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Implementation of Anesthesia-Specific Handoff Tools to Reduce Adverse Patient Outcomes

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Abstract

Background: The continuity of high-quality and safe patient care is supported by the transfer of information during the transfer of patient care. The integrity of this process is often compromised by poor communication, resulting in misunderstanding, and loss of information.[1] These deficiencies are largely due to a lack of uniformity that fosters inconsistencies and prevents the effective exchange of information, contributing to unfavorable consequences.[5] The objective of this project was to determine if consistent use of handoff tools during the transfer of patient care influences the content that is conveyed, performance improvement, and patient outcomes.[3]

Methods: To determine how handoff procedures affect patient care, a detailed evaluation of current practices was conducted. Practicing anesthesia providers were surveyed to inquire if the use of handoff tools is effective in preventing adverse patient outcomes and what method is most beneficial to facilitate the transfer of information. An education module was developed to educate providers about the issues associated with ineffective communication and the advantages of using standardized handoff techniques. Pre- and post-tests were conducted to assess the knowledge gained and evaluate attitudes surrounding the utilization of uniform practices when transferring patient information. Data collection, survey delivery, and module distribution used an anonymous online platform.

Results: Data obtained suggest the uniformity and consistency provided by the implementation of standardized handoff tools can reduce medication errors, decrease adverse patient events, improve communication among providers, and promote improvements in patient safety.

Discussion: Results indicate that providing education on the consequences of ineffective communication, and the techniques to remedy these deficiencies improve provider knowledge regarding the effectiveness of handoff tools during patient transfer. Comparison of pre-and posttest results align with the review of the literature supporting the use of handoff tools to reduce communication breakdown and promote patient safety. Limitations include limited sample size, self-reporting bias, and a shortened timeline.

Conclusion: Participation in the education module increased provider understanding concerning the consequences of inadequate communication, highlighted the influence of effective standardized handoff tools in the prevention of adverse outcomes, and improved patient safety.

***Keywords**:* Anesthesia, certified registered nurse anesthetist, CRNA, patient outcomes, SBAR, I-PASS, handoff tool

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I. Introduction

Problem Identification

Each step of the anesthetic process has associated risks that contribute to the increasingly complex nature of anesthesia.[1] Its identification as a fast-paced and dynamic environment often results in delays in workflow that are remedied with quick and, at times, ineffective solutions. Such an environment demands heightened vigilance and critical decision-making aided by mutually effective communication.[2] The importance of these elements is specifically significant when evaluating interactions among healthcare providers. The transfer of patient care weighs heavily on the efficacy of these interactions and represents a vulnerable stage that has the potential to affect patient safety.[3] Information detailed during patient handoff becomes explicitly significant in emergent situations, and loss of information in these critical settings can result in devastating outcomes. In a sentinel event assessment, The Joint Commission (TJC) affirms that communication deficiencies during patient handoff are a common theme when focus and attentiveness are compromised.[3] Additional emphasis is placed on the potential for harm when information is incomplete, untimely, misinterpreted, or unnecessary.[3] A misalignment of expectations between providers also complicates the delivery of information, resulting in omitted information that is interpreted as unimportant.[3] Dependence on the efficacy of communication is widespread in healthcare and is cemented as a fundamental aspect of the delivery of anesthesia. In support of this principle, this project aims to evaluate the impact the introduction of a standardized handoff tool has on preventing adverse outcomes by comparing the transfer of patient information using either a SBAR (Situation, Background, Assessment, Recommendation) or I-PASS (Illness severity, Patient summary, Action list, Situational awareness/contingency planning, Synthesis by receiver) format.

Background

Patient handoff constitutes the transition of responsibility to preserve the continuity of quality and safe patient care.[3,4] Impaired communication diminishes the integrity of this process, leading to degradation, misinterpretation, and loss of information.[1] Traditionally, the transfer of patient care involves a casual and informal relay of information with no standard process to guide its execution.[5] A lack of standardization and inadequate communication during this transition supports inconsistencies and inhibits the exchange of valuable information that increases the incidence of adverse outcomes.[5] The subjectivity in determining the importance of individualized patient information and provider inexperience can further compound these consequences.[4] Resolute decisiveness that is evident in the observation of proficient providers eludes most novice anesthesia practitioners and student registered nurse anesthetists (SRNAs). Additionally, the stress associated with a new clinical practice influences performance, impacting the consistency and accuracy in the translation of patient information. Skewed delivery of patient information often results in incorrect assessment diminishing the ability to prevent complications. Errors and loss of information are also exacerbated by reliance on the distinct communication skill and styles of practitioners.[1] The efficacy and value of verbal as opposed to written handoff is a topic of debate and gives credence to the importance of communication incompatibility between providers and its affect on how information is delivered, received, and interpreted.

Proposed objectives and requirements are the driving force of institutional culture and can contribute to communication difficulties. Emphasis on productivity places undue limitations on performance.[1] In this environment of urgency, production pressure promotes a hurried and unstructured process that compromises effective communication and ultimately patient safety.[1]

Scope of the Problem

The transition that occurs during patient handoff denotes change and is often associated with instability. Considering the consequences of uncertain variability, significant attention has been dedicated to determining the extent of this widespread issue. Studies indicate clinical missteps are presumed to be responsible for as many as 200,000 to 400,000 patient deaths annually.[6] According to TJC, communication failures were the primary factor in reported sentinel events from 1995 and 2006, and it has been suggested that mistakes in communication during the transfer of care may account for up to 80% of serious medical errors.[6] In 2017, TJC corroborated estimates that held communication breakdowns in American hospitals and medical practices liable in part for 30% of all malpractice claims, leading to 1,744 deaths and $1.7 billion in malpractice expenditures over 5 years.[3] Additionally, concordant evidence from the American College of Surgeons estimates that 85% of adverse outcomes result from a verbal communication breakdown.[1]

Communication failure and the enormity of its impact cannot be understated. There are no established criteria for the instruction and evaluation of anesthetic care handoff.[7] Mitigating further injury and financial burden requires a focus on identifying shortcomings and obstacles to serve as a catalyst for meaningful implementation and performance improvement.[3] Incorporating traditional approaches with innovative techniques prove to be the cornerstone in the advancement of clinical practice. Limited information exists concerning how and when inexperienced providers develop handoff skills.[7] Serving as a solution, the introduction of structured processes (i.e., SBAR and I-PASS) and evaluation tools (AnesSBAR) address the inadequate execution of handoff procedures. AneSBAR evaluates the handoff reporting of nursing anesthesia students with standards specific to anesthesia.[7] Seasoned practitioners and

SRNAs alike benefit from the uniformity that systematic implementation provides by enhancing confidence, reducing risk, and increasing satisfaction.[8]

Consequences of the Problem

Undoubtedly, one of the most complex arenas in medicine and healthcare, anesthesia relaxes the mind and numbs the senses, making critical and invasive procedures possible. The immeasurable responsibility of upholding the standards of the profession entails safeguarding the effective transfer of information. The negative implications of communication deficiencies are far-reaching, including medication errors, wrong-site surgeries, and patient injury.[9] Errors in communication have also been linked to lower satisfaction and longer hospital stays.[1] In anesthesia, the consequences are exaggerated, as seemingly insignificant inconsistencies in communication have the potential to produce insurmountable complications and in some circumstances, death. These risks associated with the loss or omission of information warrant changes to ensure the integrity, quality, and safe delivery of anesthesia.

As previously mentioned, production pressure in anesthesia can be a dangerous construct. The stress of continuous productivity creates distractions and compromises patient safety.[1] Moreover, accuracy and completeness of vital patient information are sacrificed when the emphasis on throughput in place of patient safety. Neglecting the strain this urgency places on the efficiency of patient handoff creates a domino effect that increases the potential for adverse outcomes and patient injury.[1] The subsequent financial burden is evidenced by escalating healthcare utilization and malpractice claims.[10]

Knowledge Gaps

The patient experience during the perioperative period can vary significantly. Due to the multiple care transitions, responsibility is frequently passed from one caregiver to another during

a single admission.[10] These transitions often involve language barriers, cultural considerations, as well as providers with different levels of expertise and expectations all contributing to a foundation of inconsistency that enables breakdowns in communication. Relevant research recognizes these complexities that exist during patient handover. Nonetheless, impactful implementation is absent in the current body of knowledge and fails to remedy inconsistencies to reliably influence patient care.[3]

Patient handover is plagued with deficits, where many care providers fail to recognize issues until an unfortunate event has occurred. The severity is substantiated in the assessment of patients where hypoglycemia can be inaccurately interpreted as routine recovery from anesthesia if critical information is excluded or neglected. In this setting, the incorporation of handoff tools provides a level homogeny, but no well-defined methodology exists to ensure adequate execution. Delivery of anesthesia-specific information is especially vulnerable when confronted with these variable approaches to the communication of information. SBAR often conveys the basics of patient condition, with the transfer of more detailed information left up to the discretion of the care provider. With no gauge to measure effectiveness, this subjectivity concerning the importance of information is the root of communication challenges and undermines the influence of implementation.

Proposal Solution

The Joint Commission has suggested enhancing the handoff procedure as a national objective to promote patient safety.[1] Additionally, creating uniformity in the content that is communicated, along with the usage of multiple modalities to express the relevance and severity of information, support the success of performance improvement and patient outcomes.[3] A systematic review of the literature confirms the need for process improvement in anesthesia to

prevent patient injury and further financial burden to individuals as well as the system at large. To combat these challenges, careful assessment of current practices is necessary to establish how patient care is affected by the existing handoff process. To date, consistent use of standardized anesthesia-specific processes for patient handoff have not been established, with the only obligatory prerequisite being that the transfer of information occurs with the change of care provider. This prompts the evaluation of organizational culture, knowledge deficits, and inconsistencies in practice. A baseline assessment to survey provider awareness regarding the impact of inadequate handoff was completed. This evaluation also explored the contributing factors during the transition of care and the effects on the quality of patient-specific information. Subsequent educational resources detailing the changes and benefits of practice improvement addressed these elements. Also included in provider education was the anesthesia-specific use of SBAR and I-PASS to itemize necessary anesthetic elements to transfer during patient handoff. Understanding the dangers of subtleties displayed by individual variation was fundamental to successful implementation. The consistent transfer of specific information was evaluated to determine efficacy in improving provider understanding, handoff, and outcomes. Each approach was analyzed to determine the process that optimizes quality and cost-effectiveness while maintaining improved patient outcomes.

II. Literature Review

Eligibility Criteria

A thorough literature search was performed utilizing a wide range of databases, including Cumulative Index of Nursing and Allied Health (CINAHL), Medline (ProQuest), and PubMed, in order to support the research topic. The search criteria further restricted the evidence by filtering literature published from 2012 through 2022. Search results were selected based on

analysis and evaluation of handoff processes, factors that affect communication and the delivery of information, patient safety, adverse outcomes, as well as how the interconnectedness of these elements relates to anesthetic practice.

Search Strategy

A preliminary investigation of evidence incorporating these parameters yielded randomized control trials (RCTs), comparative analysis, quality improvement, and intervention (pre/post-implementation) studies. The research focused on the introduction of standardized processes during the transfer of care, the effectiveness of handoff tools, as well as adverse effects and patient outcomes. Results were eliminated based on relevance and applicability to the research topic. After applying the inclusion and exclusion requirements, the literature that remained was analyzed.

Keywords

Search criteria used for study selection included combining the keywords, “anesthesia,” “certified registered nurse anesthetist,” “CRNA,” “patient outcomes,” “handoff,” “SBAR,” “I-PASS,” and “handoff tool.” The Boolean/Phrase “anesthesia specific AND/OR handoff tool” was also used.

Study Characteristics

Examination of the literature revealed that the source of adverse patient outcomes in anesthesia is multi-factorial placing significant importance on the transfer of patient care. The combined quantitative and qualitative components of evidence included in the review of literature reinforce the complex nature of this developing issue. Although the consensus credits enhanced handoff processes with improvements in patient outcomes, the current body of

knowledge is limited in this investigation citing the lack of standardization and inconsistencies in the delivery of patient information resulting in increased risk to patient safety.

Results

The evaluation of the causal relationship between the quality of handoff communication and patient outcomes emerged as a common theme in the research included in the literature review. In order to determine the nature of this relationship and contributing factors, Abbaszade et al. [11] examined the effects of bedside handoff on the standard of nursing care. To achieve this, nurses received written instructional materials and instruction on how to utilize the SBAR approach, after which a random sample of patients hospitalized in the coronary care units (CCUs) were surveyed.[11] The Quality Patient Care Scale (QUALPACS), which examines the psychological, linguistic, and physical aspects, was used to evaluate the standard of patient care.[11] Results revealed that after the adoption of SBAR during handoff, there was a significant improvement in the mean scores of each of the QUALPACS dimensions, evidenced by increased vigilance to patient's concerns and overall well-being, as well as improvements in communication among providers.[11]

Randmaa et al.[12] conducted a clinically controlled prospective study to examine changes in the amount of incident reports involving communication failures.[12] In this investigation staff from 1 hospital's anesthetic clinic served as the intervention group, while employees from another hospital's anesthetic clinic served as the comparison group.[12] The proportion of incident reports was monitored over a 1-year period both before and following implementation.[12] Conclusive results represented statistically significant improvements in communication accuracy and safety climate, as well as a decrease in the percentage of incident reports involving communication errors.[12]

In the execution of their RCT, Raurell-Torredà et al.[13] described teamwork as an integral element in improving outcomes and reducing errors through increased accountability and responsibility. Study objectives were aimed at improving nursing communication competency through the development of the SBAR framework to enhance evaluation techniques and build skills that affect patient safety.[13] Participants were randomly assigned to 16 intervention (SBAR simulation) groups and 15 control (lectures) groups with subsequent measurement of variables (teamwork, communication skills, and non-technical skills).[13] To fulfill study objectives, individuals in the intervention group were divided into subgroups consisting of 20 participants performing simulation sessions centered on fundamentals of professional healthcare, cooperation skills, and usage of the SBAR worksheet in accordance with recommendations. Comparison of study groups yielded substantially lower scores in control groups across all measurements, including role-specific and communication components.[13] The utilization of SBAR improved communication and teamwork and was positively correlated with better decision-making and patient intervention.[13] Additionally, clinical skills were improved by simulation incorporating the SBAR tool, improving awareness of responsibilities, and strengthening confidence in patient assessment.[13]

Joffe et al.[14] explored a distinct clinical scenario to analyze how problem-specific SBAR forms affect the information communicated between nurses and doctors. Patient management often involves after-hours communication; these exchanges—purely verbal in nature—occur under conditions of resource scarcity and exhaustion and are typically characterized by a lack of information.[14] The researchers theorized that by using problem-specific SBAR forms would support the gathering, organizing, and communication of data.[14] During implementation of their RCT, 92 phone calls (43 SBAR/49 controls) were observed and analyzed for the appropriate

delivery of situation and background cues.[14] Situational cues functioned to assess how well a patient's situation was understood and communicated in general terms, while background cues evaluated the communication of condition-specific information (i.e., medical history and laboratory results).[14] Results indicated that use of SBAR forms did not improve content delivery and were linked to a trend toward worse communication.[14] Consistently, nurses failed to identify and report case-specific information relevant to the root of the problem (background cues).[14] Furthermore, the availability of SBAR forms had no effect on communicating the reason for the call (situation cues) (88% vs. 84%, $p = .60$), and, interestingly, despite extracting the pertinent information from the record, nurses failed to report 10% of the situation cues and 14% of the background cues.[14]

The contribution of De Meester et al.[15] was to ascertain how SBAR affects the occurrence of serious adverse events (SAEs) in the hospital setting. Domains identified by root cause analysis of SAEs include an extended period of no observation and/or lack of attention to changes in vital signs, clinical deterioration is not detected and/or no action is taken despite the monitoring of vital signs, and medical attention is hindered until deterioration is noticed and help is requested.[15] This delay in receiving medical care may be the result of inadequate nurse-physician collaboration or communication.[15] Study implementation involved completion of pre- and post-intervention questionnaires to measure provider perception of collaboration and communication and the resultant impact on SAEs.[15] An investigator examined patient records with reported SAEs for 48 hours prior to the SAE for SBAR items in accordance with the SBAR form.[15] SAEs were described as unexpected fatalities, unanticipated admission to an ICU, and cardiac arrest team calls.[15] Consistent documentation of SBAR items increased from a mean of 32% pre-intervention to 56% post-intervention.[15] Additionally, 4% of the SAEs with all 4 SBAR

characteristics were recorded in the patient records prior to intervention; this number rose to 35% following intervention.[15] A rise in unforeseen ICU transfers and a fall in unforeseen fatalities were also observed.[15]

In a prospective cohort study, Caruso et al.[16] set out to establish a standardized handoff procedure from the operating room (OR) to the PACU with the intention of achieving a shared knowledge of the patient, preventing the loss of patient-specific information, and improving the transfer of patient data. The I-PASS structure was utilized in conjunction with a "read back" methodology to accomplish these objectives.[16] Additional outcomes including duration of patient transfer, as well as nurse satisfaction related to the handoff process and provider presence during the transfer of care, were also evaluated.[16] Study implementation transformed the handoff environment from an unstructured interaction between the circulating nurse, the anesthesiologist, and the PACU nurse, to a systematic collaboration, expanded to include the surgical staff.[16] The data points observed included the date, length of the handoff, surgical service, clinicians present at the bedside, total questions asked, distractions during handoff, and whether the required information was communicated during the handoff.[16] In the pre-implementation period, 41 handoffs, and in the postimplementation period 45 handoffs, were examined.[16] Outcome evaluation showed a significant improvement in total information transfer scores, observed in the transmission of patient information, as well as nurse, surgical, and anesthesia information, generating an overall mean score increase from 49% to 83%.[16] Based on study findings, the authors concluded that adopting this standardized handoff approach maximized the transfer of information presenting a more complete and accurate description of the surgical and anesthetic course during the procedure; it is also credited with improvements in nurse satisfaction and surgeon presence without lengthening the handoff time.[16]

In their prospective cohort study, Sheth et al.[17] explored how a multidisciplinary, standardized handoff process affects productivity, safety culture, and satisfaction. Through incorporation of the I-PASS tool, researchers set out to reduce patient transfer delays, enhance the culture of safety surrounding handoffs and transitions, and maintain patient/family and care provider satisfaction with the transfer process.[17] As part of the restructuring of handoff processes, researchers make every effort to ensure that a shared understanding of the patient was achieved.[17] The receiving team's use of a “read-back” technique facilitated a general understanding.[17] With the use of a common template built on the I-PASS framework and prepopulated with patient-specific data taken from the electronic medical record, the task force also standardized the handoff content.[17] Handoff procedures also called for the transmitting and receiving team disciplines to engage in face-to-face conversation in a “one message, one time” format with time set up for the receiver to synthesize the information and ask any questions.[17] To guarantee a clear transition of care, the handoff was finalized with a formal acknowledgement of responsibility and accountability.[17] Following the introduction of the modified handoff protocol, significant improvements in the patient safety culture were observed with associated decreases in adverse events.[17]

Serious medical catastrophes are frequently caused by miscommunication.[18] Starmer et al.[18] conducted an investigation of a resident handoff-improvement program assessing workflow, medical errors, and the prevalence of preventable adverse events and miscommunications. An I-PASS bundle to standardize handoff techniques, communication training, a monitoring program, and a sustainability campaign were implemented during the study.[18] Active surveillance was used to measure error rates, and review of written handoff documentation and audio recordings served as the basis for handoff evaluation.[18] As part of the practice improvement initiatives, the

incidence of medical errors dropped by 23% (24.5 vs. 18.8 per 100 admissions) and the rate of avoidable adverse events dropped by 30% (4.7 vs. 3.3 occurrences per 100 admissions).[18]

Focusing on the limited understanding surrounding handoff quality, Jorro-Barón et al.[19] conducted a cluster-randomized, stepped-wedge trial to analyze how implementation of a handoff program influences the frequency of adverse events (AEs).[19] This trial introduced an I-PASS handoff bundle, teamwork instruction, simulation, measures to reduce communication barriers, and structured evaluation of handoff techniques.[19] After implementation, medical records were examined to identify AEs and determine compliance with proposed modifications.[19] Trial results found no differences in the rate of avoidable AEs, and although adherence with each requirement in the verbal and written handoffs was noticeably higher in the intervention group, the impression of communication remained unchanged.[19]

Miller[20] asserted that improvement of patient outcomes is linked to prioritizing the quality of patient care. This initiative established specific strategies for patient transitions and highlighted the significance of standardized models and frameworks, as well as data demonstrating that non-standardized handoffs result in poor patient outcomes and serious adverse events. Miller[20] examined nurses' existing understanding of and attitudes toward the standardized I-PASS handoff, followed by identifying and removing obstacles to the tool's use. Additionally, supplemental education to facilitate I-PASS use was provided.[20] Despite best efforts, challenges continued to hinder progress, with a majority of nurses acknowledging that interruptions during shift change were significant barriers to using I-PASS.[20]

Citation	Design/Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement And Data Analysis	Findings	Results	Conclusions	Appraisal: Worth to Practice/Level
Abbaszade A, Assarroudi A, Armat M, et al[11] 2021	Quasi-experimental study Evaluate the effect of handoff using the SBAR approach on the standard of nursing care	Sample: Patients hospitalized in the coronary care units (CCUs) – 144 patients Setting: 2 public hospitals in Bojnurd, Iran, between September 2018 and February 2019	IV = Use of SBAR DV = Quality of nursing care based on the Quality Patient Care Scale (QUALPACS)	Mean (standard deviation, SD) and frequency (%) were used to summarize continuous and categorical variables, respectively. The mean score for each and both hospitals' QUALPACS dimensions was compared before and after SBAR deployment using an analysis of covariance (ANCOVA) test, G*power version 3.10.0 was used to calculate sample size, and STATA (version 12, Stata Corp, College Station, Texas) was used for analysis. Statistical significance = $p < .05$.	Following SBAR implementation, the mean scores for the QUALPACS dimensions of psychosocial, physical, and communicative significantly increased.	Increase in the mean score Psychosocial ($p < .001$ and $p < .001$) Physical ($p < .001$ and $p = .014$) Communication ($p < .001$ and $p < .001$)	Results show that employing the SBAR handoff method raises the standard of nursing care across all QUALPACS parameters.	In terms of the communication component, there is an improvement in medical staff communication as well as a better responsiveness to the concerns and demands of patients and their families. The physical component of delivery of primary care, healthcare, nutrition, medication, and nursing practices also improved.
Randmaa M, Mårtensson G, Leo Swenne C, et al[12] 2014	Clinical controlled trial – intervention study	Anesthetic clinics at two hospitals in Sweden	IV = Implementation of SBAR DV1 = staff attitudes toward safety, as well as how well different professions communicate with one another. DV2 = psychological empowerment DV3 = incident reports resulting from communication errors	Descriptive statistics including means, SDs, absolute numbers, and percentages were used to analyze the data. The Mann-Whitney U test was used for comparisons between groups, while the Wilcoxon Signed Rank Test was utilized for comparisons within groups over time. To find differences in the frequency data, the $\chi 2$ and Fisher's exact test were applied	As a result of the communication tool SBAR's introduction, staff members' assessments of the safety climate and between-group communication accuracy significantly improved over time, and there was also a propensity for improvements in within-group communication accuracy	In the intervention group, the proportion of incident reports involving communication errors reduced significantly, from 31% (36 of 116) to 11% (23 of 208), while it decreased non-significantly in the comparison group, from 25% (6 of 24) to 19% (6 of 32). Consequently, safety reporting appeared to	Implementing the communication tool SBAR in anesthesia clinics was linked to an increase in staff members' perceptions of professional communication and the climate for safety as well as a decline in the percentage of incident reports linked to communication errors.	The intervention group's safety climate improved, and the percentage of incident reports attributable to communication problems dropped, which indicated increased safety performance. Evidence of fewer incident reports, including communication errors, indicates that SBAR made

				Internal consistency was calculated using Cronbach's α Statistical significance was set at $p < 0.05$		improve in the intervention group, but the percentage of incident reports attributed to communication was considerably reduced		communication safer.
Raurell-Torredà M, Rascón-Hernán C, Malagón-Aguilera C, et al[13] 2020	Prospective randomized controlled trial (RCT)	16 intervention groups (n = 48) and 15 control groups (n = 45) All participants/ students were recruited from a public university.	IV = Introduction of teamwork skills, role and task assignment skills, and use of the SBAR DV1 = Team performance in teamwork and communication skills DV2 = Team performance in non-technical skills a	Categorical variables were expressed as frequencies and percentages and the chi-square or Fisher exact test was used for comparison between groups. Quantitative variables were expressed as means and SDs or as medians and inter-quartile ranges (P25–P75) – depending on the normality of the distribution – and groups were compared using the Student-t or Mann-Whitney U test. A value of $p < 0.05$ was considered significant. Cohen's d was used to examine effect size differences	Compared to the control group, the intervention group improved in 4 teamwork items: verbalizing out loud, paraphrasing, cross-monitoring, and role clarity, and in a single non-technical skill, patient intervention.	Verbalize out loud: ($p < 0.001$, d = 0.99) Paraphrase: ($p < 0.001$, d = 0.77) Cross-monitoring: ($p < 0.001$, d = 0.72) Role clarity: (p = 0.002, d = 0.66) Patient intervention: (p = 0.004, d = 0.66), Greater confidence in performing patient assessments (p = 0.02, d = 0.56).	Simulation using the SBAR worksheet improved clinical skills in undergraduate nurses. SBAR-trained students showed greater awareness of their own and other team members' roles, had greater confidence in their patient assessments, implemented optimal patient interventions, and showed an enhanced capacity to share key information with team members.	The study was unable to run the 19 simulation sessions for each study arm established as the minimum number necessary to identify a difference between the intervention and control groups. It remains to be seen whether this kind of training results in real changes in the workplace and whether it ultimately benefits patients.
Joffe E, Turley JP, Hwang KO, et al[14] 2013	Randomized controlled trial (RCT)	20 nurses called physicians regarding six cases 92 phone calls were analyzed (43 SBAR/49 controls) University of Texas Health Science Center at Houston	IV = Use of SBAR forms during DV = Communication of situation cues and background cues	Generalized estimating equations (GEEs) was used to determine if the employment of SBAR forms and certain communication characteristics were related.	No difference in the rate of communicated situation cues between the SBAR and control cases Using the SBAR forms was associated, although not	Situational cues (SBAR): 88% vs. 84%, p = .60 Background cues (SBAR): 14% vs. 31%, p = 0.8 SBAR communication of reason for	Significant information was frequently left out of after-hours phone calls between doctors and nurses, and doctors frequently failed to elicit the necessary information.	Regardless of the precise implementation, the SBAR framework is based on expert critical thinking. When using a generic SBAR framework, competence is

					significantly, with a lower rate of reporting the background cue. SBAR form was associated with a higher rate of communicating the reason for hospitalization and medical history. Despite obtaining the necessary information from the record in both the SBAR and control situations, some nurses provided inaccurate information or failed to report the cues	hospitalization and medical history: 95% vs. 78% and 91% vs. 71%, p = .03	Providing only an SBAR-based form did not guarantee full disclosure of crucial information.	necessary to deliver the required information. Forms with a significant detail are linked to low compliance. Even when forms are extremely brief and detailed for different issues, the responsibility still lies with the nurse to select the right form, and human error is not reduced by this intervention. Findings demonstrate that relying on the doctors to obtain the required information is also problematic.
De Meester K, Verspuy M, Monsieurs KG, et al[15] 2013	Pre- and post-intervention study	425 nurses (245 pre-intervention, 180 post-intervention) Antwerp University Hospital (AUH)	IV = Use of SBAR in nurse-physician communication DV = Incidence of serious adverse events	The characteristics of the study population's pre- and post-intervention groups were compared by descriptive analysis of the study population. Fisher's exact test, Pearson's chi-square, the independent sample *t*-test, and Cronbach's alpha were used. Statistical significance was set at $p < 0.05$	Post intervention all four SBAR elements were notated more frequently in patient records in case of a SAE Number of unplanned intensive care unit (ICU) admissions increased Unexpected deaths decreased	Post intervention SBAR elements in patient records: 4% to 35%; $p < 0.001$ Unplanned ICU admissions: 13.1/1000 to 14.8/1000 admissions Unexpected deaths: 0.99/1000 to 0.34/1000 admissions	Following the implementation of SBAR, there were higher perceptions of efficient communication and teamwork among nurses, a rise in unforeseen ICU admissions, and a decline in unanticipated fatalities.	Using SBAR allows nurses to make recommendations based on thorough assessment and be better prepared to report details regarding the patient's condition. Nurses are more competent when communicating the seriousness of the situation to the physician.
Caruso TJ, Marquez JL, Wu DS, et al[16] 2015	Prospective cohort study	41 audits during the pre-implementation phase and 45 audits during the post-implementation 311-bed freestanding academic pediatric	IV = Use of standardized I-PASS format DV1 = Overall patient information transfer	Test for statistical significance, 2-sample t-tests, and Mann-Whitney U tests were conducted. Fisher's exact tests were used.	Overall information transfer scores increased significantly. The number of questions asked by	Increases by category: Patient Information: 47% to 60%, p = .01 OR Nurse Information: 30%	A standardized, team-based approach to OR to PACU handoffs increased the quantity of patient information transferred,	Standardized protocol with defined roles can create a model of efficiency to maximize patient information transfer without increasing

		hospital in Northern California.	DV2 = Nurse satisfaction DV3 = Handoff process duration	to compare provider presence pre- and post-implementation. Paired *t*-tests were conducted for the PACU nurse satisfaction survey scores. Results were considered to be statistically significant if *p* values were < .05	the PACU nurse increased. The presence of surgeons increased significantly after implementation. Paired mean total satisfaction scores for the PACU nurses surveyed increased significantly.	to 74%, $p < .0001$ Surgical Information: 40% to 89%, $p < .0001$ Anesthesia Information: 59% to 90%, $p < .0001$ Surgeon presence: (31.7% to 100%; $p < .0001$ Other Information 72% to 91%, $p = .0008$	increased PACU nurse satisfaction, and did not increase the handoff duration.	the duration of the process. Handoffs were audited by 3 investigators, which introduced the potential for interobserver variability.
Sheth S, McCarthy E, Kipps AK, et al[17] 2016	Prospective cohort study Determine the impact of a multidisciplinary standardized handoff process on efficiency, safety culture, and satisfaction	122 patient transfers were audited The study was conducted at Lucile Packard Children's Hospital, a nonprofit, freestanding academic children's hospital at Stanford University.	IV = Patient transfer handoff method enabled by I-PASS DV1 = Delays in patient transfer DV2 = Improved safety DV3 = Family and provider satisfaction	Variables were compared pre- and post-intervention using descriptive statistics and expressed as means with SDs or medians with interquartile ranges according to their parametric distribution. Before and after the intervention, the transfer latency times, patient characteristics, and survey response were compared $\chi 2$ analysis, Fisher's exact test, rank-sum test, and Mann-Whitney U test.	Transfer latency time was significantly reduced following the intervention. Positive scores for the handoff/ transitions domain of a national culture of safety survey improved. Provider satisfaction improved related to the information conveyed, time to transfer, and overall experience. Family satisfaction also improved.	Transfer latency: 84% reduction (decreased from 397 ± 167 min to the post - intervention 24 ± 21 minutes - $p < .01$) Culture of safety: 39.8% vs 15.2% and 38.8% vs 19.6% ($p = .005$ and 0.03) Provider satisfaction: Info conveyed (34% to 41%; $p = .03$) Time to transfer (5% to 34%; $p < .01$) Overall experience (3% to 24%; $p < .01$) Family satisfaction:	Following the installation of a handoff process supported by I-PASS, patient care transitions saw improvements in transfer effectiveness and handoff-related patient safety culture. The handoff procedure was linked to increased satisfaction among patients, families, and physicians.	Continued studies on this handoff process should assess its effects on operational productivity, patient risks, and cost-effectiveness.

						Info conveyed (42% to 70%; p = .02) Opportunities to ask questions (46% to 74%; p < .01) Acute Care team's knowledge (50% to 73%; p = .04)		
Starmer AJ, Spector ND, Srivastava R, et al[18] 2014	Prospective intervention study	875 residents Nine hospitals were studied, with metrics for resident workflow, medical error rates, and avoidable adverse events.	IV = Implementation of an I-PASS handoff bundle DV = Medical errors and preventable adverse events	Using Poisson regression with a binary covariate for before versus after the intervention and a fixed effect for site, the prevalence of medical errors before and after the intervention was examined. Generalized-estimating-equation z-tests was used to compare the proportions of written and oral handoffs (individual patient entries and discussions) that contained key data elements. These tests considered clustering based on the date of the handoff discussion or document and a fixed effect for site	Between the pre-intervention and post-intervention periods, the medical error rate dropped by 23% and the incidence of avoidable adverse events dropped by 30%. Significant error reductions were seen at 6 of 9 sites according to site level analysis.	Medical errors: Decreased from 24.5 to 18.8 occurrences per 100 admissions (p < 0.001) Avoidable adverse events: Decreased from 4.7 to 3.3 occurrences per 100 admissions (p < 0.001)	The handoff program's implementation was linked to decreases in medical errors, preventable adverse events, and communication improvements without having a detrimental impact on workflow.	Decrease in errors occurred without lengthening the time needed to complete handoffs, supporting recommendations from federal and professional organizations to enhance the patient-handoff procedure. This work significantly expands upon earlier single-institution study, which identified a link between lower medical error rates and implementing a prototype handoff-improvement program. The present study was created to overcome a number of the single-center study's weaknesses.
Jorro-Barón F, Suarez-Anzorena I, Burgos-Pratx R, et al[19] 2021	Cluster-randomized, stepped-wedge trial	1465 MRs: 767 in the control period and 698 in the intervention period 445 handoffs during the intervention phase were examined,	IV = Use of standardized handoff (I-PASS) DV = Frequency of adverse events (AEs)	GAPPS tool and handoff observations were used during training. The Research Electronic Data Capture (REDCap)	No differences in the rates of preventable AE per 1000 days of hospitalization was observed and no changes in the	Rates of preventable AEs: (control 60.4 (37.5–97.4) vs intervention 60.4 (33.2–109.9), p = 0.99, risk ratio: 1.0 (0.74–1.34)	Compliance with handoff items increased once I-PASS was implemented. However, neither the frequency of the AEs nor the	After a standardized of handoff improvements in the handoffs' quality was seen. After employing the I-PASS, there were

		compared to 396 during the control period. 6 Argentine PICUs in 5 hospitals		system was used to collect data.	categories or AE types Compliance with all items in the verbal and written handoffs was significantly higher in the intervention group. The providers' perception of improved communication did not change.		feeling of improved communication changed.	no differences in the rate of preventable AEs or the overall rate of AEs. Additional research is necessary to establish if this intervention could reduce AE either by different implementation models for a longer duration or by using direct observation or voluntary reporting of AE.
Miller D.[20] 2021	Quality Improvement (QI) project	Nurses working on 2 pediatric medical-surgical nursing units (*n* = 70)	IV = Implementation of I-PASS handoff tool DV = Handoff compliance, prevention of healthcare related errors	REDCap web application was used for gathering and organizing data. The sample of survey participants and their responses were described using a streamlined descriptive data analysis. Likert responses were combined and then examined to compare outcomes.	Nurses agreed that interruptions during shift change were significant barriers to using I-PASS, despite 94% of them knowing where to find the tool in the medical record and 98% believing there was time to ask questions.	48% of the nurses reported utilizing IPASS handoff at every handoff, despite 98% of them confirming they obtained the most crucial information using it. 14% of the nurses knew there was a job aide available. 21% of the nurses felt there were no barriers to the use of I-PASS. 30% reported interruptions were the most common barrier during I-PASS handoff. 93% reported never using a standardized handoff tool.	Errors linked to health care can be avoided with the help of standardized handoff communication. Better adherence to the I-PASS handoff tool was made possible by the creation of an I-PASS toolkit, providing nurses with tools to eliminate the obstacles, and designating subject matter experts to support I -PASS implementation.	Barriers must be removed in order to enhance processes, costs, and results. The nursing stakeholders' direct input and attention to the issues preventing I-PASS handoff compliance gives the initial guidance for leadership to enhance outcomes.

Discussion/Summary of Evidence

Ineffective communication and subsequent information loss during this transition pose a significant threat to patient safety with widespread implications.[5,16] These risks are most often attributed to incomplete information, brief, informal interactions with frequent interruptions, and insufficient teams.[5,16] Despite substantial evidence supporting increased focus and recommendations from the Institute of Medicine (IOM), TJC, and the Agency for Healthcare Research that advocate for improved processes during patient handoff, no consistent, uniform processes exist to guide clinical practice during this period.[16] To combat the risks affecting patient safety, varied efforts were employed to improve interprofessional roles and communication, patient assessment, and safety.[13] Revised handoff techniques alongside a structured framework to support communication and accountability, with the intention of increasing information transfer.[13,16]

Conclusions

The information necessary to establish a common understanding of events during the surgical course is often lost in the post-surgical environment. Although the handoff process is a universal and critical component of patient care, its importance is diluted and is evident in its execution as a brief, informal, and often incomplete synopsis. Consequently, errors and inconsistencies that are present during patient transfer are magnified after the administration of anesthesia leading to devastating oversights and omissions. The research evaluated is a comprehensive representation of the existing body of knowledge and factors that contribute to these deficits. The consensus acknowledges a multifactorial origin, citing differences in communication style, inexperience, vague allotment of responsibility, lack of standardized

processes, and a need for a structuring handoff tool as contributory factors to inaccuracies and medical missteps during the transfer of care.

Endorsement of coordinated, standardized techniques and the use of structured handoff tools are suggested responses to preventing detrimental consequences and minimizing medical errors during the transfer of care. Regardless of the meticulous application, handoff implementation is based on expert critical thinking.[14] Generalized formats presented when utilizing SBAR and I-PASS often require extensive knowledge to ensure appropriate and accurate delivery of all the necessary information.[14] Implementing change is plagued with inherent challenges; research affirms that the success and compliance with individual tools (SBAR and I-PASS) is contingent on the training and support associated with their introduction. While simplicity and familiarity drive increased utilization of SBAR, evidence supports a multidimensional approach to resolving the challenges associated with communication inconsistencies during patient transfer. Research suggests blending methodologies, specifically, structuring handoffs; utilizing simulation, supplemental education, and training programs foster a culture of safety to standardize effective communication that ultimately improves patient outcomes.

III. Purpose and PICO Question

Purpose

The purpose of this project was to prepare and integrate supplemental education for anesthesia providers highlighting the need and benefit that accompanies the implementation of an organized, well-defined handoff tool in reducing inconsistencies that lead to adverse patient outcomes.

PICO Clinical Question

In nurse anesthesiologists, would implementation of I-PASS versus SBAR communication tool decrease medical errors and increase patient safety.

Population (P): Nurse anesthesiologists

Intervention (I): I-PASS (illness severity, patient summary, action list, situational awareness and contingency planning, synthesis by receiver)

Comparison (C): Verbal SBAR (situation, background, assessment, recommendation)

Outcomes (O): Prevention of errors during the transition of care

IV. Conceptual Underpinning and Theoretical Framework

Goals and Outcomes

The objectives represent declarations of the actions that advanced the project toward its goals. Applying the SMART template as a blueprint in their formulation signifies goals that are specified, measurable, achievable, realistic, and timely.[21]

Specific

CRNAs took part in an educational training program detailing the importance of individual nuances that take place during patient transfer. The learning module also specified the association between the source of communication breakdown, the consequences that result, and the intervention necessary (I-PASS vs. SBAR) to prevent adverse outcomes.

Measurable

To gauge the progress of the project and the success of implementation, pre- and post-intervention surveys served to indicate advances or accentuate stagnation. Through feedback and data analysis, assessing the delivery or omission of specific anesthesia and patient-specific information was utilized to determine the reliability and accuracy of the designated handoff tool.

Achievable

Training focused on the elimination of redundant, superfluous policies and procedures and refocusing resources to streamline and standardize handoff techniques. This appropriately placed emphasis combined with structured tools reinforced the importance of simplifying effective communication and ensuring that the most pertinent information necessary for safe and effective patient care is carried forward.

Realistic

Systematic instruction and education was based on evidence-based research, facilitated by a PowerPoint presentation on the efficient implementation of SBAR and I-PASS standardized tools to reduce medical errors.

Time-Based

After a 6-month exposure period and engagement with the educational program, CRNAs displayed increased understanding and familiarity with standardized handoff alternatives. Anesthesia providers also exhibited improved communication skills, and patient intervention, in turn, preventing adverse outcomes.

Program Structure/ SWOT Analysis

To overcome the obstacles that accompany patient handoff, a thorough analysis of current procedures was conducted to determine how the current handoff procedure affects patient care. This assessment facilitated the identification of project strengths, weaknesses, opportunities, and threats and ultimately directed the development of an educational module designed to improve communication during patient transfer, strengthen handoff practices, and promote handoff standardization in anesthesia. CRNAs participating in the educational module were surveyed pre- and post-exposure in order to gauge their understanding.

This project was conducted to determine CRNAs' knowledge and awareness of the negative consequences that can arise from inconsistent handoff procedures, the importance of uniformity in the delivery of patient information and to establish whether SBAR or I-PASS is most effective in the organizational setting. A pre-intervention survey was used to gauge initial understanding and measure the consistency of information transfer, followed by participation in the education module. Subsequent implementation included the introduction of the use of designated handoff tools (SBAR vs I-PASS) assigned in a 1:1 ratio. Post-implementation, participants were surveyed to evaluate the improvement of information transfer and provider comprehension. The results from the initial inquiries were then compared to post-implementation outcomes and used as an instrument to gauge the success of project interventions.

Strengths

Lack of standardization, inadequate or incomplete information, as well as misalignment of training and expectations are often at the center of communication failures.[3] Established research lacks effective application and does not address practice variations to consistently affect patient care.[3] These disparities are the focus of practice recommendations that remain steadfast in their support of handoff standardization.

Weaknesses

The absence of understanding concerning standardized and efficient handoff techniques by the anesthetic provider negatively impacts the development and success of the project and the organization. Traditional methods of transferring patient information among providers perpetuate the assumption that the information provided is accurate, sufficient, and conducive to safe patient care after anesthesia. Hospitals and care facilities that integrate education as part of the organizational mission frequently commission students and novice anesthesia providers. The

combination of inexperience and inadequate handoff training often causes organizational standards to fall short of expectations.

Opportunities

Longer hospital stays, decreased satisfaction, and adverse outcomes have been associated to communication errors. In the application of recommendations, comparative analysis of selected handoff tools allows for the discovery of the most appropriate and effective tool to achieve project objectives. Additionally, engaging technology to consistently include necessary patient information presents opportunities to maximize efficiency and minimize human error.

Threats

Factors that endanger the dependability and effectiveness of an organization's performance threaten successful project implementation and acceptance of emerging practice improvement. Challenging the status quo is often faced with resistance. Some clinicians fail to see the value in adjustments to antiquated practices, while others are unmotivated and are content with continuing to operate using outdated and ineffective techniques. Additionally, the logistics of implementation and financial requirements also threaten project success.

Organizational Factors

Under the direction of an interdisciplinary team, the instructional module was established and executed. These individuals were instrumental in facilitating an understanding of organizational climate and dynamics, making it possible to position individuals and processes to promote improvement. The effectiveness of project interventions was determined by comparing the findings from the initial inquiries to the outcomes following project execution, which determined the quality and consistency of information transfer.

Theoretical Framework

Securing the efficient exchange of information is an enormous duty, and challenging the status quo is often met with resistance. Change theories recognize the difficulty associated with significant change, even if modifying practice is supported by current evidence.[22] Lewin's theory of change operates by utilizing three elements for planned change: unfreezing, moving, and refreezing.[22] Additional components include driving forces that promote change and restraining forces that hinder change.[22] To profoundly effect change, driving forces must exceed restraining forces.[22] *Unfreezing* is driven by institutional recognition of ineffective handoff practices and inadequate communication.[22] Unfreezing is followed by the *moving* process, where the application of practice improvement occurs, specifically the utilization of SBAR or I-PASS.[22] *Refreezing* confirms that the proposed change establishes a new temporary balance, creating a platform for post-intervention evaluation and needs assessment.[22]

V. Methodology

Setting and Participants

Project participation included alumni of a CRNA program in South Florida. These participants consisted of CRNAs with various levels of expertise and experience. For this project, approval was requested from the International Review Board (IRB). Study participation was voluntary and requested via email. After consent for participation was confirmed, their contact information was used to distribute learning resources, surveys, and the educational module. At the conclusion of the study, any identifying information was kept confidential and not presented or revealed in any project findings.

Interventions and Procedures

The purpose of this investigation is to evaluate CRNAs' knowledge and awareness of the risks associated with inconsistent handoff procedures, the significance of uniformity in the distribution of patient information, and the relative merits of SBAR and I-PASS in an organizational setting. Systematic implementation will follow established guidelines. After submission and approval from Florida International University (FIU), the anesthesia group providing services in the study setting, and the IRB, educational materials were distributed to study participants. These resources delivered in sequence include a pre-implementation survey/assessment, the education module via PowerPoint presentation, and post-implementation survey/assessment.

Protection of Human Rights

Dedication to research involves neutrality in risk/benefit analyses and strategies to respect the rights of participants, achieved by an external review of the project's ethical components to avoid any bias that may occur.[23] Efforts to safeguard human rights during the execution of this project include a thorough assessment of recruitment guidelines, the fair and impartial selection of participants, proper assembly and documentation of informed consent together with a description of participation requirements.[23]

An email detailing study objectives and procedures was directed to individuals who met participation requirements (certified, actively practicing CRNAs) in order to engage potential subjects. Consenting procedures required full disclosure of project aims, methods of execution, institutional and IRB approval, techniques of data collection. Adequate monitoring and preserving the confidentiality of data and the privacy of the participants ensured the security of participants was appropriately protected.[23]

Data Collection

After initial evaluation, a PowerPoint presentation on the effective use of SBAR or I-PASS instruments to reduce medical errors served as the basis for systematic instruction and education. Post-implementation analysis assessed handoff quality after implementation of the standardized handoff tool. Surveys gauged the providers' successful delivery of complete and accurate patient information.

The degree to which the sample is representative of a given population determines the sample's quality and integrity of the study.[23] Demographics of the participant pool consist of 10 CRNAs actively providing anesthesia services. Specific aspects of professional practice (i.e., years of experience, level of education) were provided on a purely voluntary basis. After conclusion of the study, pre- and post-intervention data were analyzed and documented.

Data Management /Analysis

All data collected during this study was documented and entered into a password-encrypted database. With respect for participants rights and confidentiality, only a private investigator was granted access to project data. Additionally, no distinguishing information was directly connected to the associated data collected. In order to interpret the data, similar forms of narrative information are grouped together into a conceptual order based on the handoff tool used.[23] Analysis using Microsoft software enabled the assess of the anesthetic provider's prior practices in comparison to techniques adopted post-implementation.

VI. Results

Demographics

Table 1 displays the demographic distribution for this study. After informed consent was received, response to the survey includes 15 alumni which comprises a relatively small sample

size, the patient demographics data nonetheless offer some insights into the community under investigation. Five male participants, and 10 female participants represent 33.3% and, 66.7% of the total participants, respectively. The gender distribution of the sample reveals an overrepresentation of female participants, who make up the majority of the group. Any gender-related findings from the study must be interpreted with consideration of this discrepancy. The participants' ethnic composition reveals that Caucasians constituted the majority (40%), followed by African Americans (26.67%), Hispanics (20%), and only 1 participant each from Asian (6.67%) and other ethnic backgrounds (6.67%). The range of participants' educational backgrounds in the survey showed that most held doctoral degrees. One participant in the sample had a bachelor’s degree (6.67%), and 14 participants (93.33%) were CRNAs. With 86.67% of participants having 1 to 2 years of experience, the distribution of years of experience in the area demonstrated that the majority of participants are comparatively young in their careers. One person each with 2 to 5 years (6.67%), and more than 10 years of experience (6.67%) indicated a somewhat limited range of experience levels within the research.

Table 1. Patient Demographics

Participants (*n* =15)	**Count/Response**	**Percentage (%)**
Gender:		
Male	5	33.33%
Female	10	66.67%
Ethnicity:		
Caucasian	6	40.00%
African American	4	26.67%
Hispanic	3	20.00%
Asian	1	6.67%
Other	1	6.67%
Level of Education:		
Bachelor's	1	6.67%
Doctorate	14	93.33%
Experience:		
1-2 years	13	86.67%
2-5 years	1	6.67%
5-10 years	0	0.00%
> 10 years	1	6.67%

Pretest Knowledge of Consequences of Inadequate Communication

To assess baseline knowledge, participants were questioned regarding, contributing factors and consequences that often accompany inconsistencies in communication during patient handoff, these results are detailed in Table 2.

Question 1 surveyed knowledge of fundamental information by asking what organization is responsible for establishing national patient safety goals addressing handoff communication. Two participants (13%) responded Institute of Medicine, 1 participant (7%) responded Agency for Healthcare, 8 participants (53%) responded The Joint Commission, and 4 (27%) responded Occupational Safety and Health Administration.

Knowledge of consequences and contributing factors was evaluated by examining responses when asked which factors contribute to handoff communication breakdowns. Twelve participants (80%) selected the correct answer, "lack of standardized procedures." One

participant each (7%) selected “allotment of responsibility,” “alignment of communication styles,” and “transfer of patient responsibility.” To further assess understanding, participants were asked to distinguish the consequences that result from ineffective communication. Two participants (13%) responded “medical errors,” and the remaining 13 participants (68%) responded “interprofessional collaboration.” Awareness of consequences was determined by investigating participant knowledge of the influence ineffective communication has on malpractice expenditures. Thirteen participants (87%) responded that communication breakdown does contribute to malpractice expenditures, with 2 participants (13%) having opposing viewpoints.

Table 2. Knowledge of Consequences of Inadequate Communication

Question	Pretest	Posttest	% Change
1. What organization is responsible for establishing national patient safety goals addressing handoff communication:			
Institute of Medicine	2 (13%)	2 (13%)	No change
Agency for Healthcare Research	1 (7%)	1 (7%)	No change
The Joint Commission	8 (53%)	11 (73%)	↑ 20
Occupational Safety and Health Administration	4 (27%)	1 (7%)	↓ 20
2. Which factor contributes to handoff communication breakdowns:			
Allotment of responsibility	1 (7%)	1 (7%)	No change
Lack of standardized procedures	12 (80%)	12 (80%)	No change
Alignment of communication styles	1 (7%)	2 (13%)	↑ 6
Transfer of patient responsibility	1 (7%)	0 (0%)	↓ 7
3. Which of the following is NOT a consequence of ineffective communication:			
Medication errors	2 (13%)	1 (7%)	↓ 6
Sentinel events	0 (0%)	1 (7%)	↑ 7
Interprofessional collaboration	13 (86%)	13 (86%)	No change
Wrong-site surgeries	0 (0%)	0 (0%)	No change
4. Communication breakdown during the transfer of care has contributed to 1,744 deaths and $1.7 billion in malpractice expenditures			
True	13 (87%)	14 (93%)	↑ 6
False	2 (13%)	1 (7%)	↓ 6

Correct answers are bolded

Pretest Knowledge Related to Communication and Handoff Tools

Handoff tools are crucial for improving team member engagement, communication, and transfer of information. Table 3 illustrates participants' knowledge surrounding inadequate communication and use of handoff tools. Participants were asked what element is necessary for patient handoff using the I-PASS handoff tool. Three participants (20%) chose "background," 4 participants (26%) responded correctly choosing "synthesis by the receiver," 7 participants (47%) answered "assessment," and 1 participant (7%) chose "recommendation." Assessment of knowledge related to communication and handoff tools was determined by asking participants which handoff tool is finalized with a formal acknowledgement of responsibility and accountability. Eight participants (53%) selected SBAR, and 7 participants (47%) chose I-PASS. Participants were also asked how patient handoff is affected by inadequate communication. A majority of participants (67%) responded accurately responding that the "exchange of valuable information" is inhibited by ineffective communication, two participants (13%) chose "incidence of adverse outcomes," 1 participant (7%) responded "misalignment of communication styles," and 2 participants (13%) chose clinical missteps. Additional appraisal was accomplished by determining participant comprehension of factors associated with errors in communication. One participant (6%) chose "longer hospital stays," 1 (6%) selected "lower satisfaction," 1 (6%) responded increased financial burden, and 12 participants (82%) correctly responded "all of the above." Knowledge of barriers surrounding the use of handoff tools were also assessed. Participants were asked to identify barriers that prevent providers from using handoff tools. Seven participants (46%) stated a "lack of time" inhibited the accurate transfer of information, 1 participant (7%) responded "interruptions," 1 participant (7%) selected "phone calls," and 6 (40%) responded "unfamiliarity."

Table 3. Knowledge Related to Communication and Handoff Tools

Question	Pretest	Posttest	% Change
5. What element is necessary for patient handoff using I-PASS handoff tool:			
Background	3 (20%)	3 (20%)	No change
Synthesis by the receiver	4 (26%)	7 (47%)	↑ 21
Assessment	7 (47%)	4 (26%)	↓ 21
Recommendation	1 (7%)	1 (7%)	No change
6. Which handoff tool is finalized with a formal acknowledgement of responsibility and accountability:			
SBAR	8 (53%)	5 (34%)	↓ 19
WHAT	0 (0%)	0 (0%)	No change
I-PASS	7 (47%)	10 (66%)	↑ 19
SOAP	0 (0%)	0 (0%)	No change
7. Inadequate communication during patient transfer inhibits which of the following:			
Exchange of valuable information	10 (67%)	13 (86%)	↑ 19
Incidence of adverse outcomes	2 (13%)	1 (7%)	↓ 6
Misalignment of communication styles	1 (7%)	0 (0%)	↓ 7
Clinical missteps	2 (13%)	1 (7%)	↓ 6
8. Errors in communication are linked to:			
Longer hospital stays	1 (6%)	1 (7%)	↑ 1
Lower satisfaction	1 (6%)	1 (7%)	↑ 1
Increased financial burden	1 (6%)	0 (0%)	↓ 6
All of the above	12 (82%)	13 (86%)	↑ 4
9. What are significant barriers to the use of a handoff tool during patient transfer:			
Lack of time	7 (46%)	4 (27%)	↓ 19
Interruptions	1 (7%)	4 (27%)	↑ 26
Phone calls	1 (7%)	0 (0%)	↓ 7
Unfamiliarity	6 (40%)	7 (46%)	↑ 6

Correct answers are bolded

Pretest Attitude Related to Utilization of SBAR Handoff Tool

Included in the survey were inquiries asking providers to rate the likelihood of using handoff tools in practice (Figure 1, Figure 2). In the pretest survey, 5 participants (33%) expressed an enthusiastic attitude with their response of “extremely likely” to use SBAR during handoff. A substantial majority (6 participants) also expressed optimism, replying “somewhat likely,” a small minority reported they were “somewhat unlikely” to use SBAR, and 3 providers

had strong reservations, stating they were “extremely unlikely” to use SBAR during patient handoff.

Pretest Attitude Related to Utilization of I-PASS Handoff Tool

Attitudes regarding the use of I-PASS were also assessed, 2 respondents (14%) indicated they were “extremely likely” to utilize the I-PASS handoff tool. The majority (7 participants) expressed some commitment stating they were “somewhat likely” to use I-PASS, 4 providers (26%) reported they were “somewhat unlikely”, and another 2 respondents (14%) stated they were “extremely unlikely” to use the I-PASS hand off tool.

Posttest Knowledge of Consequences of Inadequate Communication

Table 2 illustrates pre- and posttest knowledge inquiries regarding the consequences of inadequate communication. After participating in an educational module, the majority of respondents (73%) maintained that The Joint Commission is responsible for determining national patient safety goals addressing handoff communication. The Institute of Medicine received 13% of the responses, and both the Agency for Healthcare Research and Quality (AHRQ) and the Occupational Safety and Health Administration (OSHA) received 7% of the responses. When asked which factor contributes to handoff communication breakdown, 12 participants (80%) responded “lack of standardized procedures” recognizing that inconsistent or non-uniform approaches to handoff communication can lead to misunderstandings, missed information, and errors during transitions of care. These findings indicate no change from initial responses. Respondents viewed “allotment of responsibility” as a contributing factor to a lesser extent, with 7% of the responses, these findings are also similar to pretest results. A small portion of participants (13%) supported that alignment of communication styles contributed to communication breakdowns, representing a 6% increase from pretest results. Additionally, after

participation in the educational module, no participants selected “transfer of patient responsibility” as a contributory factor in communication breakdown. Study results indicates that ineffective communication has varying impacts on different consequences. Most participants were successful in identifying these elements, with the majority recognizing that interprofessional collaboration is not a consequence of inadequate communication.

Posttest Knowledge Related to Communication and Handoff Tools

Following participation in the educational module, results related to knowledge of handoff tools was evaluated. When asked what element is necessary for patient handoff using I-PASS handoff tool, 7 participants (47%) responded correctly with “synthesis of the receiver,” which represents a 21% increase from pretest outcomes. “Background” and “Recommendation” showed no change from pretest to posttest, and “Assessment” displayed a 21% decrease compared to pretest results. Evaluation of results as to which handoff tool is finalized with a formal acknowledgement of responsibility and accountability yielded a 19% increase in correct responses, to 10 respondents from the initial 7. The number of participants that selected “SBAR” decreased by 19%, from 8 respondents to 5. Participants were also asked which factor is inhibited by inadequate communication; 13 participants (86%) correctly responded “exchange of valuable information” demonstrating a 19% increase from the pretest evaluation. The remaining responses, “incidence of adverse outcomes,” “misalignment of communication styles,” “clinical missteps” all showed a decrease from the pretest survey. The source of communication errors was also examined, and 86% of participants selected “all of the above,” representing a 4% increase. There were no significant changes in the responses to the other answer choices. Barriers to effective patient handoff were also addressed. Participants were asked to identify significant barriers to the use of a handoff tool during patient transfer. Although pretest results revealed a

knowledge deficit, the correct response “interruptions” increased by 26% posttest. Despite this increase, a majority of participants (46%) maintained that “unfamiliarity” was a significant limitation in the use of handoff tools. Also, a percent decrease was observed in the selection of “lack of time” from the pretest, but this option received the same participant response as the correct answer choice posttest.

Posttest Attitude Related to Utilization of SBAR Handoff Tool

In the follow-up survey, 86% (13 providers) said they were “extremely likely” to utilize the SBAR handoff tool. Comparing the results to the pretest, this shows a significant rise in the number of providers who were highly likely to utilize the tool. Notable decreases were observed posttest with no providers reporting they were “somewhat likely” or “somewhat unlikely” to use the SBAR handoff tool. An observed decrease from the pretest (6%) was also noted in those “extremely unlikely” to use SBAR (2 participants).

Posttest Attitude Related to Utilization of I-PASS Handoff Tool

A substantial increase in respondents (10 providers) communicated that they were “extremely likely” to use the I-PASS handoff tool. Two providers stated they were “somewhat likely” to use I-PASS, a 32% decrease from the pretest assessment. Only 1 provider (6%) expressed hesitation reporting they were “somewhat unlikely” to use the tool, with no change in those who were “extremely unlikely” to utilize the I-PASS handoff tool.

Figure 1. How Likely Are You to Utilize the SBAR Handoff Tool?

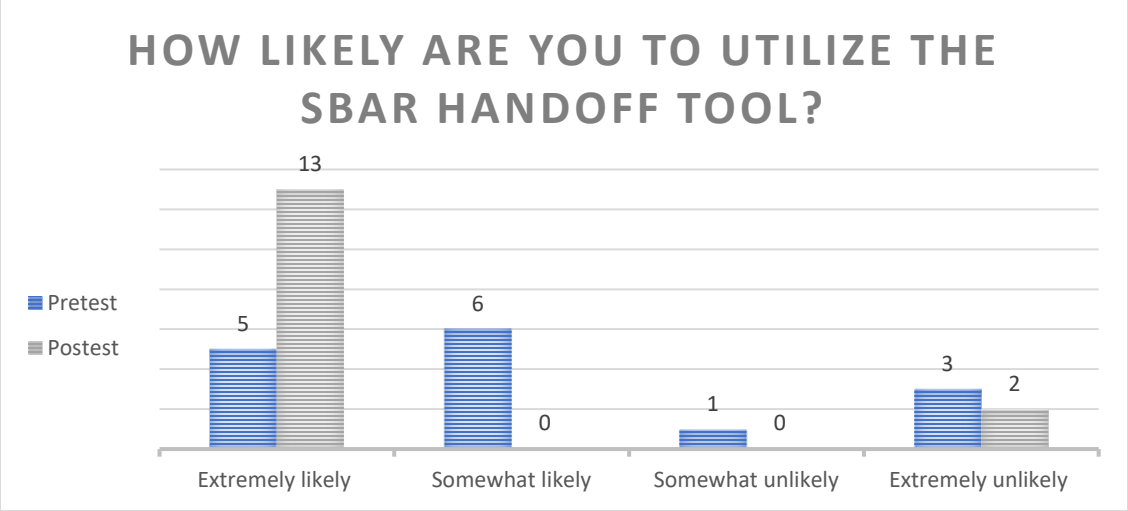
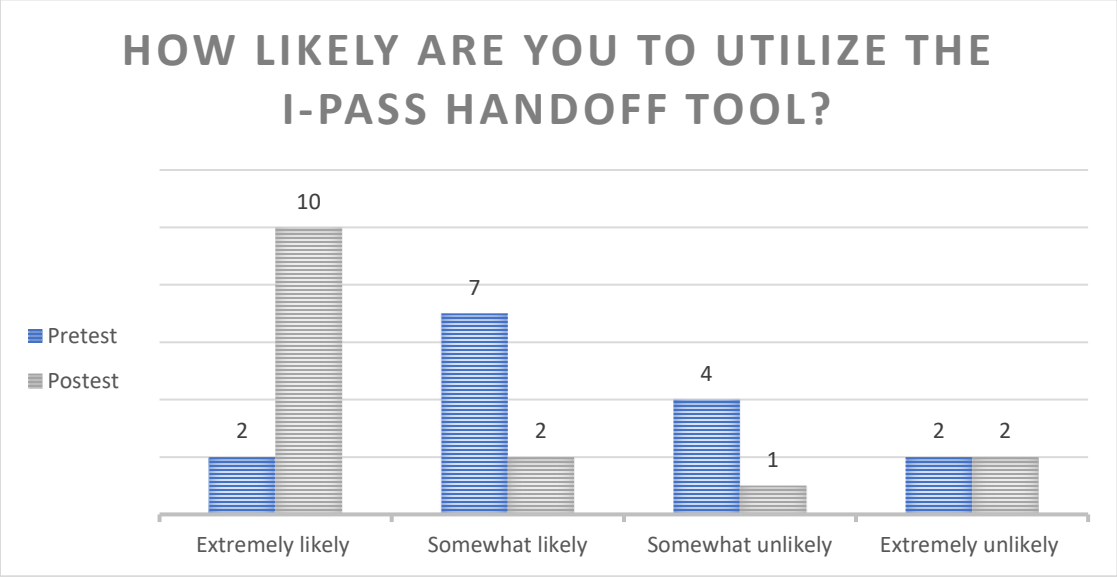


Figure 2. How Likely Are You to Utilize the I-PASS Handoff Tool?



VII. Discussion

Limitations

This study is fundamental to preventing adverse outcomes and improving patient safety. In conducting any form of research limitations have to be considered when interpreting findings, and drawing conclusions. In this study, the sample size was small (n = 15); this may compromise the validity of results, strength of relationships and limits the ability for this sample to be representative of the larger population. It is a fair assumption that some of the providers surveyed have previous experience with handoff tools; these viewpoints may skew self-reported data with respondents providing answers that may not reflect actual behavior despite the information provided. Additionally, the study's time frame makes it difficult to analyze long-term outcomes. Shortened intervals limit the ability to ensure consistent implementation necessary to determine the effectiveness of uniformity provided by using handoff tools during patient transfer.

Implications For Nursing Practice

The financial burden and threat to patient safety has thrust the need for renewed awareness concerning the dangers of ineffective patient transfer and inadequate communication to the forefront. Addressing these issues necessitates uniformity and consistency during the transfer of patient. Standardized handoffs support a seamless transition and the avoidance of care gaps by ensuring that crucial duties and tasks are not overlooked during patient transfer. Steadfast utilization plays a major role in eliminating misinterpretation and reducing the consequences of incongruent communication styles, Furthermore, these tools also allow providers to prioritize and communicate patient sensitive information, thereby preventing reducing the incidence of adverse outcomes. Consistent, context-sensitive implementation with

subsequent feedback and evaluation supports the completeness of relevant information resulting in improvements to handoff procedure, and ultimately enhancing patient care.

Conclusion

Reliability of information is essential of patient safety. Subjectivity in assessing the value of patient information often compromises its integrity resulting in adverse outcomes. The existing body of knowledge supports the use of systemic application of techniques to improve communication during patient transfer that can offset these consequences. Evidence confirms that performance improvement and patient outcomes are strengthened when there is consistency in the material provided and when multiple approaches are used to convey the importance and severity of information.[3] Utilization of standardized handoff tools stands firmly as a central component in establishing improved processes. Execution of this project sought to recognize and understand the barriers that exist during the transfer of patient care. Identification of deficits, evaluation of provider knowledge, and education of the benefits that accompany implementation of structured handoff tools facilitated performance improvement. Results exhibited improvements in provider awareness and understanding related to the utilization of handoff tools, consequences of inadequate communication, as well as increased confidence and commitment to the use of standardized techniques to prevent adverse outcomes and improve patient care.

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Appendices

Appendix A: Letter of Support

FIU
Department of Nurse Anesthesiology

Nicole Wertheim College of Nursing & Health Sciences

February 7, 2023

Yasmine Campbell, DNP, CRNA, APRN
Department of Nurse Anesthesiology
Florida International University

Dr. Campbell,

Thank you for inviting FIU alumni to participate in the Doctor of Nursing Practice (DNP) project conducted by Danielle Chung entitled "Implementation of anesthesia-specific handoff tools to reduce adverse patient outcomes" in the Nicole Wertheim College of Nursing and Health Sciences, Department of Nurse Anesthesiology at Florida International University. I have granted the student permission to conduct the project using our providers.

Evidence-based practice's primary aim is to yield the best patient outcomes by selecting interventions supported by the evidence. This proposed quality improvement project seeks to utilize the latest literature to increase provider's awareness regarding the consequences caused by ineffective communication during the transfer of patient care.

We understand that participation in the study is voluntary and carries no overt risk. All Anesthesiology providers are free to participate or withdraw from the study at anytime. The educational intervention will be conveyed by a 10-inute virtual PowerPoint presentation, with a 5-minute pretest and a 5-minute posttest questionnaire delivered by a URL link electronically via Qualtrics, an online survey product. Responses to pretest and posttest surveys are not linked to any participant. The collected information is reported as an aggregate, and there is no monetary compensation for participation. All collected material will be kept confidential, stored in a password-encrypted digital cloud, and only be accessible to the investigators of this study: Danielle Chung and Dr. Yasmine Campbell

Once the Institutional Review Board's approval is achieved, this scholarly project's execution will occur over two weeks. Danielle Chung will behave professionally, follow standards of care, and not impede hospital performance. We support the participation of our Anesthesiology providers in this project and look forward to working with you.

Sincerely,

Jorge A. Valdes, DNP, CRNA, APRN, FAANA

Chair, Department of Nurse Anesthesiology
Associate Professor

Appendix B: Informed Consent

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CONSENT TO PARTICIPATE IN A QUALITY IMPROVEMENT PROJECT

Implementation of Anesthesia-Specific Handoff Tools to Reduce Adverse Patient Outcomes

SUMMARY INFORMATION
Things you should know about this study:

- **Purpose:** Educational module to increase providers awareness of the consequences caused by ineffective communication during the transfer of patient care.
- **Procedures**: If the participant chooses to participate, they will be asked to complete a pretest, watch a voice PowerPoint, and then a post test
- **Duration:** This will take about a total of 20 minutes total.
- **Risks**: There will be minimal risks involved with this project, as would be expected in any type of educational intervention, which may include mild emotional stress or mild physical discomfort from sitting on a chair for an extended period.
- **Benefits:** The main benefit to you from this research is improved patient outcomes that result from participants having a greater understanding of handoff uniformity.
- **Alternatives:** There are no known alternatives available to the participant other than not taking part in this quality improvement project.
- **Participation:** Taking part in this quality improvement project is voluntary.

Please carefully read the entire document before agreeing to participate.

NUMBER OF STUDY PARTICIPANTS:
If the participant decides to be in this study, they will be one of 10 people in this research study.

PURPOSE OF THE PROJECT
The participant is being asked to be in a quality improvement project. This initiative aims to raise clinicians' awareness of the detrimental effects of poor communication during the transfer of patient care and to emphasize the advantages of using standardized handoff tools. If you decide to participate, you will be 1 of approximately 10 participants.

DURATION OF THE PROJECT
The participation will require about 20 minutes

PROCEDURES
If the participant agrees to be in the project, PI will ask you to do the following things:

1. Complete an online 10 question pre-test survey via Qualtrics, an Online survey product for which the URL link is provided
2. Review the educational PowerPoint Module lasting 10 minutes via Qualtrics, an Online survey product for which the URL link is provided.
3. Complete the online 10 question post-test survey via Qualtrics, an Online survey product for which the URL link is provided.

RISKS AND/OR DISCOMFORTS
The main risk or discomfort from this research is minimal. There will be minimal risks involved with this project, as would be expected in any type of educational intervention, which may include mild emotional stress or mild physical discomfort from sitting on a chair for an extended period.

BENEFITS
The following benefits may be associated with participation in this project: Increased participants' knowledge of handoff standardization can reduce adverse outcomes and help improve patient outcomes. The overall objective of the program is to increase the providers' knowledge based on the current literature.

ALTERNATIVES
There are no known alternatives available to the participant other than not taking part in this project. However, if the participant would like to receive the educational material, it will be provided to them at no cost.

CONFIDENTIALITY
The records of this project will be kept private and will be protected to the fullest extent provided by law. If, in any sort of report, PI might publish, it will not include any information that will make it possible to identify the participant. Records will be stored securely, and only the project team will have access to the records.

PARTICIPATION: Taking part in this quality improvement project is voluntary.

COMPENSATION & COSTS
There is no cost or payment to the participant for receiving the health education and/or for participating in this project.

RIGHT TO DECLINE OR WITHDRAW
The participation in this project is voluntary. The participant is free to participate in the project or withdraw the consent at any time during the project. The participant's withdrawal or lack of participation will not affect any benefits to which you are otherwise entitled. The investigator reserves the right to remove the participant without their consent at such time that they feel it is in their best interest.

RESEARCHER CONTACT INFORMATION
If you have any questions about the purpose, procedures, or any other issues relating to this research project, you may contact Danielle Chung at (786)46-3140/ dchun001@fiu.edu and Yasmine Campbell, DNP, CRNA, APRN/ (305)348-9894/ ycampbel@fiu.edu

IRB CONTACT INFORMATION
If the participant would like to talk with someone about their rights pertaining to being a subject in this project or about ethical issues with this project, the participant may contact the FIU Office of Research Integrity by phone at 305-348-2494 or by email at ori@fiu.edu.

PARTICIPANT AGREEMENT

I have read the information in this consent form and agree to participate in this study. I have had a chance to ask any questions I have about this study, and they have been answered for me. By clicking on the "consent to participate" button below I am providing my informed consent.

Appendix C: Recruitment Letter

Nicole Wertheim College of Nursing & Health Sciences

Implementation of anesthesia-specific handoff tools to reduce adverse patient outcomes

Dear FIU Alumni:

My name is Danielle Chung, and I am a student from the Anesthesiology Nursing Program Department of Nurse Anesthesiology at Florida International University. I am writing to invite you to participate in my quality improvement project. The goal of this project is to increase health care providers' awareness of the consequences caused by ineffective communication during the transfer of patient care. You are eligible to take part in this project because you are a part of the FIU Alumni.

If you decide to participate in this project, you will be asked to complete and sign a consent form for participation. Next, you will complete a pre-test questionnaire, which is expected to take approximately 5 minutes. You will then be asked to view an approximately 15 minutes long educational presentation online. After going through the educational module, you will be asked to complete the post-test questionnaire, which is expected to take approximately 5 minutes. No compensation will be provided.

Remember, this is completely voluntary. You can choose to be in the study or not. If you'd like to participate or have any questions about the study, please email or contact me at (786)461-3140 or dchun001@fiu.edu

Thank you very much.

Sincerely,

Danielle Chung
(786)461-3140
Dchun001@fiu.edu

Appendix D: IRB Approval

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MEMORANDUM

To: Dr. Yasmine Campbell

CC: Danielle Chung

From: Carrie Bassols, BA, IRB Coordinator

Date: March 3, 2023

Proposal Title: "Implementation of anesthesia-specific handoff tools to reduce adverse patient outcomes"

The Florida International University Office of Research Integrity has reviewed your research study for the use of human subjects and deemed it Exempt via the **Exempt Review** process.

IRB Protocol Exemption #: IRB-23-0087 **IRB Exemption Date:** 03/03/23
TOPAZ Reference #: 112784

As a requirement of IRB Exemption you are required to:

1) Submit an IRB Exempt Amendment Form for all proposed additions or changes in the procedures involving human subjects. All additions and changes must be reviewed and approved prior to implementation.
2) Promptly submit an IRB Exempt Event Report Form for every serious or unusual or unanticipated adverse event, problems with the rights or welfare of the human subjects, and/or deviations from the approved protocol.

1) Submit an IRB Exempt Project Completion Report Form when the study is finished or discontinued.

Special Conditions: N/A

For further information, you may visit the IRB website at http://research.fiu.edu/irb.

Appendix E: Pretest and Posttest Questionnaire

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Implementation of anesthesia-specific handoff tools to reduce adverse patient outcomes

INTRODUCTION

The primary aim of this QI project is to increase providers awareness of the consequences caused by ineffective communication during the transfer of patient care.

Please answer the question below to the best of your ability. The questions are either in multiple choice or true/false format and are meant to measure knowledge of the effects of poor communication during the transition of patient care.

PERSONAL INFORMATION

1. **Gender:** Male Female Other_____
2. **Ages 25 and above:** _____
3. **Ethnicity:** Hispanic Caucasian African American Asian

   Other_____
4. **Position/Title:** CRNA Anesthesiologist Resident

   Anesthesiologist Assistant
5. **Level of Education:** Certificate Bachelors Masters DNP PhD
6. How many years have you been a perioperative provider?

   Over 10 5-10 years 2-5 years 1-2 years

QUESTIONNAIRE

1. **What organization is responsible for establishing national patient safety goals addressing handoff communication:**
   a. Institute of Medicine
   b. Agency for Healthcare Research
   c. The Joint Commission

d. Occupational Safety and Health Administration

2. **Which factor contributes to handoff communication breakdowns:**
   a. Allotment of responsibility
   b. lack of standardized procedures
   c. alignment of communication styles
   d. transfer of patient responsibility

3. **Which of the following is <u>NOT</u> a consequence of ineffective communication:**
   a. Medication errors
   b. Sentinel events
   c. Interprofessional collaboration
   d. Wrong-site surgeries

4. **Communication breakdown during the transfer of patient care has contributed to 1,744 deaths and $1.7 billion in malpractice expenditures.**
   True/False

5. **What element is necessary for patient handoff using the I-PASS handoff tool:**
   a. Background
   b. Synthesis by the receiver
   c. Assessment
   d. Recommendation

6. **Which handoff tool is finalized with a formal acknowledgement of responsibility and accountability:**
   a. SBAR
   b. WHAT
   c. I-PASS
   d. SOAP

7. **Inadequate communication during patient transfer inhibits which of the following?**
   a. exchange of valuable information
   b. Incidence of adverse outcomes
   c. Misalignment of communication styles
   d. Clinical missteps

8. **Errors in communication are linked to:**
   a. Longer hospital stays
   b. Lower satisfaction
   c. Increased financial burden
   d. All of the above

9. **What are significant barriers to the use of a handoff tool during patient transfer?**
   a. Lack of time
   b. Interruptions

c. Phone calls
d. Unfamiliarity

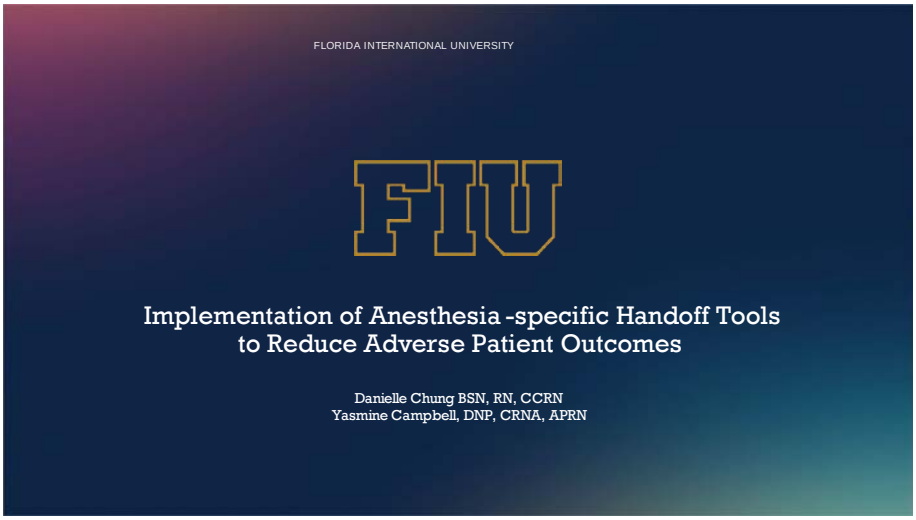
10. How likely are you to utilize the SBAR handoff tool?

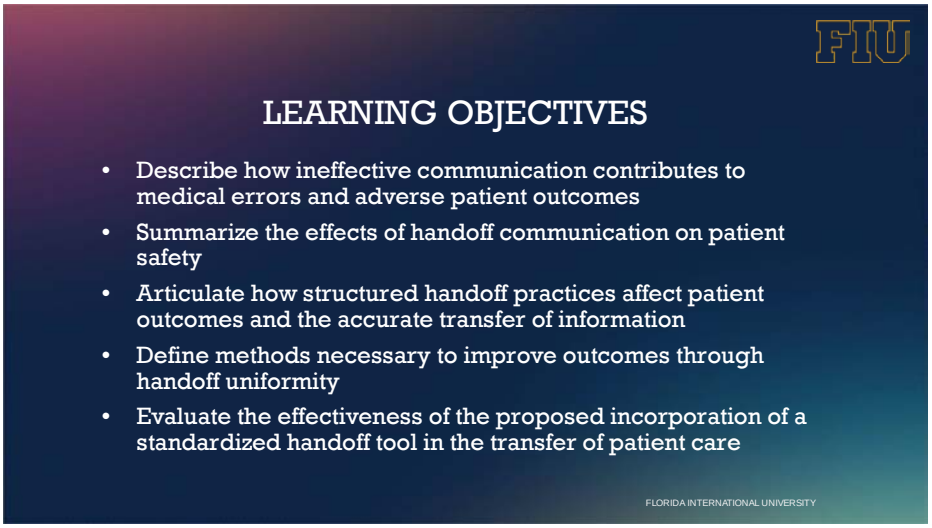
a. Most likely
b. Somewhat likely
c. Somewhat unlikely
d. Most unlikely

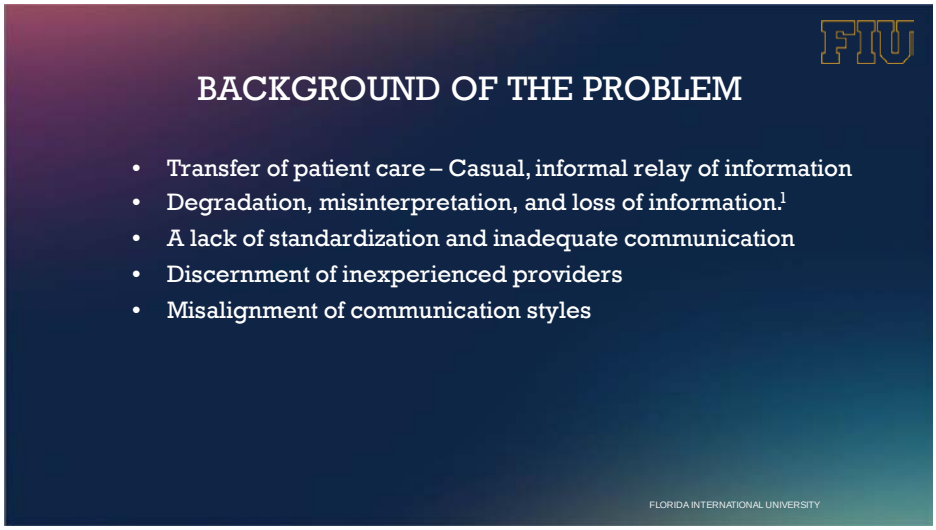
11. How likely are you to utilize the I-PASS handoff tool?

a. Most likely
b. Somewhat likely
c. Somewhat unlikely
d. Most unlikely

Appendix F: Educational Module







SCOPE OF THE PROBLEM

- Uncertain variability → Clinical missteps and medical errors
- The Joint Commission confirms:
  - primary factor in reported sentinel events
- Negative implications
  - Wrong-site surgeries
  - Patient injury
  - Longer hospital stays
  - Increased financial burden

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EDUCATION OF THE PROBLEM

Evaluation of organizational culture, knowledge deficits, and inconsistencies in practice

↓

Baseline assessment to survey provider awareness regarding the impact of inadequate handoff

EDUCATION OF THE PROBLEM

Understanding the subtleties displayed by individual variation is fundamental to successful practice improvement

↓

Anesthesia-specific use of SBAR and I-PASS

SBAR

Situation
Name:_____ **Age:** _____
Surgical procedure: _____
Anesthesia Type: _____
Airway:_____

Background
Past Medical History: _____
Allergies:_____
Medication: _____

Assessment
Lines:_____
Meds given: _____
Fluids: _____
Output: _____ **Blood loss:**_____
Vitals:_____
Surgical events: _____

Recommendation
Pain management:_____
PONV:_____
Orders:_____

I-PASS

Illness Severity
Name:_____ **Age:** _____ **ASA:** _____

Patient Summary
Surgical procedure: _____
Past Medical History: _____
Allergies:_____
Medications: _____
Anesthesia Type: _____ **Airway:**_____ **Lines:**_____
Fluids: _____
Output: _____ **Blood loss:**_____
Vitals:_____

Action List
Pain management:_____
PONV:_____
Orders:_____

Situation awareness/contingency
Surgical events: _____
Post-op follow-up: _____

Synthesis by receiver
Summary of what was heard
Asks questions

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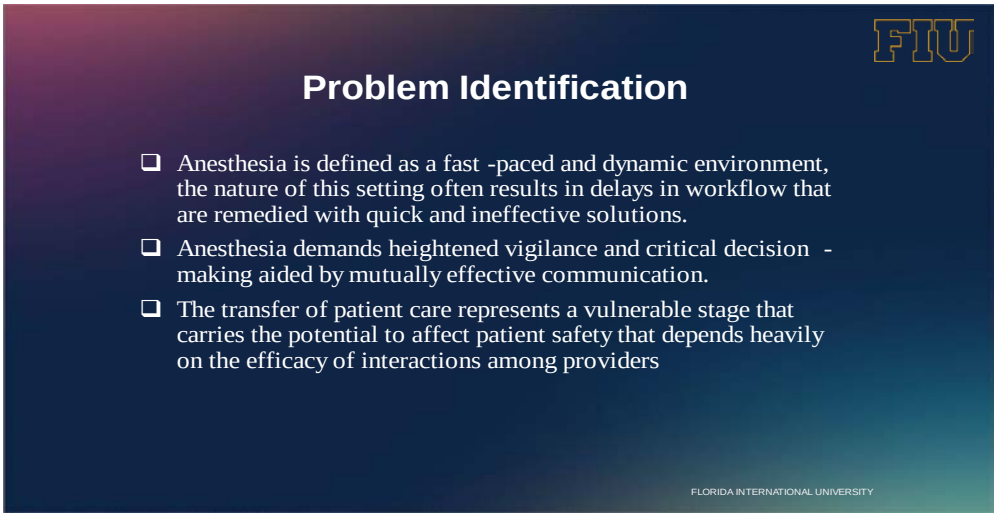
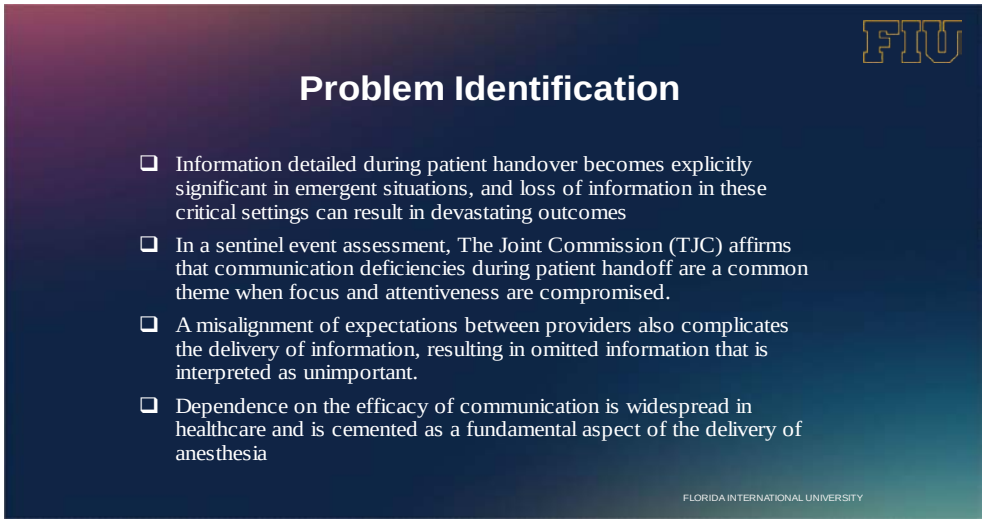
TAKE HOME POINTS

- Errors and inconsistencies that are present during patient transfer are magnified after the administration of anesthesia leading to devastating oversights and omissions
- Endorsement of coordinated, standardized techniques and the use of structured handoff tools are suggested responses to preventing detrimental consequences and minimizing medical errors during the transfer of care
- Implementing change is plagued with inherent challenges, research affirms that the success and compliance with individual tools (SBAR and I PASS) is contingent on the training and support associated with their introduction.

Appendix G: Dissemination PPT





Background

- Patient handoff constitutes the transition of responsibility to preserve the continuity of quality and safe patient care.
  - Impaired communication diminishes the integrity of this process leading to degradation, misinterpretation, and loss of information
- Traditionally, the transfer of patient care involves a casual and informal relay of information with no standard process to guide its execution.
  - A lack of standardization and inadequate communication during this transition supports inconsistencies and inhibits the exchange of valuable information that increases the incidence of adverse outcomes.

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Background

- The efficacy and value of verbal as opposed to written handoff is a topic of debate and gives credence to the importance as to how communication incompatibility between providers affects how information is delivered, received, and interpreted.
- Emphasis on productivity places undue limitations on performance.
- This environment of urgency, production pressure promotes a hurried and unstructured process that compromises effective communication and ultimately patient safety

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Project Purpose

- The stress of continuous productivity creates distractions and compromises patient safety
- The accuracy and completeness of vital patient information are sacrificed when the emphasis on throughput in place of patient safety
- Neglecting the strain this urgency places on the efficiency of patient handoff creates a domino effect that increases the potential for adverse outcomes and patient injury
- The purpose of this investigation is to evaluate CRNAs' knowledge and awareness of the risks associated with inconsistent handoff procedures, the significance of uniformity in the distribution of patient information, and the relative merits of SBAR and I -PASS in an organizational setting

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PICO/ Clinical Question

- In Nurse Anesthesiologists, would implementation of I-PASS versus SBAR communication tool decrease medical errors and increase patient safety.
  - Population (P): Nurse Anesthesiologists
  - Intervention (I): I-PASS (illness severity, patient summary, action list, situational awareness and contingency planning, synthesis by receiver)
  - Comparison (C): Verbal SBAR (situation, background, assessment, recommendation)
  - Outcomes (O): Prevention of errors during the transition of care

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QI Methods

- Transition that occurs during patient handoff denotes change and is often associated with instability
- Questions to consider:
  - Is there a knowledge deficit of the threat to patient care?
  - What are the consequences of neglecting to address the complexity and inconsistency that occurs during patient transfer?
  - What opportunities are available to improve current processes?
  - Who are the stakeholders involved in quality improvement implementation?
  - What is the impact of quality improvement on clinical outcomes?

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QI Methods

- Conduct a comprehensive baseline assessment to understand the current state of handoff procedures among the sample population
  - Pre-test survey (anonymous online platform)
- A formal education module was developed to provide an understanding of the consequences of inadequacy and the benefits of using the handoff tools effectively
- Evaluation of the impact of the education module when compared to the baseline assessment
  - Post-test survey (anonymous online platform)
  - Emphasis on the importance of a consistent communication strategy among providers

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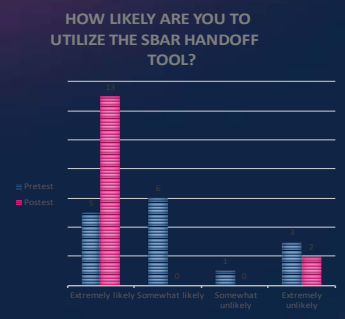
QI Results

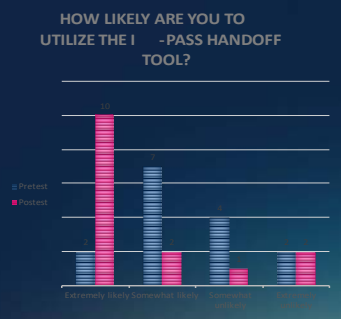
Question	Pretest	Posttest	% Change
1. What organization is responsible for establishing national patient safety goals addressing handoff communication:			
Institute of Medicine	2 (13%)	2 (13%)	No change
Agency for Healthcare Research	1 (7%)	1 (7%)	No change
The Joint Commission	8 (53%)	11 (73%)	↑ 20
Occupational Safety and Health Administration	4 (27%)	1 (7%)	↓ 20
2. Which factor contributes to hand -off communication breakdowns:			
Allotment of responsibility	1 (7%)	1 (7%)	No change
Lack of standardized procedures	12 (80%)	12 (80%)	No change
Alignment of communication styles	1 (7%)	2 (13%)	↑ 6
Transfer of patient responsibility	1 (7%)	0 (0%)	↓ 7
3. Which of the following is NOT a consequence of ineffective communication:			
Medication errors	2 (13%)	1 (7%)	↓ 6
Sentinel events	0 (0%)	1 (7%)	↑ 7
Interprofessional collaboration	13 (86%)	13 (86%)	No change
Wrong-site surgeries	0 (0%)	0 (0%)	No change
4. Communication breakdown during the transfer of care has contributed to 1, 744 deaths and $1.7 billion in malpractice expend Rates			
True	13 (87%)	14 (93%)	↑ 6
False	2 (13%)	1 (7%)	↓ 6

QI Results

Question	Pretest	Posttest	% Change
5. What element is necessary for patient handoff using as handoff tool:			
Background	3 (20%)	3 (20%)	No change
Synthesis by the receiver	4 (26%)	7 (47%)	↑ 21
Assessment	7 (47%)	4 (26%)	↓ 21
Recommendation	1 (7%)	1 (7%)	No change
6. Which handoff tool is finalized with a formal acknowledgement of responsibility and accountability:			
SBAR	8 (53%)	5 (34%)	↓ 19
WHAT	0 (0%)	0 (0%)	No change
I-PASS	7 (47%)	10 (66%)	↑ 19
SOAP	0 (0%)	0 (0%)	No change
7. Inadequate communication during patient transfer inhibits which of the following:			
Exchange of valuable information	10 (67%)	13 (86%)	↑ 19
Incidence of adverse outcomes	2 (13%)	1 (7%)	↓ 6
Misalignment of communication styles	1 (7%)	0 (0%)	↓ 7
Clinical missteps	2 (13%)	1 (7%)	↓ 6
8. Errors in communication are linked to:			
Longer hospital stays	1 (6%)	1 (7%)	↑ 1
Lower satisfaction	1 (6%)	1 (7%)	↑ 1
Increased financial burden	1 (6%)	0 (0%)	↓ 6
All of the above	12 (82%)	13 (86%)	↑ 4
9. What are significant barriers to the use of a handoff tool during patient transfer:			
Lack of time	7 (46%)	4 (27%)	↓ 19
Interruptions	1 (7%)	4 (27%)	↑ 26
Phone calls	1 (7%)	0 (0%)	↓ 7
Unfamiliarity	6 (40%)	7 (46%)	↑ 6

QI Results





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Discussion

- Sample size was small (n = 15)
- The providers surveyed may have previous experience with handoff tools
- The study's time frame makes it difficult to analyze long-term outcomes
- Overall improvement in provider understanding of communication and handoff tools

Conclusions

- The existing body of knowledge supports the use of systemic application of techniques to improve communication during patient transfer, including standardized handoff tools
- Execution of this project, exhibited improvements in provider knowledge related to the utilization of handoff tools, consequences of inadequate communication, as well as, increased confidence and commitment to the use of standardized techniques to prevent adverse outcomes and improve patient care
- In analyzing project results, participants expressed a greater probability in utilize IPASS over SBAR in communicating patient information

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- Faculty of the Nicole Wertheim College of Nursing and Health Sciences

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