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Perceptions of Teams in Providing Safe Handoffs

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Executive Summary

Problem

Pediatric hematology/oncology patients are highly complex and providing care to these patients requires effective communication and coordination. Failures of the handoff process can negatively impact patients as care is coordinated across the care continuum. Improving handoffs will drive better quality, better team and patient satisfaction, and reduce cost (Agency for Healthcare Research and Quality [AHRQ], 2020; Bigham et al., 2014; Frandsen et al., 2014; Keebler et al., 2016; Richter et al., 2016; Stimpson et al., 2020).

Purpose

This quality improvement project explored the perceptions of handoffs, transitions, and teamwork of members in a large service line team, at a quaternary pediatric health care system.

Goals

The overall goal of this project was to inform and direct improvement activities surrounding handoffs and transitions. Improved teamwork will improve handoff activities as patients transition between shifts, units, and across the organization.

Objective

The objective of this project was to survey the pediatric hematology/oncology service line to explore teams' perceptions of handoffs, transitions, and teamwork.

Plan

Upon obtaining site approval from the pediatric health care system and Regis University approval, the 411 pediatric hematology/oncology service line team members were invited to participate in a survey using a descriptive, cross-sectional, non-experimental design. The survey ranked experiences of handoff process elements including information, responsibility, accountability, and teamwork. Team members were given opportunity to further define ideal characteristics and barriers through open-ended questions. Nonparametric statistical analysis was performed on the data.

Outcomes and Results

There was a 29% participation rate with 124 surveys. Cronbach's alpha score of survey's reliability was .868. Questions pertaining to elements of handoffs were ranked using Friedman's Test of Ranking. The lowest ranked elements included shared goals and shared plan of care. Opportunities to improve teamwork dynamics also emerged. Identifying these themes was helpful in the foundational step of the quality improvement project to define, measure, and analyze the problem. These results will be shared with service line quality team to further efforts with improvement activities.

Acknowledgements

"One's destination is never a place but rather a new way of looking at things."

Henry Miller

This journey in pursuit of a DNP degree is not about arriving but remembering all those

who helped me along this path.

To my family and friends, thank you for words of love and encouragement,

sustaining me when I often stumbled and cried.

To the Regis DNP nursing faculty, thank you for setting my course

and believing in me when my courage waivered.

To my future… I see the infinite possibilities.

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Perceptions of Teams in Providing Safe Handoffs

Pediatric hematology/oncology patients are highly complex and providing care to these patients requires effective communication and coordination. This complex care is delivered within a large hematology/oncology service line at a quaternary health care organization in the Rocky Mountain region. The health care system provides pediatric health care at 17 unique sites across the state. The large hematology/oncology service line has a presence in five of these 17 locations. All services are not located at all sites. This requires patients to move or transition between sites. These complex patients in a complex system are at risk for negative outcomes related to handoffs during care transitions. Handoff failures result in treatment delays and errors, decreased patient/family satisfaction, decreased staff engagement, and increased cost. Communication errors, according to Joint Commission (TJC) report, were identified as the cause of 80% of all errors (Rosenthal et al., 2018), and mandated a standardized approach to handoffs. Improving handoffs will drive better quality, better team and patient satisfaction and reduce cost (Agency for Healthcare Research and Quality [AHRQ], 2020; Bigham et al., 2014; Frandsen et al., 2014; Keebler et al., 2016; Richter et al., 2016; Stimpson et al., 2020).

Handoffs and transitions are two of the twelve key areas measured by the Agency for Healthcare Research and Quality (AHRQ), in their Hospital Survey of Patient Safety Culture (AHRQ, 2020). This scientifically developed and extensively tested survey is used by health care organizations to support patient safety and quality improvement efforts. The tool can help organizations with assessing current state and trends regarding the patient safety culture and can identify strengths or areas for improvement. Patient safety culture is defined as the "beliefs, values, and norms shared by healthcare practitioners and other staff throughout the organization

that influence their actions and behaviors" (AHRQ, 2020, para. 4). In 2019, the organization

participated in the AHRQ Hospital Survey for Patient Safety Culture (HSOPSC 1.0).

According to Vogus, Sutcliffe and Weick (Vogus et al., 2010), safety culture has three

phases, enabling, enacting, and elaborating. The enabling phase is the effort leaders take in

ensuring psychological safety to speak up and act to improve safety. The enacting phase is the

teamwork within and between units. The elaborating phase includes the organizational learning

factors. An in depth analysis of survey data of 1,052 hospitals and 515,637 respondents, looked

at what organizational factors were positively associated with successful handoffs. Teamwork

across units was the most significant predictor of successful handoffs (Richter et al., 2016).

Handoffs and Transitions were the hematology/oncology service line's lowest scores in the

AHRQ HSOPSC survey in 2019.

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Problem Recognition and Definition

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Problem Statement

Handoffs are complex tasks. When undertaken within a complex system for complex

patients, this task can lead to failures. Failures in the handoff process can negatively impact

patients as care is coordinated in the pediatric hematology/oncology service line as patients

transition across inpatient, outpatient and throughout the organization of the large pediatric

health care system with multiple sites. The lowest scores for the hematology/oncology service

line in the Agency for Healthcare Research and Quality's HSOPSC pertains to handoffs and

transitions, and teamwork. The current handoff process as patients transition between

departments and sites does not follow a standardized format. The system's organizational

leadership as well as service line leadership is desirous of improving handoffs during patient

transitions.

Project Purpose

Exploration of perceptions of the hematology/oncology service line's interdisciplinary team of the handoff process will provide direction for improvement efforts.

PICO/Practice Question

In interdisciplinary team members, specifically providers- medical doctors (MD) and advance practice providers (APP), nurses, and support team, providing hematology/oncology/bone marrow transplant and cellular therapy care within a large service line at a regional quaternary children's health care system, will analysis of survey exploring internal and external perceptions of handoffs within the service line, as compared to no baseline data, provide common shared themes to inform activities to improve hand offs as patients transition across units and sites.

P (Population): Interdisciplinary clinical team consisting of MDs, APPs, inpatient nurses, outpatient nurses, and support staff working in the service line at the regional pediatric health care system.

I (Intervention): Distribution of quantitative and qualitative survey instrument assessing team's experience with handoffs, transitions, and teamwork.

C (Comparison): There is no baseline information on handoffs supporting patient transitions at this facility.

O (Outcome): Themes will be identified to inform interventions to improve handoffs for service line team as patients transition across sites and units.

Project Significance, Scope and Rationale

Project significance. This project was timely as the service line became even more complex with recent expansion within the region. The system is being forced to adapt to many

changes. The ever-changing environment in informatics with its frequent updates to the

electronic medical record (EMR) speaks to the impetus for improvements. There is continued

work and emphasis on the EMR and its use a tool to improve care coordination. The EMR is

foundational to information sharing for health care teams.

Overall, handoffs and transitions were the lowest score for the entire organization.

Successful improvements made as a result of greater understanding of the team's perceptions

may provide applicability to the larger organization. Improving handoffs system-wide aligns

with health strategy of coordination- reducing fragmentation with improved efficiency. In a time

when health care workers are stretched and tired, there is a need to focus on efforts to improve

team member satisfaction.

Scope. The scope of this project was a quality improvement project exclusive to the

hematology/oncology service line at the regional quaternary pediatric health care system in

Rocky Mountain region. This investigator explored the team members' perceptions of handoffs

as patients transition across the continuum of care.

Rationale. The service line's AHRQ HSOPSC results indicate that handoffs and

transitions scored lower than all other domains. A review of literature reveals poor handoffs

result in patient harm (Rosenthal et al., 2018). Teamwork is a predictor of successful

handoffs (Richter et al., 2016).

Theoretical Foundations for Project and Change

The application of complex systems theory and complex adaptive systems was chosen to

provide the theoretical framework for the project. Complex systems theory is an integrative

theory encompassing the fields of mathematics, engineering, physics, and cognitive and social

psychology (Anderson, 1999; Clancy et al., 2008). Its origins are in general systems theory

(Manson, 2001) and influenced by science of Chaos theory. Key constructs of this theory include, positive feedback, negative feedback and oscillation. Feedback can produce exponential growth or goal seeking behavior. Any oscillation can result in time delays. Theoretical propositions or characteristics of the theory are self-organization, emergence, nonlinear, chaos and turbulence- also known as unpredictability (Chaffee & McNeill, 2007; Clancy et al., 2008; Holden, 2005). Through interaction and interrelatedness, the parts of the system seek order through rules or patterns. The values and behaviors collectively emerge as organizational culture, these are conceptually identified as attractors. Stimulus and response within the system are not linear due to complexity. This variability produces chaos; multiple points of chaos create turbulence (Clancy et al., 2008). Complex system can be defined within its relationships as more than its individual parts. Within the system, interactions are nonlinear exchange of information. Through feedback loops, to enhance or inhibit, systems adapt and learn. There a many aspects, agents, and influencers that affect the interrelated system- often in an unpredictable and uncontrollable way.

The complexity theory contributes greatly to healthcare leaders as interdisciplinary, intra collaboration and teamwork are drivers of today's healthcare systems. The nonlinear approach takes into consideration social and cultural influences and added complexity. As complexity is a more philosophical framework or science, its tenets are overarching. It is often used foundationally as is in the application to the problem identified in this work. As such, it is highly congruent with nursing standards and nursing process. Complex systems are often cited in the research and has influenced theorists such as King, Rogers, and Roy (Holden, 2005). The cited references all list previous research of theoretical application to practice and advocate for further study.

According to authors (Ratnapalan & Lang, 2020, p. 19), the type of system can be charted and defined by the nature of the relationships along with degree of agreement and the number of parts along with degrees of certainty (See Appendix A). Types can range from Simple, with the lowest number of parts, certainty, relationships and agreements to Chaotic with multiple parts and relationships, uncertainty, and incongruence.

Complex adaptive system (CAS), is a complex system with the capacity to learn and adapt. It is increasingly applicable to healthcare organizations and the complex systems within organizations. Defined as "networks of interacting, interdependent agents bonded in cooperative dynamic by common goal, outlook, and need...with overlapping hierarchies" (Ratnapalan & Lang, 2020, p. 21). The most common construct of a 44 study review of complexity theory was relationships (Ratnapalan & Lang, 2020, p. 22). Complex adaptive systems are comprised of multiple agents that organize, depend, and connect in a nonlinear manner. The system learns, grows and evolves (McDaniel et al., 2009, p. 193). Given the task of handoffs in a CAS, diverse viewpoints support creative problem-solving but also may result in communication failures. Relationships may not be hierarchal but are often collaborative and can facilitate creating common patterns of emerging shared communication models.

The hematology/oncology service line is a type of system that can be described, according to Ratnapalan as a Chaotic system (Ratnapalan & Lang, 2020, Types of Systems section). There are multiple roles connecting in multiple relationships across multiple sites. The plan of care frequently changes based on patient condition and tolerance of treatment resulting in high levels of uncertainty. There is currently no agreement on standardization of handoff process.

The hematology/oncology service line is also inherently relational as a complex system. Considering connections in relationship to how handoffs or information is exchanged during transitions is imperative to understanding team perceptions. Exploring perceptions through survey is a way the complex system of the service line can provide feedback to drive adaptation or change within the system and more specifically, the team.

Adaptation within a team is described in an emerging theoretically based teamwork model. Described in *Toward the Development of the Perfect Medical Team: Critical Components for Adaptation*, the authors reviewed the literature for conceptual models, frameworks, and measures pertaining to healthcare teams to create a new model describing the "perfect medical team". (Gregory et al., 2019, p. 5). This model (See appendix B) has three team inputs, common patient-centered care, specific roles, and interdependent tasks. There are seven mediators, including psychological safety, conflict management, situation assessment and shared mental models, team leadership, team decision-making and planning, coordination and back-up behavior. The outcome of these inputs and processes is adaptation which creates a feedback loop back to inputs. Adaptation can only occur in the presence of supportive environment or conditions, and effective communication. Guiding adaptation is an effective change management approach for complex adaptive systems.

Adaptation within a teamwork model, and the complex adaptive system framework, are the conceptual models underpinning this work. Exploring perceptions of the specific roles (population) within the hematology/oncology service line, is a systemic approach to a situation assessment (survey- intervention) to identify themes/shared mental model (outcome). Exploring the evidence in the literature of handoffs and transitions provides foundation to guiding best practice.

Literature Selection/Systematic Process

      A systematic review of the literature (SROL) was completed through CINAHL with

Full Text, MEDLINE, and PsychINFO databases using search term "handoff(s)" OR

"handover(s)" AND "team(s)" AND "complex". The search date range was restricted from 2010

to 2020. This search produced 87 articles after duplicates removed. The articles were further

narrowed through reading each article's abstract to assess applicability. The articles that met

inclusion criteria contained cross-unit (complex systems), cross-role (interdisciplinary) or highly

complex patient population. Criteria that was excluded in this SROL, were role specific

handoffs, shift specific handoffs, or single unit handoff improvement efforts. This body of

evidence, though not included in this SROL, may provide support for standardizing processes

and implementing standardized tools to improve handoff efforts. Currently, there is no one

standardized approach supported in the literature. The resulting SROL includes 23 articles with

evidence supporting handoff improvement efforts in complex systems with complex patient

populations. The Level of Evidence table (See Table 1), (Stillwell et al., 2010, Table Hierarchy

of Evidence for Intervention Studies) displays the level of evidence identified within the scope of

this project.

Table 1

Systematic Review Table

Levels of Evidence		Number of Articles	Authors and Dates
I	Systematic review or metanalysis	3	Keebler et al. (2016), Riesenberg et al. (2010), Rosenthal et al. (2018)
II	Randomized controlled trial		
III	Case-control without randomization	10	Fernando et al. (2013), Riley et al. (2017) Pandaya et al. (2019), Toccofondi et al. (2012), Turner et al. (2018), Bigham et al.

			(2014), Jiang et al. 20xx), Klee et al. (2012) Skaret et al. (2019) Stimpson et al. (2020)
IV	Case-Control or Cohort Study		
V	Systematic review of qualitative or descriptive studies		
VI	Qualitative or descriptive studies	7	Lee et al (2016), Reilly et al. (2013), Rosenthal et al. (2016), McComb et al. (2017), Johnston et al. (2014), Mamykina et al. (2016), Richter et al. (2016
VII	Opinion or consensus	2	Quinonez et al. (2016) HR (2016)

Review of Evidence

Background of the Problem

The exchange of information, responsibility, and accountability are key tenets of handoff process. Handoffs in healthcare occur frequently; handoffs occur between shifts, as patients move between departments, as patients transition between levels of care, and finally as patients move home and to their communities. The handoff process may involve two people or teams of people. Effective handoffs support the complex care coordination required to provide continuity of care to pediatric hematology/oncology patients.

Systematic Review of the Literature

There were three themes identified in the search. The first included share mental model (SMM) using standardized tools or processes. The second theme suggested that with greater understanding of communication patterns and interdisciplinary roles handoffs, transitions or teamwork could improve. Finally, the use of the electronic medical record (EMR) as a platform for complex interdisciplinary handoffs emerged in the evidence.

Standardized Tools as Shared Mental Models

A 2016 published meta-analysis identified and reviewed 36 pre-/post interventional designs in clinical or hospital settings (Keebler et al., 2016), use of standardized handoff protocols improved patient, provider and organizational outcomes. However, though there was positive effect measured there was great heterogeneity of both the tool and outcome measures used. The authors identified a need to standardize outcome metrics to provide greater translatable and validated evidence. Additionally, the authors suggested a "2-step approach" to address the identified literature bias. Given that no one tool wad highlighted as gold standard, focused effort on teams creating an agreed upon process is suggested.

A 2014 multi-site study of 23 children's hospitals looked at 7864 handoffs over 12 months. Each hospital implemented their own tool. A pre-implementation handoff failure rate of 25.8% was significantly decreased to 7.9% post intervention (Bigham et al., 2014). Three additional pre-/post interventional studies in the investigators search, suggested support of a standardized approach to complex handoffs (Fernando et al., 2013; Turner et al., 2018; Weingart et al., 2013). In each of the studies, the outcome measures varied as did the standardized tool. In another systematic review looking at standardized handoff tool used in inter- and intra-facility transitions, heterogeneity of the tool used and outcomes measured, were listed as limitations to providing recommendations (Rosenthal et al., 2018). The current evidence is suggestive that a standardized tool could improve handoffs. There is no clear evidence to a specific tool; individual organizations' conditions, cultures and complexities may require a customized approach. Understanding team's perceptions is foundational in creating a shared mental model of handoff structure in the service line.

Team Communication Patterns

How teams communicate during handoffs and transitions also emerged in the literature. In comparing nurse and physician perceptions of perspective roles, responsibilities, and mutual trust, there were significant differences reported (McComb et al., 2017). Mutual trust was reported to be significantly stronger between like roles. The study highlighted the confusion regarding roles and responsibilities impacts collaboration and trust. In 2016, researchers qualitatively reviewed and recorded observed handoffs of an interdisciplinary team. Looking specifically at content and structure along with differences, they identified patterns and priorities of teams using a share mental model index. This approach was helpful in design of EMR handoff tools (Mamykina et al., 2016). In a study with the objective to find an ergonomic solution to improve the communication with handoffs both shift to shift and transition between units, a qualitative tool was piloted to analyze handoffs. The application of the tool required team involvement which supported team re-design participation. Early into the pilot, the study changed looking at transition between units to transition between providers given the cross-unit complexities (Toccafondi et al., 2012). Focused efforts on gaining insight into team dynamics involved in handoffs is important.

Leveraging Electronic Health Record

In a quality improvement project of a multidisciplinary oncology team, using Plan-Do-Study-Act methodology, (Pandya et al., 2019) an EMR shared mental model for handoffs was created and implemented. Outcome measures included, handoff related errors, tool use and completion, patient wait time and nurse satisfaction. Outcomes were measured pre-, post- and 12 months following implementation. The EMR handoff tool use was associated with reducing

med errors. The current EMR system at the pediatric health care system, allows information to be available and accessed wherever the patient and provider are, however, there is no identified handoff tool used. Creation, adoption, and implementation of an electronic based tool to support handoffs will require a team mental model for success. The measurement tool will need to explore how information exchange is supported to consider leveraging the EMR platform.

This project's focus is to gain better understanding team perceptions around handoffs, transitions, and teamwork. The current literature supports creating a shared mental model to improve handoff efforts. Gaining situational awareness of team's perceptions can guide team collaboration to create a shared/team mental model to improve handoffs and care transitions. The EMR is a platform that can support improved handoffs.

Project Plan and Evaluation

Market/Risk Analysis

Prior to initiating a project, it is imperative to assess resources, including personnel, time, equipment, and organizational readiness (Zaccagnini & White, 2017). Evaluation of organizational readiness was completed for this project through use of a SWOT analysis. The following table highlights the strengths, weaknesses, opportunities, and threats of the project (See Table 2).

Table 2

Project SWOT Analysis

Strengths	Weakness
- System Leadership support - Organizational support - Strong patient/family satisfaction score - Strong team satisfaction/engagement - Minimal budget impact	- Perceived silos of working groups - Poor understanding of cross roles and teams - Busy workloads - Competing priorities - Insufficient respondents

-

Opportunities	Threats
• Survey used in other departments within system • Survey used across organization • Cost savings recognized by payers • Improved coordination across system	• Timeliness in IRB approval • Covid-19 resurgence. Competing priorities • Data storage failure

Driving, Restraining, and Sustaining Forces

The strongest driving force to improve handoffs is the organizational readiness with a commitment to ensure a strong culture of safety. The organization financially supports the AHRQ HSOPSC every 2 years. Division and department leaders are expected to support improvement activities in response to scores. Quality and patient safety are expectations set by both The Joint Commission's requirements for accreditation (The Joint Commission [TJC], 2017) and mandated by the Institute of Medicines (Institute of Medicine [IOM], 2011). There is strong internal desire from individuals within the hematology/oncology service line to provide quality care to their patients. Viewing the service line as a complex adaptive system, its imperative to remember that the system itself is always in motion, learning, and adapting.

The service line is a complex adaptive system, and as such, change and adaptation is already occurring, sometimes not in positive ways. The goal is adaptation resulting in best practice or evidence based patient care. Fear of change or moving away from what is comfortable is a barrier to adaptation. In science-based industry discussions surrounding relationships, perceptions, and people/team skills are sometimes viewed as soft skills and not prioritized. These restraining influences will require sharing evidence and supporting practice

change based on the evidence. Attending to relationships and building team skills

are interventions positively impacting handoffs and transitions in the literature (Gittell, 2016).

The pediatric hematology/oncology service line leadership, both senior and frontline, is

motivated to improve handoffs, transitions and teamwork to improving score of future AHRQ

survey and to improve care coordination. As the next AHRQ survey is approaching in summer

of 2021, gaining greater insight and understanding of handoff process and failures will provide

focus for improvements. The AHRQ survey is administered every two years. The

hematology/oncology service line is not the only department with low handoff and transitions

scores. A reliable and valid survey tool to identify opportunities could be used across the

organizations in like work.

Need, Resources, and Sustainability

Need. Failures in handoffs can negatively impact patients as they transition across the

continuum of care. This complex task is performed within a complex system. Gaining deeper

understanding of the components of handoffs during patient transitions can help to identify

problems. Once the problem(s) is identified, improvement interventions can be planned, and

implemented. Additionally, a reliable and validated survey could be an effective measurement

tool used to demonstrate improvements from implemented activities.

Resources. The resources needed to conduct this project included personnel, supplies,

equipment, and time. The investigator required the use of computer for literature search and

documenting the project along with use of office supplies. Training was required to access and

utilize REDCap, an online data collection platform. Time was expended by investigator and

subject-matter experts used in the creation, reiterations, and validation of the measurement

tool. The faculty advisor and DNP mentor generously supplied support through the resource

of time. Service line leadership provided guidance and support of the project's implementation.

       Sustainability. The project's objective was an exploratory dive into teams' perceptions

of the handoff process to further define the problem. Through measuring the perceptions and

analyzing the data, the service line can use the information to begin planning for interventions.

Sustainability of the project will require stakeholder and leader support. There is risk for a

problem to be recognized without plan to improve. There will need to be core change team

identified to own this process (Silver, & Harel, et al., 2016). This team will need a lead, clinical

experts, clinical leaders, quality improvement expert, and executive support. This team is likely

to be supported by the hematology/oncology service line's clinical effectiveness or quality

committee. Communicating to the service line's leadership and teams and creating a sense of

urgency is an important first step in sustaining this work. It will be important when creating

solutions to drive change. New standard workflows should be created, not adding additional

work to an already complex process (Silver, & McQuillan, et al., 2016).

Feasibility/Risks/Unintended Consequences

       Feasibility. This project was feasible to implement with the hematology/oncology

service line based on executive and frontline leadership support. The service lines clinical

effectiveness council also supported the project. The project did not require capital investment.

Requests to be a part of the subject mater expert panel was met with strong affirmation. The

project implementation requirements were minimal with online format of a survey requiring only

20 minutes participation effort.

       Risks. One identified risk is staffing challenges that could reduce the number of

participants completing the survey. Lack of clarity or lack of communicating benefit of

participation could reduce the number of individuals completing the survey. A service line team member outbreak of illness could reduce participation. Given the survey is electronic, any downtime or internet connection issues could also impact participation. There is risk to the service line if improvement efforts are not focused on effectiveness and efficiency of handoffs. Correctly identifying the problem to focus efforts will lead to focused improvements. Creating a survey to explore through the understanding of the finer details of handoffs in the service line helped to mitigate the risk of handoff failures by more clearly defining the problem of handoff failures. Patient harm, team member dissatisfaction, fragmentation, and duplication of care are risks to the service line if nothing is done (Rosenthal et al., 2018; Stimpson et al., 2020).

Unintended Consequences. An unintended consequence of implementing this project is the survey identifies more issues than current available resources can address. Another issue is sharing results could create deeper divisions between the various roles and teams within the service line with finger pointing and blaming.

Stakeholders and Project Team

The stakeholders impacted by the implementation of this project include the hematology/oncology service line leadership, the service line's clinical effectiveness council, providers, nurses, patients and families, communities, and payers. Executive leaders at pediatric regional health care system may find the project translatable to organization to drive not just service line improvement efforts but other divisions and departments across the entire system.

The project team included the primary investigator, faculty advisors, DNP mentor, and service line leadership.

Cost-Benefit Analysis

The cost to conduct this project was minimal. Cost to investigator included the purchase

of IBM SPSS 26 Student. There was no cost to access and use the REDCap platform as

investigator was employed by pediatric health care system. Estimating time value of survey

participants, content validity panelists, and associated costs of developing and distributing survey

is outlined. All associated costs and projected benefit can be found in Appendix C.

Improving handoffs could result in significant cost savings.   Medical errors are estimated

to have a national annual cost of $4 billion dollars per year (Rodziewicz & Hipskind,

2020). Reducing fragmentation led to cost savings of 50% in a study of 510,000 patients with

chronic medical conditions (Frandsen et al., 2014). Improving communication and reducing

handoff failures will improve patient/family satisfaction and team member satisfaction (Stimpson

et al., 2020; Weingart et al., 2013).

The cost of replicating this project should include data collection platform, statistical

analysis and SPSS software, survey participation costs. Investigator time to implement should

also be considered. Creation and validation of survey would not need to be replicated and

therefore not tabulated. The table in Appendix D displays the estimated costs.

Mission/Vision/Goals

Mission and Vision. The investigator's mission for this exploratory study was to

improve an interdisciplinary team's complex care coordination through greater understanding of

handoff practices. The vision is the seamless coordination of care for pediatric

hematology/oncology patients and the interdisciplinary team caring for them.

Goal. The overall goal of this project is to inform and direct improvement activities

surrounding handoffs and transitions. Improved teamwork will improve handoff activities as

patients transition between shifts, units, and across the organization. The project and its findings

are not to be generalized outside the pediatric quaternary health care system as it was a quality

improvement initiative.

Process/Outcome Objectives

Process Objectives.

I.   Create survey to reflect components of AHRQ handoffs and transition, and teamwork
        to provide more detail to define core concerns.
II.   Validate content of survey through subject-matter experts and committee.
III.   Obtain IRB approval.
IV.   Administer survey to collect quantitative and qualitative data to record perceptions of
        handoffs, transitions, and teamwork between interdisciplinary team.
V.   Analyze and compare data. Correlate data by role, location, focus, and years of
        experience.

Outcome Objectives.

VI.   Establish reliability of measurement tool.
VII.   Identify themes in data of staff perceptions to drive improvement efforts.
VIII.   Share results with team.

Logic Model

A logic or conceptual model is used to demonstrate key constructs and variables

relationally and functionally (Earp, 1991) of a project. The model (See Appendix E) adapted

from Kellogg Foundation (W.K Kellogg Foundation, 2004) illustrates the project plan. This

plan identifies assumptions and factors that may influence the participants, and the process, as

well as constraints that pose a risk to the project's success. Further, the model illustrates the

structure, process, and outcomes for the project.

Appropriate for Objectives and Research Design

The design for this project is in alignment with a quality improvement focus. The

nonexperimental, descriptive design is intended to be foundational of the Six Sigma

methodology. The objective of the project as stated is to thematically identify issues in handoffs

to address variations in practice and to improve the process (Moran, 2017).

Population/Sampling Parameters

The entire team within the pediatric hematology/oncology/bone marrow transplant and

cellular therapy service line was invited to participate. The service line is a large

interdisciplinary team consisting of physicians, advance practice practitioners, registered nurses,

and support staff. These support staff include schedulers, unit clerks, medical assistants, care

assistants, administrative support team, and research team. All members of the service line and

were included in the AHRQ HSOPSC that identified handoffs and transitions as problematic.

With faculty (physicians and APPs), RNs, and support staff, a total of 411 individuals were

invited to participate. The invitation to participate was sent to team members via email directly

coming from the section chief. (See Appendix F). The email had an embedded link to complete

the survey.

Appropriateness of the Setting

The pediatric hematology/oncology service line is part of a large pediatric health care

system in the Rocky Mountain region. The service line provides care in both the inpatient and

outpatient settings. The organization's main campus has 48 inpatient beds, with 24 highly

immunocompromised/bone marrow transplant beds. The outpatient clinics averages

2,500 number of visits per month for all sites.   The southern region has a hospital with inpatient

beds and averages three inpatients per day. In the metro area where the main campus is located,

there are three outpatient clinics. In some instances, patients receive care at more than one

site. A frequent component of a pediatric hematology/oncology patient's care is radiological

exams. These studies may be performed at possible six locations. The project was supported by the health care system's Chief Nursing Executive Officer (See Appendix G).

Design Methodology

The investigator used a descriptive, cross-sectional, non-experimental survey to explore the perceptions of handoffs, transitions, and teamwork of service line team, at a quaternary pediatric health care system. There were no identified independent or dependent variables. Several demographic data points of participants were factored, including role, location of work (main campus or network of care), focus of work (inpatient or outpatient), and years in current role. Two open-ended questions were added to provide investigator with contextual qualitative data (See Appendix H).

Protection of Human Rights

The investigator for this project was prepared to ensure safety of participants by completing a CITI course prior to implementing the project (See Appendix I). Project approval through the health care system's Organizational Research Risk & Quality Improvement Review Panel (ORRQIRP), was obtained; followed by approval through Regis University's Institution Review Board (See Appendices J and K). This project was defined as quality improvement and not human subject research. The investigator disclosed the purpose of survey to potential participants and consent to participate was implied by completing the survey (See Appendix F).

Data collection procedures were followed to protect the anonymity of respondents and to maintain the confidentiality of the data collected. Additionally, study burden was minimized by time projection for survey participation to be twenty minutes. No personal or sensitive information was queried.

Instrumentation Reliability/Validity and Intended Statistics

  Instrumentation Reliability/Validity. The investigator created a measurement tool

identifying essential components to effective handoff from the evidence. The components were

defined by AHRQ, information, responsibility and accountability (AHRQ, 2020). The tool

included the component of teamwork as the evidence suggests it is a predictor of handoff

success (Richter et al., 2016). The survey tool was composed of three sections, demographics,

quantitative, and two open-ended questions. The first section asked demographic information

pertaining to role, years of experience, focus of work such as inpatient or outpatient, and

location, whether participants worked at the primary campus or at one of the networks of care

locations. The quantitative section is a 5-point Likert-style survey with rankings using, never,

rarely, occasionally, often and always. It has the four components or domains pertaining to

handoffs including information, responsibility, accountability and teamwork. There are 16 total

items in this section with two open-ended questions completing the tool. The two open-ended

questions focused on barriers and defining the ideal handoff.

   Content validity process followed guidelines presented in *Making Sense of Methods and*

Measurements: Lawshe's Content Validity Index, (Gilbert & Prion, 2016). The content validity

ratio or CVR according to Lawshe (Gilbert & Prion, 2016) is calculated per item and is based on

the number of "essential" ratings identified by the panel. The content validity index,

or CVI, scores the entire tool; it is the mean of the CVR values. A content validity ratio score for

a question (070-0.80) is supported in the literature.

  Lawshe's Content Validity Ratio:

  Content Validity Ratio = (ne - N/2) / N/2

  ne= number of essential rating

N= number of panelists

A panel of handoff experts were invited to validate the measurement tool (See Appendix L). The tool underwent a three-round iterative process of validation. Through each round, the panel of 10, all experts in handoffs, comprised of physicians, nurses, and process improvement personnel, reviewed and rated questions "essential", "useful", or "not necessary" (See Appendix M). The panel was asked to reword a "useful" question to make it "essential". "Not necessary" questions were eliminated. Each round narrowed in on specific questions deemed "useful" to revise the questions to become "essential". Following the third iteration, all but one question was deemed "essential" by the panel. All questions used in the survey scored >0.7-0.8. The CVI score for the tool was 15/16 =0.9375.

Intended statistics. There are no dependent or independent variables identified in this exploratory descriptive survey, as there is no cause or effect measured. The use of statistical analysis for this project will help identify interrelatedness of team member perceptions and support defining the problems experienced by team members performing handoffs during transitions. Each question of the survey, including the demographics are single variable.

Inferential statistics with level of significance was set at <.0.05.   Nonparametric tests were used because of the level of the data was nominal or ordinal. The data was not expected to fit a normal distribution, nor was the sample size large enough for a normal distribution to be found (Polit, 2010).

Friedman's (χ^2) is a nonparametric inferential statistical test. It was used to test the rank scores of three or more independent groups. Each question of the survey and the domains was run as an independent variable. Split files of Friedman's (χ^2) tested ranking according to role, location, focus, and years in role.

Kendall's tau (τ) is a nonparametric inferential statistical test. It was used to test the relationship between two variables. It is often used with variables measured using ordinal data.

Descriptive statistics were used to describe, compare, and characterize relationships with the intent to summarize and explain findings in an understandable way (Polit, 2010, p. 11). The demographic data for this project is presented as percentages and frequency and is presented in graph form to describe participants in the project.

Data Collection and Survey Implementation

The following steps were followed by the investigator in implementing this quality improvement project.

1. Obtained site and Regis IRB approval
2. Informed service line team members of project October 10-November 10, 2020
3. Emailed invitation to participate with REDCap survey link November 16, 2020
4. Emailed reminders. Sent November 20 and 30, 2020 and December 8, 2020
5. Survey closed December 11, 2020.

The investigator maintained confidentiality of participants' data. There were no personal identifiers used. The results were collected electronically in REDCap. These results were saved into an EXCEL spreadsheet and then uploaded to IBM SPSS 26 for analysis.

<div align="center">

Project Findings and Results

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There were 411 team members that work in the pediatric hematology/oncology service line at the regional quaternary health care system; a total of 124 team members elected to participate in the project. The participation rate was 29%. The demographic variables were explored using descriptive statistics of frequency and percentage (See Table 3). Registered nurses accounted for 48.4% of participants. Providers, physicians and nurse practitioner/physician assistants made up 33.9% of participants. Most participants, 83.1%, work

at the main campus. The focus of work, inpatient- 52.4% and outpatient- 47.6% was similar

between participants. These variables were compared to quantitative survey data to explore

differences and similarities.

Table 3

Descriptive findings: Demographic factors

Demographic Factor	Frequency	Percentage
Roles		
Physician	28	22.6%
Nurse Practitioner/Physician Assistant	14	11.3%
Registered Nurse	60	48.4%
Other	22	17.7%
Focus of work		
Inpatient	65	52.4%
Outpatient	59	47.6%
Location of work		
Primary campus	103	83.1%
Network of care	21	16.9%
Years in role		
Less than 1 year	18	14.5%
1-5 years	48	38.7%
6-10 years	25	20.2%
10-15 years	16	12.9%
Greater than 15 years	17	13.7%

The survey questions and domains were analyzed in SPSS using Friedman's (χ^2) Test of

Ranking. The ranking of the domains (all questions pertaining to specific domain) of

information, responsibility, accountability, and teamwork were found to be the same (Chi-Square

.95, p value .812). No one domain ranked lower or higher than the other (See Table 4).

Table 4

Friedman's Test of Ranking of Domains (Chi-Square 0.95; p-value 0.812

Domain	Mean Rank
Information	2.53
Responsibility	2.53
Accountability	2.46

Teamwork	2.48

Friedman's Test of Ranking (χ^2) of the individual questions, demonstrated there were statistical differences with the question ranking (Chi-square 323.511, p-value .000). The questions that demonstrated the lowest ranking across all participants were Question 10 "When patients transition between units of sites, the plan of care is easily found in the EMR", and Question 11 "When patients transition between units or sites, the goals of care are clearly stated in the EMR."

Table 5

Freidman's Test of Ranking of Questions (Chi-square 323.511, p-value 0.000)

	Mean Rank
I am aware of the risk of patient harm, as patients transition between departments. (Q 12)	12.17
When patients transition between units or sites, I am responsible for getting the information I need. (Q 9)	10.3
During handoffs to other departments, I have clear understanding of the role of the person I am handing off to. (Q 14)	10.06
The handoffs I receive provide opportunity for me to ask clarifying questions. (Q 4)	9.85
There is mutual respect demonstrated with every handoff. (Q 13)	9.66
When patients transition between units or sites, I am responsible for providing the information to the receiving unit. (Q 8)	9.19
The handoffs I receive are accurate. (Q 2)	8.89
After knowing what the patient needs, I know when it should be done. (Q 6)	8.83
After handoff, I know exactly who is responsible to act. (Q 7)	8.83
The handoffs I receive are timely. (Q 3)	8.38
The handoffs I receive are clear and well organized. (Q 1)	8.04
The person who should initiate the handoff is clearly defined. (Q 13)	8.01
After handoff, I know exactly what the patient needs (labs, meds, diagnostics). (Q 5)	7.62
Contact information of sending is easy to access when clarification is needed. (Q 15)	6.65
When patients transition between units or sites, the plan of care is easily found in EMR. (Q 10)	5.12
When patients transition between unit or sites, the goals of care clearly stated in the EMR. (Q 11)	4.42

The file was split according to demographics (See Appendix N); the only variable that ranked the two lowest performing questions differently was "other" role. This participant group is made up of schedulers, medical assistants, researchers, social workers, pharmacists, and others not listed. The lowest performing question was Question 8 "When patients transition between units or sites, I am responsible for providing the information to the receiving unit". Question 10 "When patients transition between units of sites, the plan of care is easily found in the EMR", was the second lowest score in the rankings, similar to global responses. Looking descriptively at Question 10 and Question 11's frequency and percentage, 65.9% of participants answered that the plan of care was only rarely or occasionally found in the EMR; 75.5% of participants answered the goals of care were never, rarely or occasionally found in the EMR. (see table/appendix)

The third lowest performing question over all was Question 15 "Contact information of sender is easy to access, when clarification is needed." Similar ranking was found among the demographic variables except for those participants in their role 1-5 years, those in their role greater than 15 years, and the role of physician. Those in the role 1-5 years ranked Question 5 "After handoff, I know exactly what the patient needs (labs, medication, diagnostics)" as problematic. However, those in the role greater than 15 years and those in the role of physician, ranked Question 1 "The handoffs I receive are clear and well organized', as low performing.

Aspects of handoffs that demonstrated stronger performance were identified by higher ranking. According to overall participants, Question 12 "I am aware of the risk of patient harm as patient transition between departments" ranked the highest. In the split file, Question 12 ranked highest across demographic variables except, those in role less than 1 year, or those in

role 10-15 years. The highest performing element to handoffs was Question 4 "The handoffs I

receive provide opportunity for me to ask clarifying questions" for those in role less than 1 year.

The highest performing element to handoffs for those in role 10-15 years was Question 9 "When

patients transition between units or sites, I am responsible for getting the information that I

need." For the second and third ranking of questions, overall participants ranked Question 9

"When patients transition between units or sites, I am responsible for getting the information that

I need." and "The handoffs I receive provide opportunity for me to ask clarifying

questions". There was great variability noted in split file between the demographic variables and

how participants ranked the questions from the strength perspective. In every variable, the

second and third ranked question was different in each group.

Significant correlations of variables were determined using Kendall's tau (τ). Role had

the greatest number of significant (p<0.05) correlations to the following variables; Question 3

"The handoffs I receive are timely"(-.208; .014), Question 14 "During handoffs to other

departments, I have a clear understanding of the role of the person I am handing off to"(-.199;

.032), Question 15 "Contact information of sender is easy to access when clarification is needed"

(-.237; .009), and Question 16 "There is mutual respect demonstrated with every handoff" (-

.296; .001). Each of these correlations demonstrated a low inverse relationship. Question

16 "There is mutual respect demonstrated with every handoff" also demonstrated a significant

low, positive correlation with years in role (.219; .015).

The frequencies and percentages for each question is presented in the table (See

Appendix P). For questions pertaining to handoffs that ranked occasionally, or lower- rarely or

never, could be viewed as opportunities to improve the system's performance to support a more

reliable process. Combining the occasional/rarely/never percentages, the investigator defines this

data as negative response. This categorization allows for viewing questions as highly unreliable

(> 30% negative team perceptions) unreliable (20-30% negative team perception) fairly reliable

(10-19% negative team perception) and reliable (<10% of team perceived negative).

Two open-ended questions completed the survey. One question asked participants to

list barriers or issues experienced during handoffs or transitions (See Appendix Q). The second

question asked participants to list the characteristics of ideal handoffs (See Appendix R). The

comments were evaluated for themes and categorized according to domains, information,

responsibility, accountability, and teamwork for each question. Some comments were excluded

if included references to transitions outside the service line. These included the intensive care

units or the emergency department as the focus of the survey was transitions within the

department. A breakdown of the number of comments is below in Table 6 (See Table 6).

Table 6

Open ended survey comments by domain

Domain	Comments
Barriers/issue to handoffs	
Information	11
Responsibility	11
Accountability	14
Teamwork	25
Ideal characteristics of handoffs	
Information	55
Responsibility	3
Accountability	14
Teamwork	11

The teamwork domain had the greatest number of comments listing barriers or

issues with a total of 25. Three primary subgroups were identified in the Teamwork comments.

Eight comments shared concerns with reaching parties for handoffs or for clarification, "hard to

find the right person in other locations" and "getting a hold of the appropriate person, wrong

phone assigned". Eight lacked understanding of roles "unclear roles and responsibilities between sites and roles", and "fragmentation and lack of clarity of roles" as being barriers to good handoffs. Seven comments focused on team dynamic issues, especially conflict resolution, "poor listening" "interrupting", "disagreements between attendings" "doesn't notify in timely manner", and "issues between inpatient and outpatient".

The comments received concerning the ideal handoffs, suggest that the team can speak to information domain of handoffs, needing to be timely and accurate with the ability to clarify when needed. Fifty-five of the 83 "ideal" comments were categorized to be in the information domain. Information provided in a "clear" and "concise" dominated the participant comments. Structure, organization, and format were also characteristics described as ideal in handoffs by participants. There is agreement conceptually but not in practice. Barriers to handoffs were identified by participants as "poor structure, important pieces missed", "lacking key information", "incomplete details". The elements in the information domain were found reliable (experienced as often or always by participants) 75% of the time.

It was striking that only three comments could define ideal characteristics in domain of responsibility. Within this domain, handoffs should clearly define, what the patient needs, when the patient needs it, and who should perform it. The following are the survey comments for this domain, "clearly defined what you need to do for the patient in next couple of hours", "time sensitive things highlighted', and, specific for discharge planning, "checklist including new meds, prescribed, home care and appointments needed".

Within the teamwork domain, two areas were identified as areas in need for focused improvement efforts. These were inaccessibility of contact information to clarify post handoff questions and clear identification of who should initiate the handoff. The participant's comments

supported the third lowest ranked element demonstrated by "sometimes hard to reach out to person for follow up", "finding the right person to handoff to" and "call back numbers-especially for physicians". Beyond clear identification of who initiates the handoff, there were several comments concerning role confusion across the hematology/oncology service line. Some of these comments include, "unclear roles and responsibilities between sites and roles", "duplicate work and missed work across inpatient and outpatient, and "fragmentation and lack of clarity of roles". with focused efforts needed on contact information and role clarification. Attending to the relational aspect of task integration

Reliability of the survey tool was quantified through calculating Cronbach's alpha (See Table 7). It measures the internal consistency of the survey questions to indicate the reliability of the tool (Polit, 2010, p. 354).

Table 7

Reliability Statistics

Cronbach's Alpha	N of Items
.868	16

Discussion

The project was implemented to explore the hematology/oncology service line team's perception of handoff process for patients transitioning within the system. The survey results demonstrated several key themes to focus efforts to improve the process. Emerging from the quantitative data results, the team identified that the goals and plan of care were not easily found in the EMR. Shared knowledge and shared goals are key elements found in task integration (Gittell, 2016). In the project's SROL, there is evidence to support using the EMR for handoffs and plan of care (Pandya et al., 2019; Stimpson et al., 2020; Toccafondi et al., 2012). The team

also indicated low performance score of the handoff element, knowing what the patient needs

after transition, which is in direct relation to not having an easily accessible plan of care. The

open-ended questions affirm the need to develop a shared understanding of handoff process, and

centralized location of information. Standardizing handoff process (organized, structured) and

standardizing content (accurate, accessible) is foundational step in developing a shared/team

mental model for transition based handoffs. Leveraging the EMR is promising component of the

developing team mental model.

The theoretical underpinnings of this project helped to center the work with the

hematology/oncology service line, a highly complex system. Gaining situational awareness, or

assessing the current state, was the purpose of this project. Identifying areas of opportunity to

promote the system's adaptation was the intended outcome.

<div align="center">**Limitations, Recommendations, Implications for Change**</div>

Limitations

One limitation of this study was the survey. Having been validated by a panel of

clinical experts, the non-clinical perspective was not accounted for. The survey was intended to

capture the perceptions of all service line team members, clinical and non-clinical. The inclusion

of both was intended to reflect the sample for the AHRQ survey where the problem was initially

identified. It was observed that some participants who noted "other" did not complete all four

sections of the survey. One hundred and twenty-four participants completed demographics, 104

participants completed section 1, 103 completed section 2, 94 completed section 3, and 93

completed section 4. It is not known whether participants dropped out due to time constraints, or

if survey was not completed due to nonapplicable questions.   The subject-matter experts of the

validation panel were all clinical and there was very little consideration to non-clinical team

members. Questions were created, revised and validated by clinicians or improvement specialists focused in clinical areas.

The participation rate was low at 29%; the completion rate was lower at 22% with invited participants completing all four sections. This survey was able to explore the perceptions of those who participated, but with a lower response rate, generalization is not possible.

Recommendation

The results of the survey validated what emerged from the literature. This investigator offers the following recommendations: 1. Leverage the EMR to centralize goals and plan of care for pediatric hematology/oncology patients, 2. Develop shared mental model of communication for handoffs. Collaboration should include the many roles within the service line to be more effective in developing share model of communication for handoffs resulting in safer transitions and reducing patient harm (Lewis et al., 2020) 3. Focus efforts on building stronger teams by improving access through better contact information and improving the understanding of roles across the system. Use the validated and reliable survey created in this project to measure improvements following planned interventions. It may be feasible to expand the tool to other service lines at the regional pediatric health care system to explore other improvement opportunities.

Implications for Change

This study has identified the areas of shared knowledge, shared goals, and strengthening teamwork as opportunities to improve. These are constructs used in researcher Jody Gittel's Relational Coordination model. Relational coordination is "coordinating work through relationship of shared goals, shared knowledge and mutual respect" (Gittell, 2016, p. 14). Handoffs as patients transition is a task that is integrated across the system. There is

conceptual overlap of handoffs and care coordination and there is strong literature supporting both. According to Gittel, the quality of the three constructs shared goals, shared knowledge and mutual respect, supports the frequent, timely, accurate, problem-solving, communication required in effective handoffs (Gittell, 2016). Further exploration and application of this model is recommended in next steps, the planning and intervention phases.

What isn't addressed in this project, but is emerging in importance, is the role patients and families play in handoffs, shared goal setting and shared care planning. There is a large, separate body of literature supporting access of information through electronic platforms. Developing shared goals and shared plan of care that includes the patient and family and is accessible to caregivers and healthcare providers could help to address two distinct but critical issues (Desai et al., 2018; Dykes et al., 2014; Ming et al., 2018).

Summary

Through exploring the perceptions of hematology/oncology service line team at a quaternary pediatric health care system in Rocky Mountain region, key elements of handoff process emerged that could drive systemic improvements. The validated survey was found to be a reliable tool to measure perception of handoff process. Without planning and implementation of interventions to improve handoffs, pediatric hematology/oncology patients are at risk during transitions, teamwork will be negatively impacted, and the cost of care will continue to increase due to fragmentation, duplication, and patient harm.

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Appendix A

Complex Adaptive Systems
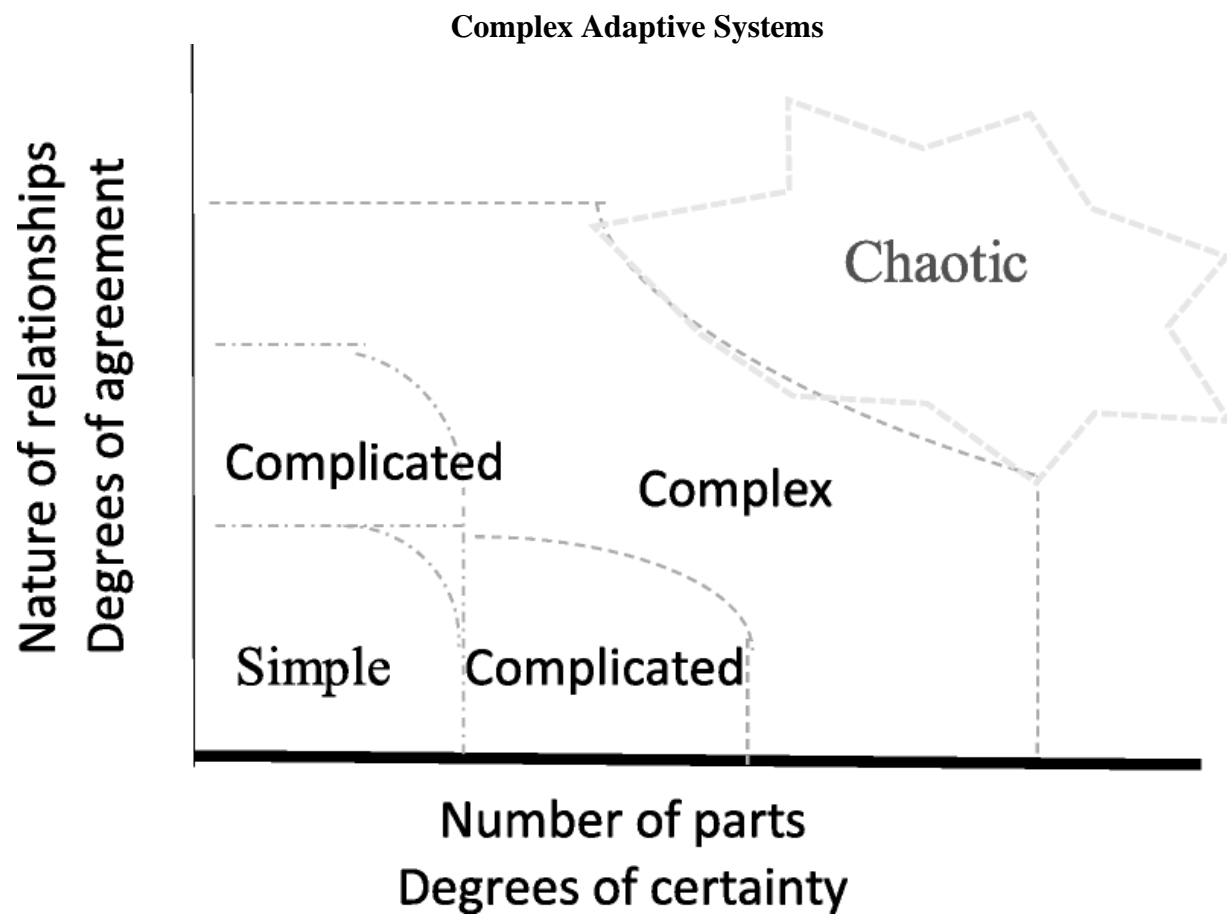
Appendix B

IMOI Model: Toward a perfect medical team

FIGURE 1
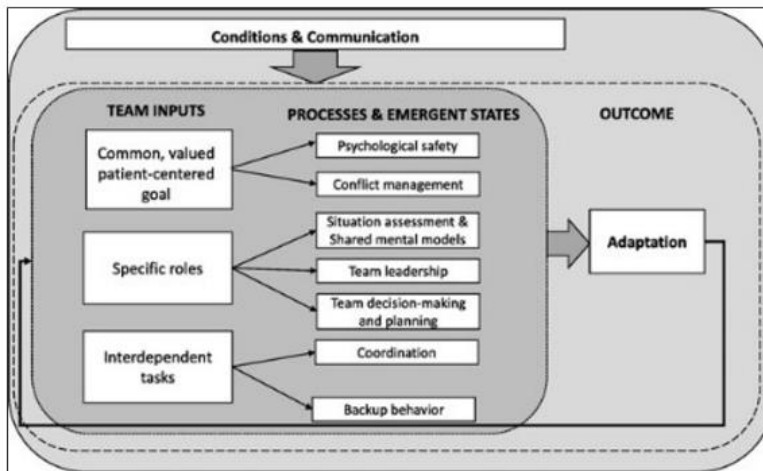
Toward the Development of the Perfect Medical Team: Critical Components for Adaptation.
Gregory, Megan; Hughes, Ashley; Benishek, Lauren; Sonesh, Shirley; Lazzara, Elizabeth; Woodard, LeChauncy; MD, MPH; Salas, Eduardo

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FIGURE 1 . The IMOI model: toward a perfect medical team. This figure is a conceptual model of the "perfect medical team" ABCs described in the article. The model follows the IMOI path,41 with three team inputs (common patient-centered goal, specific roles, and interdependent tasks), seven mediators (i.e., behavioral processes and cognitive and affective emergent states, including psychological safety, conflict management, situation assessment and SMMs, team leadership, team decision-making and planning, coordination, and backup behavior) and one outcome (adaptation). We posit that these ABCs facilitate adaptation, which is necessary for patient safety; however, this can only occur when conditions are supportive and effective communication occurs, as shown by the arrow at the top. The arrow pointing from adaptation back to the figure indicates the recursive nature of the relationship, that is, adaptation feeds back into improved teamwork in subsequent performance episodes.

Appendix C

Cost/Benefit Analysis Table

Cost	Benefit
124 x 60.00 x .25 (15 min) = $1860 (29% participation rate)	Communication errors associated with 70% sentinel events
Implementation and data collection (10 hrs.) = $0 student lead.	Care fragmentation. Study 510,000 CMC $10,000 Vs $5,000
IBM SPSS 26 Student ($64)	Medical errors account for $4 billion per year.
Data Analysis with Consultant (40 hrs.) =$0 student hours	Team member turnover. MD up to $1million, RN $50-100,000.
Result dissemination (20 hrs.) = $0 dollars student hours	Patient/family satisfaction tied to reimbursement (HCAHPS). Consumerism.
REDCap online platform/Survey Monkey	

Appendix D

Budget and Resources to Replicate

Item	Cost
Supplies (office supplies and IBM SPSS)	$100
Equipment/ REDCap or Survey Monkey (3 mo. estimate at $1,800/hr.)	$360
Survey Administration 10 hr./$60	$600
Data Analysis 40hr /$60	$2,400
Data Dissemination 10hr/$60	$600
Participation cost 100 x 15 min at $60/hr.	$1,500
total	$5, 560

Appendix E

LOGIC Model

Across a Hematology/Oncology/BMT service line at a large quaternary healthcare system, the lowest scores in AHRQ Hospital Survey of Culture of Safety pertains to handoffs, transitions and teamwork across units. Further exploration of internal and external perceptions of the interdisciplinary team of handoffs could provide direction for improvement efforts.

Problem Identification:
- Poor communication results in difficult transitions of care as patients move between sites of care in large healthcare system within a service line.
- Further exploration of perceptions in handoffs and transitions can direct improvement efforts.
- Ineffective handoffs result in patient harm, care delays, decreased patient satisfaction, and decreased staff satisfaction

Outcomes

Inputs	Constraints	Activities	Outputs	Short Term	Long Term	Impact
Service line nursing and medical leadership support Clinical Effectiveness Team and CMO to validate survey content. Support in literature REDCap. IRB- Regis and COMIRB	Convenient sampling does not generate response to ensure reliability. Survey tool without construct validity. Individual's experience and knowledge effects skill level performing handoffs Team willingness to participate. Time to complete. Budget	Develop tool to survey interdisciplinary team to explore the hand off process as patients transition between sites. Validate content through subject matter experts Administer survey Data completion and analysis Obtain IRB approval	>60% of team will complete survey Qualitative analysis of identified issues surrounding handoffs, transitions and teamwork during transitions. Quantitative data identifying opportunities for improvement surrounding handoffs, transitions and teamwork. Share results with CCBD team.	Identification of 3 top opportunities for improvements to prioritize intervention planning. Results shared with Clinical Effectiveness Council to form teams and develop improvement plans.	Improved coordination with better communication resulting in smoother transitions across care continuum Reduction in unplanned ED visits and/or hospitalizations Share results with other service lines at CHCO and other departments.	Safer, efficient care transitions through continuum of care

Appendix F

Enrollment Script/Email Invitation

I am conducting a quality improvement project required for my Doctor of Nursing Practice degree at Regis University. My project*, Understanding Perceptions of Handoffs and Transitions in a Large Service Line* hopes to inform efforts to improve handoffs here in the Center for Cancer and Blood Disorders.

Handoffs and transitions can be challenging in complex organizations like Children's Hospital Colorado and within the complex service line of CCBD. In the 2019 Agency for Healthcare Quality and Research, (AHRQ) Hospital Survey for Culture of Safety, CCBD's lowest score across the entire service line was handoffs and transitions. My project seeks to gain understanding of CCBD team member's perceptions of handoffs as patients transition across the service line to identify areas to focus improvement efforts.

Handoffs occur with the provider, with nurses, with many other roles in CCBD, and with teams, all within this large service line. For the purpose of this survey, handoffs will be broadly defined as *the sharing of information as the responsibility for a patient(s) is transferred and the accountability for patient(s) is accepted*. When answering each question, consider handoffs from a narrowed perspective, as patients transition within the CCBD service line.

The survey is a 15-item Likert scale instrument. There are five demographic questions that will help identify characteristics of the survey participants. There are 2 open ended questions. As you answer the questions, think about handoffs that you have experienced within the CCBD. It will take you about 20 minutes to complete the survey including, the Likert scale instrument, the demographic questions, and the open-ended questions. Your responses will be kept entirely confidential.

Your participation in this survey is voluntary. This is an anonymous and confidential survey. Your answers will be maintained in a secure database and only used for the purpose of understanding the current state of handoffs in the CCBD. You will not be asked to provide any personal information. Your answers are non-punitive and cannot be linked back to you. Thank you in advance for your time.
https://redcap.childrenscolorado.org/surveys/?s=D48WAY9YPH

Appendix G

Site Agreement/Approval Letter

July 10, 2020
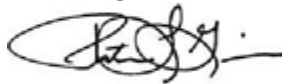
To Regis University Institutional Review Board (IRB):

I am familiar with Kelly Miller's quality improvement project entitled Perceptions of teams in providing safe handoffs. I understand Children's Hospital Colorado involvement to allow Center for Cancer and Blood Disorder's team members to complete survey, and to allow this data to be collected, analyzed, and shared to drive further handoff improvement efforts in the CCBD.

I understand that this quality improvement project will be carried out following sound ethical principles and provides confidentiality of project data, as described in the proposal.

Therefore, as a representative of Childrens Hospital Colorado, I agree that Kelly Miller's quality improvement project may be conducted at our agency/institution I would request a written summary report of the findings of this project and any recommendations related to these findings.

Sincerely,

Pat Givens, DHA, EdM, RN, NEA-BC
Senior Vice President, Chief Nursing Executive & Dr. Dori Biester Chair in Pediatric Nursing
13123 East 16th Avenue, Box 020 | Aurora, CO 80045 |
Phone: 720-777-67571 Fax: 720-777-7267 1 Patricia.Givens@childrenscolorado.org

Appendix H

Survey/Measurement tool

Information: In considering important care information shared during handoffs, please rate your agreement to the following statement	Never	Rarely	Occasionally	Often	Always
I1	The handoffs I receive are clear and well organized					
I2	The handoffs I receive are accurate					
I3	The handoffs I receive are timely					
I4	The handoffs I receive provide opportunity for me to ask clarifying questions.					
Responsibility: In considering your responsibility toward hand off process, please rate your level of agreement to the following statements.	Never	Rarely	Occasionally	Often	Always
R1	After handoff, I know exactly what the patient needs (labs, medications, diagnostics) and when it should be done.					
R2	After handoff, I know exactly who is responsible to act.					
Accountability: In considering personal accountability during the handoff process, please rate your level of agreement to the following statements.	Never	Rarely	Occasionally	Often	Always
A1	When patients transition between CCBD units or sites, I am responsible for providing the information to the receiving unit.					
A2	When patients transition between CCBD units or sites, I am responsible for getting the information I need.					
A3	The plan of care is easily found in the EMR.					
A4	The goals of care are clearly stated in the EMR.					
A5	I am aware of the risk of patient harm as patients transition between departments.					
Teamwork: In considering the handoff within the context of relating to others, please rate your level of agreement to the following statements.	Never	Rarely	Occasionally	Often	Always
T1	The person who should initiate the handoff is clearly defined.					
T2	During handoffs to other CCBD departments, I have clear understanding of the role of the person I am handing off to.					
T3	Contact information of sender is easy to access when clarification is needed					
T4	There is mutual respect demonstrated with every handoff.					
Open ended questions					
Q1	List barriers or issues that you have experienced during handoff/transitions.					
Q2	List the characteristics of the ideal handoff.					
Demographics					
D1	Role: MD/DO, NP/PA, RN, Other					
D2	Inpatient/Outpatient					
D3	Anschutz or CSH/NOC/HTC					
D4	Years in current role (<1yr; 1-5yr; 5-10yr; 10-15yr; >15yr)					

Appendix I

CITI Certificate of Training

CITI PROGRAM

Completion Date 17-Feb-2019
Expiration Date 16-Feb-2022
Record ID 30622754

This is to certify that:

Kelly Miller

Has completed the following CITI Program course:

Human Research (Curriculum Group)
Social Behavioral Research Investigators (Course Learner Group)
1 - Basic Course (Stage)

Not valid for renewal of certification through CME. Do not use for TransCelerate mutual recognition (see Completion Report).

Under requirements set by:

Regis University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w180978e4-a61a-4487-b7e5-7c8878894c8c-30622754

Appendix J

Organizational Research Risk & Quality Improvement Review Panel
(ORRQIRP) Letter of Approval

Project Lead: Kelly Miller
Approval Date: 8/12/2020
Title: Perception of Teams in Providing Safe Handoffs
QI #: 2008-3 (click the QI # to review your original ORRQIRP application)

Dear Project Lead,

ORRQIRP reviewed the above-titled project on 8/12/2020 and determined that it qualifies as "non-human subjects research". Consequently, any findings of this project should not be presented as research as defined by 45 CFR 46.102 (d).

Your project is approved for a one-year period ending 8/12/2021. If you decide to change the purpose of your project, you will need to amend your application and ORRQIRP will review it.
Your project will need to be renewed prior to the expiration date. You will receive a reminder letter for annual renewal.
If you have any questions or concerns, please contact Hannah Gilbert
at Hannah.Gilbert@childrenscolorado.org.
Sincerely,
Hannah Gilbert, MS, CCRP
ORRQIRP Chair

Appendix K

IRB Approval

REGIS UNIVERSITY

REGIS.EDU

Institutional Review Board

DATE: October 20, 2020

TO: Kelly Miller, MS
FROM: Regis University Human Subjects IRB

PROJECT TITLE: [1636712-1] Perceptions of Teams in Providing Safe Handoffs
SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF NOT RESEARCH
DECISION DATE: October 20, 2020

Thank you for your submission of New Project materials for this project. The Regis University Human Subjects IRB has determined this project does not meet the definition of human subject research under the purview of the IRB according to federal regulations.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact the Institutional Review Board at irb@regis.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Regis University Human Subjects IRB's records.

Appendix L

Invitation to Content Validity Panel

Hello,

Your names were shared with me as "handoff" experts at CHCO. My DNP project is descriptive study of CCBD's perceptions around handoffs, transitions and teamwork. These were the lowest scores across the service line in the 2019 AHRQ Hospital Survey of Safety Culture. Given the complexity of patients and the complexity of CCBD, a deeper understanding of team member perceptions could guide improvement efforts. It will be important to define "handoffs" as it pertains to this work; this definition may also help in understanding my project. *Handoff or handover is the sharing of information as the responsibility for a patient(s) is transferred and accountability for patient(s) is accepted*.

I am hopeful that you will agree to be a member of my Content Evaluation Panel to validate the survey I created. The main constructs align with the AHRQ survey, around handoffs with information, responsibility, and accountability. I also included teamwork as "teamwork across units" was also noted to be a low score.

Here is my ask. I have attached the survey, please consider each question as to whether the question is essential, useful, or not necessary. Please indicate your response with a check or x in the box. Will these questions help to explore perceptions of handoffs and teamwork as patients transition and/or responsibility is transferred across roles, shifts and sites? Please complete and return the attachment by July 30,2020.

Would you also provide me with an estimate of time needed to complete the survey?

I appreciate your assistance in driving improvements for safer and more efficient care!

Appendix M
Survey Content Validation Tool

Content Validity Tool

	Essential	Useful	Not necessary
Quantitative			
Information: In considering important care information shared during handoffs, please rate your agreement to the following statements.			
I1 My handoffs are clear and well organized			
I2 My handoffs are accurate			
I3 My handoffs are timely and not rushed			
I4 My handoffs provide opportunity for receiver to ask clarifying questions.			
I5 I need to review the EHR after receiving a handoff for additional information.			
I6 I need to call or email the sender to ask additional questions.			
Responsibility: In considering your responsibility toward hand off process, please rate your level of agreement to the following statements.			
R1 After handoff, I know exactly what the goals of care are and what the patient needs.			
R2 After handoff, I know exactly who is responsible to act.			
R3 After handoff, I know exactly what the patient needs (labs, medications, diagnostics).			
Accountability: In considering personal accountability during the handoff process, please rate your level of agreement to the following statements.			
A1 When patients transition between units or sites, I am responsible for providing the information to the receiving unit.			
A2 When patients transition between units or sites, handoffs should be role specific, provider to provider, nurse to nurse.			
A3 When patients transition between units or sites, I am responsible for getting the information I need.			
A4 The plan of care is easily found in the EHR.			
A5 The goals of care are clearly stated in the EHR.			
A5 Imperfect handoffs harm patients			
Teamwork: In considering the handoff within the context of relating to others, please rate your level of agreement to the following statements.			
T1 If conflict arises, I know how to resolve it.			
T2 The person who should initiate the handoff is clearly defined.			
T3 I can name each role within the team			
T4 I can explain the work each role performs			
T5 When something goes wrong during handoffs, people blame each other.			
Qualitative			
Q1 List barriers to handoff as sender			
Q2 List barriers to handoffs as receiver			
Q3 Do you use a standardized hand off tool? What tool do you use?			
Q4 Describe the best handoff you have experienced.			
Q5 Describe the worst handoff you have experienced.			
Q6 Identify what information is often missed in handoffs.			
Demographics			
D1 What is your role? MD/DO, NP/PA, RN other			
D2 Do you work in outpatient or inpatient?			
D3 Anschutz or NOC (including CSH)			
D4 Years in current role			

Appendix N

Statistical Analysis

Friedman's Test of Ranking Questions

Ranks	
	Mean Rank
q1	8.04
q2	8.89
q3	8.38
q4	9.85
q5	7.62
q6	8.83
q7	8.83
q8	9.19
q9	10.30
q10	5.12
q11	4.42
q12	12.17
q13	8.01
q14	10.06
q15	6.65
q16	9.66

Test Statistics[a]

N	93
Chi-Square	323.511
df	15
Asymp. Sig.	.000

a. Friedman Test

Friedman's Test of Ranking according to Roles

Ranks										
Role/MD		Mean Rank	Role/APP		Mean Rank	Role/other		Mean Rank	Role/RN		Mean Rank
1	q1	6.34	2	q1	7.92	4	q1	7.92	3	q1	7.92
	q2	8.30		q2	7.92		q2	10.05		q2	9.15
	q3	9.36		q3	8.46		q3	9.30		q3	7.72
	q4	10.80		q4	9.83		q4	11.45		q4	9.10
	q5	7.18		q5	8.50		q5	8.00		q5	7.52
	q6	8.27		q6	9.50		q6	8.75		q6	8.93
	q7	7.66		q7	9.92		q7	9.95		q7	8.86
	q8	8.27		q8	9.75		q8	3.45		q8	10.64
	q9	10.09		q9	9.75		q9	7.90		q9	11.01
	q10	4.18		q10	4.50		q10	6.90		q10	5.33
	q11	4.14		q11	3.21		q11	7.70		q11	4.18
	q12	12.09		q12	11.96		q12	11.85		q12	12.36
	q13	8.89		q13	7.21		q13	7.30		q13	7.95
	q14	10.00		q14	11.92		q14	8.10		q14	10.03
	q15	9.11		q15	5.67		q15	6.80		q15	5.74
	q16	11.32		q16	10.00		q16	9.30		q16	8.91

Test Statistics[a]

1	N	22
	Chi-Square	99.147
	df	15
	Asymp. Sig.	.000
2	N	12
	Chi-Square	71.425
	df	15
	Asymp. Sig.	.000
3	N	49
	Chi-Square	202.613
	df	15
	Asymp. Sig.	.000
4	N	10
	Chi-Square	42.650
	df	15
	Asymp. Sig.	.000

a. Friedman Test

Friedman's Test of Ranking according to Location

Ranks					
I work in Inpatient		Mean Rank	I work in outpatient	Mean Ran	
1	q1	8.30	2 q1	7.70	
	q2	8.96	q2	8.79	
	q3	8.28	q3	8.50	
	q4	10.26	q4	9.30	
	q5	7.05	q5	8.38	
	q6	8.64	q6	9.08	
	q7	8.65	q7	9.06	
	q8	9.75	q8	8.45	
	q9	10.73	q9	9.73	
	q10	5.19	q10	5.03	
	q11	4.42	q11	4.44	
	q12	11.88	q12	12.55	
	q13	8.11	q13	7.86	
	q14	9.68	q14	10.56	
	q15	6.73	q15	6.54	
	q16	9.37	q16	10.05	

Test Statistics[a]

1	N	53
	Chi-Square	185.636
	df	15
	Asymp. Sig.	.000
2	N	40
	Chi-Square	149.340
	df	15
	Asymp. Sig.	.000

a. Friedman Test

Friedman's Test of Ranking according to Years in Role

Ranks

<1 yr in role	Mean Rank	1-5 yr in role	Mean rank	5-10 yr in role	Mean Rank	10-15 yr in role	Mean Rank	>15 yr in role	Mean Rank
1 q1	8.21	2 q1	7.93	3 q1	8.43	4 q1	8.14	5 q1	7.54
q2	9.57	q2	8.88	q2	8.78	q2	8.05	q2	9.04
q3	9.50	q3	8.12	q3	7.60	q3	7.00	q3	10.07
q4	11.29	q4	9.57	q4	9.90	q4	10.00	q4	8.89
q5	7.75	q5	6.89	q5	8.78	q5	8.45	q5	7.43
q6	8.46	q6	8.57	q6	10.08	q6	8.18	q6	8.54
q7	8.21	q7	8.47	q7	9.60	q7	10.00	q7	8.29
q8	7.71	q8	9.82	q8	8.03	q8	12.14	q8	8.50
q9	9.36	q9	9.71	q9	11.85	q9	12.32	q9	8.86
q10	6.75	q10	5.25	q10	4.55	q10	3.41	q10	5.32
q11	5.18	q11	5.04	q11	3.48	q11	2.73	q11	4.86
q12	10.86	q12	12.89	q12	13.33	q12	10.91	q12	11.54
q13	7.39	q13	8.75	q13	7.15	q13	7.59	q13	8.36
q14	9.68	q14	10.79	q14	9.25	q14	10.27	q14	9.64
q15	6.46	q15	6.88	q15	5.10	q15	6.36	q15	8.68
q16	9.61	q16	8.82	q16	10.13	q16	10.45	q16	10.46

Test Statistics[a]

1	N	14
	Chi-Square	34.898
	df	15
	Asymp. Sig.	.003
2	N	34
	Chi-Square	118.042
	df	15
	Asymp. Sig.	.000
3	N	20
	Chi-Square	119.522
	df	15
	Asymp. Sig.	.000
4	N	11
	Chi-Square	71.164
	df	15
	Asymp. Sig.	.000
5	N	14
	Chi-Square	42.816
	df	15
	Asymp. Sig.	.000

a. Friedman Test

Appendix O

Statistical Analysis
Kendall's tau (τ)

Variable	Variable	p value	Coefficient Correlation	Low/Medium/High	Positive or Negative	
Role (MD, APP, RN, other)	The handoffs I receive are timely (Q3)	0.014	-0.208	low	negative	There is a low inverse correlation between the two variables.
Role (MD, APP, RN, other)	During handoffs to other CCBD departments, I have clear understanding of the role of the person I am handing off to (Q14)	0.032	-0.199	low	negative	There is a low inverse correlation between the two variables.
Role (MD, APP, RN, other)	Contact information of sending is easy to access when clarification is needed (Q15)	0.009	-0.237	low	negative	There is a low inverse correlation between the two variables.
Role (MD, APP, RN, other)	There is mutual respect demonstrated with every handoff (Q16)	0.001	-0.296	low	negative	There is a low inverse correlation between the two variables.
Years in current role	There is mutual respect demonstrated with every handoff (Q16)	0.015	0.219	low	positive	There is a low positive correlation between the two variables.

Appendix P

Statistical Analysis
Frequency and Percentage Table

Question/Domain	Frequency					Percentage				
	Never	Rarely	Occ.	Often	Always	Never	Rarely	Occ.	Often	Always
Information n= 109	6	15	91	261	63	1.4%	3.4%	20.9%	59.9%	14.4%
The handoffs I receive are clear and well organized.	1	5	26	70	7	.9%	4.6	23.9	64.2	6.4
The handoffs I receive are accurate	1	2	16	81	9	.9	1.8	14.7	74.3	8.3
The handoffs I receive are timely	2	2	28	64	13	1.8	1.8	25.7	58.7	11.9
The handoffs I receive provide opportunity for me to ask clarifying questions	2	6	21	46	34	1.8	5.5	19.3	42.2	31.2
Responsibility n=103	3	12	67	195	32	1%	3.9%	21.7%	63.1%	10.4%
After handoff, I know exactly what the patient needs (labs, meds, diagnostics)	1	8	28	58	8	1	7.8	27.2	56.3	7.8
After knowing what the patient needs, I know when it should be done	1	2	18	70	12	1	1.9	17.5	68	11.7
After handoff, I know exactly who is responsible to act	1	2	21	67	12	1	1.9	20.4	66.5	11.7
Accountability n=94	4	43	135	171	117	.9%	9.1%	28.7%	36.4%	24.9%
When patients transition between CCBD units or sites, I am responsible for providing the information to the receiving unit	3	6	18	39	28	3.2	6.4	19.1	41.5	29.8
When patients transition between CCBD units or sites, I am responsible for getting the information I need	0	2	14	46	32	0	2.1	14.9	48.9	34
When patients transition between CCBD units or sites, the plan of care is easily found in EMR	0	16	46	28	4	0	17	48.9	29.8	4.3
When patients transition between CCBD unit or sites, the goals of care clearly stated in the EMR	1	18	52	17	6	1.1	19.1	55.3	18.1	6.4
I am aware of the risk of patient harm, as patients transition between departments	0	1	5	41	47	0	1.1	5.3	43.6	50
Teamwork n=93	1	22	92	188	69	.3%	5.9%	24.7%	50.5%	18.5%
The person who should initiate the handoff is clearly defined	0	7	27	45	14	0	7.5	29	48.4	15.1
During handoffs to other CCBD departments, I have clear understanding of the role of the person I am handing off to	0	2	14	52	25	0	2.2	15.1	55.9	26.9
Contact information of sending is easy to access when clarification is needed	1	12	33	36	11	1.1	12.9	35.5	38.7	11.8
There is mutual respect demonstrated with every handoff	0	1	18	55	19	0	1.1	19.4	59.1	20.4

Appendix Q

Frequency Table
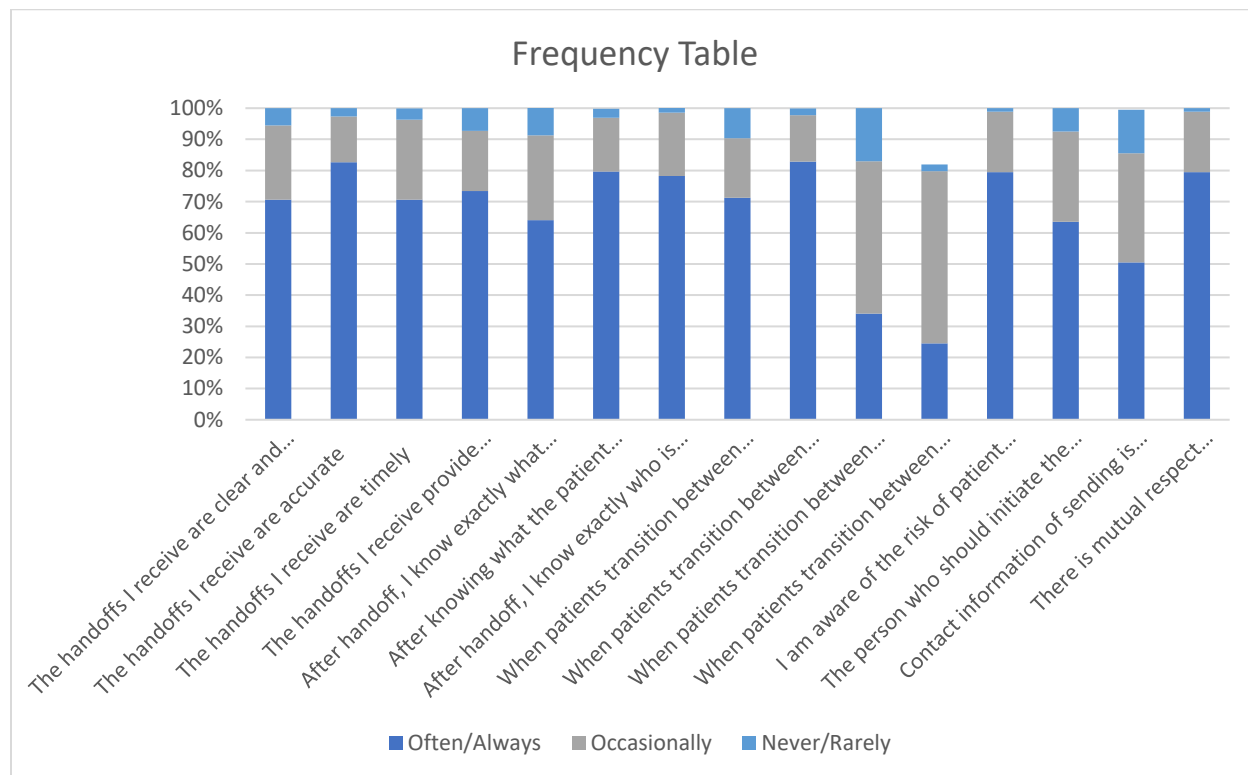
Appendix R

Table of Open Comments
Barriers to Handoffs

Information Barriers	Responsibility Barriers	Accountability Barriers	Teamwork Barriers
Getting a hold of the appropriate person, wrong phone assigned, PCD issues, wrong information/incorrect information communicated about patient plan/labs to draw/procedures needed	confusion over what is being handed off, who's role is what and what should be done	Pager going off during handoff, around too many people at handoff.	B: variation in attending involvement in genetic evaluation. Some don't want any involvement; some are actively involved and desire a more comprehensive handoff.
lack of information	delayed documentation in EMR	Outpatient primaries just read computer and don't lay eyes on patients	Knowing who to talk to.
incomplete details; one person calling only one person on the team and then telephone tag for the remainder generates errors	The EMR is not always the best place to find handoff information for outpatient. It does not feel as well organized as inpatient.	Timeliness--both parties may not have the same schedule/time. Limited time--with busy schedules have had incomplete handoffs as no time to "formulate" questions for readback. Complex--have had TOO much information provided in a handoff that made the interaction less than ideal	unclear roles and responsibilities between sites and roles
not enough time	Nursing care coordinators covering for other nurses not knowing necessarily what the patient needs and doesn't seem to be motivated to get the information.	sometime who doing the sign off is unaware of the details as he himself is covering shortly	fragmentation and lack of clarity of roles, too much reliance on EMR, some attitude that asking for help is sign of weakness
Poor structure. Important pieces missed.	busy	Finding time during the day that works for both providers	from an md standpoint, sometimes hard to find the right person in other locations.

The EMR is not always the best place to find handoff information for outpatient. It does not feel as well organized as inpatient.	Handoff between NCC to infusion RN is often lacking all the details of what the patient needs for the day. Some NCCs fill out the hand-off sheet, some come to talk to the nurse in infusion, some send messages through chat...definitely not consistent.	Time, accessibility of person	As an outpatient NCC, I give report/handoff regularly (to inpatient, other CCBD sites, etc) but never receive any handoff or sign-out back. The only handoff communication that we receive from inpatient is from the discharge email sent out by the fellows which is often times not timely and lacking details.
lacking key information	Sometimes patients with chronic conditions disappear from the inpatient lists. HTC handoffs can be a problem for those based at Childrens and often there is not any handoff from the APP's	busy service, attending doesn't provide as much information or detail as I need, "side" issues like discharge coordination and social issues are often omitted or incompletely explained	When staff don't carry their PCD's and we have a patient to handoff, but cannot reach the receiving nurse delaying transport and time we could be prepping for our next patient
Time of handoff	I think Pharmacy can sometimes be the last to know about an admission or change in plans for chemotherapy, I would love for us to be included when plans are being discussed, especially as it relates to changes in treatment.	Charge RN not given the name of RN at other CCBD site who is handing off. Handoff being like telephone where the 1st Rn is leaving so gives report to another who gives report to admitting unit and info is missing, unclear or lost. IP unit not called that patient has left other CCBD site and we don't know time of arrival. Caregivers not given clear instructions on IP guidelines and are upset when they arrive at hospital. OP staff not open to relaying this info to caregivers when asked to do so in handoff so families are prepared prior to arrival	Getting a hold of the appropriate person, wrong phone assigned, PCD issues, wrong information/incorrect information communicated about patient plan/labs to draw/procedures needed

timeliness	Occasionally there are times that it feels rushed to transfer, especially when unexpected admission (close to clinic closing time). Also, during the rush of chemo admissions during the day, many times it is a very short handoff which sometimes i feel is not enough. Sometimes in inpatient, we do not know the patients as well as the primary nurses in clinic. It would also be nice to ensure repetitive labs are discontinued in clinic prior to transfer in order to be more clear and aware of what is still outstanding. Propofol transfers from Inpatient to clinic have been much easier in the last year or so.	difficulty identifying who will "own" the patient when they get care at another campus	people rushing to get out of work, not waiting to hear what you have to say - wanting to look things up on their own rather than listen to your report. distractions, especially at night with the floor cleaning and other loud noises
poor quality of info, limited info, incorrect into	When patients come from NOC sites, we don't always have a clear understanding of where they are in their treatment plan, and it is often difficult to obtain updated chemotherapy roadmaps	timing, inability to directly interface with person(s) giving/receiving handoff, not being included (handoff may happen MD to MD or NCC to NCC, but APP is sometimes left out)	One of the parties can be easy so it is a quicker or rush handoff due to other demands
Sometimes process seems rushed	Time space, noise, person getting interrupted, person needing to be somewhere else	Handoff between NCC to infusion RN is often lacking all the details of what the patient needs for the day. Some NCCs fill out the hand-off sheet, some come to talk to the nurse in infusion, some send messages through	finding right person to communicate handoff too. Finding phone numbers of ambulatory clinics at south campus

		chat...definitely not consistent.	
		different clinic has a different "culture" of how things are done	waiting to give report when shift is ending and receiving nurse not being ready
		multiple care teams communicating differing plans to families	Inpatient handoffs when APPs are covering weekends and the resident or moonlighter or nocturnist has already left (APP weekend shifts start at 8am)
		no plan to review imaging with family, unclear antibiotic plan	sometimes hard to reach out to the person for follow up questions
			callback numbers, especially for physicians
			lack of communication with nurse care coordinators or primary team; app's discharge when on inpatient not nursing staff;
			Issues between outpatient and inpatient. Sometimes the nurse who hands off isn't the nurse whom was taking care of the patient in clinic, or answering questions with the receiving inpatient RN. Which makes it confusing and important VS, meds, ect. can be lost in translation.
			Unclear how to follow up on questions/other teams/service providers not signed in and therefore difficult to contact
			Poor listening; interrupting
			Attitude of other person, other long reports that have a cascade effect, asking or giving information that is not needed in handoff, interruptions by family or other nurses, etc.

			peer pressure from oncoming RN to give the fastest report so they can start their day
			In my current CCBD outpatient role, handoffs are usually between us MAs and nurse care coordinator. We are told what is needed and then hand off to provider. The barrier is that the same things aren't always communicated from provider to nurse to MA. Being in a PRN role, I'm also not aware of some specifics for pt interactions.
			the fellow is notified and doesn't notify inpatient team in timely manner
			Duplicate work and missed work across inpatient and outpatient settings- including insurance authorizations and appropriate timing of follow up.
			co-attending duties can be difficult in there is disagreement between attendings (there needs to be a primary, and that primary needs to be willing to communicate w/ patient if the other attending doesn't agree with the plan and it can be difficult to explain to family as a result); at times things get changed/lost in complicated patients (timing of scans, ECHOs, etc)
			difficulty connecting or determine best form of handoff (i.e. email vs phone)

			people not wanting to do bedside report and at the computer station where it is distracting

Appendix S

Table of Open-Ended Comments
Ideal Characteristics

Information Ideal Characteristics	Responsibility Ideal Characteristics	Accountability Ideal Characteristics	Teamwork Ideal Characteristics
clear and concise	Contains the info you need to do your job without too much superfluous info. Clearly defined what you need to do for the patient in the next couple hours while you learn about them in more detail.	Both parties are completely engaged and not distracted. There is clear understanding regarding the level of detail desired to be shared. Both parties depart with an agreed upon plan of action.	clear roles, standardized to assure required elements are discussed, entire teams understands roles and receives accurate information between team members, do not assume everything is in EMR
Both parties are completely engaged and not distracted. There is clear understanding regarding the level of detail desired to be shared. Both parties depart with an agreed upon plan of action.	clear, concise, timely, important or time sensitive things highlighted	Clear Plan of Care, major problems or concerns of particular patient, who to call if further questions arise. No interruptions during handoff (phone calls, people)	having a good contact person to give report. Clear communication on sending and receiving end between providers and nursing.
Timely, private, uninterrupted, organized.	Checklist including new meds prescribed, homecare and appointments needed.	patient plan of care clearly defined with both parties	Respect, kindness and curiosity
Thorough, complete, focused on important issues, efficient.		attending, fellow, receiving APP or fellow all hear the call to have the opportunity to ask questions and clarify the plan. too often the sign out is partial to the one person who took it and then the	hand off given to all those who are assuming a role in the patient's care, clear and concise verbiage, the receive is able to ask questions, documentation in EMR if applies

		decisions about care are impacted	
Clear hand off in medical record and verbally.		Call and give critical info, plan and allow opportunity for questions	No distractions
identification of pt, dx, reason for handoff/transfer pt/family needs (medical/social/spiritual/emotional) what needs to happen for pt'/family best outcomes		Double-sided, incudes all necessary info without extraneous info, opportunity for questions, face-to-face	For weekends when the leaving provider is not physically present, a written handoff and a phone number to call with questions is helpful
Concise and precise			Timely, Mutual Respect, Questions answered
Completeness--both parties must feel that handoff is complete. Format--better with use of format (IPASS, SABR, If-then). Time--both parties must have time set aside without interruption. Level to level--a nurse will want different information than a provider, so knowing to whom you are handing off to is important, and I feel that level-to-level is the ideal handoff. Timely--hand off at the time the patient is transferred, not hours later. Realize that you can't "give" or "get" ALL the information in a handoff, so have contact info ready in case questions come later. Night handoffs need to be pertinent; only issues that need to be addressed at night should be included in the handoff (i.e. don't read notes to the night team about all the daytime incidents).		patient condition: especially when it is an unexpected admission from Clinic to Inpatient. Clear and defined needs (tests,labs, etc) urgently after transfer.	One person to one person. The team who is caring for the patient is responsible for doing the work ahead of time to hit the ground running. I am exhausted by hearing, "I was not here yesterday so I don't know what happened" -- that is terrible care.
time, quiet to concentrate, concise-ie no rambling, going around in circles and back again, time for clarifying questions		Complete ID, latest labs, things to do, locations	respecting one another and trying to give the best updates you can to set your team member up for success

Detailed description of patient's current status, what the goal is in handoff and what will be accomplished while in procedure.		contact the primary team prior to discharge or transfer back to location to make sure all team members are on the same page regarding follow up therapy/lab/chemo appointments and at which location; nurse care coordinators should ideally be involved in this process	clear and concise. no assumptions of "oh everyone knows we do it this way..."
Timely and detailed.		EMR/pt information up to date	Communication with the appropriate members of the team.
Concise, clear, timely, no long list of tasks "not gotten to during day"		calm, well informed, planned, known expectations, goal of safety	Clear, concise, relevant, respectful
history or treatment, what the pt is here for today, how they presented (body system summary), why they are being transitioned, potential length of stay (if known)		Clear hand off report, by the RN taking care of the patient in clinic. Not the primary. To the receiving inpatient RN	Phone call or person to person with the main points with info of where or who (which provider) more info may be found.
concise & accurate			
clear and concise			
organized and detailed			
timely, concise, easy to get follow up			
concise but covers all the most important issues			
hand off given to all those who are assuming a role in the patient's care, clear and concise verbiage, the receive is able to ask questions, documentation in EMR if applies			
Thorough but concise. Timely.			
Double-sided, incudes all necessary info without extraneous info,			

opportunity for questions, face-to-face			
concise but complete, timely, allows time for clarifying questions, includes specific issues that will likely come up or that have been time-consuming or difficult in the past			
Structured. Not jumping around.			
clear concise communication			
Not having to go into so many different areas to find information. An overview tab like inpatient would be helpful.			
accurate and things that need to be done ASAP			
Short and concise. Run through each system, with what is not within normal limits. Give additional social info.			
Face to face handoff and communication, all questions answered before transfer of care, meeting the family with the other nurse present.			
An established format for ensuring all systems are covered, plan of care, needed labs, next steps, etc.			
structured, succinct			
Head to toe assessment. Clear communication of why patient is being admitted, what has been done in the OP setting. Any special family needs clearly communicated prior to transfer. All outstanding tests and labs are communicated and accepting provider is identified.			
Thorough communication, clear plan, contact information if there are questions.			
positive, timely, thorough,			
Short and sweet (but with the necessary patient info)			
clear, informative, reviews all systems. Willing to answer questions			

Focused, organized, to the point, relevant information, by exception.			
all info needed written out on a hard copy			
timely, consistent format, handoff given to entire team, all aspects of care address (ie therapy, physical issues, pysch/social needs, etc)			
Clear pertinent history, reason for transition between sites, significant issues/side effects patients have had, any psych/social info that is important, goals of care, plan for follow up			
Face to face hand off or over the phone so that clarifying questions can be asked.			
Concise, clear, direct communication			
not rushed or interrupted, organized, thorough			
Clear communication in chart along with verbal hand off. I do think the secure message feature helps if everyone uses it in Epic.			
thorough and timely			
prompt, thorough through all patient issues, time for questions/concerns, closed-loop communication			
The RN will complete handoff at bedside. Family participation when able/appropriate. Social concerns to be addressed in an accurate and respectful manner.			
detailed information with time to ask follow up and clarifying questions			
clear, concise, and with relevant specifics included			
Thorough but succinct review of the patient.			
concise and updated with pertinent info			
Succinct, appropriate, and provides information necessary to take care of patients			

Clear, concise, complete information			
Clear, concise, relevant, respectful			
Clarity			
bedside, concise, by systems			
person, accurate, concise, and efficient			

Page Break

Appendix T

Structural/Systemic Interventions
Select/Train for Teamwork
Shared Accountability
Shared Costs/Rewards
Conflict Resolution Practices
Meetings/Huddles
Job Design
Boundary Spanner Roles
Shared Protocols
Shared Information Systems
Spatial Design

Relational Interventions
Foster Psychological Safety
Feedback RC Metrics
Coach/Humble Inquiry

Improvement Methods
Goal and Role Clarification
Structured Problem Solving
Lean/Six Sigma

Relational Model of Organizational Change
(Gittell, Edmondson, Schein, 2014)

Relational Coordination
Communicating
Frequent
Timely
Accurate
Problem-Solving

Relating
Shared Goals
Shared Knowledge
Mutual Respect

Performance Outcomes
Quality
Efficiency
Patient Engagement
Worker Well-Being
Health & Wellness