A Quality Improvement Project: Implementation of a Standardized Handoff Report for

Nurse Anesthetists in the Post-Operative Setting

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Abstract

Handoff report is a critical time during patient care where information is transferred between providers. An incomplete handoff report can have negative consequences such as patient harm, decreases in patient safety, and dissatisfaction for all members of the team. This quality improvement project focused on the implementation of a standardized handoff tool utilized in the Post Anesthesia Care Unit by CRNAs while giving handoff report to PACU nurses. A pre-intervention survey was distributed to CRNAs at a small rural hospital and then a standardized handoff tool was introduced that was to be used for two weeks in their PACU. After each report using the standardized tool, the PACU nurses were to complete a survey regarding the tool. After the implementation period was completed, the CRNAs were sent a post-intervention survey addressing their perceptions of the handoff tool. Overall, the handoff tool led to a complete report without missing information. The PACU nurses and CRNAs did not want to adopt this tool into their practice for reasons such as length, too extensive, and low efficiency. Limitations were a low number of participants, short implementation period, and limited interactions due to COVID-19. A future suggestion is to create a standardized handoff tool specific to the unit with what they consider pertinent information.

Keywords: standardized, handoff, report, CRNA, PACU

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Section I. Introduction

Background

Handoff report occurs any time there is a transfer of patient care from one provider to another. It is the process of giving patient specific information from one provider to the next while ensuring the safety of the patient and continuity of care (The Joint Commission, 2017). An ineffective handoff report occurs when pertinent information is left out. Ineffective handoff reports are linked to sentinel or adverse events. According to The Joint Commission (n.d.), "a sentinel event is a patient safety event that results in death, permanent harm, or severe temporary harm." Lee et al. (2016) explain how ineffective handoff report contributed to almost 80% of serious events and 35% of sentinel events between 2004 and 2014.

Handoff report is variable depending on what level the provider is and what unit the transfer is to. Certain information might be deemed necessary on one unit but less important on another. Standardizing a handoff report may help improve the efficiency of report and prevent incomplete reports. A standardized handoff report between Certified Registered Nurse Anesthetists (CRNAs) and post-anesthesia care (PACU) nurses would include relevant information that should be used during every handoff report. The same report would be used with every patient to prevent the omission of information.

The implementation of a standardized handoff tool could increase the efficiency of handoff, improve patient safety, increase employee satisfaction, and decrease the financial burden related to increased hospital length of stay and additional treatments. Wheeler (2015) explained that over 70% of adverse or sentinel events in healthcare organizations were related to poor communication when analyzed by root cause. One study by Keebler et al. (2016) found that

"…handoff protocols tend to improve results on multiple levels, including handoff information passed and patient, provider, and organizational outcomes" (p. 1187).

Handoff report may be poor or incomplete due to omission of relevant information, interruptions, lack of staff which may necessitate additional patient handoffs between healthcare providers, or poor communication skills between providers. Boat and Spaeth (2013) recognized that handoff reports were inconsistent due to different beliefs in what is essential and should be included, the way they were performed, and time pressures that decreased completeness. Failures in communication have been reported to cost over $1.7 billion in United States hospitals each year (CRICO Strategies, 2015). In addition to the financial burden, communication errors result in increased hospital length of stay, unnecessary treatments, and sometimes death. According to Dahlquist et al. (2018), standardized reporting systems are shown to have more consistent and systemic transitions of patient care.

Organizational Needs Statement

The Joint Commission addressed patient handoff as a National Patient Safety Goal when handoff communication became Provision of Care standard PC.02.02.01, element of performance 2 in 2010 (The Joint Commission, 2017). To comply with the Joint Commission's recommendation, there is a clear need for a standardized handoff tool to be utilized at the partnering rural hospital in North Carolina, as there is currently no policy or dedicated handoff tool for CRNAs to use while giving report to the nurses in the postoperative setting. Although this hospital uses Epic as their charting system, which includes the Situation, Background, Assessment, and Recommendation (SBAR) tool for documentation in the operating room (OR), this system is not used during the verbal handoff to PACU nurses, potentially leading to inconsistencies in reports.

The Institute for Healthcare Improvement has developed a Triple Aim approach for enhancing healthcare systems. The Triple Aim includes reducing per capita costs, improving health, and improving the patient experience (Institute for Healthcare Improvement, 2020). The implementation of a standardized handoff report addresses all three of these dimensions. An incomplete or ineffective handoff report can result in additional testing and medications, lawsuits, and many unexpected costs to a hospital. A systematic review by Raeisi et al. (2019) concluded a complete and effective handoff can improve the continuity of patient care, thus improving health and the satisfaction of patients. In 2015, the Perioperative Multi-Center Handoff Collaborative was formed at an American Society of Anesthesiology meeting and is supported by the Anesthesia Patient Safety Foundation (APSF, 2021). It is an interest group with the task of addressing communication issues related to handoff and developing a standardized handoff tool specifically for the perioperative period.

The American Association of Nurse Anesthetists (AANA) has developed a set of 14 standards of practice for CRNAs to follow while providing patient care. Standard 11 addresses the transfer of care and need to communicate clearly and effectively to the other healthcare provider for continuity of care; and standard 12 is participation in a quality improvement process (AANA, 2019). The implementation and use of a standardized handoff tool addresses both standards as it serves to promote improved outcomes and progression of patient care. The AANA also promotes a culture of safety through collaboration and cooperation between interdisciplinary teams outlined in standard 14. This quality improvement project requires CRNAs, nurses, anesthesiologists, and management to work together to promote patient safety.

Problem Statement

Ineffective handoff reports have been linked to many negative consequences including patient harm, death, employee dissatisfaction, and additional costs. There are many reasons handoff report may be ineffective, such as missing pertinent information, distractions during the report, or poor communication. While the anesthesia providers each have a systematic method of giving patient handoff report, they do not use a common standardized handoff tool. Thus, there is potential for incomplete handoff reports at this partnering organization, as no standardized handoff tool is being used for delivering report when patients are transferred from the OR to the PACU.

Purpose Statement

The purpose of this quality improvement project is to implement and assess the acceptability and efficiency of a standardized handoff tool addressing pertinent information needed to improve patient safety and outcomes of report between CRNAs and PACU nurses during the post-operative transfer of patients to the PACU. The project will evaluate the satisfaction and completeness of report as perceived by the CRNAs and PACU nurses.

Section II. Evidence

Literature Review

Searches for pertinent literature were performed using PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), OneSearch, and Google Scholar. The MeSH terms used when searching PubMed were operating rooms, recovery room, and patient handoff. The initial search strategy, adjusted for each database or search engine as required, was ((operating room OR PACU OR post anesthesia care unit) AND (handoff OR handover)). Searches were limited to articles published in English, within the last five years (2016-2021), and scholarly or peer reviewed when this option was available in the database. See Table A1 for list of keywords and MeSH subject headings and Table A2 for actual search strategies and results.

The articles retained were specific to perioperative handoff report in the PACU, utilized a standardized handoff tool, and published within the last five years. Articles that were excluded were not specific to post anesthesia patients transferring to the PACU, not specific to communication between providers, or not the implementation of a standardized handoff tool. The articles selected were quality improvement projects and meta-analyses, providing Level I and Level IV evidence. As outlined by Melnyk et al. (2016), Level I evidence is from systematic reviews and meta-analyses of randomized control trials and Level VI evidence is obtained from well-designed case-control and cohort studies. Most projects had a process of developing their own handoff tool customized to the needs of the providers and patient population. A literature matrix is available in Appendix B.

Current State of Knowledge

The consensus of current evidence-based literature, with evidence ranging from Level I to Level VI and including quality improvement project findings, was that implementing a

standardized handoff tool improved the amount of information transferred during report (Boat &

Spaeth, 2013; Krimminger et al., 2018; Lambert & Adams, 2018; Park et al., 2017; Potestio et

al., 2015; Salzwedel et al., 2016). Identified studies and quality improvement initiatives observed

the amount of important information transferred, the efficiency of handoff, provider satisfaction

of the tool, and increased or decreased duration of handoff.

Current Approaches to Solving Population Problem

Research by Potestio et al. (2015) and Park et al. (2017) found that the checklists they

developed had a significantly higher number of patient specific items that were included in the

handoff report, however the time spent giving report was statistically higher as well despite their

prediction to decrease time. The inclusion of more information increased the amount of time

utilized to complete report. However, Krimminger et al. (2018) implemented a standardized

handoff report that decreased errors in handoff and increased employee satisfaction without

increasing handoff time. Weinger et al. (2015) completed a multimodal study that used a

standardized SBAR tool and resulted in improved quality of handoff reports. Even at three years,

a follow up found the effects of the training and use of the handoff tool were present and long

lasting.

Observations of handoff report using the PEARLs tool demonstrated an increase in the

amount of pertinent information transferred from the CRNA to the PACU nurse (Robinson,

2016). Canale (2018) and Lambert and Adams (2018) assessed CRNA's satisfaction with the use

of a standardized tool and found that it increased their satisfaction with the handoff report.

It would be interesting to know if the amount of time spent looking up or returning to the

operating room for information not included in the report changed with use of a standardized

handoff tool. No data addressing this issue was identified during the review of existing literature.

Additionally, not all checklists increased the duration of report. A randomized controlled trial by Salzwedel (2016) found that the duration of handoff in the control group compared to the checklist group did not differ statistically.

Evidence to Support the Intervention

The Joint Commission recommends standardizing the contents of handoff report to ensure vital components are included; it is timely, synthesized, two-way communication, and uses a mnemonic (The Joint Commission, 2017). This quality improvement project involved implementation of the APSF PACU Handoff Checklist developed specifically to be used in the PACU, which includes a particular set of patient information, procedure information, and medication information (Potestio et al., 2015). This checklist was ideal because it was developed specifically for the population of patients being transferred from OR to PACU care. In a systematic review and meta-analysis, Boet (2020) explained that five out of the six studies collected had adverse patient outcomes related specifically to anesthesia handoff processes.

One important and measurable outcome related to this project was nurse and CRNA satisfaction with the handoff process. A study by Leonardsen et al. (2019), grounded on the fact that many nurses reported the need for improved quality of handoff and inclusion of pertinent information, found that a standardized handoff tool improved the quality of report, which ultimately resulted in more positive experiences for personnel.

Evidence-Based Practice Framework

Identification of the Framework

Lewin's change theory is an exceptional model for addressing standardization of nursing handoff report in the hospital setting. There are three components to Lewin's change theory that include unfreezing, changing, and then refreezing (Lewin, 1947). During the unfreezing portion,

problem awareness is created, allowing people the opportunity to change their current ways of

practice (Wojciechowski et al., 2016). During the unfreezing portion of this project, participants

received education regarding the need for effective handoff report and the new handoff tool was

introduced. Unfreezing can also be referred to as breaking a habit (Lewin, 1947). The second

component is the change, or implementation of a new operating procedure. Implementing a

standardized handoff report occurred during the change section, allowing for people to adjust to

the new normal and ideally diminish resistance to change (Manchester et al., 2014). During the

implementation, the APSF PACU Handoff Checklist was utilized by CRNAs when reporting to

the PACU nurses. Finally, the third component is refreezing. According to Wojciechowski et al.

(2016), the refreezing process consists of incorporating and maintaining a new equilibrium, so it

becomes a habit. Once a new policy is accepted by all the users, it becomes routine for their

standard of practice. If the CRNAs found that the APSF PACU Handoff Checklist was useful

and effective they would potentially continue to use that checklist after the project concluded to

provide an effective report, however, this project did not address the refreezing stage.

Ethical Consideration & Protection of Human Subjects

The quality improvement project was deemed as exempt from full review through a

process created in conjunction with the East Carolina University Institutional Review Board and

the partnering organization. Approval verification can be found in Appendix C. Additionally,

approval through the partnering organization was obtained and can be found in Appendix D.

Collaborative Institutional Training Initiative (CITI) modules were completed by the researchers

prior to initiation of the project.

No patient data or individually identifying information of participants was recorded

during this project as it focuses on participants' perceptions of handoff and not patient

information. There was minimal risk for participants although some additional stress and

increase in workload was possible despite the educational opportunity and tool alignment with

currently accepted practice.

Section III. Project Design

Project Site and Population

The project was performed in the post anesthesia care unit at a small, rural hospital in eastern North Carolina. The hospital has 49 general beds, three operating rooms, and one endoscopy room (Department of Health and Human Services, 2020). The project population was made up of CRNAs and PACU nurses employed at this facility. Facilitators to this project were the willingness of the staff at the facility to participate in the project, the ECU clinical faculty to assist with participant recruitment, and the need to give handoff report. Barriers to this project were the short length of time to conduct the project and COVID-19 mandated limitations on social interactions. Additionally, due to the size of the hospital there were limited numbers of surgical cases and thus opportunities to complete the APSF PACU Handoff Checklist.

Description of the Setting

The PACU is where patients are taken after surgery. Patients remain there while they recover from their anesthesia. Patients are typically monitored until they are discharged or admitted for observation overnight.

Description of the Population

The PACU is staffed with registered nurses who monitor the post-operative patients. The CRNAs give bedside report to the receiving PACU nurse. CRNAs and anesthesiologists are available to assist the nurses if needed. At this facility, there were approximately three CRNAs on staff for the day and one PACU RN.

Project Team

The team implementing this quality improvement project was made up of a student registered nurse anesthetist (SRNA), a clinical CRNA faculty member, and a CRNA faculty

member who served as project chair and content specialist and is the Nurse Anesthesia program

director. An additional non-CRNA faculty member coordinated development and

implementation. An organization contact person, the unit manager, aided in communication with

participants. Additionally, initial development of the project was accomplished in cooperation

with three additional students addressing the same clinical issue. The primary SRNA took the

lead in regard to implementing the educational tool, administering surveys assessing participant

perceptions, and analyzing the survey data.

Project Goals and Outcome Measures

The goals of this quality improvement project were to implement a standardized handoff

tool and to assess the CRNAs' and PACU nurses' perceptions of the adequacy, including

effectiveness and completeness, of handoff report. The perceptions of the CRNAs were assessed

using an electronically delivered pre-intervention survey and post-intervention survey. The

PACU nurses provided their feedback through a survey completed after each time they received

report from a CRNA using the APSF PACU Handoff Checklist.

Description of the Methods and Measurement

A pretest/posttest methodology was used to compare a single Plan-Do-Study-Act (PDSA)

cycle of quality improvement (Langley et al., 2009). Copies of the APSF PACU Handoff

Checklist, an educational PowerPoint, and a total of three surveys were distributed. Types of

questions in the surveys included Likert type, yes or no, and open response. The styles of

questions allowed for collection of nominal and ordinal data for analysis. The data was analyzed

to assess the PACU nurses' and the CRNAs' perceptions once the surveys were completed. The

pre- and post-intervention surveys allowed for the evaluation of perceived effectiveness and

completeness of handoff report while using the APSF PACU Handoff Checklist as compared to

perceived effectiveness and completeness of handoffs prior to implementation. Satisfaction of

the CRNAs and the PACU nurses regarding their perception of handoff report was also assessed

using the surveys.

Discussion of Data Collection Process

A pre-implementation Qualtrics survey was emailed to the CRNAs agreeing to

participate in the project. The pre-implementation survey questions are outlined in Figure E1.

After completing the survey, participants were prompted to view the educational material that

introduced the standardized handoff tool. The educational material was delivered in a video

introducing the topic, explaining the tool, and outlining the process of handing the provided

cards with the PACU nurse survey to the PACU nurses. The CRNAs were given a card to be

kept for them to use for each handoff to a PACU nurse. The card for CRNAs was laminated and

included a copy of the APSF PACU Handoff Checklist on it for their reference. Additionally, the

CRNAs were given the APSF PACU Handoff Checklist virtually via email to access on a

handheld device if preferred. The card to be given to the PACU nurses had a survey for the

PACU nurses to complete after they received handoff report. The handoff checklist card is

shown in Figure E2 and the PACU nurse survey card is shown in Figure E3. The PACU nurses

were instructed to deposit the completed card in a collection box located by the nurse's station.

After the handoff tool had been used for two weeks, the CRNAs were sent an email containing a

post-implementation survey, seen in Figure E4, and asked to complete it at that point.

The results of the pre-intervention surveys were immediately available through Qualtrics

once completed. The CRNAs used this checklist tool for two weeks, then completed a post-

intervention survey also using Qualtrics. At the end of the two weeks, the completed PACU

nurse survey cards were collected from the collection box. This project was deemed exempt from

full IRB review as it did not gather any patient information or individually identifying participant

data and was conducted as a quality improvement study.

Implementation Plan

A clinical faculty member from ECU recruited CRNA participants for this project as they

had established relationships with the staff at the facility. The project was implemented by

sending an email containing a PowerPoint presentation introducing the project as well as a link

to the pre-intervention survey to be completed using Qualtrics. The participants were asked to

use the APSF PACU Handoff Checklist for two weeks when giving report to the nurses in the

PACU. They were to then give a card containing the survey to the PACU nurses to complete if

they were willing to do so. If choosing to complete the written survey, the PACU nurses were

then to place the card in a locked collection box on the unit. After the two weeks concluded, the

CRNAs who had initially agreed to participate received a second email containing a link to the

post-implementation survey through Qualtrics using anonymous survey links, and cards

completed by the participating PACU nurses were retrieved.

Timeline

An outline of the project timeline is listed in Appendix F. The project was implemented

from May 24, 2021 through June 4, 2021. Additional data collection was performed June 21

through June 25, 2021.

Section IV. Results and Findings

Results

Data collection was initially planned for two weeks. The pre-intervention survey link

using Qualtrics was sent out to three CRNAs and two responses were received. During these

initial two weeks of planned data collection, PACU RN responses were also collected but the

numbers were low. After the two weeks of data collection, the post-intervention survey link

utilizing Qualtrics was emailed to two CRNAs, as one potential participant was no longer

employed at this facility, with one response. A follow-up email reminder yielded a second post-

intervention survey response, providing 100% participation from CRNAs. Due to the initial low

responses from the PACU RNs, the data collection was extended to a third week where a total of

11 responses were recorded. Of the responses, nine were complete. Two incomplete responses

noted the APSF PACU Handoff Checklist was not used during handoff report. The two

incomplete survey cards indicated what information was or was not reported during handoff but

as the APSF PACU Handoff Checklist was not used for these handoff reports these responses

were not included in analysis.

Analysis

The pre-intervention survey assessed the CRNA's current method of handoff report, their

perceived efficiency and completeness of report, satisfaction, and propensity for errors. Both

participants reported that they currently used a systematic way to give report, they strongly

agreed that their current method was efficient and comprehensive, and they were satisfied with

their current method. However, they strongly agreed that their handoff process leant itself to

communication errors. Also, both responses reported that all anesthesia providers in the

department did not use the same standardized handoff tool.

The post-intervention survey had two responses. One respondent reported using the tool five times and the other eight times during the study period. Figure 1 displays CRNAs' responses when asked about their opinions of various aspects of the tool. The free response question regarding what they would change in the tool had the following responses: "specific mention of paralytics and reversal administration" and "I would remove time in, ASA scoring, preop activity level, limb restriction." No barriers that would prevent adoption of the tool were noted. One participant reported they were enthused for future use of this tool while one was not enthused. When asked to comment on why they would or would not like to adopt this tool in their personal use, the CRNAs responded with "standardization in this area would fall in line with HRO model principles. It would not only facilitate clear, concise communication, but also increase patient safety" and "I would likely not adopt this tool as I find it to be too extensive for the common pacu report."

Figure 1

Post-Intervention: CRNA Found the Checklist to Be (n=2)
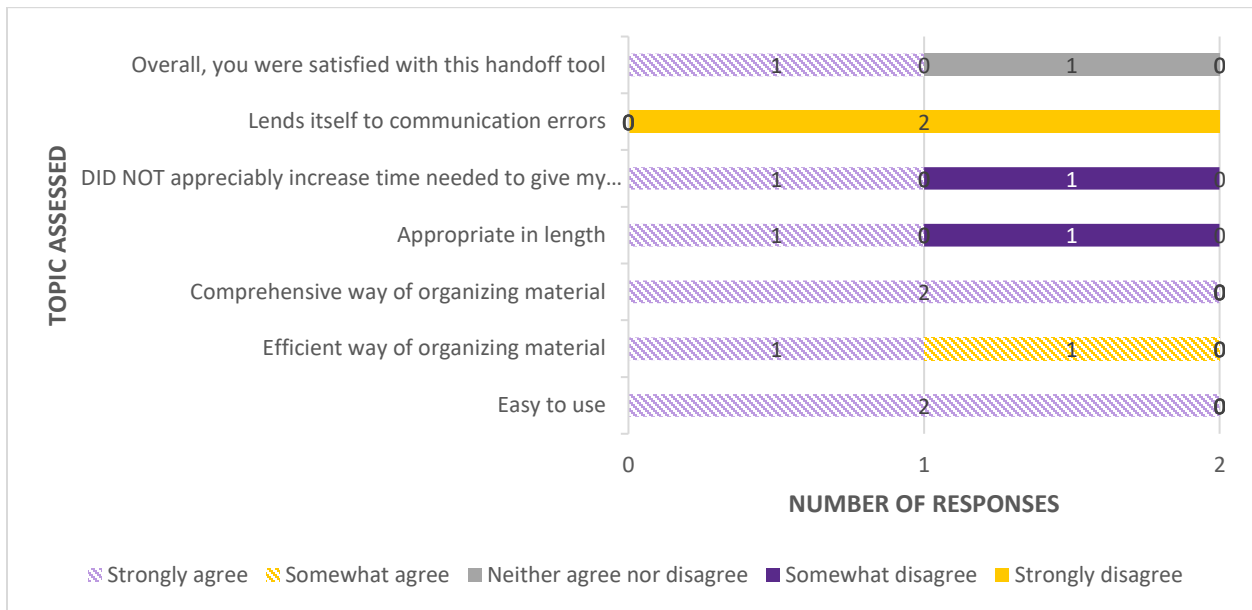
*Note.* The data represents the CRNA's response after use of the APSF Handoff Checklist.

With the additional week of data collection, there were a total of 11 responses from the PACU RNs. As previously noted, out of the 11 responses, the participants reported the tool was not used on two of the cards, therefore, although the participants completed the portion of the survey regarding what areas were addressed during handoff, this information did not reflect use of the APSF Handoff Checklist so was not included in analysis. All of the nine fully completed surveys reported they did not have essential information missing from report, but eight of the nine responses reflected that the PACU nurse would not like to use this particular checklist in the future. Overall, the level of enthusiasm for future use was neutral or not enthused. Approximately two thirds of responses regarding whether or not the tool contributed to an efficient handoff were neutral, with one disagree and two agrees. When asked if the tool contributed to a comprehensive handoff, six participants responded as neutral, one agreed, and

two disagreed. The survey asked if eight specific topics were addressed when using the tool and

the responses are displayed in Figure 2. The PACU nurse reported that all topics were either

included or deemed as not applicable.

Figure 2

Were the Following Areas Addressed During Handoff? (n=9)
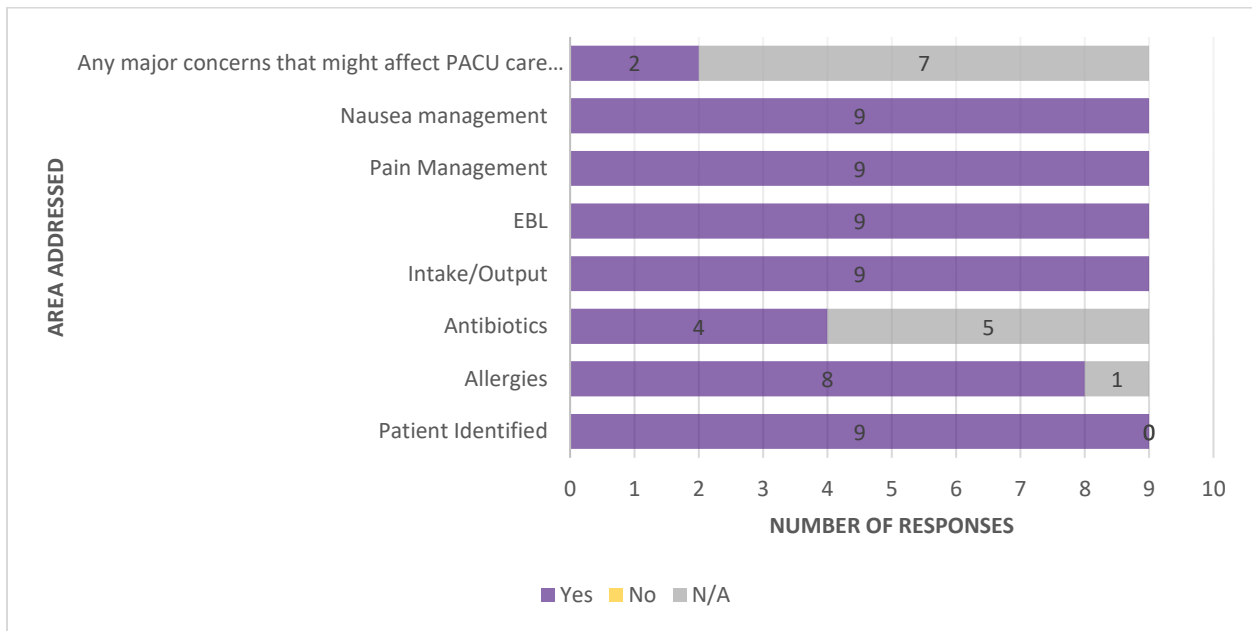
Note. This table includes the nine completed survey responses from the PACU RNs as the two

additional responses did not use the APSF Handoff Checklist tool.

Section V. Interpretation and Implications

Cost Benefit Analysis

The costs associated with performing this quality improvement pilot project were

minimal. Direct costs from printing the APSF Handoff Report checklist, lamination, printing the

PACU nurse surveys, and the survey collection box totaled approximately $40. Employee time

was not significantly increased while delivering report. If this project were to be implemented by

the facility, additional costs may be incurred for having the information technology (IT)

department embed the tool into the electronic medical records and providing additional employee

training. The benefits of this project were the potential for prevention of incomplete handoff

report associated with adverse events and the PACU nurse not having to spend additional time

looking for information that was missing from report or calling back to the operating room.

Improving handoff report has the potential to decrease adverse events such as increased length of

hospital stay, use of additional medications, and need for additional testing which would all

increase the cost of care. There were no unexpected negative outcomes or events that occurred

during this quality improvement project. Overall, this would be a good return on investment for

the organization.

Resource Management

Implementing a standardized handoff tool can be accomplished using minimal resources.

One resource the organization can use to add to a successful outcome is allowing the CRNA staff

and anesthesiologist to work together to develop their own standardized tool to tailor it to their

specific needs. This is a feasible option as it would be a simple, yet high yield change. Also, if

the organization was implementing the change on a larger scale there could be increased

likelihood of better compliance with using the tool. Additionally, the hospital's own printing

department would be useful in printing copies of the handoff tool for use during handoff report and their IT department could facilitate the insertion of the handoff tool in the electronic health record. This would provide an electronic option for using the tool during handoff report.

Implications of Findings

This quality improvement project included only two post-intervention CRNA survey responses. In those surveys, both CRNAs reported that the tool was easy to use, comprehensive, and did not lend itself to communication errors. This supports the Institute for Healthcare Improvement's Triple Aim approach for enhancing the healthcare system as it can improve patient experience if pertinent information is not missing from report. Responses obtained from the PACU nurses also supports this premise as 100% reported that no information was missing when using the APSF Handoff Checklist.

Utilizing the APSF Handoff Checklist falls in line with AANA's standards for practice 11, the transfer of care, and standard 12, quality improvement process, by addressing the need for clear communication during transfer to support continuity of care as well as participation in quality improvement activities.

Overall, the project results align with current literature, in that use of a standardized handoff tool provided for a complete handoff report, but participants did not like it nor did they want it implemented in their practice. There were overwhelmingly agreeable responses that the tool was effective, comprehensive, and no pertinent information was missing from report but as this project did not assess completeness of reports prior to the implementation actual change was not measured. However, a similar study completed by Potestio et al. (2015), found that the participants spent significantly more time delivering report when using the tool than when not using a tool, but they also addressed more items which would potentially improve

communication. This finding of greater time needed when using a tool aligns with the responses from the PACU nurses who were neutral or did not agree that use of the tool did not increase the time it took to give and receive report, with 67% being neutral, 11% disagreeing, and 22% strongly disagreeing.

Implications for Patients

The implementation of a standardized handoff tool has potential to benefit patients by decreasing information being missed or incorrectly reported during handoff report. This helps ensure continuity of care and may prevent any adverse events. Many adverse events have been directly linked back to errors in communication. Improved patient outcomes are the main goal in all healthcare organizations.

Implications for Nursing Practice

Based on the results of this quality improvement project and review of published research, using a standardized handoff tool would be advantageous to the continuity of patient care. A standardized tool can decrease the chance of inadvertently excluding pertinent information. Utilizing a standardized method of delivering handoff report when transferring care of patients can provide the nurse anesthetists and PACU nurses reassurance that they are giving or receiving a full and thorough report. While certain standardized tools may take more time to complete, painting a complete and clear clinical picture of the patient during transfer of care is necessary to prevent harm to our patient population.

In the future, the department may want to create their own handoff tool that includes what they deem pertinent to prevent lengthy reports. Another suggestion may be to include a checklist in Epic under a handoff section to ensure compliance. This project had a low number of responses from the PACU nurses which could indicate limited use of the APSF Handoff

Checklist tool. This directly correlates with the refreezing portion of Lewin's change theory. It can be difficult to create a new habit or normalize a new practice change. The low response rate in this project could be due to the fast pace of care delivery during the OR to PACU transition period or to high levels of satisfaction with their current handover methods.

Impact for Healthcare System

A standardized handoff tool can improve the healthcare system as it can prevent unintended adverse safety events. Hospitals go to many lengths to prevent any incidence of patient harm. Implementing a standardized handoff tool that is created and tailored to be unit specific is an easy and efficient way of preventing such events. Complete communication of essential information for continuity of care between healthcare professionals is outlined in Standard 11 of the AANA's Standards for Nurse Anesthesia Practice (AANA, 2019).

As previously discussed, the use of standardized handoff tools can positively impact employee satisfaction and efficiency, which the organization can directly assess from results of this quality improvement project. If repeated on a larger scale, results could guide changes to practice to improve satisfaction in the workplace and help prevent communication errors. As the health care system strives for efficient use of time, highest quality of care, and streamlining of services, standardizing the handoff communication between CRNAs and PACU nurses is one way to address these goals during transfer of patients from the OR to the PACU.

Sustainability

Based on the responses of participants, one suggestion may be to develop a tool specific to the hospital and PACU to include what they deem pertinent to prevent noncompliance with the use of a standardized tool. Participants responded that no information was missing from report but were not enthused for future use of the APSF Handoff Checklist tool. Therefore,

developing a tool specific to their practice may improve the likelihood of future use of a standardized handoff tool.

Due to the low cost of implementing a standardized handoff tool, the organization can likely afford to continue this project. Aside from educating staff members regarding the use of the tool and embedding it in the electronic health record, there would be no cost financially to continue to use the APSF Handoff Checklist tool for handoffs in the PACU. When considering the responses from the participants of this quality improvement project which included one CRNA response being not likely to adopt this tool and eight of the nine PACU nurse responses indicating they would not like to use this particular checklist in the future, there could possibly be resistance to change their reporting process which falls in line with the refreezing portion of Lewin's change theory.

Dissemination Plan

Dissemination of the findings from this QI project included a poster presentation attended by other CRNA students and department faculty delivered in person and via Zoom. Project participants were invited to attend and provided a link to the presentation although their attendance was not required. This project paper will also be available via The Scholarship, East Carolina University's digital repository.

Section VI. Conclusion

Limitations

Limitations for this quality improvement project included the small sample size. Due to the number of employees at this rural hospital, there was limited data reported. Additionally, there were social restrictions due to COVID-19 that prevented presenting the project to participants in person and limited interactions. Finally, although the project was also initially to be completed over a two week period but extended to three, this was not a lengthy period of time over which to collect data.

Recommendations for Others

An additional QI project could be done to assess the length of time spent giving handoff report, comparing the time taken to give report without using a standardized process versus when using a standardized handoff tool such as the APSF Handoff Checklist. If the time spent giving handoff report increases significantly, the organization would have to determine if it is sustainable.

As learned from this project, clearer instructions for the PACU RNs could yield better responses. The option to mark "not applicable" caused confusion when interpreting the results as to whether the information was not included or was simply a benign component of handoff report for that particular patient. Developing pre-implementation questions and post-implementation questions that aligned for comparison of before and after responses would further assist in evaluating the data. Similarly including a larger sample size would yield more data.

Recommendations for Further Study

   To further investigate this topic, one could develop a handoff tool designed specifically for the hospital and unit in question. A specialized tool could be tailored to include what is pertinent and critical for that unit and eliminate superfluous information and time spent during handoff report. Another recommendation would be to incorporate a standardized handoff report into the electronic medical record. The handoff tool can be developed by the healthcare organization, or adopted from another source, and then the IT department can embed it in the record. The handoff report could then be completed utilizing the handoff tool and documented as such in the electronic medical record. The study could assess the completeness of handoff report or number of safety events related to handoff report.

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Appendix A

Literature Search Strategies

Table A1

Keywords, PubMed MeSH, and CINAHL Subject Headings Used for Literature Searches

	Concept	
	Operating room	Handoff
Keywords	Operating room	Patient handoff
	Operation	Patient hand over
	Surgery	Patient sign out
	PACU	Signout
	Post anesthesia care unit	Patient signover
		Handovers
		Clinical handover
PubMed MeSH	Operating rooms	Patient Handoff
	Recovery room	
CINAHL Subject Headings	Operating rooms	Hand off (Patient safety)
	Post anesthesia care unit	

Note. Various combinations of the provided keywords, PubMed MeSH terms, and CINAHL subject headings were used to conduct literature searches in PubMed, CINAHL, and Google Scholar. Additionally, related articles, references, and professional websites were reviewed.

Table A2

Search Strategy

Search date	Database or search engine	Search strategy	Limits applied	Number of Results	Number Kept
10/29/2020	PubMed	(operating room OR PACU OR post anesthesia care unit) AND (handoff OR handover)	In the last 5 years 2015-2020 English	94	11
10/29/2020	CINAHL	(MH "Operating Rooms" OR MH "Post Anesthesia Care Units") AND (MH "Hand Off (Patient Safety)")	English 2016-2020 Peer reviewed	47	8
10/29/2020	East Carolina University Libraries OneSearch	("operating room" OR PACU OR "post anesthesia care unit") AND (handoff OR handover)	Last 5 years Scholarly & peer-review English 2015-2020	252	6
10/29/2020	ProQuest Search	noft(("operating room" OR PACU OR "post anesthesia care unit")) AND noft((handoff OR handover))	Last 5 years 2015-2020 Peer reviewed Scholarly journal Not full text English	35	5
10/29/2020	Google Scholar	(operating room OR PACU OR post anesthesia care unit) AND (handoff OR handover)	Since 2016-2020 Reviewed first 5 pages	3,740	5

Appendix B

Literature Matrix

APA Citation	Level of Evidence	Data/Evidence Findings	Conclusion	Use of Evidence in EBP Project Plan
Boat, A. C., & Spaeth, J. P. (2013). Handoff checklists improve the reliability of patient handoffs in the operating room and postanesthesia care unit. *Pediatric Anesthesia*, 23(7), 647-654. DOI: 10.1111/pan.12199	Quality improvement	The reliability improved from 20% to 100% on intraoperative handoffs. A checklist also improved reliability of PACU handoffs from 59% to >90%.	Two months after the implementation of the handoff report, compliance was 100% that was maintained for the remainder of the project time frame. Prior to the implementation of the standardized checklist, all pertinent data was only given in 20% of handoffs. It dramatically increased the reliability and quality of handoff.	To support use of handoff checklist.
Boet, S., Djokhdem, H., Leir, S., Theberge, I., & Mansour, F. (2020). Association of intraoperative anaesthesia handovers with patient morbidity and mortality: a systematic review and meta-analysis. *British Journal of Anaesthesia, 125*(4), 605-613.	I Systematic review and meta-analysis	40% increased risk of adverse event when handover completed intraoperatively	Intraoperative handovers increase morbidity and mortality.	To support need for standardized handoff.

Canale, M. (2018). Implementation of a standardized handoff of anesthetized patients. *AANA Journal,* 86(2), 137-145.	VI EBP improvement project	Pre and post intervention surveys showed increase in satisfaction and comprehensiveness of report.	Satisfaction of CRNAs increased with a standardized tool, majority stated they didn't previously use a standardized tool, postintervention there was a significant increase in perceived effectiveness of the standardized tool.	To support use of handoff checklist.
Krimminger, D., Sona, C., Thomas-Horton, E., & Schallom, M. (2018). A multidisciplinary QI initiative to improve OR-ICU handovers. *American Journal of Nursing*, 118(2), 48-59. Doi: 10.1097/01.NAJ.000053 0248.45711.60	Quality improvement	Decrease in interruptions during handoff and errors. Increase in duration.	The staff adapted to the new process and it resulted in improved handover and critical information, ultimately leading to a reduction in errors and patient harm.	To support handoff checklist.
Lambert, L., & Adams, J. (2018). Improved anesthesia handoff after implementation of the written handoff anesthesia tool (WHAT). *AANA Journal,* 86(5), 361-370. https://search.proquest.com/docview/212151718 0?accountid=10639	Quality improvement	Significant increase in satisfaction, defective handoff rate decreased	Significant improvement of incomplete report while using the WHAT tool. Also improvement in satisfaction of report between CRNAs and PACU RNs	To support handoff checklist.

Leonardsen, Moen, Kalsoen, & Hovland. (2019). A quantitative study on personnel's experiences with patient handovers between the operating room and the postoperative anesthesia care unit before and after the implementation of a structured communication tool. *Nursing Reports*, 9(1). Doi: 10.4081/nursrep.2019.8041	VI Quantitative study	Age and background had no statistical difference. 92.1% indication of better and safer patient handoff.	The tool improved quality and safety in handovers, and had a positive impact on staff's experiences.	To support handoff checklist.
Park, L., Yang, G., Tan, K., Wong, C., Oskar, S., Borchardt, R., & Tollinche, L. (2017). Does checklist implementation improve quantity of data transfer: An observation in postanesthesia care unit (PACU). *Open Journal of Anesthesiology,* 7(4), 69-92. Doi:10.4236/ojanes.2017.74007	IV Cross-sectional observational study	Mean of 8.7 items increased from pre-implementation to post-implementation. Improved overall handoff data transfer.	A physical checklist increased data transfer and decreased omission of pertinent patient information.	To support handoff checklist.
Potestio C., Mottla, J., Kelley, E., & DeGroot, K. (2015). Improving	Quality improvement	The percentage of items handed off increased from 51.5% to 69.5%.	Results The use of the list increased significantly	To support handoff checklist.

post anesthesia care unit (PACU) handoff by implementing a succinct checklist. *Anesthesia Patient Safety Foundation*, 30.		They had a significant increase in time spent completing handoff report.	the amount of information exchanged. However, only 4 out of 50 were 100% complete. Decrease postoperative complication and improves 24 hour patient outcomes.	
Robinson, N. L. (2016). Promoting patient safety with perioperative hand-off communication. *Journal of PeriAnesthesia Nursing,* 31(3), 245-253. https://doi.org/10.1016/j .jopan.2014.08.144	Quality improvement	"…Structured hand-off is effective in the communication of essential patient information, compliance with regulatory standards, and promotion of perioperative patient safety."	Marked improvement in communication and inclusion of essential elements in the handoff report, effective handoff.	To support handoff checklist.
Salzwedel, C., Mai, V., Punke, M., Kluge, S., & Reuter, D. (2016). The effect of a checklist on the quality of patient handover from the operating room to the intensive care unit: A randomized controlled trial. *Journal of Critical Care, 32*, 170-174.	I Randomized controlled trial	Statistical difference between study group and control group in red items handed over, duration did not statistically differ.	A standardized handoff tool increased the quantity of information handed over and the quality of transmission.	To support handoff checklist.
Weinger, M., Slagle, J., Kuntz, A., Schildcrout, J., Banerjee, A.,	Quality improvement	Acceptable handoffs increased from 7% to 70%.	Handoffs with at least 1 trained participant resulted in immediate	To support handoff checklist.

Mercaldo, N., Bills, J., Wallston, K., Speroff, T., Patterson, E., & France, D. (2015). A multimodal intervention improves postanesthesia care unit handovers. *Anesthesia & Analgesia, 121*(4), 957-971. Doi:10.1213/ANE.0000 000000000670	improvements. It also improved handovers between professional that did not receive the training (Hawthorne effect??). A QI follow-up project found that after 3 years, showed long lasting effects of the training.

Note. Levels of Evidence from (2016). *Implementing the evidence- based practice (EBP) competencies in healthcare: A practical guide for improving quality, safety, and outcomes* by B. M. Melnyk and E. Fineout-Overholt. Copyright 2016 by Sigma Theta Tau International

Appendix C

Project Approval

Based on your responses, the project appears to constitute QI and/or Program Evaluation and IRB review is not required because, in accordance with federal regulations, your project does not constitute research as defined under 45 CFR 46.102(d). If the project results are disseminated, they should be characterized as QI and/or Program Evaluation findings. Finally, if the project changes in any way that might affect the intent or design, please complete this self-certification again to ensure that IRB review is still not required. Click the button below to view a printable version of this form to save with your files, as it serves as documentation that IRB review is not required for this project. 11/12/2020

Note. This figure confirms the exemption status of the project from further IRB review.

Appendix D

Consent Form

Center for Research & Grants

Quality Assurance/Quality Improvement Project vs. Human Research Study (Requiring IRB approval) Determination Form

This worksheet is a guide to help the submitter to determine if a project or study is a quality assurance/quality improvement (QA/QI) project or research study and is involving human subjects or their individually identifiable information and requires IRB approval as defined by the Health and Human Services (HHS) or Food and Drug Administration (FDA). Once completed, please email the form to the [redacted] Center for Research and Grants (VH CRG) CRG.Quality[redacted] A CRG team member will contact you with the results of their review and may request additional information to assist with their determination. The determination will be made in conjunction with the UMCIRB office.

Please contact the VH CRG with any questions at 252-847-1177 or CRG.Quali[redacted]

For more guidance about whether the activity meets the definition of Human Subjects Research see https://rede.ecu.edu/umcirb/irb-faqs/definitions/ or https://www.hhs.gov/ohrp/regulations-and-policy/decision-charts-2018/index.html#c1

Project Title:	Assessing anesthesia providers' perceptions of adequacy of postoperative PACU patient handoff communication			
Funding Source:	None			
Project Leader Name:	Jennifer Young/Maura McAuliffe	☐ Ed.D. ☐ J.D. ☐ M.D. ☐ Ph.D. ☐ Pharm.D. ☒ R.N. ☐ Other(specify):		
Job Title: ECU SRNA/ECU CRNA Faculty		Phone: [redacted]	Email: mcauliffem@ecu.edu	
		Primary Contact (if different from Project Leader): Jennifer Young		
		Phone: [redacted]	Email: hundley19@students.ecu.edu	

Key Personnel/ Project Team members:

Name and Degree:	Department: (Affiliation if other than Vidant)	Email:
Jennifer Young, BSN, SRNA	ECU Nurse Anesthesia Program	hundley19@students.ecu.edu
Maura McAuliffe, PhD, CRNA	ECU Nurse Anesthesia Program	mcauliffem@ecu.edu

QI/QA Assessment Checklist:

Consideration	Question	Yes	No
PURPOSE	Is the PRIMARY purpose of the project/study to: • IMPROVE care right now for the next patient? OR • IMPROVE operations outcomes, efficiency, cost, patient/staff satisfaction, etc.?	✓	☐
RATIONALE 1	The project/study falls under well-accepted care practices/guidelines or is there sufficient evidence for this mode or approach to support implementing this activity or to create practice change, based on: • literature • consensus statements, or consensus among clinician team	✓	☐
RATIONALE 2	The project/study would be carried out even if there was no possibility of publication in a journal or presentation at an academic meeting. (**Please note that answering "Yes" to this statement does not preclude publication of a quality activity.)	✓	☐
METHODS 1	Are the proposed methods flexible and customizable, and do they incorporate rapid evaluation, feedback and incremental changes?	✓	☐
METHODS 2	Are patients/subjects randomized into different intervention groups in order to enhance confidence in differences that might be obscured by nonrandom selection? (Control group, Randomization, Fixed protocol Methods)	☐	✓
METHODS 3	Will there be delayed or ineffective feedback of data from monitoring the implementation of changes? (For example to avoid biasing the interpretation of data)	☐	✓
METHODS 4	Is the Protocol fixed with fixed goal, methodology, population, and time period?	☐	✓
RISK	The project/study involves no more than minimal risk procedures meaning the probability and magnitude of harm or discomfort anticipated are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.	✓	☐
PARTICIPANTS	Will the project/study only involve patients/subjects who are ordinarily seen, cared for, or work in the setting where the activity will take place?	✓	☐
FUNDING	Is the project/study funded by any of the following? • An outside organization with an interest in the results • A manufacturer with an interest in the outcome of the project relevant to its products • A non-profit foundation that typically funds research, or by internal research accounts	☐	✓

If all of the check marks are inside the shaded portions, then the project/study is very likely QI and not human subject research. Projects that are not human subject research do not need review by the IRB.

In order to assess whether your project meets the definition of human subject research requiring IRB review or may qualify as a quality improvement/assurance activity, please provide the following information:

1. Project or Study Summary:
   As a separate attachment, please provide a summary of the purpose and procedures as well address all of the following:
   a) The project question/hypothesis.
   b) The project design.
   c) Any interaction or intervention with humans.
   d) A description of the methods that will be used and if they are standard or untested.
   e) Specify where the data will come from and your methods for obtaining this data -please specify who/where [a CRG will provide you with the data, or someone from a specific department will provide you with the data, or you will pull it yourself].
   f) Specify what data will be used and any dates associated with when that data was originally collected i.e. Patient Name, Diagnosis, Age, Sex, if applicable, please attach your data collection sheet.
   g) Where will the data (paper and electronic) for your project be stored? Please specify how it will be secured to protect privacy and maintain confidentiality. For paper data, please provide physical location such as building name and room number and that it will be kept behind double lock and key. For electronic data, please provide the file path and folder name network drive where data will be stored and specify that it is secure/encrypted/password protected. If using other storage location, please provide specific details.
   h) Please specify how long data will be stored after the study is complete? (Keep in mind that data collected/generated during the course of the project that includes protected health information (PHI) should have identifiers removed at the earliest opportunity.)
   i) Please specify how the collected data will be used (internal/external reports, publishing, posters, etc.).
   Please attach a summary and/or any other additional documentation describing your project

2. If the Primary purpose of your project/study is for QA/QI, have you obtained approval from the operational leader within your department or health system:
   ☒ Yes [Please specify here whom and obtain their signature in the signature section below] ▮
   ☐ No [Contact the appropriate operational leader for approval.]

Please note:
- By submitting your proposed project/study for QA/QI determination you are certifying that if the project/study is established to qualify as QA/QI project, you and your Department would be comfortable with the following statement in any publications regarding this project "This project was reviewed and determined to qualify as quality improvement by the ▮ Center for Research and Grants."
- If you are submitting a Poster to Media Services for printing, you will need to also submit this Quality Improvement Worksheet or proof of your IRB Application and IRB Approval.
- If the ▮ CRG determines the activity is not human subject research, then any presentation, publication, etc. should not refer to the activity as "human subject research," "exempt research," or "expedited research."
- If you would like the ▮ CRG to verify that a project/study is not human subject research, please provide this form completed with the summary of your activity and any additional information to the ▮ CRG at CRG.Quality@▮ and the following will be completed and returned to you for your records.

NHSR vs. HSR Determination:

☑ Not Human Subject Research: The ▉ CRG has determined that based on the description of the project/study, approval by the IRB is not necessary. Any changes or modifications to this project may be discussed with the ▉ CRG at that time to ensure those changes do not elevate the project to human research that would need IRB approval.

☐ Human Subject Research: This project/study requires review by the IRB prior to initiation. An application in the electronic IRB submission system should be submitted.

Approval Signatures:

Department (Site) Manager: _____ Date: _2/24/21_

_____ Date: _____

UMCIRB Office Staff Reviewer: _____ Date: _3-10-21_

Appendix E

Participant Surveys

Figure E1

Pre-Intervention Survey for CRNAs

ECU

Do you currently use a systematic way (something you do for all cases) of providing report to the PACU nurses?

○ Yes
○ No

Do all anesthesia providers in your department use the same "standardized handoff tool/checklist/mnemonic" to provide report to the PACU?

○ Yes
○ No

Please mark the answer that best describes the extent to which you agree or disagree with the following statements regarding the transfer of patient care from the OR to the PACU.

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
My current handoff process provides an efficient way of transferring information.	○	○	○	○	○
My current handoff process provides a comprehensive way of transferring information.	○	○	○	○	○
I am satisfied with the transfer of care process I currently use.	○	○	○	○	○
The handoff process I currently use lends itself to communication errors.	○	○	○	○	○

Figure E2

Checklist Card

APSF PACU Handoff Checklist

Patient	Patient Identification	
	Time In	
	Allergies	
	Surgical Procedure and Reason for Surgery	
	Type of Anesthesia (GA, TIVA, regional)	
	Surgical or Anesthetic Complications	
	PMH and ASA Scoring	
	Preoperative Cognitive Function	
	Preoperative Activity Level (METs)	
	Limb Restriction	
	Preop Vitals	
Procedure	Positioning of Patient (if other than supine)	
	Intubation conditions (grade of view, airway, quality of bag mask ventilation, bite block?)	
	Lines/catheter (IVs, A-liens, CVSs, foley, chest tubes, surgical drains, VP shunt)	
	Fluid Management	Fluids= EBL= UO=
Medicati	Analgesia Plan – during case, postop orders	
	Antiemetics Administered	
	Medications due during PACU (antibiotics, etc.)	
	Other Intra-Op Medications (steroids, antihypertensives)	

Do you have any questions or concerns?

Figure E3

PACU Nurse Survey

PACU RN Survey

Were the following areas addressed in the handoff?			
	Yes	No	N/A
Was the patient identified			
Allergies			
Antibiotics			
Intake/Output			
EBL			
Pain management			
Nausea management			
Any major concerns that might affect PACU care addressed			

1) Using this tool contributed to an <u>efficient</u> handoff. (circle one)

Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

2) Using this tool contributed to a <u>comprehensive</u> handoff.

Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

3) Using this tool did not increase time needed to receive PACU report.

Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

4) After the transfer was finished, did you find there was essential information missing from the report?

    ❑ Yes

    ❑ No

5) Would you like to see **this** particular handoff checklist used in the future?

    ❑ Yes

    ❑ No

6) What is your level of enthusiasm for future use of **this** tool?

Strongly Enthused   Enthused   Neutral   Not Enthused   Strongly Not Enthused

Figure E4

Post-Intervention Survey for CRNAs

ECU

Please estimate how many times you used the assigned handoff tool when transferring care to the PACU (over the past two weeks)?

Please select the answer that best describes the extent to which you agree or disagree with the following statements regarding the transfer of patient care from the OR to the PACU.
I found the APSF PACU Handoff checklist to be:

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Easy to use	O	O	O	O	O
An efficient way of organizing the material to communicate	O	O	O	O	O
A comprehensive way of organizing the material to communicate	O	O	O	O	O
Appropriate in length	O	O	O	O	O
DID NOT appreciably increase time needed to give my PACU report	O	O	O	O	O
Lends itself to communication errors	O	O	O	O	O
Overall, you were satisfied with this handoff tool	O	O	O	O	O

Could you comment on why you would/would not like to adopt **this tool** in your personal anesthesia practice?

Please describe anything you would **change** in the handoff tool.

Are there any barriers that would prevent you from adopting a standardized handoff tool?

What is your level of enthusiasm for future use of this tool?
O Strongly enthused
O Enthused
O Neutral
O Not enthused
O Strongly not enthused

Appendix F

DNP Project Timeline

Date	Task
May 2020	Explore project topic; review literature
August 2020	Submit initial draft of Section I
September 2020	Submit review of Section I and initial draft of Section II
October 2020	Develop assessment tool
October 2020	Complete literature review
October 2020	Submit reviews of Section I and II and initial draft of Section III
November 2020	Submit information for exemption from IRB
November 2020	Submit reviews of Section I, II, and III
January 2021	Record video introducing the tool
March 2021	Vidant Project Approval forms signed
May 2021	Email video and tool to the CRNAs
May 2021	Collect data on the tool utilization
June 2021	Additional data collection performed
June 2021	Perform data analysis
July 2021	Submit initial draft of Section IV and V.
October 2021	Submit final draft of Section I-VI
November 2021	Project poster presentation

Note. This is the timeline followed while completing this DNP project.