasal, atomizer

Minimal Sedation Discharge Instructions for Caregivers

Pediatric Minimal Sedation Discharge Instructions for Caregivers

Your child received _____ for sedation in the emergency department.

Activities:

- Your child may experience episodes of sleepiness, dizziness, or lack of coordination after their sedation.
- Your child should be easy to wake from sleep.
- Allow your child as much rest as they need. They should not participate in activities that require coordination or balance.
- Do not leave your child alone.
- Your child cannot drive a motorized vehicle (if applicable).

Diet:

- Initially, start giving your child clear fluids only (e.g., water, juice, Gatorade). Encourage them to drink fluids to maintain hydration.
- Slowly begin adding solid foods as tolerated.
- Vomiting may occur. If your child vomits, wait 30 minutes and begin feeding clear fluids. Then restart feeding solids once clear fluids are tolerated.

You should return with your child to the emergency department if:

- **Frequent vomiting and not tolerating fluids by mouth.**
- **Decreased level of consciousness, unable to arouse.**

Caregiver signature _____ RN signature _____

Date _____

Appendix E: Case-Discussion Questions

Case-Discussion Questions

1. What possible medications would you expect the physician to order for this sedation?
    a. Is Lilly a candidate to receive nitrous oxide for her sedation?
2. Prior to and during the minimal sedation, what are your responsibilities as an emergency registered nurse?
3. After receiving the correct dose for minimal sedation, you note that Lilly has a decreased respiratory rate and is taking shallow breaths only. How would you intervene, what actions would you take?
4. Following the minimal sedation, what criteria would Lilly need to meet in order to be discharged home?

Appendix F: Case-Discussion – Answer Key

1. *What possible medications would you expect the physician to order for this sedation?*

- Midazolam most likely

    a. *Is Lilly a candidate to receive nitrous oxide for her sedation?*

        - No, Lilly would not be a candidate for nitrous oxide since she is younger than 4 years old and was not cooperative during the initial assessment

2. *Prior to and during the minimal sedation, what are your responsibilities as an emergency registered nurse?*

- As a registered nurse working in the pediatric emergency department, these are your responsibilities when participating in minimal sedation:
- Obtain a full set of vital signs within **four** hours of sedation.
- Administer sedative medication (confirm dose ordered is correct using drug reference).
- Place the patient on continuous pulse oximetry when the sedative medication is given and for the entire duration of the sedation.
- Ensure the patient remains with a responsible parent/caregiver.
- Required patient monitoring: the RN will ensure that the patient is checked every **five** minutes following the administration of the sedative medication. Assessment during monitoring includes level of consciousness, heart rate, respiratory rate, and oxygen saturation. This information will be documented in the patient's health record.
- Notify physician when optimal sedation is achieved to complete medical procedure.
- Evaluate patient for discharge.

3. *After receiving the correct dose for minimal sedation, you note that Lilly has a decreased respiratory rate and is taking shallow breaths only. How would you intervene, what actions would you take?*

- Administer oxygen via mask; provide rescue breaths with Ambu-bag is very low respiratory rate
- Check circulatory status (pulses, perfusion)
- Attempt to stimulate patient to determine level of consciousness
- Alert responsible physician
- Prepare and administer reversal agent as indicated

4. *Following the minimal sedation, what criteria would Lilly need to meet in order to be discharged home?*

- Patient can independently maintain a patent airway.
- Vital signs are stable and return to patient's baseline.
- Patient is alert or at their baseline level of consciousness.
- Pain is well controlled.
- Patient is well hydrated; nausea and vomiting are controlled.
- Patient is accompanied by a responsible caregiver (in cases of discharge home).
- Discharge teaching provided to patient's responsible caregiver (see Appendix A for written discharge teaching instructions).

Appendix G: Simulation Instructor Guide

Step 1: Check medication dose

Learners should first check a credible drug dose resource to determine whether the medication dose ordered by the physician is correct for the patient. Based on midazolam dosing for pediatric minimal sedation, correct dosing would be between 0.3-0.5 mg/kg/dose. Based on Lilly's weight, the physician chose to use the 0.5 mg/kg/dose.

Step 2: Draw up medication

The important skill being practiced at this step is the proper method of drawing up a medication to be given via atomizer. Instructor should ensure learners demonstrate calculation of 0.1 ml of medication required to account for the dead-space within the atomizer.

Step 3: Administer the medication

Instructor should observe each learner administering medication. Learner should articulate maximums for intranasal administration (MAX 1 ml per nostril). Medication could also be divided between two nares for improved absorption.

Appendix H: Workshop Evaluation Form

Workshop Evaluation Form

Pediatric Minimal Sedation in the Emergency Department Half-Day Workshop

Instructor Name: _____

Date: _____

Please indicate your answers with a check in the table below.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The workshop met my expectations					
The workshop met the outlined objectives					
The workshop was well organized					
The instructor was knowledgeable of the subject					
The instructor communicated effectively					
The education room was comfortable and conducive to learning					
The information presented was pertinent to my workplace					
The interactive activities were helpful to my learning					

What did you find enjoyable about the workshop?

What did you not enjoy about the workshop?

How do you think this workshop could be improved?