

IMPLEMENTATION OF A POSTOPERATIVE HANDOFF CHECKLIST FOR CARDIAC

SURGERY PATIENTS

By

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Abstract

Background: Surgical handoffs from anesthesia providers to ICU RNs mark a critical point in determining how the patient will fare overall. Communication breakdown between healthcare providers can lead to dire consequences for the patient and is a cause of increased morbidity and mortality. **Purpose:** The purpose of this quality improvement (QI) project was to measure provider satisfaction and perception of thoroughness of a standardized handoff checklist. **Methods:** An education session highlighting the importance of the handoff process was presented for both CRNAs and CVICU-RNs. Following the education session, a survey assessing the handoff tool and provider communication was distributed. **Results:** A total of 21 surveys were collected. The qualitative portion of the survey showed that overall, providers were satisfied with the new handoff tool and provider communication included a high frequency of handoff tool use. Providers reported increased clarity, conciseness, and efficiency, contrasted with a decrease in information omissions. Additionally, the qualitative data yielded a small number of suggested changes to the tool and communication process. **Conclusion:** While there is provider satisfaction with the handoff tool and communication, the small sample size limits the generalizability of the results. The inclusion of standardized handoff training could lead to increased tool use and satisfaction. Applying suggested changes to the process, such as limiting distractions and increasing surgeon presence may also increase satisfaction with handoff communication.

Keywords: standardized handoff tool, anesthesia providers, handoff, provider satisfaction

Background and Significance

The transition of patient care immediately following surgery is a time where the need for a thorough and accurate report is paramount. In the postoperative phase, communication failure between the anesthesia provider and the receiving registered nurse (RN) can have dire consequences (Boat & Spaeth, 2013). Communication breakdown is a leading cause of preventable medical errors which are linked to an estimated 44,000-98,000 deaths per year (Kohn et al., 2000). During handoff, the physiological status of the patient is tenuous, monitors and equipment are being set up, and the receiving nurse is given essential information regarding the patient. Often, many processes are happening simultaneously which leads to multitasking and sets the stage for an inadequate report, missing essential patient data (Petrovic et al., 2012). Subsequently, the patient and the delivery of care may suffer. Implementation of a standardized handoff report in the cardiac surgical intensive care unit (CVICU) decreased the amount of missed information from 26% to 16% and increased CVICU nurse handoff satisfaction scores from 61% to 81% (Petrovic et al., 2016). A 2015 study by Petrovic et al. also demonstrated improved handoff measures and increased receiving health care provider (HCP) satisfaction. Boat & Spaeth demonstrated that the use of a standardized PACU handoff checklist significantly improved reliability for intraoperative handoffs between anesthesia providers and during PACU handoffs (2013).

For patients undergoing cardiac surgery, a thorough report during handoff is critical to the well-being of the patient. Failure to relay significant information to the cardiovascular intensive care unit registered nurse (CVICU-RN) can manifest an incomplete understanding of the patient status and the inadequate delivery of care. A cardiac postoperative handoff checklist provides the

receiving nurse with a comprehensive patient picture and increased satisfaction with the handoff report.

Purpose

The aim of this project is the implementation of a Coronary Artery Bypass Graft (CABG) checklist to improve the handoff process between anesthesia providers and CVICU-RNs. The improved process will result in a reduction of data omission and increased satisfaction of both the anesthesia providers and the CVICU team.

Review of Current Evidence

The purpose of this literature review was to gather evidence supporting the need for a comprehensive handoff report for cardiac surgery patients who are transferred to the CVICU postoperatively. Electronic databases PubMed, EBSCOHOST, and CINAHL were searched. The inclusion criteria included studies published in peer-reviewed journals between 2010-2022, full-text, and English language. Keywords searched included: postoperative handoff, postoperative handover, checklist, and/or anesthesia. The search yielded 44 articles in PubMed, 20 in EBSCOHOST, and 32 in CINAHL. In total, 20 articles were critiqued, including two systematic reviews. Effective communication strategies that lead to improved patient handoffs and the impact on provider satisfaction of the strategies were the themes identified and discussed in this literature review.

Approaches to a Successful Handoff

According to the Joint Commission (TJC), handoff communication is a standardized process where patient information is transferred from one provider to another (2008). These patient data are imperative in the delivery of proper patient care. In the scenario of a post-cardiac surgery transfer, essential information including vital signs, allergies, past medical history (PMH),

surgery-specific events, input and output, estimated blood loss, and medications given are reported to the care provider assuming care of the patient. It is here where omitted information and miscommunication happen frequently resulting in, "...medication errors, sentinel events, and poor patient outcomes" (Robbins & Dai, 2015). Miscommunication and omission of information during the transfer of care give rise to a gap in continuity and allow adverse events to occur.

A 2021 article in the *American Nurse*, a publication of the American Nurses Association, declared that a reduction in adverse events can be achieved through the use of a standardized handoff tool that improves communication between providers (Freel & Felharty, 2021). To be successful a standardized handoff tool must contain, at a minimum, 7 elements. These elements are: 1) introduction 2) story 3) history 4) assessment 5) plan 6) error prevention, and 7) dialogue (Freel & Felharty, 2021). The standardized tool should provide detailed, patient-specific information to allow for a thorough transition of care. Handoff should begin with the introduction that details vital information such as the patient's code status, allergies, any advance directives, contact information, and the patient's providers and consulting providers. After the initial introduction is made, the provider handing off should detail the patient's hospital course including any admission screening assessment, learning assessment, and review of the treatment plan. The outgoing provider should note the patient's medical and surgical history, taking time to note any major events within the last 72 hours, including blood administration. Subsequently, an up-to-date assessment should be dictated including vital signs, pain management, current medications, intake and output, labs, and radiology findings. Additionally, diet orders and activities of daily living should be noted. The goals of the care plan should be reviewed, any new orders received or tasks needing completion should be discussed and acknowledged by the two providers, as needed medications should be discussed, and continuous infusions should be

thoroughly reviewed. Patient-specific medication information should be assessed in detail, and any high-alert warnings should be discussed. Finally, care providers should extend the opportunity for the patient and the family to be involved, when reasonable (Freel & Felharty, 2021).

Systematic reviews by Riesenberget al. (2010) and Segall et al. (2012) and a scoping review by Rose & Newman (2016) identified many commonalities integral to successful handoffs including relaying only patient-specific information, avoidance of interruptions, and proper training prior to implementation. An overriding theme throughout the literature was the use of a standardized protocol is instrumental in improving the accuracy and comprehensive nature of the patient transfer. All studies reported an increase in accuracy, pertinent information, and/or communication. This notion is echoed in an integrative review by Gardiner et al. that found standardizing the handoff process leads to improved communication, a reduction in omitted information, and decreased postoperative complications (2015). A randomized controlled trial (RCT) by Salzwedel et al. incorporated the use of a digital voice recorder in the handoff process and demonstrated an increase in the amount and substance of patient information conveyed (2016). Additionally, a new anesthesia-centered tool was developed and implemented which was also shown to improve handoff communication in a study by Lambert & Adams (2018). Numerous studies have linked standardized handoff tools and communications to a reduction in medical errors, yet no universal handoff tool has been implemented for the PACU or CVICU. The Joint Commission acknowledges that communication errors are the core cause of sentinel events in healthcare, and over half of communication errors occur during handoff; making it imperative to ensure standardization of handoff occurs (2016).

Effect on Patient Outcomes

Communication breakdown during the handoff process significantly increases the likelihood of devastating consequences on patient well-being (Joint Commission, 2017). To this point, studies have shown an overall improvement in patient outcomes with the implementation of a handoff protocol, and the success is not limited to specific clinical settings or patient populations. For example, a reduction in complications considered preventable like cardiac arrest, iatrogenic pneumothorax, and drug errors following cardiac surgery was reported when a scripted handoff tool was instituted in a cardiac surgical intensive care unit (Hall et al., 2017). The use of a standardized handoff tool in the pediatric intensive care unit resulted in a statistically significant decrease in cardiopulmonary resuscitation, metabolic acidosis, mediastinal reexploration, and time requiring ventilatory assistance (Agarwal et al., 2012). Additionally, an increase in handoff documentation was associated with a decrease in patient mortality during interhospital transfers (Usher et al., 2016).

Inadequate handoff and poor handoff communication result in 80% of preventable adverse events according to The Joint Commission (2017). Errors that occur during handoff can lead to increased hospitalization time, physical harm, increased cost, and even death. The Joint Commission and The World Health Organization acknowledge that the vast majority of adverse events that impact patient outcomes are due to miscommunication, and both organizations have mandated the implementation of a standard handoff (Galatzan et al. 2018).

Effect on Provider Satisfaction and Perception

The use of a standardized handoff increases provider satisfaction (Agarwal et al., 2012, Burns, et al., 2018; Karamchandani et al., 2018; Riesenberber et al., 2010). The process ensures the

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transfer of patient information is concise, comprehensive, and contextual. Segall et al. found interventions such as limiting interruptions and allowing time for questions positively impacted provider satisfaction (2016). Yang and Zhang reported an increase in perception of teamwork (2016), while Rhudy posited an increase in teamwork takes place generally in every study where a standardized handoff is instituted (2019). Talley et al. reported an increase in perceived communication with multidisciplinary teams in the operating room led to an increase in perceived patient care as well as an increase in handoff satisfaction (2019). The inclusion of stakeholders in the standardization process was an additional recommendation found in the literature that can have a significant impact on the success of a handoff tool (Rhudy 2019; Segall et al., 2012). According to Boat & Spaeth, providers must accept and believe in the protocol for the implementation of a standardized handoff to be successful (2013). Therefore, it is imperative to modify any handoff tool after receiving feedback from stakeholders.

Quality of Evidence

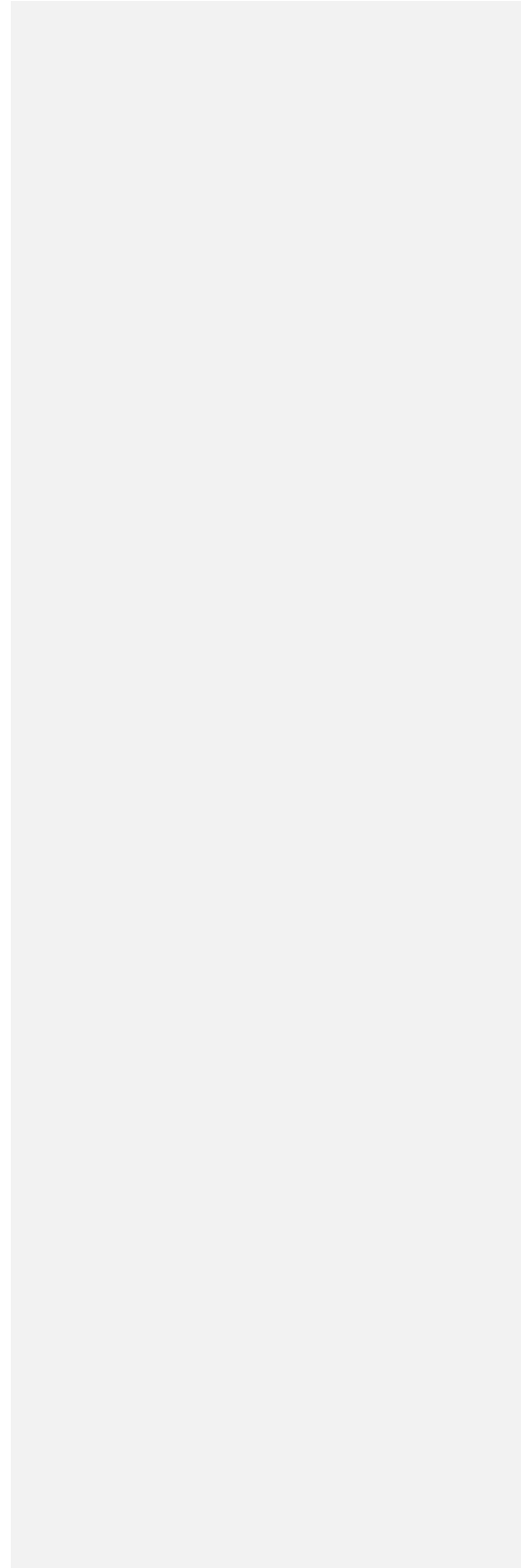
The evidence supporting a single standardized handoff that should be used by all clinical settings is lacking. To date, studies have been consistent in the reported outcomes but limitations in study design, sample size, and broad generalizability have been noted ([Rhudy, 2019](#); [Riesenberg et al. 2010](#); [Segall et al., 2012](#); [Rhudy, 2019](#)[Segall et al., 2012](#)). Only one RCT was found in this literature search. Riesenberg et al. (2010) and Rhudy (2019) identified the need for future research to include the effect of a standardized handoff on patient outcomes. In a 2016 study, Yang and Zhang relied on a pre-test/post-test quasi-experimental design, while Usher et. al (2016) and Agarwal et. al (2012) utilized a retrospective observational model to find short-term improvement in patient outcomes. The researchers described the unit-specific nature and possible observational bias as other limitations (Yang and Zhang, 2016). This review of the

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literature supports the implementation of a standardized handoff tool to ensure an accurate and thorough report leading to improved communication between teams and increased provider handoff satisfaction. Further studies linking standardized handoffs and patient outcomes are needed.

Theoretical Model -Lewin's Change Theory

Lewin's Change Theory of Nursing consists of three tenets: driving forces, restraining forces, and equilibrium (Petiprin, 2020). Driving forces are responsible for the change that takes place; these driving forces move the change equilibrium in the desired direction. In contrast, restraining forces impede change and work to shift the change equilibrium in the opposite direction (Petiprin, 2020). Equilibrium is the point where both driving forces and restraining forces have equal influence and no change occurs. Lewin described a three-phased model of change: unfreezing, movement, and refreezing (Petiprin, 2020). Unfreezing makes movement toward a novel practice possible and allows change to start. Refreezing occurs once there is an adoption of the new practice and acceptance of the new practice as the norm. The driving forces, such as better outcomes and ease of use, need to be greater than restraining forces or barriers for practice change to come about (Petiprin, 2020). Application of Lewin's Change Theory to this project includes step 1: (Unfreezing) the health care providers (HCPs) letting go of previous report styles or a lack of standardization through inclusion in the handoff tool revision process, step 2: (Movement) the adoption of the new handoff checklist, step 3: (Refreezing) HCPs accepting the handoff checklist as the new practice. For a standardized postoperative handoff report to be successfully implemented and thereby, practice change to occur, the CRNAs and CVICU RNs need to buy in to the benefits of the change. This will be made possible by including them in changes to the new tool.



Methods

~~Insert a new introductory sentence here.~~ This study was a quality improvement (QI) project approved by UNCG and hospital review boards. The evaluation of the handoff report sheet was completed by the collection and analysis of post-implementation survey data. The anonymous surveys, along with project information sheets were available in the CVICU and anesthesia departments. Demographics collected were the role of the participant and years of experience caring for patients following/during cardiac surgery. The surveys were collected on December 20, 2021, from the anesthesia department and the CVICU by this Primary Investigator (PI). The surveys were available for 6 weeks. The data from the surveys were compiled into Microsoft Excel for analysis.

Design

~~This quality improvement project employed a xx design.. Give a brief statement on the type of design here.~~ This quality improvement project employed a cross-sectional design where a survey was administered approximately five months after the handoff checklist had been implemented.

The novel tool created by the CVICU was evaluated with a post-implementation survey measuring provider satisfaction, report completeness, barriers, and limitations. All CRNAs and CVICU RNs responsible for the postoperative transfer of cardiac patients were asked to critique the checklist and give feedback. After analysis of the survey data, the checklist recommendations were provided to facility stakeholders with the intent of improving the handoff process and therefore, provider satisfaction and handoff communication.

Translational Framework

The underpinning of this [quality improvement \(QI\)](#) study is based on the Plan-Do-Study-Act (PDSA) model. PDSA is straightforward and generalizable allowing for significant improvement in processes. The QI model is a simplification of the scientific method of experimentation consisting of a four-step, cyclical and continuous process for instituting and testing small-scale change (Institute for Healthcare Improvement, 2017). The PLAN phase of this project is identifying the need for a standardized handoff report, reviewing research on similar tools, preparing a handoff checklist, and developing a data collection plan. The DO portion of the study is the implementation of the handoff checklist for the CVICU. The gathering and analysis of data from the HCPs serve as the STUDY portion, while the ACT phase will consist of revising the handoff checklist based on knowledge gleaned from the data. At this point, the cycle will begin again with the creation of a new plan to implement the revised tool.

Population and Setting

The facility is a large teaching facility in an urban city in central North Carolina. The CVICU has 26 beds with approximately 50 RNs on staff who are trained to admit postoperative cardiac patients. The anesthesia department has approximately 40 CRNAs. This PI attended morning meetings in the CVICU and anesthesia breakrooms where participants were recruited for the project. Inclusion criteria for the survey participants were CRNAs and CVICU RNs. This group of HCPs included both men and women of diverse ethnicities, ages 22-60. The CVICU was selected because it is the unit responsible for receiving major cardiac surgical patients directly from the OR and there are typically 2-5 cardiac surgeries performed each weekday.

Project Implementation

This DNP project was intended to gather data, evaluate, and revise a newly implemented handoff checklist in the CVICU. The development of the handoff tool was completed in May 2021 and was implemented in June 2021. The project, along with a brief education session about the importance of the handoff process, was presented to the CVICU on November 8, 2021, and the anesthesia department on November 10, 2021. The subjects were informed that participation was voluntary and refusal to participate or stopping participation would not result in a penalty or loss of benefits. A novel survey created by this PI was used for this QI project. The surveys were left on the units and were available for six weeks. On December 20, 2020, the surveys were gathered, and the data was analyzed. The completed surveys were kept in a locked drop box in the CVICU and anesthesia departments. Based on the results found, a revised handoff tool was submitted to the CVICU to allow for the revision of the current tool.

Instrument

The novel survey developed by the PI contained 18 questions; 14 quantitative Likert-style questions and four qualitative, open-ended questions (see Appendix B). The questions were designed to evaluate the frequency of handoff tool utilization and to measure categories including satisfaction with the handoff checklist, report completeness, report adequacy, report clarity, handoff efficiency, omitted information, and provider satisfaction with the transfer of care process. The survey assesses user perception of report thoroughness, and inquires if the standardized handoff tool resulted in fewer omissions of pertinent information and errors in communication. The survey examined user perception of efficiency, asking providers to reveal if the handoff tool decreased the amount of time that handoff report took, if the tool contained too

much information, and if the tool resulted in the receiving nurse feeling more prepared to care for the patient at the time of receipt. The four qualitative questions were designed to address what strategies could increase the use of the handoff sheet during report, if there were any relevant data missing or the report sheet contained unnecessary information, and communication barriers to an improved handoff experience.

Data Analysis

The project will analyze the post-implementation survey data using descriptive statistics. Ordinal level quantitative data will be analyzed by cumulative frequency. Central tendency, including mode and mean, will be evaluated. The qualitative data will be analyzed for any themes that may help improve the handoff process and identify communication barriers and facilitators.

Results

The sample size for this project was 21 out of 90 possible participants, netting a 23.3% response rate. The demographic data collected in the first two items included in the survey were current HCP position and years of experience (Table 1). Of the 20 responses, 85% reported using the tool frequently or always (Table 2).

Table 1

Participants Characteristics

Position	n	Years of Experience	n
CRNA	7	1-5 Years	12
RN	6	6-10 Years	6
No Answer	8	10+ Years	1
		No Answer	2

Table 2

Frequencies and Percentages of Handoff Use by CRNA (n=7)/ RN (n=6)/No Role Reported (n=8), Total Responses (n=21)

	Always n (100%)	Frequently n (67-99%)	Sometimes n (34-66%)	Rarely n (1-33%)	Never n (0%)
CRNA	5 (71.4%)	2 (28.6%)	0	0	0
RN	0	2 (33.3%)	3 (50%)	0	0
No Role reported	6 (74%)	2 (25%)	0	0	0
Total	11 (55%)	6 (30%)	3 (15%)	0	0

The primary aim of this project was to measure provider satisfaction with the post-cardiac surgery handoff tool and subsequent handoff communication. Overall, 64.7% of participants said they were either satisfied or very satisfied with the handoff tool and 70.6% reported being satisfied or very satisfied with handoff communication. For the following Likert-style questions, agree or strongly disagree was considered a positive response. Findings included: improved handoff clarity (85.7%), receiving RN's perception of being better prepared to care for patients (80%), increased handoff efficiency (61.9%), decreased omissions (76.2%), decreased communication errors (57.1%), and 76.5% felt the handoff report was comprehensive when using the tool (Table 3). For the question about time spent during report, 38.1% said handoff time decreased while 23.8% reported an increase.

Table 3

Number and Percentages of Likert Category Responses

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
2. Does not follow how I am used to giving report	4 (19%)	9 (42.9%)	5 (23.8%)	2 (9.5%)	1 (4.8%)
3. Checklist takes too much time	6 (28.6%)	10 (47.6%)	3 (14.3%)	2 (9.5%)	0
4. Contains too much information	3 (14.3%)	8 (38.1%)	3 (14.3%)	7 (33.3%)	0
5. Colleagues do not use the checklist (n=20)	2 (10%)	5 (25%)	12 (60%)	1 (5%)	0
6. Decreased number of communication errors	0	0	9 (42.9%)	10 (47.6%)	2 (9.5%)
7. Increased handoff efficiency	1 (4.8%)	2 (9.5%)	5 (23.8%)	10 (47.6%)	3 (14.3%)
8. Decreased handoff time	1 (4.8%)	4 (19%)	8 (38.1%)	6 (28.6%)	2 (9.5%)
9. Improved clarity	0	1 (4.8%)	2 (9.5%)	13 (61.9%)	5 (23.8%)
10. Decreased omissions	0	1 (4.8%)	4 (19%)	9 (42.9%)	7 (33.3%)
11. Handoff is consistent and complete (n=17)	0	2 (11.8%)	2 (11.8%)	9 (52.9%)	4 (23.5%)
12. Better prepared to care for patient (RN only) (n=5)	0	0	1 (20%)	3 (60%)	1 (20%)
	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
13. Handoff tool (n=17)	5 (29.4%)	6 (35.3%)	2 (11.8%)	4 (23.5%)	0
14. Handoff communication (n=17)	3 (17.6%)	9 (52.9%)	4 (23.5%)	1 (5.9%)	0

The highest percentage of dissatisfaction with both the handoff tool (42.9%) and communication (14.3%) was from the CRNA group (Tables 4 and 5). Four participants did not answer the two questions directly addressing provider satisfaction, including three RNs and one from the group that did not identify their role. However, the three RNs who did reported 100% satisfaction with both the tool and communication.

Table 4

Frequencies and Percentages of Handoff Tool Satisfaction by CRNA (n=7)/ RN (n=3)/No Role Reported (n=7)/ Total Responses (n=17)

	Satisfied	Neutral	Not Satisfied
CRNA	4 (57.1%)	0	3 (42.9%)
RN	3 (100%)	0	0
No Role reported	4 (57.1%)	2 (28.6%)	1 (14.3%)
Total	11 (64.7%)	2 (11.8%)	4 (23.5%)

Table 5

Frequencies and Percentages of Handoff Communication Satisfaction by CRNA (n=7)/ RN (n=3)/ No Role Reported (n=7)/ Total Responses (n=17)

	Satisfied	Neutral	Not Satisfied
CRNA	5 (71.4%)	1 (14.3%)	1 (14.3%)
RN	3 (100%)	0	0
No Role reported	4 (57.1%)	3 (42.9%)	0
Total	12 (70.6%)	4 (23.5%)	1 (5.9%)

To further address satisfaction the survey included qualitative questions. Question 15 inquired if there were any suggestions as to what could be done to increase utilization of the handoff tool. A common response was it would be used if the CRNA brought the form. Items 16 and 17 assessed barriers and modifications that could improve patient handoff. The survey yielded common themes including the following: 1.) suggestions of less noise; 2.) consistent cardiac

surgeon presence during report; and 3.) an additional area on the handoff sheet for pre-op cardiac output and index.

Discussion

The lack of standardization for handoff between the OR and CVICU compromises the quality and continuity of care patients receive; the post-implementation survey was developed to assess this problem and improve the handoff tool and communication between care teams. Transitions in care between departments can lead to increased and unnecessary costs, and inefficiency. Based on the survey responses indicating an increase in handoff efficiency and only a small percentage reporting the handoff checklist takes too much time or contains too much information, the handoff tool has shown to increase efficiency.

Studies have shown that erroneous, avoidable mistakes occur during transitions due to poor communication between care providers (Usher et. al, 2016). Achieving ideal communication requires a standardized handoff tool that is utilized consistently. To that end, the survey determined the handoff tool was utilized frequently. The use of the handoff tool also led to decreased omissions of important patient information, a decrease in communication errors, and to a thorough handoff report which would indicate the handoff tool improved handoff communication. Additionally, most CVICU-RNs felt better prepared to care for the patient when the tool was used which could indicate that using the tool leads to better patient outcomes.

Although 85% of respondents said they used the handoff tool frequently or always, the tool was intended to be used with every patient handoff. Utilization of the handoff tool could be limited by the lack of standardized training surrounding the use of the tool during patient handoff between the OR and the CVICU nurse. Blazin et al. (2020) report that approximately 4,000 transitions of care or handoffs occur per day, but few providers have received formal training or

education on effective handoff communication. Dedicating resources to standardized training for use of the tool and proper handoff could yield greater utilization of the tool and participation in the survey. Another factor decreasing utilization may be the media used. Hard copies of the handoff tool are kept in the operating rooms for CRNAs to fill out and bring to be used during the transfer of care. Therefore, use of the handoff tool by the CVICU-RN is dependent on the anesthesia provider. Filling out a handoff sheet filled with different data when the CRNA must either have committed to memory or find in multiple locations within the electronic health record (EHR) while caring for the patient can lead to errors and omissions and compromise patient safety. This is especially true in the case of cardiac surgery, where major hemodynamic changes can happen rapidly.

Limitations

The generalizability of this QI initiative is limited by the small sample size, unique patient population, and project/survey design. Of the 90 possible participants, 23.3% completed the survey. More than one-third of the sample (n=8) chose not to divulge their role, which makes an accurate breakdown of satisfaction by role problematic. Additionally, 19% (n=4) did not answer the two questions regarding satisfaction which further dilutes the results of this QI project. The cardiac surgical patient population is unique with limited diversity in illness and has a specific care protocol. This QI project was completed using a PI-created survey and the validity and reliability have not been proven. Since baseline provider satisfaction data was not obtained, measuring the degree of change in provider satisfaction was not possible. Therefore, only descriptive statistics of the data gathered were performed. Improvement in patient outcomes was not assessed or linked to the implementation of the handoff tool and was beyond the scope of this

QI project, but large, multicenter studies have concluded that the implementation of a handoff tool leads to a reduction in medical errors and improved patient outcomes.

Recommendations

To glean a better representation of provider satisfaction and handoff tool utilization, a project with a larger sample size and ensuring the participant role is identified would be beneficial in comparing satisfaction between groups. Measures to improve handoff communication should be focused on adopting a structured process and adapting this process across all handoff settings to minimize errors during transitions of care. Standardized training to increase familiarity with the handoff tool and the handoff process is also recommended. Additional research is needed in the CVICU to evaluate the impact of the new handoff tool on patient outcomes and patient safety. Further research analyzing provider satisfaction, error reduction, and patient outcomes with a handoff tool that is electronic versus a paper handoff tool should be considered. If all the information on the form was compiled from the electronic health record and a new electronic form within the chart was created, the sheet could be viewed by both the CRNA and CVICU-RN.

Continued research assessing the various handoff tools and their impact on patient outcomes, patient safety, and error reduction should be pursued with the goal of universalization of a standard tool and the development of a handoff protocol, although there is no consensus to which methodology is best.

Conclusion

This project aimed to assess provider satisfaction with both the handoff checklist and communication as well as provide recommendations for improving the tool. The project aims

were achieved, and identification of barriers and recommendations were provided to the CVICU and anesthesia departments. The post-implementation survey revealed providers were satisfied with the tool and handoff communication. Utilization of the tool was high but could be increased with the recommended changes. Improving the handoff tool to improve utilization will improve provider satisfaction and ultimately patient outcomes.

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APPENDIX A

Handoff Tool

CVOR to CVICU Handoff (proposed form)

1. **INTRODUCTIONS** (all team members present)
2. **PATIENT IDENTIFICATION** (Verify Name band & allergies)
3. **INFECTION PRECAUTIONS** no / yes _____
4. **PROCEDURE DETAILS** (Described by CRNA or surgeon) elective/ urgent on / off pump

5. **MEDICAL HISTORY** _____

6. **INTRAOPERATIVE COURSE** (Intubation/ ventilation / monitoring/ lines) _____

7. **STATUS POST CPB**

Pacing?	Yes /no	Underlying Rhythm			
Drips:					
TEE findings post			Estimated EF%		
CO/CI	/	PA Measurement	Pre:	Post:	Last BG/Time /
Last Fentanyl		Last Versed			Last Paralytic
Last Hgb/Time	/	Prior Plavix w/o washout		Yes/No	
PRBC's		FFP		Platelets	Cell Saver
Albumin		EBL		UOP	IVF

8. **CVOR NURSING / PERFUSION ISSUES/ INCREASE RISK FOR ANTICIPATED EVENTS / COMPLICATIONS** (graft/valve, PTX, tamponade, hemostasis, AKI, arrhythmias, stroke, vasoplegia)

9. **READBACK OF OUTSTANDING ISSUES CRNA/BEDSIDE RN and QUESTIONS**

DISCUSS WHEN MD @BEDSIDE

10. **EARLY EXTUBATION CANDIDATE** (input here from MD) YES / NO if no please indicate reason: Complicated OR / Poor general status / difficult airway /Respiratory compromise/ Other

11. **OTHER ISSUES FROM THE MD/ANESTHESIOLOGIST**

Please print name legibly for F/U to improve process as we go

Staff giving report _____ Staff receiving report _____

APPENDIX B

Survey Tool

Postoperative Cardiac Surgery Handoff Satisfaction Survey

Position: CRNA / RN

Years of Experience in Current Position: 1-5 6-10 11+

	Never (0%)	Rarely (1-33%)	Sometimes (34-66%)	Frequently (67-99%)	Always (100%)
1. I use the cardiac surgery checklist for handoff.					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
2. The cardiac surgery checklist does not follow how I am used to getting handoff report.					
3. Using the cardiac surgery checklist takes too much time.					
4. The cardiac surgery checklist contains too much information.					
5. My colleagues do not use the cardiac surgery checklist.					
6. The use of the cardiac surgery checklist has decreased the amount of communication errors during patient handoff between anesthesia and postoperative care providers.					
7. The use of the cardiac surgery checklist has increased handoff efficiency between anesthesia and postoperative care providers.					
8. The use of the cardiac surgery checklist during handoff has decreased the amount of time taken to complete the handoff process.					
9. The use of the cardiac surgery checklist has improved the clarity of communication during handoff.					
10. The use of the cardiac surgery checklist has decreased the omission of pertinent patient information during handoff report.					

11. The new handoff format between providers is standardized, consistent, and complete. (If you disagree, please comment below.)					
12. I am better prepared to care for my patient after handoff when using the cardiac surgery checklist (RNs ONLY)					
	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
13. How satisfied are you with the cardiac surgery handoff checklist?					
14. How satisfied are you with handoff communication since the implementation of the cardiac surgery handoff checklist?					

15. What would increase the utilization of the cardiac handoff checklist?

16. Is there anything you feel needs to be added, removed, or changed to the standardized handoff form to make it better?

17. Are there other communications barriers that occur during the handoff period that are not addressed by the cardiac surgery checklist (environment, noise pollution, etc.)?

18. Are there any additional comments or suggestions you would like to contribute?