OPTIMIZING THE INTERDISCIPLINARY TEAM IN A NEUROSCIENCE ICU

by

Allison Gibson

A doctoral scholarly project submitted to the faculty of
The University of North Carolina at Charlotte
in partial fulfillment of the requirements
for the degree of Doctor of Nursing Practice

Charlotte

2021

Approved by:

_____
Dr. Kathleen Jordan

_____
Dr. David Langford

_____
Dr. Robert Blessing

_____
Dr. Richard McAnulty

ABSTRACT

ALLISON GIBSON. Optimizing the interdisciplinary team in a neuroscience ICU. (Under the direction of DR. KATHLEEN JORDAN)

Introduction: A high-functioning interdisciplinary team is needed to achieve optimal team and patient outcomes in the provision of care for intensive care patients. The difference between a high functioning and suboptimal interdisciplinary team manifest as variations in team outputs. Identification of key characteristics of high functioning teams can be used to assess and evaluate current interdisciplinary teams for potential areas of optimization. **Methods**: This project is a quality improvement needs assessment of the current interdisciplinary team performance in the neuroscience intensive care unit (NSICU) at a large academic medical center. This project employed a mixed method design, using quantitative methods for collected survey data and qualitative methods for thematic analysis of open-ended responses. **Results:** The survey had a 59.5% response rate, with 84 team members completing the survey. The majority of participants were registered nurses (n=51), followed by medical providers (n=21), and then other therapist members (n=12). Five themes were identified from open-ended responses regarding strengths and barriers to team effectiveness: structure, roles, the rounding processes, engagement, and team interactions. Within these themes, the needs of the team included: a shared decision-making model, improved engagement of staff members, improved team stability, clearly defined roles, interventions to improve the rounding process, and further evaluation of team interactions. **Discussion:** Assessment and diagnosis are the first steps in approaching optimization of the interdisciplinary team. Each interdisciplinary team is unique. Understanding the needs of the team is essential to creating a high functioning team. **Key words:** Interdisciplinary, Multidisciplinary, Team, Quality improvement, Team processes

DEDICATION

This DNP Project is dedicated to my daughter, Penelope. Never underestimate yourself and how much you have to offer the world.

ACKNOWLEDGEMENTS

I cannot express enough the gratitude for all the support and encouragement I have received throughout this experience. Between every line of this project are numerous hands that have helped guide and push me to this point. Thank you to my committee: Dr. Kathleen Jordan, my committee chair, Dr. Robert Blessing, my clinical expert, Dr. David Langford, and Dr. Richard McAnulty. I offer my sincere appreciation for the learning opportunities you have each provided.

I also want to acknowledge Jessica Camargo who spent many hours editing my work. Allison Cochran who helped with my statistics, understanding, and organization of my results. Every one of my professors throughout the program who helped me look at my project with a new perspective. I owe each of you appreciation for the depth and completeness of my project.

To my fellow classmates, my completion of this project was more satisfying because of each of you. Thank you for the group text, the pre-COVID group hangout, and the laughs. In this program we are all over the state but I never felt alone because of you.

To all of my work colleagues I owe you quite a few coffees. Across all disciplines my project was met with a plethora of support. So many of my fellow team members helped ease my work when I was overwhelmed and continued to support me to the finish. I am so passionate about this project because of each of you.

Lastly, I want to thank my husband, Cory. I would have never started this journey or finished it without you. Your love and patience has been necessary to sustain me. To Penny, my baby, thank you for allowing me time away from you. I know this project has been a sacrifice for you both. To my mother, Jane Englebright, thank you for the encouragement, the listening ear, and for being the example I stive to live up to.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

NSICU	An acronym for Neuroscience Intensive Care Unit
ICU	An acronym for Intensive Care Unit
MD	An acronym for Physician
APP	An acronym for Advance Practice Provider
RN	An acronym for Registered Nurse
PT	An acronym for Physical Therapist
OT	An acronym for Occupational Therapist
ST	An acronym for Speech Therapist
RT	An acronym for Respiratory Therapist

CHAPTER 1: INTRODUCTION

A high-functioning interdisciplinary team is needed to achieve optimal patient outcomes in the provision of care for the critically ill (O' Brien, et al., 2018; Wang et al., 2018). In 2000, the Institute of Medicine brought interdisciplinary teams into the spotlight with the aim to create environments that improve patient outcomes and care delivery (Yeager, 2005). The Society of Critical Care Medicine has also supported the interdisciplinary team approach to the care of critically ill patients (Hoffman, et al., 2004; Weled et al., 2015). Over the past decade there have been changes to the interdisciplinary team as advanced practice providers have integrated into healthcare, and as healthcare has become increasingly specialized and complex (Andregard & Jagland, 2015; Halliday et al., 2018; Hoffman et al., 2004).

Interdisciplinary teams vary in design and structure across institutions and even across departments within a single institution. These teams are open systems, interacting and operating within the environment of the larger organizational system. Even small changes within the team or the organizational environment can have a substantial impact on team performance (Cashman et al., 2004). Simply placing multiple individuals together does not create a high functioning interdisciplinary team. Creating a high-functioning team requires thoughtful planning, consistent execution and continuous attention from all team members. Every team is unique. Every team is in constant interaction with a dynamic environment of the intensive care unit and the larger organization. While there are many differences between teams, high performing teams share some common characteristics. Creating high performing teams is essential to providing safety, quality patient care in the intensive care environment (Reader & Cuthbertson, 2011).

Background

Historically, nurses and physicians have worked collaboratively to meet the needs of quality and safety at all levels of illness. Collaboration and teamwork can be noted in literature as far back as the 1940's, but became a formal entity in the 1970s. In 1972, The National Joint Practice Commission defined joint practice between nurses and physicians as a collaboration between colleagues working together to provide a team focused approach to patient care (Yeager, 2005). Since then, the terms team and teamwork have been applied to various health care situations. The term "team" generally implies collaboration, but the reality is that teamwork in healthcare is not clear or always intuitive (Nancarrow et al., 2015). The study of teams and team theories has a much longer history outside of healthcare. Evaluation of specific interventions that improve team effectiveness has been largely inconclusive and variable (Mickan & Rodger., 2000).

Researchers have struggled to have a universal definition of the interdisciplinary team due to the complexity of teamwork and the variety of environments in which teams operate (Mickan & Rodger., 2000). Interdisciplinary teams are broadly defined as a small group of practitioners from multiple disciplines working together with complementary skills and a common purpose that keep members mutually accountable (Mickan & Rodger., 2000; Beaird et al., 2020). This team is an open system and is sensitive to multiple factors within the team and the operating environment. Thus, there are many variables that facilitate and inhibit effective team functioning.

The difference between a high functioning and a suboptimal interdisciplinary team manifests in team outputs. While a high functioning team can improve care delivery and outcomes, a suboptimal team can lead to team conflict and patient harm (Kilgore & Longford,

2009). Team conflict can manifest in many ways but has potentially devastating consequences to team member longevity, team cohesion, and team effectiveness.

Problem Statement

In the intensive care environment, patient care is detailed, complex, and constantly changing. Practitioners from multiple backgrounds work together to apply evidence-based care, discuss patient progress, current research, and to develop an individualized plan of care for each patient. Often this entails multiple interactions throughout the shift. The aim of an interdisciplinary team approach is to bring different specialties together to provide holistic and comprehensive patient care. Each member of the team brings a paradigm and perspective originating from the discipline. Blending these perspectives on patient care and teamwork is part of creating a high performing team (Lancaster et al., 2015). Practitioners are educated in a specific discipline, but it is rare for academic or occupational education to include formal training in teamwork. Training in how to be part of a team is often learned on the job, leading to variable results.

Perceptions affect how team members interact with each other and work together to achieve a common purpose. Establishing an effective team begins with defining roles and understanding how those roles can function interdependently in the acute care setting (Kilpatrick et al., 2013). Well-functioning teams are communication rich, have established accountability, shared decision making, trust between team members, and defined leadership (Gausvik et al., 2015; Lancaster et al., 2015). Each of these characteristics can be affected when new members join the team, and thereby impact team performance.

There are several obstacles to team development that occur simultaneously and are decided consciously or unconsciously within the team environment. Barriers such as vague

communication, lack of leadership, power dynamics, lack of trust, and type of decision making all impact each member of the team, and the team as a cohesive unit (Gausvik et al., 2015; Lancaster et al., 2015). Changes to the team structure and role-shifting among members can negatively affect team dynamics, perceived team effectiveness, and job satisfaction (Kilpatrick et al., 2013). In the academic setting, interdisciplinary teams are constantly undergoing change, placing these environments at particularly high risk for low or poor performing teams.

In the quest to improve interdisciplinary team effectiveness, ensuring collaboration is key. Assessing how individuals within the team interact, as well as understanding team functions and structure, is the starting point for improvement interventions (Yeager, 2005). Currently, there is no widely accepted template for creating a high-functioning team in the intensive care environment.

Purpose

This project is a first step to creating a framework for optimizing interdisciplinary team processes in the intensive care environment. This project evaluates the perceptions of team effectiveness by members of the interdisciplinary team. Thematic analysis of the responses will identify variables impacting team effectiveness. The goal of this project was to gather and analyze data for the purpose of examining the strengths and barriers to effective team functioning of members of an interdisciplinary team working in a large Neuroscience Intensive Care Unit (NSICU). The data from this project identifies the current strengths and barriers in a NSICU from the perspective of individual team members. Understanding how interdisciplinary team members perceive team effectiveness is a necessary first step to optimizing team performance in the intensive care environment. This information is a prerequisite to designing and developing interventions to optimize the interdisciplinary team effectiveness.

Clinical Question

In the neuroscience intensive care unit (NSICU) at an academic hospital with an established interdisciplinary team-rounding structure, what are the perceived strengths and barriers experienced by team members and their perceived impact on optimal team functioning?

Project Objectives

The objective of this project was to identify and understand the perceived strengths and barriers experienced by members of the interdisciplinary team in the NSICU at a large academic center. Through assessment of team member perceptions, potential facilitators and barriers impacting team performance can be identified. All team members were invited to complete a survey regarding perceived team effectiveness, team satisfaction, and potential strengths and barriers to effective team functioning. Open-ended responses were analyzed for themes.

Outcomes of this project can be used to create a template or framework for optimizing the effectiveness of an interdisciplinary team in the intensive care environment. Results from this study can be used to guide the future expansion and organization of the interdisciplinary team model. Findings may also identify team processes that can be modified to enhance communication, trust building, decision making, and role clarity. A long-term objective at the culmination of this project is the optimization of team design, improved team processes, and team performance expectations. This will enhance and maximize patient care quality and safety. For individual team members this will improve investment into the team and potentially increase job satisfaction and occupational wellbeing with aim to increase longevity of team members.

CHAPTER 2: REVIEW OF LITERATURE

This literature review summarizes studies related to teamwork among interdisciplinary teams in the intensive care environment. The review of literature involved searching PubMed, CINAHL, Clinical Key, Science Direct, and Scopus databases for articles related to interdisciplinary teamwork in the acute care setting published since 2005. The search terms, methods, inclusion and exclusion criteria are detailed in Figure 1. Initially, 993 articles were captured. Articles were reviewed for relevance to the topic by reading abstracts and titles. The resulting articles were read and filtered for content related to interdisciplinary team processes or characteristics. The filtered articles totaled 28, which were analyzed for recurrent themes.

The delivery of healthcare has historically been interdisciplinary, requiring physicians, nurses, and other professionals to work together to provide patient care. As healthcare has become more complex with increased technological advancements, care has become more specialized (Hinami et al., 2010). The result is an increasing number of specialized professionals involved in delivering care to each patient. Modern day healthcare requires effective interdisciplinary teams to deliver safe and effective patient care.

Studies on the interdisciplinary team approach to care offer diverse perspectives from individual, team, and organizational levels (Manser, 2009; Mickan & Rodger., 2000; Reader et al., 2009). Unique to healthcare is the dynamic environment in which teams function. This makes the team sensitive to multiple factors within the team and within the environment. Each team is unique and operates with a unique set of barriers and facilitators to team effectiveness.

Literature from the last two decades focuses on myltifaceted and integral components related to teamwork in the healthcare setting. Identifying and defining the characteristics that make a high functioning team is complex and often impacted by individual team environments.

Organizational structure, individual characteristics, and team processes all impact the outputs produced by the team. A simple formula for team performance is team inputs plus team processes equal team outputs (Reader et al., 2009). Many inputs are organizational or fixed, such as individual team members or tasks. There are, however, a number of team processes that are more fluid, providing an opportunity for improvement.

Five themes emerged from the literature related to high performance teams. These themes include leadership, coordination, collaboration/decision making, communication, and environment. (Manser, 2009; Mickan & Rodger., 2000; Reader et al., 2009). Environment is not a team process, but rather an organizational structure element. It was included in this review because the unique challenges of the ICU environment frequently impact team processes. The environment offers a modifiable variable that should be considered in process improvement.

An important difference between a high-functioning and suboptimal interdisciplinary team is the degree to which the team utilizes each of these processes. Team processes exist along a spectrum and can be positive when used correctly or negative when not optimized. There is a circularity to these processes due to their dependence on each other to function. For example, leadership is dependent on communication and coordination. Understanding these relationships is necessary when evaluating and designing effective team interventions.

Team Leadership

Leadership has been the topic of much study, as it has a direct impact on team effectiveness (Ten Have et al., 2013; Manser, 2009; Mickan & Rodger., 2000, Murphy et al., 2019). Leadership must exist within the team to establish team goals, set performance expectations, organize available resources, and coordinate team functions. Teams with shared goals, tasks, and responsibilities tend to work more positively together.

Historically, healthcare has functioned in a medical model with an implicit hierarchy (Manthous & Hollingshead, 2011; Beaird et al., 2020; Reader et al., 2007). This type of leadership is actually detrimental to interdisciplinary team effectiveness and directly impacts team outputs. A hierarchical leadership style closes off communication between team members, directly impacting coordination, decision making, and collaboration processes (Lancaster et al., 2015). Dissolving hierarchies is necessary for team members to work together optimally. Highlighting distinct differences between members facilitates role clarity, an essential component of team coordination.

A specific leadership style is not required for a high functioning team (Manser, 2009). However, adaptive leadership behaviors that are sensitive to the environment and situation are associated with improved teamwork. Leadership styles that value everyone's contributions, encourage participation, and practice shared decision-making are associated with higher functioning interdisciplinary teams (Manser, 2009; Mickan & Rodger, 2000; Jain et al., 2006). Intensivists frequently function as the leaders for the interdisciplinary team in the ICU. While team leadership and management skills have been deemed essential to intensivists, there is a lack of universal leadership education or training (Manthous & Hollingshead, 2011; Ten Have et al., 2013). Instead, providers often develop a leadership styles while on the job, causing varying degrees of success.

Team Coordination

Team coordination is the awareness of the roles of other members on the team and their roles while working together to achieve optimal results (Mickan & Rodger, 2000). Coordination is a complex task that requires members to understand each role and its unique contribution. With this understanding, the team can effectively divide and delegate work (Manthous &

Hollingshead, 2011). Highlighting the variety and the unique attributes of each team member encourages ownership in the care plan and engages teams in creating a shared understanding and purpose (Mickan & Rodger, 2000). Utilizing team member differences in an organized fashion to complete complex tasks prevents duplication of work and enhances efficiency.

As the team develops and changes, the coordination needs will also vary (Mickan & Rodger, 2000). Role confusion and overlap between members have been linked to poor team outcomes, with inefficacy, frustration, and confusion being cited by multiple members of the interdisciplinary team (Reader et al., 2009). Medical centers and intensive care environments are especially prone to care coordination issues as team members change frequently with rotating providers and shifts, often placing together team members who do not understand each other's background knowledge, roles, or goals. When teams are working on complex tasks, the coordination of team functions is essential to yield positive and efficient patient care.

Team Collaboration/Decision Making

Collaboration is a complex and dynamic process which differs from coordination. Collaboration is reliant on communication, mutual valuing of each team member, and recognition of individual and shared goals (Yeager, 2005). Collaboration allows different specialties and perspectives to provide care in a seamless rather than fragmented fashion (Kilgore & Longford, 2009). Interdisciplinary collaboration requires respect and open communication along with a shared decision-making approach. Interdisciplinary rounds are the physical manifestation of collaboration providing a consistent process for teams to do the work of patient care (Beaird et al., 2020).

Changing team members communication failures, time constraints, and lack of role clarity can all pose challenges to team collaboration. One significant barrier to collaboration is

lack of nurse involvement with team collaboration, multiple studies have shown that in team environments, nurses are not speaking up, not being heard, and not being included in decision making (Beaird et al., 2020; Lancaster et al., 2015; Murphy et al., 2019; O'Brien et al., 2018; O'Leary et al., 2010; Reader et al., 2007). As frontline caregivers, nurses are assessing, spending time with patients and families, and are responsible for carrying out a large portion of direct care. However, perceptions of the quality of team member. Provider perceptions of team collaboration are often higher than those of nurses (O'Leary et al., 2010). Understanding the perception of each team member is needed to ensure team collaboration is effective.

Nursing and provider collaboration with joint decision making responsibilities are linked to improved patient outcomes, as well as improved team outcomes. Effective collaboration processes improve team member confidence, self-worth, and perceptions. These factors are related to improved relationships, team member satisfaction and decreased burnout (Beaird et al., 2020, Reader & Cuthbertson, 2011).

Team Communication

Communication involves the exchange of information. Communication can be verbal and nonverbal. All team functions require reliable communication processes. Communication is needed to collaborate, to lead, and to coordinate the interdisciplinary team. Communication has been identified as a teamwork process that is associated with perceived high-quality care and improved patient safety (Manser, 2009; Mickan & Rodger, 2000; Jain et al., 2006).

Poor communication negatively impacts teamwork. Communication issues are frequently cited as contributing factors to adverse events as well as declining job satisfaction. Miscommunication between interdisciplinary team members is identified as a contributing factor to most preventable adverse events (Beaird et al., 2020; Reader & Cutherbertson, 2011; O'Leary

et al., 2010; Wang et al., 2018; Yeager, 2005). Approximately two-thirds of sentinel events are related to communication failures (O' Leary et al., 2010; Wang et al., 2007). Failures in communication have been linked to high communication times such as handoffs, change of shift, and interdisciplinary rounds. Over 37% of errors have been linked to nursing and physician miscommunications (Reader et al., 2009). The use of structured communication has been associated with creating a more collaborative culture with improved teamwork (Gausvik et al., 2015; O' Leary et al., 2010)

Patterns of communication and decision making are directly impacted when a new member is introduced on the team. These changes then impact the pace of communication and thus care delivery and can directly impact patient care. There is no consensus regarding the optimal type of communication. Rather, having a shared, consistent, open, and clear communication process is associated with positive team results. The key to teamwork is a shared perception of team effectiveness and communication (Andregard & Jangland, 2015; Kilpatrick, 2012; Reader et al., 2007). Interdisciplinary rounds were designed to create transparency and improve communication within the team.

Team Environment

The intensive care unit (ICU) is a unique environment in which critically ill patients can deteriorate rapidly. The interdisciplinary team has increased opportunities for team suboptimization due to the dynamic nature of the environment (Reader & Cuthbertson, 2011; Manser, 2009). Intensive care teams frequently work in high stress situations, with variable shifts, and changing team members, while integrating different perspectives and cultures. ICU teams must be adaptive and fluid to manage patient care in this environment, which makes standardization difficult. Similarly, ICU team members change frequently, thereby changing

team composition. In some organizations, the majority of the team may be trainees or students such as medical residents or interns. Understanding the skill level and functions of each team member is essential to an effective team (O'Brien et al., 2018). As experience level and background of members change, so does the output from the team, leading to variable impacts on patient care (Murphy et al.,2019).

Facilitators and Barriers

Merely forming a team and bringing together disciplines is not the same as facilitating a high-functioning interdisciplinary team. Barriers to team performance need to be identified and minimized. Teams are affected by micro and macro factors of institutions and members. There are a multitude of barriers outside of the team that impact functionality. Barriers occur on the individual level, team level, and organizational level. Time constraints of various members, different perceptions on the purpose of interdisciplinary team rounds, lack of universal team structure, environmental factors, and team hierarchy are common barriers teams face (Ten Have et al., 2013; Murphy et al., 2019). Outside of the team itself are other impacting factors such as policy, scope of practice variability, and organization limitations. Unit characteristics such as staffing, noise, rounding location, and nursing leadership also have variable impacts on the interdisciplinary team (Beaird et al., 2020; Yeager, 2005).

Multiple factors impact the interdisciplinary team at organizational, team, and individual levels. Aligning these levels is needed for optimizing the interdisciplinary team. Teamwork is not intuitively known, but learned, and can be fostered and optimized (Cashman et al., 2004). ICU outcomes are reliant on interdisciplinary teams having good teamwork and functioning collectively.

Theoretical Framework

A systems framework is required to understand a complex, continuously evolving concept such as interdisciplinary teams. Changes in the healthcare system are often nonlinear and simultaneous. Knoster's Management of Complex Change is a framework that takes into account multiple variables needed to achieve success (Learning Accelerator, n.d). There are five elements required for effective change to occur: vision, skills, incentives, resources, and an action plan. When a project has all five of these components, successful outcomes are achieved. Incomplete or partially complete components lead to a variety of problems for a project: false starts, frustration, resistance, anxiety, and confusion (Learning Accelerator, n.d). Refer to Figure 2 to see Knoster's model.

The ICU is an ongoing system of change; thus, Knoster's model of managing complex change can be viewed as an ongoing and constant process, much like the plan of care. In line with Knoster's model, the vision is that every member of the interdisciplinary team would have a voice and could use their individual strengths in an integrated fashion, to optimize the interdisciplinary team into a high-performing unit. It is important to define and recognize each team member's skills, roles, and perspectives.

This project is the first step in improving the quality of interdisciplinary teamwork at a Neuro ICU by assessing and identifying opportunities for improvement on the interdisciplinary team. The goal is to explore team members' perceptions of barriers and facilitators that impact the interdisciplinary team experience. Identification of motivators for team members is key to understanding the individual goals of people on the team, and the team as a whole. Using the collected themes and knowledge from studying the interdisciplinary team, an action plan can be developed and implemented to improve interdisciplinary team functioning and outcomes.

As part of the assessment process, team members completed a survey regarding perceived team effectiveness, team satisfaction, and the barriers and facilitators to team function. Data was collected and evaluated for reoccurring themes based on Knoster's change theory; such as false starts, frustration, resistance, anxiety, confusion. When addressing complex issues such as interdisciplinary team functions and processes, it is necessary to recognize that not all teams are the same. This project is a needs assessment of the interdisciplinary team in a busy NSICU.

CHAPTER 3: DESIGN

This project is a needs assessment of the current interdisciplinary team process in the NSICU that is intended to identify and describe barriers, facilitators, and perceptions of team effectiveness. This project is a mixed method design, using quantitative methods for collected survey data and qualitative methods for thematic analysis of open-ended responses. The needs assessment is the foundational element of a larger performance improvement project.

Subjects

The population of interest are members of the interdisciplinary team in the NSICU at a large medical center. The core interdisciplinary team members are composed of the attending physician (MD), advance practice provider (APP), fellow , and bedside registered nurse (RN). Other members of the interdisciplinary team include nutritionist, physical therapists (PT), occupational therapist (OT), speech therapist (ST), and respiratory therapist (RT).

Registered nurses have care for one to two patients at a time. NSICU nurses provide direct patient care, perform frequent patient assessments, and implement complex medical orders. Advance practice providers (APP) work on a one-to-eight patient ratio. APP function at the bedside, managing the plan of care for each patient. The APP is usually the first point of contact for the nurses, families, and consulting services.

The fellow role can fluctuate based on the team needs for a particular day. At times the fellow works on a one-to-sixteen patient ratio similar to the attending physicians. Other times the fellow functions in a role similar to the APPs with a one-to-eight patient ratio. The fellow leads interdisciplinary patient care rounds and aids in overseeing the plan of care. The attending physician serves as the team lead, organizing roles and flow of the team. There are two ICU attending physicians available in person or by phone at any given time. One attending is

managing eight patients and performing triage function for flow of patients into and out of the unit. The second attending is managing sixteen beds of the NSICU. Three teams exist on any given day and are geographically formed so that each team covers eight beds. Refer to Figure 3 for example of staff model relative to interdisciplinary team members.

Physical therapists, occupational therapists, and speech therapists were included in the sampling as they do round with a member of the interdisciplinary team once a day. Respiratory therapists were included as they are considered part of the core ICU team. Excluded from this study were neurosurgical colleagues, who round separately from the NSICU team.

Setting

The setting for this project was at a large academic medical center in the southeastern United States. The NSICU is a twenty-four bed ICU that is staffed around the clock with a provider model using three distinct ICU teams. The NSICU team members participate in daily rounds together and work in variable roles to provide care for these patients. This team makes formal rounds on patients together every morning to ensure that comprehensive care is being provided. This is the time where the team jointly performs a physical assessment on the patient, reviews imaging and laboratory data, discusses supporting therapies, current evidence-based research, family or patient concerns, and formulates a plan of care for the day.

Measurement Tool

Web-based surveys were distributed by email to members of the interdisciplinary team in the fall of 2020. Surveys were constructed in Qualtrics and had three components. The first component included collection of demographic data such as role, gender, and number of years working in NSICU. Surveys otherwise were unidentifiable. Qualtrics did not record email addresses from participants. The second component was a 19- question survey using Likert scale

questions looking at team perceptions. Questions were designed by the project lead based on the common themes found in the literature for successful interdisciplinary teams by Reader et al. (2009) and Andregard & Jangland (2015). These four themes were found to be essential to a high-functioning team: team communication, team leadership, team coordination, and team collaboration/decision making (Reader et al., 2009).

The last portion of the survey was an open-ended response area that was used for identification of undiscovered variables that affect interdisciplinary team interactions in rounds. These questions were meant to clarify and provide quality in-depth information that could reveal additional themes. Survey questions are shown in Appendices E and F.

Intervention and Data Collection

This project was conceived, designed, and implemented over a two-year timeframe. Surveys were distributed to team members in October 2020 (see Table 1). An introductory email was provided explaining the purpose of the study and inviting subjects to participate (see Appendix C). Participation in this study was optional. Completion of the survey was deemed implied consent. Reminders to respondents were sent over the next three weeks. Of the 141 surveys distributed, 84 (%) were completed. Team members were incentivized to complete the survey by offering candy in the breakroom. The project was reviewed by the medical center's IRB and determined to not meet the definition of research (see Appendix A and B).

SWOT Analysis

In designing this project, an analysis of its strengths, weakness, opportunities, and threats (SWOT) was applied, to aid with anticipation of project needs (see Appendix D). For the NSICU at Duke, there were a number of one-time and ongoing change processes occurring at the time of this project. . In 2020 there were plans to hire multiple new RNs, new APPs, and new attending

physicians in preparation for moving to a larger unit. Each year, a new fellow and resident class begins, the most recent in July 2020. In March of 2020 the novel COVID-19 virus impacted the health system in multiple ways delaying expansion plans and testing the medical centers capacity. The NSICU prematurely changed units in summer of 2020 to aid with the distribution of resources during the public health crisis. In spring of 2021, the NSICU will be moving again to a new building and will expand to a 32-bed unit. Keeping the above factors in mind, a SWOT analysis was undertaken.

Strengths

This assessment of the interdisciplinary team is in line with leadership and unit objectives to optimize team performance and to provide the highest quality of care. This project provides a safe mechanism for team members to have their voice heard. This project is minimally time-consuming for staff to complete and minimally tasking for leadership. Surveys were distributed via an email system that was already established. This data will be used for future planning and growth of the interdisciplinary team as the unit prepares to expand.

The NSICU at this particular academic medical center the APP group has been functioning as part of the interdisciplinary team for over 25 years. Having such a large and established group of APPs dedicated to the NSICU potentially impacts the stability of team processes. Conducting an assessment of team perspectives in an environment with a large APP presence is unique and potentially insightful to the impact advance practice providers have on the interdisciplinary team.

Weaknesses

Surveys are easy to overlook or delete when administered via email. Staff engagement in a survey is difficult to obtain unless members are personally invested or incentivized.

Implementation in October 2020 provided a large number of new team members in the survey sample. It is unusual to hire so many new members at one time, but with ongoing expansion plans, hiring increased. The addition of new fellows, residents, APPs, nurses, and attending physicians over a short time has the potential to negatively impact the interdisciplinary team. Conducting the survey at this time added additional variables into the results as the sample included many new team members. Demographic data, such as number of years working and role, were included to give context to potentially confounding variables and answers. New staff members often experience increased stress while learning new roles and a new organization. In addition, new team members in this substrate may have different strengths and barriers than the rest of the team.

Opportunities

Rotating members is a routine organizational structural element in the ICU interdisciplinary team at this academic medical. Learners rotate through the unit, some become members of the team and others have more transient experiences. Rotating team members include neurocritical care fellows, other discipline fellows, residents, and interns. Transient learners that often participate in team processes include APP and medical students. The education of learners is a pillar to the values of most academic organizations that serve as a safe place for medical professionals to grow and learn. The addition of new staff provides this study with the opportunity to see variations between new and established staff perceptions and experience on the interdisciplinary team. New team members are a constant variable in the academic setting. Understanding their impact will be helpful in optimizing the interdisciplinary team.

The U.S. health climate has a significant and unknown impact on the interdisciplinary team. The U.S. healthcare system is impacted by the ongoing COVID-19 pandemic, the strain on the interdisciplinary team is unknown. Crisis planning and measures have the opportunity to strengthen or deteriorate team dynamics.

Threats

The COVID-19 pandemic also presents a threat to this project due to the additional strain impacting team members and team processes. The composition of the team has fluctuated as providers stretch to meet the increased needs presented by the pandemic. Nursing turnover has increased as nurses have left to respond to surges in other communities. Decreased prioritization of this project may occur as leadership goals and energy shift to meet the crisis needs of the unit. In the context of new providers, changing of the unit's location and size, and a public health emergency, assessment of barriers and strengths of the interdisciplinary team is easy to overlook.

Marketing plan

The SWOT analysis identified opportunities to tailor a marketing plan to the needs of various stakeholders. Marketing to leaders focused on improving foundations and building a stronger future. The interdisciplinary team is the foundation of the NSICU. In the setting of significant change, uncertainty, and limited resources, a well-functioning team is critically important. As leaders plan for expansion and growth, assuring the effectiveness of the interdisciplinary team is a component of these plans. This assessment will be beneficial to identifying strengths and barriers to team effectiveness that currently exist.

Marketing to team members recognizes the unique opportunity to evaluate an established APP practice group functioning as part of the interdisciplinary team. Messages emphasized gaining insight on providers' perspectives on the strengths and barriers the team experiences.

The ultimate goal of this project was to maximize quality and safety for patient care delivery and outcomes, while improving the team environment in order to ensure longevity of team members as the health system braces for the future.

The marketing plan also recognizes the array of distractions in the current environment, highlighted in the SWOT analysis. Electronic communications integrated into existing communication patterns were used to reach potential participants. Three weekly reminders provided prompts to the distracted team members.

Financial Impact on Practice

As a hospital system striving to provide high quality patient care, optimizing the interdisciplinary team is critical for team effectiveness and best patient outcomes. Optimizing the interdisciplinary team also has many financial benefits for the hospital system and the patient (Kilgore & Longford, 2009). The economic efficiency of the interdisciplinary team could be substantial if optimized correctly.

High-functioning interdisciplinary teams are associated with improved system, patient, and team member outcomes. Improved patient outcomes include decreased mortality, decreased length of stay, decreased healthcare delivery costs, and increased patient and family satisfaction (Wheelan et al., 2003). Increased patient satisfaction as well as improved outcomes is not only beneficial for patient care but essential to a thriving hospital system. A decrease in adverse events is necessary for improved patient care, but also ensures a decrease in unnecessary costs, and an increased reimbursement opportunity. Each of these outcomes has an impact on value-based reimbursement for the organization.

From an occupational health and safety perspective, high functioning teams are associated with increased staff satisfaction and retention. High functioning teams decrease

occupational strain. Improving retention decreases costs of recruiting, hiring, and on-boarding replacement staff. (O'Brien et al., 2018; Welp & Manser, 2016).

A team approach to care ensures that hospitals can continue to provide care as demands for health services continue to rise. Nursing and provider shortages are projected to continue. One such example is the addition of APPs in the critical care setting over the past decade (Halliday, et al., 2018; Hoffman et al., 2004). The need to provide sustainable and safe care to critically ill patients is one of the many reasons for adding APPs to the team (Andregard & Jagland, 2015; Halliday et al., 2018; Hoffman et al., 2004).

The addition of new members to the interdisciplinary team, as well as variation in how the APP role is implemented, impacts the interdisciplinary team (Kilpatrick et al., 2013).. Utilizing APPs on the interdisciplinary team allows for a greater portion of patients to be seen by the health system, potentially increasing revenue just by improving patient care volume. When optimized, the interdisciplinary team can preserve the current work force, improve patient care outcomes, optimize system resources, and extend high quality healthcare further.

In looking to the future, creative approaches with changing team structures and members are likely. The interdisciplinary team, with all its members working together successfully, has the potential to broaden the reach of a single provider at the bedside, meeting the impending provider shortages while lessening healthcare system costs.

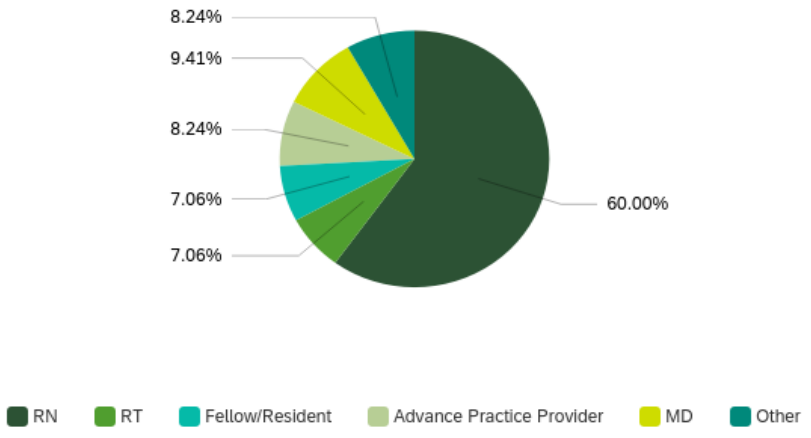
CHAPTER 4: RESULTS

Demographics

The web survey on Interdisciplinary Team Perspectives was distributed to 141 members of the NSICU interdisciplinary team. Demographic information regarding age, experience, education, and rounding participation were collected. Completed surveys from 84 team members resulted in a 59.5% response rate. Respondents included nurses, respiratory therapist, fellows, APP, attending physicians, and then other members (See Figure 4). Other members also referred to as the therapist group include physical therapist (PT), occupational therapist (OT), speech therapist (ST), and respiratory therapist (RT). For simplicity of result evaluation respondents were further clustered into three groups nurses, providers, and therapist. The majority of participants were registered nurses (n = 51), followed by providers (n = 21), and then other members (n = 12).

Figure 4

Interdisciplinary team members roles



Nurse participants were younger than provider and therapist team members. Of the 51 nurses who responded, 78.5% of them were under 35 years old, while participants in the provider and therapist cohorts had slightly older members (see Table 2). Gender differences were noted among the cohorts, with larger numbers of females noted in the nursing and therapist cohorts (85.7% and 100% respectively). From the provider cohort, less than half (45%) were female (see Table 3)

Highest education level completed varied by the educational expectations for the role. For nurses, 94% (n = 48) had a bachelor's degree, while 66.7% (n = 14) of providers had a doctoral level degree, with the other 33% (n = 7) holding a master's degree. A more diverse educational background was seen in the therapist cohort, with 25% (n = 3) having a bachelor's degree, 41.7% (n = 5) having a master's degree, and 16.7% (n = 2) a doctorial level degree (see Table 4). When asked about formal education related to interdisciplinary teamwork, 72.6% (n = 37) of nurses responded positively. Comparatively only 23.8% (n = 5) of providers or therapists reported formal education related to interdisciplinary teamwork (see Table 5).

In all categories of respondents, the majority of participants (nurses 80.4%, providers 71.4%, and 50% of therapists) had less than five years of experience working in the NSICU at this facility. The therapist cohort had the most experience, with 49.9% (n = 6) having over 5 years of experience working in NSICU (see Table 6). More than half (58.3%, n = 7) of the members in the therapist cohort reported participating in rounds less than half of their shifts, while a majority of providers (71.4%, n = 15) and nurses (51%, n = 26) reported participating in rounds every shift (see Table 7).

Table 6
Year in the neuroscience ICU

	Nurse n =51	Provider n =21	Therapist n =12	Total
Years Neuro	Count (Percentage)			
0-5	41 (80.4)	15 (71.4)	6 (50)	62 (73.8)
6-10	6 (11.8)	2 (9.5)	4 (33.3)	12 (14.3)
11-15	1 (2.0)	0	1 (8.3)	2 (2.4)
16-20	3 (5.9)	2 (9.5)	0	5 (6.0)
>20	0	2 (9.5)	1 (8.3)	3 (3.6)

Team Perceptions

The second portion of the Interdisciplinary Team Perspectives survey consisted of 19 perception questions in a Likert format. There was a drop off of responses from participants for this portion of the survey, only 72 (%) of the eighty- four respondents completed this portion of the survey. Questions were designed around the five themes described in the literature review: team leadership, team coordination, team collaboration/decision making, team communication, and the environment. Refer to Table 8 for results related to team perception questions.

Analysis of team leadership perspectives demonstrated that nurses, providers, and other members generally felt supported by the interdisciplinary team. When team members had questions, they responded that these were answered, and that rounds were effective in identifying the plan of care for the day. Areas of separation among the cohorts included the identifying the team leader and feeling there were personal leadership opportunities on the team. A majority of nurses, 80.4% (n = 37), and providers, 73.7% (n = 14), reported they were able to identify the team leader. Among the therapist group only 45.5% (n = 5) agreed they could identify the team leader. Providers had the highest rating on identifying leadership opportunities for themselves at 78.9% (n = 15). In contrast, only 58.7% (n = 27) of nurses agreed, and even fewer, 16.7% (n = 2), agreed from the therapist group.

Overall, members of the interdisciplinary team perceived team decision-making as relatively high with 80.4%% (n = 37) of nurses, 89.5% (n = 17) of providers, and 54.6% (n = 6) of therapist agreeing. A majority of team members agreed they were able to verbalize their thoughts with 89.1% (n = 41) of nurses, 100% (n = 19) of providers, and 81.8 % (n = 9) of therapist agreeing. Regarding self-worth, 76.1% (n = 35) of nurses, 94.7% (n = 18) of providers, and 72.7% (n = 8) of therapist felt they were important to the interdisciplinary team. Team decision making was also rated positively by nurses 80.4 (n = 37) and providers 89.5% (n = 17). The therapist cohort had a more divided response regarding team decision-making, with 54.6% (n = 6) agreeing and 36.4% (n = 4) disagreeing.

A majority of nurses, providers, and therapist members agreed that teams were well coordinated and that roles were understood. Separation among cohorts occurred regarding team structure and timing interferences. Perceptions regarding team structure varied with 68.9% (n = 31) of nursing staff agreeing that they could identify a consistent rounding structure. Comparatively, only 47.4% (n = 9) or provider cohort and 36.4 % (n = 4) of the therapist cohort perceived consistent team structure. On the topic of the timing of rounds and interference to provision of patient care most groups were divided. Over half, 56.5 % (n = 26) of the nursing cohort agreed that the timing of rounds interfered with their ability to provide patient care. These sentiments were also seen in 42.1% (n = 8) of providers and 45.5% (n = 5) of therapists.

For team communication, a majority of nurses, providers, and therapist members were able to understand the plan at the completion of interdisciplinary rounds. All cohorts generally agreed that they were able to reach team members when needed. However, the trends regarding encountering of misinformation are concerning: 30.4% (n = 14) of nurses, 31.6% (n = 6) of

providers, and 27.3% (n = 3) of therapist reported encountering misinformation that differed from the prescribed plan of care.

Team environment refers to the environment in which the team is functioning; for the most part, nurses, providers, and therapists agreed that they had the support needed to be present and that they could hear the speaker during team rounds.

Open-ended Perceptions

The third portion of the Interdisciplinary Team Perspectives survey was three open-ended questions looking for themes that otherwise, were not reflective in the survey questions. Participants were asked about their perceptions of current barriers and strengths that exist on the team, as well as how they could see the team improving. Using Braun and Clarke's (2006) thematic analysis method, data was analyzed for patterns and themes. Responses were analyzed for underlying subthemes and thematic maps were made around each major theme. Five themes were identified: team stability, role definition, the rounding process, engagement, and team interactions. Each theme is complex, and many contain additional subthemes. Refer to Figures 5, 6, 7, 8, and 9 to view thematic maps and Table 9 for organization of themes and subthemes.

Team Stability

A common theme arose from responses regarding a lack of stability and standardization on the team. There are two subthemes related to structure: member stability and process stability. All open-ended responses related to stability can be seen in Tables 10, 11, and 12.

Member stability. Lack of member stability was mentioned by almost every discipline represented on the team. Concerns related to an influx of new graduate nurses, as well as high turnover rates for nursing staff, were mentioned as potential barriers to the current interdisciplinary team. An APP stated that "the influx for new grad nurse hires," made it difficult

to have streamlined rounds. These thoughts were echoed by a physician who wrote “new nurses and float pool nurses make it difficult to fully integrate” members onto the team.

Inconsistency with other members being present on rounds was noted by nurse, provider, and therapist cohorts. Additionally, rotating staff such as residents and fellows were mentioned as providing a lack of structure and consistency to team rounds. A nurse mentioned her concern with the rounding team, stating, “We have no idea who is who, and what their level of medical knowledge is.”

Process stability. Process stability refers to consistency in orders, protocols, and approaches to care. Due to the timing of rounds, PT, OT, ST, and RT have a variable presence on rounds, leading to inconsistencies with ordering and providing therapy.

A PT cited an example of inconsistencies with order placement: “I have advocated for new therapy orders from a patient that never got dropped, despite telling a team member directly, saying it in my note, and contacting the first call provider via the messaging system on EPIC.” These inconsistencies with order placement can lead to bigger problems with team communication and failure to meet patient needs.

Nursing staff voiced specific concerns about changes between providers and rounding teams leading to variable responses and emergency situations. An experienced NSICU nurse wrote “No consistency between providers for standard of care.” She voiced concern that providers were “not following neurocritical care guidelines or previous unit standards, and then being unwilling to explain why suddenly it is going to be done ‘this way’.” Another nurse wrote “When I have worked Saturday to Sunday to Monday, I feel like plans of care will shift when providers come off and another one comes on for the week.”

Rounding stability. For the purposes of this study rounding stability is refers to how the team is physically moving from patient to patient. There were multiple responses regarding the unpredictable nature of the route the rounding team followed each day. The unpredictability made participation in rounds difficult for some team members. “Never know when the team is going to rounds, who they will start on etc. this is difficult when RN has two patients” said one RN. Another nurse suggested that improving rounding stability could aid with establishing “A more routine flow so that RN can better anticipate timing of rounds (i.e., to pause sedation or holdoff an interrupting round for needs)”.

Role Definition

The second theme identified in the open-ended responses was understanding team member roles. This theme refers to role clarity and role definition. Open ended responses related to roles can be viewed in Tables 13, 14, and 15. Lack of staff stability complicate role clarity. One team member wrote, “I don’t know everyone’s name and role. This is worse since COVID.” This comment captures both the ongoing confusion surrounding knowing rotating team members and their roles, and the unique external contributing factors of the COVID-19 pandemic that has team members assigned to new locations. “Providers do not always introduce themselves to a new nurse. A quick introduction would make them feel more welcome” wrote one nurse.

Staff instability contributes to not knowing the individual, not knowing the individual’s role, and not knowing if that individual will enact the role according to NSICU expectations. Another component of staff instability is lack of understanding of the responsibilities each role has within the team. “Undefined roles and inefficiencies” function as a barrier to the interdisciplinary team, stated one fellow. “Sometimes the team will have too many members, which may result in losing track during rounds.” A respiratory therapist wrote “Too many people

trying to do every role. Lots of digressing." Which further supported the sentiments of one nurse who wrote, "Needs to be a clear leader, designated roles like you run rounds, you write notes etc. So, everyone has a role and rounds can work in the most efficient manner."

Suggestions for improvement in this role clarity included simple interventions such as "have some kind of list with pictures of all team members in their roles" or education for staff regarding roles and responsibilities. An important point from nursing was being "cognizant of what's going on with the nurse and a specific patient" and as a team to be flexible recognizing the other responsibilities of the nurse. Simple interventions such as introducing team members at the start of team interactions was also suggested to aid with improved role clarity.

Rounding Process

The largest theme mentioned in the open-ended responses was related to the rounding process, with a wide range of responses. Subthemes included duration, efficiency, and purpose of interdisciplinary rounds. Open ended responses related to rounding process can be viewed in Tables 16, 17, and 18.

Duration. All cohorts described the rounding process as too lengthy. The length of time spent rounding was noted as a barrier to interdisciplinary team effectiveness. "Some rounds take up to 30 mins or more for 1 patient" states one nurse. Rounds "Take entirely way too long, too many interruptions." voices another nurse. Nursing was not alone in these concerns, one APP noted "Occasionally rounds take up too much time, which delays making a plan for the day which ultimately delays patient care. The nurse gets frustrated. Patient/family members get frustrated".

Reasons for prolonged rounds included "prolonged family discussion during interdisciplinary rounds, which results in prolonging the duration of rounds. Sometimes the team

will have too many members… and multiple interruptions of rounds." Other reasons mentioned were "multiple phone interruptions" and "extending rounds with teaching."

While the duration was considered too long, other responses did underscore the thoroughness of rounds and the benefit of a systems approach. One APP mentioned a strength of the interdisciplinary rounding process because rounds are "very thorough". The comprehensive rounding process was designed to assure coordinated, holistic care is provided to complex, critically ill patients. "Going through each body system thoroughly to ensure nothing gets missed".

Efficiency. The concern with long duration of rounds extends to the second subtheme: efficiency. Efficiency refers to the question of whether the amount of time spent in rounds is a beneficial use of time for each team member.

All cohorts mentioned a priority on competing tasks as limiting the ability to be present for lengthy interdisciplinary rounds. "The duration of rounding sometimes, especially when it lasts till late afternoon, can affect the ability of performing procedures and following up on what discussed during the interdisciplinary rounds," stated one fellow. The nursing cohort voiced concerns from prolonged rounds; for example, one nurse said, "During rounds, we typically have meds due, are titrating medications, are dealing with opening and closing EVD's; the list is endless".

Purpose. Barriers to interdisciplinary team rounds included a lack of consistent understanding of the purpose of interdisciplinary rounds among the team members. "Rounds are not a time for teaching the medical student, the resident etc. Extended rounds with teaching takes at least an hour for each patient and puts every nurse back against the wall to get everything done that needs to be done," stated one nurse. One perspective was that rounds were being used to

complete individual tasks such as documentation while rounding which prolonged rounds. An APP suggested " not writing notes while rounding". Another team member emphasized, "It is important to establish the purpose of the rounds" as a time for dialogue and communication. While duration was a concern, "Rounding with the patient in mind not just to get through rounds" was still voiced. These comments indicate a desire for improved efficiency and a shared understanding of the purpose of rounds.

Integration of families into the rounding process was also mentioned. Family integration is a perceived purpose of the interdisciplinary team but integration on rounds has perceived negative impacts to efficiency and duration of rounding. Lack of family integration has the perception of impaired holistic care for the patient. Comments from the team were reflective of a need for family involvement. For example, one APP advocated for "increased family and patient involvement when applicable."

Structure. Rounding structure in this study refers to the format of rounds and the structure of the team members while rounding. Rounding format includes how the team approaches the care of each patient. Barriers noted related to rounding structure include lack of member stability and unclear team roles and function. There did seem to be a consistent approach to patient assessment using a system-based approach which was noted by a number of members as being a positive to providing thorough patient care.

Multiple suggestions were given on improving the rounding process. Multiple team members advocated for "more consistency with an efficient rounding structure". Working to decrease "non acute interruptions" and distractions that occur during rounds. One suggestion related to families was "minimizing the interruptions during rounds from family members and other hospital staff. Postponing the family meetings and discussion till the rounds end."

Timing

Timing in the context of this study is looking at the physical time of the day in which rounds are occurring. Subthemes related to this topic include multidisciplinary collaboration and night shift. Open ended responses related to timing can be viewed in Table 19 and 20.

Multidisciplinary collaboration. The collaboration between unit-based team members and other disciplines such as the therapists or neurosurgery is perceived to be negatively impacted by the timing of rounds. PT, OT, and ST respondents mention timing of rounds impedes their ability to be present. One PT wrote: “Timing seems to be a challenge, which is the nature of acute care.” Another therapist wrote, “Sometimes the medical team are not available and then the therapist has to keep circling back or just end rounds for the day.” There are also comments referring to the other obligations of therapists throughout the hospital. Changing therapy staffing models during the weekends further exacerbates the issue. Nursing staff mention frustration as different disciplines fail to coordinate their care for the patient. “ICU and neurosurgery teams have high tendencies (almost 100%) to not round together, but will come within 5-15 minutes of each other on nightshift; this is constantly waking up patients who are already experiencing delirium, exhaustion, etc.”

A concerning comment which highlights a potential threat to the interdisciplinary team is that “Therapists are expected to meet the same productivity standards as those who do not participate in rounds, so length of time is a huge component,” implying there is little incentive to attempt to participate in interdisciplinary rounds.

Night Shift. From responses it is evident that interdisciplinary communication which includes or extends to night shift is lacking. One nurse wrote there is a “lack of consistency for the team rounding at night”. Another nurse stated, “I have worked night shift for over 3 years

and have not directly participated in a while". Both comments are concerning as care for the critically ill is a 24 hour job. The fact that night shift members do not participate in evening interdisciplinary rounds is a potential place for improved communication.

Team interactions

Interactions on the team can be both a barrier and a strength. Subthemes under team interactions include psychologic safety, respect, communication, and engagement. Open ended responses related to team interactions can be viewed in Tables 21, 22, and 23.

Psychologic safety. Psychological safety refers to the comfort of each team member has in speaking up and contributing to team discussions and decision-making. Some concerning responses from nursing included not "feeling safe to ask questions" or not being met with an "openness to questions regarding their patients". One nurse mentioned "As a new nurse, I sometimes feel intimidated to speak up to more experienced and knowledgeable team members". Dismissive attitudes from providers were cited from some nursing staff. One experienced NSICU nurse wrote "Fellow attitudes toward nursing are very dismissive, and often don't listen to concerns, and often walk away from someone asking a legitimate question. I do think I have heard fellows tell someone not to bother them or interrupt rounds with questions etc.… on multiple occasions. It's often an inexperienced nurse, they often come find me to go and ask the same question to get an answer to their question without the attitude".

The perception of team support was a subtheme associated with psychologic safety. The perceptions of having a resource or provider readily available was associated with positive perception or strength of the interdisciplinary team. Instances where team members were difficulty to reach, or no present was associated with perceptions of poor team interactions. "24/7

coverage of APPs is awesome! Never have to worry that we don't have a provider or when we need something for our patients" was a current strength noted of the interdisciplinary team.

Respect. Repetitive responses of not feeling listened to or heard were mentioned across disciplines. Team members made statements of not feeling valued or respected. One respiratory therapist mentioned not being notified of rounds which then led to physically being left out. Echoing this concern one nurse wrote there is "no respect for knowledge and years of experience" among the interdisciplinary team. Another nurse wrote "Generally the bedside nurses' thoughts and ideas for the patient are no longer valued as they once were. Many times, the team talks amongst themselves and doesn't not include the bedside nurse so that he/she can hear what they are saying. When the bedside nurse is in the room and actually performing patient care the teams becomes annoyed when they cannot come out to join rounds on their timeline. Many times, they start rounds without the bedside nurse being present."

Communication. Communication was mentioned as a barrier for a multitude of reasons. Being physically unable to hear the presenter on rounds was a concern from the nursing cohort. Distractions occurring which impaired hearing included physical noise on the unit, phones, and alarm bells, and multiple side conversations. "Sometimes rounding team members are quiet or having side conversations/phone call that make it difficult to follow the flow of rounds" said one nurse. Impaired conflict resolution related to disagreements among interdisciplinary team members was another concern, along with inefficiencies related to communication feedback. Multiple members mentioned not being updated whenever changes related to plan of care occur post rounds. Due to the communication issues, especially the lack of timely updates, there were concerns about misinformation being passed onto the next shift.

Engagement. Engagement refers to the level of participation different team member have with the interdisciplinary team. Lack of engagement themes can be seen from the responses of the nurses, physical therapist, speech therapist, occupational therapist, and respiratory therapist. Barriers to engagement seemed to occur mostly from feelings of not being listened to or invested in. Timing was also a significant barrier for PT, OT, and ST, limiting their presence and engagement on the team. Investment into team members references team interactions which work to build up the knowledge and skill level of other members on the team. There is an obvious desire for investment felt from multiple disciplines. One team member wrote "Speak loudly and educate all who are interested not just residents or students".

When engagement was noticed or mentioned in responses it was generally with a positive perspective. One team member expressed that "when the team uses the information that nurses provide in making their decisions, that makes us feel heard, considering that we are spending the most time monitoring the patient." Positive feedback regarding staff engagement was noted with nursing when they summarized the plan of care for the day and formally recapped rounds.

Suggestions for areas of improvement included establishing "better communication with team members about changes to the patient care plan that occur after rounds." In addition, it was recommended that the team create a more inclusive rounding style in which team members are notified and collaboration is encouraged. Shared education among the entire teams' aids with feelings of inclusion and investment.

Discussion

The primary objective of this study was to identify and understand the perceived strengths and barriers experienced by members of the interdisciplinary team in a high-acuity, high-volume critical care environment, with an aim to identify areas for process improvement.

The literature review demonstrated a clear difference in outcomes from teams that are functioning effectively. The results of this project were examined using the characteristics of a high-functioning team to identify gaps that present opportunities for process improvement. The analysis presents an uncomfortable (or tenuous) picture of team members perceptions of team function.

Leadership

There is no universal leadership style that has been determined to be the most effective. Sharing leadership responsibilities among team members and engaging in joint decision making are characteristics of a high functioning team. The team perception survey revealed that shared leadership processes are not perceived by all members of the team. Consider that 21.7% of nurses state there were no leadership opportunities for them on the interdisciplinary team, and 19.6% of nurses remained neutral on the topic. Combined that represents 41.3% of nurses either don't care, are unengaged, or don't feel like they have the opportunity to lead during interdisciplinary rounds. And yet they spend the most time with patients implementing and monitoring the medical treatments.

Responses to the team perception questions indicate that nurses and providers agreed they could identify a team leader, yet over half of the therapist members did not agree. Open ended responses support concerns related to stability. Problems related to process stability on the interdisciplinary team reference swings in the plan of care related to variation in approach among different physician and APP providers. Other results suggesting opportunities related to leadership include lack of role clarity among team members, rounding inefficiencies and variation, and disengagement. These findings give rise to the question "Do we have a leadership style that is setting boundaries, providing structure, and facilitating shared decision making?"

Team Collaboration/Decision making

There were conflicting results related to collaboration and team perceptions of joint decision making. From the team perception results, it is evident that the majority of team members agreed that the team makes decisions together. Open ended responses indicated not feeling listened to, not feeling respected, and feelings indicating a lack of engagement from team members. When asked about potential ways to improve interdisciplinary team processes, collaboration was specifically mentioned. Each member and profession within the interdisciplinary team is unique and offers a different perspective to patient care. Barriers that impede attendance and engagement should be minimized or eliminated to maintain the holistic approach to care that is the focus of interdisciplinary teams.

Literature has shown that through collaboration, patients receive a high quality of care. Interventions aimed at increasing team member engagement will be beneficial in improving collaboration. Results from this survey indicate a need for engagement among nurses and therapists. A consistent rounding route was identified by nurses and therapists as an improvement that would facilitate their presence and engagement in interdisciplinary rounds.

Coordination

Coordination within the team was rated positively in the perception results. Conversely, open-ended responses from multiple team members commented on concerns related to overlapping roles, lack of staff structure and process structure. Lack of role clarity may signal larger concerns of inefficient workflow from duplicating tasks or missed care if task assignment isn’t clear.

Concerns from multiple team members regarding competing tasks appeared in both team perception questions and responses to open-ended questions. Over half of the participating

nurses and a little under half of the providers and therapists said that interdisciplinary rounds interfered with time required to perform of patient care tasks. Concerns raised regarding rounding duration, inconsistency and timing may also contribute this tension between participating in rounds and performing necessary care activities.

Team coordination was rated favorably. Open ended responses gave insight into concerns with efficiency and duration of rounds. Multiple team members identified the length of rounds impeding the efficiency of the team and impacting individual tasks. Improving efficiency entails mitigating unnecessary time waste. This includes optimizing the rounding process as a team and optimizing the task list for each team member.

Role clarity seems to be a two-fold problem. The current team indicated that they did not know team members, and furthermore, did not understand what each role entails. Suggestions for improvement included: improving the consistency of the rounding team, introducing team members at the start of rounds, and working to have a reference sheet or "some kind of list with pictures of all the team members and their roles." Interventions as simple as introduction of team members and making a reference sheet to post on the unit could have significant impacts in understanding team members.

Communication

From a patient safety perspective, the results related to communication were concerning. Studies have repeatedly shown team communication problems can have devastating impacts on patient care. The team perception survey results indicate that 30% of team members are encountering a misinformation. Open-ended responses indicate problems with feeling heard or listened to by team members, impaired communication styles as they relate to conflict, and failure to communicate changes to the plan of care. Strategies to enhance psychological safety

and provide non-providers opportunities to bring concerns forward may improve team communication.

Environment

This survey provided very little insight into compounding environmental variables impacting the current interdisciplinary team. The physical timing of rounds was a universal barrier for other members of the interdisciplinary team. There was also mention of the inability to hear members of the team during rounds. Factors cited as reasons for poor hearing included distractions such as phones, pages, and alarm and call bells. Another factor mentioned was the floor cleaning machine which historically was being used during rounds.

CHAPTER 5: CONCLUSION

Significance

This project provides a need's assessment to identify opportunities for improvement on the interdisciplinary patient care team in a neuroscience ICU. Overall, there has been successful integration of multiple disciplines at the bedside with an established interdisciplinary rounding process however results from this survey indicate multiple areas that could be optimized. The interdisciplinary team is viewed as thorough, intellectual, and caring. An in-depth look at responses suggest several opportunities for improvement regarding team processes.

Continued improvement of the interdisciplinary team has the potential to increase staff satisfaction, decrease burnout, and improve staff turnover rates (reference). Improved team processes have the possibility to increase team outcomes such as efficiency and engagement. Most importantly, patient care outcomes are directly impacted by team outcomes which can result in improved length of stay, decreased adverse events, and decreased mortality rates (reference).

Improving team characteristics such as leadership, coordination, collaboration, and communication is a multifaceted process. Application of Knoster's model of complex change is helpful in determining where the interdisciplinary team is struggling and where interventions can be aimed. Listening to the voices of current team members provides leadership insight into barriers to optimal performance as well as suggestions for improvement. Results from this survey can be used to target specific areas of improvement that the interdisciplinary team in the NSICU at Duke University Medical Center requires.

Summary

The interdisciplinary team is a complex and dynamic organism that functions in a variety of environments. In the critical care environment these teams face many variables that impact team processes and outcomes. Assessing and understanding the effectiveness of existing team processes is the first step in identifying opportunities for improvement. Through assessment of team members' perceptions, interventions can be specifically targeted to the needs of the specific team.

For NSICU at Duke University Medical Center, current needs for effective teams include a shared decision-making model, improved engagement of other health care professionals, improved team stability, clearly defined roles, improved rounding process, and further evaluation of team interactions. Further effort is needed in each of these areas to identify the root cause behind some of these inefficiencies.

Limitations

This survey first and foremost was an assessment of perceptions of an existing interdisciplinary team program in a neuroscience ICU. The implications for current practice directly impact the interdisciplinary team at Duke University Medical Center in the neuroscience ICU. There are multiple limitations that should be considered regarding the results of this project.

This project was conducted in a single unit at a single hospital, examining the use of interdisciplinary teams unique to the setting of a large academic medical center. While many of the findings can be informative to other interdisciplinary rounding teams, care must be used in over generalizing. Academic medical centers differ significantly from community and other hospitals. This in itself could be a reason for difference in unit culture, integration of learners, variable and large teams, as well as high staff turnover.

A significant limitation was the implementation of this project during the height of the 2020 COVID pandemic. The pandemic had significant impacts on the participants in this project. Nursing turnover and stress increased during the pandemic, unit location as well as patient population was affected by increased hospital strain and capacity challenges. Overall effects of the COVID-19 pandemic are unknown; however, the situation likely impacted the perceptions of team members.

Finally, the survey tool used for this study was designed specifically for the NSICU at Duke University Medical Center. The tool was created by a single researcher and the tool itself was not validated. For larger studies involving multiple units or multiple sites, further tool development is needed. Additionally, thematic analysis of this study was conducted by a single researcher. Larger qualitative studies are needed to include different practices and membership of rounding teams from multiple sites with multiple researchers used to validate findings.

Future recommendations

Multiple strategies are needed to improve interdisciplinary team processes. This project found multiple areas of improvement. An in-depth look at the current leadership style and decision-making style is needed. Integration of tools that facilitate joint decision making could be helpful at improving collaboration and engagement. Interventions focused on staff retention and engagement could prove beneficial in improving collaboration.

Improvements regarding the rounding process will require further analysis. Results from this survey indicate that there are multiple concerns related to the rounding process. Concerns range from the duration of rounds, feelings of inefficiency, competing tasks, as well as variable rounding structures. Some specific suggestions for improvement provide a starting point for improvement efforts.

A remaining concern is the amount of misinformation that was encountered among team members. Understanding the relationship of misinformation to participation in rounds and psychological safety is an important next step. Communication pathways outside of team rounds also need to be explored in order to identify how misinformation is occurring.

Results of this project were presented to the NSICU leadership team. Results are currently being applied to the interdisciplinary team to improve engagement, standardize team processes, improve communication, and improve team interactions.

This study uniquely contributes to the current knowledge regarding high functioning teams as it applies to a specific Neuroscience ICU team at Duke University Medical Center. An assessment of the perceptions of team effectiveness by members of the interdisciplinary team provides the foundation for process improvement. Research informs both the framework for assessment and the approach to continuous improvement. Improvement efforts that focus on specific team needs, include regular reassessment of team perceptions, and provide demonstrate measurable improvement in processes and outcomes is recommended. The effects of the intervention are then assessed to find the next opportunity for improvement. Optimizing the effectiveness of the NSICU team at Duke University Medical Center is an important institutional goal. The interdisciplinary team is comprised of the providers of tomorrow, impacting the health of each other, their patients, and the team as a whole.

REFERENCES

Andregard, A., & Jangland, E. (2015). The tortuous journey of introducing the nurse practitioner as a new member of the healthcare team: a meta-synthesis. *Scandinavian Journal of Caring Sciences*, *29 (*1), 3-14.

Beaird, G., Baernholdt, M., White, K. R. (2020). Perceptions of interdisciplinary rounding practices. *Journal of Clinical Nursing, 29*, 1141-1150.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3, 77-101.

Cashman, S. B., Reidy, P., Cody, K., Lemay, C. A. (2004). Developing and measuring progress toward collaborative, integrated, interdisciplinary health care teams. *Journal of Interprofessional Care, 18*(2), 183-196.

Gausvik, C., Lautar, A., Miller, L., Pallerla, H., Schlaudecker, J. (2015). Structured nursing communication on interdisciplinary acute care teams improves perceptions of safety, efficiency, understanding of care plan and teamwork as well as job satisfaction. *Journal of Multidisciplinary Healthcare, 8*.

Halliday, S., Hunter, D. J., & McMillan, L. (2018). Ward staff perceptions of the role of the advanced nurse practitioner in a 'hospital at day' setting. *British Journal of Nursing*, *27*(2), 92-97.

Hinami, K., Whelan, C. T., Konetzka, R. T., Edelson, D. P., Casalino, L. P., Melzer, D. O. (2010). Effects of provider characteristics on care coordination under co-management. *Journal of Hospital Medicine*, *5(*9), 508-51.

Hoffman, L. A., Happ, M. B., Scharfenberg, C., Divirgilio-Thomas, D., Tasota, F. J. (2004). Perceptions of physicians, nurses, and respiratory therapists about the role of acute care nurse practitioners. *American Journal of Critical Care, 13*(6), 480-488.

Jain, M., Miller, L., Belt, D., King, D., Berwick, D. M. (2006). Decline in ICU adverse events, nosocomial infections and cost through a quality improvement initiative focusing on teamwork and culture change. *BMJ Quality & Safety*, *15*, 235-239.

Kilgore, R. V., Longford, R. W. (2009). Reducing the failure risk of interdisciplinary healthcare teams. *Critical Care Nursing Quarterly, 32*(2), 81-88.

Kilpatrick, K. (2012). Understanding acute care nurse practitioner communication and decision-making in healthcare teams. *Journal of Clinical Nursing*, 22, 168-179.

Kilpatrick, K., Lavoie-Tremblay, M., Lamothe, L., Ritchie, J. A., & Doran, D. (2013). Conceptual framework of acute care nurse practitioner role enactment, boundary work, and perceptions of team effectiveness. *Journal of Advanced Nursing, 69*(1), 205-217.

Lancaster, G., Kolakoqsky-Hayner, S., Kovacich, J., Greer-Williams, N. (2015). Interdisciplinary communication and collaboration among physicians, nurses, and unlicensed assistive personnel. *Journal of Nursing Scholarship*, *47*(3), 275-284.

Learning Accelerator. (n.d.) *Tools: Knoster model for managing complex change*. https://www. Practives.learningaccelerator.org

Manser, T. (2009). Teamwork and patient safety in dynamic domains of healthcare: a review of the literature. ACTA Anaesthesiologica Scandinavica, *53*(2), 143-151.

Manthous, C. A., & Hollingshead, A. B. (2011). Team Science and Critical Care. *American Journal of Respiratory and Critical Care Medicine*, *184*(1), 17-25.

Mickan, S., & Rodger, S. (2000). Characteristics of effective teams: a literature review. *Australian Health Review, 23*(3), 201-208.

Murphy, M., Curtis, K., McCloughen, A. (2019) Facilitators and barriers to the clinical application of teamwork skills taught in multidisciplinary simulated trauma team training. *Injury international Journal, 50*(5), 1147-1152.

Nancarrow, S. A., Smith, T., Ariss, S., Enderby, P. M. (2015). Qualitative evaluation of the implementation of the interdisciplinary management tool: a reflective tool to enhance interdisciplinary teamwork using structured, facilitated action research for implementation. *Health and Social Care in the Community*, *23*(4), 437-448.

O'Brien, A., O'Reily, K., Dechen, T., Demosthenes, N., Kelly, V., Mackinson, L., Corey, J., Zieja, K., Stevens, J. P., Cocchi, M. N. (2018). Redesigning rounds in the ICU: Standardizing Key Elements Improves Interdisciplinary Communication. *The Joint Commission Journal on Quality and Patient Safety, 44*(10), 590-598.

O'Leary, K. J., Ritter, C. D., Wheeler, H., Szekendi, M. K., Brinton, T. S., Williams, M. V. (2010). Teamwork on inpatient medical units: assessing attitudes and barriers. BMJ *Quality and Safety, 19*(2), 117-121.

Reader, T. W., & Cuthbertson, B. H. (2011). Teamwork and team training in the ICU: Where do the similarities with aviation end? *Critical Care, 15*, 313. DOI: 10.1186/cc10353

Reader, T., Flin, R., Mearns, K., Cuthbertson, B. (2009). Developing a team performance framework for the intensive care unit. *Critical Care Medicine*, *37*, 1787-1793.

Ten Have, E. C. M., Nap, R. E., Tulleken, J. E. (2013). Quality improvement of interdisciplinary rounds by leadership training based on essential quality indicators of the interdisciplinary rounds assessment scale. *Intensive Care Medicine*, *39*, 1800-1807.

Wang, Y., Qiao-Qin, W., Lin, F., Zhou, W., Shang, S. (2018). Interventions to improve communication between nurses and physicians in the intensive care unit: An integrative literature review. *International Journal of Nursing Science*, *5*(1), 81-88.

Weled, B. J., Adzhiginey, L. A., Hodgman, T. M., Brilli, R. J., Speretz, A., Kline, A. M., … Task force on models of critical care. (2015). Critical care delivery: the importance of process of care and ICU structure to improved outcomes: an update from the American college of critical care medicine task force on models of critical care. *Critical Care Medicine, 47*(7), 1520-1525.

Welp, A., & Manser, T. (2016). Integrating teamwork, clinician occupational well-being and patient safety- development of a conceptual framework based on a systematic review. *BMC Health Services Research, 16*(1).

Wheelan, S. A., Burchill, C. N., Tilin, F. (2003). The link between teamwork and patients' outcomes in intensive care units. *American Association of Critical-Care Nurses, 12*(6).

Yeager, S. (2005). Interdisciplinary Collaboration: The heart and soul of health care. *Critical Care Nursing Clinics of North America, 17*, 143-148.

Table 1

Project timeline

	2019							2020										2021			
Month	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
Research Team Meetings	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Literature Review		X	X					X	X							X		X			
Survey Development													X	X							
IRB Approval														X							
Implementation															X	X					
Data Analysis																	X	X	X		
Preparing final reports																			X	X	
Manuscript Preparation																				X	
Dissemination of finding																				X	X

Table 2

Current age

	Nurse n =51	Provider n =21	Therapist n =12	Total
Age	Count (Percentage)			
<25	9 (17.7)	0	0	9 (10.7)
25-35	31 (60.8)	9 (42.9)	3 (25)	43 (51.2)
36-45	6 (11.8)	5 (23.8)	7 (58.3)	18 (21.4)
46-55	2 (3.9)	6 (28.6)	1 (8.3)	9 (10.7)
>55	3 (5.9)	1 (4.8)	1 (8.3)	5 (6.0)

Table 3

Gender

	Nurse n =51	Provider n =21	Therapist n =12	Total
Gender	Count (Percentage)			
Female	42 (85.7)	9 (45)	12 (100)	63 (77.8)
Male	7 (14.3)	11 (55)	0	18 (22.2)

Table 4

Highest education completed

	Nurse n =51	Provider n =21	Therapist n =12	Total
Highest Education	Count (Percentage)			
Associate	1 (2.0)	0	1 (8.3)	2 (2.4)
Bachelor	48 (94.1)	0	3 (25)	51 (61.7)
Doctorate	0	14 (66.7)	2 (16.7)	16 (19.1)
High School	0	0	1 (8.3)	1 (1.2)
Master's	2 (3.9)	7 (33.3)	5 (41.7)	14 (16.7)

Table 5

Any education in interdisciplinary teamwork

	Nurse n =51	Provider n =21	Therapist n =12	Total
Response	Count (Percentage)			
Do not recall	7 (13.7)	6 (28.6)	5 (41.7)	18 (21.4)
No	7 (13.7)	10 (47.6)	5 (41.7)	22 (26.2)
Yes	37 (72.6)	5 (23.8)	2 (16.7)	44 (52.4)

Table 6

Year in the neuroscience ICU

	Nurse n =51	Provider n =21	Therapist n =12	Total
Years Neuro	Count (Percentage)			
0-5	41 (80.4)	15 (71.4)	6 (50)	62 (73.8)
6-10	6 (11.8)	2 (9.5)	4 (33.3)	12 (14.3)
11-15	1 (2.0)	0	1 (8.3)	2 (2.4)
16-20	3 (5.9)	2 (9.5)	0	5 (6.0)
>20	0	2 (9.5)	1 (8.3)	3 (3.6)

Table 7

Participated in rounds in past 6 months

	Nurse n =51	Provider n =21	Therapist n =12	Total
Number of Shifts	Count (Percentage)			
Every shift or all	26 (51)	15 (71.4)	2 (16.7)	43 (51.2)
Less than half	7 (13.7)	2 (9.5)	7 (58.3)	16 (19.1)
More than half	13 (25.5)	3 (14.3)	1 (8.3)	17 (20.2)
None	5 (9.8)	1 (4.8)	2 (16.7)	8 (9.5)

Table 8

Team perception questions

Question	Nurse	Provider	Therapist	Total
	Count (Percentage)			
Team well-coordinated	n =46	n =19	n =11	
Agree	37 (80.4)	15 (80.0)	9 (81.8)	61 (80.1)
Disagree	7 (15.2)	3 (15.8)	0	10 (13.2)
Neutral	2 (4.4)	1 (5.3)	2 (18.2)	5 (6.6)
Understand role	n =46	n =19	n =11	
Agree	39 (84.8)	16 (84.2)	10 (90.9)	65 (85.5)
Disagree	5 (10.9)	2 (10.5)	0	7 (9.2)
Neutral	2 (4.4)	1 (5.3)	1 (9.1)	4 (5.3)
Structure	n =46	n =19	n =11	
Agree	31 (68.9)	9 (47.4)	4 (36.4)	44 (58.7)
Disagree	10 (22.2)	6 (31.6)	4 (36.4)	20 (26.7)
Neutral	4 (8.9)	4 (21.1)	3 (27.3)	11 (14.7)
Timing interferes	n =46	n =19	n =11	
Agree	26 (56.5)	8 (42.1)	5 (45.5)	39 (51.3)
Disagree	8 (17.4)	9 (47.4)	1 (9.1)	18 (23.7)
Neutral	12 (26.1)	2 (10.5)	5 (45.5)	19 (25)
Id team leader	n =46	n =19	n =11	
Agree	37 (80.4)	14 (73.7)	5 (45.5)	56 (73.7)
Disagree	5 (10.9)	4 (21.1)	4 (36.4)	13 (17.1)
Neutral	4 (8.7)	1 (5.3)	2 (18.2)	7 (9.2)
Questions answered	n =46	n =19	n =12	
Agree	39 (86.7)	17 (89.5)	11 (91.7)	67 (88.2)
Disagree	4 (8.9)	0	1 (8.3)	5 (6.6)
Neutral	2 (4.4)	2 (10.5)	0	4 (5.3)
Leadership opportunities	n =46	n =19	n =12	
Agree	27 (58.7)	15 (78.9)	2 (16.7)	44 (57.1)
Disagree	10 (21.7)	1 (5.3)	4 (33.3)	15 (19.5)
Neutral	9 (19.6)	3 (15.8)	6 (50)	18 (23.4)
Supported by team	n =46	n =19	n =12	
Agree	38 (82.6)	18 (94.7)	12 (100)	68 (88.3)
Disagree	5 (10.9)	0	0	5 (6.5)
Neutral	3 (6.5)	1 (5.3)	0	4 (5.2)

Question	Nurse	Provider	Therapist	Total
	Count (Percentage)			
ID plan of care	n =46	n =19	n =11	
Agree	43 (93.5)	18 (94.7)	10 (90.9)	71 (93.4)
Disagree	1 (2.2)	1 (5.3)	1 (9.1)	3 (4.0)
Neutral	2 (4.4)	0	0	2 (2.6)
Team decides together	n =46	n =19	n =11	
Agree	37 (80.4)	17 (89.5)	6 (54.6)	60 (79)
Disagree	5 (10.9)	1 (5.3)	4 (36.4)	10 (13.2)
Neutral	4 (8.7)	1 (5.3)	1 (9.1)	6 (7.9)
Verbalize thoughts	n =46	n =19	n =11	
Agree	41 (89.1)	19 (100)	9 (81.8)	69 (90.8)
Disagree	3 (6.5)	0	1 (9.1)	4 (5.3)
Neutral	2 (4.4)	0	1 (9.1)	3 (4.0)
Feel important	n =46	n =19	n =11	
Agree	35 (76.1)	18 (94.7)	8 (72.7)	61 (80.3)
Disagree	5 (10.9)	0	1 (9.1)	6 (7.9)
Neutral	6 (13.0)	1 (5.3)	2 (18.2)	9 (11.8)
Present but don’t participate	n =46	n =19	n =11	
Agree	0	1 (5.3)	2 (18.2)	3 (4.0)
Disagree	39 (84.8)	16 (84.2)	7 (63.6)	62 (81.6)
Neutral	7 (15.2)	2 (10.5)	2 (18.2)	11 (14.5)
Understand plan at completion	n =46	n =19	n =11	
Agree	44 (95.7)	18 (94.7)	9 (81.8)	71 (93.4)
Disagree	0	0	1 (9.1)	1 (1.3)
Neutral	2 (4.4)	1 (5.3)	1 (9.1)	4 (5.3)
Reach team when needed	n =46	n =19	n =12	
Agree	38 (84.4)	18 (94.7)	11 (91.7)	67 (88.2)
Disagree	7 (15.6)	0	1 (8.3)	8 (10.5)
Neutral	0	1 (5.3)	0	1 (1.3)
Misinformation	n =46	n =19	N=11	
Agree	14 (30.4)	6 (31.6)	3 (27.3)	23 (30.3)
Disagree	22 (47.8)	12 (63.2)	7 (63.6)	41 (54)
Neutral	10 (21.7)	1 (5.3)	1 (9.1)	12 (15.8)

Question	Nurse	Provider	Therapist	Total
	Count (Percentage)			
Can hear discussions	n =46	n =19	n =11	
Agree	31 (67.4)	16 (84.2)	8 (72.7)	55 (72.4)
Disagree	9 (19.6)	2 (10.5)	1 (9.1)	12 (15.8)
Neutral	6 (13.0)	1 (5.3)	2 (18.2)	9 (11.8)
Interferes with duties	n =46	N=19	n =10	
Agree	20 (43.5)	3 (15.8)	3 (30)	26 (34.7)
Disagree	14 (30.4)	13 (68.4)	5 (50)	32 (42.7)
Neutral	12 (26.1)	3 (15.8)	2 (20)	17 (22.7)
Support to be present	n =46	n =19	n =10	
Agree	34 (73.9)	18 (94.7)	8 (80)	60 (80)
Disagree	7 (15.2)	0	0	7 (9.3)
Neutral	5 (10.9)	1 (5.3)	2 (20)	8 (10.7)

Table 9

Open ended responses themes and subthemes

Themes	Subthemes
Stability	
	Member
	Process
	Rounding
Role	
Rounding Process	
	Duration
	Efficiency
	Purpose
	Structure
Timing	
	Multidisciplinary
	Night Shift
Team Interactions	
	Psychologic safety
	Respect
	Communication
	Engagement

Table 10

Open-ended responses: perceived barriers related to stability

Speaker	Subtheme	Quote
RN	Processes	"There is no consistency between attending physician and their hemodynamic goals for the patients."
RN	Processes	"There is no consistency between treatment choices for the TBI patient with ICP, as a result bedside nurses are always confused as to the expectations and normalcy of orders and hemodynamic goals."
RN	Member stability	"Fellow attitudes toward nursing, they are very dismissive, and often don't listen to concerns, and often walk away from someone asking a legitimate question. I do think I have heard fellows tell someone not to bother them or interrupt rounds with questions etc… on multiple occasions. Its often an inexperienced nurse, they often come find me to go and ask the same question to get an answer to their question without the attitude. Its disgusting and leads to higher nurse turnover because of its impact on their feeling of belonging. If the teams are frustrated by always having in experienced nurses around, maybe they should stop treating them like crap… real talk."
RN	Processes	"When I have worked Saturday to Sunday to Monday, I feel like plans of care will shift when providers come off and another one comes o for the week. I think that providers could communicate actions taken that past week and why to help ease the transition from provider to provider each week."
RN	Processes	"Consistently- I feel like every provider has a different approach and sometimes there is miscommunication regarding plan of care between providers."
RN	Rounding structure	"Formal structure"
MD	Rounding structure	"Not yet well formed"
MD	Member stability, Consistency	"Lack of consistency with respiratory team members who are often not integrated into rounds. New nurses/float pools nurses make it difficult to fully integrate"
APP	Member stability	"The influx of new grad nurse hires that have difficulty presenting information"
RN	Processes	"No consistency between providers or standard of care. not following neurocritical care guidelines or previous unit standards and then being unwilling to explain why suddenly it's going to be done "this way""

Table 11

Open-ended responses: improvement suggestions related to stability

Speaker	Subtheme	Quote
RN	Process	"Standardization of protocols as it relates to treating ICP's and high acuity neuro ICU patients."
MD	Rounding structure	"Consistent structure"
RN	Rounding structure,	"Better organization, structure, and time management. Consistently."
Other	Processes	"Consistency with orders when advocated for an appropriate patient (for therapy). My concern is that these patients may slip through the cracks and not every therapist will be insistent on orders being placed."
MD	Rounding members	"Consistency of rounding team, retention of nursing staff"
RN	Consistency, Leadership, Expectations	"Consistent expectations for RN involvement. Consistent provider leading rounds (IE. Always the fellow or NP)."
RN	Structure Communication	"Consistent structure. Maybe have a follow up plan in place if there are unclarified orders/ goals between other teams."
RT	Processes	"Listen to your peers, don't express interests and opinions and then decide to do something else. Particular individuals will ask to do things that aren't indicated or necessary, but would like you to do them "just because, I want to see"."
RN	Processes	"Mondays are the worst. I've rounded past 3:00 PM consistently and feel rushed to change the game plan for the patient with minimal time left in the shift."
MD	Rounding structure	"More efficient structure"
MD	Rounding structure	"Needs more structure"

Table 12

Open-ended responses: perceived strengths related to team interactions

Speaker	Subtheme	Quote
RN	Rounding format	"There is a consistent structure that helps keep us organized"
RN	Rounding format	"There is a predictable/consistent pattern for talking through the patient care (ie-Neuro, Resp, etc.)"

Table 13

Open-ended responses: perceived barriers related to role definition

Speaker	Subtheme	Quote
RN	Team jobs	"Other times, the structure of the team is not clear that day and it is hard to know who is putting in orders."
RN	Team jobs	"Different attendings round with different structures (alternating days, round on all 16, fellow runs rounds, etc.) This gets confusing for others on the team."
RN	Role changes, Nights	"Lack of consistency for the team rounding at night"
MD	Chain of command	"In general, roles well defined, but there can be lack of clarity at times between primary providers (NP, resident, junior fellow)"
MD	Team jobs	"Assigned roles for each team member"
Fellow	Team jobs	"Undefined roles. Inefficiency. Multiple interruptions for non-acute issues"
RT	Team jobs, Role confusion	"Too many people trying to do every role. Lots of digressing."
APP	Team jobs, Support	"Role of fellow. Strength of APP or fellow,"
RN	Team members, Trust	"Providers do not always introduce themselves to a new nurse. A quick introduction would make them feel more welcome."
Other	Team members, Trust	"I don't know everyone's name and role. This is worse since COVID."
RN	Team jobs, Leadership	"Need to be a clear leader, designated roles like you run rounds, you write notes etc. So everyone has a role and rounds can work in the most efficient manner."
RN	Team jobs	"Not clear roles-who is writing orders, ect."
RN	Role Understanding, Trust	"Not recognizing that new nurses do not have basic knowledge base or understanding of this situation and disease process. Not introducing rounding team each day to nurses. We have no idea who is who and what their level of medical knowledge is."

Table 14

Open-ended responses: improvement suggestions related to role definition

Speaker	Subtheme	Quote
RN	Team jobs Engagement	"Better defined primary providers roles better integrate nursing staff formally."
RN	Team jobs Role understanding	"Clear roles, cognizant of what's going on with the nurse and a specific patient, being willing to skip to another room if needed, actually asking nurse for their input in providing teaching in that moment (this happens with certain people rounding but not with others)"
Others	Team members	"Also have some kind of list with pictures of all team members in their roles."
RN	Knowledge level, Role confusion	"I think that new graduate nurses would benefit from more education about provider roles and responsibilities on the unit (attending versus fellow versus NP) this information was not presented to me during my formal nursing education."
APP	Team jobs	"Let the APP take turns with the fellows leading rounds. It forces everyone to think actively about patient care. Possibly adding a third MD to see each eight patients? I don't think it's helpful to give 8 to the fellow and APP, just to have a fellow and an MD discuss/change plans off line leader, without the APP."
RN	Team members	"Providers do not always introduce themselves to a new nurse. A quick introduction would make them feel more welcome"

Table 15

Open-ended responses: perceived strengths related to role definition

Speaker	Subthemes	Quote
RN	Support	"24/7 coverage of APPs is awesome! Never have to worry that we don't have a provider or when we need something for our patients."
APP	Team jobs support	"Although the role of the other providers (fellows, residents) fluctuates at times, I think the APPs have a well defined role during rounds (exams, orders)"
Other	Support	"Competent colleagues who all know their roles listen to each other, have a spirit of helpfulness and working together for the patient's best outcome, good sense of humor."
RN	Team jobs	"Everyone seems to have an active role in voice during rounds."
Fellow	Multidisciplinary	"Having pharmacists on rounds with us is tremendously useful."
Fellow	Support	"It is nice to have experienced APPs, to have the viewpoint of all APPs, the attending, the resident, and the fellow during rounds."
RN	Support	"Our NP's are the backbone of this unit."
RN	Support	"Strong APPs"

Table 16

Open-ended responses: perceived barriers related to the rounding process

Speaker	Subtheme	Quote
RN	Night Rounds	"Lack of consistency for the team rounding at night."
RN	Duration, Structure	"Formal structure and time restraints."
Fellow	Efficiency, Interruptions	"Undefined roles. Inefficiency. Multiple interruptions for non-acute issues."
RT	Efficiency , Competing task	"Too many people trying to do every role. Lots of digressing. Rounds take so long that it interrupts with my care. Too many scans. Lack of respect at times."
RN	Duration	"Take entirely way too long, too many interruptions."
MD	Structure	"Not yet well formed"
RN	Duration, Completing task	"Duration of rounds can sometimes impede RN ability to perform care in timely manner"
MD	Team members	"Lack of consistency with respiratory team members who are often not integrated into rounds. New nurses/float pools nurses make it difficult to fully integrate."
RN	Structure, Duration, Interruptions	"Formal structure and time restraints. What is and is not appropriate to interrupt for."
RN	Duration, Structure	"I also think that there could be more organized way of doing rounds in a timely manner."
RN	Duration, Purpose	"Time- some attendings go so quick that I don't feel heard and don't feel like the patient is getting the best out of rounds as they could. Some go so slow or sidebar so often that it impedes on my patient care."
RN	Duration	"Time some rounds take up to 30 mins or more for 1 patients."
RN	Duration	"Time management. Attending on low and middle rounds take up majority of day shift."
RN	Duration , Competing task	"The time rounds start interfere with morning care and when a lot of teaching is happening during rounds it adds a lot of time."
RN	Duration, Competing task, Valued	"The team seems to rounds at the most convenient time for them and not necessarily the nurse. Sometimes they can skip the room, but not too often. It's hard to rounds and discuss the patient when you don't have the nurse present who is with the patient for 12 hours."

Speaker	Subtheme	Quote
Fellow	Duration, Completing task, Structure, Interruptions	"The duration of rounding sometimes, especially when it lasts till late afternoon, can affect the ability of performing procedures and following up on what discussed during the interdisciplinary rounds. Prolong family discussion during interdisciplinary rounds, which results in prolonging the duration of rounds. Sometimes, the team will have too many members, which may result in losing track during rounds, and multiple interruptions of rounds."
RN	Duration, Efficiency	"Sometimes rounding on dayshift can take an excessive amount of time, which does not allow RNs to complete care for duel patients in a timely manner. ICU And NSU teams have high tendencies (almost 100%) to not round together, but will come within 5-15 minutes of each other on nightshift; this is constantly waking up patients who are already experiencing delirium, exhaustion, etc."
RN	Competing task	"Sometimes it can be hard for RNs to juggle participating in rounds ,responding to patient call bells, and answering phone calls during rounds when there is not enough help on the unit (resource/NA not available). that is the main barrier to RN participating on rounds."
RN	Interruptions	"Rounds sometimes have to get interrupted when another patient requires new orders or has an immediate need while the team is rounding on a different patient. This is hard to get around because if it's a need that urgent or time sensitive, there's no other option other than to interrupt."
RN	Duration	"Rounds last too long and extend into the afternoon. Interfering with patient care and team breaks."
RN	Duration, Competing task	"Rounding during the day often interfering with the nurse accomplishing tasks for the patient, particularly if the nurse is double that day."
APP	Duration, Interruptions	"Occasionally rounds take up too much time, which delays making a plan for the day which ultimately delays patient care. The nurse gets frustrated. Patient/family members get frustrated. Different attendings round with different structures (alternating days, round on all 16, fell ow runs rounds, etc.) This gets confusing for others on the team. Nursing interruptions. I think this has improved recently, but we do still occasionally get interruptions for request that could wait until after rounds."
RN	Rounding Route, Competing task	"Never know when the team is going to rounds, who they will start on etc. difficulty when RN has 2 patients. This can interfere with medication administration if rounds are taking a long time."
RN	Competing task	"Need to be a clear leader, designated roles like you run rounds, you write notes etc. so everyone has a role and rounds can work in the most efficient manner. I think it should be okay for the nurse to ask the team to skip the patient and come back, for example if there is something that occurred right at shift change and now its 930 and the nurse hasn't even completed their 8 am assessment or meds, labs etc., then the team should be mindful and skip to another room. This is an example of how rounds can interfere with patient care."

Speaker	Subtheme	Quote
Fellow	Competing task, Interruptions	"Loud unit, other patient cares and emergencies, which naturally take priority to finishing rounds. An additional issue is frequent interruptions by other staff (ie nursing, etc.) regarding issues that do not pertain to the patient we are rounding on."
MD	Efficiency	"Lack of adequate time "
MD	Interruptions	"Interruptions during rounds disrupt the flow."
RN	Night rounds, Duration, Competing task, Support	"I have worked night shift for over 3 years and have not directly participated in a while. I think previously I encounter barriers sch as lengthy rounds, other disciplines interacting with patient at same time (speech, OT/PT), patient needing care, and lack of support from neighbors."
RN	Duration, Investment	"I feel as an RN barriers that exist would be the time it takes to complete rounding can interfere with patient care depending on the patient assignment. Also most of the time it is difficult to hear the conversations had during rounds cause the teach isn't always directed towards all team members."
RN	Competing Task	"Early rounds shortly after shift change when doing assessment/med passes."
RN	Competing Task	"During day shift, most often the busiest time are right in the morning with morning work morning meds. It can be a lot when the team attempts to start rounds right at 8 or 9 am if you have two patients with lots of morning meds/needs."
RN	Interruptions	"Distractions from phone calls/changes in patient conditions elsewhere on the unit."
MD	Competing Task	"Attending having non-ICU responsibilities…PHAST, Consults, Stroke."
RN	Competing Task	"As an RN who participates in rounds timing can be a huge issue. There have been times I had to administer 0800 medications late or I had to put a stop to my morning tasks to rounds (which can take up to 30 minutes or longer.) this can be particularly detrimental when we are doubled
RN	Competing Task	"As a nurse, team rounds are sometimes started during morning medication passes or during other patient care and can make it difficult to participate in team rounds or adequately take care of patients."
RN	Rounding flow	"Decisions on what patients are rounded on first are never communicated to the bedside nurses."
RN	Duration, Competing task	"With high acuity neuroscience ICU patient with multiple vasoactive mediations, high ICPS, scheduled serial labs q3h with q3h hyperosmolar medications and mannitol- rounds take too long. It is really inappropriate to have to stop patient care to stand there with the rounding team for an entire hour. Part of this is because some attending chooses to teach during rounds, which should be held until after rounds. 10. At this point rounds have gone until 2-3 pm which totally disregards the nurses getting to lunch in a timely manner."

Speaker	Subtheme	Quote
RN	Duration, Interruptions	"In regard to morning rounds there are often issues that need to be addressed before rounding, but the team often expressed frustration with interruptions- there needs to be a system of addressing these needs."
RN	Purpose, Competing task	"Rounds are not a time for teaching the medical student, the resident etc. During rounds, we typically have meds do, are titrating vasoactive medications, are dealing with opening and closing EVDs , the list is endless. Extended rounds with teaching takes at least an hour for each patient and puts every nurses back against the wall to get everything done that needs to be done. "
APP	Duration	"Another issue- 1 MD is responsible for 16 patients on the middle and high side- this makes rounding take too long. "

Table 17

Open-ended responses: improvement suggestions related to team interactions

Speaker	Subtheme	Quote
RN	Duration, Structure, Purpose	"1. More organized and timely 2. No in-depth teaching during rounds 3. Listen and acknowledge the bedside nurses when they have an idea and thought concerning the patient they actually spend 12 hours with them and the team sees the patient for five minutes."
RN	Efficiency, Interruptions, Communication	"Timely rounds. Less phone interruptions. Speaking loud enough for everyone to be able to hear what is being said. "
RN	Duration, Structure	"Better organization, structure, and time management. Consistently.
MD	Structure	"Consistent structure"
RN	Route	"Clear roles, cognizant of what's going on with the nurse and a specific patient, being willing to skip to another room if needed, actually asking nurse for their input in providing teaching in that moment (this happens with certain people rounding but not with others)."
RN	Route, Investment, Communication, Structure	"Collaborate with other team members if it is appropriate time to round so that they are not distracted by other tasks that may take priority at that moment. Have is that individual who always leads rounds. Speak loudly and educate all who are interested not just residents or students."
Fellow	Efficiency, Structure	"More consistency with AN EFFICIENT rounding structure. Ideas on avoiding nonacute interruptions."
MD	Structure	"Consistency of rounding team
RN	Structure	"Consistent expectations for RN involvement. Consistent provider leading rounds (ie. Always the fellow or NP)."
RN	Route	"Develop a system to allow nurses and staff to know the order patients will be seen/ "rounded on" to allow patient care planning accordingly (CT/MRI scans, medication administration, PT/OT/speech evaluations, etc.). "
RN	Night rounding, Structure	"Having consistent rounding pattern on nights to make sure the night team is on the same page for the plan/goals for the shift. Some providers are amazing at this while others do not check until morning."
RN	Can't hear, Interruptions, Distractions	"I can't hear them talking a lot of times. Also, they get sidetracked talking about other patient concerns (that aren't emergent) in the middle of rounding on my patients."

Speaker	Subtheme	Quote
RN	Interruptions	"I think that if nurses were encouraged to review their orders on EPIC as they recapped rounds he would spare the team future interruptions for missing orders/needing clarification on orders."
APP	Duration, Efficiency	"Succinct yet thorough"
Other	Purpose	"It is important to establish the purpose of the rounds - some providers use it as a time to tell PT/OT/SLP who they are allowed to see versus it being an opportunity for global discussion about the patients."
Fellow	Interruptions, Support	"Limiting interruptions, possibly have additional resident/fellow coverage during the mornings to try to troubleshoot issues that arise within the unit while the rounding team is rounding."
RT	Purpose, Duration	"Discuss bigger topics and grand rounds, or meetings, not during rounding. Complete rounds in a timely manner."
RN	Efficiency	"Make rounds more efficient. 45 minutes to one-hour rounds is really inefficient and stressful for nurses when trying to provide adequate care for two patients"
Fellow	Interruptions	"Minimizing interruptions during rounds from family members and other hospital staff. Postponing the family meetings and discussions till the rounds and performing a brief focused neuro exam prior to starting rounds on all patients, which help as well as saving time and may result in a more efficacious rounding."
RN	Efficiency	"More succinct"
RN	Structure Duration	"New rounding system. Mondays are the worst. I've rounded past 3:00 PM consistently and feel rushed to change the game plan for the patient with minimal time left in the shift. The old rounding on an East was the smoothest."
RN	Distractions	"No side conversations/pausing for phone calls would be helpful."
APP	Duration, Purpose	"Not writing notes while rounding"
APP	Efficiency	"Nurse lead rounds - it would be helpful for the nurses to come to round with more information available (how many anti-hypertensive PRNS overnight, how many PRN's for pain meds overnight, how has the blood pressure been, last bowel movement, etc.). This would save time having to stop and look up this information."
RN	Duration	"One thing from my previous experience is the timeliness of rounding. At times, they were lengthy due to multiple reasons."

Speaker	Subtheme	Quote
RN	Duration, Efficiency, Purpose	“Rounding with the patient in mind not just to get through rounds. But also not taking an hour to round because you were teaching -it makes it hard for the nurses to recover the day.”
RN	Duration Interruptions	“Rounds can take a very long time. It can sometimes be difficult to get answers from the team about your patient when they are still rounding on other patients into the afternoon. It would be helpful if there was someone available to answer patient related questions/place orders during this time that didn't require you to interrupt their flow for other patients.”
RN	Interruptions	“Shorten rounds by unnecessary interruptions.”
MD	Duration	“Shorter rounds, more focus from nursing staff with better preparation.”
RN	Duration	“Sometimes rounding takes quite a while. If there is anything that can be done to speed up the process, that would be helpful.”
RN	Purpose Duration	“Stop sacrificing the quality of rounds for time. It's true that rounding is completed in a more timely manner, and the fellows recount their decision with the attendings. But calling the fellow and mid provider multidisciplinary team is kind of laughable. The only thing they want to do is complete rounds as fast as possible to check boxes, they generally aren't interested in anyone else’s ideas or inputs about what they have been seeing in the room.”
RT	Communication	“Each discipline team member should be notified about rounds.”
RN	Efficiency, Duration	“Timing: it is difficult and inefficient for patients when rounds in the late afternoon.”
RN	Interruptions, Route, Support	“There have been a few times where the first call provider has come to pre round which I thought was helpful so that they could answer questions or fix orders before rounding. We have been told to limit interruptions on rounds so it can be hard to figure out when the best time to bring something up to the team would be. Sometimes I will save something to bring up to the team during rounds and then rounds ends up not occurring till two PM or three PM. Maybe if someone could create a rounding schedule (sicker patients first, less sick patients last) where the nurses could see the schedule and have a better understanding of when the team will come to them. I do however think interruptions during rounds would be brought to a minimum if the first call provider can consistently do many pre rounds to address any early shift concerns.”
RN	Route, Interruptions	“A more routine flow so that RN can better anticipate timing of rounds (ie to pause sedation or holdoff an interrupting rounds for needs).”

Speaker	Subtheme	Quote
RN	Structure, Interruption, Duration, Route	“Better structure - if there are multiple people on round it would be nice to identify the person who you should interrupt (IE a sign on their WOW, or announced at huddle) this would allow those interruptions that are needed to not derail the rest of rounds; Rounds get too lengthy at times - is it possible to not update notes in real time so that rounds could be quicker? I think this contributes to having to repeat things because the attending/fellow are still typing and others have moved on to the next box more concise! We shouldn't rounding consistently into late afternoons, this should be the exception not the norm. A more consistent route of rounds to help the nursing staff plan on when you may round on that room. I get this is hard because of the changing acuity, admissions, etc. But could the off going NP identify the round and post for morning huddle?”

Table 18

Open-ended responses: perceived strengths related to team interactions

Speaker	Subtheme	Quote
RN	Structure	"Consistency in rounding format"
RN	Purpose	"Discussing the plan of care for the day with all members of the team, clarity on goals in orders, and rapport with team members."
RN	Night rounding	"Due to being on nights, I'm not sure of the current strength and rounding."
RN	Purpose Efficiency	"For the most part rounds are very efficient. They contribute to my knowledge of the patient's condition and leave me with clear goals for patient plan of care."
RN	Through	"Going through each body system thoroughly to ensure nothing gets missed."
RN	Engagement Support	"I think it is helpful when the house officer to lead rounds because they are more engaged which helps when there are extra questions/concerns throughout the day."
RN	Purpose	"I think the discussion aspect of the rounding team is great. The team always explains the reasoning behind medications or orders which allows me to better understand my patient and take care of them."
RN	Purpose	"It is a great opportunity for nursing staff and providers to learn from each other. When interdisciplinary team rounding adjourns everyone is on the same page regarding the patient plan of care."
RN	Purpose	"That they exist in general. The opportunity to coordinate plan involving all members of the care team is invaluable."
RN	Purpose	"The team is generally on the same page during rounds."
RN	Structure	"There is a predictable/consistent pattern for talking through the patient care (ie-Neuro, Resp, etc.)"
APP	Thorough	"Thorough"
APP	Thorough	"Thorough plan of care"
MD	Purpose	"When it works correctly everybody feels heard, patient care is more holistic."
RN	Purpose	"Collaboration, teaching!"
MD	Collaboration	"Not yet harmonized"
RN	Purpose	"Strong understanding of the plan of care. Allows time to clarify issues or communicate RN needs from team and for the RN to contribute recommendations."

Table 19

Open-ended responses: perceived barriers related to timing

Speaker	Subtheme	Quote
Other	Physical Time	"Timing seems to be a challenge, which is the nature of acute care. I'm not sure if it will be beneficial to meet prior to ICU rounds or following completion."
RN	Physical Time	"The team seems to rounds at the most convenient time for them and not necessarily the nurse. Sometimes they can skip the room, but not too often. It's hard to rounds and discuss the patient when you don't have the nurse present who is with the patient for 12 hours."
Other	Physical Time	"Sometimes the medical teams are no available, and then the therapists have to keep circling back or just end rounds for the day Not all therapy disciplines are available."
RN	Physical Time	"As an RN who participates in rounds timing can be a huge issue. There have been times I had to administer 0800 medications late or I had to put a stop to my morning tasks to rounds (which can take up to 30 minutes or longer.) this can be particularly detrimental when we are doubled."
APP	Multidisciplinary	"Neurosurgery- it would be nice if they would let the APPS know when they're coming in the early morning- sometimes you're stuck in a room and don't realize they're around until after they've left."
RN	Multidisciplinary	"ICU and neurosurgery teams have high tendencies (almost 100%) to not round together, but will come within 5-15 minutes of each other on nightshift; this is constantly waking up patients who are already experiencing delirium, exhaustion, etc."

Table 20

Open-ended responses: improvement suggestions related to timing

Speaker	Subtheme	Quote
RN	Multidisciplinary	"ICU and neurosurgery teams could coordinate early morning rounds or late night rounds (nightshift) to eliminate constant disruption of patient rest and the RNS time."
Other	Productivity	"Also, therapists are expected to meet the same productivity standard as those who do not participate in rounds, so length of time is a huge component."
Other	Physical Time	"It would be nice if at least one member of each medical team was available to go over the list around the same time every day."

Table 21

Open-ended responses: perceived barriers related to team interactions

Speaker	Subtheme	Quote
RN	Respect, Psychologic safety	"Fellow attitudes toward nursing, they are very dismissive, and often don't listen to concerns, and often walk away from someone asking a legitimate question. I do think I have heard fellows tell someone not to bother them or interrupt rounds with questions etc… on multiple occasions. Its often an inexperienced nurse, they often come find me to go and ask the same question to get an answer to their question without the attitude. Its disgusting and leads to higher nurse turnover because of its impact on their feeling of belonging. If the teams are frustrated by always having in experienced nurses around, maybe they should stop treating them like crap… real talk."
MD	Engagement	"Bedside nursing engagement and knowledge of the patient, assigned roles for each team member, active discussion of issues, frequent absence of RT."
RT	Respect	"Too many people trying to do every role. Lots of digressing. Rounds take so long that it interrupts with my care. Too many scans. Lack of respect at times."
Other	Conflict	"Timing, disagreements between providers (one feeling more comfortable with therapy working with a patient)."
RN	Feeling heard	"Time- some attendings go so quick that I don't feel heard and don't feel like the patient is getting the best out of rounds as they could. Some go so slow or sidebar so often that it impedes on my patient care."
RN	Communication	"Volume, some rounds consist of providers talking amongst themselves and RN can miss a message."
RN	Psychologic safety	"Feeling " safe" to ask questions."
RN	Communication, Hearing, Engagement	"The physical barrier of computers makes it difficult to hear or see team members and feels like a wall, making it challenging for the nurse to participate as a team member."
RT	Communication, Feeling heard	"The new attending is not very personable and doesn't listen to the staff."
RN	Engagement	"Sometimes it can be hard for RNs to juggle participating in rounds, responding to patient call bells, and answering phone calls during rounds when there is not enough help on the unit (resource/NA not available). That is the main barrier to RN participating on rounds."
MD	Engagement	"Lack of nurse participation"

Speaker	Subtheme	Quote
RN	Communication, Hearing	"It varies by day. Sometimes rounding team members are quiet or having side conversations/phone call that make it difficult to follow the flow of rounds. Other times, the structure of the team is not clear that day and it is hard to know who is putting in orders. Most often, I feel they are well lead and responsive to nursing concerns. However, it depends on the team."
Fellow	Engagement	"I think it would be better if we had rounds daily with social work and case management (even by zoom) to discuss needs for patients from those areas."
RN	Night Engagement	"I have worked night shift for over 3 years and have not directly participated in a while. I think previously I encounter barriers sch as lengthy rounds, other disciplines interacting with patient at same time (speech, OT/PT), patient needing care, and lack of support from neighbors."
RN	Communication, Hearing, Investment	"I feel as an RN barriers that exist would be the time it takes to complete rounding can interfere with patient care depending on the patient assignment. Also most of the time it is difficult to hear the conversations had during rounds cause the teach isn't always directed towards all team members."
RN	Engagement, Psychologic safety	"Newer staff not having the confidence or knowledge to speak up during rounds."
RN	Communication	"Communication between the different team members on opposite shift
RN	Psychologic safety	"As a new nurse, I sometimes feel intimidated to speak up to more experienced and knowledgeable team members."
RN	Respect, Communication, Hearing, Investment, Valued	"Generally, the bedside nurses' thoughts and ideas for the patient are no longer valued as they once were. Many times the team talks amongst themselves and doesn't not include the bedside nurse so that he/she can hear what they are saying. When the bedside nurse is in the room and actually performing patient care the teams becomes annoyed when they cannot come out to join rounds on their timeline. Many times they start rounds without the bedside nurse being present."
RN	Support	"There have been many days when we do not see the team and have not been told they are going to grand rounds. Not one provider has remained on the unit for emergency situations."
APP	Support	"Junior fellow and resident should not be round without and experience ACNP."
RN	Respect, Valued	"1. Lack of inclusion of bedside nurse. 2. No respect for knowledge and years of experience."

Table 22

Open-ended responses: improvement suggestions related to team interactions

Speaker	Subtheme	Quote
RN	Duration, Structure, Purpose, Feeling heard	"Listen and acknowledge the bedside nurses when they have an idea and thought concerning the patient they actually spend 12 hours with them and the team sees the patient for five minutes."
RN	Communication	"Speaking loud enough for everyone to be able to hear what is being said."
RN	Communication	"Changing the plan of care for patient after rounds and not sharing that information with bedside nurses."
RN	Engagement	"Better defined primary providers roles better integrate nursing staff formally."
MD	Communication	"Better communication with team members about changes to the patient care plan that occur after rounds so that information can be related to oncoming shift."
RN	Engagement, Investment, Respect	"Clear roles, cognizant of what's going on with the nurse and a specific patient, being willing to skip to another room if needed, actually asking nurse for their input in providing teaching in that moment (this happens with certain people rounding but not with others)."
RN	Investment	"Speak loudly and educate all who are interested not just residents or students."
Fellow	Conflict, Communication	"Communication style can be improved when people have different opinions."
RN	Psychologic safety	"Consistency and openness to questions regarding their patients --nursing's ability to deductively reason what is and is not pertinent is sometimes difficult and providers can be quick to snap or write them off. Providers have more education, expertise, an experience to lean on and should not fault new grads for asking questions period however, we should coach in private and explain leader why it is not a pertinent interruption to promote staff growth."
RN	Psychologic safety, Communication	"Clear communication/expectations for the RN during rounds. Positive responses from provider when RN and ask questions/clarifies situation (ie more approachable/willing to teach). There are a lot of new nurses and is helpful when they are met with kindness teachable spirits and not condensation
RN	Communication	"Consistent structure. Maybe have a follow up plan in place if there are unclarified orders/ goals between other teams."
RN	Communication	"Establishing what our goals is for the patient in terms of their new baseline or what their previous baseline was prior to the event/illness that we are trying to get the patient back to . I want to know realistic goals for the patient based on the extent of their injuries."

Speaker	Subtheme	Quote
RN	Engagement	“I personally think nurses should be more active in our rounds, which is the nurse staff issue. I know in some other units the nurses will go over their assessments, drips, lines, etc automatically, without prompting from providers. I believe this makes nurses more active in the process, and as a nurse I am a fan.”
RN	Communication	“I think there could be more follow-up from providers in the afternoon regarding changes made during rounds this may decrease the amount of time spent on each individual patient.”
APP	Engagement	“Increased family/patient involvement when applicable.”
RT	Feeling heard	“Listen to your peers, don't express interests and opinions and then decide to do something else. Show more appreciation towards your peers, the ones who are working with the patient bedside for 12 hours straight.”
RN	Feeling heard	“Listening to the nurses’ opinions especially if they've been with the patient the last three days.”
RN	Engagement, Communication	“Lower screens during rounds to make it easier to be seen and heard by the nurses. Add a section at the end of rounds before recap to ask if there are any nursing concerns.”
APP	Engagement	“Nurse lead rounds - it would be helpful for the nurses to come to round with more information available (how many anti-hypertensive PRNS overnight, how many PRN's for pain meds overnight, how has the blood pressure been, last bowel movement, etc). this would save time having to stop and look up this information.”
MD	Engagement	“Shorter rounds, more focus from nursing staff with better preparation.”
RT	Inclusive	“The team could improve by collaborating with all staff members.”
Other		“Perhaps a place to post general service-based questions - I think there is not a lot of teaching /discussions since everyone has a job to get done.”
MD	Engagement	“Nurse lead rounds, 24-7 fellow presents.”
RN	Communication, Support	“With patient care overnight, not wait until day shift to make changes in patient care. I here don't rock the boat a lot, and issue should be addressed as they come up and not deferred until day shift.”

Table 23

Open-ended responses: perceived strengths related to team interactions

Speaker	Subtheme	Quote
RN	Support	"24/7 coverage of APPs is awesome! Never have to worry that we don't have a provider or when we need something for our patients."
Other	Valued, Investment	"As a PT, I feel valued and appreciated for what I can offer. Clinicians are receptive to education I can give about additional care we give to patients. Providers always take extra time to explain things to me when I ask questions (not during rounds)."
Other	Support, Humor	"Competent colleagues who all know their roles listen to each other, have a spirit of helpfulness and working together for the patient's best outcome, good sense of humor."
RN	Communication	"Openness of most providers."
RN	Communication, Purpose, Rapport	"Discussing the plan of care for the day with all members of the team, clarity on goals in orders, and rapport with team members."
Other	Valued	"Each time I'm present the team's welcoming and willing to communicate. I've never felt undervalued during these encounters."
RN	Feeling heard	"Everyone has a say and is heard."
RN	Feeling heard, Valued	"Everyone seems to have an active role and voice during rounds."
RN	Purpose	"Everyone works affectively , plan of care is generally clear by the end of rounds."
RN	Investment, Support	"For the most part rounds are very efficient. They contribute to my knowledge of the patient's condition and leave me with clear goals for patient plan of care. My providers are available throughout the shift and often follow up with me in the afternoon to assess patient progress."
RN	Communication	"Good communication between most of the NPs and RNs."
RN	Communication Support	"Good communication, easily accessible"
Fellow	Support	"Having pharmacists on rounds with us is tremendously useful."
RN	Engagement	"I think a strength would be having the person leading rounds asking for a read back of what was discussed always helps and asking if anyone has further input or questions."
RN	Engagement, Support	"I think it is helpful when the house officer to lead rounds because they are more engaged which helps when there are extra questions/concerns throughout the day."

Speaker	Subtheme	Quote
RN	Communication	“I think the discussion aspect of the rounding team is great. The team always explains the reasoning behind medications or orders which allows me to better understand my patient and take care of them.”
RN	Communication	“It is very helpful for nurses to gauge a more clear understanding of the plan for the patient.”
RN	Communication, Respect, Engagement	“It is helpful to go over the whole plan for the patient and have a chance to bring up concerns/questions for the entire team to discuss. It is also a good learning opportunity. All team members I've interacted with have been respectful and do listen to nursing input which is a strength as well.”
RN	Support	“Knowledge and understanding”
Other	Communication, Support	“Knowledgeable staff, patient driven care, collaborative teamwork/discussion for complex cases.”
RR	Feeling heard, Caring	“Most are compassionate and caring. Most of the time to listen to you and your opinion.”
MD	Respect, Communication	“Mutual respect ability to communicate while.”
RN	Engagement	“Read back ensures that we are on the same page. Many of our attendings really engage nursing and are willing to discuss options along the way.”
RN	Engagement, Investment	“Rounds have brought a lot of learning opportunities for all members of the team. Team members also get ample opportunity to get to know one another and build relationships that makes working together easier and safer for the patient.”
RN	Respect, Investment	“Rounds with the attending are usually appropriate, and very respectful. Nurses feel elevated, and often these are the most satisfying round compared to the fellows who were dismissive, and discounting, mean, and nasty.”
RN	Engagement, Listening	“Some attendings are better than others at asking for nurse input on how the patient is doing in their concerns, I think it is very important since we're at the bedside all day. 9 out of 10 times I feel good after rounds about the plan for the day.”
APP	Support, Communication, Investment	“Strong support from the MD, open discussions with the team, certain MD's take the time to teach. Everyone is respectful to each other and asking questions is encouraged.”

Speaker	Subtheme	Quote
RN	Communication, Engagement, Listening	"Plus, as a nurse I think we see a lot of what providers don't because we're in the rooms the most. If providers seek time to listen to the nurse's assessment of the situation they can make better decisions when it comes to their patient care."
Fellow	Engagement	"The readback provided by the bedside nurse at the end of rounds on each patient to summarize the plan of for the day."
RN	Psychologic safety	"The team accomplishes a lot and is very proactive. I feel comfortable as an RN expressing my concerns and asking questions."
RN	Psychologic safety, Support, Listening	"The team always listens to the RN concerns during rounds. House officers and neurosurgery on call providers are always easily and readily accessible for nursing staff."
RN	Communication, Listening	"The team is good about taking into consideration what the nurse has observed works best for the patient, as the nurse typically spends the most time at the bedside caring for the patient. The team is really good about asking for insights from the nursing staff. I also appreciate the members of the team opening up discussions and considering multiple approaches for possible solutions that best fit the patients need instead of just settling on what may be the most obvious/easiest."
RN	Communication, Feeling Heard	"The team uses information that nurses provide to make their decisions; that makes us feel heard, considering that we spend the most time monitoring the patient."
RN	Feeling Heard	"They have listened well to the input that I have given."
MD	Feeling Heard	"When it works correctly everybody feels heard, patient care is more holistic
MD	Engagement Support	"People want to be engaged and participate. The NP group is very strong, 24 presence of fellows."
RN	Communication Engagement	"Strong understanding of the plan of care. Allows time to clarify issues or communicate RN needs from team and for the RN to contribute recommendations."
MD	Diversity	"Willingness of team members to have interdisciplinary team rounds"
MD	Diversity	"Multidisciplinary team members."
APP	Diversity	"Interdisciplinary"
Fellow	Support	"Smart people"

FIGURES

Figure 1

Literature search

Phase 1: initial search	
Electronic Search	Pubmed, CINAHL, Clinical key, science direct, and Scopus databases
Keywords	Critical care OR acute care AND teamwork AND interdisciplinary or multidisciplinary rounds
Filters	Full text online, published after 2005, English
Results	993

Phase 2: Screening of results	
Filter	Read though titles of articles or relevance
Filter	Evaluate relevance of abstract related to interdisciplinary team characteristic and processes
Results	72

Phase 3: Article Selection	
Inclusion criteria 1:	Study looked at interdisciplinary teams in acute care setting and characteristics
Inclusion criteria 2:	Study looked at interdisciplinary teams in acute care setting and perceptions
Inclusion criteria 3:	Study looked at interdisciplinary teams in acute care setting and barriers
Results	28

Figure 2

Knoster's Management of Complex Change

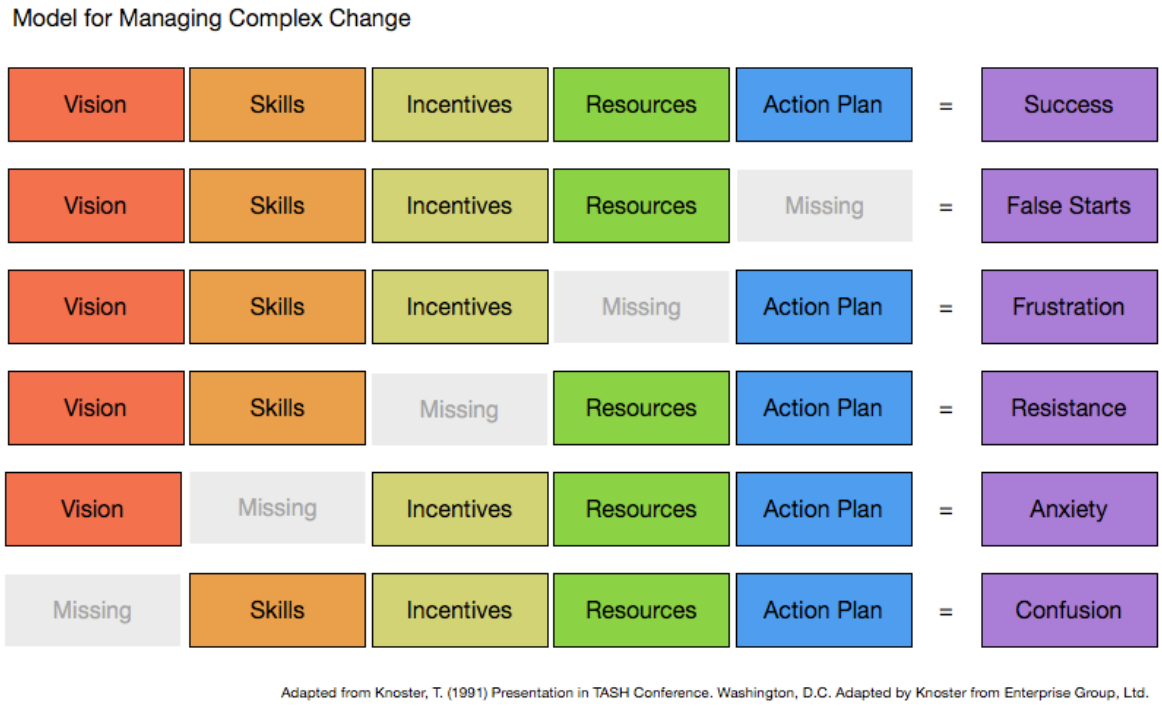


Figure 3

NSICU rounding team: 24 bed unit patient ratios

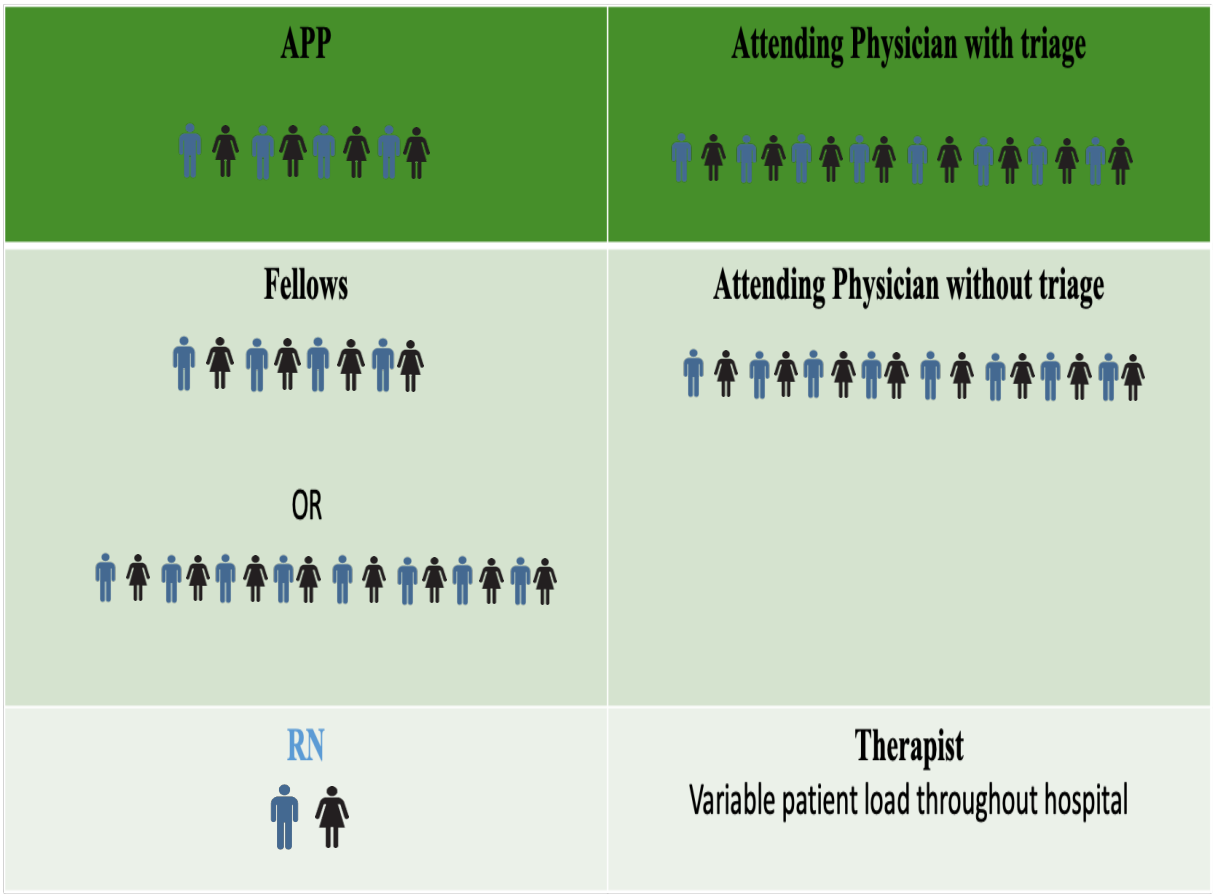


Figure 4

Interdisciplinary team members roles

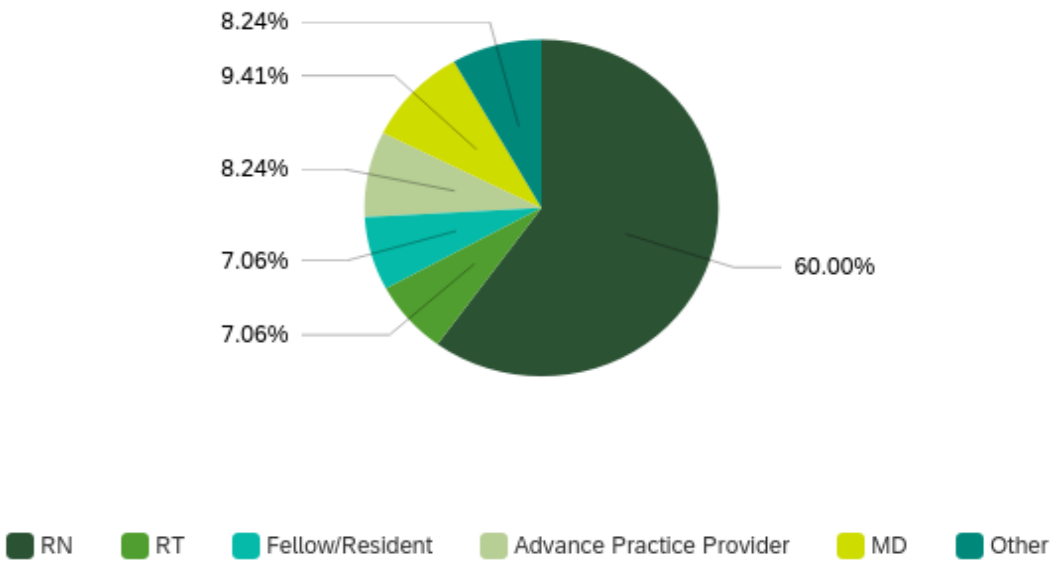


Figure 5

Thematic mapping for stability

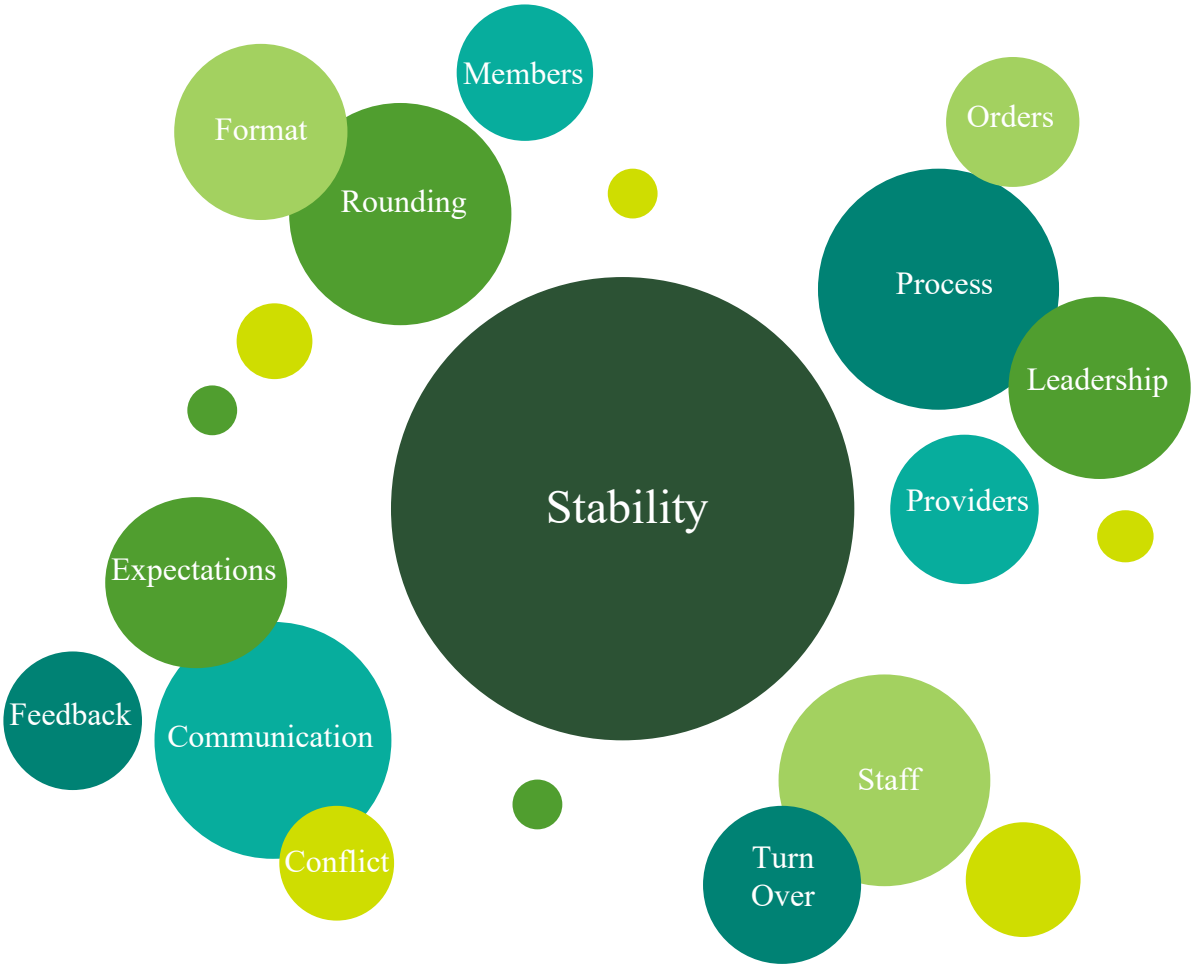


Figure 6

Thematic mapping for role definition

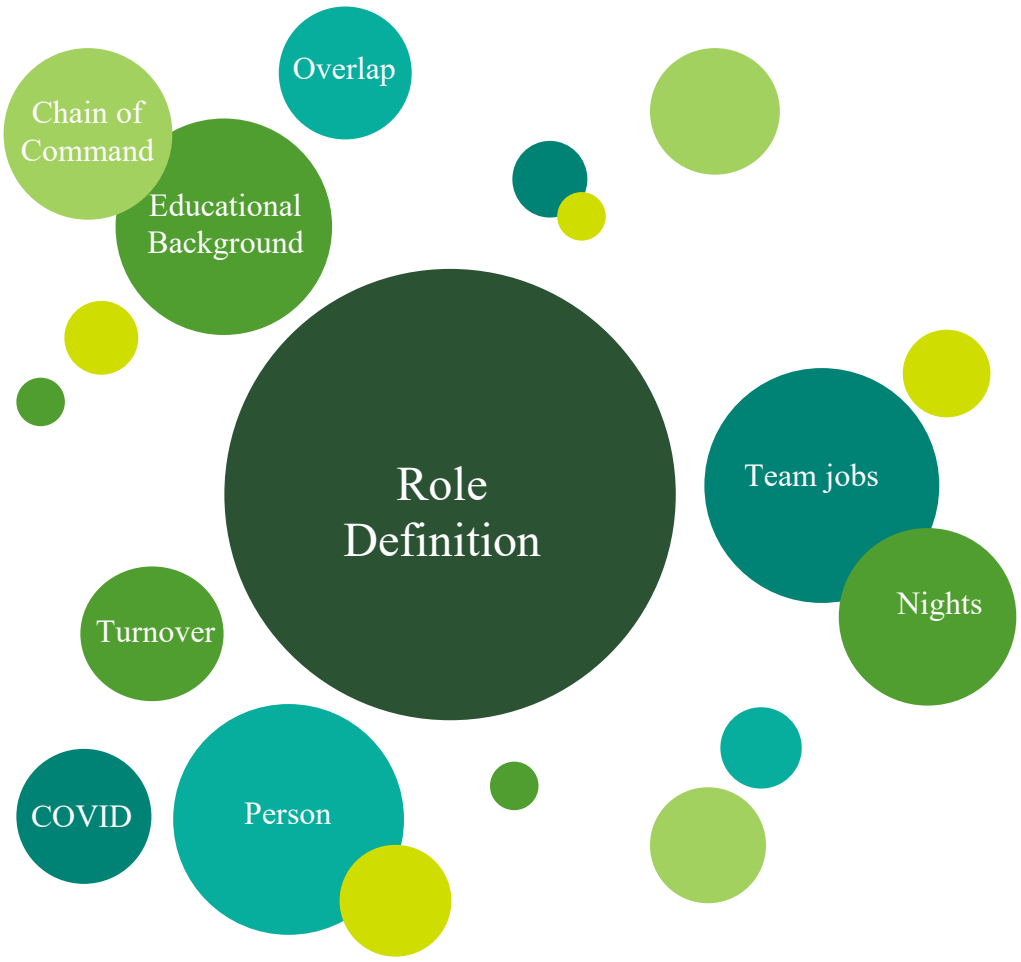


Figure 7

Thematic mapping for rounding process

Figure 8

Thematic mapping for timing

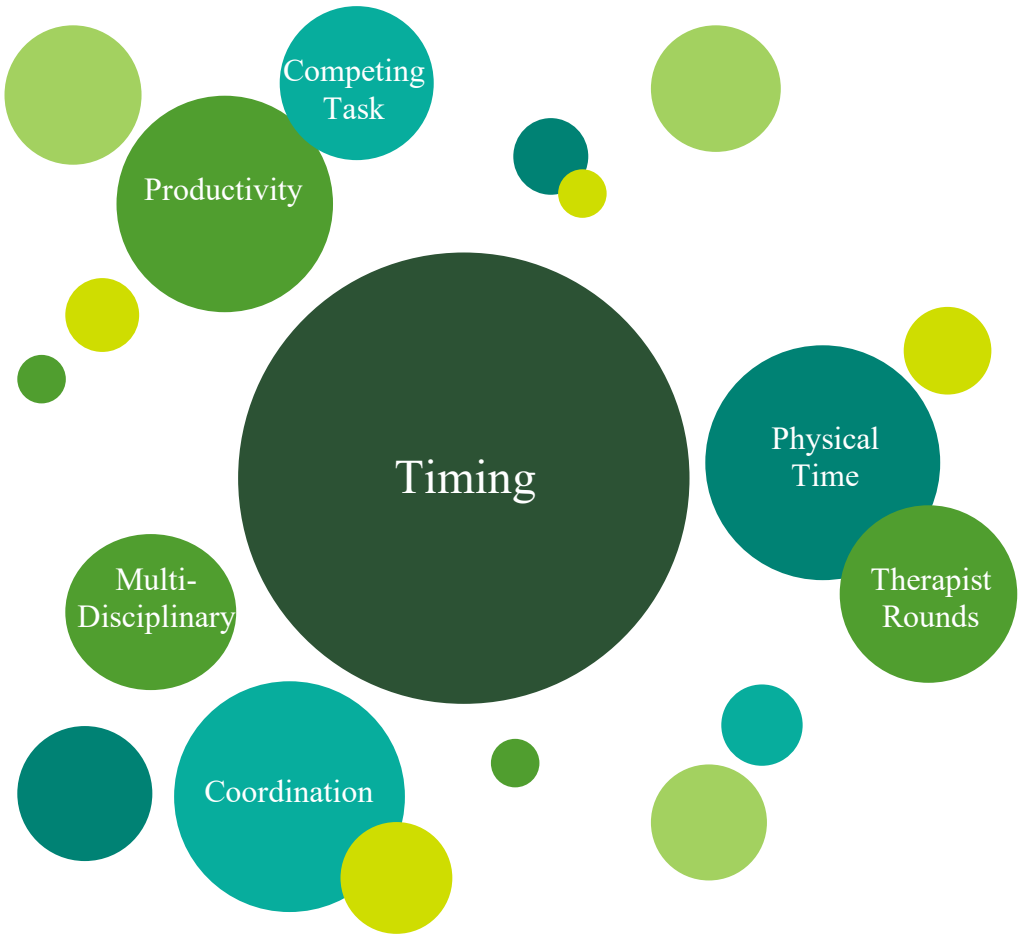
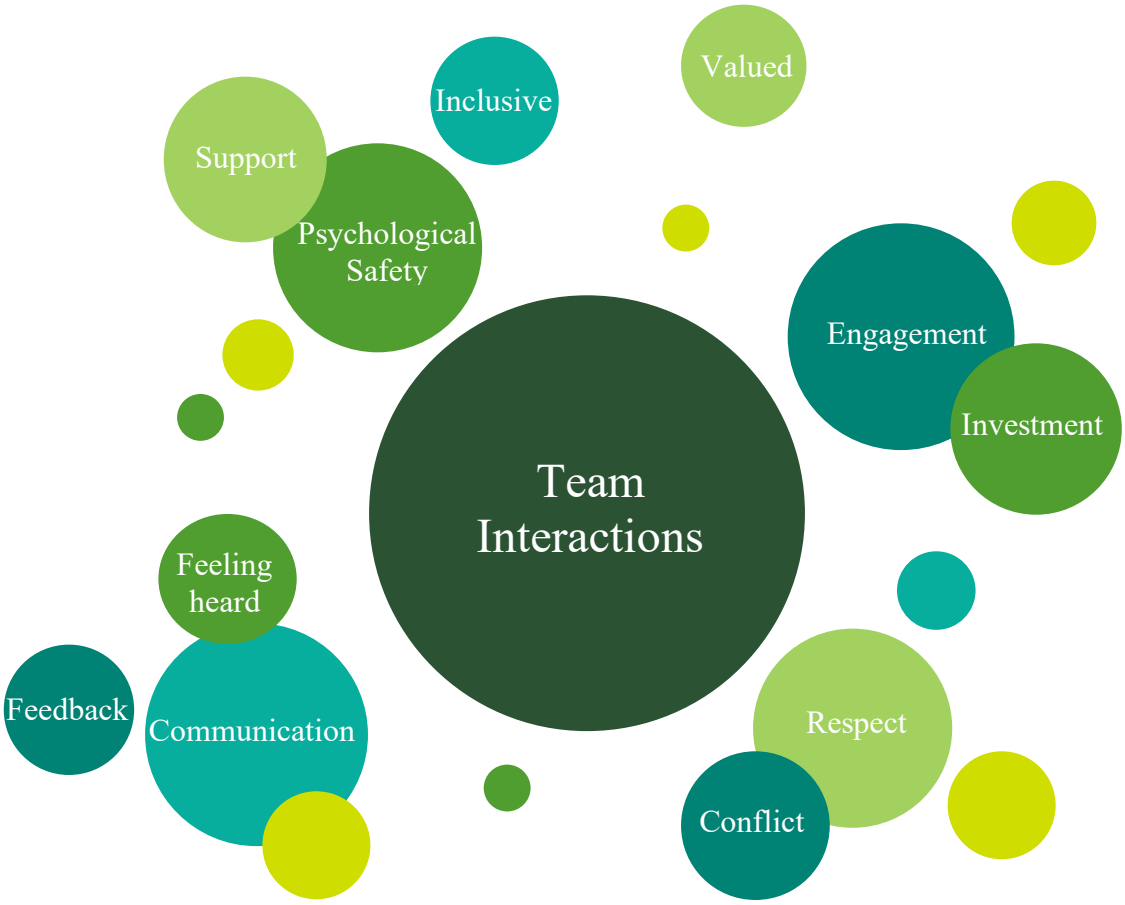


Figure 9

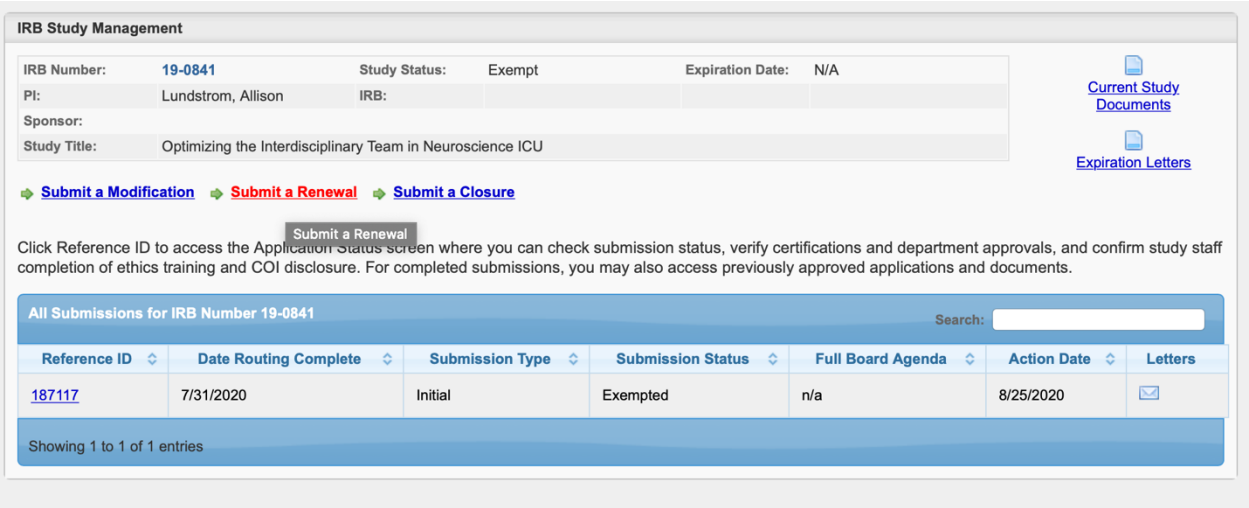
Thematic mapping for team interactions



APPENDICES

Appendix A

UNCC IRB approval



IRB Study Management

IRB Number:	19-0841	Study Status:	Exempt	Expiration Date:	N/A
PI:	Lundstrom, Allison	IRB:			
Sponsor:					
Study Title:	Optimizing the Interdisciplinary Team in Neuroscience ICU				

Current Study Documents

Expiration Letters

Submit a Modification Submit a Renewal Submit a Closure

Submit a Renewal

Click Reference ID to access the Application Status screen where you can check submission status, verify certifications and department approvals, and confirm study staff completion of ethics training and COI disclosure. For completed submissions, you may also access previously approved applications and documents.

All Submissions for IRB Number 19-0841 Search:

Reference ID	Date Routing Complete	Submission Type	Submission Status	Full Board Agenda	Action Date	Letters
187117	7/31/2020	Initial	Exempted	n/a	8/25/2020	

Showing 1 to 1 of 1 entries

Appendix B

Duke IRB approval

DukeHealth
Institutional Review Board

DUHS INSTITUTIONAL REVIEW BOARD DECLARATION OF ACTIVITY NOT MEETING THE DEFINITION OF RESEARCH

The DUHS IRB has determined that the following activity does not meet the definition of research as described in 45 CFR 46.102(d), 21 CFR 50.3(c) and 21 CFR 56.10(c) and satisfies the Privacy Rule as described in 45 CFR 164.514.

Protocol ID: Pro00105988
Reference ID: Pro00105988-INIT-1.0
Protocol Title: Optimizing the Interdisciplinary Team In Neuroscience ICU
Principal Investigator: Deborah Allen

This IRB declaration is in effect from June 08, 2020 and does not expire. However, please be advised that any change to the proposed research will require re-review by the IRB.

DUHS Institutional Review Board
2424 Erwin Rd | Suite 405 | Durham, NC | 919.668.5111
Federalwide Assurance No: FWA 00009025

Appendix C

Letter to participants

You are receiving this email because you are a member of the interdisciplinary team on the Neuroscience ICU at Duke. We want to tell you about a project we are doing with the team. Working in an interdisciplinary team is both rewarding and challenging. The project team would like to collect information about staff perceptions and experience of working within an interdisciplinary team.

What is involved in this project?

You are invited to complete a survey in Qualtrics, a secure platform behind the Duke firewall.
The survey takes about ~15 minutes to complete.
Your participation in completing the survey is voluntary and you can choose not to participate.
You do not have to answer any question that makes you feel uncomfortable.
Your survey responses are anonymous and completely confidential; you will not be identified.

Why are we doing this project?

The objective of this project is to identify and understand the strengths and barriers to optimizing the interdisciplinary team in the NSICU. This project will explore perceptions of individual team members across multiple disciplines that regularly work together as members of the interdisciplinary team.

A secondary objective is that based on the findings, team design, team selection, role boundaries and performance expectations could be optimized.

Your honest feedback is welcomed. Click on this link (Qualtrics link) if you agree to participate. Thank you for your time and consideration.

If you have questions, please contact:
Deborah H. Allen, PhD, RN, CNS, FNP-BC, AOCNP at 919 6814719

Appendix D

SWOT analysis

Strength	Weakness
• **Easy to distribute** • **Minimally time consuming** • **Project in line with leadership goals** • **Needed for future planning** • **Provides voice to all members**	• Potential for survey overload • Large number of new staff with limited experience with NSICU team
Opportunities	**Threats**
• **Potentially for new staff perspective** • **Changing health care climate with potential to strengthen of team** • **Increased engagement from team members through crisis**	• Changing health climate limiting team resources • Fatigue of staff post crisis • Loss of leadership focus on the interdisciplinary team

Appendix E

Demographic survey questions

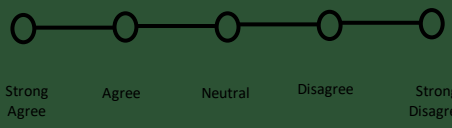
Demographic Questions
• Which role best describes you: ___ RN __ RT __ Fellow__ Advance Practice Provider __ MD __ Other
• Current Age ___ < 25 years ___ 25-35 years ___ 36-45 years ___ 46-55 years ___ >55 years
• Gender _____Male _____ Female _____Prefer not to answer
• Number of years working in your current role ___ 0-5 years ___ 6-10 years ___ 11-15 years ___ 16-20 years ___ >20 years
• Highest level of education completed __ High School diploma __ Associates Degree __ Baccalaureate Degree __ Master's degree ___ Doctorate __ Other
• Do you recall having education in your academic program(s) on the subject of interdisciplinary teamwork? _____ Yes _____ No_____ Do not recall
• In the past 6 months how often have you participated in interdisciplinary team rounds? ___ None ____ Less than half my shifts or time that I work ___ More than half my shifts or time that I work ____ Every shift that I work

Appendix F

Perception and Open-ended survey questions

Perception Questions

Each question was asked with an accompanied Likert scale like below



Team coordination

1. I feel like the interdisciplinary team is well coordinated
2. I understand everyone's role on the interdisciplinary team
3. I feel like there is a consistent structure to team rounds
4. I feel like the timing of team rounds interferes with the provision of patient care

Team leadership

1. I feel like I can clearly identify the team leader on the ICU rounding team
2. When I have questions, I feel they get adequately answered
3. I feel like I have leadership opportunities on the team
4. I feel I am supported by my team members
5. Interdisciplinary team rounds help me identify the patient's plan of care

Team decision making

1. I feel that the interdisciplinary team makes decisions together
2. I have the opportunity to verbalize my thoughts on rounds
3. I feel I am an important member to the interdisciplinary team
4. I am present on rounds but I do not actively participate

Team communication

1. I understand the plan of care for the day at the completion of interdisciplinary team rounds
2. I feel like I can reach any team member when needed
3. I feel like I encounter misinformation related to patient care that differs from the plan of care discussed on rounds

Environment

1. I understand the plan of care for the day at the completion of interdisciplinary team rounds
2. I feel like I can reach any team member when needed
3. I have the support I need to be present on interdisciplinary rounds.

Open Ended Questions

1. What barriers do you think currently exist with the neuroscience interdisciplinary team rounding team?
2. What strengths do you think currently exist with neuroscience interdisciplinary team rounding team?
3. How could the neuroscience interdisciplinary rounding team improve?