Implementation and Evaluation of a Checklist in the Postanesthesia Care Transitions

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Table of Contents

Abstract

The transition from the operating room to the postoperative care unit is a critical time in the perioperative period for patients. Patients are physically transferred from one location to another and critical information regarding patients' intraoperative period must be delivered accurately to ensure patient safety. Over the past few years, many healthcare regulating agencies have advocated for a standardized care transitions by suggesting a handoff checklist should be implemented but this has failed to be universally executed. There is not one template universally implemented in post anesthesia standardized handoffs but many different models. Nonetheless, research has shown using a standardized template for this care transition has shown that more information was delivered to the receiving parties and safety events related to miscommunication in postoperative transitions were decreased. The purpose of this project is to refine care transitions through a standardized handoff which will improve communication and decrease safety-related events. Nurses and anesthesiologists were anonymously surveyed about their perception of postanesthesia transitions prior to and after introduction of the intervention. A postanesthesia handoff checklist formatted in a Situation, Background, Assessment, and Recommendation method was implemented at a level one trauma center in the Midwest based on feedback from the organization. The documented handoffs indicated there was a high compliance with using the checklist. The postsurveys presented low participation and neutral feelings regarding the use of a handoff checklist

Keywords: postoperative, postanesthesia, handoff, care transitions, anesthesia, PACU, nurses, handover, report, communication, team, admission, surgery, patient transfer

Implementation and Evaluation of a Checklist in the Postanesthesia Care Transitions

Introduction

This project was submitted to the faculty of Marian University Leighton School of Nursing as partial fulfillment of degree requirements for the Doctor of Nursing Practice (DNP), Nurse Anesthesia track. The transfer of patient care from an anesthesia provider to a registered nurse (RN) is a critical time in the perioperative period. A comprehensive handoff report is necessary to ensure the receiving provider has an accurate account of the patient's experience in the operating room to maximize safe patient care.

Background

The care transitions from anesthesia personnel to a Post Anesthesia Care Unit (PACU) RN permits providers to have an opportunity for face to face communication that includes an interactive discussion on the details of a patient's procedures. The transition of care is a vulnerable time for the patient because of the physical transfer, collaboration from multiple providers, and many patients having similar medical histories.

Without a validated method, there are often variances in the handoff report dependent on the provider and the nurse who participate in the transfer of care. This type of care transition has been described harshly as "informal, unstructured, and incomplete" compared to other medical care transitions (Milby, Bohmer, Gerbershagen, Joppich, & Wappler, 2014, p. 192). Postoperative handoff has been determined as a barrier in delivering safe patient care because it is "high-risk" and "error-prone" (Agarwala, Firth, Albrecht, Warren, & Musch, 2015, p. 96). When vital items are not included in a care transition there is a possibility of a critical piece of information not being communicated to the subsequent provider. This miscommunication can generate a medical error or increase mortality and/or morbidity for patients and produce longer PACU stays and delays in treatment (Rose, Newman, & Brown, 2019).

The attitude of many anesthesia professionals is that the report they deliver is adequate and they do not need to change anything about the delivery of their report (Lane-Fall, Brooks, Wilkins, Davis, & Riesenberg, 2014). These behaviors lead to poor morale of the organization and critical information not being delivered to the subsequent provider. Other detrimental behaviors include delivering reports when the nurse is not ready to accept information, side conversations during the reports, and noise from televisions or radios can affect the quality of the postanesthesia reports (Petrovic, et al., 2015).

The Joint Commission (TJC) identified that the foremost reason for anesthesia associated sentinel events were communication errors and twice as many deaths are associated with communication errors than with inadequate care (Park, et al., 2017; Siddiqui, et al., 2012,). Breakdown in communication impacts as many as 85% of medical errors (Boat & Spaeth, 2013). The annual cost of medical errors in the United States is estimated at more than 17 billion dollars and medical errors result in up to 400,000 deaths annually (Halterman, Gaber, Janjua, Hogan, & Cartwright, 2019). Verbal report errors from physicians and nurses are responsible for 37% of errors in the handoff process (Siddiqui, et al., 2012). The World Health Organization (WHO) recognizes that communication errors are one of the top five preventable errors (Halterman, et al., 2019).

In 2007, the WHO designed a checklist for surgeries called a “time out” or universal protocol which ensures that the right patient is having the right surgery on the right location which decreased morbidity, mortality, and surgical complications. This structured report increased information accuracy during transfer, patient safety, and teamwork in the operating room (OR) (Milby, et al., 2014). The research behind using a checklist is derived from “The Checklist Manifesto” which states that safety is improved with standardization (Bruno & Guimond, 2017). Checklists have been used since the 1930s and assist in preventing tasks from

being overlooked which leads to poor outcomes (Bruno & Guimond, 2017). In 2005, TJC "mandated a standardized approach to handoffs" (Park, et al., 2017). Then again in 2009, TJC made standardized care transitions a National Patient Safety Goal (Petrovic, Martinez, Aboumater, 2012). The implementation of a postanesthesia checklist would confirm all the outlined data is being transferred from the anesthesia provider to the receiving RN and complies with the recommendations from the WHO and TJC.

Purpose

The purpose of this DNP project is not only to comply with the recommendations of the WHO and TJC who have been advocating for this change since 2005, but also to improve patient outcomes (Petrovic, et al., 2015). The use of standardized handoff has been shown to improve safety by decreasing patient morbidity, mortality, and surgical complications (Segall, et al, 2012). Another objective of this project is to improve satisfaction, decrease stress, and improve communication among providers.

Problem Statement

Miscommunication or missing information in a care transition is a problem that can lead to adverse events or suboptimal management of patients' care. Using standardized care transitions have been proven to advance postoperative handoff reports. A Problem, Intervention, Comparison, Outcome, and Timeline (PICOT) question was formulated to examine this issue. In anesthesia providers transferring the care of patients to nurses does utilizing a standardized handoff checklist for report improve the transfer of information compared to anesthesia providers who do not use a standardized handoff checklist during patients' PACU stay? A quality improvement project was designed around this question to examine if a standardized report would change perceptions of postoperative care transitions and improve patient outcomes.

Organizational "Gap" Analysis of Project Site

The care transitions from over twenty anesthesia providers delivering a postanesthesia report on over seventy-five patients was informally observed at the hospital from May to August 2019, a variance was noted from anesthesia providers delivering reports and nurses receiving reports. The ideal future state of this postoperative handoff report is for 100% of the organization's determined items to be delivered to the receiving RN. The current state of the postanesthesia report is the anesthesia provider includes what they think is appropriate in handoff reports and depending on the nurse, they ask follow-up questions to complete reports. Many nurses are spending valuable time that could be spent delivering patient care, searching for this missing data in patients' charts when a complete report is not delivered to them.

Prior to the intervention, many of the organization's anesthesiologists begin delivering reports while the nurse is still hooking up the patient to the vitals sign monitor and the report is frequently interrupted with side conversations. The current reports can be described as scattered and unpredictable. Anesthesia residents have stated that their education on care transitions were informal and inconsistent. These residents graduate and are employed as attending anesthesiologists who continue these erratic care transitions (Muralidharan, et al., 2018). The current state of postoperative handoff reports creates practice gaps that could potentially impact patient safety. The ideal state of this report eliminates these gaps and supplies the receiving nurse with an entire narrative of patients' perioperative periods. The difference between these two methods revolves highly around communication and standardization.

Review of the Literature

The American Society of Anesthesiologists (ASA) published both practice guidelines and standards of care in 2013 for the postanesthesia period. The practice guideline for postanesthetic care includes no information on handoff reporting but focuses on outcomes and treatment (ASA,

2013). The standards for care in the postanesthesia period, state that an anesthesia staff member that is knowledgeable on the patient's condition accompanies the patient to the PACU. The patient will be continuously evaluated and monitored in the PACU. An oral report is necessary and is delivered to the PACU nurse caring for the patient by the anesthesia provider according to the standard of care. Three criteria must be met in this report:

1. The patient's status on arrival to the PACU shall be documented.
2. Information concerning the perioperative condition and the surgical/anesthetic course shall be transmitted to the PACU nurse.
3. The member of the anesthesia care team shall remain in the PACU until the PACU nurse accepts responsibility for the nursing care of the patient. (ASA, 2014).

These criteria are very general and allow the presence of variability in care transitions. Other reasons for variance in PACU handoffs include a differing understanding of what should be included in the report, contradictory expectations and opinions, time pressures, and an unfamiliar environment for new or temporary employees. The PACU can be an unfamiliar environment for students, staff in training, per diem employees, float pool nurses, or staff reallocated from other areas of the hospital. Consequences of variance include patients and their familys' dissatisfaction, the receiving staff spending additional time searching for missing data which is an inefficient use of time in the fast-paced environment of the PACU, and medical errors due to miscommunication (Boat & Spaeth, 2014).

The use of handoff checklists for postanesthesia care transitions have been comprehensively researched and the use of these handoffs decreases the variance in care transitions (Rose, Newman, Brown, 2019). There are many different models and interpretations on how to implement a checklist in handoff reporting to PACU nurses. Examples in the literature include mnemonics, situation background assessment recommendation (SBAR) methodology,

and checklists ranging from 11- 59 points (Rose, Newman, & Brown, 2018).

The existing processes of postanesthesia care transitions were studied to evaluate the necessary criteria for handoff checklists and then a template was designed based on the designated criteria (Boat & Spaeth, 2014). Study designs included prospective cohort, observational with no intervention, quasi-experimental, and cross-sectional observational studies. In the majority of studies, data was collected before the intervention to establish a baseline percentage of complete handoff reporting. Data was amassed throughout the studies and the number of complete handoff reports were analyzed. Additional data was also collected throughout questionnaires to measure staff's presumption of safety, incident reports were used to measure safety metrics, and in some studies, the time spent delivering the report was measured (Randmaa, Martensson, Swenne, & Engstrom, 2013). The timeframe for the studies ranged from two weeks to six months. Many projects presented a teaching session on the handoff and the criteria their organization deemed necessary to include in a complete handoff. Almost every study displayed this criterion in the PACU by attaching it to the wall or to the patient's bedside table. Some studies supplied providers with pocket cards they could attach to their badge. One organization designed a smartphone application, so staff members had an easy way to access the checklist (Jullia, et al., 2017).

A recurrent theme in the research was nurses receiving handoff had a note sheet or template in the electronic health record (EHR) they completed which was modeled from the handoff checklist. Electronic Anesthesia Information Management System (AIMS), a smartphone application, has also been used to guide care transitions (Agarwala, et al., 2015). Valuable steps before initiating the report included completing a critical hookup of the patient to the monitor, obtaining a preliminary set of vital signs, and asking the RN if they were ready for report, and forecasting if the anesthesia provider had any concerns for the patient's future (Boat

& Spaeth, 2014, p. 650). Assessing if the nurse is ready for report allows for the undivided attention of both providers. A preliminary set of vital signs assesses if the patient is still in a stable condition after being transported from the OR to the PACU. Assessing the anesthesia provider's concerns, allows the nurse to be focused on patient specific indicators.

The setting of all of the studies was the PACU, a department that is described as a fast-paced and "highly distracting environment" which creates vulnerability and limitations to research (Halterman, et al., 2019). Many of the limitations of these studies were related to data collection, because the data were either self-reported, researchers were present, researchers could only observe one study at a time, and/or human error (Milby, et al., 2014; Park, et al., 2017). In studies that staff members were aware that they were being observed, it is possible they altered how they delivered their report, this modification in behavior is called the Hawthorne Effect (Milby, et al., 2014). The design of many of these studies did not allow for randomization which is a limitation of many quality improvement projects. The information was dispersed and available to all of the employees which creates an inability to randomize subjects because of a universal exposure to the intervention. Selection bias was recurrently listed as a limitation in these studies and can occur when there is only one researcher (Randmaa, et al., 2013).

Implementation of an SBAR postanesthesia checklist handoff has shown a drastic increase in comprehensive reporting in every study that was reviewed (Randma, Swenne, Martensson, Hogberg, & Engstrom, 2016; Halterman, et al., 2019; Randmaa, Martensson, Sweene, & Engstrom, 2013; McKechnie, 2015). The benefits of using a checklist include creating a guide for information delivery, improvement in information transfer, and decreased errors. Outcomes of evidenced-based handoff reporting tools were decreased miscommunication, reduced safety-related events, diminished order entry errors, reduced unexpected death, and improvements in safety reporting (Randmaa, et al., 2013). Anesthesia providers and nurses

involved in these studies agreed that teamwork improved and that they were encouraged to work together. Nurses felt empowered to ask more questions to address all the criteria when there was a designated checklist that permitted more complete reporting (Boat & Spaeth, 2013).

Communication errors are the most preventable adverse event in healthcare and over half of these errors occur during patient care transitions (Jullia, et al., 2017). The standardized handoff template strives to decrease and eventually eliminate medical errors due to miscommunication. One study reported that communication errors caused 14% of postoperative adverse events (Lane-Fall, et al., 2014). Providers with good communication skills have been found to more accurately identify problems with patients, have decreased stress, develop greater job satisfaction, possess a more satisfied patient population with better outcomes, and their patients are more likely to heed their advice and follow the treatment plan (McKechnie, 2015). Standardization of the handoff checklist is one of the easiest ways to decrease the loss of information and prevent miscommunication from occurring. TJC instructed that an unvarying approach to handoff reporting should be implemented over a decade ago that incorporates a universal list of criteria but this has been yet to be universally achieved (Park, et al., 2017).

Evidence-Based Practice: Verification of Chosen Option

The American Association of Anesthesiologists Standard of Care for postoperative care transitions is concise and just requires intraoperative anesthesia staff to be present for transport, monitoring, and verbal report (Park, et al., 2018). The evidence-based practice has shown there are many ways to deliver the postoperative reports, numerous models of designing a handoff checklist, and varying criteria to what should be included in the report. The use of a checklist as a cognitive aid has improved the completeness of postoperative reporting in the United States and abroad Randmaa, et al., 2013.

Theoretical Framework

The theoretical framework used for this project is Cheryl Stetler's Model of Research Utilization, which applies decision-making steps and critical thinking to examine and evaluate research. There are five phases to this model: preparation, validation, decision-making, application of the evidence, and evaluation (White, Dudley-Brown, & Terhaar, 2016). Preparation for this project includes the exploration of relevant data for implementation. Validation is the assessment of the data. Decision-making is the evaluation of the data and if it will be practical for the application of the evidence. After the evidence is implemented the intervention will be evaluated for effectiveness (White, Dudley-Brown, & Terhaar, 2016).

Goals, Objectives and Expected Outcomes

The goal of implementing a handoff checklist for postanesthesia care reporting is for providers to communicate to nurses a complete account of the events that occurred in the operating room especially related to anesthesia in 100% of their reports. The expected result of this goal is an improvement in delivering safe patient care, decreased medical errors due to miscommunication, enriched communication, and increased teamwork. The reporting will include specific criteria based on the handoff reporting tool. The goal will be measurable by reviewing patients' charts for the documentation of the anesthesia handoffs. Anesthesia providers will deliver the reports and PACU nurses will receive the reports, complete their charting, and inquire about any handoff criteria that were not included in the reports. The objective of this project is to educate healthcare professionals on a handoff checklist and the importance of complete reporting. The expected outcome is the amount of complete reporting will change as providers incorporate using a SBAR PACU handoff checklist into their routine.

Project Design

The implementation of a handoff checklist for PACU reporting is a quality improvement project, specifically a process improvement project. Quantitative methods will include the calculation of complete reports and use of the handoff tool. Qualitative data would be the opinions of PACU nurses and anesthesia providers about the quality of reporting and how the handoff checklist meets the needs of the organization.

Project Site and Population

The project site is a Level I Trauma Center located in the Midwest with over 20 operating rooms. The surgeons perform minimally invasive procedures, gynecological, pediatric, cardiac, robotic, ear, nose, throat, transplant, and orthopedic surgeries. All of these surgeries except pediatrics will be included in the population using the SBAR handoff tool. Anesthesia care is delivered by a private physician group, which is one of the largest in the Midwest.

Methods

Participants in this project are the anesthesiologists and their students, trainees, or residents and PACU nurses and their students or trainees who are delivering postoperative anesthesia report to a RN in the Orthopedics (Ortho) and Main PACUs will be included in this project. Because of the nature of this quality improvement project, all employees in these departments will be exposed to the information on handoff checklists, which makes randomization impossible. Participants will be involved in this project because of their employment with the hospital or anesthesia group.

Preparation for this quality improvement includes designing a handoff specific to this hospital to fit the needs of the organization. The handoff will utilize the SBAR format. The SBAR format was selected because it is the most universal system approach tool used in healthcare and has been proven to be effective (McKechnie, 2015). SBAR is not only used in healthcare but also by other high-risk organizations (Randmaa, et al., 2013). Benefits of

designing the handoff using this tool are the simplicity of design, it requires minimal training, it is appropriate for many circumstances (including face to face, telephone, and written handoff), it is a brief and concise tool, the structure is predictable, and it can be used by all staff members. The universality of the SBAR format validates its applicability to this project. The information included in the checklist will be derived from a review of the literature and the needs of the organization. A list of criteria to be potentially included in the organization specific handoff is listed in Appendix A. The checklist will be formatted in the SBAR structure and specific to the organization and their patient population. Clinical stakeholders will be the decision makers to confirm the desired criteria for the handoff. Handoff criteria will be displayed in each bay in the PACU and set to be the lock screen on the iPads used by the anesthesiologists. The Main and Ortho SBAR postanesthesia handoff checklist is listed in Appendix B.

Before the implementation of the SBAR postoperative checklist, the two cohorts: RNs and anesthesiologists, will be given a preintervention survey to gauge their perspective on the current state of postanesthesia reporting (Appendix C and D). Modifications to the SBAR checklist may be necessary based on this information. After the conclusion of the data collection from the SBAR handoffs, a similar survey will be given to each group. This survey will assess their perceptions of postanesthesia care transitions, safety, and teamwork based on their experience using the SBAR postanesthesia handoff (Appendix E and F). Staff members will be educated by the clinical stakeholders and provided with a one-page overview of the project (Appendix G).

The benefits of this quality improvement project is dependent on the actions of the healthcare professionals involved. How these participants deliver and engage in the postanesthesia reporting process will affect the usefulness of the handoff checklist. This document will be scrutinized to examine if it meets the needs of the PACU nurses and

anesthesiologists at the hospital. The report will always revolve around the patients who have had surgery and anesthesia and their medical need for a visit to the PACU. The extraneous factors would include staff members not aware of the handoff checklist, non-compliant staff members, and medical emergencies that may trigger a delay in postanesthesia report being delivered.

The care transition will begin with the anesthesiologists bringing their patients to the PACU along with the patients' charts and their iPad with the checklist set as their lock screens. They will begin delivering their report to the PACU nurse after the critical hookup to the vitals sign monitor is complete. The nurses will confirm they are ready to receive the report. The postanesthesia report will follow the format of the checklist (Appendix B). The PACU nurses will record this report on a modified version of their preexisting report sheet that follows the postoperative handoff (Appendix H). The nurse will document the report delivered to her/him and conclude this process by asking any questions she/he may have. These sheets are not part of the medical record and will be placed into a secure vestibule at the PACU nurses' station. The report sheets will be devoid of any confidential patient information. After the report is delivered and patient care is complete, the nurses will circle an answer to two questions and note any comments about the postanesthesia care transition. These two questions and a line for comments is located in the bottom righthand corner of this report sheet. These forms will be collected at the end of the study and descriptive statistics will be utilized to assess the completeness of the reporting. The institutional stakeholders will be updated at the end of the data collection.

Measurement Instruments

To measure the outcomes of this DNP Project the following will be used: preintervention data, report sheets with the survey (Appendix H), and postintervention data. Preintervention data will be collected anonymously from the preintervention survey completed by nurses and

anesthesiologists. These surveys will be distributed via email and collected through the Survey Monkey website. This information will be recorded into Qualtrics to perform descriptive statistics of the participants answers to questions 1-5 (Appendices C and D). This information will be utilized to assess the staff's views of postanesthesia reporting prior to the intervention. Additional data will be collected from the report sheets at the end of the two-week period. Descriptive and inferential statistics will be derived from this information to detail areas of strength and opportunities for improvement for complete handoff reporting. At the end of the study, data from the intervention will be displayed to demonstrate the effectiveness of the intervention. After the two-week trial period is complete, nurses and anesthesia providers will be surveyed with a similar anonymous assessment on Qualtrics via email. They will be able to convey their opinions of the intervention, how the intervention impacted patient care, and assess areas for future quality improvement interventions related to postanesthesia care transitions (Appendices E and F). Descriptive statistics will be performed on questions 1-7 of the postintervention survey.

Implementation Plan and Procedure

Cheryl Stetler's model of research utilization was applied to implement this project. The researcher and stakeholders from the hospital prepared for the implementation of this quality improvement project. A literature review of criteria included in postanesthesia care transitions was performed and a collective list was derived (Appendix A). After several drafts and a collaborative effort from the primary researcher and the hospital stakeholders, a final Main and Ortho PACU SBAR Handoff was finished (Appendix B). Decision-making performed by the hospital stakeholders was the primary deciding influence for what criteria was included in the final SBAR checklist.

Validation of the need for this project was confirmed by the staff via an anonymous preintervention survey, input from the stakeholders, and the recommendations from the WHO and TJC to have implement standardized reporting in all postanesthesia handoffs. The necessity for this project was confirmed by the informal observations by the primary researcher from May-August 2019. Validation will be derived from the assessment of the data received from the nurse report sheets and the postsurveys. Decision-making will additionally include the evaluation of the intervention, the data, and whether this tool will be practical in this organization's clinical practice. Application of the evidence will be used to revise the SBAR checklist, prioritize the needs of the organization, and future research. The evaluation will be completed after two weeks of collecting the nurse report sheets and postintervention data are collected and analyzed.

Data Collection Procedures

Data collection from the intervention will be performed by the student in charge of the project. A presurvey will be distributed to nurses and anesthesiologists and they will be given two weeks to complete it. The SBAR Postanesthesia Checklist will go live and data will be collected at the end of the two-week collection period from the confidential surveys on the nurses' report sheets. Postintervention data will be collected via an anonymous survey, the same as the preintervention survey and staff will have a week to complete it. Practical considerations include that the information will be in a paper format and not in the electronic health record, it will involve physical collection of the nurses' sheets, and it will require participation from the staff members. Other considerations include motivating the staff members to take a survey on the project and encouragement from the clinical stakeholders may be required.

Ethical Consideration/Protection of Human Subjects

Marian University Institutional Review Board (IRB) has granted an exemption for this project and no IRB approval is necessary from the hospital before the initiation of the project. All participants are protected by the Health Insurance Portability and Accountability Act of 1996 (HIPAA) which, among other guarantees, protects the privacy of patient's health information (Modifications to the HIPAA Privacy, Security, Enforcement, and Breach Notification Rules, 2013) (Office for Human Research Protections, n. d.). Additionally, the primary investigator and the practice personnel who carefully conducted this project followed the Standards of Care for the postanesthesia report published by the ASA. All information collected as part of evaluating the impact of this project was collected as aggregated data from the project participants and did not include any potential patient or staff identifiers.

The risks to patients contributing to this project was no different than the risks were to the previous patients whose postanesthesia reports were delivered in an unstructured manner. The patients' involvement in the project was exclusively that they had a procedure performed and received anesthesia and an anesthesiologist had to give a postanesthesia report, nothing was modified regarding their care besides how the report was delivered. Confidentiality was assured by turning in the report sheets to a secure receptacle. The sheets were designed to not include identifying information of the person submitting them. The nurses' report sheets were also devoid of information that would allow the patient to be identified. The stakeholder's modified the nurses' report sheet to state, "Student Project Report Sheet, no patient identifiers to be included per the request of the of anesthesiologists. These forms were disposed of using the hospital's disposal containers for protected health information. No documents on the researcher's personal computer and no information provided by staff in surveys via Qualtrics and Survey Monkey included any patient information. Marian IRB approval is presented in Appendix I.

Data Analysis and Results

Data will be analyzed from the preintervention surveys, surveys on the nurses' report sheets, and postintervention surveys. All data will be submitted to the researcher by PACU nurses and anesthesiologists. The responses to the preintervention and postintervention surveys are displayed in Appendices J, K, L, and M. The survey data from the nurses' report sheets was logged using the tool in Appendix N. The results from the intervention data are displayed graphically in Appendix O.

Preintervention Results and Analysis

Anesthesiologists were given the link to the preintervention survey on March 9, 2020. From March 9 - March 16, 2020 a total of 38 anesthesiologists completed the survey. This organization employs 83 anesthesiologists to cover all of their contracts in the Midwest and some never work at this particular hospital. The anesthesiologists were in 100% agreement that they were satisfied with the postanesthesia handoff report they delivered. 68% of respondents answered they strongly agreed (value 2) with their postanesthesia handoffs 32% agreed (value 1). The minimum score was 1 (agreed) and maximum 2 (strongly agreed). The mean was 1.32, standard deviation 0.46, variance 0.22. All but one person (97% of respondents) agreed they communicated potential patient problems to the PACU nurse. 84% strongly agreed (value 1), 13% agreed (value 2), and 3% disagreed (value 4). The minimum was 1 (disagreed) and the maximum 4 (strongly agreed). The mean was 1.21, standard deviation was 0.57, and the variance was 0.32. They were divided on the topic of postanesthesia report being rushed, 8 (21% value 2) agreed it was rushed, 7 (18% value 3) responded neutral, 21 (55% value 4) disagreed, and 2 (5% value 5) strongly disagreed. The minimum was 2 (agree) and maximum was 5 (strongly disagreed). The mean was 3.45, the standard deviation was 0.88, and the variance was 0.77). The majority disagreed or strongly disagreed (79%) with receiving a phone call about something that could have been included in handoff. The minimum was 2 (agreed) and maximum was 5

(strongly disagreed). The mean was 3.97, the standard deviation was 0.84, and the variance was 0.71. The majority (89%) agreed that there is good teamwork and communication between themselves and the PACU nurses. The minimum was 1 (strongly agreed) and the maximum was 3 (neither agreed nor disagreed). The mean was 1.66, the standard deviation was 0.66, and the variance was 0.44. To the open ended question, "Do you have any concerns about post-anesthesia handoff" many said no, "not the way I do it", "I'm more thorough than many of my partners", no because they were familiar with the nurses receiving the patients, or they made sure the nurse was comfortable before they left the PACU. Other feedback included that the process needed standardization, the report should begin after the first set of vitals, some nurses do not listen despite saying they are ready for handoff which caused the anesthesiologist to have to repeat report, some nurses are distracted and performing other tasks or talking to other nurses during report, and nurses take breaks and do not give report to the nurse relieving them. The five Likert scale questions are displayed graphically in Appendix J.

Nurses were given the link to the preintervention survey on March 9, 2020. Between March 9 and March 14, a total of 19 nurses took the survey. This hospital employs approximately 60 PACU nurse and 5 are on leave. The majority of the PACU nurses were satisfied with the report they received (79%). The remaining nurses were divided equally between feeling neutral and disagreeing. The minimum value was 1 (strongly agreed) and the maximum was 4 (disagreed). The mean was 2.11, the standard deviation was 2.11, and the variance was 0.73. Fifteen of the nurses (79%) agreed that potential problems were communicated to them, 3 (16%) were neutral, and 1 (5%) strongly disagreed. The minimum value was 1 (strongly agree) and the maximum was 5 (strongly disagreed). The mean was 2.11, the standard deviation was 0.91, and the variance was 0.83. The most variance in responses to a survey question was noted on the question about feeling that post anesthesia report was rushed.

Six strongly agreed/agreed (32%), 6 (32%) were neutral, and 7 (34%) disagreed/strongly disagreed (36%). The minimum value was 1 (strongly agreed) and the maximum was 5 (strongly disagreed). The mean was 2.89, the standard deviation was 1.07, and the variance was 1.15, Pertaining to the question about making a phone call about something that could be included in handoff, 8 nurses strongly disagreed/disagreed (42%), 6 (32%) responded neutral, and 5 (26%) strongly agreed/agreed. The minimum value was 1 (strongly agreed) and the maximum value was 5. The mean was 3.16, the standard deviation was 0.99, and the variance was 0.98. All but one nurse (95%) agreed/strongly agreed there was good communication and teamwork between them and the anesthesiologists. The minimum value was 1 (strongly agreed) and the maximum value was 3 (neither agreed nor disagreed). The mean was 1.79, the standard deviation was 0.52, and the variance was 0.27. To the open ended question regarding concerns about postanesthesia handoff nurses responded they wanted actual doses of medications given during surgery, some anesthesiologists were fabulous and others do the bare minimum, some anesthesiologists do not care, it is all dependent on the anesthesiologist, that the anesthesiologists need to wait till the patient is hooked up to the monitor before they begin report otherwise they have to repeat themselves, some anesthesiologists "are rushed to close the chart and give report before the brakes are on the bed", "some talk over my shoulder while I am getting vitals", that "drive by reports are given", medications are not being mentioned especially from medications from acute pain service, there are issues with orders, "some anesthesiologists do not know a patient's complete medical history- very SCARY!!!!!", and they are searching through the record for things that were missed. The five Likert scale questions are displayed graphically (Appendix L).

The results from the preintervention survey indicate a need for a process improvement. Overall the staff feel that postanesthesia report is effective, communication and teamwork are good but their comments to the final question of the survey signify areas for improvement. Both

the nurses' and anesthesiologists' concerns about standardization and attention to report are addressed with the and Ortho PACU SBAR Handoff. This checklist begins with critical hookup to the vital sign monitor and then the next step is to ask the nurse if she is ready for report. This allows both the nurse and anesthesiologist to see baseline PACU vital signs and treat critical vital signs immediately. By asking the nurse if she is ready for report, it is clear the report is beginning and both providers' attention should be focused on the delivery and acceptance of report. By using the checklist, concerns about medications and dosages, searching through the medical record, and lack of knowledge about the patient's medical history should be decreased and ideally eliminated. The SBAR checklist ends with the nurse asking any questions she may have; this gives her the opportunity to ask questions about orders and clarify any missing or vague information delivered in the report.

Intervention Results and Analysis

The SBAR Handoff Checklist was implemented into practice on June 3, 2020. The collection of nurses' report sheets with the survey on handoff was collected from June 3- June 17, 2020. The primary researcher entered the data from these sheets into Qualtrics on June 24, 2020. The tool used to log data from these sheets is found in Appendix N. A total of 244 surveys were turned in to the secure receptacle. To the question, "Was the handoff checklist use?" 66% (161) of the nurses circled "yes", 25% (62) of the nurses did not complete the question, and 9% (21) circled "no". The minimum value was 1 (yes) and the maximum was 3 (no). The mean was 1.43, the standard deviation was 0.65, and the variance was 0.42. The PACU nurses indicated that 74% (180) of the reports were complete, 25% (62) nurses did not answer the question, and 1% (2) answered that they did not receive complete handoff. The minimum was 1 (yes) and the maximum value was 3 (no). The mean was 1.27, the standard deviation was 0.46, and the variance was 0.21. In the two reports that a nurse indicated the report was not complete, the

handoff checklist was not used, and they did not indicate what data was missing from the report they received. Only one comment was filled in on the 244 sheets, which was “great report 10/10”.

The surveys turned in on SBAR Handoff demonstrated that the majority of the anesthesia providers were using the new template. An unexpected limitation of this study was that 25% of the nurses did not complete the survey. It was expected that some nurses would not turn in their report sheet with the survey, but it was unforeseen that they would neglect to answer any of the questions. This limitation may be due to the primary researcher being reliant on clinical stakeholders to provide education on the SBAR report. The primary researcher was not being allowed on the hospital campus due to COVID19 policies and all education was provided by the clinical stakeholders via email. The primary stakeholder did not have access to these employee email lists. Another consequence of the primary researcher not allowed on campus was that the previous nurses report sheet was still available. This sheet did not include the survey questions about handoff and many of the 25% of the incomplete report sheets were in this previous format. The completed report sheets displayed that the vast majority of the anesthesiologists did use the handoff tool and gave a complete handoff report.

Postintervention Results and Analysis

Anesthesiologists were given the link to the preintervention survey on June 29, 2020. From June 29 – July 9, 2020 a total of 21 anesthesiologists completed the survey. The anesthesiologists responded to the question about the handoff being more standardized 50% strongly agreeing or agreeing. Of the respondents 3/24 (12.5%) disagreed or strongly disagreed. The remainder 6/24 responded neutrally. The Likert scale was assigned numbers with strongly agree being 1 and strongly disagree being 5 to all the multiple-choice questions in this survey. The mean of the responses was 2.48. The standard deviation was 1.14. The variance was 1.30.

To the question regarding improvement of the post anesthesia care transitions. The majority was neutral with 7/21 (33.3%) of the respondents answering this way. 7/21 (33.3%) disagreed or strongly disagreed and the other 7/21 (33.3%) agreeing or strongly agreeing. The mean was 3.05, the standard deviation was 1.05, and the variance was 1.09. The anesthesiologists were almost in unanimous agreement with 20/21 (95%) of them answering they communicated potential problems to the PACU nurses. The minimum was 1, the maximum was 5, the mean was 1.67, the standard deviation was 0.56, and the variance was 0.32. The answers to the question about the postanesthesia report being less rushed using the checklist was divided with 3/21 (14%) strongly disagreeing, 7/21 (33.3%) disagreeing, 7/21 (33.3%), and 4/21 (19%). The minimum was 2 and the maximum was 5. The mean was 3.43, the standard deviation was 0.95, and the variance was 0.91. To the question about receiving a phone call from the nurse about something that could been included in report, 2/21 (10%) agreed, 4/21 (19%) were neutral, and the remainder 15/21 (71%) disagreed or strongly disagreed. The minimum was 2 and the maximum was 5. The mean was 3.81, the standard deviation was 0.85, and the variance was 0.73. To the question about the report beginning after the patient was hooked up to the monitor 17/21 (81%) agreed. One person (5%) disagreed and the remainder 3/21 (14%) were neutral. The minimum response was 1 and the maximum was 4. The mean was 1.86, the standard deviation was 0.83, and the variance was 0.69. To the question about teamwork improving the majority 11/21 (52%) were neutral. Five anesthesiologists (24%) agreed, 2 (10%) strongly disagreed, and 3 (14%) disagreed. The minimum response value was 1 and the maximum was 4. The mean was 3.10, the standard deviation was 0.87, and the variance was 0.75. To the open-ended question about any additional thoughts or concerns was that it was already what they were doing, that they encouraged others to be very thorough like they were, that they never saw or used the checklist, and that the nurses

report sheet needs updated with their input. The results from this survey are displayed graphically in Appendix L.

Nurses were given the link to the postintervention survey on July 1, 2020. Between July 1 and July 16, a total of 16 nurses took the survey. The five-point Likert scale was assigned numbers with strongly agree designated at 1 and strongly disagree assigned 5. To the question about the handoff being more standardized, 4 (25%) nurses answered strongly agree, 4 (25%) agreed, 7 (44%) were neutral, and 1 (6%) disagreed. The minimum value was 1 and the maximum was 4. The standard deviation was 0.92, the variance was 0.84, and the mean was 2.31. The majority of nurses were neutral about the quality of the postanesthesia handoff report improving (11 nurses), 2 (12.5%) disagreed, 2 (12.5%) agreed, and 1 (6.3%) strongly agreed. The minimum value was 1 and the maximum value was 4. The variance was 0.48, the standard deviation was 0.7, and the mean was 2.88. Regarding potential problems being communicated to the nurse, 7 (44%) were neutral and the remaining nurses answered they agreed or strongly agreed. The minimum value was 1 and the maximum value was 3. The mean was 2.2, the standard deviation was 0.83, and the variance was 0.69. In response to the question about the report being less rushed the nurses responded they were neutral (63%), three nurses (19%) disagreed, and the other 3 nurses agreed or strongly agreed. The minimum value was 1 and the maximum was 4. The mean was 2.94, the standard deviation was 0.75, and the variance was 0.56. The response to the question about calling the anesthesiologist the nurses responded that they disagreed (44%), strongly disagreed (12.5), were neutral 3 (19%), or strongly agreed/agree 4 (25%). The minimum value was 1 and the maximum value was 5. The mean was 3.31, the standard deviation was 1.21, and the variance was 1.46. The response to the question about the report beginning after the patient being hooked up to the monitor, 7 nurses (44%), 5 nurses were neutral (31%), and 4 nurses (25%) agreed. The minimum value was 2 and the maximum value

was 4. The mean was 3.19, the standard deviation was 0.81, and the variance was 0.65. To the question about teamwork the majority of nurses 12/21 (75%) were neutral, 3 (19%) disagreed and 1 (6%) agreed. The minimum value was 2 and the maximum value was 4. The mean was 3.13, the standard deviation was 0.48, and the variance was 0.23. To the open-ended question about additional thoughts or concerns the only actual comment was "Unfortunately, the anesthesiologists who just want to drop & dash did not embrace the new report format. I don't know what could have been done to increase buy in from the MDs. For those who are respectful & practice collegially with us already I did see a small improvement using the new format." The results from this survey are displayed graphically in Appendix M.

The results of this survey demonstrated that modifications and continuing education still need to be performed. There was an unexpected limitation of the primary research not being allowed on the hospital campus, impacted employee education on the SBAR checklist is strongly demonstrated by the responses from the anesthesiologists that they did not know about this quality improvement project and handoff checklist. The opinions of the anesthesiologists that completed the survey did not change and the limitation of bias may exist against the primary researcher due to their position as a student nurse anesthetist. The nurses and anesthesiologists disagreed about report starting after the patient was hooked up to the monitor and that all issues were communicated. The overwhelming result was that their opinion was neutral. This could be due to the fact that the survey was generalized to the entire population of reports and not specific to individual reports. The anesthesiologists and nurse acknowledged that some providers are better at delivering report than others. The only updates to the nurses' report sheet came from nursing management to allow them a place to document things that were not previously being included in their report.

Implications for Future Practice

The future practice of care transitions at this hospital would benefit from using a tailored PACU handoff report sheet. The current sheet could continue to be utilized or modified based on the suggestions from the nursing and anesthesia staff. Further research could be done after the report sheet was modified. Continuing education could be provided to the staff to increase their knowledge on why using standardized handoffs are important. In this project, only a single sheet was provided to the staff there was no in person communication to the staff from the primary researcher. More research could be collected using the appropriate report sheet with the survey questions completed by a greater number of nurses. The care transitions could also be observed by a researcher to provide further insight into the handoff process and areas for improvement. Additional modification may be derived from this information. There was also a high rate of non-participation in the surveys despite multiple requests from the nurses' supervisor and the anesthesiologists' business partner. The organization could also modify this report and use it for postanesthesia handoffs from anesthesia to intensive care nurses. A similar checklist could also be implemented for anesthesia providers who assume care of a patient during an ongoing surgical procedure. Many SBAR checklists could be implemented throughout this hospital and their other locations to improve patient care, decrease miscommunication, and increase teamwork.

Conclusion

Postanesthesia care transitions occur over 40 million times annually in the United States (Segall, et al., 2012). The biggest risk of medical errors occurring during the postanesthesia period is from miscommunication during this handoff (Siddiqui, et al., 2012). Using a standardized form for report has been recommended by both the WHO and TJC to decrease errors in this type of setting. In order to comply with these recommendations there must be a high level of participation to create the workplace culture that supports the quality improvement

projects. The COVID19 pandemic caused unexpected limitations to the project that were significant to its implementation including the start date of data collection. The expected outcomes from this study were not achieved. Further research and participation from the staff are necessary to achieve the goal of 100% of postanesthesia reports being delivered using the checklist for postanesthesia care transitions.

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Appendix A

Potential criteria for SBAR Postanesthesia Handoff

Assess for Readiness for POH (Postoperative Handoff)

Patient information
- Age
- Gender
- Patient name
- Allergies
- ASA physical status
- Name band check

Preoperative information
- Diagnosis
- Preoperative status
- Premedication
- Medical history
- Preoperative level of activity, METs
- Limb restrictions
- Surgical history
- ASA classification
- Baseline neurologic status, vital signs, height, weight
- Baseline physical examination
- Baseline weight
- Pertinent laboratory values
- Underlying preexisting diseases: neurology (Parkinson's disease, TIA, stroke, arterial hypertension, disturbances of consciousness, other diseases), cardiology (CAD, cardiac arrhythmias, heart failure, other cardiac diseases), pulmonary (COPD, asthma, other lung diseases), kidney, myopathies, renal, liver, metabolic disorders (Diabetes), infectious disease
- Drug/alcohol abuse
- Anesthesia risk assessment
- Pacemaker/ICD
- Code status
- Current medications (especially beta-blockers)
- Anatomy/obesity
- History of PONV
- MH history

Anesthesia information
- Type of anesthesia (GA, TIVA, regional)
- Type of analgesia
- Nerve block (w/ or w/o catheter), epidural, spinal
- Airway management
- Intubating conditions
- Medications administered (narcotic totals, anticoagulant, antibiotics, anticonvulsants, NMB)

- PONV prophylaxis
- Complications
- Vascular access/invasive monitoring
- Current blood type and crossmatch
- ST-segment changes

Intraoperative information

- Type of anesthesia (general, gas, TIVA, sedation, MAC, regional, combination)
- Airway management (difficult/ LMA/ETT)
- Mask ventilation
- Tracheostoma
- Catheter insertion
- Hemodynamic occurrences (cardiac instability)
- Volume management (intake and output)
- Antibiotic therapy
- Anesthesia-related events, management, concerns: allergic reaction, tooth damage
- Blood loss
- Drains
- Packing
- Skin inspection
- Arterial line
- Central line
- Postoperative pain management initiated
- Blood transfusion (has needs)
- Unexpected events (ex. Arrhythmias, hypotension)
- Laboratory results and analysis
- Vasoactive medications/catecholamines
- Medications given- opioids, benzos, antiemetic (PONV prophylaxis, antibiotics, vasopressors, other
- Time last narcotic given

Surgery information

- Surgeon
- Type of surgery
- Reason for surgery, diagnosis
- Actual surgical findings
- duration
- Surgical complications/events/concerns
- Antibiotic plain
- Blood loss
- Medications to be restarted
- DVT prophylaxis
- Tubes, drains, catheters, shunts (special instructions)
- NG tube
- Postoperative diet
- Fluid management (intake/output/EBL)
- Positioning

Postoperative arrival to PACU

- Patient's LOC
- Hemodynamic status
- Neuromuscular blockade status
- Pertinent laboratory values
- Fluid status
- Patient position
- Vital signs
- Pain score
- Language barriers
- Patient with a legal guardian
- Oxygen status and amount
- Thermodynamic control
- Respiratory ventilator settings
- Arrival time to PACU
- Postoperative anesthesia orders present
- Medications due in PACU
- Patient disposition (home, admitted, ICU)
- Point out failed punctures
- Location of patient's personal belongings
- Immediate expected events next 30 minutes

Anticipatory guidance/clarification/contingency management

- Anticipated bleeding, pain, and airway problems
- Analgesia plan/PONV plan
- Plan for IV fluids
- Contact information for anesthetic problems
- Contract information for surgical complications, antibiotic plan
- Postoperative consults and investigations
- Plan for monitoring vital signs and parameters
- Plan for invasive lines and monitoring

Appendix B

Main and Ortho PACU SBAR Handoff

Critical Hookup performed
Are you ready for the report?
Situation:
- Patient name
- Procedure
- Diagnosis

Background:
- Past medical history
- Allergies
- Significant labs (if applicable)
- Notable baseline VS (if applicable)
- Baseline neuro status (if abnormal)

Assessment:
- APS procedure and premedication
- Anesthesia type
- Medications administered and dosages (pain, N/V, antibiotic, etc.)
- Neuromuscular blockade administered and dosages and reversal (if applicable)
- Vital signs and fluid concerns throughout the case and interventions performed
- Pain management plan
- IVs/catheters/tubes
- I & O
- Surgical or anesthetic issues

Recommendation:
- Additional concerns
- Patient destination

Do you have any questions/concerns?

Appendix C

Anesthesiologists pre-implementation survey

I am satisfied with the postanesthesia report I deliver
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

I communicated potential patient problems to the PACU nurse (ex. BP issues, fluid status, etc.) and offered a solution (ex. Call me, give a fluid bolus, etc.)
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Disagree

I feel the postanesthesia report is rushed
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

In the last month, I have received a phone call from a PACU nurse about something that could have been included in the handoff
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

There is good communication and teamwork between PACU nurses and me during the postanesthesia period.
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Do you have any concerns about the postanesthesia handoff?

Appendix D

Nurses pre-implementation survey

I am satisfied with the postanesthesia report I receive
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Potential patient problems were communicated to me (ex. BP issues, fluid status, etc.) and the anesthesiologist offered a solution (ex. Call me, give a fluid bolus, etc.)
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

I feel the postanesthesia report is rushed
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

In the last month, I have made a phone call about something that could have been included in the handoff.
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

There is good communication and teamwork between anesthesiologists and me during the postanesthesia period.
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Do you have any concerns about the postanesthesia handoff?

Appendix E

Anesthesiologists post-implementation survey

The postanesthesia report I deliver using the handoff checklist is more standardized
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

The quality of the postanesthesia handoff I deliver has improved
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

I communicated potential patient problems to the PACU nurse (ex. BP issues, fluid status, etc.) and offered a solution (ex. Call me, give a fluid bolus, etc.)
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

I feel the postanesthesia report is less rushed after using the Postanesthesia Checklist
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

In the last month, I have received a phone call from a PACU nurse about something that could have been included in the handoff
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Reports began after the patient was hooked up to the monitor and the nurse was ready for report
- Strongly agree
- Agree
- Neutral
- Disagree

- Strongly Disagree

The communication and teamwork between PACU nurses and I have improved during the postanesthesia period.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Do you have any concerns about the postanesthesia handoff?

Appendix F

Nurses post-implementation survey

The postanesthesia report I receive using the handoff checklist is more standardized
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

The quality of the postanesthesia handoff I receive has improved
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Potential patient problems were communicated to me (ex. BP issues, fluid status, etc.) and the anesthesiologist offered a solution (ex. Call me, give a fluid bolus, etc.)
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

I feel the postanesthesia report is less rushed after using the Postanesthesia Checklist
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

In the last month, I have made a phone call about something that could have been included in the handoff.
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

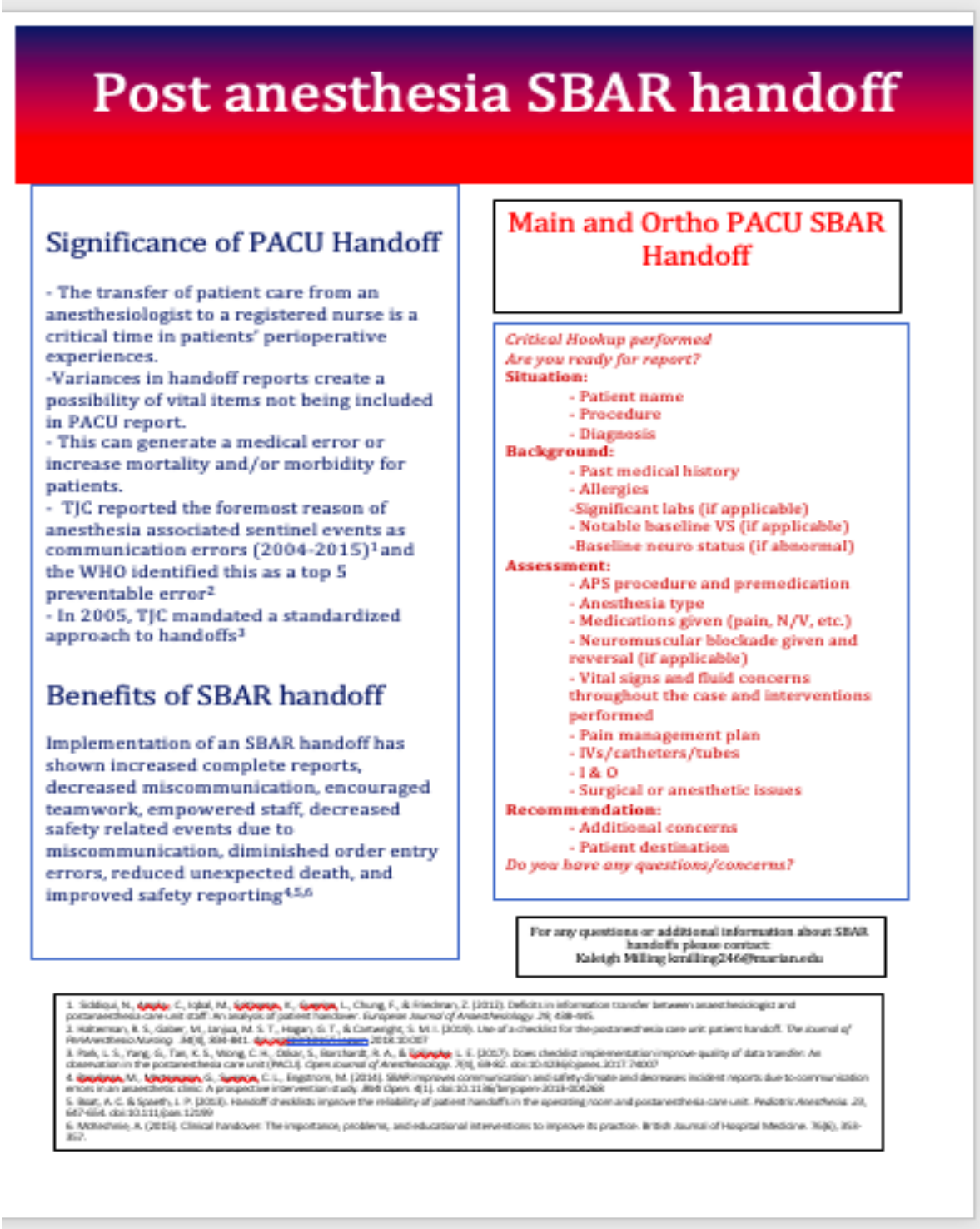
Reports began after the patient was hooked up to the monitor and I was ready for the report
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

The communication and teamwork between anesthesiologists and I have improved during the postanesthesia period.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Do you have any concerns about the postanesthesia handoff?

Appendix G



Post anesthesia SBAR handoff

Significance of PACU Handoff

- The transfer of patient care from an anesthesiologist to a registered nurse is a critical time in patients' perioperative experiences.
-Variances in handoff reports create a possibility of vital items not being included in PACU report.
- This can generate a medical error or increase mortality and/or morbidity for patients.
- TJC reported the foremost reason of anesthesia associated sentinel events as communication errors (2004-2015)[1] and the WHO identified this as a top 5 preventable error[2]
- In 2005, TJC mandated a standardized approach to handoffs[3]

Benefits of SBAR handoff

Implementation of an SBAR handoff has shown increased complete reports, decreased miscommunication, encouraged teamwork, empowered staff, decreased safety related events due to miscommunication, diminished order entry errors, reduced unexpected death, and improved safety reporting[4,5,6]

Main and Ortho PACU SBAR Handoff

Critical Hookup performed
Are you ready for report?

Situation:
- Patient name
- Procedure
- Diagnosis

Background:
- Past medical history
- Allergies
-Significant labs (if applicable)
- Notable baseline VS (if applicable)
-Baseline neuro status (if abnormal)

Assessment:
- APS procedure and premedication
- Anesthesia type
- Medications given (pain, N/V, etc.)
- Neuromuscular blockade given and reversal (if applicable)
- Vital signs and fluid concerns throughout the case and interventions performed
- Pain management plan
- IVs/catheters/tubes
- I & O
- Surgical or anesthetic issues

Recommendation:
- Additional concerns
- Patient destination

Do you have any questions/concerns?

For any questions or additional information about SBAR handoffs please contact:
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Appendix H

Nurses' report sheet with handoff questionnaire (right bottom corner)

Procedure: Surgeon: _____ Anesthesiologist: _____ APS: _____ General/Mac: _____ PACU: Arrival____ Met___ DC____ Destination_____ OR: Fluid_____ PRBC_____ EBL_____ UO_____ Meds in OR: Paralytic & Reversal:	Intrathecal/block _____ Epidural: Fent/Morph____ ml/h Demand dose: _____ml q___ min Spinal sensation: admission_____ Discharge_____ Regional anesthesia: APS medications:	Age: _____ Weight: _____ Allergies: Code status: Isolation: Bed Cart Waffle Hovermat
Diagnosis: H & P:	Pre- op vitals: BP_____ HR_____ RR_____ Temp_____ Sat_____ Pain_____ End vitals: BP_____ HR_____ RR_____ Temp_____ Sat_____ Pain_____ Neuro check:	Extubation ET/LMA@_____ Airway@_____ Re-intubation_____ A-line: R L Femoral Radial D/C@_____ Bair Hugger on _____ Bair Hugger off _____
Xray_____@_____ Labs_____@_____ Accucheck_____@_____ Significant Labs:	PCA: Dilaudid Morphine _____mg/mcg every _____ min Max_____ in 4 hours Cont. rate_____	IV #1_____ IV #2_____ IV #3_____
PACU meds: Opioid Totals:	Drains/Foley: Chest tube:	Dressings:
CBI	Report: RN_____ Room_____	Handoff checklist used: Yes/No Complete Handoff: Yes/No Comments:

Appendix I

IRB Approval

MARIAN UNIVERSITY
Indianapolis ®

Institutional Review Board

11-08-2019

Kaleigh Milling

Institutional Review Board

IRB #B19.116

Implementation and Evaluation of a Checklist in the Postanesthesia Handoff Report

New Project
Determination of Exempt Status 11-08-2019

The Institutional Review Board at Marian University has reviewed your protocol and has determined the procedures proposed are appropriate for exemption under the federal regulations. As such, there will be no further review of your protocol and you are cleared to proceed with your project. The protocol will remain on file with the Marian University IRB as a matter of record. Please be mindful of the importance of reporting only de-identified, HIPAA-compliant information about the patient in any exhibit or publication.

Although researchers for exempt studies are not required to complete online CITI training for research involving human subjects, the IRB **recommends** that they do so, particularly as a learning exercise in the case of student researchers. Information on CITI training can be found on the IRB's website: http://www.marian.edu/academics/institutional-review-board.

It is the responsibility of the PI (and, if applicable, the faculty supervisor) to inform the IRB if the procedures presented in this protocol are to be modified or if problems related to human research participants arise in connection with this project. Any procedural modifications must be evaluated by the IRB before being implemented, as some modifications may change the review status of this project. Please contact me if you are unsure whether your proposed modification requires review. Proposed modifications should be addressed in writing to the IRB. **Please reference the above IRB protocol number in any communication to the IRB regarding this project.**

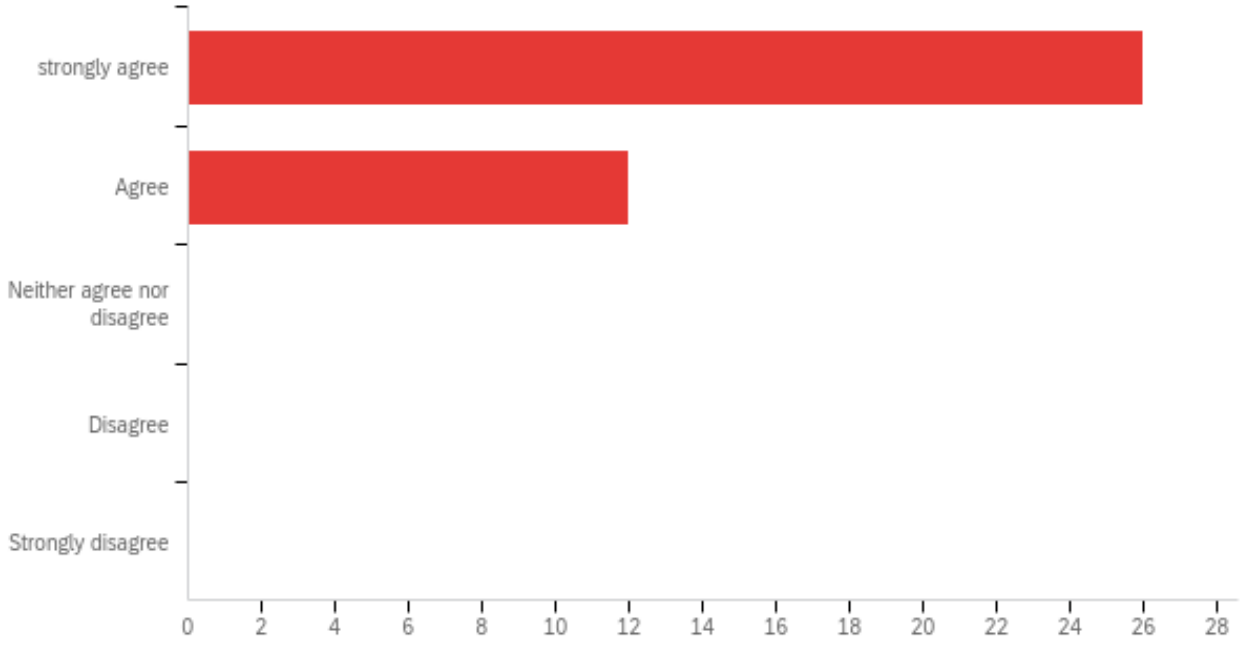
Bryan Larsen, Ph.D.

Chair, Marian University Institutional Review Board

Appendix J

Anesthesiologists preintervention survey results

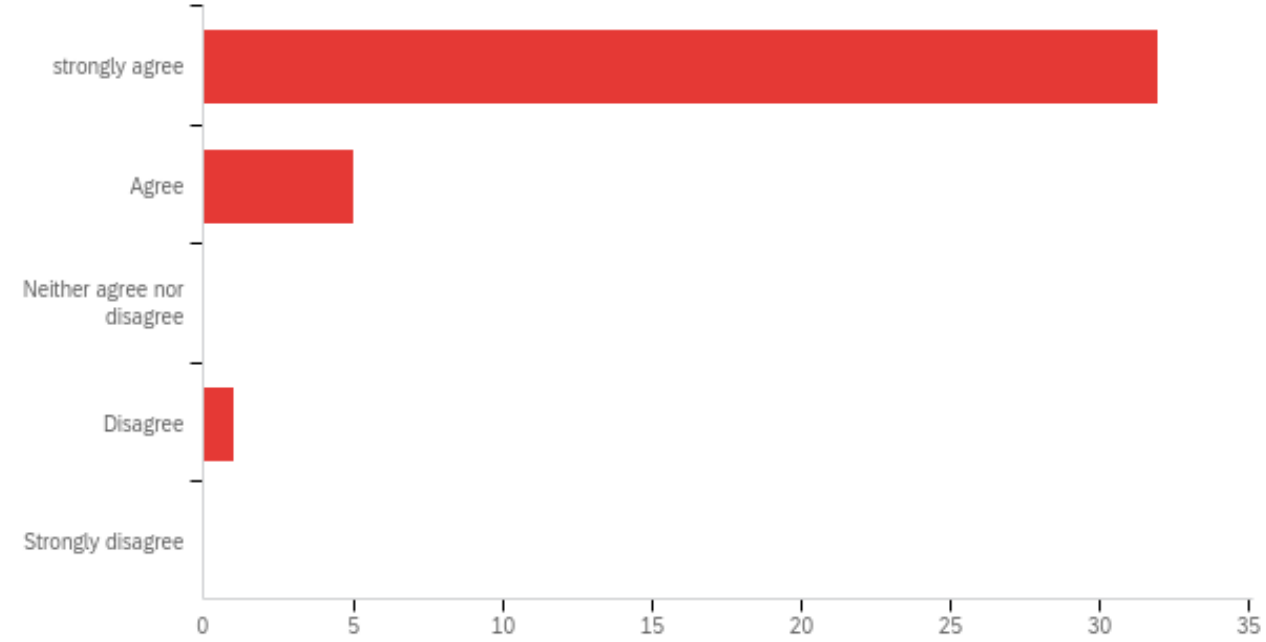
Q1 - I am satisfied with the post-anesthesia report I deliver



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	I am satisfied with the post-anesthesia report I deliver	1.00	2.00	1.32	0.46	0.22	38

#	Answer	%	Count
1	strongly agree	68.42%	26
2	Agree	31.58%	12
3	Neither agree nor disagree	0.00%	0
4	Disagree	0.00%	0
5	Strongly disagree	0.00%	0
	Total	100%	38

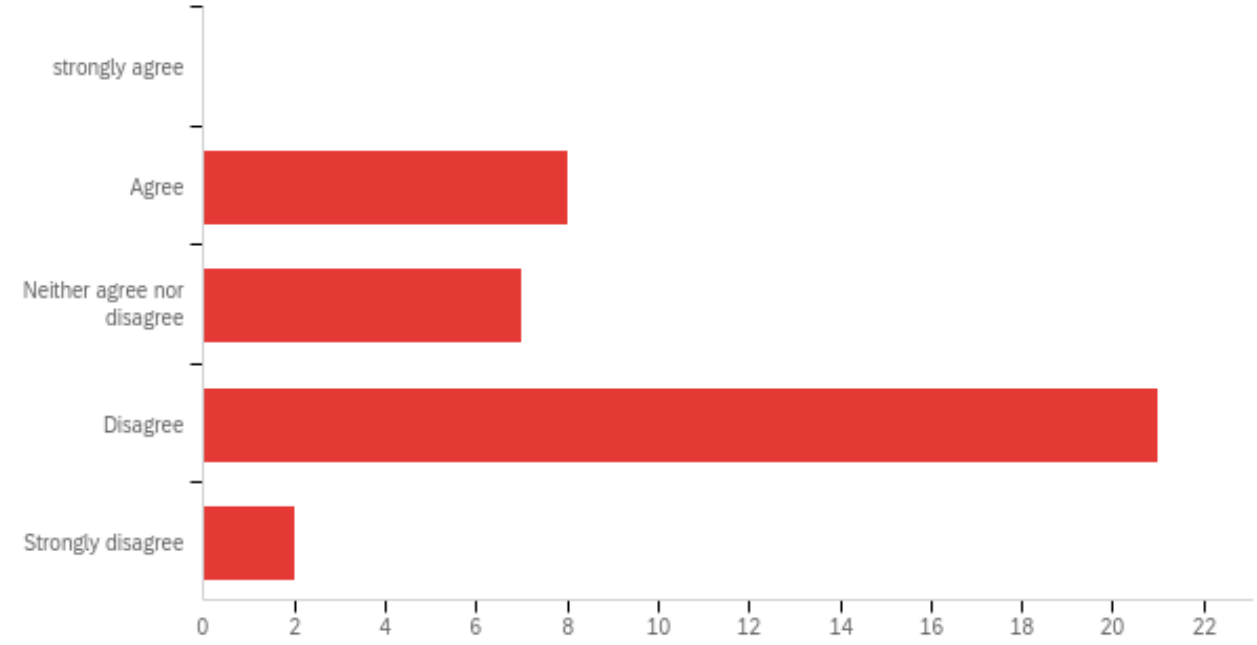
Q2 - I communicated potential patient problems to the PACU nurse (ex. BP issues, fluid status, etc.) and offered a solution (ex. Call me, give a fluid bolus, etc.)



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	I communicated potential patient problems to the PACU nurse (ex. BP issues, fluid status, etc.) and offered a solution (ex. Call me, give a fluid bolus, etc.)	1.00	4.00	1.21	0.57	0.32	38

#	Answer	%	Count
1	strongly agree	84.21%	32
2	Agree	13.16%	5
3	Neither agree nor disagree	0.00%	0
4	Disagree	2.63%	1
5	Strongly disagree	0.00%	0
	Total	100%	38

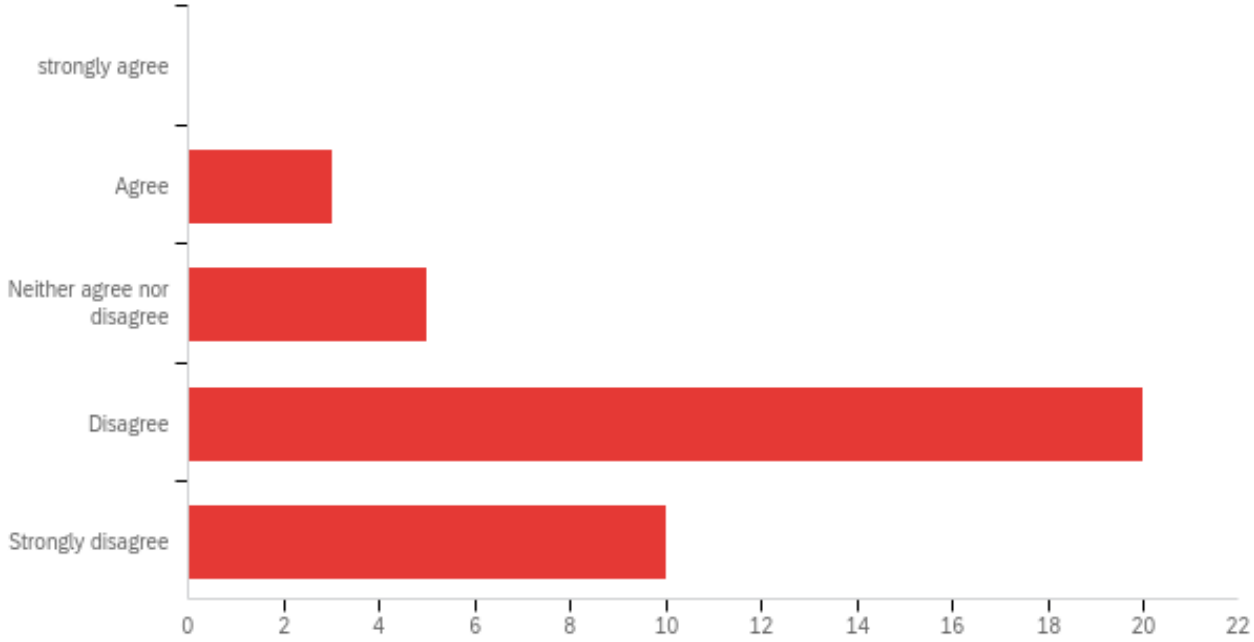
Q3 - I feel post-anesthesia report is rushed



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	I feel post-anesthesia report is rushed	2.00	5.00	3.45	0.88	0.77	38

#	Answer	%	Count
1	strongly agree	0.00%	0
2	Agree	21.05%	8
3	Neither agree nor disagree	18.42%	7
4	Disagree	55.26%	21
5	Strongly disagree	5.26%	2
	Total	100%	38

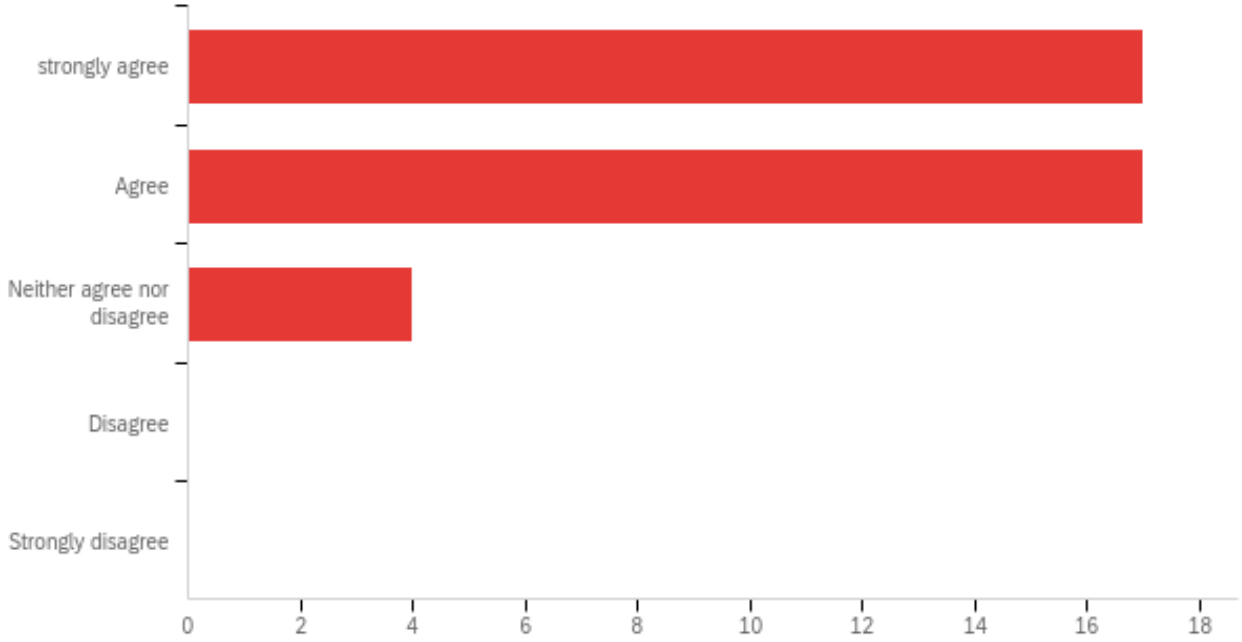
Q4 - In the last month, I have received a phone call from a PACU nurse about something that could have been included in the handoff



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	In the last month, I have received a phone call from a PACU nurse about something that could have been included in the handoff	2.00	5.00	3.97	0.84	0.71	38

#	Answer	%	Count
1	strongly agree	0.00%	0
2	Agree	7.89%	3
3	Neither agree nor disagree	13.16%	5
4	Disagree	52.63%	20
5	Strongly disagree	26.32%	10
	Total	100%	38

Q5 - There is good communication and teamwork between PACU nurses and me during the postanesthesia period.



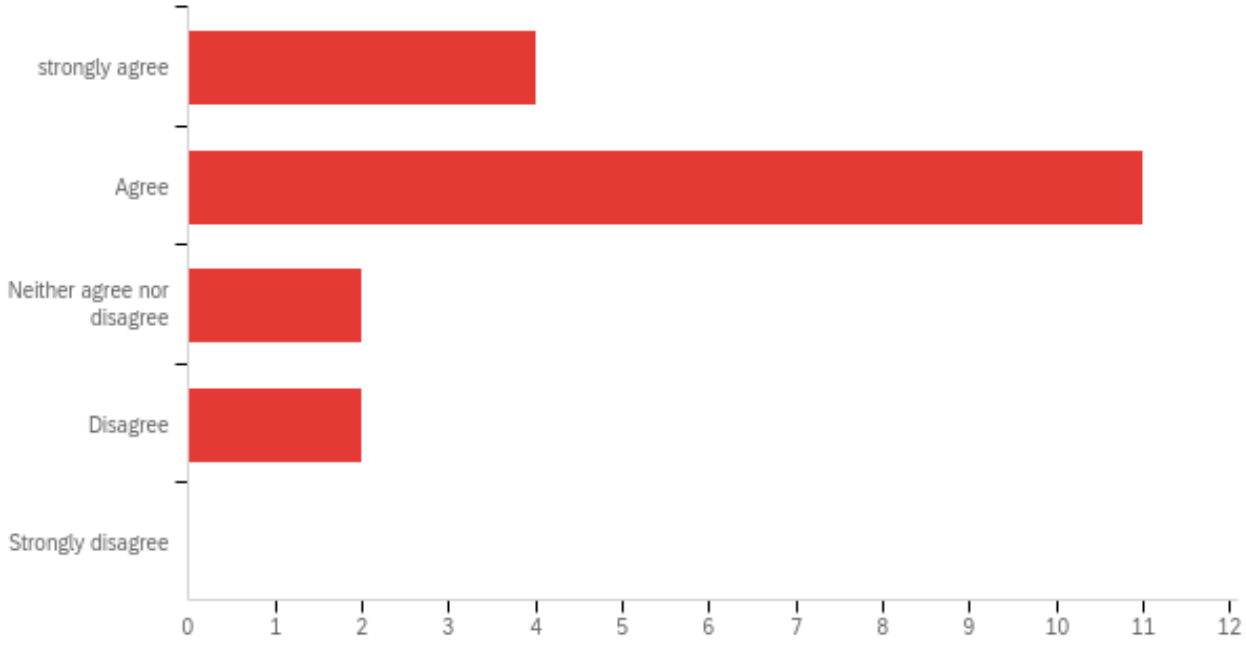
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	There is good communication and teamwork between PACU nurses and me during the postanesthesia period.	1.00	3.00	1.66	0.66	0.44	38

#	Answer	%	Count
1	strongly agree	44.74%	17
2	Agree	44.74%	17
3	Neither agree nor disagree	10.53%	4
4	Disagree	0.00%	0
5	Strongly disagree	0.00%	0
	Total	100%	38

Appendix K

Nurses preintervention survey results

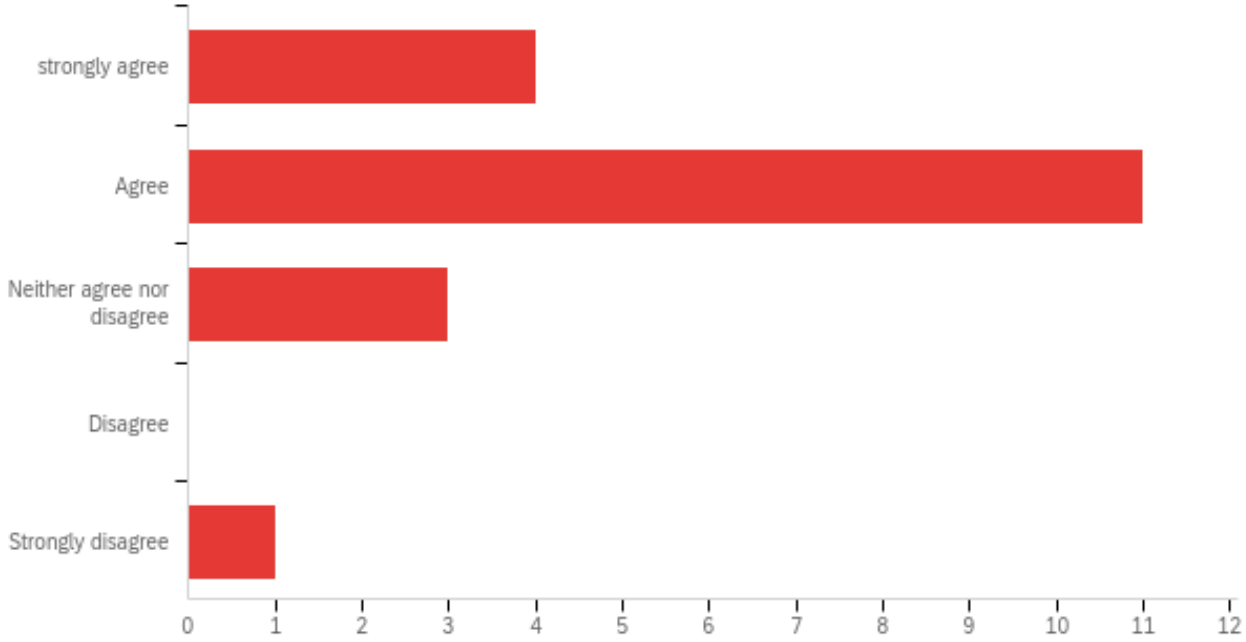
Q1 - I am satisfied with the post anesthesia report I receive



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	I am satisfied with the post anesthesia report I receive	1.00	4.00	2.11	0.85	0.73	19

#	Answer	%	Count
1	strongly agree	21.05%	4
2	Agree	57.89%	11
3	Neither agree nor disagree	10.53%	2
4	Disagree	10.53%	2
5	Strongly disagree	0.00%	0
	Total	100%	19

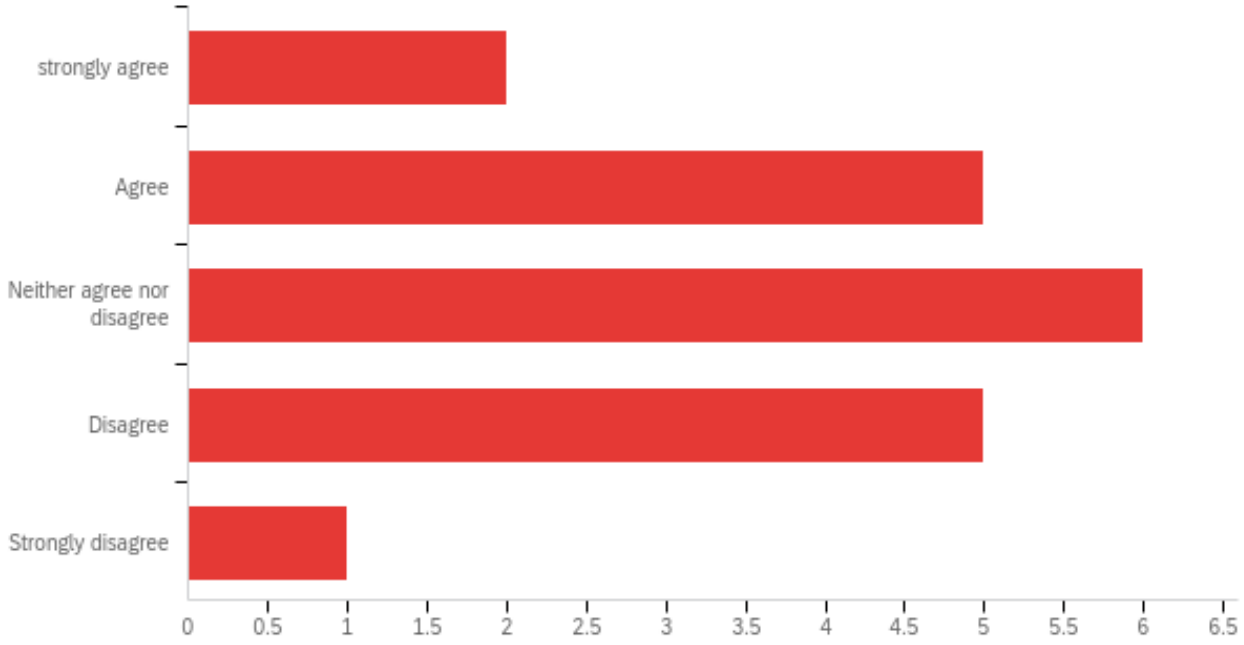
Q2 - Potential patient problems were communicated to me (ex. BP issues, fluid status, etc.) and the anesthesiologist offered a solution (ex. Call me, give a fluid bolus, etc.)



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Potential patient problems were communicated to me (ex. BP issues, fluid status, etc.) and the anesthesiologist offered a solution (ex. Call me, give a fluid bolus, etc.)	1.00	5.00	2.11	0.91	0.83	19

#	Answer	%	Count
1	strongly agree	21.05%	4
2	Agree	57.89%	11
3	Neither agree nor disagree	15.79%	3
4	Disagree	0.00%	0
5	Strongly disagree	5.26%	1
	Total	100%	19

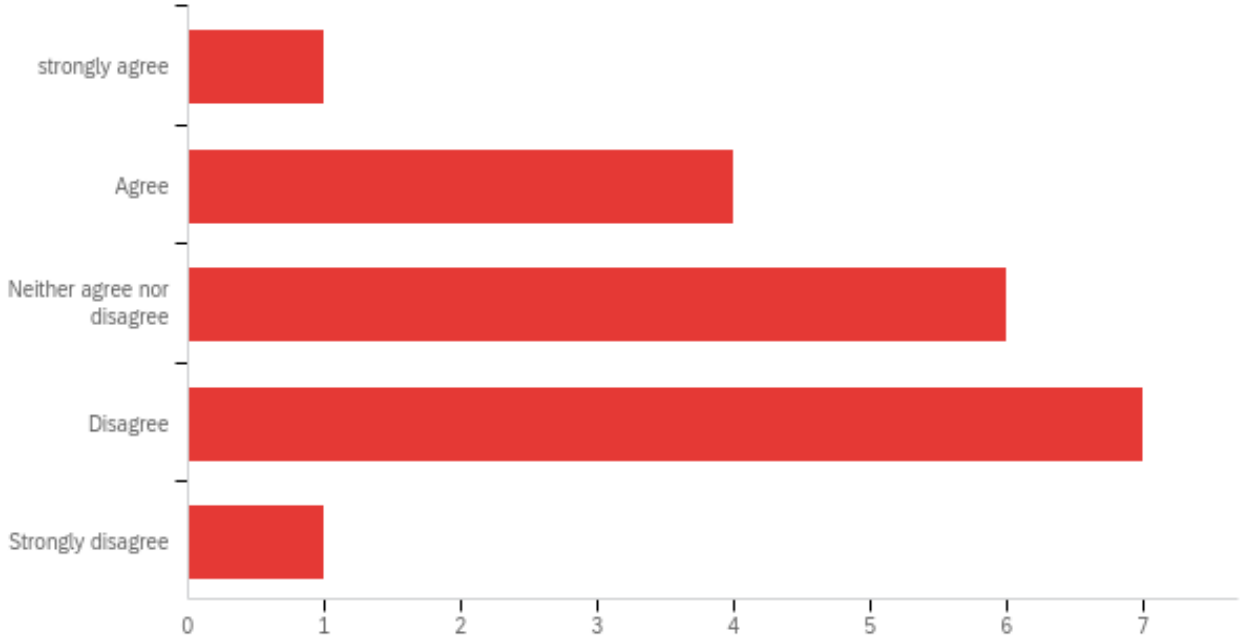
Q3 - I feel post anesthesia report is rushed



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	I feel post anesthesia report is rushed	1.00	5.00	2.89	1.07	1.15	19

#	Answer	%	Count
1	strongly agree	10.53%	2
2	Agree	26.32%	5
3	Neither agree nor disagree	31.58%	6
4	Disagree	26.32%	5
5	Strongly disagree	5.26%	1
	Total	100%	19

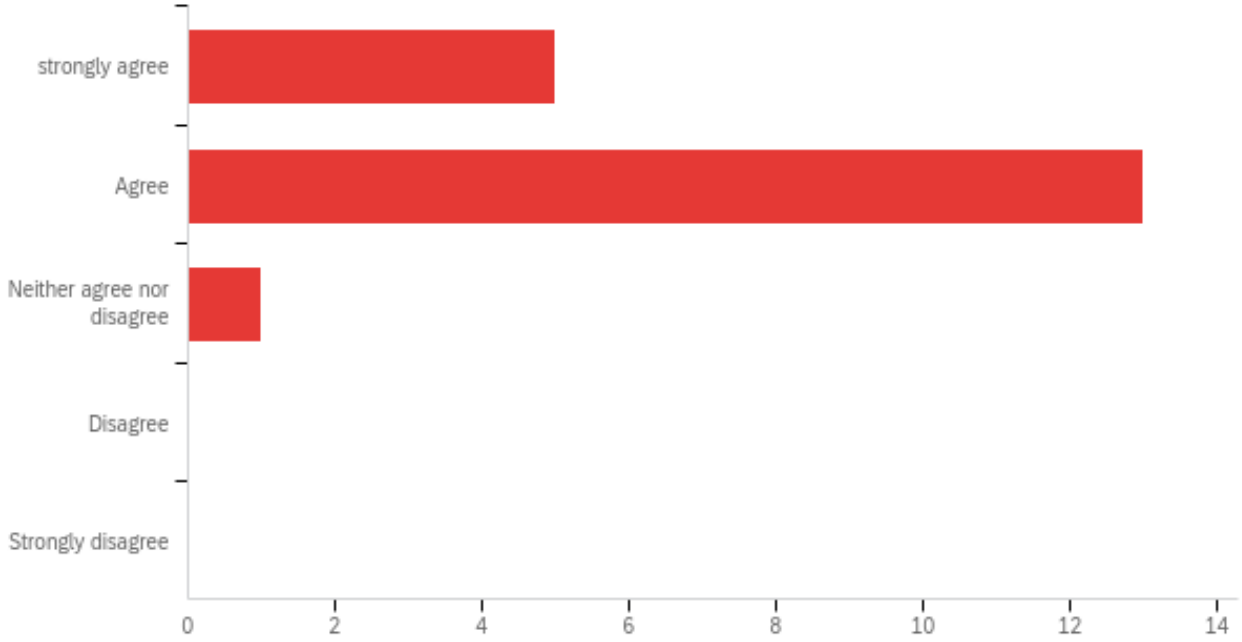
Q4 - in the last month, I have made a phone call about something that could have been included in handoff.



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	in the last month, I have made a phone call about something that could have been included in handoff.	1.00	5.00	3.16	0.99	0.98	19

#	Answer	%	Count
1	strongly agree	5.26%	1
2	Agree	21.05%	4
3	Neither agree nor disagree	31.58%	6
4	Disagree	36.84%	7
5	Strongly disagree	5.26%	1
	Total	100%	19

Q5 - There is good communication and teamwork between anesthesiologists and me during the postanesthesia period.



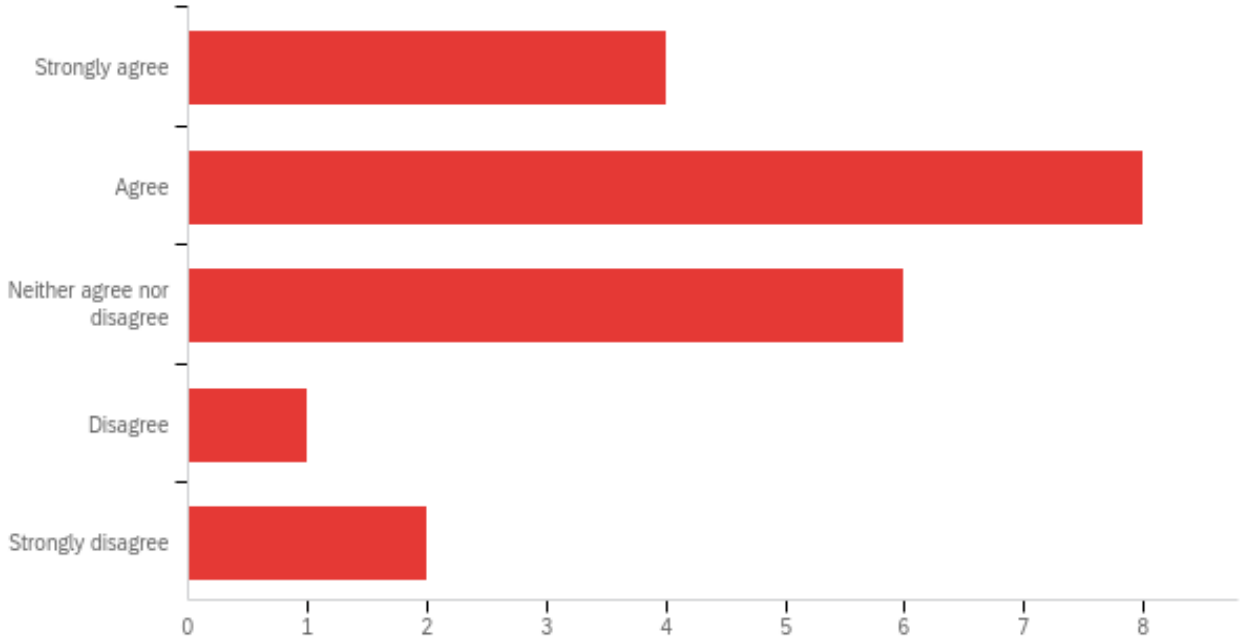
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	There is good communication and teamwork between anesthesiologists and me during the postanesthesia period.	1.00	3.00	1.79	0.52	0.27	19

#	Answer	%	Count
1	strongly agree	26.32%	5
2	Agree	68.42%	13
3	Neither agree nor disagree	5.26%	1
4	Disagree	0.00%	0
5	Strongly disagree	0.00%	0
	Total	100%	19

Appendix L

Anesthesiologists postintervention survey results

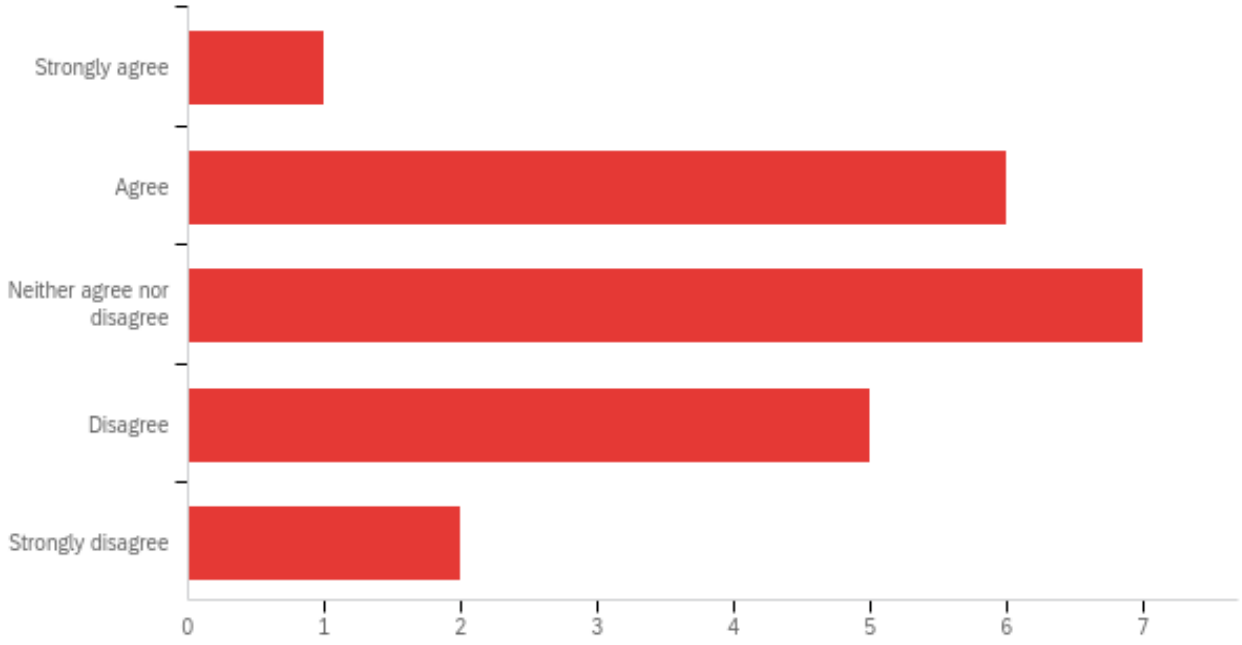
Q1 - The postanesthesia report I deliver using the handoff checklist is more standardized



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	- The postanesthesia report I deliver using the handoff checklist is more standardized	1.00	5.00	2.48	1.14	1.30	21

#	Answer	%	Count
1	Strongly agree	19.05%	4
2	Agree	38.10%	8
3	Neither agree nor disagree	28.57%	6
4	Disagree	4.76%	1
5	Strongly disagree	9.52%	2
	Total	100%	21

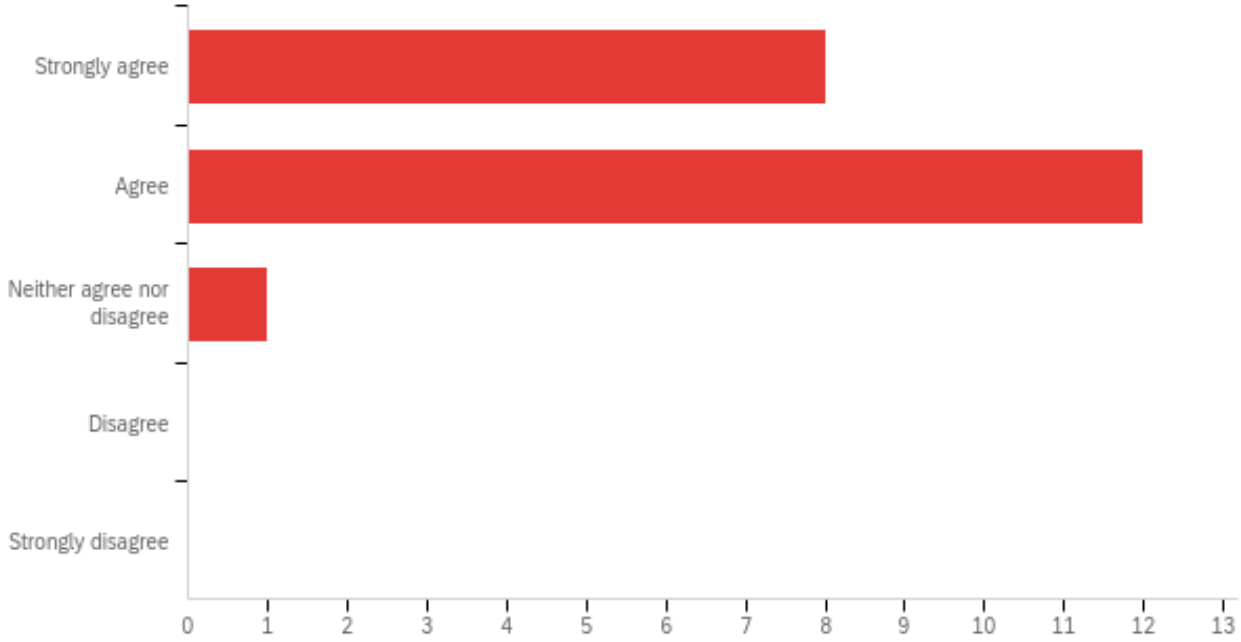
Q2 - The quality of the postanesthesia handoff I deliver has improved



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	The quality of the postanesthesia handoff I deliver has improved	1.00	5.00	3.05	1.05	1.09	21

#	Answer	%	Count
1	Strongly agree	4.76%	1
2	Agree	28.57%	6
3	Neither agree nor disagree	33.33%	7
4	Disagree	23.81%	5
5	Strongly disagree	9.52%	2
	Total	100%	21

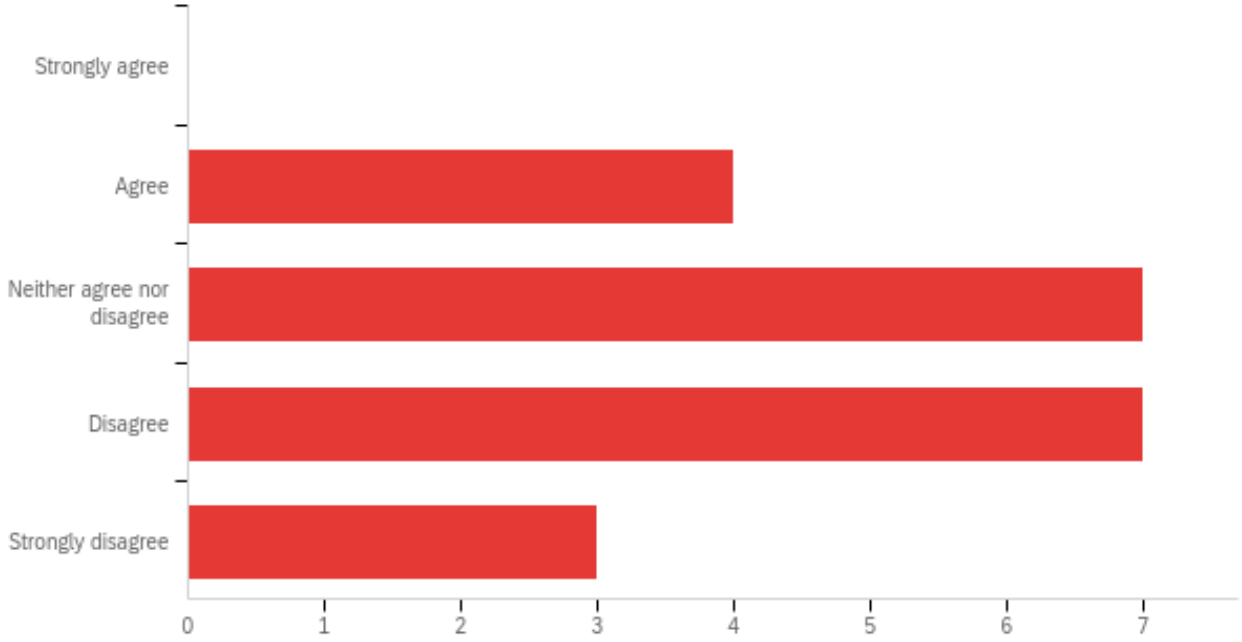
Q3 - I communicated potential patient problems to the PACU nurse (ex. BP issues, fluid status, etc.) and offered a solution (ex. Call me, give a fluid bolus, etc.)



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	I communicated potential patient problems to the PACU nurse (ex. BP issues, fluid status, etc.) and offered a solution (ex. Call me, give a fluid bolus, etc.)	1.00	3.00	1.67	0.56	0.32	21

#	Answer	%	Count
1	Strongly agree	38.10%	8
2	Agree	57.14%	12
3	Neither agree nor disagree	4.76%	1
4	Disagree	0.00%	0
5	Strongly disagree	0.00%	0
	Total	100%	21

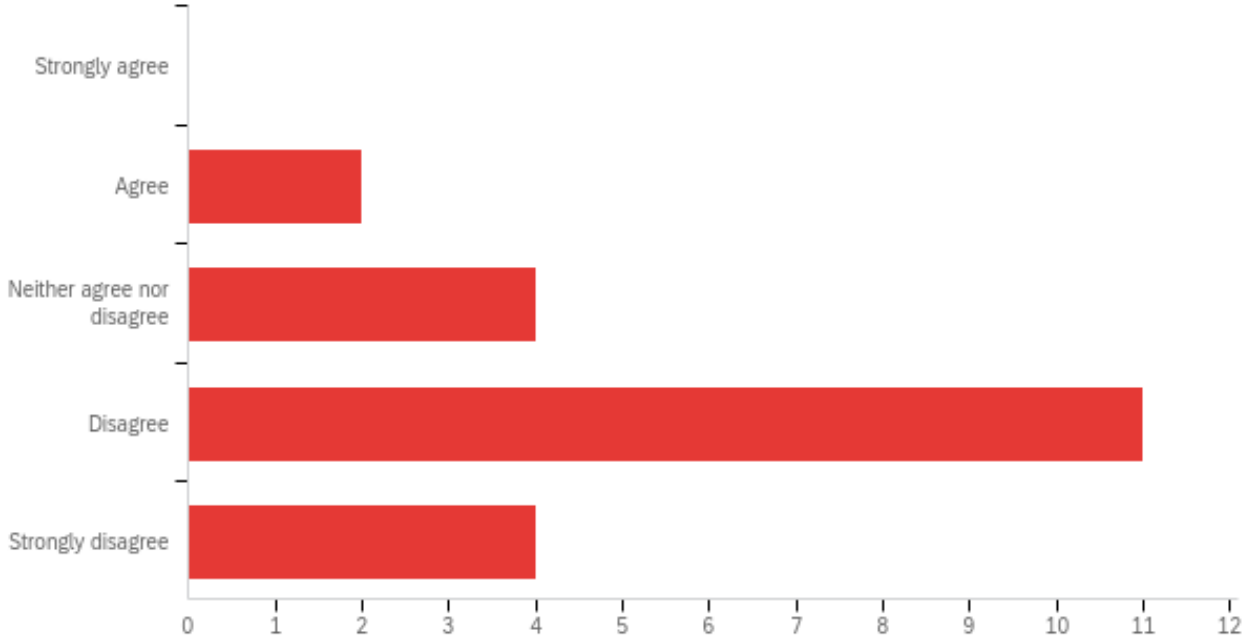
Q4 - I feel the postanesthesia report is less rushed after using the Postanesthesia Checklist



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	I feel the postanesthesia report is less rushed after using the Postanesthesia Checklist	2.00	5.00	3.43	0.95	0.91	21

#	Answer	%	Count
1	Strongly agree	0.00%	0
2	Agree	19.05%	4
3	Neither agree nor disagree	33.33%	7
4	Disagree	33.33%	7
5	Strongly disagree	14.29%	3
	Total	100%	21

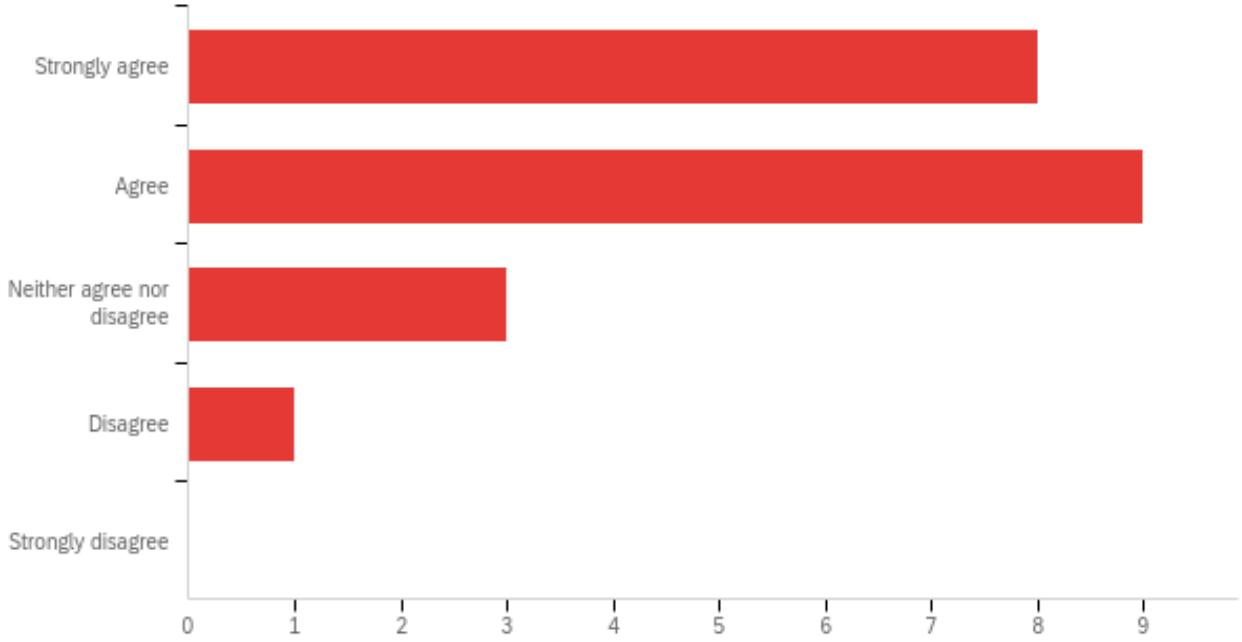
Q5 - In the last month, I have received a phone call from a PACU nurse about something that could have been included in the handoff



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	In the last month, I have received a phone call from a PACU nurse about something that could have been included in the handoff	2.00	5.00	3.81	0.85	0.73	21

#	Answer	%	Count
1	Strongly agree	0.00%	0
2	Agree	9.52%	2
3	Neither agree nor disagree	19.05%	4
4	Disagree	52.38%	11
5	Strongly disagree	19.05%	4
	Total	100%	21

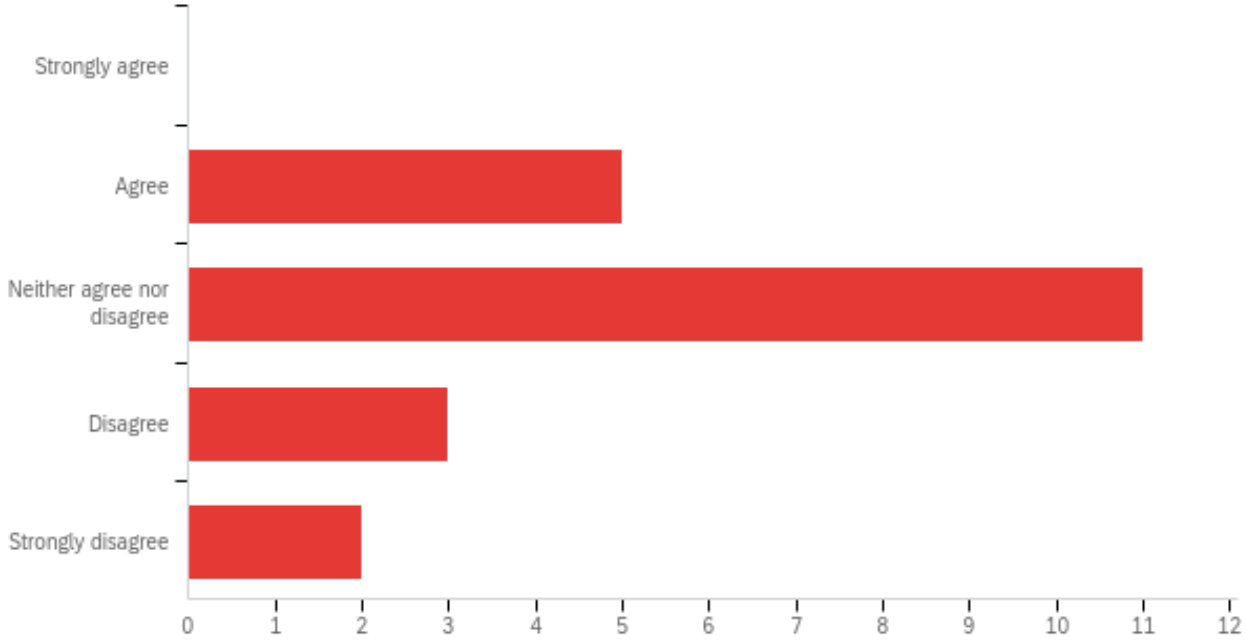
Q6 - Reports began after the patient was hooked up to the monitor and the nurse was ready for report



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Reports began after the patient was hooked up to the monitor and the nurse was ready for report	1.00	4.00	1.86	0.83	0.69	21

#	Answer	%	Count
1	Strongly agree	38.10%	8
2	Agree	42.86%	9
3	Neither agree nor disagree	14.29%	3
4	Disagree	4.76%	1
5	Strongly disagree	0.00%	0
	Total	100%	21

Q7 - The communication and teamwork between PACU nurses and myself has improved during the postanesthesia period.



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	The communication and teamwork between PACU nurses and myself has improved during the postanesthesia period.	2.00	5.00	3.10	0.87	0.75	21

#	Answer	%	Count
1	Strongly agree	0.00%	0
2	Agree	23.81%	5
3	Neither agree nor disagree	52.38%	11
4	Disagree	14.29%	3
5	Strongly disagree	9.52%	2
	Total	100%	21

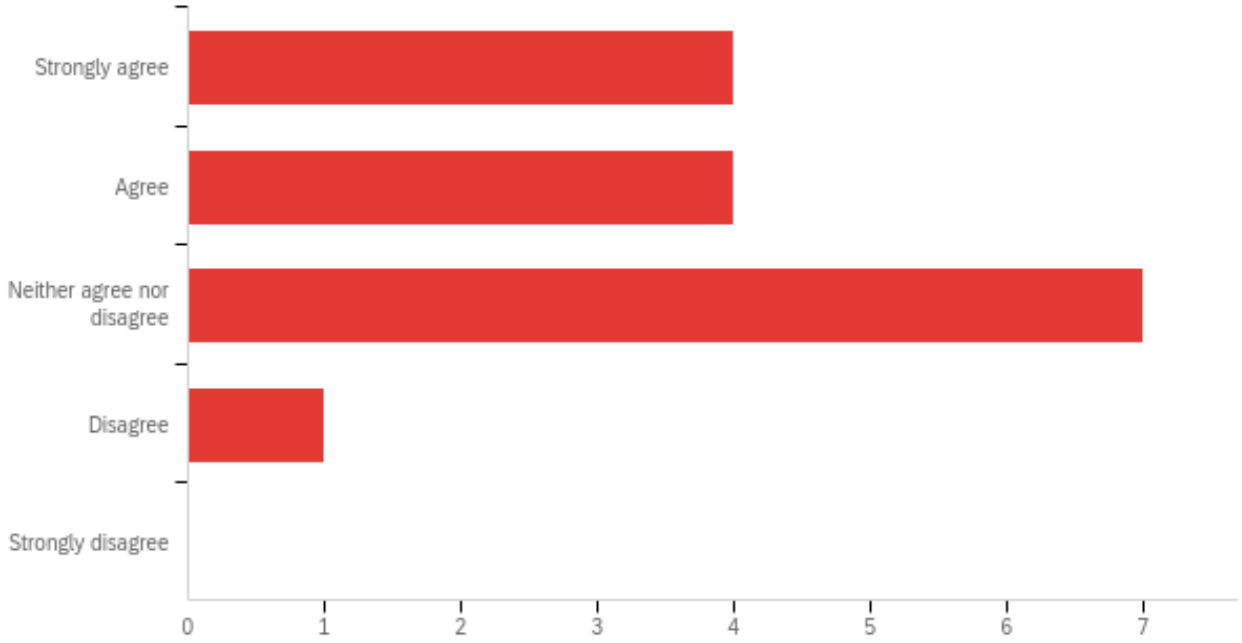
Q9 - Do you have any concerns/additional thoughts regarding the postanesthesia handoff?

Do you have any concerns/additional thoughts regarding the postanesthesia handoff?
It's pretty much everything I already do. Adding another "checklist" for me to deal with wasn't really helpful or efficient
I believe I've always been very thorough in handoffs prior to this study, but I encourage others to do so and think this study may have helped others
I have already used this method since 2009. Nothing new to learn from
The organization and layout of PACU handoff sheet that RN fills out needs to be updated with PACU RNs input.
Sorry. I never had the check list at the bedside.
I never saw this postop handoff sheet?

Appendix M

Nurses postintervention survey results

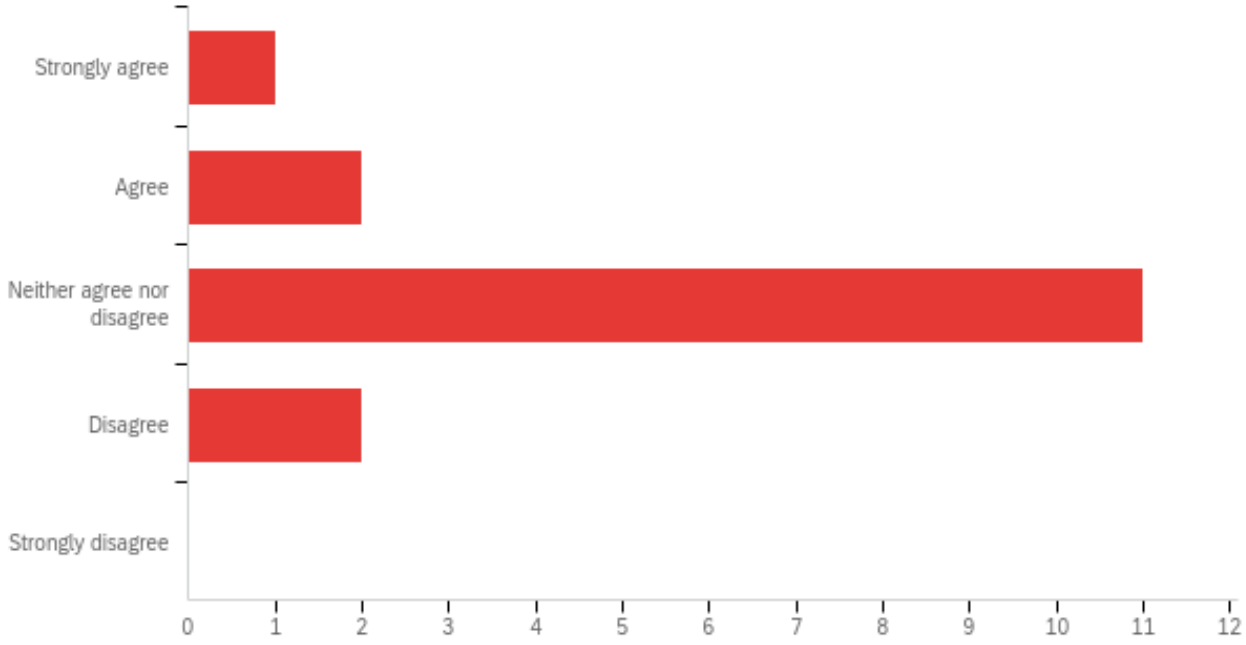
Q1 - The postanesthesia report I receive using the handoff checklist is more standardized



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	The postanesthesia report I receive using the handoff checklist is more standardized	1.00	4.00	2.31	0.92	0.84	16

#	Answer	%	Count
1	Strongly agree	25.00%	4
2	Agree	25.00%	4
3	Neither agree nor disagree	43.75%	7
4	Disagree	6.25%	1
5	Strongly disagree	0.00%	0
	Total	100%	16

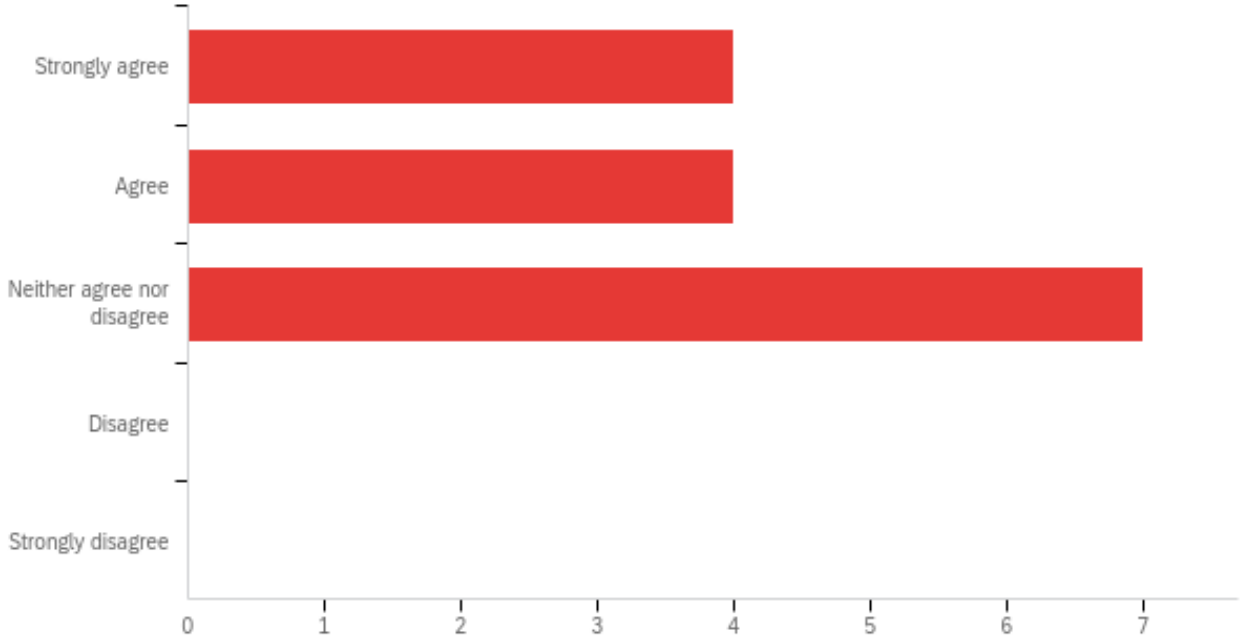
Q2 - The quality of the postanesthesia handoff I receive has improved



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	The quality of the postanesthesia handoff I receive has improved	1.00	4.00	2.88	0.70	0.48	16

#	Answer	%	Count
1	Strongly agree	6.25%	1
2	Agree	12.50%	2
3	Neither agree nor disagree	68.75%	11
4	Disagree	12.50%	2
5	Strongly disagree	0.00%	0
	Total	100%	16

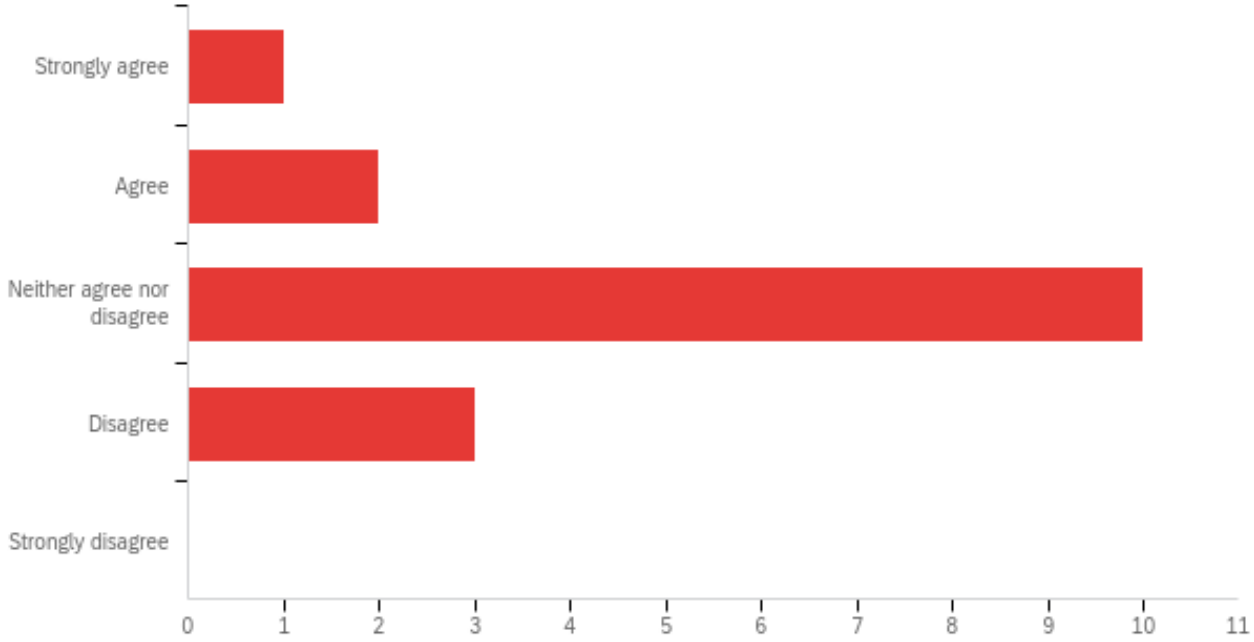
Q3 - Potential patient problems were communicated to me (ex. BP issues, fluid status, etc.) and the anesthesiologist offered a solution (ex. Call me, give a fluid bolus, etc.)



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Potential patient problems were communicated to me (ex. BP issues, fluid status, etc.) and the anesthesiologist offered a solution (ex. Call me, give a fluid bolus, etc.)	1.00	3.00	2.20	0.83	0.69	15

#	Answer	%	Count
1	Strongly agree	26.67%	4
2	Agree	26.67%	4
3	Neither agree nor disagree	46.67%	7
4	Disagree	0.00%	0
5	Strongly disagree	0.00%	0
	Total	100%	15

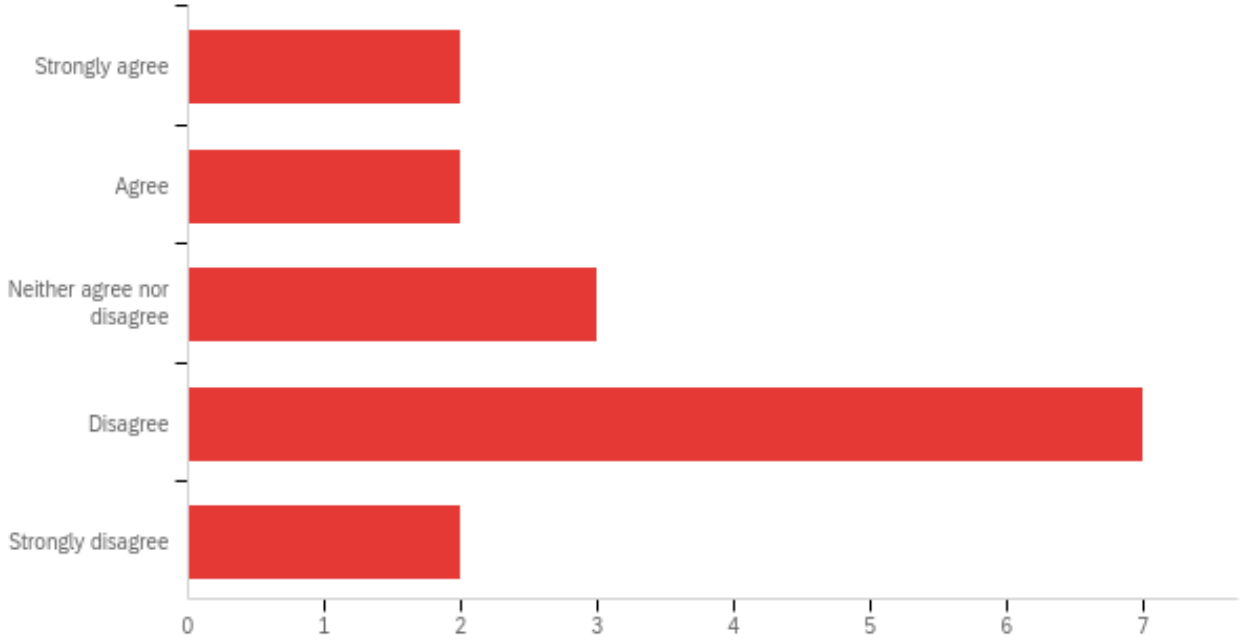
Q4 - I feel the postanesthesia report is less rushed after using the Postanesthesia Checklist



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	I feel the postanesthesia report is less rushed after using the Postanesthesia Checklist	1.00	4.00	2.94	0.75	0.56	16

#	Answer	%	Count
1	Strongly agree	6.25%	1
2	Agree	12.50%	2
3	Neither agree nor disagree	62.50%	10
4	Disagree	18.75%	3
5	Strongly disagree	0.00%	0
	Total	100%	16

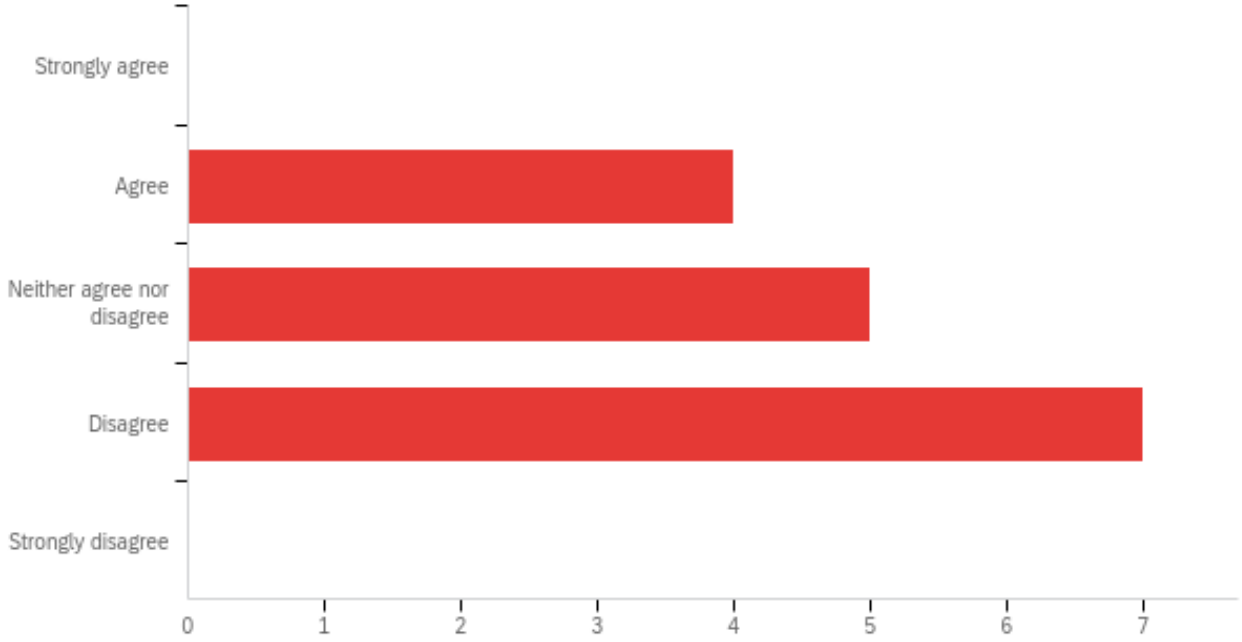
Q5 - In the last month, I have made a phone call about something that could have been included in the handoff.



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	In the last month, I have made a phone call about something that could have been included in the handoff.	1.00	5.00	3.31	1.21	1.46	16

#	Answer	%	Count
1	Strongly agree	12.50%	2
2	Agree	12.50%	2
3	Neither agree nor disagree	18.75%	3
4	Disagree	43.75%	7
5	Strongly disagree	12.50%	2
	Total	100%	16

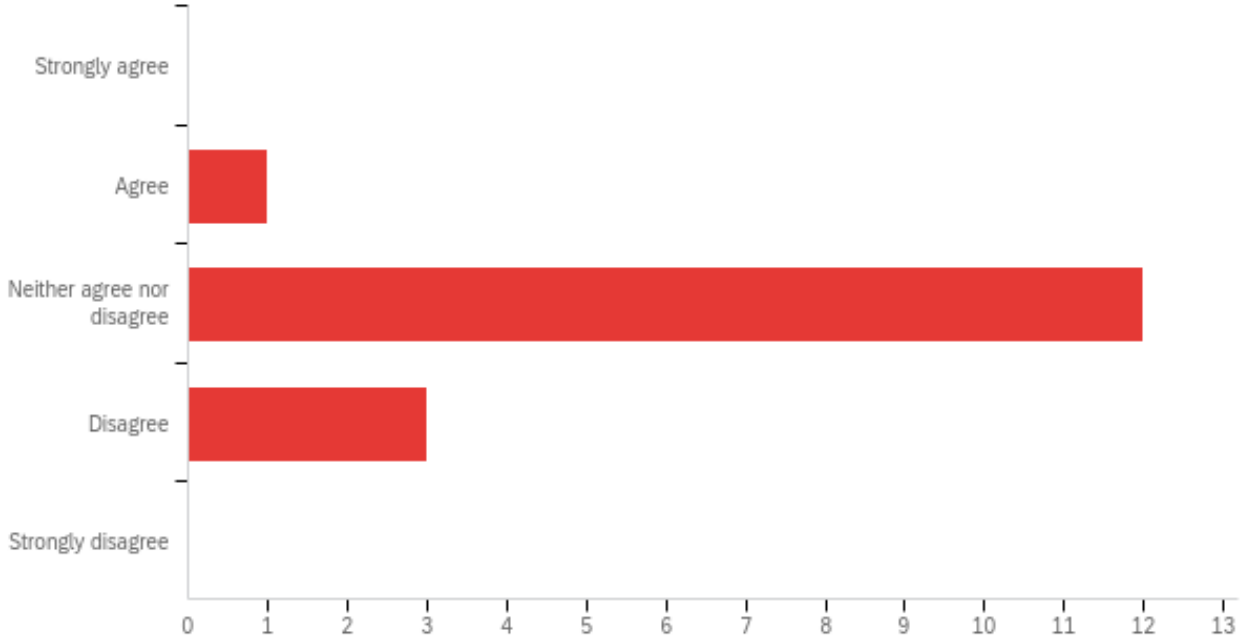
Q6 - Reports began after the patient was hooked up to the monitor and I was ready for the report



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Reports began after the patient was hooked up to the monitor and I was ready for the report	2.00	4.00	3.19	0.81	0.65	16

#	Answer	%	Count
1	Strongly agree	0.00%	0
2	Agree	25.00%	4
3	Neither agree nor disagree	31.25%	5
4	Disagree	43.75%	7
5	Strongly disagree	0.00%	0
	Total	100%	16

Q7 - The communication and teamwork between anesthesiologists and I has improved during the postanesthesia period.



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	The communication and teamwork between anesthesiologists and I has improved during the postanesthesia period.	2.00	4.00	3.13	0.48	0.23	16

#	Answer	%	Count
1	Strongly agree	0.00%	0
2	Agree	6.25%	1
3	Neither agree nor disagree	75.00%	12
4	Disagree	18.75%	3
5	Strongly disagree	0.00%	0
	Total	100%	16

Q10 - Do you have any concerns/additional thoughts about the postanesthesia handoff?

Do you have any concerns/additional thoughts about the postanesthesia handoff?
unfortunately, the anesthesiologists who just want to drop & dash did not embrace the new report format. IDK what could have been done to increase buy in from the MDs. for those who are respectful & practice collegially w/us already I did see a small improvement using the new format.
No

Appendix N

SBAR PACU handoff reporting tool

Was the handoff checklist used?
- Yes
- Not included on report sheet
- No

Was a complete report delivered?
- Yes
- Not included on report sheet
- No

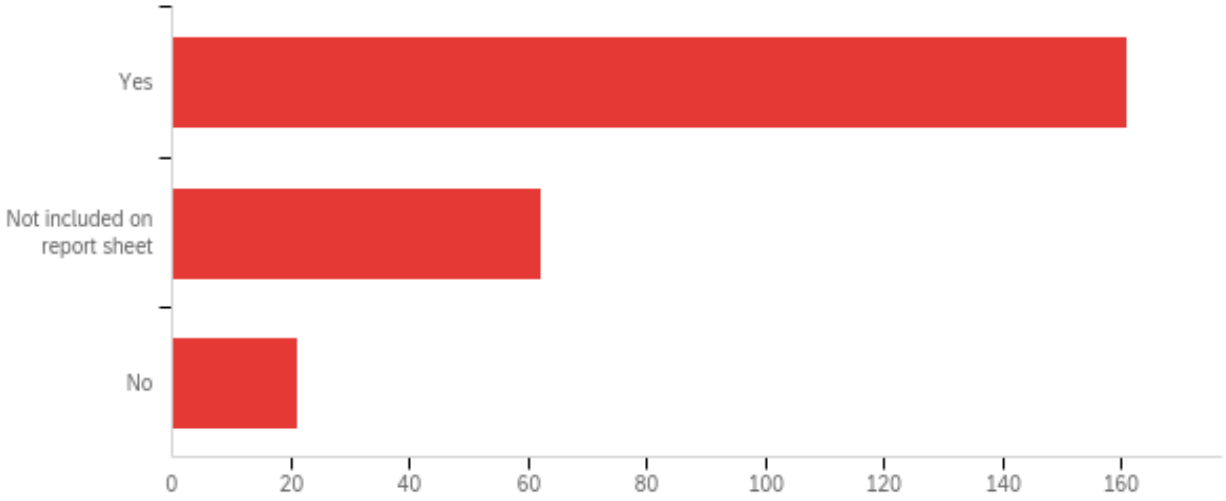
Handoff report was missing what criteria?
- N/A complete report was delivered
- Not included on report sheet
- Situation
- Background
- Assessment
- Recommendation

Comments

Appendix O

Data collection from SBAR handoff reports tool

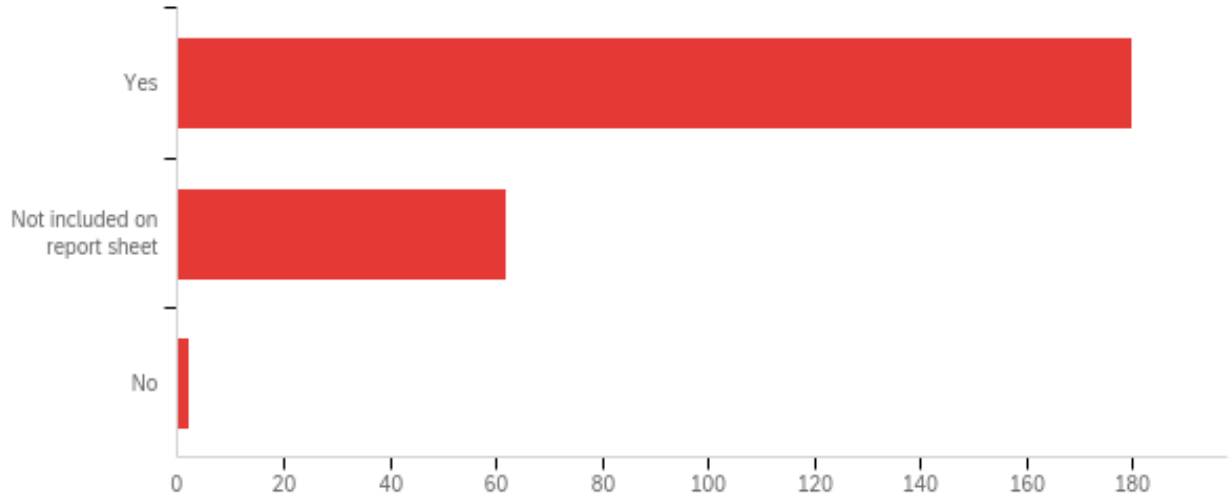
Q1 - Was the handoff checklist used?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Was the handoff checklist used?	1.00	3.00	1.43	0.65	0.42	244

#	Answer	%	Count
1	Yes	65.98%	161
2	Not included on report sheet	25.41%	62
3	No	8.61%	21
	Total	100%	244

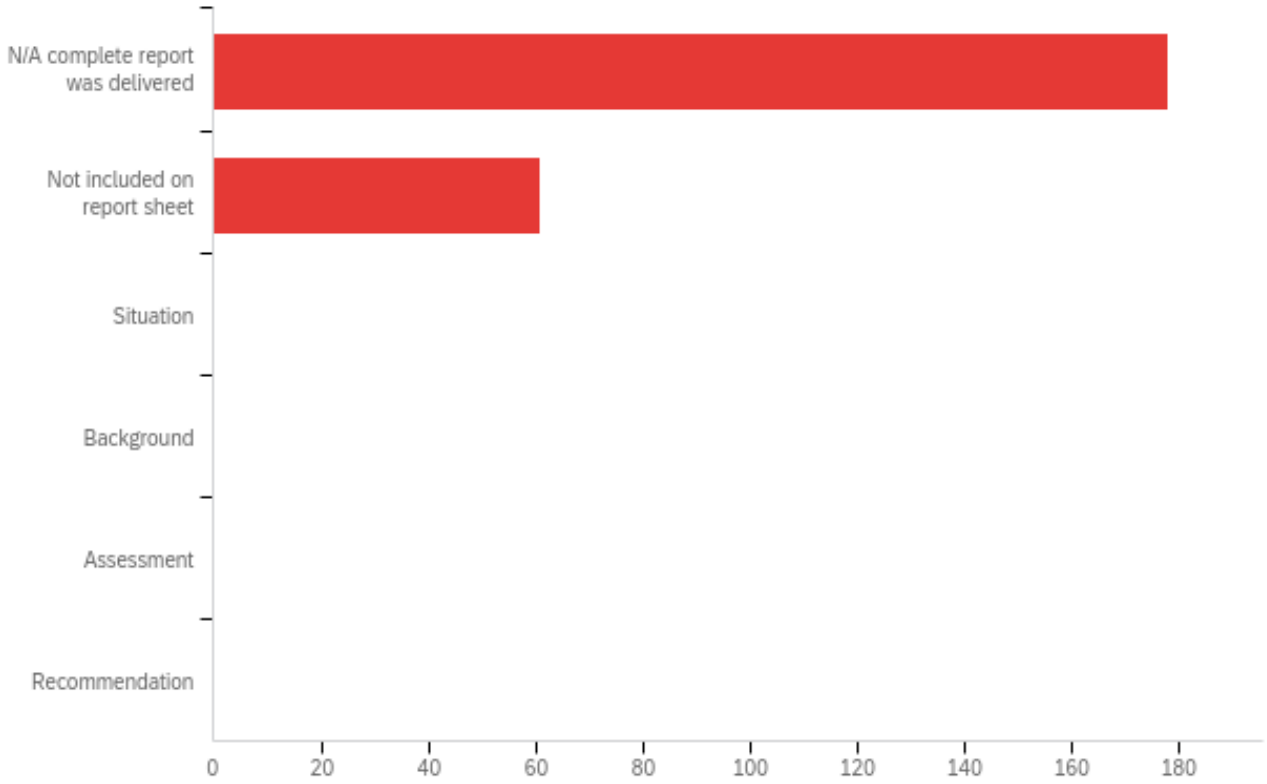
Q2 - Was a complete report delivered?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Was a complete report delivered?	1.00	3.00	1.27	0.46	0.21	244

#	Answer	%	Count
1	Yes	73.77%	180
2	Not included on report sheet	25.41%	62
3	No	0.82%	2
	Total	100%	244

Q3 - Report was missing what criteria?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Report was missing what criteria?	1.00	2.00	1.26	0.44	0.19	239

#	Answer	%	Count
1	N/A complete report was delivered	74.48%	178
2	Not included on report sheet	25.52%	61
3	Situation	0.00%	0
4	Background	0.00%	0
5	Assessment	0.00%	0
6	Recommendation	0.00%	0
	Total	100%	239

Q4 - Comments...

Comments...
great handoff 10/10