TexMed 2016 Quality Improvement Abstract

Please complete all of the following sections.

Procedure and Selection Criteria

- Applicants should demonstrate an understanding of QI concepts through the use of quality tools, measures of success and the use and interpretation of data. Judges will use the scoring described in this matrix to identify projects to be presented at the conference, as well as, projects to be considered for the awards.
- Maximum points are delineated with a brief explanation of the content that should be included under each section. Applicants must select one of the following improvement categories into which the project best fits: patient safety, patient centered care, timeliness, efficiency, effectiveness, or equity. Applicants may describe the problem and results in narrative or graphic format.

PROJECT NAME: Improving Patient Handoffs in the OR-ICU and OR-OR Settings

Institution or Practice Name: University of Texas Southwestern Medical Center

Setting of Care: Cardiac Operatings Rooms and Intensive Care Units

Primary Author: Thomas Lowrey (MSII) and Jim Sheng (MSII)

Secondary Author: Philip Greilich MD (Project Sponsor);

Other Members of Project Team: Fallon Ngo MD; Trent Bryson MD; Isaac Lynch MD; Rachel Harrison MD, Rachel Makinde MD, Eleanor Phelps BSN MA RN; Glory Gituma CCRN

Is the Primary Author, Secondary Author or Member of Project Team a TMA member (required)?
    ☒ Yes ☐ No
Please provide name(s): Philip Greilich MD

Project Category: *(Choose most appropriate category)*

☒ Patient Safety	☐ Patient Centered Care	☐ Timeliness
☐ Efficiency	☐ Effectiveness	☐ Equity

☐ **Enhanced Perioperative Recovery/Future of Surgical Care program**

For this poster session, TMA is looking for projects that demonstrate the six aspects of Quality Care as defined by the Institute of Medicine.

- Safe - avoids injuries to patients from care that is intended to help them
- Timely - reduces waits and delays for both those who receive care and those who give care
- Effective - based on scientific knowledge, extended to all likely to benefit, while avoiding underuse and overuse
- Equitable - provides consistent quality, without regard to personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status
- Efficient - avoids waste, including waste of equipment, supplies, ideas, and energy

- Patient centered - respects and responds to individual patient preferences, needs, and values, ensuring that patient values guide all clinical decisions

Quality Improvement (QI)

Overview: *Describe 1) where the work was completed; 2) a description of the issue that includes how long the issue has been going on and the impact the issue has on the organization/facility; 3) what faculty/staff/patient groups were involved, and 4) the alignment to organizational goals.*

This quality improvement project is currently being conducted at Clements University Hospital with initial focus on 3rd floor operating rooms (cardiac, thoracic and vascular) and the 9th floor CVICU. Eventually the initative will spread to the intraoperative setting (OR-OR), other units in the hospital and across the UTSW health system.

Clinical handovers in high-paced, high-stakes environments, such as operating rooms and intensive care units, are especially risky, error prone and a common cause of preventable patient harm. Furthermore, The Agency for Healthcare Research and Quality has consistently identified "handoffs and transitions" as one of the lowest performing composites in its Hospital Survey on Patient Safety (HSOPS) culture. Previous studies have indicated that the standardization of the handoff process has the potential to decrease medical-error rates by nearly a quarter (23%) and the occurrence of preventable adverse events by nearly a third (30%). With these factors in mind, The Joint Commision, ACGME and AAMC have all mandated the development of structured handover processes at healthcare instituations.

Involved parties have included faculty anesthesiolgists, surgeons, critical care specialists, nurses, medical students, and quality improvement specalists.

Alignment with organizational goals:
- Reducing preventable adverse events is in line with the mission of the hospital to ease human suffering and will decrease associated cost waste
- A more reliable OR-ICU/OR-OR transfer of care process will optimize care provision and reduce time spent on treating complications due to failures in communication
-A reliable perioperative transfer of care process will fulfill mandates from the TJC, ACGME and the AAMC

Aim Statement (2 points for each portion of SMART, with max points 10): *Describe the goal of the project incorporating SMART.*

Specific – what faculty/staff/patient groups were involved and where the work was completed
Measureable – numerical values that define baseline and goal
Actionable – what solutions/interventions were implemented
Realistic - able to implement solutions and sustain outcomes with given constraints
Time bound – what date established to reach goal by

The primary aim of this project is to improve the reliability of OR-ICU and OR-OR patient handoffs at Clements University Hospital by 50% by 2018.

Project team includes:
- Thomas Lowrey (Medica Student)
- Jim Sheng (Medical Student)
- Rachel Makinde, MD (Anesthesiology Resident)
- Rachel Harrison, MD (Surgery Resident)
- Philip Greilich MD Department of Anesthesiology and Pain Management
- Fallon Ngo MD Department of Anesthesiology and Pain Management
- Isaac Lynch MD Department of Anesthesiology and Pain Management

- Trent Bryson MD Department of Anesthesiology and Pain Management
- Eleanor Phelps BSN MA RN Office of Quality, Safety, and Outcomes Education
- Glory Gituma CCRN Clements Univeristy of Hospital

Planned Interventions:
- Standardized education
- Video Illustration
- OR-ICU: ICU cognitive aid
- OR-OR: EMR cognitive aid

Measures of Success (5 points for describing solutions measurement and 5 points for describing outcome measurement, with max points 10): *Describe how you measured your interventions to ensure adherence and describe how you measured your outcome.*

In order to evaluate the success of our proposed interventions, an objective measurement tool was first created to evaluate the quality of handoffs and a training program was established to train observers in reliable data collection. The measurement tool was created in five steps:

1) Identify candidate technical and non-technical elements that are involved in all peri-operative and OR-ICU handoffs (ie. state patient name, introduce handoff team members).
2) Determine critical to quality (CTQ) technical elements using a modified Delphi method, where experts in the field and key stakeholders (surgeons, anesthesiologists, nurses, intensivists) were surveyed to narrow down the *essential* elements of all transfers-of-care (TOC) from the primary list established in step 1. (See Figure 3 in "Quality Tools" section)
3) Determine validated method to assess teamwork behaviors such as leadership, communication, cooperation, and coordination in TOC.
4) Field test evaluation tool by grading simulated and real time handoffs, improving the tool via small PDSA cycles to clarify any ambiguous elements.
5) Finalize data collection process.

The observer training program involves five steps:

1) Orientation and grade sample video with project expert. The project expert will also use this opportunity to educate the observer on all elements of the grading tool, and clear any confusion the observer may have regarding the tool or data collection process.
2) Independent grading session #1 (4 sim videos) using the grading tool. Simulation videos will demonstrate TOCs of varied quality, ranging from an "ideal" handover (ie. completing all elements on the grading tool) to an imperfect handover.
3) Independent grading sessions #2-4 (4 sim videos/session) to view and evaluate the same 4 simulation videos as step 2 using the tool. *Inter*-rater and *intra*-rater reliability must be established at this step (kappa score > 0.80).
4) Complete debriefing questionnaire after each session.
5) Ensure *inter-* and *intra-* rater reliability by achieve passing score (kappa > 0.80).

Trained observers will utilize the grading tool to collect baseline data at Clements University Hospital 3rd floor CV Surgery OR and 9th floor CVICU. Quality of handoffs will be determined by percentage of elements completed on the grading tool. After interventions are implemented at study site, trained observers will return and reassess using the grading tool. Success of the intervention will be measured by changes in completed elements on the grading tool and overall quality of handoffs compared to pre-intervention.

Use of Quality Tools (5 points for appropriate tools utilized during each PDSA phase, with max points 20): W*hat quality tools did you use to identify and monitor progress and solve the problem? Provide sample QI tools, such as fishbone diagram or process map, and identify which phase of the PDSA cycle each tool was utilized in. Note tools here and send as addendum with abstract form.*

Plan Phase:
> Project charter- A project charter was created by the medical students at the start of the project to define the problem, opportunity, aim, benefits, scope, objectives and project barriers. This document is utilized to keep the team organized and on track with project goals. (Addendum Fig.1)

> Stakeholder analysis – A stakeholder analysis was completed to determine key stakeholders, their level of involvement, role in the project, attitude, influcne, interests, motivations, drivers, expectations and management activites. (Addendum Fig. 2)

> Process Map- In order to understand the current state of OR-ICU/OR-OR care transfers, numerous transfers were observed and recorded to create a process map. This map helped the team determine key areas for improvement. (Addendum Fig 3.)

> Brainstorm and extensive literature review - To gain fundamental knowledge of TOC and understand "best-in-class" practices identified through evidence-based studies.

Do Phase:
> Multiple small scale tests of change were conducted through out this phase.

> Fishbone diagram - Discussed with key stakeholders to craft a fishbone diagram. Identified potential causes behind lack of reliability in patient handoffs, and classified them into groups including materials, people, management, equipment, environment and process. (Addedum Fig. 4)

> Affinity Diagram - Similar to Fishbone, helped identify potential causes behind lack of reliability in patient handoffs and grouped them into categories. This helped us discover problematic steps and potential areas of improvement.

> Brainstorming - Identified potential areas of improvement in TOC using tools we have created (process map, fishbone), and discussed ideas with stakeholders and project leads

Check/Study Phase:
> FMEA - With a group of TOC experts, identified potential areas of failure in the current TOC process and as their impact on the process/patient. Provided score to understand which step should be prioritized in our intervention

> Delphi CTQ survey (voice of the customer/critical-to-quality tree):
> To ensure we accurately capture the voice of the customer, Clements Univeristy Hopsital stakeholders (faculty anesthesiologists, surgeons, critical care specialists and nurses) were administered a survey to determine elements they believed critical to transfers-of-care. Two rounds of surveys were performed and elements passed if >80% of respondents believed them to be essential. Elements not passing the intitial round were surveyd in the second round to determine final critical to quality elements. This information and literature was then utilized to create an "ideal" transfer of care video and measurement tools. (Addendum Fig. 5)

> Five Why's - Brainstormed with stakeholders to understand why certain steps of the process are done the way they are.

> Root Cause Analysis - Similar to Five Why's, discussed with experts to understand why certain problems existed in the process (ie. why is important information not properly transferred between OR team and ICU team?)

Act Phase:
>Measurement tool was created to objectively evaluate the quality of handoffs, accomodating for the unique needs and environment of our study site --- CUH. The tool was completed using information gathered through extensive literature review of best-in-class practices, discussion with experts in the field and key stakeholders, and the Delphi survey in Check/Study Phase. (Addendum Fig. 6)
>
>Establishment of Observer Training Program (details see "Measures of Success" section), ensuring an objective, reliable, and sustainable method to train observers and obtain data.

Interventions (max points 15 includes points for innovation): W*hat was your overall improvement plan (include interventions and identify quick wins)? How did you implement the proposed change? Who was involved in implementing the change? How did you communicate the change to all key stakeholders? What was the timeline for the change? Describe any features you feel were especially innovative.*

Through discussions with key stakeholders and analysis of quality tools, the intervention will include a cognitive aid in the ICU setting with delineated roles amongst providers. The interventions will be implemented following successful observer training and collection of baseline measurments. As the project progresses to the intraoperative phase the proposed intervention will include an automated EMR-based cognitive aid (checklist) that would be help insure all CTQ information was discussed during every handover. A survey was previously administered to UTSW Department of Anesthesiolgy and Pain Management (n=122) indicating that faculty are interested in pursuing such EMR based aides for intraoperative transfers of care. Additional interventions will include standardizing education on TOCs for team members, including a video illustration of "ideal" practices.

Results (max points 25): *Include all results, using control charts, graphs or tables as appropriate. Charts and graphs must be appropriately labeled or points will be deducted. Note charts, graphs and tables here and send as addendum with abstract form.*

Results regarding improvements in reliability will be attained once a successful intervention is implemented and data collected. Thus far our results include data from the critical-to-quality survey and creation of a standardized evaluation form.

Conclusions and Next Steps (max points 20): *Describe your conclusions drawn from this project and any recommendations for future work. How does this project align with organizational goals? Describe, as applicable, how you plan to move ahead with this project.*

Although the intervention has not been implemented, the team was able to successfully create a step-by-step process for re-designing peri-operative and OR-ICU handovers with frontline clinicians. The effectiveness of our estabilished methodology will be evaluated by studying changes in the quality of handovers at the study sites and in the sustainability of the process.

Alignment with organizational goals is outlined in the "Overview" section

Our next steps include 1) completing observer standardized training 2) baseline data collection 3) analysis of baseline data and determining pilot intervention (cognitive aid) 4) pilot program implementation and measurement 5) Refine intervention, determine education componenet and spread to other units and affiliated UTSW hospitals.

Addendum
Figure 1: Project Charter

June 17, 2015	OR TO ICU TRANSFERS OF CARE

General Project Information

Project Title	Improving the Patient Handoff Process in the Operating Room to the Intensive Care Unit	Start Date: 6/16/2015
Strategic Alignment	The project aims to prevent patient harms from medical errors and medical adverse events, which aligns with the goals and missions of hospital.	

Description of Issue

Opportunity / Problem Statement	Clinical handovers or transfers-of-care (TOC) can be defined as a process of transferring information, authority, and responsibility from the departing clinician or clinical team (senders) to the incoming team (receivers) that allows for continuity of patient care. Poor handovers are a common cause of preventable patient harm. Clinical handovers in high-paced, high-stakes care environments, such as operating rooms (ORs) and intensive care units (ICUs), are especially risky and error prone. Previous studies indicate that the standardization of the handoff procedure have the potential to decrease medical-error rates by nearly a quarter (23%) and the occurrence of preventable adverse events by nearly a third (30%).
Project AIM/Goal	The primary aim of this project is to improve the reliability of OR to ICU patient handoffs by 50% by 2018
Benefits	1. Reducing preventable adverse events is in line with the mission of the hospital to ease human suffering and will decrease associated cost waste. 2. A reliable OR to ICU TOC process will optimize care provision and reduce time spent on treating complications due to failure in communication. 3. Reliable perioperative TOC process will fulfill mandates from the TJC, ACGME, and the AAMC at all UTSW affiliated hospitals*
SCOPE	1. The scope of the study includes TOCs in the third floor operating rooms (cardiac, thoracic, vascular) for at Clements University Hospital.

Project Risks/ Constraints/Barriers	1. Availability of physicians/staff for guidance 2. Resources (i.e. video production, financial support, etc) 3. OR and ICU scheduling 4. Hospital regulations regarding video recordings/HIPPA 5. Staff resistance

Document Version	Date	Description of Change	Version Prepared By
Ver. 1	June 15th, 2015	First draft of complete charter	Thomas/Jim
Ver. 2	June 16th, 2015	Updated project objectives/goals	Thomas/Eleanor
Ver. 3	June 18th, 2015	Updated project objectives/goals and Project risks/constraints/barriers	Thomas

Document Approvals

	Name	Signature	Date
Executive Sponsor	Dr. Grielich		
Project Manager	Eleanor Phelps		

Project Objectives/Goals	Objectives	Measures	Baseline	Target(s)
	1. Determine the best practices for OR to ICU TOC through literature review/discussions with field professionals		Dr. Greilich established OR to ICU TOC tool	Elements that are critical to safe TOC are identified
	2. Determine criteria for pass/fail for the standards of the new evaluation tool (Faculty project team)	Tolerance limits for "pass" and "fail" are set	None or TBD	Evaluation tool based ready to test
	3. Through TOC simulations/videos, establish inter-rater reliability amongst current trained observers on created evaluation tool (Dr. Guttman and Dr. Greilich)	Inter-reliability amongst trained observers using standardized videos	None	Establish rater reliability amongst trained observers (Kappa => 0.8 between trained observers)
	Review current perioperative handoff process in CUH OR and ICU and create process map; Review multiple handoff processes (as needed) to validate process map	Current OR to ICU TOC at Clements University Hospital	Current practices	Process maps validated by front-line providers
	Utilizing the established evaluation tool, collect baseline observation data	Numerator= count of observed (pass) events Denominator = count of expected (pass) events on evaluation tool	None	Observations completed in 3rd floor operating rooms and 9th floor CVICU
	6. Analyze collected baseline data and determine most appropriate intervention	Brainstorming sessions with stakeholders to develop intervention (s)	None	Preliminary analysis of current state completed
	7. Implement established pilot program intervention and create audit plan to ensure proper implementation and adoption	Stakeholder acceptance of pilot	Current OR to ICU TOC practices	Implementation plan completed and presented to sponsor for acceptance Pilot improvement in CVOR
	8. Utilizing the established evaluation tool, collect post-intervention observation data	Numerator= count of observed (pass) events Denominator = count of expected (pass) events on evaluation tool	None	Post-intervention observations completed
	9. Data analysis of post-intervention data; Determine sustainability plan or spreading plan or re-evaluate	Numerator= count of observed (pass) events	None	Data analysis and reports prepared for sponsor

Figure 2. Stakeholder Analysis

Name or Group	Contact	Level of Involvement	Role in the project	Attitude	Influence	Interest	What the project needs from the stakeholder	Stakeholder motivation, drivers, expectations of project	When does this stakeholder need to be involved in the change effort?	Stakeholder Management Activities	Who Delivers	When due	Status
ICU Nurses		Key Stakeholder	Service provider	Supportive	Moderate	High	CTQ, consultation, support & leadership	support and consultation for project, assistance with development, implementation, and sustainability of intervention	During process evaluation, data collection, intervention implementation and spread	Include key representative on input and current standards	Jim and Thomas will contact weekly to obtain input and updates	Friday EOD	Start on July 1
Anesthesiology Education		Stakeholder	Teaching Faculty	Unsure	Moderate	Moderate	CTQ, consultation, assistance with education with stakeholders	support on project when needed, assistance with curriculum development	starting next week	Include key representative on input when needed; start discussion with key representative about intervention/education	Jim will contact when needed	End of summer	Start on July 1
Surgery Education		Stakeholder	Teaching Faculty	Unsure	Moderate	Moderate	CTQ, consultation, assistance with education with stakeholders	support on project when needed, assistance with curriculum development	starting next week	Include key representative on input when needed; start discussion with key representative about intervention/education	Jim will contact when needed	End of summer	Start on July 0
Nursing Education		Stakeholder	Teaching Faculty	Unsure	Moderate	Moderate	CTQ, consultation, assistance with education with stakeholders	support on project when needed, assistance with curriculum development	starting next week	Include key representative on input when needed; start discussion with key representative about intervention/education	Jim will contact when needed	End of summer	Start on July 1
Equipment Technicians		Stakeholder	Service provider	Unsure	Low	Low	CTQ, consultation	Support on project when needed	starting next week	Include key representative on input when needed	Jim will contact when needed	End of summer	Start on July 1
Suzanne Dellaria, MD	suzanne.dellaria@utsouthwestern.edu	Project team	Collaborator/contributor	Supportive	High	High	CTQ, support & leadership	Anesthesiology QI leader	Starting next week	Include her input on the process.	Jim will contact her weekly to gather additional information. Follow discussions with e-mail to summarize	Tuesdays by noon	Start on July 1
Gary Reed, MD, MS	gary.reed@utsouthwestern.edu	Steering Committee	Supporter	Supportive	Moderate	Moderate	CTQ, support & leadership	Dean of Quality Improvement Education	Started from the beginning providing guidance for students and project lead	Help with aspects of the quality improvement process	Thomas contacts him regarding questions pertaining to steps in the QI process	When questions arise	Start June 2
Isaac Lynch, MD	isaac.lynch@utsouthwestern.edu	Project team	Collaborator/contributor	Supportive	High	High	CTQ, support & leadership	Roles as both an intensivist and OR anesthesiologist	Starting next week	Include his input on the process; perspective from both sides of the handoff is crucial	Thomas will contact him weekly to gather additional information. Follow discussions with e-mail to summarize	Wednesday by noon	Start on July 1
Falon Ngo, DO	Falon.Ngo@utsouthwestern.edu	Project team	Collaborator/contributor	Supportive	High	High	CTQ, support & leadership	New faculty anesthesiologist interested in research and QI	Starting next week	Include her input on the process	Jim will contact her weekly to gather additional information. Follow discussions with e-mail to summarize	Tuesdays by noon	Start on July 1
Trenton Bryson, MD	Trenton.Bryson@utsouthwestern.edu	Project team	Collaborator/contributor	Supportive	High	High	CTQ, support & leadership	Anesthesiology department QI project involvement; project site consultant; EMR consultant	June 1st	Include him on input for handoff process (especially intraoperative TOC), current standard of practice, and EMR usage	Jim will contact weekly, update him on status of project and obtain input.	Friday EOD	Start July 1st
Tiffany Moon, MD	tiffany.moon@utsouthwestern.edu	Project team	Collaborator/contributor	Supportive	High	High	CTQ, support & leadership	Anesthesiology department QI project involvement	June 1st	Include her on input for handoff process, current standard of practice	Michael will contact weekly, update her on status of project and obtain input	Friday EOD	Start July 1st
External Stakeholders													
Patients		Key Stakeholder	Consumer	Supportive	High	High	Cooperation	Receive quality care	TBD		TBD	TBD	TBD

Figure 3. Process Map (OR-ICU)
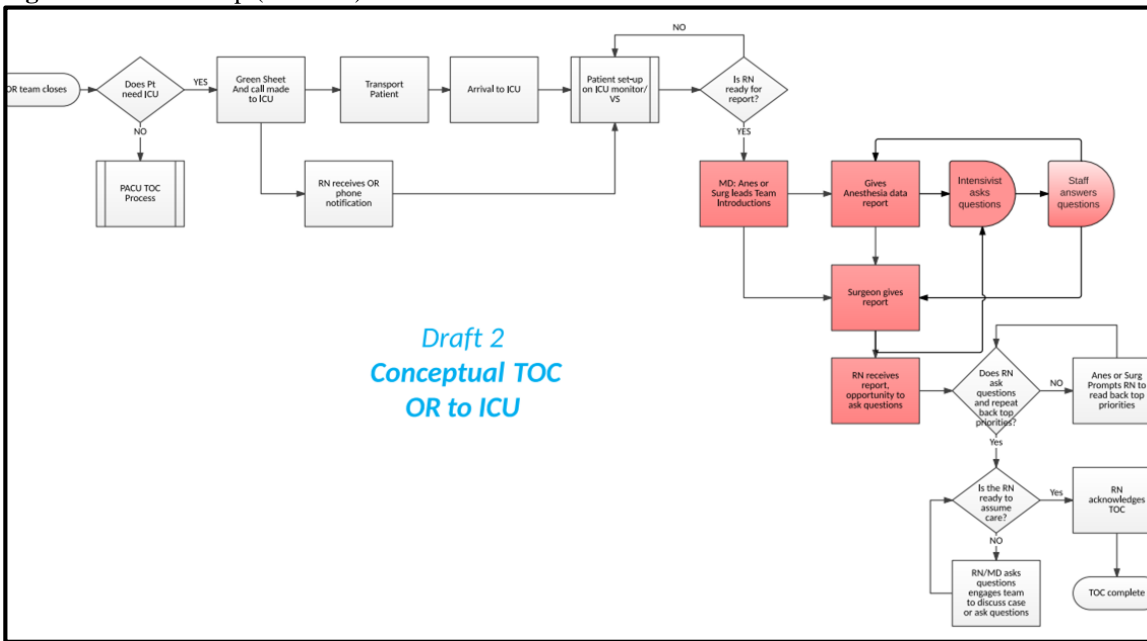
Figure 4. Fishbone Diagram

AIM: Reduce harms attributed to perio-perative handovers by 50%

Materials
- People not sure who's in charge of Green sheet
- People not sure where to find Green sheet
- Lack of leadership/champion for tool utilization (Green sheet)
- Tool too cumbersome/confusing to use (Green sheet)
- ...n/utilization of established material (Green sheet)
- ...tions unclear on established material (Green sheet)
- ...aluation tool not fully corresponding to process tool

People
- "It's too much trouble"
- Turnover of employees
- Reluctance to change
- Lack of defined leader
- Under-staffing leading to more responsibilities

Equipment
- Lack of Anesthesia Tech in transport process
- Current setting on equipment not intuitive
- Default setting on equipment not "ideal setting"
- Not sure who sets up what machine
- Lack of notification about when report occurs

Management
- ...ack of clear leader in hand off process
- ...poor handoff education at institution
- ...in supporting the importance of hand-vers

Environment
- Different standards at different institutions
- Culture of team
- Noise level
- Distractions from other tasks and people etc
- Existing institution norms
- Rapid movement/change in the OR
- Distance to ICU may not be most optimal

Process
- Loss of information between handoff staff
- Unstandardized process
- Difficulty or ease of work flow
- Lack of defined staff roles
- Variable number of staff present
- Highly variable process
- Lack of info on level of detail in handover
- Un-optimized transport process
- Timing of handoff

Lack of reliability in patient hando...

Figure 5: Delphi Survey

TABLE 1. Results of Delphi Procedure

	First Round			Second Round		
	Inclusion	Exclusion	Result	Inclusion	Exclusion	Result
I. Handover Team Tasks						
All team members present	Y	N	98%	–	–	–
Handover team introductions	N	Y	62%	N	Y	64%
Handover team identifies themselves	N	Y	74%	N	Y	62%
RN states readiness for report	Y	N	95%	–	–	–
II. Patient Information						
Patient Name	N	Y	73%	Y	N	85%
Patient Age	N	Y	63%	N	Y	28%
Patient ASA status	N	y	20%	N	Y	8%
Weight/Height	N	y	18%	N	Y	11%
Allergies	N	y	67%	N	Y	66%
III. History and Operative Course						
Baseline vitals	N	y	67%	N	Y	67%
Pertinent PSH	N	y	63%	N	Y	23%
Pertinent PMH	N	y	74%	N	Y	69%
Patient diagnosis & indication for procedure	Y	N	91%	–	–	–
Anesthesia course and complications	Y	N	100%	–	–	–
Surgical course and complications	Y	N	100%	–	–	–
Pertinent labs (i.e. ABG, K, GLU, SVO3)	–	–	–	N	Y	83%
IV. Airway & Intravascular Access						
Airway difficulty & special devices (if needed)	Y	N	95%	–	–	–
Ease of mask ventilation	N	Y	79%	N	Y	71%
Peripheral Ivs (size and location)	N	Y	52%	N	Y	21%
Central line (location, date of placement)	N	Y	62%	N	Y	36%
Arterial line (location, date of placement)	N	Y	57%	N	Y	38%
V. Medications/Infusions & Devices						
Last/total dose of sedatives/opioids	N	Y	70%	N	Y	51%
Last dose of muscle relaxant +/- reversal	N	Y	77%	N	Y	64%
Last dose of antibiotic (type and time)	N	Y	58%	N	Y	41%
Verify pacemake settings and state underlying rhythm	Y	N	95%	–	–	–
Other devices (i.e. spinal drains, ICD, etc.)	Y	N	89%	–	–	–
VI. Postoperative Goals						
Target MAP and/or SBP (mmHg)	Y	N	100%	–	–	–
Target CVP/stroke volume variation (SVV), if available	Y	N	86%	–	–	–
Review pressor/inotropics and weaning strategy	Y	N	98%	–	–	–
Transfusion trigger (Hgb level)	N	Y	73%	N	Y	79%
Extubation plan	Y	N	86%	–	–	–
VII. Input & Output						
Review current infusions	–	–	–	Y	N	94%
Crystalloids (type/mLs)	N	Y	48%	N	Y	28%
Colloids (type/mLs)	N	Y	44%	N	Y	28%
Blood transfusions (PRBC, PLT, FFP, CRYO)	N	Y	81%	Y	N	87%
Urine output (mLs)	N	Y	58%	N	Y	38%
Chest tube drainage (rate over last hour)	N	Y	77%	N	Y	77%
Estimated blood loss (mLs, if not CPB case)	N	Y	60%	N	Y	54%
VIII. Special Concerns						
Anesthesiologist greatest concern	Y	N	100%	–	–	–
Surgeon greatest concern	Y	N	100%	–	–	–
RN/Intensivist asked for their greatest concern	Y	N	95%	–	–	–
Isolation precautions	N	Y	44%	N	Y	36%
Contact information (family)	N	Y	30%	N	Y	15%
IX. Nursing Readback						
Target hemodynamics (BP,CVP)	Y	N	88%	–	–	–
Plan for weaning of vasoactive infusions	Y	N	86%	–	–	–
Transfusion trigger (Hgb level)	N	Y	80%	N	Y	79%
Extubation plan	N	Y	83%	Y	N	89%
Timing of next antibiotic	N	Y	49%	N	Y	45%
X. Final Questions & Closure						
Intensivist clarifications and final questions	Y	N	98%	–	–	–
Contingency contact (hemodynamics, bleeding, etc).	N	Y	67%	Y	N	92%
RN states readiness to assume care of patient	Y	N	90%	–	–	–

Figures 6. Transfer-of-Care Measurement Tool (Technical and Non Technical)

Patient Sticker Here		Date:	
Name:		Time of Arrival:	**Transferring Provider Present:**
MRN:		Start Handover Report:	☐ ANES Resident ☐ ANES Fellow ☐ ANES Faculty ☐ CRNA ☐ SRNA
DOB	Sex: F/M	End Time:	☐ SURG Resident ☐ SURG Fellow ☐ SURG Faculty ☐ Other (if not listed please write in)

Receiving Provider Present: (Please circle: CA1, CA2, CA3)

Name of Observer: ___ Are you familiar with the patient? ☐Very well ☐Somewhat ☐Not at all ☐ ICU Physician ☐ ICU Resident ☐ICU Fellow ☐ NP/PA ☐ICU RN ☐ Respiratory Therapist

	N/A	O	NO	N/A = Not Applicable O=Observered NO=Not Observed
Intra-op				1 SURG FAC/RES states PROCEDURE performed; Postoperative CONCERNS and EXPECTATIONS ☐ Procedure stated ☐ Concerns/Expectations stated
				2 OR RN gave a PHONE report to the ADMIT RN using the checklist ☐ Phone Report ☐ Checklist Used ☐ Names of Handover Participants Exchanged
Pre-Departure				3 ANES Tech, EQUIP, DRUG box avail when pt ready to transfer beds (Real Time Obs only) ☐ Drug Box ☐ Monitors ☐ Oxygen/AmbuBag
				4 EKG leads, Pacemaker and PAC placed/secured as planned ☐ ALL EKG leads/cables across abdomen ☐ PAC afixed to shoulder ☐ Pacemaker between legs
				5 Pre-Departure Checklist completed ☐ Equipment ☐ Monitors ☐ Routine/Destination ☐ Contingency Plan ☐ Readiness ☐ Notification
Pre-Arrival				6 VENT and MONITORS set-up prior to arrival ☐ VENT ☐ Monitors
				7 Visual Cognitive Aids present prior to arrival ☐ Names on White Board ☐ COORD ☐ ICU MD ☐ SURG ☐ ANES ☐ ADMIT RN ☐ MONITOR RN
Transport to ICU				8 COORD, ADMIT RN, RT, SURG and ICU MD notified OR "Wheels Out" (Real Time Obs only)
				9 All staff present for transport (Grade with Real time observer only) ☐ ANES Tech ☐ OR RN ☐ ANES
ICU- Arrival				10 ALL members of the ICU handover team present/waiting ☐ COORD ☐ ADMIT RN ☐ RT ☐ SUPPORT ☐ ICU MD w/in 5min ☐ SURG w/in 5min
				11 ANES provided name & pts name; COORD identify him/herself during "wheels in" ☐ ANES Name ☐ Patient Name ☐ RN COORD Name
				12 COORD RN asked ANES MD if "ok" to begin hook up
Hook-up				13 Admit RN and RT attach Ventilator / Monitors & Readback Verbalized when completed ☐ Vent connect Readback ☐ Monitor connect Readback
				14 COORD request everyone to take place. ALL participants present/in place ☐ COORD requests ☐ Participants move to proper position
				15 COORD RN asked ANES MD if patient was STABLE enough to BEGIN handover ☐ RN request Readiness. ☐ ANES confirms Readiness.
				16 COORD RN distribute VCA and ask participants if NAMES is correct on WHITE Board ☐ Admit RN ☐ ANES ☐ SURG ☐ ICU MD ☐ Monitor have VCA
Introduction				17 COORD RN did give rules of conduct ☐ Sterile Cockpit ☐ Minimizes Distractions
				18 ICU MD stated social contract of handover participants ☐ Commitment of stay Focused ☐ Estimated Duration of Handover
				17 COORD RN did give rules of conduct ☐ Sterile Cockpit ☐ Minimizes Distractions
				18 ICU MD stated social contract of handover participants ☐ Commitment of stay Focused ☐ Estimated Duration of Handover
Handover Report				19 COORD asked ANES MD to provide BRIEF statement about patient SITUATION. ☐ Surgery performed ☐Stable/Unstable condition ☐Treatment Required
				20 COORD asked SURG MD to state any CRITICAL concerns
				21 COORD asks/ or SURG MD states BACKGOUND? ☐ Pertinent PMH ☐ Indication ☐Procedure(s) Performed ☐Complications/Concerns ☐ Dressing/Drain/Tubes
				22 COORD or ICU MD did insure orderly/complete discussion of the HEMODYN conditions ☐Baseline BP ☐Pre/post ECHO findings ☐Pacer settings/underlying rhythm ☐ Target BP/CVP ☐Review inotropes/Pressors ☐ Weaning Plan ☐ RN READBACK
				23 COORD or ICU MD did insure orderly/complete discussion of the BLEEDING conditions. ☐ Blood Transfusions ☐ Transfusion trigger ☐Next rxn (RBC, PLT, CRYO, FFP) ☐ RN READBACK
				24 COORD or ICU MD did insure orderly/complete disscusion of the AIRWAY/RESP conditions ☐A/W Difficulty/Devices ☐Last Opioid/NM relax/reversal ☐Vent settings/sedation plan ☐Extubation Plan ☐ RN READBACK
				25 COORD or ICU MD did insure orderly/complete discussion of RENAL/METABOLIC conditions ☐preop RENAL dysfxn ☐UOP ☐IVF admin ☐Electrolyte abn (k+) ☐ RN READBACK
				26 COORD or ICU MD ensure an orderly/complete discussion of the Endocrine/Other ☐ Insulin gtt/LAST Glucose ☐ Special Devices (ie Spinal Drain) ☐ RN READBACK
Wrap-up				27 COORD did ask SURG MD for any SPECIAL instructions & who to call for questions NOW & AFTER hrs ☐SURG Special Instructions ☐Afterhours Contact
				28 COORD asked and ICU MD verified all the CTQ issues were addressed ☐COORD asked ☐ICU MD verified
				29 COORD asked for ACTION Items and MONITOR/other READ ACTION items ☐COORD requested actions items ☐Monitor/other READ action items
				30 COORD asked ANES/SURG GREATEST concern in patients safe care ☐ COORD asked ☐ ANES/SURG responded d
				31 COORD did ask ADMIT RN/ICU MD if ADD'l INFO needed for safe care and READINESS to ASSUME Care ☐ COORD asked ☐RN/ICU MD
				32 COORD thanked team for their TIME and ATTENTION and stated DURATION of Handover ☐COORD Thanked ☐ Duration of Handover Stated
Video Information				Date of transfer _____ Video ID info. _____ Comments, notes and helpful information: _____

Communication and Teamwork Skills (adapted from CATS)		Observed & Good	Variation in Quality	Expected, NOT Observed
Leadership	Coordinator is present and manages handover sequence in efficient and effective manner			
	Leader (ICU MD/other) is present and manages team expectations; medical sense-making, and minimizes interruptions			
Communication	Closed-loop communication (with read back) is used with names used			
	Information exchange is clearly audible, at appropriate pace; in professional tone			
	Team members think aloud, take turns; individual member input requested			
Cooperation	Team member requests are responded to in timely manner			
	All team members engaged (not distracted by pager, phone, environment)			
	Team members exhibit respect for one another			
Coordination	All members present			
	Verbalize expected timeframes patients care needs			

Subjective Feedback (Please leave your comments about the handoff):

What was Effective/Ineffective about the Handoff?	What aspect(s) of the handoff could be improved?
- Behaviors/preparedness -Technical/equipment	- Surrounding conditions - Member Training

Improving Patient Handoffs in OR-ICU and OR-OR Settings

UT Southwestern Medical Center

Thomas Lowrey MS II, Jim Sheng MSII, Eleanor Phelps BSN MA RN, Fallon Ngo MD, Trent Bryson MD, Isaac Lynch MD, Rachel Harrison MD, Rachel Makinde MD, Glory Gituma CCRN Philip Greilich MD

Background

• Handovers or transfers-of-care (TOC) can be defined as a process of transferring information, authority, and responsibility from the departing clinician or clinical team (senders) to the incoming team (receivers) that allows for continuity of patient care.
• Poor handovers are a common cause of preventable patient harm. Clinical handovers in high-paced, high-stakes environments, such as operating rooms (ORs) and intensive care units (ICUs), are especially risky and error prone.
• Previous studies indicated that the standardization of the handoff process, to include communication-enhancing devices such as cognitive aids, have the potential to decrease medical-error rates by nearly a quarter (23%) and the occurrence of preventable adverse events by nearly a third (30%).
• Given this, a charter to reduce perioperative non-routine events by improving the reliability of handoffs was initiated in 2014. The University of Texas Clinical Safety & Effective approved funding for our pilot study entitled "*Enhanced Communication from the OR-to-ICU (ECHO-ICU)*" in 2015. The initial AIM of this work was to create a pragmatic model for: 1) transforming clinicians' attitude and approach to handoffs; 2) measuring its impact on reliability; and 3) reinforcing knowledge, skills, and teamwork behaviors necessary for project sustainability and spread.

Aim Statement

The primary aim of this project is to improve the reliability of OR-ICU and OR-OR patient handoffs at Clements University Hospital (CUH) by 50% by 2018.

Determine critical-to-quality elements for all TOCs in order to create a safe, informative, and efficient patient handover.

Project Design

The project was conducted through the **DMAIC model** (Define, Measure, Analyze, Improve, Control).
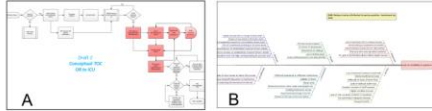

A step-by-step process was established (outlined above) to develop an "ideal" handoff, create an objective evaluation tool, and train observers for the study.

## Methods/Discussion

Understanding the Process   DMAIC

A. Process map of the OR-to-ICU TOC created from close observation of TOC's, stakeholder interviews and literature review. Allowed us to identify the problem step (highlighted in red) to be the verbal transfer of patient information.
B. Fishbone diagram detailing various elements contributing to lack of reliability in TOCs. Grouped into branches (ie. Environment, management etc). Important elements to note included a lack of structure and lack of leadership.

Determining Critical-to-Quality/Measurement Tool   DMAIC

- Surgeon
- Anesthesiologist
- Intensivist
- ICU Nurse
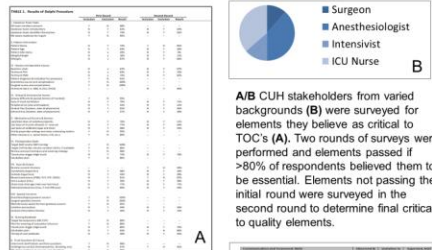
A/B CUH stakeholders from varied backgrounds (**B**) were surveyed for elements they believe as critical to TOC's (**A**). Two rounds of surveys were performed and elements passed if >80% of respondents believed them to be essential. Elements not passing the initial round were surveyed in the second round to determine final critical to quality elements.
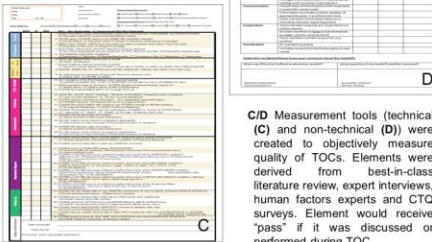
C/D Measurement tools (technical (**C**) and non-technical (**D**)) were created to objectively measure quality of TOCs. Elements were derived from best-in-class literature review, expert interviews, human factors experts and CTQ surveys. Element would receive "pass" if it was discussed or performed during TOC.

Training the Observers   DMAIC

Four simulation videos were created to train observers on how to collect data with the measurement tool. In situ simulation, TeamSTEPPS training and videotaping were used to create the program for designing the "ideal" handover. In order to ensure intra- and inter- rater reliability, multiple simulation videos were established with varying degrees of "quality" and observers must receive kappa = 80%. (1 ideal video; 3 non-ideal variants).

<u>Measures Used:</u> % critical elements completed per OR-ICU transfer

<u>Trained Observers:</u> CRNA's and Resident physicians

<u>Measurement Period:</u> Begin July 2016

Planned Intervention

Previous studies indicated that the use of a handoff checklist can significantly improve the quality of TOCs. A survey was sent to the UT Southwestern Department of Anesthesiology to gauge interest in the potential implementation of a intra-operative handover checklist. Questions included:

A: Do you feel like the Handover Checklist will increase the quality of information received in handoffs?
B: Do you think the Handoff checklist will increase patient safety?
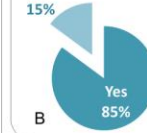
Results indicated that most anesthesiologists believe a handoff checklist would improve the quality of TOCs in the OR and would use it if provided.

From literature and survey, we determined:
Potential OR-ICU Intervention: ICU cognitive aid
Potential OR-OR Intervention: EMR cognitive aid

Next Steps

1) Complete observer standardized training
2) Begin baseline data collection
3) Project team analyze baseline data, FMEA, pilot intervention (cognitive aids)
4) Pilot program implementation and subsequent measurement
5) Refine, determine education component and spread to other units/hospitals

References/Financial Disclosure

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