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Virtual Patient/Family Communication in the Acute Care Setting

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Virtual Patient/Family Communication in
the Acute Care Setting

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Virtual Patient/Family Communication in the Acute Care Setting

A
Translational Project Paper

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Dedication

This paper is dedicated to my family. First, to my parents, Ferol and Sam Jenkins, who instilled in me the love of learning and the value of education. To my three adult daughters, Teresa, Maria, and Sam, who continuously inspire me to be the best I can be. Finally, to my husband, Paul, whose love, support, and confidence in me push me to achieve things I never thought possible.

Acknowledgments

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Table of Contents

List of Figures

List of Tables

Abstract

Patient and family-centered care strategies see patients and families as valuable healthcare team members. Such strategies thus treat these groups as essential clinical partners in providing safe, high-quality care. Participation, collaboration, and shared decision-making are central to this framework. Historically, hospitals have relied on physical presence at the bedside as a prerequisite to engaging families in the shared decision-making process. Visitor restrictions of the COVID-19 pandemic removed the primary strategy for family participation: physical presence. Healthcare organizations rapidly deployed mobile devices to help minimize the exposure of healthcare providers and provide video visits for family members. This deployment was often rushed, with minimal workflow analysis, role definition, or standard operating procedures. These deficiencies led to low adoption rates, poor user satisfaction, and often unanticipated clinician distress when used at patients' end of life. A better understanding of these virtual tools is necessary to ensure high-quality patient care.

The present quality improvement project aims to understand workflow; organizational barriers to adoption; and provider, family, and patient-related barriers to successfully using virtual communication in the acute care setting. The setting of this project was the intermediate care unit of a 140-bed community hospital that is part of a not-for-profit health system in the southwestern United States. Semi-structured interviews were performed to capture the lived experiences of family members and healthcare workers who used the virtual visit intervention during hospital visitor restrictions. The findings from these interviews, a literature review, and a workflow analysis identified several themes of the current tool's benefits, barriers, and enhancements. These themes were mapped to the sociotechnical model of healthcare information

technology adoption to identify and suggest successful design criteria for a standardized virtual intervention. This intervention could be applied when external interactions are limited, like the pandemic or individual family circumstances. Overall, participants found that the intervention during the COVID-19 pandemic provided comfort and closure, facilitated family-shared decision-making, and reduced patient loneliness. Areas of opportunity include device availability, features, application usability, virtual communication techniques, and standardized workflow. Although hospital visitor restrictions due to the COVID-19 pandemic are no longer in place, the lessons learned, and the criteria identified can help standardize and improve family-centered communication strategies when family members cannot be physically present in the hospital.

Keywords: family-centered care, virtual visiting, family communication, COVID-19

Introduction

Patient and family-centered care focuses on patients and families as partners rather than passive care recipients. A framework that treats patients and families as clinical partners and emphasizes their participation, collaboration, and shared decision-making can facilitate safe and high-quality care. Several benefits of patient and family-centered care have been described. First, family partnership and collaboration reduce anxiety and prepare family members for discharge and necessary follow-up care (Hart et al., 2020; Park et al., 2018). Second, studies have indicated that family-entered care improves patient experiences, safety, quality, and outcomes across diverse disease profiles and patient demographics (AHRQ, 2019; Hugelius et al., 2021; Wendlandt et al., 2022). Third, family-centered care not only benefits families but also enhances provider and caregiver experience and engagement (Johnson & Abraham, 2012). In summary, viewing patients and families as partners has improved the overall quality, safety, and experience of patients, families, and their care team (AHRQ, 2019; Johnson & Abraham, 2012; Park et al., 2018).

In a set of guidelines for healthcare providers, Johnson and Abraham (2012) identify four core concepts that provide a framework for family-centered care in all patient/family encounters. These include:

1. Dignity and Respect

2. Information Sharing

3. Participation

4. Collaboration

Effective communication is critical to these core concepts of family-centered care, which constitutes a vital component of the relationship between patients/families and care providers (Kaslow et al., 2020). Shared decision-making can only happen when families are engaged and invited into the conversation. For example, listening to patients' concerns improves patient safety and efficiency (Levinson, 2000). A 2011 study by Helitzer et al. found that effective communication positively impacted patients' symptom resolution and specific physiological measures (Helitzer et al., 2011). Moreover, patients and families are more likely to participate in care when clinicians invite questions and respond positively to the patient's needs and views. Therefore, patient–caregiver communication is vital to realizing an effective integrated patient and family care model (AHRQ, 2019).

Historically, hospitals have relied on physical presence as a prerequisite to engaging families in the shared decision-making process (de Havenon et al., 2015; Rose et al., 2021). This prerequisite is not family-centered; instead, it focuses on institutions' and providers' schedules. Families face many barriers to being physically present when their loved ones are admitted to the hospital (Rose et al., 2022; Stelson et al., 2016). First, employment might complicate someone's flexibility to be at the bedside. Second, for family members who do not live in the same town as their hospitalized loved one, requiring physical presence creates a significant barrier to successful provider/family communication. Finally, physicians' rounding schedules do not always follow a predictable pattern, so it is difficult for the family member to time their visits to overlap with the providers. Despite these challenges, physical presence remains the primary strategy for inviting families into the conversation and shared decision-making (Hart et al., 2020).

With the COVID-19 pandemic, visitor restrictions were implemented to protect caregivers and the vulnerable patient population (Virani et al., 2020). These restrictions were implemented during a crisis when many nations' top priority was containing the spread of the virus (Hugelius et al., 2021; Wendlandt et al., 2022). As a result, in many healthcare facilities, patients diagnosed with COVID-19 were denied visits. Visits to other hospitalized patients were either denied or severely restricted in frequency and duration (Hafner, 2020). In addition, in many long-term care facilities, residents were not allowed any visitors, even when they were neither infected with nor exposed to the virus (Hindmarch et al., 2021). This lack of physical presence exacerbated the existing challenge of family inclusion, shared decision-making, and communication and negatively impacted care as it eliminated physical presence, the primary tactic healthcare organizations relied on for family involvement (Fenton et al., 2022; Hart et al., 2020; Hugelius et al., 2021; Kennedy et al., 2021; Weiner et al., 2021). Specific documented examples of the negative impacts of patient isolation that arose during the period include the following:

1. Patients with dementia faced a further decline in cognitive function and increased depression (LeVasseur, 2021)

2. Family members had increased distress and reduced understanding of the treatment plan (Hugelius et al., 2021; Rose et al., 2022; Wendlandt et al., 2022)

3. Families found it challenging to stay informed (Nguyen et al., 2022) and experienced increased conflict with care teams (Fenton et al., 2022)

4. COVID-19 visitor restrictions negatively impacted the physical and mental health of patients. Patients had "increased loneliness, agitation, depressive symptoms; and decreased nutrition intake, reduced activity" (Hugelius et al., 2021, p. 7)

During the pandemic, patient care had to be balanced with containing the spread of COVID-19 and protecting care providers (Lessa et al., 2022). Early in the pandemic, there were significant shortages of personal protective equipment (PPE) essential for infection control and prevention (Fang et al., 2020). Healthcare organizations sought strategies to reduce PPE use while keeping team members safe. Each separate trip into an isolation room creates a demand for PPE. Therefore, organizations sought to limit the number of individuals entering COVID-19-positive rooms and the total number of trips (Houghton et al., 2020). Healthcare organizations quickly adopted technology for virtual rounding to spare PPE, prevent further transmission of the virus, and protect care providers by limiting physical presence in COVID-19 patient rooms. In addition, mobile device use was expanded to include communication with family members as a virtual visitation tool and for family conferences with the healthcare provider. Although it met an acute need for communication, this rapid implementation had significant challenges and unintended consequences, especially for healthcare providers using these tools (Dhahri et al., 2021).

Purpose of the Project

This project aims to address the challenges highlighted by COVID-19 visitor restrictions. Currently, there is no sustained strategy for supporting patient and family-centered care in the acute care setting when family members cannot be physically present in the hospital. The project's goal is to identify design criteria through interviews, workflow analysis, and existing research to ultimately recommend a standardized virtual communication intervention to be used when family cannot be physically present in a care setting.

Population, Intervention, Comparison, Outcome (PICO)

PICO is a framework used in evidence-based practice to refine and focus the problem statement and retain clarity of what is in and out of scope (Sackett, 2001). The PICO framework was applied to this quality improvement project, and it is outlined below.

- *Population*: This project focused on patients in the Intermediate Care Unit (IMCU) East, a 16-bed unit in a 140-bed community hospital in the southwestern United States, their care providers, and family members

- *Intervention*: The intervention is to perform workflow analysis and end-user interviews

- *Compare*: This work compares the current virtual communication workflow and staff practice with optimal design criteria

- *Outcome*: Develop and recommend design criteria for a standardized virtual intervention for contact with families during inpatient admission and before discharge.

Specific, Measurable, Actionable, Realistic, Time-Bound (SMART) Statement

The SMART statement is a goal-setting framework to ensure project goals are specific, measurable, actionable realistic, and time-bound (Doran, 1981). The SMART statement for this quality improvement project is to develop design criteria for a standardized virtual communication intervention for patient/family/clinician communication during restricted inpatient visitation through feedback obtained during interviews with patients, families, and clinicians; workflow analysis; and existing qualitative research by December 2022.

- *Specific:* population narrowed to one unit in one location and one intervention in an acute care setting

- *Measurable*: lived experiences of participants through qualitative interviews and workflow process mapping

- *Actionable*: analyzing and recommending design criteria that can be realized in current healthcare settings

- *Realistic*: one care location, narrow in scope

- *Timebound*: finish all interviews and data analysis by December 2022

Current Practices in the Literature

Several studies before and during the pandemic have evaluated and demonstrated the feasibility of virtual communication in restricted visiting environments. Virtual visiting is beneficial for patients and family members in reducing stress, isolation, and loneliness and providing reassurance (Bansal et al., 2021; Brecher, 2013; Hochendoner et al., 2022; Wong & Merchant, 2021). Several authors have concluded that virtual visits should be a regular offering as restrictions are not limited to a pandemic environment (Jeitziner et al., 2022; Krewulak et al., 2022; Rose et al., 2022; Xyrichis et al., 2022). Many studies have identified positive benefits and barriers of related technology and have stressed the need for further development and refinement to complement in-person visitation (Ehrler et al., 2021a; Kuntz et al., 2020; Levido et al., 2022).

Current Practices in the Studied Organization

In a 140-bed community hospital that is part of a not-for-profit health system in the southwestern United States, a virtual rounding and communication tool was implemented in response to a PPE shortage in July 2020. This implementation was part of a system-wide rollout to address the immediate concern of virus spread and PPE shortage. The community hospital deployed iPads using HIPAA-compliant Microsoft Teams to allow clinicians to complete rounds virtually in isolation rooms when appropriate. In November 2020, this capability was expanded

to include patients' family members, enabling virtual care conferences and virtual family visits. The virtual rounding was intended for patients with suspected or confirmed COVID-19 diagnoses. Patients with COVID-19 had the most restrictive visiting, with no visitors, with some exceptions for end-of-life (EOL). In the summer of 2020, the visitor policy at this hospital was as follows: for emergency department and COVID-19 patients, no visitors are allowed, with some exceptions, and one visitor per patient in all other circumstances. In March 2021, visitor restrictions were lifted for non-COVID-19 patients, if the visitors passed health screenings and wore masks. These policies were slightly modified in September 2021 to allow limited visitation for positive or suspected COVID-19 patients: one visitor for one hour per 24-hour period.

In November of 2020, the following departments were provided with iPads for the COVID-19 patient population: the intensive care unit (ICU), the IMCU, and the emergency department. The IMCU was designated the non-ICU COVID unit. At this time, patients in COVID-19 isolation were separated from the general patient population to help prevent hospital-acquired transmission. The IMCU had one iPad for every patient room, with the idea that the devices would stay in the room and always be available.

The implementation faced several challenges. First, the technology was rapidly implemented, as COVID-19 was an emerging and unprecedented situation. The devices were rolled out simultaneously to all units to respond to the crisis without a pilot unit. Training was not standardized: some healthcare providers had at-the-elbow training, some remember getting a tip sheet, and others remember being trained just in time with a colleague. Many users felt uncomfortable with the technology. Finally, there was no technical support for family members, so when they could not get connected or had challenges during the call, the support task fell on the nurse's shoulders.

To further complicate matters, several technologies were implemented simultaneously during this time. The organization implemented a discharge care coach, which used texting to screen patients for possible complications. The hospital was also replacing all its intravenous pumps. This pump replacement required all nurses and anesthesia providers to receive training. This all occurred in a three-week period in November 2020.

Finally, a limited use case was envisioned for tablets. Initially, they were introduced to spare PPE and reduce virus transmission. The family communication feature was only added after several months of tablet use. It was often only used in EOL situations rather than for more frequent check-ins with families, care teams, and patients. The direct implications of these challenges were not completely understood without any meaningful measurement of adoption or user satisfaction. The quality improvement project seeks to illuminate these consequences and suggest tactics to address them.

Models/Framework

Sociotechnical Model

The sociotechnical model is a systems approach that recognizes healthcare information technology implementation as an interplay of people, processes, and technology. It also acknowledges the complexity of healthcare environments in which technology is used. The sociotechnical model comprises eight overlapping and interacting dimensions (Sittig & Singh, 2010):

1. Hardware, software, computing infrastructure
2. Clinical content
3. Human-computer interface
4. People

5. Workflow and communication

6. Internal organization, policy, procedures, and culture

7. External rules, regulations, and pressures

8. System measurement and monitoring.

This model was designed for all healthcare information technology implementation phases, including design, development, implementation, and evaluation. Any healthcare information technology intervention must be evaluated across all dimensions to observe its overall impact (Sittig & Singh, 2010).

Following theme generation, this model provided an organizing principle to ensure the recommendations included the intersectionality of all the dimensions considering the technology, workflow, communication, and people.

Relationship-Centered Care (RCC)

RCC was created by the Academy of Communication in Healthcare and is this organization's principal framework for therapeutic communication. The Academy of Communication in Healthcare describes RCC as "a collaborative, person-centered approach that recognizes communication as the foundation of the therapeutic relationship" (*ACH - Academy of Communication in Healthcare*, n.d.).

RCC emphasizes the importance of empathy, active listening, and open and honest communication in establishing trust and rapport with the patient (C. L. Chou & Cooley, 2018). By focusing on the relationship between the healthcare provider and patient, RCC aims to improve patient satisfaction, enhance the accuracy of health information sharing, and ultimately lead to better health outcomes. This model was used to identify recommendations specific to the quality of the communication within the virtual communication tool.

Summary

Family-centered care is foundational for patient safety, quality, and engagement (Dokken et al., 2020; Johnson & Abraham, 2012; Kaslow et al., 2020; Park et al., 2018). Family-centered care depends on effective communication between patients, families, and care providers to exchange genuine, meaningful information, shared decision-making, relevant interventions, and individualized care plans (Dokken et al., 2020; Hart et al., 2020; Park et al., 2018). Hospitals have mostly relied on physical presence to include families in the care team (Fenton et al., 2022; Wendlandt et al., 2022). However, barriers for families to be physically present in the hospital existed before COVID-19 visitor restrictions and will continue in the future (de Havenon et al., 2015; Rose et al., 2022; Xyrichis et al., 2022). Virtual communication tools are an essential complement to in-person visiting, and optimizing these tools for more widespread adoption will further support family-centered care and shared decision-making (Bansal et al., 2021; Bavare et al., 2021; Rose et al., 2021).

Evidence-Based Practice Review

This evidence-based practice review evaluates the current literature and practices to illuminate the evidence supporting the use of virtual tools, specifically in the inpatient setting, for family communication between providers and patients in restricted environments. With the assistance of Travis Holder, the Texas Medical Center librarian, a search was performed using the following databases: OVID, PubMed, and CINAHL. The following concepts were used: Palliative Care, Hospice, COVID-19, Inpatients, Family Communication, and Patient-Centered Care. The detailed Medical Subject Headings (MeSH) and keywords associated with the concepts are illustrated in Table 1. First, each concept was searched separately using MeSH terms and keywords using the Boolean operator "or." Next, the results of each concept using the Boolean operator "and" were used. Similar searches were conducted using the aforementioned databases.

Table 1

Literature Search Concepts

Concept	MeSH	Keyword
Palliative Care	Palliative Care	Palliative Treatment
		Palliative Care
		Palliative Therapy
Hospice	Hospice Care	Hospice
	Hospices	
		COVID-19
COVID-19	SARS-CoV-2	SARS-COV-2
	COVID-19	Coronavirus
		Novel Coronavirus
		Coronavirus disease
		Severe Acute Respiratory
		Syndrome Coronavirus 2
Inpatients	Inpatients	Inpatient
		Hospitalized
		Hospitalised
Family Communication	Patient Centered Care	Family Communicat*

Concept	MeSH	Keyword
Patient-Centered Care	Patient Navigation Visitors to Patients	Visitors to patients Patient-Focused Care Patient-Centered Care Family-Centered Care

The resulting 576 records were initially examined for duplicates. After removing duplicates, there were 485 records. The remaining records' abstracts were then reviewed for the following inclusion/exclusion criteria:

Inclusion Criteria

1. Studies between 2011 and present

2. Studies with a focus on family communication

3. Studies with a component of restricted visitation

4. Studies involving palliative care and/or COVID-19

5. Studies that focused on adult populations

6. Studies in the inpatient setting

7. Studies that used some form of virtual communication with families

Exclusion Criteria

1. Studies performed before 2011

2. Studies where the setting was outpatient, ambulatory, long-term care, skilled facility, or in the home or other non-acute care setting

3. Studies that focused on pediatric or neonatal populations

4. Studies whose focus was on palliative care education

5. Studies whose primary focus was on palliative care itself

After reviewing the records based on the selection criteria, 48 were selected for in-depth review. 16 additional articles were found using the relevant cited materials in the full-text articles. The 64 articles reviewed in their entirety were then screened with the selection criteria and relevance to the topic of virtual communication. The resulting articles totaled 34. The matrix method (Garrard, 2017) was used to catalog each of these 34 articles in a spreadsheet to prepare for synthesis. The consequent PRISMA diagram is illustrated in Figure 1. The studies selected for review included qualitative studies, case studies, expert opinions, organizational experience, care guidelines, and quality improvement projects (Dang & Dearholt, 2018).

Figure 1

PRISMA Diagram of Literature Search
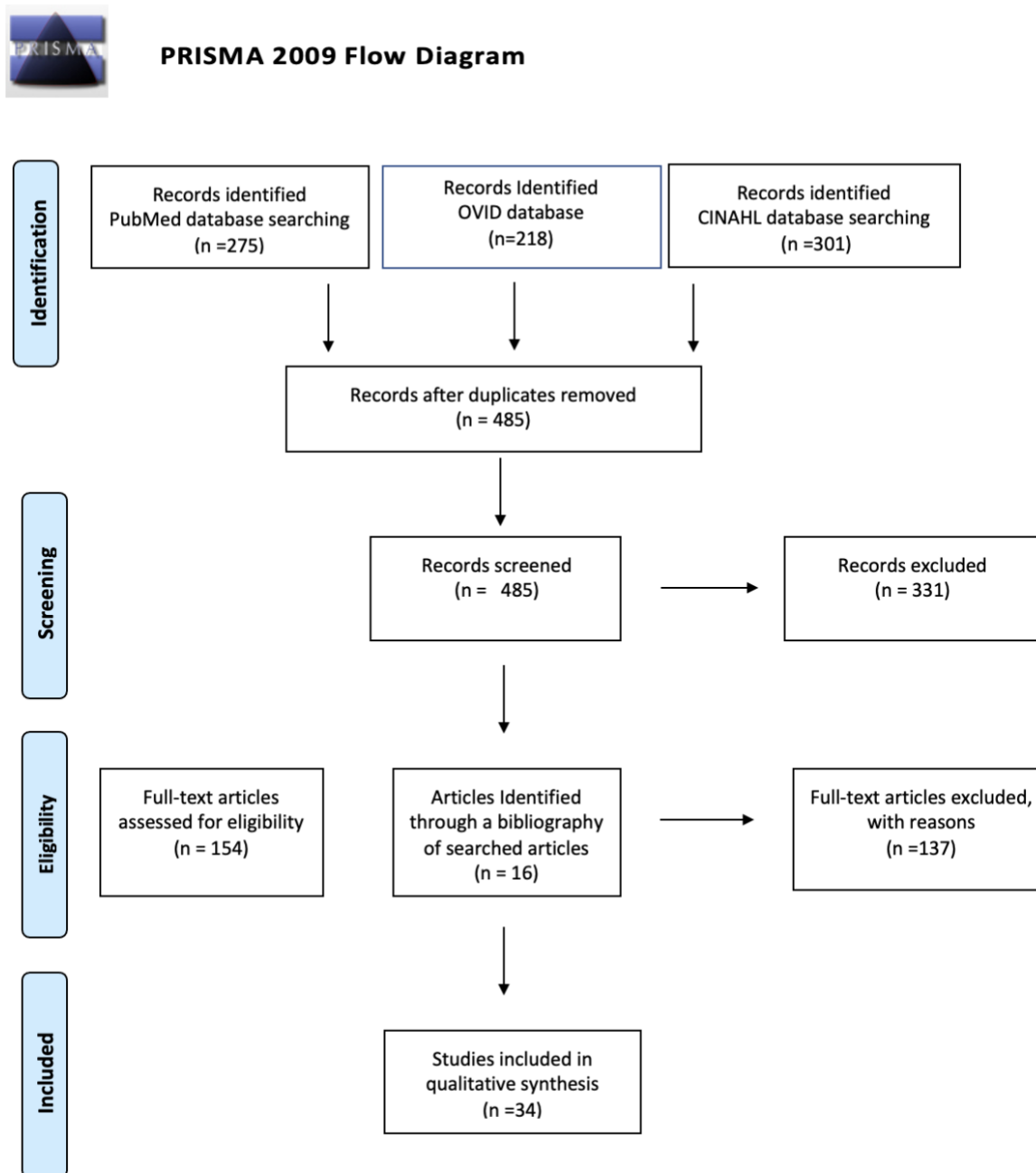
Note: Developed by (Moher et al., 2009).

Once the articles were selected for synthesis, the Johns Hopkins Evidence-Based Practice Model (Dang & Dearholt, 2018) was used to analyze the articles for strength and quality. This model uses a three-phased approach: (1) identifying the practice question, (2) gathering and evaluating evidence, and (3) translating those findings into practice changes based on the strength and quality of the evidence. The articles identified were analyzed according to the strength of the evidence with the following practice question: *How can we leverage virtual visits in a restricted environment to provide family-centered care?* Using the Johns Hopkins Evidence-Based Practice Model for Nursing and Healthcare Professionals tools *Research Evidence Appraisal Tool Appendix E* and *Non-Research Evidence Appraisal Tool Appendix F*, each article was evaluated for strength and quality. Using the model's classification system, 23 articles were labeled Level III: non-experimental studies, systematic reviews, mixed methods, and exploratory studies. These articles had an overall quality rating of A/B, defined as high/good quality. Quality is evaluated around study design, transparency, verification, and insightful interpretation. 2 articles were Level IV, which includes clinical practice guidelines or consensus panels with an overall quality of B, defined as good quality. Quality in these studies was evaluated by the evidence included, stakeholder involvement, attention to and elimination of any possible biases (Dang & Dearholt, 2018, p. 292) . Finally, 9 articles were Level V, which includes literature reviews, scoping reviews, case reports, and opinions of nationally recognized experts, with an overall quality rating of B (good quality). Quality in these studies depends on the exact type of article but generally considered the integration of literature and research, clearly defined goals, formal evaluation, and definitive conclusions (Dang & Dearholt, 2018, p. 295).

Since the inclusion criteria included a period before the COVID-19 pandemic, many of the earlier articles focused on communication between family and palliative care patients at the

end of life when there was some barrier to in-person visits (Brecher, 2013; X. Guo et al., 2019; Stelson et al., 2016). These articles included topics such as feasibility studies, implementation descriptions, identifying barriers and benefits of the interventions, and providing recommendations and toolkits. The articles published at the outset of COVID-19 focused mainly on describing the feasibility and implementation of an intervention. Several articles were intended to guide other organizations in rapidly implementing a virtual intervention in response to the crisis (Hart et al., 2020; Rios et al., 2020). Finally, more recent articles evaluated interventions and considered both benefits, barriers, and suggestions for further research. In parallel, attention was paid to the impact of visitor restrictions on patient experience as well as financial and mental health costs (Azad et al., 2021; Fenton et al., 2022). Recent articles also discussed continuing interventions in a non-pandemic setting to improve the overall family-centered care (Rose et al., 2021, 2022; Suresh et al., 2020; Wong & Merchant, 2021; Xyrichis et al., 2022).

Overall, the studies recognize that technology facilitates communication in restricted environments. Several studies found that technology fills a gap, but physical presence remains preferred (Doucette et al., 2019; Kennedy et al., 2021; Ritchey et al., 2020). In addition, several articles recommended specific criteria for implementing virtual technologies (Chen et al., 2021; Dhahri et al., 2021; Hart et al., 2020; Ritchey et al., 2020). The following section discusses the strengths, weaknesses, and proposed solutions identified by existing research.

Strengths

In a restricted environment, video visits were found to have several benefits. First, they reduced isolation and enhanced the quality of life of patients (Brecher, 2013; Ehrler et al., 2021; Q. Guo et al., 2017; Sasangohar et al., 2020). Second, video visits offered a vehicle for family

involvement, shared decision-making and being included as part of the care team (Hochendoner et al., 2022; Kuntz et al., 2020; Levido et al., 2022; Xyrichis et al., 2022). Third, video visits provided a richer connection than telephone contact alone (Pahuja & Wojcikewych, 2021). Fourth, in a restricted setting, regular video visits reduced the anxiety of family members and enabled family bonding (Brecher, 2013; Hochendoner et al., 2022; Kuntz et al., 2020; Rose et al., 2021; Türkmen & Kebapçı, 2022; Wong & Merchant, 2021). Fifth, connecting patients with families through virtual visits improved staff morale (Rose et al., 2021; Xyrichis et al., 2022). Sixth, hospital-provided devices helped reduce the "digital divide" caused by socioeconomic barriers to the technology (Cook et al., 2021; Ehrler et al., 2021). Seventh, the video visits brought the outside world into the hospital (Rose et al., 2022). Family members, patients, and clinicians described rewarding experiences such as participating in a family celebration, visiting with pets, and sharing landscape scenes (Cook et al., 2021; Rose et al., 2021, 2022; Türkmen & Kebapçı, 2022). Finally, virtual communication also enabled large family meetings across many locations in a way that in-person cannot (Kennedy et al., 2021; Rose et al., 2021).

Weaknesses

The studies also identified many challenges with virtual visit technology when family members could not be physically present. First, family members found virtual visits stressful and felt they added to their suffering (Chen et al., 2021; Dhahri et al., 2021). Second, the health literacy of family members was often a barrier to conversations (Chen et al., 2021; Hart et al., 2020; Rose et al., 2022). Medical language was hard to understand and contributed to family members' suspicion (Chen et al., 2021). Third, language interpretation, when needed, was often on a separate platform from the video visits (Hart et al., 2020; Maaskant et al., 2020). Fourth, families were often frustrated by the lack of coordination and depersonalized nature of virtual

conversations (Chen et al., 2021; Maaskant et al., 2020). The lack of coordination led to multiple healthcare providers being involved in communication, leaving families feeling like there were inconsistent stories (Chen et al., 2021). The video visits tended to focus on the physical rather than holistic updates about the patient, leaving the family unsatisfied with the interaction (Maaskant et al., 2020). Fifth, technology literacy and access were also barriers. Not all family members had a smartphone or device for video calls, and many family members also struggled to set up their devices without assistance (Bansal et al., 2021; Cook et al., 2021; Hart et al., 2020; Rose et al., 2021). Furthermore, some family members did not have reliable internet access (Hart et al., 2020). The audio was often insufficient for conversations in ICUs with a lot of background noise from the equipment (Krewulak et al., 2022; Kuntz et al., 2020; Sasangohar et al., 2020). Sixth, interventions were time intensive for nursing staff. Many organizations rapidly deployed new devices without mapping a workflow or defining roles. Consequently, the burden of device management fell primarily on busy clinicians (Ehrler et al., 2021; Maaskant et al., 2020). Finally, EOL conversations brought unique challenges. Video communication was often solely used in EOL situations, and family members wished these video calls were initiated much sooner (Chen et al., 2021). EOL virtual visits caused participating clinicians extreme stress and suffering (Dhahri et al., 2021). Many healthcare organizations did not operationalize a formal debrief after the virtual EOL conversations. The EOL virtual scenarios raised ethical and privacy issues of unconscious dying patients being viewed on-screen (Cook et al., 2021; Hart et al., 2020). In addition, family support following EOL virtual visits was often not operationalized as this relied on physical presence before COVID-19 (Jeitziner et al., 2022). Nevertheless, family members reported positive feelings about EOL visits (Dhahri et al., 2021).

Proposed Solutions

Family-centered care and communication are well-established best practices (Institute for Patient and Family-Centered Care, n.d.; Johnson & Abraham, 2012; Kaslow et al., 2020; Park et al., 2018). Therefore, criteria for video visits should use family communication best practices to form foundations and requirements (T.-J. Chou et al., 2021; Chua et al., 2020; Modic et al., 2020). The following criteria for successful adoption and implementation were identified in the literature review. First, there were strategies identified around workflow and communication. The most common success factor in the video visits was a formal structure that included timely and consistent communications to manage family and patient expectations (Chen et al., 2021; Ehrler et al., 2021; Jeitziner et al., 2022; Kennedy et al., 2021; Lopez-Soto et al., 2021; Maaskant et al., 2020). This strategy included contacting the family upon patient admission to develop a communication plan (Maaskant et al., 2020). Additional success factors included having a primary family member designated for communication and informing family members of the available methods of communication (Hart et al., 2020). Many articles recommended a standard operating procedure for video visits, including communication strategies, device maintenance, and information storage (Dhahri et al., 2021; Rios et al., 2020; Ritchey et al., 2020).

Second, detailed training for staff and psychological support is essential (Dhahri et al., 2021; Ritchey et al., 2020). Communication skills specific to video interactions should be standardized and taught (Cherniwchan, 2022; T.-J. Chou et al., 2021; Chua et al., 2020; Dhahri et al., 2021; Kennedy et al., 2021; Seccareccia et al., 2015; M. Webb et al., 2021). To help mitigate the risk of suffering and stress caused by the intervention, emotional preparation and a formal debrief for clinicians involved in EOL video visits are needed (Dhahri et al., 2021; Rios et al., 2020). In addition, to improve the effectiveness of video visits, patient and family preferences

should be considered, including rituals that may be comforting (Cook et al., 2021; Dhahri et al., 2021; Fox, 2014; Kuntz et al., 2020).

Third, minimizing the burden on direct care providers to manage video visits is essential A technology's ease of use should be evaluated and consideration given to possible additional tasks created by its implementation (Ehrler et al., 2021; H. Webb et al., 2020). Several articles emphasized the importance of using devices and applications users are already familiar with and of introducing interventions that do not increase the workload of clinicians (Ehrler et al., 2021; Sasangohar et al., 2020). Volunteers passionate about patient experience could help relieve the burden on the nursing staff (Rios et al., 2020; Suresh et al., 2020; Taffel et al., 2021; Türkmen & Kebapçı, 2022). Fourth, innovation should continue to improve this communication option. Family-centered care is even more critical during visitor restrictions, and innovation must continue to solve the barriers that restricted visitation causes (Ashana & Cox, 2021; Hart et al., 2020; Kentish-Barnes et al., 2021; Nguyen et al., 2022). Virtual visits have the potential to facilitate shared decision-making in other circumstances when family members face barriers to in-person visiting (Rose et al., 2022; Suresh et al., 2020; Wong & Merchant, 2020; Xyrichis et al., 2022). Many studies stated the importance of having this virtual visit option outside a visitor-restricted environment (Maaskant et al., 2020; Rose et al., 2022; Türkmen & Kebapçı, 2022).

As the COVID-19 pandemic evolved, many studies moved from feasibility studies to critical analysis of interventions. Several new studies have focused on the cost of visitor restrictions to patient experience, healthcare quality, and cost of care (Azad et al., 2021; Fenton et al., 2022). More research in this domain will provide additional knowledge about the costs of visitor restrictions. The impact of restrictions was not fully appreciated before the global hospital

visitor restrictions enforced during the height of the COVID-19 pandemic (Azad et al., 2021;

Fenton et al., 2022; Fox, 2014; Kentish-Barnes et al., 2021)

Methodology (Setting and Project Design)

The present quality improvement project aims to determine successful design criteria for a virtual communication intervention in the acute care setting in restricted visiting environments. Key factors were identified for a successful virtual communication tool by considering a variety of user experiences with the existing technology and workflow mapping. These methods were employed to understand how the technology was implemented and experienced and to identify ways the intervention could be ultimately improved. A broad spectrum of participants were interviewed, including healthcare workers and family members. The spectrum of interviewees ensured a holistic perspective of the intervention and workflow. Workflow mapping was also used to complement the subjective experience of the users. Finally, limited observations confirmed the workflow mapping and the user's subjective experiences.

Aim of Methods

The first goal of this project was to record and analyze the lived experiences of the employees, patients, and family members who used the current design of the virtual communication intervention at the community hospital. In addition, data were collected from the workflow mapping and analysis, semi-structured interviews, and literature review to explore this intervention's benefits, challenges, and opportunities to ultimately identify successful design criteria for a virtual communication intervention in the acute care setting.

Interviews

Project Setting Participant Recruitment

The setting of this project was the IMCU of a 140-bed community hospital in the southwestern United States. This IMCU unit is a 16-bed monitored unit that served as the non-ICU COVID-19 unit during the various hospital pandemic surges from March 2020–March

2022. The project team included the Chief Nursing Officer, the Acute Care Services Manager, the Acute Care Services Supervisor, the Patient Experience Advisor, and the Informatics Manager.

Compliance

Before any participants were interviewed, the project underwent the health system's formal Institutional Review Board (IRB) determination process. The organization designated this project a quality improvement project and not original research. In addition, before any patients were contacted, the local hospital attorney was consulted and informed of the project and plan. Finally, we agreed to do the minimum necessary patient/family interviews to protect and respect patient privacy.

Participant Identification

Participants from the hospital who used the virtual communication tool in the IMCU were identified. The following selection criteria were used to identify eligible employee participants:

1. Present and former employees of the hospital

2. Experience using the virtual intervention

3. Worked with patients, family members, or employees on the IMCU from December 2020–December 2021

The employee participants were selected from multidisciplinary roles, as each role had a slightly different perspective and use case for the intervention. Employee participants were selected from the following disciplines: provider, nursing, spiritual care, case management, informatics, patient access, and patient experience. 25 employees were invited, and 13 agreed to

be interviewed. Invitations were sent throughout the data collection process until no new themes were discovered from each subsequent interview.

To identify patient/family participants, the following selection process was used. The organization did not use any formal documentation of a patient's use of the virtual communication intervention. A secure calendar containing information about previous video calls was cross-referenced with electronic medical record admission information to identify potential patients and family members. Their records were then examined to confirm a documented virtual visit. 17 patients were identified using this method, and five family members agreed to be interviewed. In addition, two professionals from outside organizations who used similar virtual communication technology were interviewed. A total of 20 participants were interviewed who used the intervention.

Setting and Circumstances for Interview

The interview setting was selected to ensure the participant's comfort and privacy, and care was taken to provide a relaxed environment. Employees were given the choice of when and where the interview would occur. Nine of the 13 employees chose to speak in person and agreed to the interview audio recording. The remaining four interviews took place on Zoom or Microsoft Teams video conferencing; all agreed to video recording.

Patient family member interviews were conducted via phone to protect the individual's privacy and reduce COVID-19 exposure as these interviews were conducted during active COVID-19 surges. The interviews of family members were also not recorded to ensure anonymity and protection of privacy.

All interview practices followed guidelines approved by the compliance office. Semi-structured or open-ended questions were used to encourage participants to describe their

experience with the intervention, the benefits, and the challenges they encountered when using the intervention. Semi-structured interviews are frequently used in healthcare quality improvement projects because they allow flexibility and dialogue between the participant and interviewer (DeJonckheere & Vaughn, 2019; Kallio et al., 2016).

The interview script was the same for all employees, independent of their roles. The script for the family members had slight modifications. The detailed script for each of these groups is highlighted below. The following questions were given to hospital employees.

1. Could you tell me about your experience using the virtual communication tool with the patient/family member?

2. What are some of the challenges you faced using the intervention?

3. Tell me about the experience setting up the technology.

4. Describe the video scheduling process.

5. What are some of the positive benefits you experienced using the video intervention?

6. What would you like to see changed/improved?

7. Are there additional functions or features you were expecting?

The following questions were used for the patient's family interviews.

1. What is your experience with the virtual communication tool?

2. How did you find out about this communication option?

3. Could you describe any challenges you had with the technology?

4. What challenges did you face using this communication method?

5. What are some of the positive benefits you experienced using the video intervention?

6.   What would you like to see changed/improved?

The interviews were conducted from March 2022–August 2022. The interview length ranged from 25–60 minutes.

Workflow Mapping

Workflow process mapping is vital in quality improvement projects. This exercise highlights the existing process, identifies improvement opportunities, and reduces waste and redundancy. It can also illuminate processes that happen sequentially and in parallel (Antonacci et al., 2021; Nash et al., 2019; Scoville & Little, 2014). Workflow process mapping was conducted to visualize the various process steps from all the stakeholders in the virtual communication tool. Although the semi-structured interviews identified the challenges and benefits each person experienced with the communication tool, the workflow process mapping created a visual representation of the integration of the roles. The strategy for this project was to identify and map the process steps of each participant's roles and then integrate them into a single document using swim lanes for an overall view of the process. Current workflow steps were identified through the user experience, role-based tips sheets, and training videos. The results of the workflow mapping are included in the results section.

Interview Transcript Coding and Theme Development

Video and in-person interviews were audio recorded and transcribed verbatim into Microsoft Word. In cases where the discussions were not audio or video recorded, responses were typed in real-time and verified with the participant to ensure that the documented perceptions were accurate. In the transcript, each participant was identified by their role (patient, provider, case manager, et cetera) and a number to ensure confidentiality while maintaining the distinct perspective of their role. Delve Tool was used to aid in coding and theme generation

(https://delvetool.com/). This software tool assists with organizing and coding interview transcripts, including transcript storage, code organization, categorization, and theme. The actual coding itself was done manually. First, the transcripts were input into the Delve software tool, and then each transcript was coded line by line. Coding is a strategy used in qualitative methods to help label and describe the material into smaller phrases or words (Charmaz, 2017; Singh & Estefan, 2018; Urquhart, 2013). After each interview was coded, the resulting codes were examined and compared with previously generated codes. This involved re-reading the transcripts and listening to the audio as needed to understand the context. During this process, codes that reflected the same concept but slightly varied in nomenclature were combined into a single code. This thorough examination of the codes also enabled the discovery of significant themes from the various individual codes. Themes are broader concepts that connect the unique codes by recognizing patterns, similarities, and connections across principles (Bowen, 2009; Charmaz, 2017; Urquhart, 2013). This coding process continued after each subsequent interview to constantly compare the emergent codes with existing codes and themes. These themes were then connected and nested in a hierarchical organization, ultimately identifying several overarching themes. Next, the themes and subthemes were further defined and labeled.

Mapping Themes to Models

Once the final themes and subthemes were identified, refined, and recorded, the sociotechnical model (Sittig & Singh, 2010) and RCC model (*ACH - Academy of Communication in Healthcare*, n.d.; C. L. Chou & Cooley, 2018) were used as organizing principles to analyze the critical success factors for this intervention related to these models.

The Sociotechnical Model

Sittig and Singh's (2010) sociotechnical model identifies 8 interdependent dimensions to evaluate health information technology interventions, detailed in the introduction. Their model was designed to be applied in all healthcare information technology intervention lifecycle aspects, including design, planning, implementation, evaluation, and optimization. The power of Sittig and Singh's (2010) model lies in its systems approach across all the dimensions and gives a framework for analyzing the interplay between technical dimensions and human factors. This model was used as an organizing principle in analyzing and grouping themes and ultimately identifying critical success factors in the design that would correspond with these dimensions.

Art of Communication

The health system uses the Academy of Communication in Healthcare's RCC (*ACH - Academy of Communication in Healthcare*, n.d.; C. L. Chou & Cooley, 2018) as a framework for all therapeutic communication in the organization, including patient and clinician interaction as well as employee interactions. The model includes several notable features "establishing rapport, negotiating a shared agenda and responding to emotion" (C. L. Chou & Cooley, 2018, pp. 32–44). In this project, the model was used to help guide the virtual visit intervention design criteria for the therapeutic communication component. Specific challenges exist with communicating therapeutically in a virtual environment (Chua et al., 2020). In addition, the RCC model has specific elements that can be adapted and optimized to make video communication more individualized and personalized (Akgün et al., 2020; Al Harthy et al., 2021; Chua et al., 2020; Modic et al., 2020).

Results

Participant Characteristics

The interview participants had several common characteristics. All of them had experience with virtual communication intervention in the hospital from December 2020 to December 2021. Overall, 14 participants were hospital employees. The following roles were included: palliative care provider, chaplain, patient access representative, patient experience advisor, informatics manager, care manager, nursing leaders, and frontline nurses. Six (30%) of the interviewees were nurses, as they were the primary users. Five participants were family members who had used the virtual communication tool when their loved ones were admitted to the IMCU when the COVID-19 visitor restrictions were in place. Two additional participants from outside organizations who had successfully used a similar intervention were also interviewed. The interviews were conducted from March to August 2022. The data were transcribed and coded in parallel to the interviews. Table 2 provides the detailed role descriptions of the interviewees.

Table 2
Participants and Their Roles

Role	N
Frontline nurses	4
Nursing leaders	2
Palliative care MDs	2
Chaplain	1
Case manager	1
Patient experience advisor	1
Informatics manager	1
Patient Access Rep	1
Leaders from outside organizations	2
Family members	5
Total	20

Themes Generated

Benefits of Virtual Visits During COVID-19 Restrictions

An overwhelming theme obtained from every interview was the significant benefits of this intervention, specifically during the pandemic and visitor restrictions. Several subthemes emerged and are discussed below.

Subtheme 1: Comfort and Closure for Families. All the family members interviewed expressed the importance of seeing their loved ones on video when the hospitals were in lockdown. In general, COVID-19 admissions involved a longer length of stay than many other conditions. This led to prolonged periods of family separation. In this context, the ability to see family members and the faces of those caring for them added a layer of personalization and connection and reduced anxiety among the patients. The intervention gave the families a realistic image of what was occurring in the hospital and allowed the staff to provide them with explanations about the equipment in the room and the treatment plan. The families expressed feelings of comfort and confidence in the care because of this virtual connection. This was especially important when the patient's condition deteriorated rapidly.

Subtheme 2: Convenient. Virtual visits allowed communication between families and care providers, regardless of the location. This service benefited family members in several ways. It allowed those living in another city or state to connect with the patients and facilitated family meetings. It provided flexibility to families with small children and a safe way for the patients to connect with their loved ones.

COVID-19 visitor restrictions enacted on a large scale highlighted some of the already existing visiting-related challenges. One family member who lived in California and could not be

at the patient's bedside especially appreciated this option. Another ill family member was glad to have an alternative communication method to talk to his mother.

Subtheme 3: Bridged a Gap. As previously discussed, family-centered care has traditionally required the physical presence of family members (de Havenon et al., 2015; Rose et al., 2021). With visitor restrictions, this primary strategy for involving families in shared decision-making was removed. Several clinicians considered virtual intervention as bridging the gap that COVID-19 restrictions created and as the next best thing to physical presence. They were relieved there was some way to help connect families under such extreme circumstances.

Subtheme 4: Reduced Loneliness and Isolation. Nurses described increased isolation within the unit because of strict isolation and pandemic-related practices. The IMCU had a containment wall to separate patients with COVID-19. Due to the PPE shortage, nurses clustered their care; they carried out several actions simultaneously while in the room to minimize the number of trips in and out. Patients with a suspected or confirmed COVID-19 diagnosis were not allowed visitors, with few exceptions, such a patient's end of life. In a non-pandemic environment, there was a steady stream of healthcare workers in a patient's room throughout the day, including lab, dietary, and environmental care service (housekeeping) providers, chaplains, and case management workers. Because PPE is reserved for those who provide hands-on patient care, the above-mentioned ancillary service providers were no longer allowed into the rooms. All these factors meant that the patients in COVID-19 isolation spent significant time alone in their hospital rooms. The virtual visit intervention gave them not only time with their families and supported shared decision-making but also a distraction from otherwise long and lonely days.

Subtheme 5: Brought Home to the Hospital. Another benefit of video visitation was bringing the outside world to the patients. The tool helped connect families and patients and

allowed the latter to participate in family events. For example, several nurses animatedly described weddings and graduations that their patients attended virtually. It also allowed pets, children, and geographically dispersed groups to connect with their loved ones. In addition, one nurse described patients participating in Netflix watch parties with their families.

Subtheme 6: Extended the Reach of Rounding Providers. The intervention was also beneficial for provider-patient communication. Both nurses and providers stated that the intervention helped the busy, overstretched physician. Often, physicians would be making rounds in the hospital; being able to quickly join a session virtually rather than physically helped them connect with more patients in a shorter timeframe. It also helped them quickly respond to situations needing physician consultation with more details than would be possible via a phone call.

Subtheme 7: Additional Uses Discovered. Although the virtual communication tool was designed for virtual clinician rounding and family visits, several employees identified additional use cases during the pandemic. For example, the palliative care team used the technology to complete advanced directives in the hospital. It helped the hospital include the family in physical therapy education. It also facilitated patients' visualization of their home environment, demonstrations of the physical therapy exercises, and more personalized recommendations based on the said environment and allowed the family members to ask questions. Table 3 contains a summary and example quotes from the participants.

Table 3

Overarching Theme of the Benefits Broken Down by the Subthemes

Subtheme	Description	Example Quote
Comfort and closure for families	Families and care providers identified how beneficial it was for them to see their loved ones, especially at the end of life.	"Seeing family members at the end was an enormous comfort for me. I still remember his last words, which gives me enormous comfort even now, 1/5 years later" (daughter who was out of state)
Convenience	A more flexible way to visit patients when the family faced barriers	"I had COVID myself, so I was happy to have a way to see Mom" (family member)
Bridging a gap	An alternative to in-person visiting	"Met a need that I don't know what we would have done otherwise." (Provider)
Reduced fear, isolation, and loneliness	Patients with COVID-19 spent most of their time in a room alone. The intervention helped combat their loneliness.	"It allowed them to focus on something else for a while than sitting in the hospital alone, which sounds very sad when I say it out loud." (RN) "I can't even imagine how scary it would be being a patient and having no one there and your healthcare team covered from head to toe." (RN)
Bringing home to the hospital	Patients could participate in events. Pets, children, and large families could gather.	"The patient got to watch their son's graduation. It was really special." (RN)
Extended the reach of the rounding MDs	Gave providers more flexibility both with	"It was nice to be able to connect with the provider

Subtheme	Description	Example Quote
	scheduling and geography	even when they were off site" (RN)
Additional uses discovered	Advanced Directives	"We were able to do some advanced directives having a notary watch them a sign," Provider

Limitations of Virtual Visitation as Implemented

The interviews revealed several subthemes that reflected the challenges and barriers of the virtual communication tool.

Subtheme 1: Time Intensive for Nurses. All the employees expressed that the intervention was labor intensive, and much of the actual work fell on the bedside nurse. Nurses were sometimes the only employees to enter the COVID-19 isolation rooms physically. Therefore, they had to provide any help or support needed during the virtual interactions. The following section describes the factors that contributed to the increased workload of the nursing staff.

Setting up Family Members for a Call was Cumbersome. Nurses were unfamiliar with Microsoft Teams before implementing this tool and the community in general was less fluent with it than with Zoom or FaceTime. The nurses had to walk the family members through the steps of downloading and setting up Teams on the phone. This was challenging when the family member attempted to download the app while using the same device for the call, as it took significant time and led to much frustration on both sides. Nurses sometimes resorted to using their own devices for time-critical end-of-life communication.

Families Could Not Call Independently. The application design required a scheduled appointment before the virtual connection that could be done only through the hospital. The virtual visits also required the nurse to connect the call at the designated time. To request an appointment, families had to call the hospital. There were no dedicated staff members to make appointments, so the families called the nurse's station. The families were entirely dependent on the hospital staff to schedule and initiate calls. Overall, the nurses' perception was that the video calls did not reduce the number of regular phone calls to the nurses' station.

Patients Could Not Manage Calls Independently. Even when the nurses successfully set up the connection, it often was not feasible for the patient to manage the call alone for the following reasons. First, their conditions often made it difficult to hold the device stationary. Without a stand, the nurses often found themselves holding the iPad. Second, although the iPads had a durable case with a kickstand designed for tabletop use, the over-the-bed table did not have enough room. Third, the iPad speaker and microphone were inadequate to be heard above the ambient din of the equipment in the room. This required the nurses to repeat every sentence for the patient and the other person on the call. Finally, the nurses also felt that it was more compassionate to be present with the patients during end-of-life discussions.

Nurses Were Often the Tech Support. Family members and ancillary providers leaned on nurses for tech support during the setup and initiation of calls.

Subtheme 2: Device Challenges. The organization deployed iPads enabled with Microsoft Teams as the sole device to be used for virtual visits during the pandemic. Although the devices were easily portable and had a user interface that many people were familiar with, they had several shortcomings.

The Audio and Speaker Were Not Sufficient for the Situation. In many of the IMCU rooms, the patients received oxygen support and had special mattresses to prevent pressure injury, resulting in significant ambient noise. In addition, many patients had age-related hearing deficits. Thus, the patients and family members faced difficulty hearing each other even at maximum volume. To compensate, as mentioned above, the nurses repeated the conversation to both parties. They also had to maneuver the iPad so the patient could speak into the microphone, which resulted in the camera being pointed at the ceiling and losing a primary advantage of video calls: the ability to see each other.

The iPad Was Difficult to Position. Another challenge the nurses and others mentioned was positioning the iPad. The devices had a heavy-duty case equipped with a kickstand for a flat surface. However, the nurses found that this was not sufficient for positioning. The over-the-bed table was often used for other items, including a call bell, tissues, food, water, and other personal items. Therefore, the nurses had to hold the device most of the time. Furthermore, the interviewees who were on the other end of the call found that the camera was often not pointed at the patient.

The Devices Were Small and Portable. Although the organization had designated an iPad for every room in IMCU, they were often unavailable. They were not attached or secured in any way, so they could be moved. The hospital also had no standard device storage space, so nurses described wasting time searching for an available device.

The Devices Were Often Not Charged. Although the workflow design was to keep the iPads in the patient's room along with the charging cord, this seldom happened. Instead, the devices often were taken out of the room without the cords. The charging cables were often mistaken as belonging to the patients' or employees' personal devices and would frequently disappear.

Subtheme 3: Application Usability. Both family members and employees mentioned challenges with the application setup and workflow. Many employees were yet to use Teams routinely in their standard day-to-day work. Therefore, although the management was familiar with the application, most frontline staff were not. Each virtual visit session required the entry of "visitor" emails. This often led to data entry errors and rework. The calls took multiple devices, that is, the device in the patients' room and a separate device to set up the session. As mentioned earlier, the patients and family members could not connect independently without an

appointment and an employee to help. Several nurses expressed the difficulty in setting up the application and the trouble even when everything was set up correctly; they often struggled alone in the room, trying to reach the families for end-of-life calls. This frustration and desperation led several to use their own devices to ensure that the families could say goodbye to their loved ones.

Subtheme 3: Technical issues. Virtual communication relies on technology. Several participants noted that technical issues such as connectivity problems, audio or video lag, or equipment malfunctions occasionally disrupted interactions.

Subtheme 4: Emotional Toll. Several nurses and family members described the emotional toll on the nursing staff, which took several forms. First, the nurses were exposed to the high mortality and end-of-life conversations. In a non-restricted environment, family members and their loved ones typically are left alone for personal, intimate conversations, especially during end of life (Collini et al., 2021). However, this changed with the visitor restrictions. The nurses found themselves present during these conversations several times a day. Since the patients could not easily use the device on their own, the nurses did not want to leave the patient alone in the room to have these conversations. The hospital did not anticipate the additional moral stress on nurses when using the tool. The following quotes illustrate the findings.

"Witnessing so much death, separation, and goodbyes changes you." (RN)

"The experience being there with the patients at the time of death when their loved ones could not take a toll." (RN)

"The content of conversations took an emotional toll on nurses facilitating call." (Family Member)

"These are usually private conversations; for those nurses to proctor those

multiple times a day has to take a toll." (Family member)

"The increased death was traumatic for nurses." (Chaplain)

Second, several nurses regretted not using the tool more frequently. They understood how vital it was to involve families and said they should have used it more for more patients. However, several participants felt that since the intervention was associated with COVID-19, they were reluctant to use the iPads again.

Subtheme 5: Training and Implementation. All the employees spoke of training challenges. The frontline nurses' and the community's lack of familiarity with Microsoft Teams made the training needs complex. Most respondents noted the need for standardized training. Many frontline nurses expressed that the training was inadequate and desired ongoing training to improve utilization and sustainment. Because the providers had used something similar in an outpatient setting, they often acted as super users for nurses, which they felt was not a good utilization of their time. Some users only recalled receiving only a tip sheet, whereas others remembered being trained by another user.

The trainers felt it was a monumental task because of the sheer number of users. They also mentioned a lack of feedback on the training. In addition, the trainers appeared to imply that the training needed to be organized and coordinated better. The implementation itself was also described as chaotic, rapid, and poor. During this period, the organization had additional implementations: replacing the fleet of SMART IV pumps with a different vendor and introducing a new digital coach application for patients. This made it difficult for the nurses to gain proficiency in all the technologies implemented simultaneously in the three weeks in November 2020.

Subtheme 6: Privacy and Security Concerns. Healthcare information sharing is subject to guidelines and regulations to protect medical information (Office for Civil Rights, 2008). Many employees understood that Microsoft Teams was chosen over Zoom or FaceTime due to security issues. No clinicians expressed security concerns surrounding the software. Instead, they were worried about physical device security, using emails to connect, and patient consent when they could not communicate.

Several clinicians worried about the physical device security since the iPads were portable and not attached to stands. Consequently, they often would take the devices out of the rooms. However, the workflow was designed to keep one iPad in each room, with a unique ID for Teams associated with that room. Removing the iPads from the rooms had several unintended consequences. The devices were challenging to locate when needed as there was no standard storage location. When found, the iPads were not always charged, and the charging cords disappeared often. Using the iPads in different rooms than the one assigned added more work for the nurses who had to ensure that the providers and family were connected to the correct session.

The participants also expressed security concerns about using a family member's email to send the appointment link. Unauthorized visitors could join the session if the receiver's email address was not secure or compromised. However, there were no such documented events. Moreover, the use of emails was seen as cumbersome compared to using a cell phone number by the person scheduling the appointment and the family member attempting to access the link. This is discussed in more detail under workflow.

The primary concern around privacy on such calls was when the patients could not communicate their wishes. While the clinicians were comfortable with in-person visits of family and friends in such situations, there was a feeling and perception of additional intrusion that the

video call caused. However, the clinicians were sensitive to the comfort of and closure for families and felt torn about connecting a patient who had not expressly consented to the call.

Subtheme 7: External Environment. The intervention was implemented during extraordinary times due to the global pandemic that separated families from their hospitalized loved ones. These circumstances profoundly impacted the regular clinical workflow and, in turn, how the intervention was adopted. Several nurses mentioned how the pandemic changed how they cared for their patients. Due to a scarcity of PPE and concerns over virus exposure, they minimized both the trips to (by clustering care) and the time spent in the rooms. They also learned to care for a new disease with constantly changing information. Consequently, there were also overwhelmed. In this context, the addition of a new, time-intensive technology was sometimes more than they could manage. Moreover, they faced an increase in end-of-life conversations and deaths corresponding.

Another change surrounded communication and isolation. Nurses were isolated in the rooms most of the day without access to their colleagues. Nurses could enter a room together before the pandemic, especially if they were uncertain about a procedure or process. With COVID-19, they were often isolated, and this impacted the technology adoption in several ways. The nurses were not as comfortable trying the intervention without extra support in the room if they faced difficulties. The traditional form of staff communication changed with limits imposed on personal meetings to reduce exposure. This eliminated a strategy used by leaders to help disseminate new information and quickly get a pulse on what was happening.

Table 4

Overarching Theme of Limitations Divided into Subthemes

Subtheme	Description	Example Quote
Time intensive	Had to stay in room with the patient Family needed assistance	"…one patient who you're helping facilitate the call with, but you have three other patients that you essentially have to put some of their care on hold. Because if the call doesn't go well or the patient doesn't know how to work it, you must stay in there the whole time." (RN)
Device challenges	Devices not in the room/charged Audio insufficient	"You as the nurse, you're trying to help facilitate that conversation, and so sometimes you're, you know, repeating, what the family member is saying." (RN)
Technical issues	Inconsistent connection	"There were so many variables related to a successful connection. We often resorted to our own devices." (RN)
Emotional toll	Nature of conversations and their volume caused nurses distress	"These are usually private conversations- for those nurses to proctor those multiple times a day, that's got to take a toll." (Family member)
Training and implementation	Training not standardized Training not adequate	"I don't think we understood this platform to be able to use excessively or even educate families on how to use it successfully." (RN)

Subtheme	Description	Example Quote
Privacy and security	Device security Privacy concerns around incapacitated patients	"I worried the patient might not want to be on video. I also wanted the family to be able to say goodbye." (RN)
External environment	The pandemic resulted in visitor restrictions and changed the workflow for nurses	"COVID changed how we cared for our patients, we were isolated and didn't have the ability to have your teammates help, and you're trying to get this family on and you can't." (RN)

Workflow Process Mapping

Workflow process maps were created using interview data, training materials, and observations. Figures 1-4 illustrate the role-based workflow process mapping of nurses, family members, and providers. The following section will highlight some of the pain points of each role.

Nursing Workflow Challenges

1. Finding a charged device. Devices were often not in the respective rooms or not charged. Charging cords were also difficult to find.

2. COVID-19 changes to care delivery workflow. Nurses were more isolated in the rooms, so it was challenging to get help from colleagues.

3. Dual devices. The design required both the iPad and another device to connect the call.

4. Assisting family with Microsoft Teams. Nurses were often the sole tech support for family members.

5. Staying in the room the entire time. The intervention took much of the nurse's time and required them to stay there throughout.

Figure 2

Nursing Workflow
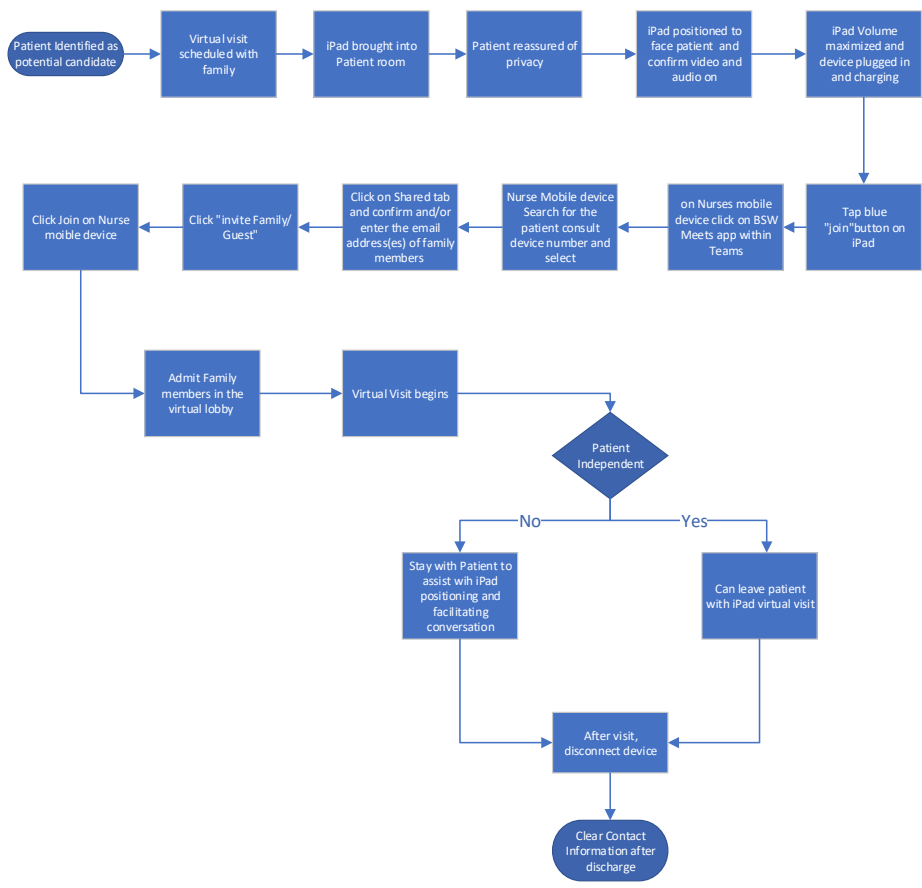
Figure 3

Nursing Workflow Part 1
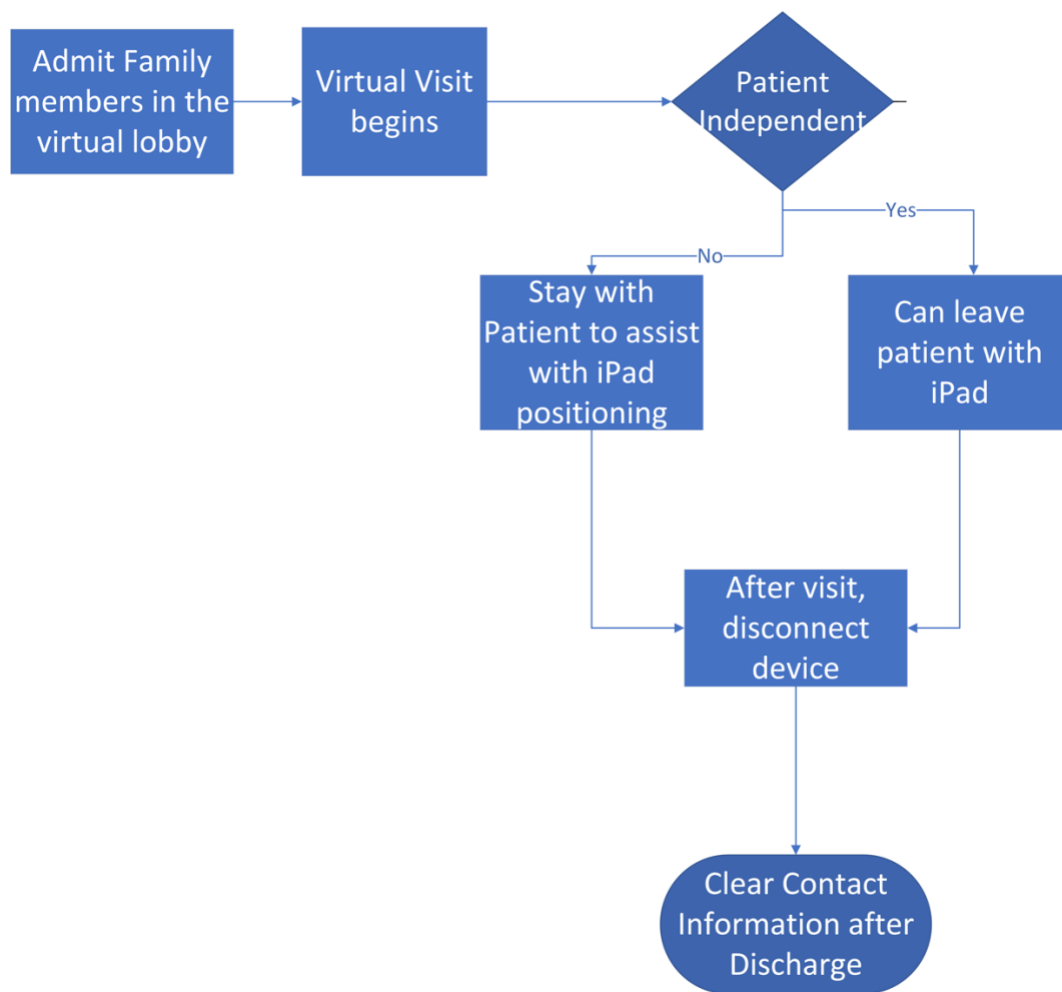
Figure 4

Nursing Workflow Part 2
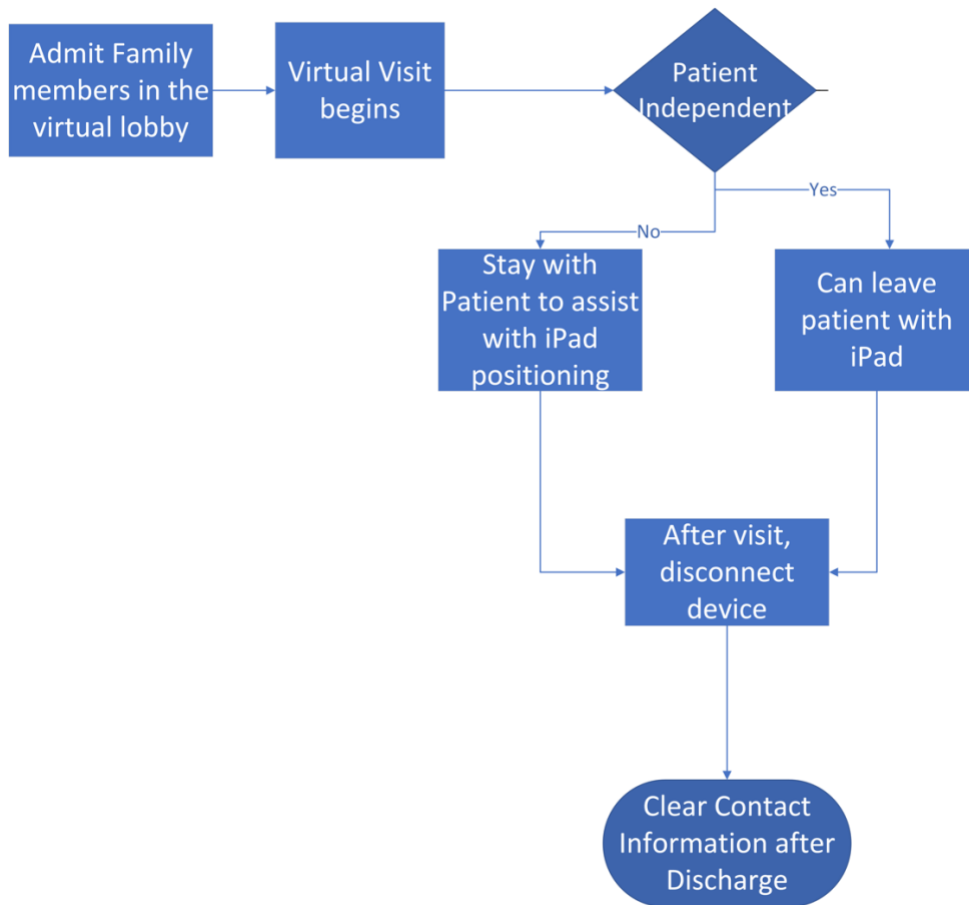
Family Workflow Challenges

1. Lack of communication about virtual visiting. Family members often did not
   know about this option to communicate with patients until the clinical team
   contacted them.

2. Low fluency with Microsoft Teams. Installing and learning how to use the
   application took significant time and were frustrating to the family members and
   those helping them.

Figure 5

Family Workflow
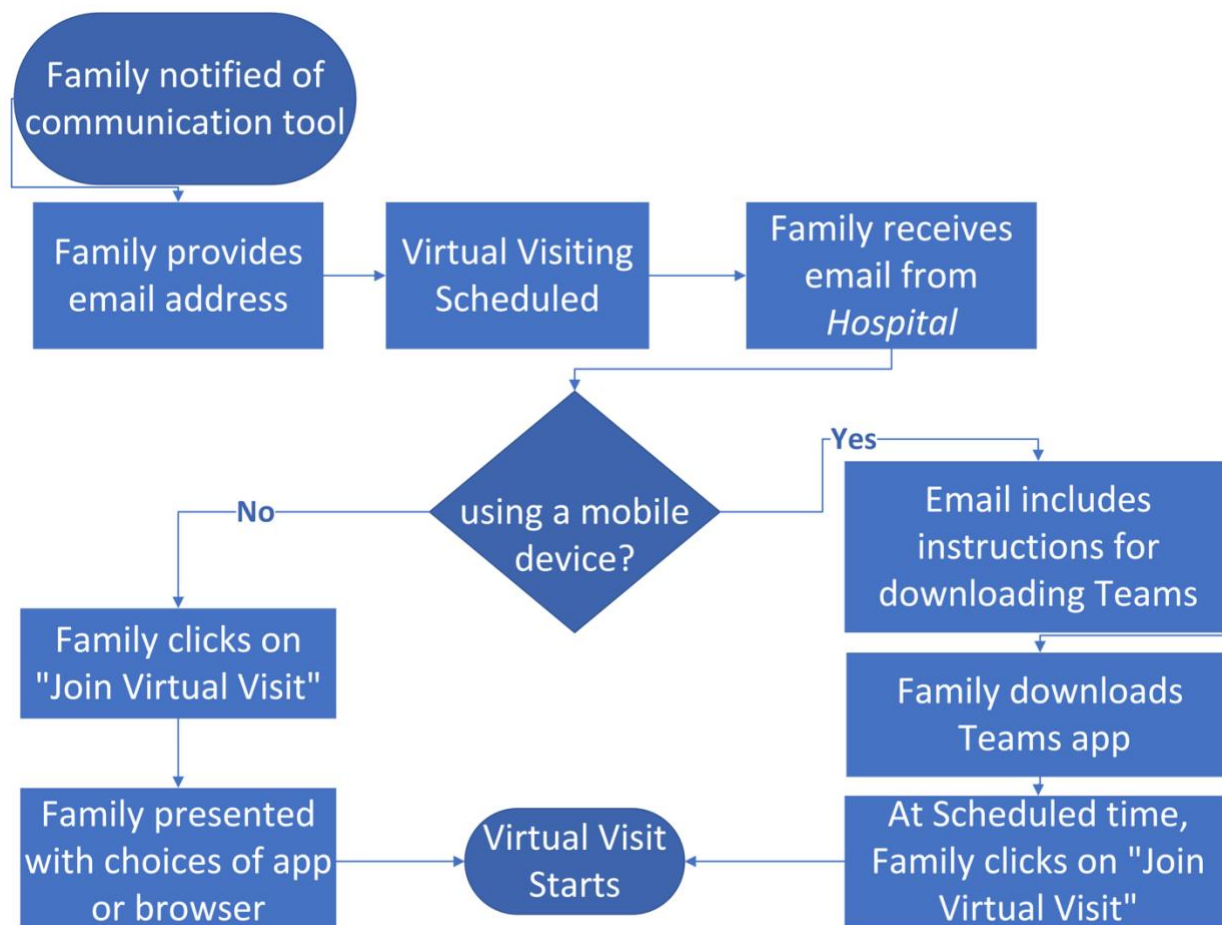
Provider Workflow Challenges

Device ID. If the device was removed from the assigned room, the physicians would have to stop what they were doing to obtain the correct device ID.

Figure 6

Provider Workflow

.
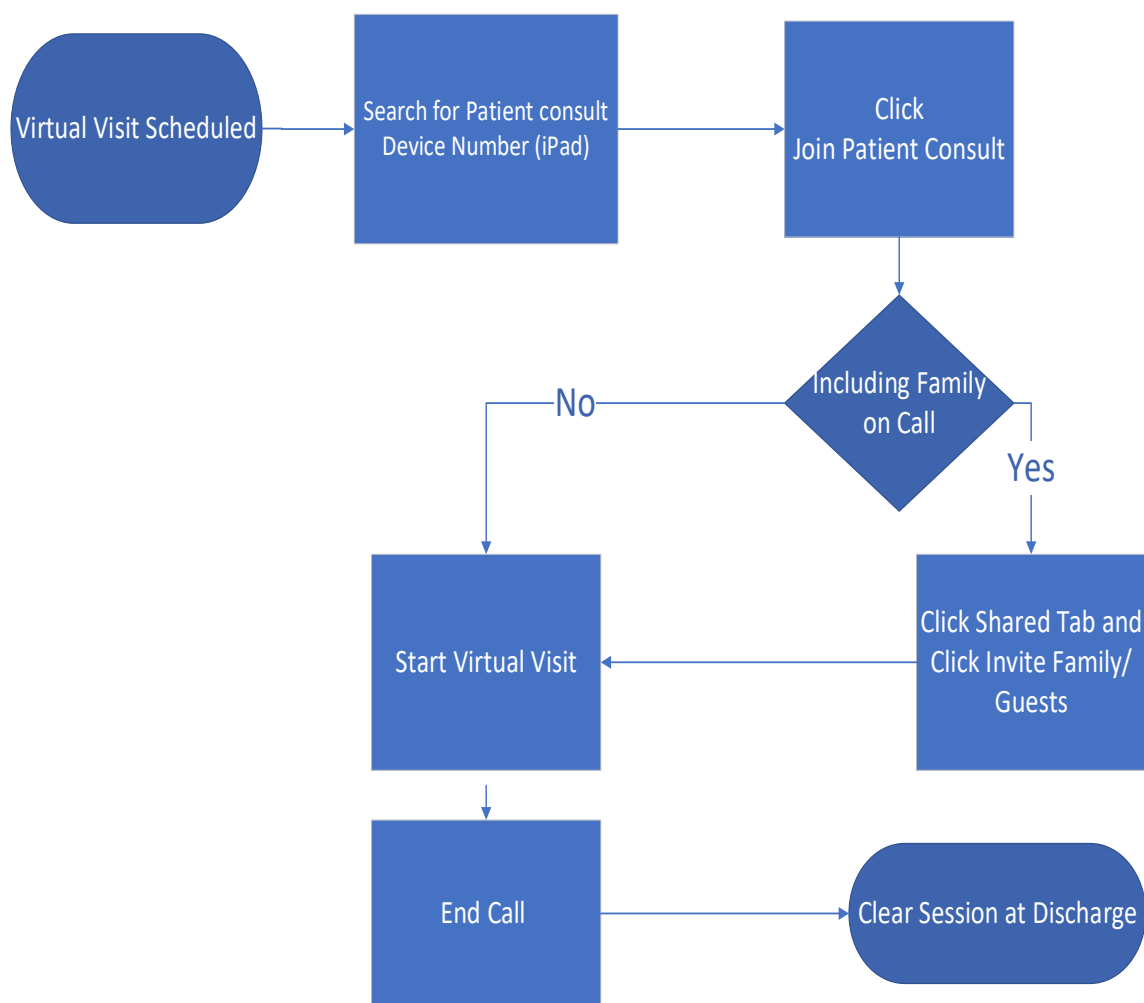
Mapping Generated Themes to Models

Two models were used to map the results into actionable recommendations for areas of improvement: Sittig and Singh's (2010) sociotechnical model and the Academy of Communication in Healthcare Relationship-Centered Care (*ACH - Academy of Communication in Healthcare*, n.d.)

Sociotechnical Model

This next section outlines the results obtained using the sociotechnical model's eight dimensions. The insights obtained from the implementation were categorized under each dimension, sometimes in more than one dimension. The mapping helped illuminate the possible design improvements. Table 5 provides a visual representation of the mapping.

Hardware/Software. Several recommendations related to the hardware address the concerns of device availability, positioning, screen size, and audio quality. Devices must be readily available, easy to position, and have sufficient speakers and microphones to accommodate the ambient noise in a patient's room. If the organization stayed with the same version of iPads, these improvements could be accomplished by adding a device stands on wheels and an external speaker. Alternatively, a tablet with a more robust speaker can also be used. The stands for the iPads would help locate the devices more efficiently and with positioning during calls, allowing patients and nurses to be hands-free. Several participants mentioned the television because it was always in the room, positioned well, used pillow speakers, and had a large screen size. They wished for the flexibility of casting the calls on to the larger screen.

Clinical Content. Improvements related to adding additional features fall under this category. All the participants mentioned improvements related to multifunctionality to help

combat loneliness while in the hospital. At the time of this project, the device had a single-use design. The recommendations are as follows:

1. Access to electronic medical records (EMR). This could improve patient engagement and provide them with a supportive environment to adopt the patient portal before discharge.

2. Asynchronous messaging capabilities. The device can include capabilities for families to send messages or music playlists.

3. Spanish language programming and infotainment. Both the families and the nurses expressed the desire for additional programming on the device to provide entertainment and education. This included Spanish language programming and more tailored education before patient discharge.

Human-Computer Interface. The iPads were described as easy to use, but the Teams application was more challenging for the clinical staff and the family members. Many participants mentioned, "It should be just like FaceTime." Additional questions revealed the desire for simplicity. Specific application recommendations are as follows:

1. No application download required

2. Cell phone numbers or emails used for invitations

3. A simple button to connect and disconnect

4. The ability for patients and families to connect independently

5. Integration with a translation service, so another device is not required

6. Choosing a software or solution with which users have baseline fluency

7. A scheduling feature that allows families to schedule appointments

People. Two barrier subthemes were mapped to this dimension: training and emotional toll. Although there were various forms of training, including the elbow support, tip sheets, and small training sessions, the clinicians did not feel like they received adequate training. The challenges of the external environment also made the traditional training methods less effective. Furthermore, it was assumed that everyone was fluent with Microsoft Teams, so the amount of training was underestimated. Finally, there was no measurement or monitoring of the intervention's use or adoption in any meaningful way to recognize early on that the tablets were underutilized. The recommendations are as follows:

1. Assess the external and internal environment pressures and use these assessments to adapt the training.

2. Use system measuring and monitoring early in the implementation to obtain a better picture of the adoption and identify and remove barriers quickly. Rounding on employees also will provide valuable information on workflow and technical barriers.

3. Plan for human resource demand. New healthcare information technology often has unintended consequences, including the potential to add additional tasks/or roles (Coiera et al., 2016). In this virtual communication intervention, many new tasks fell to the already overwhelmed nursing staff, which led to its underutilization and promotion to families who could have benefited from it. Process improvement activities can remove workflow challenges and waste, while assessing and planning human resource requirements can help with sustainability. Several hospitals have had a more structured and successful approach with

volunteers and students after recognizing the required resources (Lee et al., 2022;

Taffel et al., 2021).

Workflow and Communication. Several workflow challenges emerged from both interviews and workflow mapping. Although the staff were trained on how to use the software, there was a lack of standardized operating procedures, contributing to wasted time and frustration. The recommendations are as follows:

1. Designate a standard storage/charging space for the iPads when not in patient rooms.

2. Communicate with patients and families about the option during the admission process with a handout in the admission packet and verbally explain the procedure of use. Use existing touch points with patients, such as bedside shift reports, to ask if the patient has any questions about this option.

Internal Organization Policy, Procedures, and Culture. Factors related to the internal organization included multiple implementations, security, visitor restrictions, privacy, and non-standard training.

External Rules, Regulations, and Pressures. The response to the pandemic caused several rapid changes in the hospital, such as drastic visitor restrictions as well as revised RN workflows and care delivery, which included clustered care, isolation in the unit, and rapidly learning how to care for a new disease. For any new technology implementation, considering these external pressures and how they impact the internal organization, assumptions of the implementation environment are important for its adoption and the technology to be valuable and relevant.

System Measurement and Monitoring. There was no regular measuring or monitoring of the utilization or performance of the intervention. The recommendations are as follows:

1. Measure system utilization and performance.

2. Regularly report these metrics to unit leaders, executive sponsors, and patient experience, quality.

3. Round on the staff frequently during initial implementation and on schedule.

4. Respond to low utilization to remove any barriers.

5. Round on patients to validate the use

Table 5

Insights and Design Considerations Mapped to the Sociotechnical Model Dimensions

Dimension	Insights from Implementation	Design Considerations
Hardware/software/ computing infrastructure	Device was hard to locate Device not charged Device was hard to hold Speaker and mic were not adequate Digital divide	Readily available devices Speaker and microphone for hearing impaired/with a large amount of ambient noise. Larger screen Hands-free devices Flexible positioning (stand)
Clinical content	Families desired more functionality	Infotainment Spanish language programming EMR access

Dimension	Insights from Implementation	Design Considerations
Human-computer interface	Lack of application fluency	Application fluency
	Multiple devices needed	Minimize steps
	Emails difficult to enter	Scheduling functionality
	Required app download	Patient/family can initiate independently
People	Emotional toll	Brief and debrief
	Training	Prioritize as standard intervention
	Digital literacy	
Workflow and communication	Scheduling challenges	Standard operating procedure
	Families unaware of the intervention	Communication Standard work
	Teams' workflow multistep	Communication about intervention
		On-demand feature
Internal organization policy, procedures, and culture	Multiple implementations	Coordination of project timelines
	Security-focused	
	Visitor restrictions	Understanding that visitor restrictions will continue to exist
	Privacy	
	Non-standard training	

Dimension	Insights from Implementation	Design Considerations
		Considerations around video privacy
		Standardized training /assessment of knowledge
External rules, regulations, and pressures	COVID-19 changed RN workflows	Adapt training and implementation to external environmental changes
	Visitor restrictions	
	Isolation requirement	
System measurement and monitoring	No meaningful measuring of usage	Integration with EMR
	No satisfaction survey	Integrated survey
	Devices not updated	

Relationship-centered Care Model

Relationship-centered Care, or RCC, is a model developed by the Academy of Communication in Healthcare, which created evidence-based relationship-centered communication in healthcare. The health system adopted this model for therapeutic communication. This model recommended specific communication tactics for the virtual intervention that would align with the health systems' expectations and standards surrounding communication. The following sections will discuss the recommendations based on the model's application. (C. L. Chou & Cooley, 2018; T.-J. Chou et al., 2021; Chua et al., 2020; Rose et al., 2021)

Prepare the Family and Patient Before the Visit. This step involves ensuring the family knows what they will notice in the room, such as monitoring equipment, sounds, and the patient's general condition. This will help reduce their stress of seeing their hospitalized loved ones. The step also involves preparing the patient, who may be distressed about seeing themselves for the first time on the video call. Many patients will not have looked in a mirror for a long time, so seeing themselves can be shocking. A strategy that helps lessen the shock is to provide a mirror ahead of time (Rose et al., 2022).

Communicate the Participants and Their Roles. This step involves introducing everyone and their roles before building rapport. In a video call, not all the participants will be seen in camera view. Pausing to introduce everyone in the room and explaining their role helps increase the trust and transparency between the clinicians and the family (Rose et al., 2021, 2022).

Acknowledge the Setting and Orient the Family on the Benefits of a Virtual Call. This step acknowledges the difference between physical presence and in-person videos and

removes any barriers if possible. Perform a sound check, ensure everyone's technology works appropriately, and outline any steps if the call is disconnected. Orient the family on the benefits of virtual visiting, noting some of the positive aspects, such as including multiple family members separated by geography, and how it allows more flexibility in terms of time (Rose et al., 2021, 2022).

Respond to Emotions. Mosskant et al. (2020) found that clinicians in video interactions focused heavily on the physical condition, leading to depersonalized interactions. Emotional cues are sometimes hard to interpret on video, and gestures help clarify the communication. Silence is also an effective tool in therapeutic communication and can demonstrate compassion and respect (Kemerer, 2016). However, silence can be misinterpreted as communication challenges in a virtual environment. Using a simple script in virtual communication to convey that the silence is intended can give the participants space to emote. For example, providers/nurses can say, "Take your time; I am here."

Concluding the Visit and Closure. The absence of call closure at the end of calls was found to be awkward at best and emotionally stressful at worst. Setting expectations about the call duration and giving family members more control over ending the call will help improve their satisfaction and reduce distress (Rose et al., 2022).

Table 6

Academy of Communication in Healthcare: Quick Tips to Connect

Tip	Think	Do
Be present	Do I know who I'm meeting?	Explain role. Speak about the current situation.
Reduce communication barriers	What is reducing my non-verbal communication?	Address any communication barrier (mask, turning your back).
Identify patients' needs	What do they expect? What assumptions am I making?	Ask open ended questions. Ask for the entire list.
Listen without interruption	What are they saying? What are they feeling?	Listen for content and emotion. Resist interrupting.
Respond first with empathy	Respond to what they said before telling	Validate the emotions.
Share information	How can I be clear and concise?	Provide information in small chunks.

Note. This content is adapted from The Academy of Communication in Healthcare: COVID-19: quick video tips to connect. http://www.achonline.org/Telehealth

Discussion

This paper presents a quality improvement project to support family-centered communication in acute care settings when family members are not physically present in the hospital. Currently, there are no strategies supporting patient- and family-centered care in such cases, which is a significant problem. Therefore, this project aimed to analyze the virtual visit intervention and propose improvements for sustainable, standardized virtual communication in restricted environments. The visitor restrictions implemented in response to the COVID-19 pandemic provided an ideal opportunity to investigate various aspects of this topic. For the project purposes, interviews with healthcare professionals and families of hospitalized patients, workflow analysis, and a literature review were used. The project identified several benefits of the tool, including providing comfort and closure to families, bridging communication gaps, reducing patients' loneliness, bringing patients home to the hospital, and extending the reach of providers.

Benefits of Virtual Communication

The project identified several benefits of the virtual communication intervention. First, it bridged any communication gaps and provided comfort and closure to families. This finding is supported by several studies. For example, Bansal et al. (2021) found that family members cherished virtual communication options and Rose et al. (2021) found that video communication greatly relieved family members' distress caused by the separation. Second, the tool reduced loneliness among patients. This is supported by Ehler et al. (2021), who performed iterative versions of their video communication interventions. In a follow-up survey, 87% of the patients surveyed strongly agreed that access to virtual communication helped reduce their loneliness (Ehrler et al., 2021).

Third, the communication benefited families and patients by bringing their home into the hospital. Brecher et al. (2016) found similar results in their study where they described case studies in which virtual tools were used for patient and family communication. Brecher concluded that the virtual interventions helped bring home to the hospital, strengthened relationships with family members, and reduced the emotional burden created by separation created. Importantly, this study also showed that the patients were grateful for being given the opportunity to virtually participate in significant family events and communicate with distant relatives.

Finally, the project found that virtual communication extended the reach of healthcare providers. This finding is consistent with that of Webb et al. (2021), who found that patient access increased, and the providers improved their productivity because time used to don and doff PPE was saved.

Challenges of Virtual Communication

The project also revealed several challenges associated with virtual communication interventions: technical issues, emotional toll on the nurses, time required for the nurses to use the tool successfully, lack of relevant training for all users, challenges associated with the rapid implementation, privacy and security concerns, and changes related to the external environment.

Technical issues related to virtual healthcare visits are a recurrent theme in the peer-reviewed literature. For example, Bansal et al. (2022) and Sansagohar et al. (2021) revealed that virtual interventions in healthcare have been associated with common complaints about audio and video quality by patients and their families.

Regarding the negative impact on healthcare providers, Dhahri et al. (2021) found that nurses placing end-of-life video calls were at a greater risk of mental distress than the attending

family members. Similarly, Webb et al. (2020) found that healthcare staff was consistently distressed by the virtual interventions, as they felt they could not sufficiently comfort the family members after the call. Moreover, repeated exposure to intimate and difficult conversations places clinicians at risk of moral injury (H. Webb et al., 2020).

Using the sociotechnical and relationship-centered care models, this project outlined several design considerations to ensure more sustainable use of virtual technology for communication in acute care. These include device considerations, improved workflow, standard operating procedures, and specific communication techniques to optimize therapeutic virtual communication. In advising any organization embarking on a similar project, special attention must be paid to the impact on the people using the technology. The present project revealed the unintended consequences of the excessive staff time needed and the emotional toll on nursing in EOL conversations. These were unexpected and must be considered when assessing and creating a mitigation plan.

Implications and Recommendations

Future research on the consequences of COVID-19 visitor restrictions and the implementation of virtual interventions to address such limitations can obtain a better picture of the actual costs and benefits. This project's analysis of benefits and concerns has implications for better structuring interactions between providers and patients in various healthcare settings, including those outside the COVID-19 context. First, the findings support the idea that communication is critical for health outcomes, and virtual technology provides an essential avenue for such communication. Second, although the scale of restrictions resulting from the pandemic was unprecedented, visitor restrictions have always existed, even when hospitals have a lenient visiting policy. Virtual tools can be useful in such cases. These restrictions were in the

form of barriers on the family side, such as geographically dispersed family members, families with small children who cannot visit, those who are themselves ill, lack of time, strict work schedules, and lack of coordination among family members. These factors have made it difficult for families to visit their hospitalized loved ones and be part of the care conversations.

Despite the significant insights gained from this work, further research is required to understand the best way to implement virtual communication interventions in a healthcare setting. For example, future studies can determine strategies that can mitigate the negative impact on healthcare providers. Notably, this project suggests that virtual communication interventions are not a panacea, and care must be taken to ensure that they are implemented considering all parties' benefits and concerns.

Limitations

The project had several limitations, many of which were related to the setting and selection of participants. First, the project was conducted at one unit in a community hospital. However, the challenges and solutions may vary in larger hospitals due to the access to technology resources and specialized roles of staff. The recommendations were made accordingly so that the solutions are flexible enough accounting for this variation. The second limitation was the small number of participants. Although the participants represented many healthcare roles, the sample size prevent these findings from being generalized to the larger population. Third, the project only included those who used the technology, and the perspective of those who did not use the technology (either family or healthcare workers) was not captured. This perspective could help hospitals identify further challenges before starting any performance improvement activities. Fourth, the family members interviewed all spoke only English. Translation services add further complexity to the virtual communication environment because it requires another device. Considering this perspective may help ensure that the communication tool supports all families. Finally, because the intervention was used primarily for end-of-life conversations, no patients could be interviewed to obtain their perspectives.

Other limitations are related to the project structure and process. First, the interviews were conducted up to nine months after the participants used the intervention, so there is a potential for recall bias. Second, the interviews of family members were done by phone call only to protect their privacy and limit their exposure to COVID-19. Although the family members shared personal stories, it is possible that in-person interviews would have achieved even greater transparency. Third, the author completed the coding and categorization of each interview independently. Fourth, since the intervention was used only for patients with COVID-19 and

often in end-of-life situations, it failed to capture some of the benefits of everyday use by hospitalized patients and their families. This communication intervention was used in very specific circumstances for end-of-life communication which is more highly emotionally charged than a regular visit communication. Finally, the organization had limited or no data on the intervention usage. This made participant identification and measuring of use and adoption difficult.

Conclusions

This quality improvement project used literature reviews, semi-structured interviews, and workflow analyses to examine the use of virtual technology for family communication during COVID-19-related visitor restrictions. To better understand the advantages and disadvantages of virtual communication in healthcare settings, this project implemented a sociotechnical model, which enabled structured analysis and evaluation of the design, optimization, and evaluation of technologies and strategies that supported these virtual interactions. Overall, the model showed that participants expressed gratitude for this type of intervention. It also highlighted the importance of easy-to-use, readily available technology that did not create additional work for healthcare providers, especially nurses. Notably, the model revealed concerns about the apparent lack of standard operating procedures for implementing this communication framework and that participants experienced discomfort and frustration in their absence.

Although the project focused on implementing virtual communication in the context of the COVID-19 pandemic, virtual communication strategies can likely support family-centered care goals outside of the pandemic context. For example, cases where socioeconomic or health concerns of family members prevent their visits to patients may significantly benefit from opportunities for these family members to communicate with patients using virtual tools. Similarly, virtual communication will allow provider interactions with family members in these types of situations. Therefore, this project may have broad implications beyond the COVID-19 pandemic context.

More research is needed to explore the benefits of a standardized virtual communication platform to support family-centered care and communication goals. During the COVID-19 pandemic, hospitals were able to pivot quickly to implement the use of virtual tools. However, such use was not sustained at the community hospital where this project was implemented. Hence, the full benefits of virtual communication outside of the COVID-19 context have not yet been realized there. Additional research into the costs of visitor restrictions will provide a

starting point for justifying the continued implementation of virtual visitation to complement its in-person counterpart. Embracing family-centeredness and offering flexibility to families that experience circumstances that make physical presence difficult can potentially improve the quality, safety, and experiences of providers and patients and reduce healthcare costs.

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Appendix A: Glossary of Terms

DIGITAL DIVIDE The recognition that the use of technology could further increase existing

gaps in care because of access to technology (rural areas) or because of

socioeconomic barriers.

EOL End of life, death is imminent.

FAMILY CENTERED CARE A philosophy of healthcare delivery that considers families

and patients as part of the care team

PICO A framework used in evidence-based projects to identify a population, problem,

relevant intervention and clearly defined outcome**.**

PPE Person protective equipment. Used in the healthcare industry to refer to items

such as gloves, gowns, and masks, eye shields to reduce disease transmission.

RCC Relationships Centered Care. Developed by the Academy of Healthcare

Communication, this model values respect, relationship building, responding to

emotion and reciprocity as central components of a therapeutic relationship.

SMART A goal-setting strategy to ensure aims are specific, measurable, achievable,

realistic and timebound.

SOCIOTECHNICAL MODEL A model for implementing healthcare information

technology that recognized HIT is an interplay between people processes and

technology. This model has 8 dimensions that include both technical and human

dimensions to analyze healthcare IT holistically.

TECH LITERACY The ability to use any given technology safely and with ease to

VIRTUAL VISITS Connecting patients with their family using video technology when in-

person visits are not possible.

Appendix B: Project Management Plan

Introduction

This project plan was originally created to satisfy the requirements of SBMI 7360 in the 2021 Spring semester. At that time, the envisioned project scope included an implementation of improvements to an existing virtual technology. These assumptions guided much of the work and project documents contained in this appendix. The pandemic had a significant impact on healthcare organizations during 2021, which impacted the project scope, plan, and overall activities. At the time of the project scoping and plan in the Spring of 2021, COVID-19 vaccines were becoming widely available, and there were assumptions that the most difficult times of the pandemic were over. However, this was not the case. The organization saw the biggest surge with the delta variant in July and August of 2021. The omicron variant in December 2021 and January 2022 created staffing crises and overwhelming patient volumes. As a result, the project's scope was narrowed to workflow analysis, feedback from users, design and recommendations. In his classic article *Leading Change: Why Transformation Efforts Fail*, John Kotter identifies 8 common errors that prevent organizational transformation. These errors are related to his 8-step change management theory. In this project, the major challenge was the external environment uncertainty and changes related to the COVID-19 pandemic that created additional unplanned demands on the organization. As a result, there were no resources available or the organizational capacity or desire to pursue design changes and implementation at this time. Using Kotter's categories, the error's executing the planned project were

1. lack of compelling vision

2. not removing barriers to the new vision

COVID-19 did provide the sense of urgency for the initial implementation, but because the

vision was narrowly focused on communicating during COVID-19, there was not the

commitment or enthusiasm to continue improvements once the visitor restrictions were lifted.

Because the intervention had significant challenges, the barriers to use outweighed any perceived

benefit. Once families were allowed to come back into the hospital, the sense of urgency

dissipated to use virtual communication.

Project Overview

Patient-centered and family-centered care are effective strategies for improving patient &

family engagement. Viewing patients and families as partners have improved overall quality,

safety, and experience (AHRQ, 2017). Family-centered care sees patients and families as

essential clinical partners in achieving the goals of providing safe and high-quality care (Hart et

al., 2020). Family-centered care focuses on partnership and collaboration to help reduce anxiety

and prepare the family member for the discharge and follow-up care needed (Hart et al., 2020).

Central to patient and family engagement is effective communication. Effective

communication is vital to the relationship between patients/families and care providers.

Listening to patient's concerns not only improves patient safety but has been shown to improve

efficiency (Levinson, 2000). In a study by Helitzer et al., the authors found that effective

communication positively impacted patients' symptom resolution and specific physiological

measures (Helitzer et al., 2011). Patients are more likely to participate in their care when

clinicians invite questions and respond positively to the patient's needs and views (AHRQ,

2017).

Before COVID-19 in the acute care setting, provider/family communication relied

heavily on family physical presence. This prerequisite is not family-centered; instead focused on

the institutions and providers' schedules.   The families often are not included because the conversations are still happening based on the institution's plan, not patient convenience. Physicians rounding schedules do not always follow a predictable pattern. For families who do not live in the same community as their loved ones, physical presence creates a significant barrier to successful provider/family communication. During the pandemic, hospitals severely restricted visitation in some cases; eliminated it. This lack of physical presence exacerbated the existing challenge of family inclusion.

In the COVID-19 crisis, care for these critical patients had to be balanced, containing the infection's spread, and protecting the care providers. Early in the pandemic, there were significant shortages of personal protective equipment (PPE).   Healthcare organizations looked for ways to slow the PPE burn rate while still keeping their team members safe. Looking for ways to minimize trips into rooms, healthcare organizations quickly adopted technology for virtual rounding.

In response to the PPE shortage, Community Hospital deployed iPads using HIPAA-compliant, Microsoft Teams App branded app to allow clinicians to virtually round when appropriate. In November of 2020, this capability was expanded to include patients' family members to enable virtual care conferences and virtual family visits. The implementation faced several challenges.

1. A rapid adoption with minimal stakeholder engagement

2. Multiple IT projects implemented at once

3. Narrow use case envisioned

These iPads remain vastly underutilized as there is a lack of role definition, workflow analysis & multidisciplinary team involvement in implementation.

This project will seek to understand workflow, organizational barriers to adoption, and provider or patient-related barriers to the successful use of iPad communication leading to a standardized iPad intervention for contact with families during the inpatient admission and before discharge.

Inadequate communication between care providers, patients, and their families in restricted circumstances during inpatient care leads to patients and families not fully engaged as partners in their care (Kaslow et al., 2020). This has several consequences: patients and families are unprepared for care transitions, reduced patient satisfaction, and increased medical errors.

Proposed Solution

The solution is a mobile device that allows video care conferences to connect patients, families, and caregivers very through video calls. A current solution has been deployed but needs further analysis & integration into existing operations and workflow.

Project Integration

Figure 7

The Project Organization (chart)

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                        │ Executive Sponsor│
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    │ Project Manager │──────────┤
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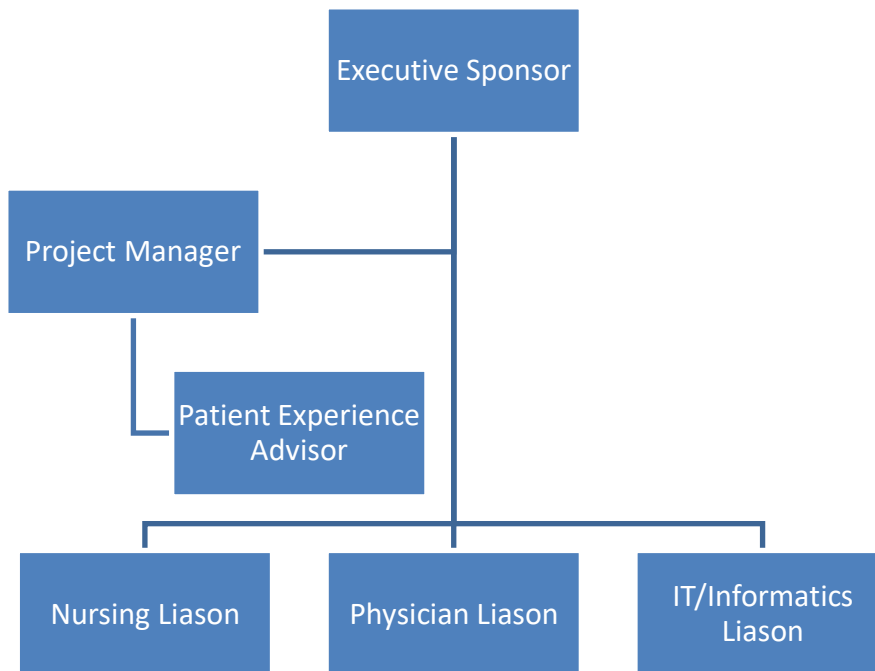
Table 7

Dr. Alter System Snapshot

Customers	Products and Services
Patients Families Physicians Nurses Patient Care Techs Case Management Spiritual Care	• iPad • Microsoft Teams • Virtual Care Conferences (patent, family, and care providers) • Video Visits with Family

Major Activities or Processes
1. Finding an iPad to use 2. Nursing asking patient identifying family representative 3. Capturing family member's contact information -email) and entering into Microsoft Teams App 4. Sending family member instructions for Microsoft Teams 5. Family downloading MS Teams 6. Hospitalist, through rounding may identify a palliative care patient need video visits 7. Hospitalist Admin contacts family and palliative care MD/NP to schedule an appointment 8. Send an invite to families & Providers via Microsoft Teams 9. Video Care Conferences with Clinical staff, families, and patients 10. Video Visits between Patients and Families (without clinicians) 11. Support for devices if there are technical challenges 12. Support for Clinicians via informatics if the ere is a question on functionality 13. Charging the iPad 14. Finding a Power Cord

Participants	Information	Technologies
Patients Families Physicians Nurses Spiritual Care Information Services Clinical Informatics	A patient who might benefit Family Contact Approved Family Contact information (email) iPad control number Physician schedule Family Schedule	iPad Microsoft Teams Email Family Device Wireless at hospital Broadband at the family home

Project Scope Management

Project Charter & Scope

Project Purpose and Justification. This project aims to enhance communication

between patients, families, and care providers when family physical presence is not possible.

iPads with Microsoft Teams have been deployed to areas with COVID-positive patient populations. These care areas have eliminated all visitors. The technology deployed initially was iPads with Microsoft Teams. This allowed a HIPAA-compliant, secure way to have virtual care conferences. Due to the pandemic crisis, the technology was rapidly deployed without a thorough analysis of how to operationalize it. This project will optimize the existing virtual intervention with the following goals and objectives:

1. Understand barriers to the adoption of virtual care conferences.

2. Analyze existing workflow of virtual care conferences through direct observation and qualitative interviews of providers, patients, and their families.

3. Design and implement an optimized standard virtual intervention based on feedback obtained in the analysis.

4. Improve the quality of virtual care conferences as measured by interview, workflow analysis and theme generation. Themes will be mapped to Sittig and Singh sociotechnical model.

The analysis will be performed in an intermediate care unit (IMCU) of a community hospital in southeastern United States. The iPads were deployed in November of 2020 without a formal operationalized plan. The project will analyze current workflow and processes through observation & interviews of care providers, patients, and families. This project will include developing a qualitative interview guide and recommendations based on workflow analysis, interview results, observations, and feedback. The resulting design & workflow will be recommended for future optimization.

Strategies: A qualitative interview guide will be developed to measure perceptions of patients, families, and their care providers. Data will be coded and analyzed into themes.

Assumptions: Community Hospital will continue its commitment to offering virtual care conferences.

Constraints: This is an optimization project. Optimization and recommendations may identify current software or hardware are not in an ideal state. If a recommendation involves a new solution (hardware or software) instead of improving the existing system, the organization may choose not to move to the new solution.

Requirements/characteristics

Table 8

Functional Requirements

#	Desired Functionality	Existing Functionality	Change / New	Justification for the Desired Functionality	Stakeholders / Business impacted	Priority
1.	HIPAA compliant secure app for video communication for remote visitation and care conferences	iPad with Microsoft Teams		Increase patient, family, and care provider communication Reduce the PPE usage	Inpatients on IMCU Physicians Nurses Case Management Spiritual Care Family Members	1
2.	Ability to schedule visits with providers	No scheduling operationalized- some workarounds created	Documented process using BSW Meets App to schedule providers with Patients/Families	Hard to have spontaneous meetings with providers schedule and not knowing families schedule	Providers Nursing Patients Families Informatics	4
3.	Request Process: Ability for families and or care providers to request a meeting	Patients and families only know about functionality if told. No formal request process for families to have remote visits	This is not happening	A request process would help the organization plan for the volume and be a potential marketing advantage.	Providers Guest Services Patients Families Nursing Spiritual Care Patient Experience Informatics Marketing and Communications	3
4	iPad has stand to make view easy for patient & care provider	iPad only has a kickstand on the case.	Add a mobile stand	Create the best viewing experience without holding the device.	The stand would make the iPad more usable and less likely to be lost. Nurse would not have to hold device	4

Table 9

User Requirements

#	Desired Functionality	Existing Functionality	Change / New	Justification for the Desired Functionality	Stakeholders / Business impacted	Priority
1.	Ability to schedule appointment	Using workaround and no defined process	We formalized documented process for scheduling appointments.	Hard to have spontaneous meetings with providers schedule and not knowing families schedule	Providers Nursing Patients Families Patient Experience Spiritual Care Marketing &	4
2.	Ability to notify families ahead of time of functionality	Families and patients only know about it if suggested by nursing	The formal way that all patients and their families know this is an option for "visits" and care conferences	With visitor restrictions, this can both decrease anxiety, managed expectations, and reduce multiple phone calls to the nursing unit, which can take away from patient care	Providers Nursing Patients Families Patient Experience Spiritual Care Marketing & Communications	3
3.	The ability for families/patient or care providers to request a meeting	If family members know about functionality, they call the nursing unit.	Documented process using BSW Meets App to schedule providers with Patients/Families	Increasing communication between family, patients, and care providers can decrease anxiety and improve transitions of care	Families Patients Patient Experience Providers Nursing	5
4.	The ability for families and patients to use iPad and Teams spontaneously without an appointment or intervention from care providers	Currently, patients are calling the nurse for assistance.	Make the process more usable for patients	Patients can quickly initiate video calls with external family members.	Patient Families Nursing Providers Patient Experience	2
5.	Easy way to have video care conferences with family and patients	iPad with Microsoft Teams. Must have families email address, and families must have downloaded Team's App	Using existing App and improve workflow or making recommendation for different application	Communication can reduce anxiety, improve care planning and transitions of care	Patients Families Providers Nursing Patient Experience	1

| 6. | High-quality audio and video connection | Video and audio high Quality | | Low-Quality audio and video can increase frustration and anxiety | Patients Family Providers Nursing | |

Acceptance criteria

1. Application with good quality audio and video

2. Families and Patients can use the application with little education (tip sheets)

3. Patients and families are notified of remote visitation functionality upon admission

4. Request process formalized for scheduling at remote visitation/care conference

5. Procedure/process for scheduling visits is operationalized.

6. Providers, Nursing understand the value of offering this communication method

Project deliverables

1. Documented analysis of current workflow and processes

2. Qualitative interview guide for interviews of patient, family, and caregiver perception and lived experience of communication intervention and ideas for improvement

3. Codes and themes generated by of nurse, provider, patients, and family's perceptions and experience derived from interviews

4. Themes mapped to both sociotechnical model and relationship centered care models to and resulting holistic recommendations

5. Documented standardized procedure for the iPad communication intervention.

6. Executive summary of recommendations for organization

Table 10

SWOT Analysis

INTERNAL FACTORS	
STRENGTHS (+)	**WEAKNESSES (-)**
1. Increased family/provider/patient communication 2. Bridge communication gap 3. Richer communication than phone calls alone 4. iPads already deployed 5. Microsoft Teams platform HIPAA compliant and internally supported 6. The efficiency of geographically dispersed family members	1. Add additional time 2. Other resources required to schedule, and support 3. Hospitalists not used to operating with appointments 4. Harder to use than FaceTime 5. No measurement of user satisfaction 6. Organization may not see the value of continuing the video conferencing
EXTERNAL FACTORS	
OPPORTUNITIES (+)	**THREATS (-)**
1. Competitive advantage in the marketplace 2. Expansion of use cases 3. Could provide an assessment of home environment before discharge 4. Community now more comfortable with the virtual medium 5. Connecting community clergy	1. Families don't know how to use App 2. Not all family members have Smartphones or broadband 3. Lack of Trust in a virtual environment 4. Cyber Attacks 5. IT is transitioning to a managed services model,

Project Schedule

Figure 8

Revised Project Schedule

TASK	START	END	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	01 2023
Project Approval	8/1/21	9/30/22	█						
Methods refinement	10/1/21	10/31/21		█					
Interview Guide	10/15/21	10/31/21		█					
IRB Approval	11/1/21	11/30/21		█					
Interviews	3/1/22	9/30/22			█	█	█	█	
Coding and Analysis	3/1/22	12/21/22			█	█	█	█	
Recommendations Finalized	1/1/23	2/14/23							█

Note. This revised schedule reflects the change in scope.

Project Cost

Table 11

iPads and Virtual Care Conferences: Proposed 5 Year Total Cost of Ownership 2021-2026

Organizational Cost	One-time Fees	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Hardware	$ -	$ 7,500.00	$ 2,500.00	$ 5,000.00	$ 7,500.00	$ 2,500.00	$ 25,000.00
Build/Backfill Team	$ -	$ 3,500.00					$ 3,500.00
Go-live Support Team	$ -	$ 3,600.00					$ 3,600.00
Training Materials	$ -	$ 1,170.00					$ 1,170.00
Ongoing Patient Experience Advisor Time	$ -	$ -	$ 7,800.00	$ 8,190.00	$ 8,599.50	$ 9,029.48	$ 33,618.98
Patient Access/ Concierge	$ -		$ 12,480.00	$ 13,104.00	$ 13,759.20	$ 14,447.16	$ 53,790.36
Vendor Total	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Organizational Total	**$ -**	**$ 15,770.00**	**$ 22,780.00**	**$ 26,294.00**	**$ 29,858.70**	**$ 25,976.64**	**$ 120,679.34**
Taxes	$ -	$ 1,301.03	$ 1,879.35	$ 2,169.26	$ 2,463.34	$ 2,143.07	**$ 9,956.05**
Grand Total	**$ -**	**$ 17,071.**	**$ 24,659.35**	**$ 28,463.26**	**$ 32,322.04**	**$ 28,119.71**	**$ 130,635.38**

Project Quality Management

Planning

Table 12

Deliverables and Acceptance Criteria

Deliverables	Acceptance Criteria
Project Abstract and plan submitted to hospital system institutional review board (IRB) for determination of original research or quality improvement project	IRB determines Project is Quality Improvement, signed and dated approval to move forward
Interview guide created for employees and separate interview guide submitted for family members.	Approved by Compliance Approved by Hospital System Project Office Approved by DHI Faculty Committee
List of potential patients and family members for interviews submitted to hospital attorney	Hospital compliance approves list with revisions
List of potential employees submitted to CNO	CNO approves with revisions/additions
Code and themes generated from interviews	Approved by DHI faculty advisor Approved by Sponsor
Themes mapped to sociotechnical model	Approved by DHI faculty advisor
Themes mapped to RCC	Patient Experience Leader who is certified in RCC
Final Complete Recommendations/Presentation	Faculty Advisor Faculty Committee Sponsor
Executive Summary of Recommendations to Organization	Approved by DHI faculty committee Approved by Organizational Sponsor

Note. This is the modified acceptance criteria to reflect changes in project scope without

implementation.

Table 13

Quality Assurance Activities

Quality Assurance Activities
▪ What steps will you take to ensure quality is built into the production processes?
Interview guide will be approved by DHI faculty advising committee. Selection of interviewees will correspond to many disciplines using the tool. Interviews will be recorded with the permission of employees interviewed to ensure the transcript is accurate. Family members interviewed will be approved of compliance. These interviews will not be recorded. At the conclusion of these interviews, the notes will be confirmed with the family members to ensure they represent participants impressions.
▪ How will you ensure that Requirements are correct, complete, and accurately reflect the customer's needs?
The requirements of the intervention will be derived from the interviews and workflow analysis. Interview transcripts will be coded, and themes derived from this activity. Delve Tool will be used to help organize the transcripts and code as well as notes about the codes.   The coding will be iterative, and codes will be constantly compared, nested, combined an analyzed to end with a manageable number of themes and subthemes.
▪ How will you verify that the Specifications accurately represent the Requirements?
The project will document and validate the current workflow and design ideal workflow and technology based on the user interviews and observations. The user perspective will be incorporated at every step of the project plan. The sociotechnical model will be used to help organize and classify the generated interview themes. This model is designed to be used at every stage of healthcare IT implementation to ensure people processes and technology are incorporated into any intervention. Member of the faculty committee will also review sociotechnical model categorization
▪ What steps will you take to ensure that the project plan is followed?
Biweekly meetings with the faculty advisor to review plan and progress. Biweekly 1:1 meetings with the CNO to review progress and elevate any barriers.
▪ What audits and reviews are required, and when will they be held?
Audits in this context will refer to reviewing transcripts, codes and themes to make sure data is coded consistently. Interviews and coding will be done in parallel, using qualitative methods as guides for this QI project.
▪ What will you measure to determine if the project is out of Scope?
The project plan and charter are used to determine activities and if they are in or out of scope. The project scop in this case was narrowed because of lack of resources and capacity in the organization due to COVID-19 pandemic

Quality Assurance Activities
▪ What will you measure to determine if the project is within budget?
The cost sheet will be used as a guide to monitor the budget. Because the project scope was narrow to analysis, design and recommendations, the project had no cost to the organization in this phase.
▪ What will you measure to determine if the project is within schedule?
Progress compared to Project schedule, work breakdown structure and biweekly meetings with faculty advisor and Chief Nursing officer

Note. This is the modified Quality Assurance Activities to reflect changes in project scope

without implementation.

Quality Control and Monitoring

Table 14

Quality Control and Monitoring

Project Monitoring and Control
Define the following:
▪ How will you ensure that adequate testing is done? How do you define "adequate"?
Since the project scope narrowed from implementation to analysis and design, the "testing" in this context is related to capturing accurately the themes from the interviews. Although this was not a research project, qualitative methods will be used as a guide to determine the number of interviewees, and the coding process.
▪ How will you report and resolve variances from acceptance criteria?
Variances in this context will refer to contradictory themes generated from the interviews. If this occurs, the interviewee pool will be expanded to get additional experiences to ensure that the user experience is represented fully.
▪ At what milestones will testing and reviews take place – who and how will they do them?

Project Monitoring and Control
Reviews will be done at the following points: Project Proposal submitted to Institutional Review Board of hospital system. Interview guide submitted for approval to Chief Nursing officer, Hospital Legal Counsel, and Faculty Advisors. Patient family member selection submitted and approved through hospital legal counsel. Coding and themes generated reviewed with faculty advisor. Categorization of themes into Sociotechnical model submitted to faculty advisor for input and approval. Patient Experience Advisor who is also trained in the Relationship Centered Communication will review and approve the design recommendations for the communication portion of the intervention.
▪ What action by the Sponsor constitutes acceptance of deliverables at each phase?
Meetings with the Chief Nursing Officer and Faculty Advisor are scheduled on a regular basis to review progress, approvals completed and next step.
▪ What action by the Sponsor constitutes "full and final acceptance" of final deliverables?
Sponsor will receive and approve a final executive summary of design recommendations in the Quality Improvement Project.

Note. This is the modified monitoring and control table to reflect changes in project scope

without implementation.

Project Resource Management

Table 15

Project Resource Management

Role	Responsibility	Authority
Executive Sponsor	Overall support making project an organizational priority Escalation Point for Project Manager Communication to Executive Team	Overall approval of project, budget, and scope Assign resources to the project, both human and capital, removal barriers
Project Manager	Oversite of Project: Creating all project documents, Communication, Coordination, Communication	Setting Meetings, Project timelines Presentations/communication on progress

Role	Responsibility	Authority
Patient Experience Advisor	Voice of the Patient and Family. SME on Art of Communication Program and ensuring this is incorporated into this medium	No direct authority, but can escalate to project manager
Physician Liaison	SME on hospitalist workflow. Communicate MD perspective Change Agent for MDs	Setting new workflow direction with Providers
Nursing Liaison	Communicating Frontline nurse perspective. SME on nursing workflow	Assigning additional nursing resources as needed. Setting new workflow direction with providers
IT/Informatics liaison	Assisting with any technology barriers. Assist with Training Documents. Resolving any technology issues. Monitoring performance of IT tools (Teams, iPads)	Authority is specific to IT resources. We are deploying IT resources when needed

Project Communication Management

Table 16

Information Distribution & Performance Reporting

Project Name:	Virtual Patient/Family Communication in the Acute Care Setting
Project Manager:	Kathleen de Figueiredo
Date:	27-Mar-21

#	Recipient	Message	Assumptions	Timeline	Channel	Recipients Response	Responsible
1	Executive Team	Summary Information on purpose and progress	Executive Team Hyper focused on Patient Experience	Monthly	Updates at Admin Huddle During Quality Agenda	risks and offer to remove barriers	Director of Quality- Project Manager
2	Project Team	Project overview, all details around project plan, highlight risks and mitigation strategy.	Detailed information during each phase of the project including confirmation of resources, milestones, role responsibilities budget status, and review of deliverables.	Weekly during Kickoff, and more frequent touchpoints during implementation.	Email, MS Teams Site & Teams Meetings, In person meetings	Concerns, barriers, understanding of expectations milestones, risks, and challenges.	Director of Quality- Project Manager
3	Nurses	Project Overview, Expectations of their role, re-training plan, how to receive help, and provide feedback	Nurses have seen the iPads as a burden so this relaunch will have to make sure to address the majority of their concerns	once project is approved, a general overview of what to expect, and what the interviews will entail. Interviews will happen frequently at the start to gather barriers and requirements. Updates after will be weekly check-ins, and more detailed information at formal meetings	In Person staff meetings, Informal Rounding, Unit Based Council, Department Huddle, Email	Understand timeline, demonstrate understanding of technology, raise any concern or barriers	Director of Acute Care Services Director of Quality-PM Manager of Acute Care Services Supervisor of IMCU
4	Providers	Project Overview, Expectations of their role, re-training plan, how to receive help, and provide feedback	Physicians are neutral/slightly positive about the iPads so any communication will need to emphasis the positive features/workflow we will bring forward	once project is approved, a general overview of what to expect, and what the interviews will entail. Interviews will happen frequently at the start to gather barriers and requirements. Updates after will be weekly check-ins, and more detailed information at formal meetings	Medical Executive Committee Meeting, Email, Hospitalist Department Meeting, Informal Rounding,	Understand timeline, demonstrate understanding of technolgoy.raise any concern or barriers	Quality Medical Director Hospitalist Admin Hospitalist Director
5	Spiritual Care & Case Management	Project Overview, Expectations of their role, re-training plan, how to receive help, and provide feedback	Spiritual Care has been the super users of this technology, so frequent communication of the plan will help address any anxiety about the change	once project is approved, a general overview of what to expect, and what the interviews will entail. Interviews will happen frequently at the start to gather barriers and requirements. Updates after will be weekly check-ins, and more detailed information at formal meetings	In Person Staff meetings, Informal rounding, email.	Understand timeline, demonstrate understanding of technology. Raise any concern or barriers	Director of Spiritual Care, Director of Case Management, Project Manager
6	Patients/Family Members	A subset will be involved in the pre-intervention interview & post intervention interview. For these group, specific expectations around participation will be needed. Ongoing Patient and Family Education of the technology and purpose, how to use etc. will need to be communication on admissions	Patients and families will need information about the technology both what it is for, how to use, how to receive help.	preintervention, post-intervention, and ongoing as part of any new admission.	Information included on admission packet, verbally mentioned by admission nurse	verbalize understanding of technology purpose	Director of Marketing and Communication, Director of Quality, Admission Nurses
7	Patient Access (Registration)	Project Overview, Expectations of their role, re-training plan, how to receive help, and provide feedback	Patient Access has not been involved in the initial roll out of the technology, so they may have some hesitation of having "one more thing to do".	Project Kickoff, and then monthly updates. More frequent weekly to daily communication leading up to relaunch.	In Person Staff meetings, Informal rounding, email.	Understand expectations, communicate any risks or barriers	Director of Access Services
8	Quality and Patient Safety Council	Project Overview, Goals, Milestones and Metrics	This council is responsible for overall Quality, Patient Safety and Experience. Will be good ambassadors and champions	Monthly Council Meetings	Updates at regular council meetings and consent agenda.	Support	Director of Quality- Project Manager
9	Clinical Compliance & Corporate Compliance	Project proposal & design, progress and milestones	Compliance will be a key stakeholder in the beginning and throughout the project	prior to start for approval and classification,	Virtual meeting for approval, then email updates	Approval	Director of Quality- Project Manager
10	Alaina Tellson, Office of Nursing Research BSW Health	Project proposal & design, progress and milestones	Alaina has knowledge of all of the project requirements including legal	prior to start for approval and classification, then monthly check ins	Virtual meeting for approval, then email updates	Feedback on project design, approval for moving forward	Project Manager

Project Risk Management

Table 17

Risk Catalogue

Risk	Possible impacts on the project
Organization does not prioritize this kind of communication and decommissions current devices	The project foundation is analyzing the current workflow of a previous implementation. I would have to shift direction slightly if they are not committed to the current state.
IT outsourced	There is less local control and collaboration during this managed services transition
Patients/Families not having broadband at home	This limits who can participate and would exclude rural and socioeconomic disadvantaged family members
The physician will see this as added time and constraints to an already busy schedule	Physicians may be less likely to be involved if they view this as one more item that will constrain their schedule
Families could have lack of trust in a virtual environment	Project would not get as many participants, limiting the overall findings.
Families don't own device to use	This would skew the results since only families with financial means to have an appropriate device would be able to be interviewed.
Additional Resources may be needed for the optimal workflow to happen	In this financially constrained time, organizations are looking for efficiencies and not adding additional FTEs.

Note. These risks are from the original project plan and include the risks that eventually

modified the project scope, namely organizational priorities.

Risk analysis

Table 18

Risk Analysis

Risk	Likelihood	Consequences	Priority of Risk
Organization does not prioritize this kind of communication and decommissions current devices	Likely	Major	Significant
IT outsourced	Low	Minor	Low
Patients/Families not having broadband at home	Moderate	Major	High
The physician will see this as added time and constraints to an already busy schedule	Moderate	Moderate	Significant
Families could have lack of trust in a virtual environment	Unlikely	Moderate	Moderate
Families don't own device to use	Moderate	Major	Significant

Note. These risks are from the original project plan and include the risks that eventually

modified the project scope, namely organizational priorities

Project Procurement Management

Because this project is an optimization and workflow analysis and recommendations, the

procurement was already completed prior to the beginning of the quality improvement project,

and the project manager did not have visibility into these prior procurements. No additional

outside vendors will be used.

Project Stakeholder Management

Table 19

Senior Leaders and Key Decision Makers

Ensuring project feasibility	Name of person/group	Why exactly is this person/group important?
Who can help fund the initiative	• Chief Nursing Officer • Chief Executive Officer	• CNO is an enthusiastic proponent of improved Patient and Family Communication • CEO is laser-focused on improving our HCAHPS scores Influential with the CFO and well connected to the CIO
Providing Additional Resources	• VP of Operations • Chief Nursing Officer • Director of Human Resources	• COO has many support services reporting to him • CNO and HR work extremely collaboratively and are creative in developing solutions when resources are scarce
Who can decide whether or not the project can proceed, be terminated, or be put on hold?	• CEO • CNO • DHI Committee Members	Executive Team essential for reasons stated above. I have also included all three of my committee members from SBMI as they will be instrumental in approval
Who can remove obstacles and barriers that are beyond the project team's control?	• CNO	• CNO is solution-oriented, creative, and has resource control
Who needs to approve/sign off on deliverables?	• CNO • Director of Acute Care Services	• The project will be on IMCU with the deliverables

Ensuring project feasibility	Name of person/group	Why exactly is this person/group important?
	• DHI Committee Members	• As Executive Sponsor, CNO will need to approve the deliverables
Who can help build additional senior-level political support?	• Spiritual Care • Director of Quality/	• Highly respected by the C-Suite and has worked in the organization for a long time. He has used iPad technology from the beginning to connect with patients and families • Director of Quality: Co-Chairs the Quality & Patient Safety Council with Quality Medical Director. Serves as a Trusted Advisor for C-Suite on Quality, Experience, and Clinical Compliance
Add other senior leaders and key decision-makers who can influence the project	• Chief Financial Officer • Chief Medical Officer	CMO is very hands-on and wants to make things easier for the MDs. He is also very collaborative with nursing and is solution oriented • CFO always important for financial considerations

Table 20

Stakeholder Contributors

Ensuring the Quality of deliverables and activity execution:	Name of person/group	Why exactly is this person/group important?
Where can we find the required project resources	• Chief Nursing Officer • VP of Operations	Has the authority to reassign individual employees into a project role
Where can we find required SMEs?	• Director of Acute Care • Manager of Clinical Informatics • Director of Case Management • Assistant to hospitalist services • Patient Experience Advisor • Clinical Compliance/Patient Safety Officer	Manages a group of employees who have relevant skill sets
Who can provide support in the areas of training and competency development?	• Director of Professional Development	Manages the corporate training department Oversees approved training vendors
What groups can help us publicize/communicate this initiative	• CEO • Chief Nursing Officer • Director of Quality • Director of Marketing • Director of Acute Care Services	CEO and CNO have regular communication channels. The Director of Marketing is collaborative and has excellent ideas for reaching an audience in various ways. The Director of Acute Care Services has regular in-person huddles.
Who can help us support the initiative once it is deployed?	• Clinical Informatics Manager • Patient Experience Advisor • Director of Guest Services • IS Manager • Medical Director, Hospital Services	

Table 21

Tier 3 Stakeholder: Recipients

Areas where people/groups may be impacted:	Name of person/group	Why exactly is this person/group important?
Who is the intended audience for the project outputs or the change?	• Patients • Families • Patient Access Services Reps • Chaplains • Patient Experience Advisor • Case Management • Nursing • Physicians • Community Clergy	• The initiative will require a change to how this person/group works
Will the change have any effect on secondary groups or individuals?	• Environmental Services • Dietary & Food Service • Therapies	• Although they will not be using the technology, they frequently go into the room and could potentially be asked for assistance.

Implementation/Deployment Strategy

After analyzing the current workflow through observation and interviews, the optimized

HIPAA-compliant solution will allow collaboration software that includes the following

capabilities: chat, phone calls, video calls, video meetings, file sharing. This project will

examine the barriers and make recommendations, optimization for a solution to provide remote

visitation during a restricted environment. As previously mentioned in the introduction, the

external environment created significant barriers to the possibility of implementing any

optimizations. The project, then narrowed it's focused on the analysis, design and

recommendations. However, the implementation deployment strategy was created with the

original project plan. The following sections contain the considerations for implementation of

any optimization to the current virtual communication tool.

The implementation and deployment strategy will test new design and recommendations,

provide training, go-live support, and ongoing usage and user perceptions monitoring.

User Acceptance Testing

Clinical champions and stakeholders will test the recommended design and workflow.

This first will occur in tabletop exercises without the patient and family members. The testing

will then be walked through the unit without patients and family members and finally with

patients and family members. The new process will be fully documented in narrative and Visio

diagram form Signoff: After the various scenarios have been tested, adjusted, and tested again,

stakeholders, the project team, and executive sponsors will sign off the new process flow.

Training

Training tip sheets will be created to train the approved workflow and have detailed

instructions on how the application works, troubleshooting, and tablet storage. Since the tablet

will be reasonably user-friendly, training will be at the elbow and charge nurse meetings. This

will be implemented on a 16-bed unit so that key clinical champions will have additional

training.

Communication Plan

The communication plan will include the current media for internal communication of the

pilot and project. This consists of a weekly newsletter by the CEO, a Yammer internal social

media app to help advertise the project and benefits, weekly top 5 nursing priorities, group me,

huddles, department meetings, and charge nurse meetings. Councils include Medical Executive

Committee and Quality and Patient Safety Council. Multidisciplinary rounds will also be a great

way to communicate and further identify patients who could benefit from the intervention.

Go-live Support & Addressing issues.

Once the recommended changes are made in the workflow, rounding on the unit by the

clinical champions and project manager will happen on days and nights the first week. Issues

will be logged on an issue management log, addressed, and communicated to the project team

and unit.

Monitor and Reporting.

Part of the project uses a qualitative survey instrument to measure the benefits of the

workflow optimization design. This data will be reported to the DHI faculty and Site

Leadership.   Usage statistics will also be monitored and reported to the project team.

Celebrate the wins along the way.

Patient and family stories will be documented and shared with the organization to build

momentum and illustrate the positive benefits of the intervention.

Lessons learned.

The critical lessons learned from the implementation and deployment will be shared with

the project team and project sponsors.

Appendix C: Return on Investment (ROI) / Cost-Benefit Analysis

Virtual communication offers several benefits that can lead to a positive return on investment (ROI), including reduced travel costs, increased productivity, improved collaboration between families, patients, and care providers, and increased patient and provider satisfaction. To fully understand the potential ROI of this technology, it is important to consider the costs of visitor restrictions.

Costs of Visitor Restrictions

Families have always faced barriers to visiting their loved ones in hospitals. However, with the COVID-19 pandemic, the restrictions were universal and widespread. This led to more research on the cost of visitor restrictions. The studies by Fenton et al. (2022) and Azad et al. (2021) examined the outcomes of non-COVID-19 patients during these restrictions. They found that patients and families had a decreased perception of the quality of care and increased emotional distress.

Additionally, the families had no contact with the medical team, and there was lesser discharge counseling. Finally, the ICU length of stay increased because of delayed end-of-life discussions (Azad et al., 2021; Fenton et al., 2022). Considering these costs of visitor restrictions, there is a potential ROI from improving communication when families cannot be physically present in the hospital.

Potential Return on Investment

Although further research is needed on the cost of visitor restrictions, potential cost savings could be estimated by looking at the possible reductions in ED visits, readmissions, and ICU patient days. ED utilization and readmissions can be reduced as virtual communication provides an alternative method for families to be part of the care team. Involving the family in

the care-related conversation can improve their understanding of discharge instructions and follow-up care. Furthermore, ICU patient days can be reduced by lowering the delay in the advanced directive discussions with family members. Table 6 illustrates the potential savings or cost avoidance.

Table 22

Potential Return on Investment from Virtual Visiting

Item	Unit Cost	Annual Volume at the Hospital	Program Effect %	Reduction (#)	Savings for the US Healthcare System
ED Visits	$ 2,318[1]	40,000	-2%	-800	($1,854,400)
Readmission	$15,200[2]	725	-2%	-14	($ 212,800)
ICU pt. days	$ 6,300 [3]	20,000	-.05%	-100	($ 630,000)
Total Annual Impact					($2,697,200)

Note. The table includes estimates of cost avoidance. Unit Cost estimates are from the following sources:

[1] https://www.cbsnews.com/pictures/emergency-room-visit-cost-most-expensive-states/

[2] Statistical Brief #278. Healthcare Cost and Utilization Project (HCUP). July 2021. Agency for Healthcare Research and Quality, Rockville, MD.

[3] Estimate from the hospital finance department, 2022

Appendix D: Executive Summary for Organization

Purpose	This Executive Summary aims to provide recommendations following a quality improvement project to optimize virtual technology to connect families with patients and care providers when they cannot be physically present in the hospital.
Summary	During the visitor restrictions during the COVID-19 pandemic, we implemented iPads with Microsoft Teams app to facilitate communication between patients, their loved ones, and other healthcare providers. An analysis of these interventions through interviews, workflow analysis, and observations identified various benefits, challenges, and ideas for improvement. Although the virtual tool was implemented to address the specific challenge of hospital-imposed visitor restrictions, there are advantages to offering this to patients as a complement to in-person visiting post-COVID-19 restrictions. Families could face many barriers to in-person visiting, including geography, work hours, childcare responsibilities, and physical limitations. The offering supports family-centered communication. Below are some recommendations based on this project's findings to make this communication method sustainable in any environment. The potential ROI for supporting this communication method is related to more positive care transitions directly impacted by family-centered communication, including reducing readmissions, ED utilization, and ICU patient days.
Recommended Action	The following will highlight some key improvements that would address many of the challenges identified in the project. **Device Recommendations**: Devices must be readily available, easily positioned, and have sufficient speakers and microphones to accommodate the ambient noise in a patient's room. Device cart/stand would provide both the ability to position, be hands-free, and help with device tracking. Initially, 2 devices could be piloted in a specific unit for a relaunch. **Application recommendations:** All participants desire more simplicity in the setup and use. Several features to consider: no application download required, Cell phone numbers or emails used for invitations, A simple button to connect and disconnect, The ability for patients and families to connect independently, Integration with a translation service, so another device is not required, Choosing a software or solution with which users have baseline fluency, A scheduling feature that allows families to schedule appointments. **Standard operating procedure**: SOPs to communicate to the family and patient about this offering and communication standards during the visit, device care, and tracking. This would also include preparation and debriefs for employees following difficult conversations. The emotional toll on nursing was a key negative finding in our current intervention design. **Relationship-centered care:** Use this existing program and toolkit to provide specific direction in virtual communication. **Measurement and monitoring:** Include measuring use and satisfaction with the tool to monitor adoption closely.