

DEVELOPMENT, IMPLEMENTATION, AND EVALUATION OF A STANDARDIZED  
HAND-OFF COMMUNICATION TOOL AT CHILDREN'S HOSPITAL OF MICHIGAN

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A doctoral research project submitted in partial fulfillment of  
the requirements for the degree of

DOCTOR OF NURSING PRACTICE

2022

Oakland University  
Rochester, Michigan

## ACKNOWLEDGMENTS

The authors would like to acknowledge the following for their contributions to this quality improvement project:

Primary investigator, Dr. Dominik Choromanski, MD, for your support and guidance through this project.

Our CRNA champion, Santina Marras, MS, CRNA, for your due diligence, dedication, and passion for this project.

Project chair, Dr. Anne Hranchook, for all your support, hard – work, and commitment for this project.

DEDICATION

We dedicate this to our families, The Baldes and the Thurmans, for always believing and supporting us through this program.

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### **Abstract**

Poorly communicated information during postoperative patient hand-offs can result in medical errors that compromise patient safety. Applying a standardized communication hand-off tool encourages consistency and accuracy during transfer of patient information, subsequently reducing communication failures that are associated with preventable medical errors. The aim of this evidence-based quality improvement project was to design and apply a standardized hand-off tool for use between Certified Registered Nurse Anesthetists (CRNAs), Pediatric Anesthesia Fellows, Anesthesiologists, and Pediatric Intensive Care Unit (PICU) Fellows and RNs at Children's Hospital of Michigan. The tool was developed in collaboration with an interprofessional team and incorporated input obtained from a pre-intervention survey that the stakeholders identified as critical to communicate during transfer of care for their patient population. The communication tool was piloted for one month following which a post-intervention survey was administered to assess the perceptions of the CRNAs, Pediatric Anesthesia Fellows, Anesthesiologists, and PICU Fellows and RNs regarding the tool's use and functionality. The tool was modified according to this input and is under consideration for permanent adoption by Children's Hospital of Michigan.

*Keywords:* Communication, transfer of care, certified registered nurse anesthetist, standardized hand-offs, anesthesia, pediatric

Development, Implementation, and Evaluation of a Standardized Hand-off Communication Tool  
at Children's Hospital of Michigan

Communication between Certified Registered Nurse Anesthetists (CRNAs), Pediatric Anesthesia Fellows, Anesthesiologists, and Pediatric Intensive Care Unit (PICU) Fellows and RNs in the post anesthesia recovery unit is key to the continuity and safety of patient care delivery. Important data points have been known to be lost with inadequate transfer of responsibility through verbal handoff (Street et al., 2011). Communication failure in patient handoff represents a common source of sentinel events (Chapman et al., 2016). The Joint Commission (2017) continues to list improving the effectiveness of communication among caregivers as a National Patient Safety Goal. The Joint Commission (2017) defines a hand-off as follows:

*... the transfer and acceptance of patient care responsibility achieved through effective communication. It is a real time process of passing patient specific information from one caregiver to another for the purpose of ensuring the continuity and safety of the patient's care.*

Effective communication is essential for patient hand-offs because it conveys the optimal, continued responsibility of patients and has a direct impact on clinical decision-making. The standardization of handoff may increase nurse satisfaction, which will benefit nurse-patient and nurse-peer communications (Chapman et. al, 2016).

### **Background**

In their 2017 sentinel event alert publication, the Joint Commission noted that communication failures were responsible for 30 percent of all malpractice claims, which resulted in 1,744 deaths and costs around 1.7 billion dollars over a five-year period (Joint Commission,

2017). While in the hospital, nurses have the most contact with patients, making accurate communication and delivery of information critical with a direct impact on patient outcomes. Studies have shown that the use of a standardized hand-off resulted in a significant reduction in preventable adverse events by 30% and medical errors by 20% (Starmer et al., 2014). Additional research found that children experience 70,000 adverse events annually, of which 60% were preventable (Gampetro et al., 2021). The pediatric population is vulnerable because of their immature physiology and developmental limitations which inhibit their ability to advocate for themselves.

### **Practice Gap**

After meeting with Children's Hospital of Michigan (CHM) clinical coordinator, it was discovered that currently there is not a standardized hand-off communication tool used between the CRNAs and the PICU. The current practice includes paper charting and oral hand-offs. The gap in practice identified is the inconsistency in hand-off reports between anesthesia providers and the PICU. The lack of a standardized hand-off tool and resulting potential for gaps in communication during the hand-off process leads to increased patient vulnerability to safety issues. Applying evidence-based communication methods may result in improved patient care. Formality and consistency of handoffs may further enhance patient outcomes as well as nurse satisfaction.

### **Purpose**

The aim of this DNP Project was to develop and evaluate a standardized hand-off tool in collaboration with and for use by CRNAs, Pediatric Anesthesia Fellows, Anesthesiologist, PICU Fellows and RNs during handoff in the pediatric intensive care unit.



### **PICOT Question**

The PICOT question for this evidence-based practice quality improvement project was: Will the development and implementation of a standardized hand-off tool for use between CRNAs, Pediatric Anesthesia Fellows, Anesthesiologists, PICU Fellows and RNs at CHM result in improved quality and continuity of transfer of care information and team satisfaction with the transfer of care process?

### **Review of Literature**

A search of the literature was conducted to identify articles that applied standardized hand-off procedures between anesthesia and the recovery room or intensive care. Search terms included: hand-offs, hand-off, handoff, adverse events, communication, transfer of care, preventable events, anesthesia, and critical care. Professional practice guidelines from the Joint Commission and the AORN were also included. These terms were entered in PubMed, CINAHL, and Cochrane databases. The inclusion criteria included literature published within the last ten years, subjects focused on hand-offs and anesthesia, preventable errors, communication, transfer of care and critical care. Articles were excluded if they did not include the perioperative period. A total of 113 articles were identified, and 22 articles best answered the clinical question.

### **Benefits of Structured Hand - Offs**

The benefits of standardized hand-offs include enhance communication between healthcare professionals by increasing accuracy, decreasing the omission of information, reducing the reliance on memory and recall, setting guidelines for required content, and ensuring important content is covered (Krimminger et al. 2018; Leonardsen et al. 2019; Starmer et al. 2014). Standardized hand-offs also support the development of employee teamwork, accountability, rapid determination of a patient's condition, surroundings, and treatment, which

facilitates identification of medication errors, prevents patient falls, and provides the opportunity for nurses to recognize a change in a patient's clinical status (Boshart, Knowlton, & Whichello, 2016). It has been shown that the consistency and standardization of the bedside report prevented communication failure (Bigani & Correia, 2018; Boshart et al., 2016; Elgin & Poston, 2019; Tan, 2015). Standardized hand-off is also viewed as beneficial to patients and their families. Having open communication with hand-off reports allows patients to feel more secure and comfortable, less anxious, and more likely to comply with management (Tan, 2015). They also promote patient care by improving skin integrity, plan of care, code status, updates of care, and checking patient identifiers compliance significantly (Faloon et al., 2018).

### **Efficiency of Written and Electronic Checklists**

Verbal hand – offs require the speaker to recall patient information from memory. In addition to verbal communication, using written or electronic checklists optimizes the quality of the transferring of patient information from one healthcare provider to the next. Checklists enable the speaker to focus on what is essential to communicate while decreasing the amount of information that may be forgotten with the use of a verbal hand – off only.

A study completed by Jullia et al. (2017) stated written checklists help standardized oral communication and decrease the loss of patient information. This study was completed in Ontario, Canada and consisted of a 1- hour training sessions for CRNAs and anesthesia residents to introduce an intraoperative handoff checklist. This checklist was laminated and displayed inside the operating rooms to be utilized when hand – off reports occur from within the operating room. Their results showed the intraoperative written checklist improved communication during anesthesia handovers by 43% and provider satisfaction with the checklist at 68%. They concluded that checklists can be effective communication tools.

Smith et al. (2018) conducted a mixed – methods study at a Midwestern health center regarding the implementation of a written admission hand-off template to supplement verbal hand – offs in patients being admitted from the emergency room. Prior to this study there was no standardized verbal or written hand-off process. The researchers evaluated post – intervention surveys with efficiency and patient safety as the focus. They concluded that most emergency physicians and internal medicine physicians felt using the tool had a positive impact on efficiency and patient safety compared to previous hand-off strategies. Therefore, the introduction of a standardized hand – off process improved the quality of verbal hand – offs.

A study by Gleicher et al., (2017), performed an interventional time-series QI study over a 4-month period at an adult cardiac center with a total of 37 observed handovers. A protocol using a standardized handover tool was developed using quality improvement methodologies. The protocol included a handover with content checklist and the introduction of a formal ‘sterile cockpit’ timeout. Implementation of the protocol was refined using monthly iterative Plan-Do-Study-Act. The primary outcome was the quality of handoffs, which were measured by a Handover Score, comprising handover content, teamwork and patient care planning indicators. The secondary outcomes included handover duration such as handover duration, adherence to the standardized handover protocol and handover team satisfaction surveys. Thirty-seven handovers were observed (6 pre-interventional and 31 post-interventional). The mean handover score increased (6.5 to 14.0 with a maximum of 18 points). Specific improvements, however, included fewer handover interruptions and more frequent postoperative patient care planning. An average handover duration increased slightly (2:40 minutes to 2:57 minutes). Caregivers noted improvements in teamwork, content received and patient care planning. The majority (> 95%) agreed that the intervention was a valuable addition to their operating room and unit. The

implementation of the standardized handover protocol for the postcardiac surgery patient was associated with fewer interruptions during handover, more reliable transfer of critical content and overall, improved patient care planning.

Starmer et al. (2013) conducted a prospective intervention study of 1,255 patient admissions (642 before and 613 after the intervention) involving 84 resident physicians (42 before and 42 after the intervention) from July-September 2009 and November 2009-January 2010 on 2 inpatient units at Boston Children's Hospital. The intervention consisted of a "Resident handoff bundle" of standardized communication and handoff training, a verbal mnemonic, and a new team handoff structure. On one unit, a computerized handoff tool linked to the electronic medical record was introduced. The results were that medical errors decreased from 33.8 per 100 admissions to 18.3 per 100 admissions and preventable adverse events decreased from 3.3 per 100 admissions to 1.5 per 100 admissions. There were fewer omissions of "key" handoff elements on printed handoff documents, especially on the unit that received the computerized handoff tool (significant reductions of omissions in 11 of 14 categories with computerized tool: significant reductions in 2 of 14 categories without computerized tool). The study concluded that the implementation of a handoff bundle was associated with a significant reduction in medical errors and preventable adverse events among hospitalized children.

Salzwedel et al. (2013) performed a randomized controlled trial with hypothesis that using checklist between anesthesiologist and the post anesthesia care provider during handoff will increase the amount of information transmitted during patient handover after anesthesia. A video recording of a total of 120 handovers was analyzed. Prior to the incorporation of the checklist, 40 handovers were implemented, then 80 handovers were implemented post checklist. There was randomization of two groups: one with a checklist and one without a checklist.

Specific information and the time used to give handovers were analyzed. The results were that with the use of a written checklist- the overall items handed over increased significantly (median score of 32.4 - 48.7%). The duration of the handover increased (median score of 86 – 121 seconds. This study concluded that the use of a checklist for post anesthesia handovers may improve the quality of patient handovers, by increasing information given during the handover and ultimately improving patient care.

Saxena et al. (2020) performed a systematic review to assess the current literature on perioperative routines and crisis checklists. The articles used in this study did not have a data limitation and included articles until March of 2019. There was a combination of data from individualized studies and quantitative meta-analysis. The data represents was by means of a qualitative comparison with the reference groups based on a content analysis approach. A total of 874 articles were identified only 25 were included in their review Most of the identified studies (23.92%) showed that the use of the checklist in anesthesia did the following: decreased human error, improved patient safety and teamwork, and increased equality of care. The reference of the WHO surgical time out, anesthesia specific checklists have been shown to be effective for providers handoffs, in emergencies, and during routine anesthesia procedures. The limitation that was discovered during this study is lack of literature on anesthesia specific checklists exist. The recommendation of more large-scale studies is necessary to identify an ‘ideal’ anesthesia checklist and its most appropriate implementation method.

### **Healthcare Provider Satisfaction**

At a hospital in Jordan, Dalky, Al – Jaradeen, and AbuAlRrub (2020) evaluated the implementation of a Situation–Background–Assessment–Recommendation (SBAR) communication tool among intensive care unit (ICU) and critical care unit (CCU) nurses. A pre-

and posttest quasi – experimental design was used which included 71 nurses who participated in this study. They measured the effectiveness of the SBAR implementation using a 43 – itemed questionnaire with the following factors: job satisfaction, general relationship and communication, teamwork, and leadership. Their results showed a significant improvement in posttest scores when compared to the pretest scores in both “satisfaction” ( $p < .01$ ) and “general relationships and communication” ( $p < .001$ ). The authors concluded that with the complexity of ICU patients, patient information cannot be transferred without a comprehensive and effective tool such as SBAR. The SBAR instrument allows nurses to provide a short, organized, and complete communication tool to convey patient information in a timely manner, thus ensuring safer and high-quality patient care. Therefore, a standardized hand-off tool, such as SBAR enhances RNs satisfaction and promotes further benefits in caring for patients.

Ting, Peng, Lin, and Hsaio (2017) conducted a study at a medical center in Taiwan, evaluating SBAR on safety attitudes among nurses in an obstetrics department. The study consisted of obstetric nurses applying the SBAR technique when reporting abnormal fetal heartbeat tracing. Pre- and postintervention safety attitude questionnaires were evaluated with the following variables scored: teamwork climate, safety climate, job satisfaction, stress recognition, perception of management, and working conditions. Their results showed a significant improvement between pre – versus post surveys with the following top variables: job satisfaction ( $p .002$ ), teamwork climate ( $p < .002$ ), safety climate ( $p < .01$ ), and working conditions ( $p < .02$ ). They concluded that with the application of SBAR, nurses can organize their findings and develop concise patient reports. Structured communication techniques can enhance nurses’ confidence when relaying patient information to physicians, thus improving job satisfaction, working conditions, and patient safety.

At a pediatric hospital in California, Caruso et al. (2015) carried out a prospective cohort study to determine whether the use of the standardized hand-off, Illness severity, Patient summary, Action list, Situation awareness and contingency planning, Synthesis by Receiver (I – PASS), would increase the transfer of patient information without prolonging the duration during operating room to post -anesthesia unit (PACU) patient transfer of care. The data of their study included the amount of patient information referred to, hand – off duration, provider presence, and nurse satisfaction. The results included an increase in transferred information from 49% to 83% ( $p < .0001$ ), total satisfaction score increased from 36 to 44 ( $p = .004$ ), and number of questions asked by the PACU RN increased from 1.1 to 1.8 questions per hand – off ( $p < .001$ ). Caruso et al. (2015) concluded that a standardized, team approach to these hand – offs increase patient information communicated, PACU RN satisfaction, and did not increase hand – off duration.

A quality improvement study was carried out at a 39 – bed neonatal intensive care unit (NICU) with the aim of decreasing the number of avoidable interruptions during provider hand – off at shift change with the implementation of NICU I – PASS. With a total of 14 pre – implementation surveys and 12 post – implementations surveys evaluated, their results exhibited a decrease of 87% of avoidable interruptions per hand – off, hand – off duration time decreasing to 38%, and an increase in provider satisfaction with the quality of the hand – offs ( $p = .049$ ). Cardona, LaBadie, Cooperberg, Zubrow, and Touch (2020) concluded that with the application of a uniform hand–off process there was a sustained reduction in avoidable interruptions as well as reducing the duration and enhancing provider satisfaction. It is also important to note that the key drivers for their success included the engagement of the providers.

Turner et al. (2018) evaluated the use of a hand – off checklist for patient transferring from the operating room to the medical – surgical ICU. Their study consisted of 112 participants, which included: ICU physicians, nurses, surgical team physicians, and allied health professionals. The results of their study showed significant improvements in healthcare providers' satisfaction with postop hand – off communication to the ICU ( $p < .001$ ), postop hand – offs ( $p < .001$ ), and understanding the postop plan ( $p < .001$ ). They concluded that the use of a hand – off checklist significantly increased providers satisfaction, daily ICU and surgery communication, and an overall better understanding of the plan of patient care.

Lambert and Adams conducted a quality improvement study to improve the quality of anesthesia handoffs in the operating room and PACU. The authors of the study created their own handoff tool, “The Written Handoff Anesthesia Tool” (WHAT), performed a survey to evaluate CRNAs and PACU RNs satisfaction with anesthesia handoffs and a Target Solutions Tool (TST) to identify the adequacy, contributing factors, and specific patient data omitted by senders of anesthesia handoff before and after the implementation of their WHAT. The primary purpose of this study was to identify barriers and omissions in anesthesia handoffs between CRNAs and PACU RNs and between CRNAs for breaks and case relief before and after implementation of a standardized format.

Two separate tools were used both before and after implementation of their study. The Anesthesia Handoff Communication (AHC) and the TST, which is offered by the Joint Commission Center for Transforming Healthcare. A survey was generated by Qualtrics and distributed to all participants who met their inclusion criteria and consented to participate. The TST was used to measure and analyze the current handoff process, identify reasons for



inadequate handoffs and methods to improve the handoff process. Reevaluation of the process occurred as corrective measures were implemented.

The study was conducted in 2016 between September and November, in a 350-bed hospital in the Southeastern United States. Sample size consisted of 22 CRNAs and 15 PACU RNs. Sampling was done by convenience. All CRNAs and PACU RNs were included in the implementation of the WHAT as well as pre-and post-data collection using the TST forms. The actual sample size for the TST forms was 446. The TST program results showed improvement in the defective rate for both CRNA-to-PACU RN and CRNA-to-CRNA handoffs. At baseline 60.7% of the CRNA-to-PACU RN anesthesia handoff communications were rated as defective. After implementation of the WHAT, only 36.4% were rated as defective. The CRNA-to CRNA handoff communication baseline defective rate was 59.5% and the postimplementation defective rate was 10%, which showed an 83% improvement after the implementation of the WHAT.

Implementation of the WHAT resulted in the handoff process significantly improving for CRNA-to-PACU RN ( $p < 0.001$ ) and CRNA-to-CRNA ( $p < 0.001$ ) handoffs. The satisfaction with anesthesia handoff significantly improved for CRNAs ( $p < 0.001$ ) and PACU RNs ( $p = 0.001$ ). Contributing factors to inadequate handoffs and omitted patient information were identified and significantly improved for CRNA-to-PACU RN and CRNA -to-CRNA handoffs: ineffective method ( $p < 0.001$ ;  $p < 0.001$ ), baseline vital signs ( $p = 0.009$ ;  $p = 0.014$ ), and preoperative neurologic status ( $p = 0.12$ ;  $p = 0.004$ ). Statistically significant improvement was obtained for 12 of the 23 patient details for CRNA-to-PACU RN handoffs and 17 of 21 for CRNA-to-CRNA handoffs.

Benton, Hueckel, Taicher, and Muckler (2019) conducted a quality improvement project using a preexisting tool, I-PASS hand-off form. I-PASS hand-off is a mnemonic base tool, which

has been associated with a reduction in adverse events and improvement in information transfer as well as nurse satisfaction. An electronic form of the I-PASS handoff tool was adopted by the operating room to the neuro ICU. A total of 38 handoffs were observed and are estimated to occur as often as one to six times within an 8-hour period, depending on the caseload.

Participants were asked in person to participate in a survey of current handoff process (Neuro ICU and NPs n =12). To ensure all pertinent information relevant to the handoff tool or procedure was gathered, all neuro ICU nurses, and NPs (n =34) were also asked to fill out an electronic survey to evaluate the current handoff process. The use of the I-PASS hand-off form was evaluated with the USE questionnaire, and participants' perception of the current handoff procedure was evaluated using a survey questionnaire modeled from previously published satisfaction surveys. Responses from the survey and USE questionnaire were assessed using a 5-point Likert scale.

A total of 16 providers from the receiving and sending teams completed the usability assessment of the postoperative I-PASS hand-off form. All 16 participants answered all five knowledge-based questions correctly, suggesting that the information was accurately transferred from the participants' perspective.

Participants agreed/strongly that the I-PASS hand-off form helped them to be more effective, with 68.8% who agreed/strongly that the handoff form was useful. Most of the participants (75%) agreed/strongly agreed that it worked the way they wanted it to work. Participants were asked in the end to list the positive and negative aspects of the handoff form. The most frequently reported positive feature of the handoff form was the customization, which allowed the provider to enter texts or select certain information to auto populate. Participants also rated the handoff form to be easy to use and learn. Some participants (most of the neuro ICU

nurses and NPs) perceived the current postoperative handoff procedure to provide insufficient information sometime/very often. During the requirements/information gathering phase, results from the survey data suggest that distractions very often disrupt handoffs. Overall results of this study showed that participants viewed postoperative IPASS handoff form to be easy to use (87.5%), satisfactory (75.0%) and user friendly (75.0%).

Shah, Oh, Xue, Lang and Nair (2016) conducted a pilot observational study auditing handoffs against a pre-existing checklist evaluating information reporting and attendee participation to standardize the handover process and quickly identify handoff-related errors. The development and use of a novel electronic anesthetic information transfer tool (T2) were used for the transfer of information for intubated patients for cardiothoracic service cardiothoracic intensive care unit and other surgical services surgical intensive care unit to the ICU from the operating room. A single two item survey regarding frequency of use and helpfulness of T2 was separately distributed to all anesthesia providers, surgery residents, and attending physicians, as well as all ICU personnel engaging in the ICU transfer-of-care. A total of 26 handoffs, 12 during pre-interventions (no T2 used) and 14 during post-intervention (T2 used) were observed.

Results showed a moderate improvement in the discussion of the intraoperative anesthetic plan, medications, blood products, and intraoperative laboratory results with the post-implementation group. A similar increase in reporting airway concerns, antibiotics administration, and fluid losses was observed when using T2 tool. Apart from the wound management plan (for which the discussion is typically led by the surgery team), the reporting rates for all items pertaining to their current patient status were greater than 50 percent when using the T2 tool.

At 6 months postimplementation, the T2 was utilized at least once by 79 of the 162 respondents (49%). A significantly greater proportion of anesthesiologist reported use of the T2 compared to the remainder of the cohort (68% vs 41.5%;  $p = < 0.05$ ). The “Resident” role, from both department’s anesthesia and ICU care teams, reported the highest frequency use of the T2 template. The “ICU Nurse” role was associated with the largest number of survey responses ( $n = 43$ ). Only 20 respondents (47%) reported using the T2, while 10 respondents (23%) were not familiar with the tool at all. The majority of the users reported using the T2 at least once also rated the tool as being at least “somewhat helpful” (77 of 79 users; 97.5%). All but one respondent with the “ICU Nurse” job title found the T2 to be “very helpful” (19 of 20 users; 95.0%).

Canale (2018), conducted an evidence-based practice improvement project to implement a standardized handoff to improve the quality and continuity of the transfer of information, perceptions of patient safety, and healthcare worker satisfaction. Twenty CRNAs were selected to create a Team Strategies to Enhance Performance and Patient Safety (TeamSTEPPS) change team. Sample size consisted of the 20 CRNAs involved in transfer of care process of an anesthetized patient in the perioperative department of an 800-bed regional medical center in West Central Florida. A pretest/posttest survey was administered. Items modified to address the indicators of the project more closely: continuity and quality of transfer of information, perioperative staff satisfaction, and perioperative staff perception of patient safety.

The project was conducted through a series of scheduled face-to-face meetings and supplemental follow-up emails. Education of the change team, modification, adoption and implementation of a standardized handoff procedure in the perioperative setting was used in the TeamSTEPPS model. The TeamSTEPPS change team began four weeks after the sample of the

twenty CRNAs was selected. The CRNAs were given 72 hours to complete the anonymous pre-intervention survey two weeks before beginning education of the team and complete anonymously the post-intervention survey within 72 hours after the standardized handoff was implemented for a period of two weeks.

Results from this study, 6% of the 20 CRNAs ( $n = 1$ ) reported performing 6 or more standardized handoffs during the 2 weeks prior to the intervention, 72% of CRNAs ( $n = 13$ ) reported that they performed a standardized handoff at least 6 times, and as many as 15 times or more, during the 2 weeks following the intervention. No CRNAs strongly agreed with being satisfied with the handoff process before the intervention, but 50% ( $n = 9$ ) strongly agreed with being satisfied with the transfer process after the intervention. More than half, 67% ( $n = 12$ ) CRNAs reported that they disagreed or strongly disagreed with the handoff process being appropriate before the intervention, only 6% ( $n = 1$ ) reported disagreeing or strongly disagreeing that the handoff process was appropriate following the implementation of the standardized process. Ninety-five percent of CRNAs surveyed ( $n = 17$ ) agreed or strongly agreed that the preintervention handoff process lent itself to mistakes, whereas only 11% of CRNAs surveyed ( $n = 2$ ) agreed or strongly agreed that the standardized handoff process lent itself to mistakes. More than half of the CRNAs, 78% ( $n = 14$ ) of CRNAs disagreed or strongly disagreed that the handoff process was comprehensive before the intervention, 6% ( $n = 1$ ) disagreed or strongly disagreed that the standardized process was comprehensive. Finally, whereas 67% ( $n = 12$ ) disagreed or strongly disagreed that the preintervention handoff process was effective for transferring important information, 6% ( $n = 1$ ) disagreed or strongly disagreed that the standardized handoff process provided for effective transfer of important information. Preintervention and postintervention survey data were analyzed using a paired T test with a range

of  $P < 0.0001$  to  $0.0003$ , demonstrated statistically significant improvements in the quality and continuity of the transfer of information, perceptions of patient safety and healthcare worker satisfaction.

Suzanne Wright, CRNA, PhD, author of “Examining Transfer of Care Processes in Nurse Anesthesia Practice: Introducing the PATIENT Protocol”, described a 2-phase study to examine current transfer of care practices of CRNAs as they manage patients during the intraoperative period (2013). She developed, implemented, and evaluated a communication checklist tool designed to enhance situational awareness (SA), thereby improving the quality and effectiveness of the anesthesia transfer of care. In the first phase of the study, the development and electronic mailing of a questionnaire pertaining to transfer of care practices was conducted. The second phase, a transfer of care checklist based on the results of the phase 1 survey was developed.

The phase 1 questionnaire was sent to 1,000 CRNAs practicing throughout the United States. The sample was derived from a population of CRNAs who were active members of the Virginia Association of Nurse Anesthetists in Richmond. The most important factors to communicate when transferring care of an anesthetized patient from one anesthesia provider to another, characteristics of transfer of a transfer of care process that would most likely lead to them to adopt such a change in practice, and barriers that would most likely prevent them adopting a systematic transfer of care process were ranked. A phase 2 prototype of the checklist tools was established as a consensus from a panel of experts and was used as a guideline for the pilot tested. A mnemonic strategy PATIENT (Patient/Position/Procedure, Airway/Antibiotics/Anesthesia/Allergies, Temperature, Intravenous & Intake/Output, End-tidal carbon dioxide, Narcotics, Twitches) was incorporated to improve the utility of the tool. The

pilot group was a convenience sample of 74 CRNAs providing anesthesia in operating suites at each of the 2 large community hospitals and 1 large teaching hospital in central Virginia.

The test was performed over a two-week testing period at each location. The results from phase 1 was 302 of the 1,000 CRNAs responded (30.2%). Most subjects responded that they currently did not have a systemic process for communicating vital information during the transfer of care event ( $n = 220$ , 72.8%). Many respondents used SBAR (situation, background, assessment, and recommendation) as their method of transferring care ( $n = 9$ , 11%). Respondents were asked what barriers would hinder them from adopting a standardized format of transferring of care information, the answer was “no barriers were perceived if it improved their practice and promoted patient safety” ( $n = 248$ , 82.1%). The most frequently reported barrier to adopting a systemic transfer of care process was that “not every anesthesia provider would comply unless the process was made to be a standard of care” ( $n = 33$ , 60%).

The results from phase 2 with the development and evaluation of the PATIENT checklist tool. PATIENT was chosen in consideration of the IOM’s acknowledgment of patient centeredness as 1 of the 6 dimensions of healthcare is likely to reduce cost and improve quality. The survey was completed by 30 of the 74 enrolled subjects, yielding a response rate of 40.5%. Four CRNAs (13.3%) responded they did not use the check list at all relating to not having the opportunity to do so ( $n = 2$ ) or they forgot to use it ( $n = 2$ ). Seventeen CRNAs (56.7%) indicated they used the checklist 1 to 5 times, 5 (16.7%) used the process 6 to 10 times, 1 (3.3%) used it 11 to 15 times, and 3 (10%) used the process more than 15 times. Thirty respondents, 87% ( $n = 14$ ) agreed or strongly agreed that they liked the idea of adopting a standardized transfer of care process when giving or receiving an anesthetized patient. When evaluating the PATIENT tool itself, 90% ( $n = 27$ ) of respondents believed that both the length and scope of content were

appropriate and that the tool “lent itself to memory”. All respondents either agreed ( $n=18$ ) or strongly agreed ( $n=12$ ) that the PATIENT checklist tool provided an effective way of organizing important information.

### **Theoretical Framework**

This project was guided using Imogene’s King’s Theory of Conceptual System and Goal Attainment (King, 1981). King’s theory was first introduced in the 1960s. This model focuses on attaining certain life goals for the patient and the nurse. There is a direct relationship between the nurse and patient, therefore, communication of information, setting goals together and then taking the correct actions to accomplish those goals is the main aim (King, 1981). The theory has an interpersonal system that requires the concepts of communication, interaction, role, stress, and transaction. King’s theory provides the framework for the authors of this project to develop, introduce, and standardize a consistent handoff communication tool between the anesthesia department and the PICU.

King has interrelated the concepts of interaction, perception, communication, transaction, self, role, stress, growth and development, time and space into a theory of goal attainment (Gonzalo, 2021; King, 1981). Standardizing the transfer of care process will improve communication and thus patient safety. According to King’s theory, nursing is a process of action, reaction, and interaction whereby nurse clients share information about their perceptions. The goal of the standardized handoff tool will allow the anesthesia department and the PICU staff to share pertinent information that is consistent, therefore promoting a mutual goal of satisfaction.

King’s Conceptual System and Theory of Goal attainment model is “based on an overall assumption that the focus of nursing is human beings interacting with their environment, leading



to a state of health for individuals, which is an ability to function in social roles” (Gonzalo, 2021). The interpersonal system is an ongoing dynamic process with one individual affecting another in certain situations in the environment (Johnson, 2016, p. 5). An example of an interpersonal system is the anesthesia providers transporting patients from the operating room (OR) to the PICU, using a standardized handoff tool to transfer patient information to the PICU nurse.

King emphasizes the nursing process in her model with the steps of the nursing process being assessment, nursing diagnosis, planning, implementation and evaluation. The theory of goal attainment and the nursing process is central to the design of this project. Identifying the need for a standardized handoff tool for the transfer of care in the PICU led to the initiative to develop a transfer of care tool. Collaboration and planning between the anesthesia team and PICU staff will be facilitated by use of a standardization handoff tool which may limit error and maximize effective communication. Implementation of the created tool from pre survey questions will help assist with the structure and consistency of the communication. Evaluation of the effectiveness of the newly developed handoff tool and measurement of satisfaction with the tool, will hopefully result in permanent adoption that may lead to improved patient outcomes.

This project focuses on King’s interpersonal system approach to attain the goal of favorable usage of a consistent communication handoff tool. A standardized handoff tool may assist participants in maintaining consistency, structure and the conveying of pertinent information, resulting in low risk of error and nurse satisfaction.

## **Methods and Procedures**

### **Project Design and Approvals**

This EBP quality improvement DNP Project used a pretest/posttest quality improvement design. It follows the Plan Do Study Act (PDSA) model to test change that is implemented. The nursing theoretical framework applied to this project is Imogene's King's Theory of Conceptual System and Goal Attainment. This project was reviewed by Wayne State's Institutional Review Board. On January 7, 2022 this DNP Project was deemed to not constitute human subjects research and therefore did not require IRB review or oversight (Appendix XX).

According to the Institute for Healthcare Improvement (2021), PDSA is an instrument to assist in process improvement and document a test of change. There is one cycle per each individual test of change, each cycle consisting of:

Plan – an idea developed to test change

Do – implementing the change

Study – assessing and evaluating the consequences

Act – determining what modifications should be made to the original idea

The application of the PDSA model for this DNP Project is discussed further under the section heading “intervention”.

### **Sample and Setting**

The project site was the Children's Hospital of Michigan (CHM) located in Detroit, Michigan. Children's Hospital of Michigan is a part of the Detroit Medical Center and contains 228 beds. They specialized in children and adolescents and train more pediatricians than any other hospital in the state. Participants included CHM CRNAs, Pediatric Anesthesia Fellows,

Anesthesiologists, PICU RNs and PICU Fellows that were willing to participate in the project currently employed at CHM.

### **Key Personnel and Stakeholders**

Key personnel include the authors, Isabela Balde, RN, SRNA, Nicole Thurman, RN, SRNA, the CHM Chief CRNA, anesthesiologist hand – off champion, Dr. Dominick Choromanski, and the CHM PICU RN Manager. The stakeholders include CRNAs, PICU RNs, PICU and Anesthesia Fellows as well as the pediatric patients and their families at CHM.

### **Recruitment Strategy and Data Collection Procedures**

A convenience sample was recruited via email solicitation of CRNAs, Pediatric Anesthesia Fellows, Anesthesiologists, PICU RNs and PICU Fellows working at CHM. The Pediatric Anesthesia Clinical Research Coordinator, PICU Manager and PICU Fellowship Coordinator assisted in distribution of the emails which included an embedded link to the surveys launched through Qualtrics. The pre-intervention survey was distributed on January 29<sup>th</sup>, 2022 and remained open for 1 month. The post-implementation survey was distributed on July 6<sup>th</sup>, 2022 and was available for a period of 3 weeks. Dr. Choromanski contacted the PICU manager and PICU Fellows Coordinator to encourage participation in the surveys and use of the handoff tool once implemented. Department meetings were also held to raise awareness and educate CRNAs and anesthesiologists about the QI project goals.

### **Instruments**

The pre-intervention and post-intervention surveys employ a mixed method and are an adaption of several instruments published in the literature for examining transfer of care processes in nurse anesthesia practice. The pre-intervention survey consists of 4 categorical questions, 3 multiple choice items, and 4 open ended questions (see Appendix A). The post-

intervention survey consists of 1 categorical item, 5 Likert scale items and 4 open ended questions (see Appendix B).

### **Intervention**

The intervention followed the PDSA framework. This quality improvement method consists of working in a team to identify a plan for improvement, testing change, collecting and analyzing data to understand the problem and identify if change or progress occurred. This DNP Project underwent 2 PDSA cycles which included a pre-intervention stage and a post-intervention stage.

The pre-intervention stage consisted of identifying an inter-professional team of stakeholders to assist in developing, implementing and evaluating a standardized hand-off tool. The post-intervention stage included launching a survey to evaluate participant satisfaction and perceptions of the tool's functionality and effectiveness in assisting with providing a consistent, thorough transfer of care communication. The data from the second survey will guide future revisions to the hand-off tool. The entire PDSA cycle is presented as follows:

### **PDSA Cycle I**

The "Plan" phase includes identifying a team, developing a problem statement, determining a goal for improvement and a plan for how to measure if progress or change occurred. The planning phase began in August of 2021 and ran through January of 2022. From August of 2021 through October of 2021, we identified an inter-professional team of CRNAs, Anesthesiologists, and Oakland University faculty and developed the following problem statement:

*CHM currently uses paper charting and oral hand-offs between the Anesthesia*

*Department and the Pediatric Intensive Care Unit. The lack of a standardized hand-off*

*tool for use during transfer of care between anesthesia and the PICU has the potential for allowing gaps in communication that may result in preventable errors.*

From October 2021 to January 2022, we collaborated with the team to develop a pre – and post interventional survey to assess the practice concern and evaluate progress after implementation of a new handoff tool. As part of this process, we submitted an application to Wayne State’s IRB and a Quality Improvement proposal to CHM Pediatric Research Coordinator. The IRB submission was deemed “not research” and the proposal was approved.

The “Do” phase occurred between February and April of 2022 and involved carrying out the plan. The pre-intervention survey was launched via internal email distribution and coordinated by the Pediatric Research Coordinator. Data was collected for a period of one month via Qualtrics®, a web – based software platform.

The “Study” phase occurred between April and May of 2022. The Study phase consisted of analyzing the data obtained from the pre-interventional survey using IBM SPSS® statistical software. A combination of descriptive statistics were used to analyze quantitative data and a qualitative approach was used to identify themes from the open-ended responses.

The “Act” phase started May of 2022. The data from the pre-interventional survey was used in combination with the expertise of the inter-professional team to develop a new hand-off tool for use by CHM for transfer of care communication between the anesthesia department and the PICU. The new tool was modeled after a combination of hand-off tools proposed by the team and found in the literature. The final tool that was developed incorporates “SBAR” which provides a common and predictable structure to communication (Müller et al., 2018). “SBAR” stands for:

Situation - what is going on with the patient?

Background - what is the clinical background, or context?

Assessment - what do I think the problems/issues are?

Recommendation - what is the “big picture” and thinking ahead to plan and discuss contingencies.

The new hand – off tool was launched and trialed at CHM from June 1<sup>st</sup> until June 30<sup>th</sup>, 2022. During this time, the anesthesiologist on our team held department meetings where he introduced the new tool and visited PICU and anesthesia personnel to encourage use of the tool.

### **PDSA Cycle II**

PDSA Cycle II began with the launch of the post-interventional survey on July 8<sup>th</sup>, 2022. The process to launch the post-interventional surveys was identical to the process outlined earlier for the pre-interventional surveys. To date, 7 participants have taken the survey. Preliminary data was shared with the department of anesthesia and the inter-professional team on July 20<sup>th</sup>, 2022 at a department meeting. Data from this survey and feedback from the inter-professional team will be used to make any further changes to the hand-off tool.

### **Data Analysis**

Data obtained through categorical and Likert-type questions from pre-intervention and pos-interventional surveys were analyzed using IBM® SPSS® data software. A descriptive analysis of survey responses was conducted. In addition, thematic analysis of free-text responses was conducted to identify themes that emerged from relevant patterns and trends.

### **Benefit Cost Analysis**

The Benefit – Cost Ratio (BCR) is the ratio of the present value of benefits to the present value of costs. It can be measured in monetary or qualitative terms. The ratio should be greater

than 1.0 for a project to be considered viable (Investopedia, 2022  
<https://www.investopedia.com/terms/b/bcr.asp>).

The projected benefit-cost analysis was calculated using data available online regarding the annual surgical volume at CHM (*Pediatric surgery: Children's hospital of Michigan*, 2022), the current average CRNA average hourly rate in Michigan (2022) and the estimated cost for printing paper in hospitals ((Haefner, 2018)). The time savings per handoff is an estimate and will need to be verified in future analysis. The estimated BCR for this project was over 200 times the acceptable minimum value of 1.0 and thus demonstrates the potential for the new handoff tool to be of great value to CHM and thus be a sustainable practice change.

Table I. Benefit Cost Ratio CHM Handoff Tool

Benefits	Calculation	
A. Reduction in time spent during handoff	minutes X annual cases X CRNA hourly rate/min	5 min X 14,000 surgeries annually = 70,000 minutes X \$1.58/min = \$110,600
B. Reduction in number of follow up calls to clarify missed information	minutes X annual cases X CRNA hourly rate/min	5 min X 10% of all handoffs = 1400 X 5 = 7,000 minutes X \$1.58 = \$11,060
C. Reduction in cost of medical errors due to missed information	hospital data not available for closed claims	unknown
<b>I. Total benefits from A + B + C</b>		<b>\$121660 *</b>
Costs		
Printing of handoff tool	cost per printed sheet X 14,000 surgeries annually	0.04 cents X 14,000 = \$560
<b>II. Total costs</b>		<b>\$560</b>
<b>Benefit/cost ratio</b>	<b>I / II</b>	<b>217.25</b>

## Evaluation

This evidence-based quality improvement project was evaluated using the PDSA model using data collected via a post-implementation survey and through feedback provided during the

dissemination of the project at CHM on July 20, 2022. Evaluation data is presented in the results section of this paper.

## **Results**

### **Pre-intervention Survey**

A total of 44 participants responded to the pre-interventional survey. This included: 10 Anesthesiologists, 7 CRNAs, 24 PICU RNs, 2 Pediatric Fellows, and 1 PICU Fellow. Of those responding, 38% worked at CHM for 5 years or less and 34% worked more than 36 hours per week.

Those surveyed were asked if they are currently using a standardized process for handoff. The majority (72%) answered that they were not. When presented with 10 potential characteristics of a hand-off tool and asked which would make them most likely to adopt it, those responding chose utility (15.7%), improves patient safety (14.3%), organized (13.9%), purposeful (12.1%), and provides a quick orientation to the ongoing case and patient condition (12.1%) as the most important.

When asked what barriers would prevent respondents from adopting a hand-off tool, the majority (59%) said “none of the above – I am willing to adopt”. Other barriers identified included that the hand-off tool would take too long to fill out or take the providers attention away from the patient. See Figure I. below.



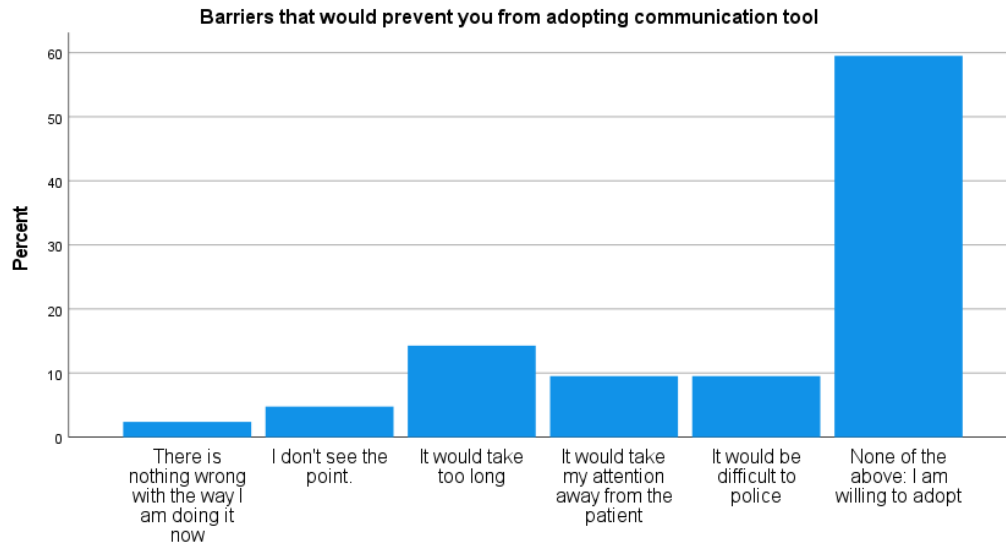


Figure I. Barriers to Adoption of Hand-off Tool

Those surveyed felt that the most important things to communicate during a hand-off included the following: information about ventilatory status, fluid administration, urine output, blood loss, patient history, allergies, IV access, lines, level of difficulty with ventilation/intubation and the type of procedure.

An open-ended question asked participants to suggest characteristics of a transfer of care process not already identified that might lead them to adopt a standardized hand-off tool. Several themes emerged: efficiency, time and multidisciplinary approach.

### **Post-Intervention Survey**

A total of 6 participants responded to the post-interventional survey. Of those responding, 3 had used the hand-off tool 1- 5 times, 1 had used it 6-10 times and 2 had not used it during the transfer of care process. Participants were asked to respond to five questions regarding their perceptions of the new tool using a Likert scale where 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree table. Results are depicted in Table II below.

Table II. Post-intervention User Opinions about New Hand-off Tool

Question	Minimum	Maximum	Mean	Std Deviation
I like the idea of adopting a standardized transfer of care process for use intraoperatively when giving/receiving report of an anesthetized patient.	1	4	3	1
The length of the standardized hand - off tool is appropriate.	2	4	3.2	0.75
The standardized tool hand - off tool lends itself to memory.	3	4	3.6	0.49
The standardized hand-off is comprehensive.	3	4	3.8	0.4
The standardized hand - off provides an effective way of organizing vital information.	3	4	3.6	0.49

Respondents were asked to briefly describe any positive aspects of the using the new hand-off tool. Those that responded (5) stated that the tool incorporated important information needed by the PICU, was easy to use and facilitated the transfer of care process and made the process more organized and comprehensive. One respondent reported that they were less likely to forget something when reporting off using the new tool.

Those surveyed that used the tool over the trial period were also asked for suggestions for improvement. Three providers responded. The following table summarizes the open-ended responses.

Table III. Post-intervention Survey Suggestions for Improvement

Suggestions for Improving Hand-off Tool
Too long
Not enough line space to write X 2
Some pre-op information is redundant and takes too long to enter X 2
Include an area for a patient ID sticker versus filling out by hand

Those surveyed were also asked if anything else should be added or deleted from the hand-off tool. Two respondents replied. One wrote that the tool was good and comprehensive as it was. The second wrote that there should be more basic information added such as if the airway was easy or difficult to manage.

### **Discussion**

The findings from this quality improvement project reveal that the anesthesia department and PICU team members were willing to adopt this change. Although 72 % indicated that they were not currently using a standardized hand-off process for transfer of care between anesthesia and the PICU, 59% responded that they would be willing to adopt a new process and that they did not feel there were any barriers to doing so.

There was also a willingness to adopt change at CHM. This was evident in the engagement demonstrated by the inter-professional team that we worked with to develop and conduct this project. Dr. Choromanski M.D. and Santina Marras, MS, CRNA, were true champions for change. They assisted the authors in gaining support for every aspect of this project. They assisted in reviewing IRB applications, reviewing the surveys, developing the hand-off tool, distributing the surveys and educating the departments involved. It was very evident they wanted to see this important change become a reality.

The pre-intervention survey results assisted the inter-professional team with the development of the new hand-off tool. The hand-off tool included all items identified by respondents such as fluid administration, urine output, blood loss, patient history, allergies, IV access, lines, airway, and the type of procedure. Although we included 2 lines for pre-procedure and post procedure airway information, the post-intervention

survey respondents want us to add more detail on whether the airway was difficult or easy to manage (i.e. difficult/easy intubation).

The themes identified in the pre-intervention survey included the need for the new hand-off tool to be efficient, not take long to complete or use, and be designed for a multidisciplinary approach. Although we had a low response rate for the post-intervention survey, we learned that some felt the hand-off tool was too long and others felt that the amount of space provided to record information was not enough. The hand-off tool will need to be modified to address these concerns and be re-assessed for improvement.

When asked on the pre-intervention survey what characteristics would most likely promote adoption, those responding chose utility (15.7%), improves patient safety (14.3%), organized (13.9%), purposeful (12.1%), and provides a quick orientation to the ongoing case and patient condition (12.1%) as most important. Although the post-intervention survey indicates there is room for improvement, the new tool does meet many of these important characteristics. The tool design is modeled after “SBAR” (Situation, Background, Assessment, Recommendation). It is a communication method that helps provide essential, concise information, usually during crucial situations and provides focused and concise information (Müller et al, 2018).

### **Limitations**

There were limitations identified for this quality improvement DNP Project. These include the following: the sample size was small, the project involved a single institution, there was uneven participation among survey respondents (RN, CRNA, anesthesiologist ect), there

was a time constraint limiting the amount of time for piloting the hand – tool, and the number of respondents for the post-intervention survey was very low as a result of the latter limitation.

### Barriers

Some of the barriers experienced included obtaining IRB approval and working virtually during the COVID pandemic. The IRB application and approval process at CHM goes through Wayne State. As a result of the COVID pandemic, many studies that were under review were delayed and new applications for review were put on hold. In addition, the authors had to conduct all communication virtually which added to the challenge of working in an intra-professional team and moving through the process. Additional challenges resulted being the project took over a year to complete. During that time, there was turnover of IRB Directors, managers and staff. We were fortunate to work with an anesthesiologist (Dr. Choromanki, M.D.) and CRNA champion (Santina Marras, MS, CRNA) that helped us to get through these processes.

### Conclusion

The Joint Commission established that communication failures were responsible for 30 percent of all malpractice claims, resulting in 1,744 deaths and 1.7 billion dollars spent over a five-year period (Joint Commission, 2017). Despite the requirements and recommendations previously discussed, there are many areas within healthcare that need to develop and adopt a systematic process for hand-off of care of patients. This EBP quality improvement project demonstrated that the quality of transfer of information, perceptions of patient safety, and healthcare worker satisfaction improved at CHM through the implementation of a standardized transfer of care hand-off tool. Further work is needed to revise the tool based on post-intervention survey data and to finalize approvals to make this change permanent.

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**Appendix A - Pre – intervention Survey**

1. What is your specialty?
  - a. Anesthesiologist
  - b. CRNA
  - c. PICU RN
  - d. Pediatric Anesthesia Fellow
  
2. How long have you been working at Children’s Hospital of Michigan or how long in their profession?
  - a. 0-5 years
  - b. 6 –10 years
  - c. 11 –15 years
  - d. 16 –20 years
  - e. 21 –25 years
  - f. 26 – 30 years
  - g. 31-35 years
  - h. Over 35 years
  
3. On average, how many hours per week do you provide care at CHM in the department of anesthesia
  - a. Less than 36 hours
  - b. More than 36 hours
  
4. Are you currently using a systemic process for communicating vital information during the transfer of care event (e.g. when one anesthesia provider relieves another anesthesia provider for a break or end of shift?)
  1. Yes
  2. No

5. If so, please describe.
6. Please choose what you feel to be the 7 most important factors to communicate when transferring care of an anesthetized patient from one anesthesia provider to another.
  - a. Patient medical/surgical history
  - b. Procedure
  - c. Allergies
  - d. Status of paralysis (e.g. train of four)
  - e. Information about narcotics that have been administered/narcotics left to be accounted for
  - f. Information about ventilatory status (PIP, ETCO<sub>2</sub>, LMA vs ETT, ventilation mode, etc)
  - g. IV access and other invasive lines
  - h. Fluid administration/urine output/blood loss
  - i. Information about temperature; warming or cooling the patient
  - j. Information on level of difficulty of ventilation/intubation
  - k. Information on antibiotic administration
  - l. Information of antiemetic administration
  - m. Information on type of anesthetic (inhalation vs IV)
7. Please suggest any “other” information you feel would be important to include in the anesthesia transfer of care event.
8. Which characteristics of a transfer of care process would most likely lead you to adopt such a change in practice? (Choose all that apply).
  - a. Brevity
  - b. Purposeful
  - c. Utility (easy to use)
  - d. Organized (organizes salient elements of the case for easy retrieval)
  - e. Comprehensive
  - f. Conducive to memory
  - g. Has a written component
  - h. Improves patient safety

- i. Encourages proper reconciliation of controlled substances
  - j. Provides quick orientation to the ongoing case and patient condition
9. Please suggest any “other” characteristics of transfer of care process that might lead you to adopt such a change in practice.
10. What barriers would most likely prevent you from adopting a systematic transfer of care process?
- a. There is nothing wrong with the way I am doing it now.
  - b. I don’t see the point.
  - c. It would take too long.
  - d. It would take my attention away from the patient.
  - e. It would be difficult to police.
  - f. None of the above; I would be willing to adopt a systematic approach to transferring care if it improved my practice and promoted patient safety.
11. Please suggest any “other” barriers you feel would prevent you from adopting a systematic process for the transfer of care event in nurse anesthesia.

**Appendix B - Post – intervention Survey**

1. Over the past 2 weeks, how many times did you use, to some extent, the standardized tool as your transfer of care process intraoperatively when either giving or receiving report of an anesthetized patient?
  - a. 0
  - b. 1 – 5
  - c. 6 – 10
  - d. 11 – 15
  - e. 15+
  
2. I like the idea of adopting a standardized transfer of care process for use intraoperatively when giving/receiving report of an anesthetized patient.
  - a. Strongly Disagree
  - b. Agree
  - c. Disagree
  - d. Strongly Agree
  
3. The length of the [standardized tool] checklist is appropriate.
  - a. Strongly Disagree
  - b. Agree
  - c. Disagree
  - d. Strongly Agree
  
4. The [standardized tool] checklist lends itself to memory.
  - a. Strongly Disagree
  - b. Agree

- c. Disagree
  - d. Strongly Agree
5. The [standardized tool] checklist is comprehensive
- a. Strongly Disagree
  - b. Agree
  - c. Disagree
  - d. Strongly Agree
6. The [standardized tool] checklist provides an effective way of organizing vital information.
- a. Strongly Disagree
  - b. Agree
  - c. Disagree
  - d. Strongly Agree
7. If you have used the [standardized tool] transfer of care process in the past \_\_\_ weeks/month, please briefly describe any positive aspects of the process.
8. If you have used the [standardized tool] transfer of care process in the past \_\_\_ weeks/month, please provide suggestions for improvement/barriers to use.
9. Was there anything else that should be added? Deleted?
10. If you have chosen not to use the [standardized tool] transfer of care process over the past 2weeks, please explain.
11. Additional Comments:



<b>Appendix C – Literature Review Matrix</b>					
Author (Year)	Design Method	Level of Hierarchy	Setting/Sample	Results	Discussion/Conclusion
Benton, Heuckel, Taicher, Muckler, (2019)	<p>Quality improvement</p> <p>Aim: To enhance usability at the neuro ICU, the IPASS handoff form was adapted for postoperative use using an iterative approach over a series of four phases as described by: requirements/information gathering, adaptation/development, evaluation and modification, and usability testing.</p>	Level 5	<p>IPASS tool</p> <p>Setting: Neuro ICU 32-bed department</p> <p>September – November 2016</p> <p>All Neuro ICU nurses and NPs</p> <p>CRNA – to-PACU RNs &amp; CRNA – to CRNA were senders &amp; receivers</p> <p>38 handoffs to be observed</p> <p>Targeted Solutions Tool (TST) used to determine whether anesthesia handoffs were perceived as adequate and to</p>	<p>the handoff process significantly improving for CRNA-to-PACU RN (P &lt; 0.001) and CRNA-to-CRNA (P &lt;0.001) handoffs.</p> <p>The satisfaction with anesthesia handoff significantly improved for CRNAs (P &lt; 0.001) and PACU RNs (P= 0.001).</p> <p>Contributing factors to inadequate handoffs and omitted patient information were identified and significantly improved for CRNA-to-PACU RN and CRNA -to-CRNA handoffs: ineffective method (P &lt; 0.001; P &lt; 0.001), baseline vital signs (P= 0.009; P = 0.014), and preoperative neurologic status (P= 0.12; P = 0.004).</p>	<p>Standardized handoffs has resulted in improved adequacy of anesthesia handoff communication.</p> <p>The results of this study demonstrate the use of a written tool significantly improved the adequacy and completeness of anesthesia handoff communication between CRNAs and PACU RNs and among CRNAs after development and implementation of a structured format – the WHAT.</p> <p>Limitations of this study included a sample of convenience, the use of one facility, and a possible Hawthorne effect from participants’ awareness of being evaluated.</p>

			<p>identify the factors contributing to inadequate handoffs and patient details omitted.</p> <p>Pre and Post test survey</p>	<p>Statistically significant improvement was obtained for 12 of the 23 patient details for CRNA-to-PACU RN handoffs and 17 of 21 for CRNA-to-CRNA handoffs.</p>	
Canale (2018)	<p>Evidence-based practice improvement project</p> <p>Aim: To implement a standardized handoff to improve the quality and continuity of the transfer of information, perceptions of patient safety, and healthcare worker satisfaction.</p>	Level 5	<p>TeamSTEPPS change team</p> <p>Setting: 800-bed regional medical center in West Central Florida.</p> <p>Team members agreed to adopt the modified PATIENT mnemonic for use as the designated standardized handoff tool for the transfer of care of the perioperative anesthetized patients at their hospital.</p> <p>A follow up email was sent</p>	<p>Preintervention and postintervention survey data were analyzed using paired t test with a range of <math>P &lt; 0.0001</math> to <math>0.0003</math>, demonstrating statistically significant improvements in the quality and continuity of the transfer of information, perceptions of patient safety, and healthcare worker satisfaction.</p> <p>No CRNAs strongly agreed with being satisfied with the handoff process before the intervention, but 50% (<math>n = 9</math>) strongly agreed with being satisfied with the transfer process after the intervention.</p>	<p>The paired t test indicated statistically significant improvement when comparing participants' pre and postintervention handoff procedures.</p> <p>The greatest improvements made by the change team were related to the number of standardized handoffs performed and whether the CRNA believed that the handoff process lent itself to mistakes.</p> <p>The standardized handoff tool was easy to modify and adopt, and simple to use.</p> <p>Following the conclusion of the this project, the author was approached by the operating room nurses and anesthesiologists, and was solicited for direction on how they too could learn more about the standardized handoff themselves.</p>

			<p>to introduce the new modified “PATIENT” handoff, and participants were instructed to begin using it.</p> <p>Implementation of newly modified and adopted standardized handoff tool TeamSTEPPs change team began 4 weeks after the sample of 20 CRNAs were selected.</p> <p>CRNAs given 72 hours to complete anonymous postintervention survey withing a 72-hour window after the standardized handoff was implemented for a period of 2 weeks.</p> <p>20 CRNAs</p>	<p>More than half, 67% (n = 12) CRNAs reported that they disagreed or strongly disagreed with the handoff process being appropriate before the intervention, only 6% (n =1) reported disagreeing or strongly disagreeing that the handoff process was appropriate following the implementation of the standardized process.</p> <p>Ninety-five percent of CRNAs surveyed (n = 17) agreed or strongly agreed that the preintervention handoff process lent itself to mistakes, whereas only 11% of CRNAs surveyed (n =2) agreed or strongly agreed that the standardized handoff process lent itself to mistakes.</p> <p>More than half of the CRNAs, 78% (n = 14) of CRNAs disagreed or strongly disagreed that the handoff process was comprehensive before</p>	<p>The greatest areas of improvement were noted in the increased number of standardized handoffs performed following the intervention and a reduction in tendency of the handoff to lend itself to mistakes following the intervention.</p> <p>Limitations: This is a perception of improvement; a direct impact on reduction of errors or near-misses could not be measured, and this project evaluated the end-users’ perception of patient safety.</p> <p>One barrier of this quality improvement project was difficulty coordinating schedules of a large anesthesia personnel from one facility to meet at the same time.</p>
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			Pre & post intervention handoff procedures	the intervention, 6% (n = 1) disagreed or strongly disagreed that the standardized process was comprehensive.	
Dalky, Al – Jaradeen, Fawzi, AbulAIRrub (2020)	Quasi – experimental  Purpose: to evaluate SBAR among ICU RNs	Level 5	Setting: Jordanian ICU/CCU floors  71 nurses pre and post	Significant improvement in “relationships and communication” and “satisfaction” (p<.001, p< .01)	Shortlisted and focused SHO enhances RNS satisfaction and promotes further benefits in caring for patients  The sensitivity of ICU patients information cannot be transferred without comprehensive and effective communication using SBAR  ICU RNs need short, organized, complete tool to transfer patient information in a timely manner, thus ensuring safer and higher quality of care  Can lead to increased patient satisfaction and quality of care
Jullia et al. (2017)	Hypothesis: improve communication in the OR w/ checklist	Level 5	January – May 2016	43% increase in communication scored items in the OR	<30% anesthesia prviders stated they already used a handover checklist before the study  This study found the same as the literature, that a checklist protocol can increase provider satisfaction  Checklists can be effective communication tools
Lambert & Adams (2018)	Quality improvement	Level 5	WHAT tool	A total of 16 providers from the receiving and	Most of the neuro ICU RNs and NPs perceived the current postoperative

	<p>Aim: Primary purpose to identify barriers and omissions in anesthesia handoffs between CRNA and PACU RNs &amp; between CRNAs for breaks and case relief before and after implementation of a standardized format Written Handoff Anesthesia Tool (WHAT). Secondary purpose, to improve CRNAs and PACU RNs perception and satisfaction with anesthesia handoff communication.</p>		<p>Setting: 350-bed level IV NICU in Southeastern U. S.</p> <p>August – October 2017</p> <p>USE questionnaire evaluated the IPASS handoff</p> <p>All ICU RNs and NPs (n = 34)</p>	<p>sending teams completed the usability assessment of the postoperative IPASS handoff form.</p> <p>This project show that participants viewed the postoperative IPASS handoff form to be easy to use (87.5%), satisfactory (75.0%), and user-friendly (75.0%).</p> <p>Participants agreed/strongly that the I-PASS hand-off form helped them to be more effective, with 68.8% who agreed/strongly that the handoff form was useful.</p>	<p>handoff procedure to sometimes/very often provide insufficient information, with the most of the participants having to call the provider to seek additional information or look elsewhere for the information.</p> <p>A limitation of this QI project includes its small sample size. Four rather than the recommended five senders participated in the usability test.</p>
<p>Ting, Peng, Lin, Hsiao (2017)</p>	<p>Evaluate SBAR on safety attitudes in the obstetrics department</p>	<p>Level 5</p>	<p>Setting: medical center in Taiwan</p> <p>29 pre surveys 34 1<sup>st</sup> post surveys 33 2<sup>nd</sup> post surveys</p> <p>February 2012 to March 2015</p>	<p>Most ratings in the categories of teamwork climate, safety climate, job satisfaction, and working conditions improved</p>	<p>SBAR can assist nurses organize their findings and make concise reports thus improving patient safety</p> <p>Structured communications improve nurses' confidence when relaying information of obstetricians</p> <p>Improved job satisfaction and working conditions</p>

Turner et al. (2018)	<p>Mixed – methods pre and postintervention survey</p> <p>Evaluate checklist handover for postop patients to the ICU</p> <p>Evaluate daily communication tool between general surgery and ICU providers</p>	Level 5	<p>Setting: medical – surgical ICU</p> <p>112 participants</p> <p>Handover checklist</p>	<p>Significant improvements:</p> <p>Satisfaction of HCP w/ postop hand – off communication to ICU (p &lt; .001)</p> <p>Postop hand-off (p &lt; .001)</p> <p>Understanding the postop plan (p &lt; .001)</p>	Significantly increased satisfaction among HCP regarding postop hand - off, daily ICU and surgery communication, and overall understanding of plan of patient care
Saxena, Krombach, Nahrwold, Pirracchio (2020)	Systematic review	Level 5	25 articles	15 out 17 studies on routine checklists reported them beneficial	<p>Checklists have been shown to facilitate teamwork and communication</p> <p>Routine checklists were found to be effective</p> <p>Increases of information exchange between HCPs</p> <p>Crisis checklists improved performance</p> <p>Checklists have the ability to decrease human error, improve teamwork, and increase quality of care</p>
Shah, Oh, Xue, Lang, & Nair, (2016)	<p>Pilot observational study</p> <p>Purpose: Auditing handovers [handoffs] against a</p>	Level 5	Setting: An academic medical center from October 27 – December 12 2014	A moderate improvement in the discussion of the intraoperative anesthetic plan, medications, blood	The pilot investigation revealed that overall quality of handoff, in terms of information exchange, was improved when using T2 tool in conjunction with the pre-existing checklist.

	<p>pre-existing checklist evaluating information reporting and attendee participation to standardize the handover process and quickly identify handoff-related errors.</p>		<p>Transferring of care from the OR to ICU</p> <p>Transfer tool (T2) was piloted to facilitate transfer of care of intubated surgery patients in an ICU for cardiothoracic service (CTICU) and other surgical services (SICU).</p> <p>A single two-item survey regarding frequency of use and helpfulness of T2 was distributed to all anesthesia providers, surgery residents, and</p>	<p>products (or lack thereof), and intraoperative laboratory results with the post-implementation group. A similar increase in reporting airway concerns, antibiotics administration, and fluid losses (i.e. urine output and blood loss) was observed when using T2 tool. With the exception of the wound management plan (for which the discussion is typically led by the surgery team), the reporting rates for all items pertaining to their current patient status were greater than 50 percent when using the T2 tool.</p> <p>At 6 months postimplementation, the T2 was utilized at least once by 79 of the 162 respondents</p>	<p>Quantitative improvements were mostly observed in reporting of elements related to anesthesia course and patient status.</p>
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			<p>attending physicians, as well as all ICU personnel during the time period of July 1 2015 – August 1 2015.</p> <p>2 question survey was posed to obtain subjective measure of comfort and satisfaction of the using T2 by the end-user.</p>	<p>(49%). A significantly greater proportion of anesthesiologist reported use of the T2 compared to the remainder of the cohort (68% vs 41.5%; <math>p = &lt; 0.05</math>). The “Resident” role, from both departments anesthesia and ICU care teams, reported the highest frequency use of the T2 template.</p> <p>The “ICU Nurse” role was associated with the largest number of survey responses (<math>n = 43</math>). Only 20 respondents (47%) reported using the T2, while 10 respondents (23%) were not familiar with the tool at all. The majority of the users reported using the T2 at least once also rated the tool as being at least “somewhat helpful”</p>	
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				<p>(77 of 79 users; 97.5%).</p> <p>All but one respondent with the “ICU Nurse” job title found the T2 to be “very helpful” (19 of 20 users; 95.0%).</p>	
<p>Wright et al. (2013)</p>	<p>A nonexperimental exploratory study with a purpose to (1) examine current transfer of care practices of CRNAs during intraoperative period (2) develop, implement, and evaluate a communication checklist tool designed to improve situation awareness.</p>	<p>Level 5</p>	<p>Setting: sample derived from a population of CRNAs- active members in Virginia Association of Nurse Anesthetists in Richmond.</p> <p>Questionnaire of 10 items</p> <p>Convenience sample of 74 CRNAs</p> <p>2 large community hospitals and 1 large teaching hospital in</p>	<p>Phase 1: Characteristics identified as most likely to lead to a change in practice was improving patient safety (n =234, 77.4%).</p> <p>The ability to provided a quick orientation to the case and patient condition (n = 222, 73.5%) and utility or ease of use ( n =218, 72.2%).</p> <p>When asked what barriers would most likely prevent subjects from adopting a systematic transfer of care process- answer</p>	<p>Responses to the open-ended questions on the PATIENT checklist evaluations tool suggest that a change in current transfer of care processes may be met with resistance from some practitioners.</p> <p>AANA have established standards of practice that CRNAs (Practice Standard VII) states that CRNA must “transfer the responsibility for care of the patient to other qualified providers in a manner which assures continuity of care and patient safety.”</p> <p>The implementation of the PATIENT checklist could be incorporated into electronic charting systems and serve to</p>

			<p>central Virginia.</p> <p>Two phase study, phase 1 questionnaire Phase2 checklist prototype of PATIENT mnemonic strategy PATIENT (Patient/position/procedure, Airway/antibiotics/anesthesia/allergies, Temperature, Intravenous &amp; Intake/Output, End-tidal carbon dioxide, Narcotics, Twitches)</p>	<p>was “no barriers were perceived if it improved their practice and promoted patient safety” (n = 248, 82.1%).</p> <p>The most frequently reported barrier to adopting a systematic transfer of care process was that not every anesthesia provider would comply unless the process was made to be a standard of care (n = 33, 60%).</p> <p>Phase 2: (developed from phase 1 results) Four CRNAs(13.3%) responded they did not use the checklist at all, citing they had no opportunity to do so (n = 2) or they forgot to use it (n = 2).</p> <p>Seventeen CRNAs (56.7%) used the process 6 to 10 times,</p>	<p>support CRNAs in adhering to select standards of practice.</p> <p>The development of a standardized transfer of care communication tool can serve to promote Situational Awareness (SA) in swift and organized manner and minimize existing variation in handoff processes.</p>
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				<p>1 (3.3%) used it 11 to 15 times, and 3 (10%) used the process more than 15 times.</p> <p>Would the CRNA adopt the standardization transfer of care process for use when giving and/or receiving report of an anesthetized patient- of the 30 respondents, 87% either agreed ( n = 14) or strongly agreed (n = 12) with the use of a standardized tool.</p> <p>In evaluating the PATIENT checklist tool itself, 90% (n = 27) of respondents believed that both the length and scope of content were appropriate and that the tool lent itself to memory.</p> <p>All respondents either agreed (n=18) or</p>	
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				strongly agreed (n = 12) that the PATIENT checklist tool provided an effective way of organizing important information.	
Gliecher et al. (2017)	Quality Improvement study	Level 5	Setting: Cardiovascular Operating room (CVOR) to the cardiovascular intensive care unit (CVICU). An interventional time-series study over a 4-month period at an adult cardiac surgery center. A standardized handover protocol was developed using quality improvement methodologies. The protocol included a handover content checklist	<p>The mean handover score increased from 6.5 to 14.0 (maximum 18 points).</p> <p>Specific improvements included fewer handover interruptions and more frequent postoperative patient care planning.</p> <p>Average handover duration increased slightly from 2:40 to 2:57 min.</p> <p>Caregivers noted improvements in teamwork, content received and patient care planning.</p> <p>The majority (&gt;95%) agreed that the intervention was a valuable addition to the</p>	Implementation of a standardized handover protocol for postcardiac surgery patients was associated with fewer interruptions during handover, more reliable transfer of critical content and improved patient care planning.

			<p>and introduction of a formal ‘sterile cockpit’ timeout. Implementation of the protocol was refined using monthly iterative Plan-Do-Study-Act.</p> <p>37 handovers were observed (6 pre intervention and 31 post intervention).</p>	CVOR to CVICU handover process.	
Salzwedel et al. (2012)	<p>Randomized control trial</p> <p>Aim to prove that checklists for handover between anesthesiologist and post-anesthesia care unit nurses will</p>	Level 2	A total of 120 post-anesthesia patient handovers were recorded on video and analyzed.	<p>The overall handed over increased significantly from a median of 32.4 - 48.7%.</p> <p>The duration of handover increased from a median of 86 – 121 seconds.</p>	The results of this study suggests that the use of a checklists for patient handover in the PACU increases the number of items of patient information handed over from anesthesiologist to PACU nurse.

	<p>increase the amount of information transfer during patient handover after anesthesia.</p>		<p>Forty handovers before the implementation of the checklist and 80 after the implementation of the checklist, randomized into two groups: with and without the use of the checklist.</p>	<p>Instructions about items that should be included in handovers, but without the use of a written checklist, was not associated with an increase in the number of items handed over or duration of the interview.</p>	<p>Some anesthesiologist using the checklist only handed over half of the items on the lists. The reason for lack of compliance with the checklist is unclear.</p> <p>There were several reasons for poor compliance with the checklist: Before the implementation of the checklists, only 31.4% of items, considered important handover items by a group of senior anesthesiologists and PACU nursing staff, were handed over.</p> <p>Lack of knowledge could be the reason for non compliance, unwillingness to use the checklist and the checklist might not be suitable for all procedures.</p>
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SHO = Standardized Hand – off, NP= Nurse Practitioner, ICU = Intensive Care Unit, RNs = Registered Nurse, CRNAs= Certified Registered Nurse Anesthetist

### Appendix D - CHM Hand-off Tool



**Children's Hospital of Michigan**  
 3901 Beaubien Blvd, Detroit, MI 48201  
 Department of Anesthesiology  
 PICU Handoff Report



<b>S</b>	<b>SITUATION</b>
MR Number: _____ Patient Name: _____ DOB: _____ Age: _____ Gender: _____ WT: _____ ASA: _____ DOS: _____ ID Band Location: _____ OR Time Out: _____ PICU Time In: _____ Allergies: _____ Anesthesia Attending: _____ Anesthesia Provider: _____ PICU RN: _____ PICU Attending: _____ PICU Fellow: _____ Surgical Procedure: _____ Presenting Diagnosis: _____ Attending Surgeon: _____ Surgical Resident: _____	
<b>B</b>	<b>BACKGROUND</b>
Surgical Information/Issues: _____ Preop VS: BP: _____ HR: _____ RR: _____ SPO2: _____ Temp: _____ Problem List/Medical History: _____ Presurgical Airway: _____ Postsurgical Airway: _____ Intraoperative VS Ranges: BP: _____ HR: _____ RR: _____ SPO2: _____ Temp: _____ Anesthetic Agents: _____ Paralyzed: YES NO _____ Paralytic agent: _____ Reversed: YES NO _____ Antibiotics: Drug: _____ Dose: _____ Time Last Dose Adm. : _____ Medications Adm: (Total Dose, Units, Route, Time of last dose) Narcotic(s): _____ Dose: _____ Time Last Dose Adm. : _____ Other drugs: _____ Dose: _____ Time Last Dose Adm. : _____ Infusion: _____ Dose/rate: _____ Time Last Dose Adm. : _____ Infusion: _____ Dose/rate: _____ Time Last Dose Adm. : _____ Intake: Fluid: _____ Volume Adm: _____ Fluid: _____ Volume Adm: _____ Blood Product: _____ Volume/Units Adm: _____ Blood Product: _____ Volume/Units Adm: _____ Output: Urine Output: _____ EBL: _____ Labs: Hgb/Hct _____ Glucose: _____ Other Labs: _____	
<b>A</b>	<b>ANESTHESIA ASSESSMENT</b>
Intraoperative Events / Complications: _____ Special Precautions (position/extubation/isolation/spine/radiation ect.) _____ Tubes/Lines/ Wires: _____	
<b>R</b>	<b>RECOMMENDATIONS</b>
Plan: _____	

## Appendix E - IRB Letter – Project Not Research



IRB Administration Office  
87 E. Canfield, Second Floor  
Detroit, MI 48201  
[www.research.wayne.edu/irb](http://www.research.wayne.edu/irb)

### Notice of IRB Administrative Determination: Non-Human Participant Research (HPR)

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**To:** Choromanski, Dominik  
**From:** Heather Park-May  
**Date:** January 7, 2022  
**Re:** Development, Implementation, and Evaluation of a Standardized Hand&ndash;off  
Communication Tool at Children&rsquo;s Hospital of Michigan

**WSU IRB HPR Number:** 2022 003....eProtocol # 21-01-3139

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Materials in the above referenced proposal were received by the Wayne State University Institutional Review Board Administration Office via eProtocol submission for exempt review (category 2) on 12/23/21

This project does not constitute human participant research according to the definition codified in the Common Rule at 45 CFR 46 and FDA regulations. This means that IRB review and oversight is not required for this project. We recommend you keep this memo for your records.

The project also does not involve individuals who would receive a test article (drug or device) as participants and therefore the FDA regulations do not apply. Thus, this project does not require review or approval by the Wayne State University Institutional Review Board.

**Please be aware that projects involving identifiable Personal Health Information (PHI) which the IRB has determined does not meet the definition of human participant research must still adhere to HIPAA regulations, and may require authorization from the covered entity's privacy officer\*.**

**Projects must also obtain support from any unaffiliated institution(s) involved.**

**Please contact applicable affiliates: (DMC, Karmanos Cancer Institute, J.D. Dingell Veterans Administration Veterans Medical Center) to obtain authorization to conduct your project.**

Please note that changes to the study plan may impact this determination as to whether the project constitutes Human Participant Research. Please contact the IRB Administration office if there are changes to the study plan that may affect this determination.

Heather Park-May Digitally signed by Heather Park-May  
Date: 2022.01.07 10:48:42 -05'00'

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Wayne State University IRB Administration Office



**WSU IRB Determination:**  
(To be completed by IRB Administration)

<input checked="" type="checkbox"/>	<b>Not Human Participant Research - IRB review is not required</b>
<b>Type of activity that does not require IRB review:</b>	
<input type="checkbox"/>	Case Report <b>Note:</b> IRB approval is required if the case report involves more than three cases
<input type="checkbox"/>	Course Related Activities <b>Note:</b> IRB Approval is required if a student is involved in an activity designed to teach research methodologies and the instructor or student wishes to conduct further investigation and analyses in order to contribute to scholarly knowledge.
<input type="checkbox"/>	Decedents: Research limited to death records, autopsy materials or cadaver specimens. <b>Note:</b> IRB approval is required if decedent information contains psychotherapy notes, or information related to HIV, mental health, genetic testing or drug or alcohol abuse
<input type="checkbox"/>	Journalism/Documentary Activities <b>Note:</b> IRB approval may be required when journalists conduct activities normally considered scientific research intended to develop generalizable knowledge (e.g. systematic research, surveys, and/or interviews that are intended to test theories or develop models).
<input type="checkbox"/>	Oral History <b>Note:</b> IRB approval is required when the activities are intended to develop generalizable conclusions (e.g., that serve as data collection intended to test economic, sociological, or anthropological models/theories)
<input checked="" type="checkbox"/>	Program Evaluation/Quality Improvement/Quality Assurance Activities <b>Note:</b> Investigators conducting QI/QA projects should ensure that they have received approval from any applicable committees within their department or the site in which the activity will occur
<input type="checkbox"/>	Public Use Datasets <b>Note:</b> IRB approval is required for the use of restricted use data, if a proposal is required to obtain the dataset, or if a data use agreement is involved.
<input type="checkbox"/>	De-Identified Private Information and/or Human Biological Specimens <b>Note:</b> IRB approval is required if the information being collected could enable the investigator to identify or readily ascertain the identity of the individual whom the private information or specimens belongs to.
<input type="checkbox"/>	Public Health Surveillance <b>Note:</b> Activities are limited to those necessary to allow a public health authority to identify, monitor, assess, or investigate conditions of public health importance
<input type="checkbox"/>	Other Project type not considered to be HPR Describe:

<input type="checkbox"/>	<b>Project is Human Participant Research- IRB Review Required.</b>
<b>Type of IRB required:</b>	
<input type="checkbox"/>	Exempt IRB review is required (minimal risk research): Rationale:
<input type="checkbox"/>	Expedited IRB review is required (minimal risk research): Rationale:
<input type="checkbox"/>	Full Board IRB review is required (greater than minimal risk research): Rationale:

<b>Reviewer Comments:</b>	Knowledge gained from this study is not intended to be applicable to a larger population beyond the site of data collection or the specific participants/subjects studied, therefore the project is not intended to contribute to generalizable knowledge, thus the study does not meet the regulatory definition of research (45 CFR 46.102(I)). The study involves human participants via prospective interaction with participants through a survey (45 CFR 46.102(E)). This study is not human participant/subject research. Human Subject Research Protections regulations do not apply to this quality improvement & program evaluation project. IRB Review is not required.
<b>Authorized IRB Reviewer Signature:</b>	<b>Heather Park-May</b> Digitally signed by Heather Park-May Date: 2022.01.07 10:48:20 -05'00'