Procedural sedation: Policy, practice & knowledge

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Procedural Sedation: Policy, Practice & Knowledge

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Dedication Page

This project work is dedicated to my family who has provided endless hours of support and encouragement.

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Abstract

Diagnostic and invasive procedures performed outside of the operating room with nurse-administered procedural sedation are increasing. As procedural sedation practice national guidelines are evolving, there are inconsistent state regulations and a great deal of variability in staff training. These challenges lead to potential knowledge gaps and practice variation that create unsafe patient environments. A local hospital has continued to experience near miss events when procedural sedation is administered. In an attempt to investigate this issue and create improved practice, an organizational policy analysis was conducted. The aims of this project were to: 1) analyze current hospital policy content compared with AORN's *Guideline for Care of the Patient Receiving Moderate Sedation/Analgesia*; 2) propose policy changes based on content gaps and barrier analysis; 3) assess current team members' knowledge with hospital policy for procedural sedation patient monitoring and knowledge of common procedural sedation medications; and 4) develop a plan for implementing policy changes and knowledge deficits identified. The Knowledge to Action framework activation cycle was used to guide policy analysis and practice change. The institution's Procedural Sedation Committee served as the discussion forum and decision making body regarding policy change. A staff survey yielded information specific to medication knowledge and procedural sedation. Policy analysis identified the following gaps in the organizational policy: a lack of objective patient assessment scoring for discharge readiness; the need for potential extended recovery times for specific patient populations; patient monitoring with capnography; pre-procedural patient education components; nurse knowledge expectations and nursing involvement in performance improvement activities. Results of the project include

implementation of the Aldrete discharge readiness assessment tool, a change in policy

specific to extended recovery for specific patient populations and implementation of a

decision tree to determine when procedural sedation was occurring. During this project, it

was discovered that additional exploration is needed regarding nurse's procedural

sedation medication and practice knowledge in order to create the next intervention that

will lead to best practice.

      Keywords: procedural sedation, moderate sedation, knowledge to action, hospital

policy

Procedural Sedation: Policy, Practice & Knowledge

Diagnostic and invasive procedures performed outside of the operating room with nurse- administered sedation are increasing. Guidance from state boards of nursing and professional organizations vary in scope of practice and clinical standards related to procedural sedation. The Virginia Board of Nursing and the Association of periOperative Registered Nurses recently published updated guidance for nurse-administered procedural sedation. Professional practice guidelines, state practice acts and regulatory requirements provide the foundation for hospital policies and procedures (American Nurses Association, 2016). Healthcare institutions develop policies and procedures that are adapted to the local work environment (Becker, et al., 2012; Squires, Moralejo & LeFort, 2007). Squires, Moralejo and LeFort (2007) found nurses accessed institutional policy and procedure manuals for knowledge on best practice rather than other primary sources. Hospital policies and procedures are more accessible to nurses in the moment of care, as opposed to searching and reviewing primary studies (Harrison, Le'gare', Graham & Fervers, 2010). Local adaption and incorporation of procedural sedation guideline recommendations into institutional policy can facilitate practice change towards consistent and safe patient care (Antonelli, Seaver & Urman, 2013 and Harrison, Le'gare', Graham & Fervers, 2010).

Background and Significance

Rising percentages of clinical staff trained under inconsistent regulations increases the potential for practice variation and confusion. Easy access to institutional policies, including regulatory and professional standards, can enhance practice

consistency (Squires, Moralejo, & LeFort, 2007). Procedural sedation is an example of where hospital policy can promote best practice and relevant regulatory compliance.

Procedural sedation is now commonly provided in areas such as the emergency department, cardiac catherization lab, interventional radiology, ambulatory clinics and hospital inpatient nursing units (Carperelli-White & Urman, 2014; Gaitan, Trentman, Fassett, Mueller, & Altemose, 2011; Gozal & Mason, 2010; McCoy et al., 2013; Conway, Page, Rolley & Worrall-Carter, 2011; Youn, Ko & Kim, 2015). Increased demand has resulted in non-anesthesia providers directing and administering sedation (Crego, 2015; Gozal & Mason, 2010; McCoy et al. 2013). Multiple, sometimes conflicting, guidance documents concerning nurse-administered procedural sedation, combined with rapid growth in volume and types of procedures performed outside of the operating room, results in confusion and potential patient safety issues (Crego, 2015; O'Malley & Poling, 2015).

Nurses' training is variable and physician direction for sedation administration is inconsistent (Conway, Rolley, Page & Fulbrook, 2014; Crego, 2015; Gaitan et al., 2011; O'Malley & Poling, 2015). Inconsistency extends from training and regulation to variation in patient care. Practice varies within specialty groups, including gastroenterology and emergency medicine (Meyer & Engelbrecht, 2015; Shavit, Leder, & Cohen, 2010; Vaessen & Knape, 2016). Non-anesthesiologist provided sedation practices are also highly variable (Fanning, 2008). Inconsistent practice includes medications administered, staff involved, patient monitoring and departmental within the same institution. Significant differences in practice and individual patient response to treatment

makes procedural sedation a complex and high-risk process (American Society of Anesthesiologist Task Force, 2002; McCoy et al., 2013).

Threats to patient safety range from mild events such as reversible oxygen desaturation to severe events, including death. Overall complication rates are difficult to determine. Studies report adverse events based on specific medications, patient population or setting where sedation is administered (Conway, 2011). Meyer and Engelbrecht (2015) suggested complications may be higher than reported due to staffing problems and minor issues missed. Complication rates may not include near miss events, when a physician or nurse fails to recognize procedural sedation and the need for additional patient safety monitoring. Studies conclude procedural sedation outside of the operating room generally safe, but there remains significant variation in the definition of adverse events (Crego, 2015).

Near miss events are a concern at the local hospital. Over the last year there have been six identified near miss events. During these events, patients experienced minor oxygen desaturation issues and lengthened recovery times. One patient required movement to a higher level of care for closer observation. Once fully recovered, all near miss event patients returned to baseline. Reviewing the last year, the overall event rate is less than 0.5% , with over five hundred procedural sedation cases each month. Due to the concerns with near miss events, annual required education for nursing was instituted focused on basic identification of sedation levels. This education has not produced a significant decrease in near miss events.

Regulation

The Centers for Medicare and Medicaid Services (CMS) and The Joint

Commission (TJC) provide national level regulatory requirements (Murphy, 2013). A

variety of professional organizations provide sedation practice direction. The American

Society of Anesthesiologist (ASA) developed guidelines specifically for non-anesthesia

provided procedural sedation (Crego, 2015; Murphy, 2013). Multiple sub-specialty

nursing organizations have also developed their own guidelines and reference the ASA

guidelines. Examples include the American Association of Nurse Anesthetists (AANA),

Association of periOperative Registered Nurses (AORN), Society of Gastroenterology

Nurses and Associates (SGNA), Emergency Nurses Association (ENA), and the

Association of Radiologic & Imaging Nursing (Crego, 2015; Murphy, 2013; O'Malley &

Poling, 2014). State nursing board regulations vary and continue to evolve on this

subject. Evolving regulatory requirements and professional organization guidelines with

unknown adoption patterns contributes to practice variation and risk for patients.

Literature Review

Typically, guidelines assist in establishing best practice and reduce variation

(Cohn, Gautam, Preddy, Conners & Kennedy, 2016; Keiffer, 2015). The ASA has had

the most influence on procedural sedation regulatory standards (Crego, 2015). The ASA

Practice Guidelines for Sedation and Analgesia by Non-Anesthesiologists defines

sedation levels, patient selection, monitoring, training recommendations, availability of

emergency equipment and recovery care (American Society of Anesthesiologists, 2002).

Many of the guideline recommendations were determined by expert opinion consensus

and had limited or absent supporting evidence in the literature (American Society of Anesthesiologists, 2002).

Guidelines published by nursing organizations have conflicted and created confusion regarding best practice related to RNs administering procedural sedation. The AANA's joint statement with ASA in 2005 stated drugs such as induction agents commonly used in procedural sedation should be limited to Advanced Practice RNs (AANA, 2005). This position directly opposed the *Procedural Sedation Consensus Statement* (2008), a collaboration statement endorsed by medical and nursing organizations. In 2016, AANA retired the 2005 position and endorsed *Non-Anesthesia Provider Procedural Sedation: Considerations for Policy Development.* This document describes anesthesia's responsibility for oversight and guidance in sedation care and aligns with CMS and TJC standards. Sedation provided and directed by non-anesthesia providers is recognized as necessary in today's healthcare environment. AANA's policy considerations include levels of sedation, training and competency expectations, documentation and quality improvement expectations (AANA, 2016). The AANA's 2016 position now aligns with the *Procedural Sedation Consensus Statement (2008)*, which recognizes procedural sedation by RNs as an advanced skill that requires specific knowledge and competence. In 2015, AORN's *Guideline for Care of the Patient Receiving Moderate Sedation/Analgesia* was updated (Ogg, 2015). These guidelines provide foundational practice expectations. Recommendations are intended to be adaptable across all settings to provide best practice with procedural sedation (Burlingame, et al., 2016).

State Boards of Nursing

Guidelines provide broad, consistent direction, with the caveat that RNs must function within the limits of their state licensure practice acts and organizational policies (Crego, 2015). State to state, practice acts vary in rules and details associated with administering procedural sedation. States bordering Virginia address sedation in practice acts, board position statements or guidance documents.

West Virginia's Board of Nursing position statement (2010) addresses the RN scope of practice regarding administration of medications classified as anesthetics and limits these as appropriate for RNs who are not certified registered nurse anesthetists (CRNAs), only when patients are ventilated in acute care and in the emergency setting for rapid sequence intubation. North Carolina's position statement (2015) for RN administered sedation states "administration of sedative, analgesic, and anesthetic pharmacological agents, for the purpose of moderate or Deep Procedural Sedation/Analgesia, to non-intubated clients undergoing therapeutic, diagnostic, and surgical procedures, is within the non-anesthetist Registered Nurse (RN) scope of practice" (p. 1). In contrast, the Maryland Board of Nursing has no specific guidance related to administration of moderate or deep sedation by RNs (Maryland Board of Nursing, 2015). The Virginia Board of Nursing's (2015) guidance document *90-63* Registered Nurses and Procedural Sedation* defines levels of sedation and designates the intended sedation level as the determinant if sedation may be administered by a non advance practice nurse. The Virginia Board of Nursing (2015) requires nurse administered moderate sedation be an advanced skill with specific competencies related to medications, oxygen delivery, airway management, rescue procedures, risk assessment

scales, patient care prior, during and post sedation and recognition of sedation complications. There is no guidance in Virginia nursing regulation related to medication classification or medication associated scope of practice with procedural sedation.

Variability in state boards of nursing regulations and professional organizations' guidelines for procedural sedation creates confusion when seeking best practice (Crego, 2015). The literature is primarily focused on physician practice and descriptive accounts. Physician practices vary by medications, patient monitoring and case scenario approach (Fisher, Stassen, & Nunn, 2011; Gaitan et al., 2011; Lavi et al., 2014; Leroy et al., 2010; Pinto, Bhimani, Milne & Nicholson, 2013; Schinasi, Nadel, Hales, Boswinkel & Donoghue, 2013; and Shavit, Leder & Cohen, 2010).

Problem Statement

Evolving practice guidelines, inconsistent regulation and staff training lead to potential knowledge gaps and practice variation, creating an unsafe patient environment. Accessible, evidence-based institutional policies can promote consistent and safe practice. The aims of this project were to: 1) analyze current hospital policy content compared with AORN's *Guideline for Care of the Patient Receiving Moderate Sedation/Analgesia* (Ogg, 2015); 2) propose policy changes based on content gaps and barrier analysis; 3) assess current team members' knowledge with hospital policy for procedural sedation patient monitoring and knowledge of common procedural sedation medications; 4) develop a plan for implementing policy changes and knowledge deficits identified.

AORN's *Guideline for Care of the Patient Receiving Moderate Sedation/Analgesia* provides recommendations for best practice (Ogg, 2015). Because the

guideline is written at a global level, it requires adaptation for application at the local

level (Grimshaw, et al., 2012). Using a theoretical framework to guide analysis and

planning can increase successful implementation of practice changes (White & Dudley-

Brown, 2012).

Theoretical Framework

Nilsen (2015) describes the use of process models as "...guiding the process of

translating research into practice" (p.3). The Knowledge to Action (KTA) framework was

used to guide this project. Harrison, Graham, van den Hoek, Gogherty, Carley and Angus

(2013) describe the application of KTA cycle involving two major elements with fluid

boundaries. The first element is knowledge creation where primary studies, meta-analysis

and knowledge tools or guidelines are created. The second element involves planned

action and consists of two phases: knowledge activation and evaluation. The first phase

of the second element, the knowledge activation cycle, was the focus of this project and

included the steps: identify the problem, adapt the knowledge to use in the local

environment, assess barriers to knowledge use, and select, tailor and implement

interventions to promote use. The second phase, evaluation includes monitoring

knowledge use, evaluation of outcomes and sustainment of knowledge use and will be

completed at a later time (White & Dudley-Brown, 2015). A graphic of the KTA

framework can be found in Appendix A (Harrison, et al., 2013).

The KTA's knowledge activation cycle guided this project to include:

identification of the problem, adaptation of discovered knowledge to use in the local

environment, assessment of barriers to knowledge use, and implementation of

interventions. The first step of this project was to identify the issue or problem. The

problem focus was procedural sedation knowledge and practice confusion. The AORN's

(2015) *Guideline for the Care of the Patient Receiving Moderate Sedation/Analgesia,*

was used to demonstrate existing knowledge for best practice. Following the KTA steps

of knowledge activation, contents of the guideline were adapted and included in proposed

organizational policy revisions; barriers and facilitators to practice change were assessed;

interventions chosen; implementation planning completed and selected interventions

executed.

Project Description and Design

Institutional Policy Analysis

The first two aims and primary focus of this project were policy analysis and

revision based on best practices and data from an organizational specific procedural

sedation knowledge and practice survey. Translating knowledge into active practice,

involves adapting knowledge for local use, assessing barriers and facilitators for changes

and tailoring implementation methods. To adapt knowledge for local use, regulations

from TJC, the Virginia Board of Nursing's *90-63* Registered Nurses and Procedural*

Sedation guidance document and AORN's (2015) *Guideline For Care Of The Patient*

Receiving Moderate Sedation/Analgesia's recommendations were compared with hospital

policy using a policy comparison grid. See Appendices B, C and D for full policy

analysis content. Continuing the steps of the KTA knowledge activation cycle, the gaps

identified in the analysis were explored and adapted for inclusion in the revised policy.

Barriers and facilitators were discussed in the Procedural Sedation Committee and

considered in the policy revision and implementation plan.

Knowledge and Practice Survey

A staff survey was developed to assess participants' knowledge of medications commonly administered during procedural sedation and ability to identify when procedural sedation is occurring. No validated surveys were found in the literature that explored nursing' procedural sedation knowledge. A modified Delphi process, similar to the process used by Conway, et al. (2014) was adopted to develop survey questions. The following were used to develop the survey questions: clinical observations of procedural sedation practice outside of the operating room, questions brought to the procedural sedation committee, procedural sedation patient event reviews, discussions with nursing pain council members as well as other bedside nursing staff, local experts and current literature. The local hospital Institutional Review Board and James Madison University Institutional Review Board deemed the survey exempt, as a quality assurance/quality improvement activity. Survey analysis was completed for study sub-groups knowledge gaps and practice identification.

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Findings

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Policy Analysis

The hospital policy was compared to TJC and Virginia Board of Nursing's regulations and was determined to be in alignment. Evaluation of AORN's *Guideline for Care Of the Patient Receiving Moderate Sedation/Analgesia* recommendations resulted in several opportunities to align the organizational policy with best practice and improve patient safety. Gaps included lack of objective patient assessment scoring for discharge readiness; the need for potential extended recovery times for specific patient populations; patient monitoring with capnography; pre-procedural patient education components;

nurse knowledge expectations and nursing involvement in performance improvement activities.

The AORN guideline recommended the use of a discharge assessment readiness tool that was not included in the policy. Organizational investigation lead to the discovery that the Aldrete tool was in use in the post anesthesia care unit (PACU). This was identified as a facilitator to expand use of the Aldrete scoring assessment to all areas where sedation is provided.

The AORN guideline calls for extended recovery times for patients who receive medication reversal agents, the morbidly obese, those with difficult airway and patients with sleep apnea. The guideline also lists specific medications that require longer recovery times. Patient populations were only partially addressed in the policy. Longer recovery needs for these patient populations is covered in organizational sedation training; however, only medication reversal was actually included in the policy. No barriers were identified with adding the specific patient populations to the policy to consider longer recovery times.

Capnography use during procedural sedation was another identified gap. Capnography monitoring was identified as a best practice for safe care in the AORN guideline. The primary barrier for implementing this best practice was lack of capnography equipment outside of the operating room and limited capital funds. The AORN guideline also included pre-procedural patient education components that were not in the policy.

There was also a gap identified between the AORN practice guideline and the organizational policy related to nurse medication knowledge. The practice guideline

provided specific medication knowledge expectations and the organizational policy did

not. However, the policy globally addressed training and competency requirements. The

organizational required procedural sedation nurse education is in alignment with the

Virginia BON regulation.

The last gap identified was related to the involvement of nursing staff in

performance improvement activities specific to procedural sedation. Barriers to

addressing this gap in policy were concerns related to awareness and potential duplication

of quality improvement activities in the organization. The committee will continue to

seek further information before making additional policy changes related to this

identified gap.

Knowledge and Practice Survey Results

To address the third aim of this project, a self-developed electronic survey was

utilized to gather information related to medication knowledge and the ability to identify

procedural sedation. The electronic survey was sent to RN's and physicians at the project

hospital. The survey invitation was sent to 1,719 RNs who have organizational email

accounts. The physicians who received the email invitations were invited by email to

participate by physician department chairs. Nurses who completed the survey, self

identified as competent if they had completed specific procedural sedation training or as

not competent if they had not completed specific procedural sedation training. A total 456

RNs participated in the survey, for a response rate of 26.5%. All areas where nurses

practice were represented including intensive care, progressive care or step down, non-

monitored units, procedural areas, emergency room, operating room and outpatient

clinics. Forty-one physicians participated. This was considered low physician

participation; therefore, this group was excluded from the analysis. Nurse responses were analyzed based on the two self-identified groups. All survey question answers were included in the data analysis. Participants could answer any or all questions. No adjustments were made for missing data.

  Knowledge questions. Seven survey questions focused on common sedation medication knowledge. Medication questions were directed at participant knowledge of peak effect, onset of action and duration of effect. Medications selected for survey content are included in the project hospital's procedural sedation training. A one-way analysis of variance (ANOVA) with Turkey-Kramer test for pair wise comparison was completed. There were no significant differences in medication knowledge between self-identified competent or not competent nurse groups. Result details can be found in Appendix E. Although there were no statistically significant differences among the two groups for medication knowledge, there were other findings that indicate a need for future exploration and intervention. The overall survey results are concerning regarding medication knowledge. The majority of medication questions were answered correctly more often by the nurses that identified themselves as not competent compared to the nurses that identified themselves as competent. There were also specific medications such as morphine with less than 50% correct answers in both groups. These findings indicate there is a knowledge deficit that must be addressed.

  Practice identification questions. Near miss events, defined as nurses not recognizing that procedural sedation is occurring was the other major component of the survey. The nurse must be able to identify when procedural sedation is occurring in order to either follow the policy or seek assistance. There were 6 case scenario questions for

participants to identify if procedural sedation was present and one question that asked

participants to rank their confidence with identification of procedural sedation.

Participants' self-identified recognition of procedural sedation as a learning need. Fifty-

nine percent self-ranked themselves with limited or no confidence in identifying

procedural sedation (95% CI= 53,65). This finding validates that there is practice

confusion. Case scenario questions confirmed nurses fail to identify procedural sedation.

Scenario questions addressed three categories, common and less common medications,

medical resident participation and situations not meeting procedural sedation criteria.

Scenarios involving less common medications were correctly identified as procedural

sedation 59% of the time. Scenarios involving medical resident assistance were correctly

identified as procedural sedation by 55% of participants. Two case scenarios were

identified correctly as not being procedural sedation with 40% and 67% accuracy

respectively. Case scenarios with common sedation medication combinations of fentanyl

and versed were more likely to be correctly identified (83% and 84% respectively).

Analysis of the six scenario questions overall concluded that only 7.5% of participants

identified procedural sedation with 100% accuracy. Eighty three and a half percent

correctly identified procedural sedation 50- 100% of the time. The mean (95%

confidence interval) accuracy rate was 61.8 (CI= 58.7, 64.8)%. Further study is needed to

determine what aspects of procedural sedation prompted the inaccurate identification.

Policy Changes and Implementation Planning

The first three aims completed in this project involved policy analysis, change

recommendations and assessment of team members' knowledge with hospital policy

identifying procedural sedation and common medications. Policy analysis findings

including gaps, barriers and facilitators in addition to procedural sedation identification

and medication knowledge results were presented and discussed with the Procedural

Sedation Committee. Continuing the knowledge activation cycle steps, barriers and

facilitators were discussed and lead to policy adaptations and interventions. The fourth

and final aim of this project resulted in proposed policy changes that were categorized

into simple and complex implementation items. Simple items involved minimal planning

and complex items required more extensive development. The simple items to implement

included the Aldrete tool for discharge scoring and extended recovery time for specific

patient populations. A plan to improve access to capnography equipment is in process

and policy adjustments will be initiated following completion. Medication knowledge

deficits were identified as a broader issue beyond the procedural sedation policy and will

require a comprehensive education plan beyond this project.

Aldrete Tool

The lack of an objective assessment discharge scoring system to be used outside

of traditional surgical areas was identified as a high priority. The Aldrete Recovery Score

was currently used in the PACU. The curriculum that was developed to implement the

Aldrete tool in PACU was adapted for use outside of the operating room environment.

The curriculum was updated to include procedural sedation recovery instead of

anesthesia recovery language. Another project that was already in progress was updating

of the electronic medical record (EMR) sedation documentation. The Aldrete tool

documentation and policy expectations were added to this project. Staff that had

previously completed a procedural sedation competency process were assigned the

sedation documentation education, including the Aldrete tool component, on the

organization's electronic learning system. The new documentation was loaded into the

EMR sandbox that is a practice EMR environment. Staff were given three weeks to

practice the new functionality without affecting live patient records. Following

completion of the education, the procedural sedation policy was updated to align with the

new practice. The training process for staff that needed to complete procedural sedation

for the first time was updated to include the Aldrete tool components and EMR

documentation changes.

Extended Recovery

The issue of extended recovery for specific patient populations was identified as

another area of policy change. The patient populations addressed in the AORN guideline

were added to the policy; however, the Procedural Sedation Committee did not accept

adding a list of specific medications. Specific medications were not added to the policy

due to the concern that rapid evolution of medication use for procedural sedation could

not be captured and changed in a timely fashion to promote patient safety. The policy

change was communicated to current staff and their respective nurse managers via email.

The email content included a reminder of extended recovery best practice and notification

of policy changes.

Capnography

The consistent availability of capnography equipment was identified as a

significant need to ensure patient safety during procedural sedation. A multi-year capital

plan was developed to improve the availability of capnography equipment. The plan was

approved for purchasing during the 2016 and 2017 fiscal years. By the end of calendar

year 2017, the equipment barrier will be resolved and the policy will be updated to

include the use of capnography for all procedural sedation cases.

Performance Improvement

The main issue identified related to nurse involvement in performance

improvement (PI) was a lack of organizational awareness of work being done on

procedural sedation issues outside of the committee. There was concern about duplication

of efforts across disciplines and departments. The opportunity to discover what is actually

being done will be included in future initiatives. A quality improvement activity that

currently exists is committee review of all procedural sedation case events involving

reversal agents, respiratory or cardiac arrest and near miss events. In order to better

achieve nurse involvement in PI activities, a recommendation to be considered across the

organization is for each procedural area to include nurses in the review of sedation

practice.

Medication Knowledge

The medication knowledge survey question results identified a knowledge gap for

the majority of participants. These findings were presented to the Procedural Sedation

Committee and it was determined that the issue was broader than the scope of the

committee's work. The findings were then presented to the Nursing Education Council.

This council is now considering options to further explore and address the identified

medication knowledge deficits.

Practice Identification and Policy Application

The survey findings confirmed that participants' lack skill in determining when

procedural sedation is occurring. Survey findings indicate that the current annual

education requirements are not sufficient. Also, the policy content was not guiding nurse

recognition of procedural sedation. As a part of the fourth aim of this project, a decision

tree algorithm was developed to guide recognition of procedural sedation. This decision

tree was approved by the Procedural Sedation Committee and incorporated into the

procedural sedation policy as a decision guide. This algorithm was presented to nursing

shared governance councils and disseminated in person by members and by email as an

attachment to minutes. Nursing supervisors have reported an increase in the number of

procedural sedation concerns escalated to them since the implementation of the decision

tree. They also reported that most of the concerns raised met criteria for procedural

sedation and allowed them to intervene and create a safer patient environment. The next

step of decision tree implementation is to update the annual education content to include

scenarios, decision tree information and a post education learning assessment.

Discussion, Limitations and Implications

This project included a policy analysis, exploration of medication knowledge and

practice, and policy revision for procedural sedation at a local hospital. The policy

analysis was accomplished by comparing the AORN guidelines, the TJC and the Virginia

BON regulations to the hospital policy and practices. A survey was used to evaluate

medication knowledge and practice issues related to recognition of procedural sedation.

Based on the policy analysis and survey results, hospital policy and practices were

changed. Although this project was conducted at one facility and results are not

generalizable, the implications for practice may be applicable to other hospitals.

Significant hospital policy changes were needed in order to align with published

guidelines. While exploring and implementing these changes, the following limitations

were identified. The knowledge and practice survey was developed and approved prior to the project focus changing to policy analysis. The use of a non-validated survey and low response rates limits the application of findings beyond the single institution. Although the timing of the survey created challenges, the findings were ultimately applicable to the policy analysis. The physician recruitment process for the survey was not well designed and depended on individual's forwarding email communications. There were also three other physician surveys being conducted concurrently that may have impacted response rates. Another limitation encountered during the project was the need for Procedural Sedation Committee input and approval to any changes being made. There are significant challenges with implementing a national guideline whose first recommendation is to follow state regulations that vary. Another challenge related to implementing the national guidelines is they are only available to AORN members or for a fee for non-members. This limited access is a barrier to disseminating what is considered best practice.

The process of this policy analysis was complex. Future policy analysis projects will include more specific timelines, policy analysis as the first step, more rigorous development of survey content and inclusion of proposed tools in the survey. It is also possible that the policy analysis and the staff survey could have stood alone as individual projects.

The results of this project have a direct implication for local practice. This project could also be a starting point for regional or state discussions to gain improved access to best practice guidelines. Sharing of this project is the beginning point for discussion that needs to occur across the state and the nation.

Procedural sedation volume, locations where sedation is provided and complexity of medications administered will continue to evolve. Additional issues that need to be addressed that will influence the evolution of procedural sedation best practice include: align nurse practice regulations across states, add basic sedation concepts to nursing education curriculum and ongoing development of evidence through research focused on nursing practice and patient outcomes.

Evaluation and Conclusion

Each of the four aims of the project was accomplished. The first aim of completing a policy analysis was achieved by comparing hospital policy with the AORN's *Guideline for Care Of the Patient Receiving Moderate Sedation/Analgesia and TJC and Virginia BON regulations.* The second project aim was completed through discussion with the Procedural Sedation Committee of proposed policy changes and associated barriers and facilitators for implementation. The third aim of assessing current team members' medication knowledge and recognition of procedural sedation for policy application was achieved by the development and application of an electronic survey. The fourth and last aim was met through plan development for policy changes. The intent of the fourth aim was exceeded through the implementation of simple policy changes. Changes implemented included the Aldrete discharge readiness assessment tool, a change in policy specific to extended recovery for specific patient populations and a decision tree to determine when procedural sedation was occurring. Capnography monitoring will be implemented when capital purchase is complete. Medication knowledge findings and the implications for practice create concerns that must be further explored. Although annual education is currently required, additional training and policy changes may be needed.

The Procedural Sedation Committee will determine next steps needed to align nurse involvement in PI activities.

Procedural sedation is a complex issue. Variation in training and regulation creates practice confusion. When guidelines are updated, hospital polices need to be analyzed, local adaptations made and implementation plans completed to update practice. The KTA framework, activation cycle provided a logical foundation for this project. Future work is needed to continue to develop alignment of national guidelines, state regulations and organizational policy. This project will make a significant impact in procedural sedation practice in a local hospital system. There is opportunity for impact beyond the local system. This work must be continued in order to enhance procedural sedation practice consistency, ensure patient safety and quality outcomes.
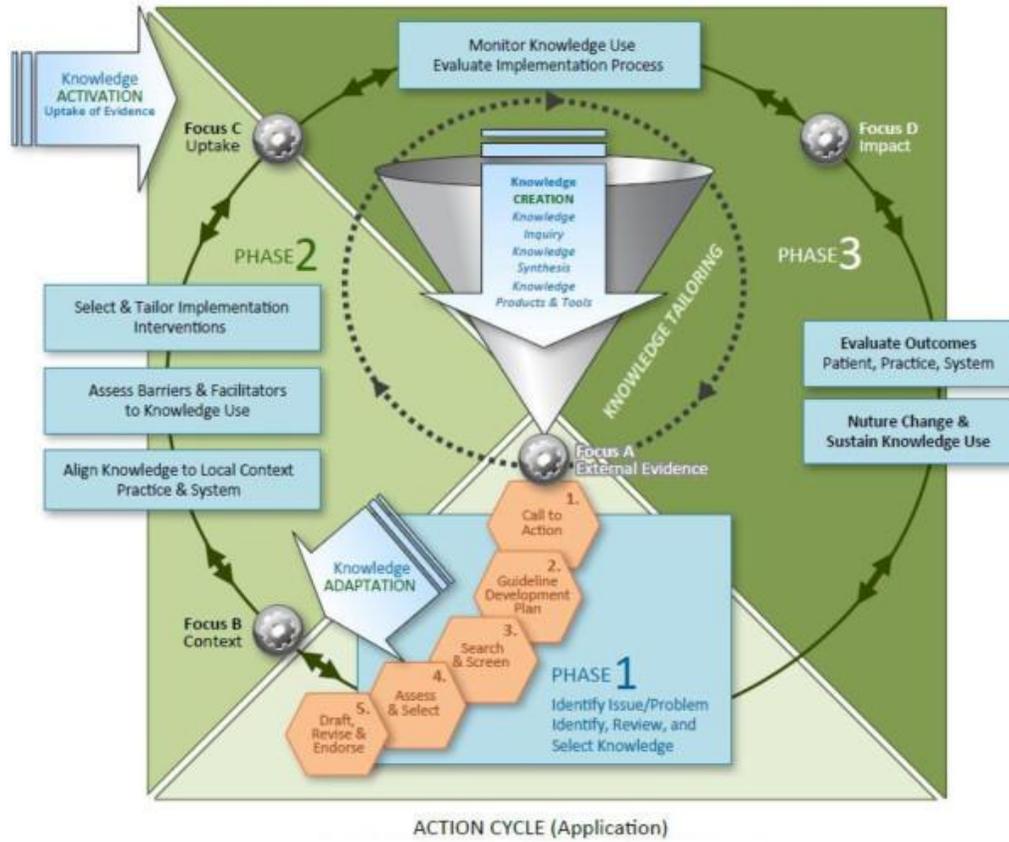
Appendix A

Knowledge to Action Model

Figure 1. Knowledge to Action (KTA) Framework depicting the three phases of knowledge creation, knowledge activation and evaluation (Harrison, et al., 2013).

Appendix B

Policy Analysis Grid-The Joint Commission Standards

AORN Guideline Recommendations	Regulatory considerations	Supported in Procedural Sedation Policy?	Barriers to implement	Facilitators
Perioperative RN administering moderate sedation/analgesia must practice within the scope of nursing practice as defined by his or her state board of nursing and should comply with state advisory opinions, declaratory rules, and other regulations that direct the practice of the registered nurse.	The Joint Commission (TJC) * regulations are paraphrased; items specific to the administration of anesthesia are omitted.			
	TJC-Hospital plans for operative or high-risk procedures that require moderate/deep sedation or anesthesia:			
	a) A RN supervises perioperative nursing care;	a) defined as limited to RNs with sedation competency	a) NA	a)NA
	b) equipment is available to monitor the patient's physiologic status;	b) Present in policy	b)NA	b)NA
	c) resuscitation equipment available	c) Present in policy	c)NA	c)NA
	TJC-Hospital provides the patient with care before initiating operative or other high-risk procedures, including those requiring moderate or deep sedation			
	a)Prior to the administration of sedation the	a) pre-assessment is required within 2	a) NA	a)NA

hospital conducts a pre-sedation patient assessment;	hours prior		
b) provides the patient with pre-surgical education according to his/her plan of care;	b) Not addressed in policy	b) Part of the standard of care to educate prior to providing care.	b)NA
c) Patient is reevaluated immediately before administering sedation	c) Not specifically addressed. Pre-sedation assessment is completed within 2 hours of sedation.	c) Belief this is in practice and not necessary to be written in policy.	c)None
TJC-Hospital monitors the patient during operative or other high risk procedures during the administration of moderate or deep sedation.			
a) the patient's oxygenation, ventilation, and circulation are monitored continuously.	a) level of consciousness, EKG and respiratory status are continuously monitored.	a) NA	a)NA
TJC-Hospital provides care to the patient after operative or other high-risk procedures with administration of moderate or deep sedation			
a) hospital assesses the patient's physiological status immediately after the procedure and/or as the patient recovers from moderate or deep sedation	a) Present in policy	a)NA	a)NA
b) hospital monitors patient physiological	b) minimum frequency of every 5 minutes	b)NA	b)NA

status, mental status and pain level at an appropriate frequency and intensity	established in policy		
c) A qualified independent practitioner discharges the patient from the recovery or from the hospital or according to criteria approved by clinical leaders.	c)Present in policy	c)NA	c)NA

Appendix C

Policy Analysis Grid-Virginia Board of Nursing Regulation

AORN Guideline Recommendations	Regulatory considerations- VA Board of Nursing (BON)	Supported in Procedural Sedation Policy?	Barriers to implement	Facilitators
Perioperative RN administering moderate sedation/analgesia must practice within the scope of nursing practice as defined by his or her state board of nursing and should comply with state advisory opinions, declaratory rules, and other regulations that direct the practice of the registered nurse.	BON-Registered nurses may administer mild to moderate sedation under certain conditions- in the presence of a health care professional appropriately credentialed for sedation. The health care professional selects and orders the sedation and is available during the entire procedure.	Present in policy	NA	NA
	BON-Education and Training: Sedation administration is considered an advanced skill & requires demonstrated competencies:			
	1)Knowledge of the purpose, actions and side effects of sedating medications;	1) Course content is not included in policy. Current common medications administered are reviewed in didactic course	1) Not appropriate for policy content	1)NA
	2)Knowledge of the respiratory system and oxygen delivery;	2) ACLS/PALS and/or Neonatal certification required as pre-requisite for course and noted in policy	2)NA	2)NA

3)Demonstrated airway management competency;	3) Only through certifications above	3) ACLS and PALs sufficient	3)Group agreed increased simulation training focus on airway
4)Understanding of cardiovascular system, medication pharmacology and antidotes, dysrhythmia recognition and sedation complications;	4) Reviewed in didactic course and cardiac rhythm recognition pre-course requirement	4) Not appropriate for policy content	4)NA
5)Ability to initiate emergency rescue procedures and resuscitation;	5) Practiced in simulation component of course	5)NA	5)NA
6)Identification and differentiation of levels of sedation and common patient assessment risk scales; and	6) Reviewed in course and in simulation scenarios and definitions included in policy & decision tree	6)NA	6)NA
7)Competency in pre, intra and post procedural nursing care from initial assessment to discharge.	7)Validated via live case observation post course/simulation	7)NA	7)NA

BON-Monitoring & documentation: must understand standards of monitoring and documentation to include:

1)Pre-sedation assessment – airway, NPO status, pregnancy, medical history,	1)Pre-assessment components are not detailed in policy but are included in didactic and	1)NA	1)NA

medication history, allergies, previous complications with sedation and history and physical;	simulation scenarios		
2)Collaboration with physician to develop sedation plan;	2)Noted in policy and included in didactic	2)NA	2)NA
3)Continuous monitoring to include heart rate, respiration, blood pressure, EKG, oxygenation via pulse oximetry and level of sedation; and	3) Continuous monitoring detail noted in policy	3)NA	3)NA
4)Continuous monitoring into the recovery phase as the patient returns to baseline until discharge.	4) Post procedure monitoring is noted as every 15 minutes time two and then every 30 minutes until discharge criteria met	4) NA	4)NA

Note content abbreviated from Virginia Board of Nursing. (2015). *Guidance Document 90-63*Registered nurses and procedural sedation*. Retrieved from https://www.dhp.virginia.gov/nursing/nursing_guidelines.htm

Appendix D

Policy Analysis Grid-AORN Guideline Recommendations

AORN Guideline Recommendations	Supported in Procedural Sedation Policy?	Barriers to implement	Facilitators
The perioperative RN should perform and document a patient nursing assessment before administering moderate sedation The perioperative RN administering moderate sedation/analgesia should continuously care for the patient throughout the procedure.	Present in policy	NA	
a) the RN caring for the patient receiving moderate sedation/analgesia should have no competing responsibilities that would compromise continuous monitoring and assessment of the patient during the administration of moderate sedation.	a) Present in policy	a)NA	a)NA
b) The perioperative RN providing moderate sedation/analgesia should be in constant attendance with unrestricted immediate visual and physical access to the patient.	b) Not addressed in policy	b)Small number of survey participants reported inability to observe 20% reported as most of the time Some tests/procedures prevent or limit visualization (radiation oncology)	b)None

c) The RN should monitor and document the patient's physiological and psychological responses, identify nursing diagnoses based on assessment of the data, and implement the plan of care. <u>Baseline/Intra-operative/ post-operative-</u>monitoring should include: pulse, blood pressure, respiratory rate, SpO$_2$ by pulse oximetry, end-tidal carbon dioxide by capnography, pain level, anxiety level and level of consciousness	c) Capnography or ETCO$_2$ monitoring is a recommendation if equipment available.	c)Capnography is not a skill present with many physicians or nurses. Capital equipment plan & training in progress to address. Assessment of pain and anxiety during sedation is part of the didactic course and EMR documentation	c)None
<u>Equipment</u> pulse oximetry, ECG, capnography, blood pressure measurement devices, oxygen source, masks and cannulas, suction source. tubing and tips and oral and nasal airways should be working properly and immediately available in room where procedure is being performed.	Present in policy	NA	NA
<u>Alarms</u> of automatic monitoring devices should audible and set to alert the RN to critical changes in the patient's status	Present in policy	NA	NA
The perioperative RN should know the recommended dose, recommended dilution, onset, duration, effects, potential adverse reactions, drug compatibility, and contraindications for each medication used during moderate sedation.	Not present in policy. Component of didactic course	Not appropriate for policy. Addressed in training.	Survey data indicates educational need

a) Before administering medications, the perioperative RN should verify order, verify correct dosing parameters and identify the patient-specific maximum dose	a)Not addressed in sedation policy	a) Addressed in training and addressed in general MD orders policy	a)NA
b) Intravenous medications should be administered one at a time, in incremental doses, and titrated to desired effect ie. moderate sedation	b)Not addressed in policy	b)Not appropriate for policy. Addressed in training	b)NA
c) When administering medications by non-intravenous route, the per-operative RN should allow sufficient time for drug absorption before considering additional medication.	c)Not addressed in policy.	c)Not appropriate for policy. Addressed in training.	c)NA
d) Supplemental oxygen should be immediately available.	d)Present in policy	d)NA	d)NA
e) The perioperative RN should document medications administered including medication, strength, total amount administered, route, time, patient response and adverse reactions	e)Present in policy	e)NA	e)NA
f) opioid antagonists and benzodiazepine antagonists should be readily available whenever these drugs are used.	f) Present in policy	f)NA	f)NA
The perioperative RN should evaluate the patient for discharge readiness based on specific discharge criteria.	Present in policy	NA	NA
a) Medical supervision of patient recovery and discharge after moderate sedation/analgesia should	a)Present in policy	a)NA	a)NA

be the responsibility of the operating practitioner or
a licensed independent practitioner

b) The health care organization should create a
multidisciplinary team to collaboratively develop
discharge criteria for patients receiving moderate
sedation/analgesia
Discharge readiness should include:

1)return to preoperative baseline mental status;	1) Present in policy	1)NA	1)NA
2) stable vital signs;	2) Present in policy	2)NA	2)NA
3) sufficient time interval (ex. 2 hours since the last administration of an antagonist);	3) Present in policy	3)NA	3)NA
4) Use of an objective patient assessment discharge scoring system (ex. Aldrete recovery score, post-anesthetic discharge scoring system);	4) Not present in policy.	4) Education needs and EMR expansion	4)In use in PACU environment
5) absence of protracted nausea;	5) Present in policy	5)NA	5)NA
6) intact protective reflexes;	6) Not present in policy	6) Included in current training Not necessary in policy	6)NA
7) adequate pain control;	7) Present in policy	7)NA	7)NA

8) return of motor/sensory control;	8) Not present in policy	8)Part of Aldrete	8)NA
9) ability to remain awake for at least 20 minutes;	9) Not present in policy	9) Disagreement on always criteria	9) NA
10) arrangement for safe transport from facility	10) Present in policy	10)NA	10NA
Discharge may be delayed when the patient: a) has obstructive sleep apnea;	a) Not present in policy	a)taught in course	a)NA
b) receives morphine;	b) Not present in policy	b) concern with medication specific instructions	b)None
c) receives dexmedetomidine;	c) Not present in policy	c) concern with medication specific instruction	c)None
d) receives an antagonist or	d) Present in policy	d)NA	d)NA
e) experiences postoperative nausea and vomiting	e)Present in policy	e) NA	e)NA
The perioperative RN must give the patient and his or her caregiver verbal and written discharge instructions with copy in medical record.	Is assumed DC instructions	Viewed as unnecessary-contained in general	NA

	noted in the record are provided both verbally and in written form	DC process policy	
The healthcare organization should provide the perioperative RN with initial and ongoing education and competency verification	Didactic and simulation training is required as noted above		
Moderate sedation/analgesia policies and procedures should be based on the state's medical and nurse practice acts, regulatory requirements, practice guidelines, professional organizations' statements, and accreditation requirements.	Compliant	NA	NA
Perioperative personnel should participate in quality assurance and performance improvement activities that are consistent with the health care organization's plan to improve understanding of and compliance with the principles and skills of moderate sedation/analgesia administration.	Currently this is not a standard expectation.	Paid time barrier and resistance to standardization	Opportunity for staff nurse engagement in performance improvement activities related to sedation.

Appendix E

Medication focused question results

Question focus	RNs with sedation competency Group 1 Correct (CI)	RNs with no sedation competency Group 2 Correct (CI)	p-value 1 vs. 2
Fentanyl	59(47,71)%	58(52,64)%	0.991
Versed	62(50,74)%	71(65,76)%	0.361
Morphine	41(29,53)%	38(32,43)%	0.887
Dilaudid	37(24,49)%	48(42,54)%	0.259
Renal and hepatic affect	68(56,81)%	52(46,58)%	0.061
MAOIs either correct answer selected	24(12,35)%	30(24,35)%	0.624
MAOIs both correct answers selected	1.8(0,5.4)%	5.5(2.8,8.1)%	0.560

Note. One way analysis of variance (ANOVA) with Turkey-Kramer test for comparison

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