

**Communication Plan: Patients with Suspected COVID-19**

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She has no known conflict of interest to disclose.

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### **Abstract**

Hospital visitation policies have continued to evolve throughout the pandemic resulting in visitation restrictions for COVID patients. To positively shape the experience for patients, families, and care providers a new communication plan utilizing virtual visiting emerged. The purpose of this quality improvement project, developed based on the caring theory, is to explore if implementing iPads with virtual visiting capabilities is effective in increasing patient and family satisfaction. iPads were deployed throughout a large, emergency department located in the southwest United States to enable virtual communication among patients, families, and healthcare workers to measure the patient and family's satisfaction. After the virtual visit the patient and family member had the option to complete a satisfaction survey. The anonymous post-visit Likert-scale surveys measured (1) ease of iPad use, (2) staff engagement, and (3) mental health - coping and stress. Participants were recruited via the electronic medical record that displayed patients being ruled out for COVID. Data was analyzed using descriptive analysis and the results showed high levels of satisfaction among the patients and families in all areas. There is sufficient evidence to suggest that the availability of virtual visits is beneficial for patients and families. The implementation of video communication via iPad showed high levels of patient and family satisfaction, mental health outcomes and increased family involvement.

Key Words: *Virtual visits, visitation restrictions, COVID-19, technology, communication, family visitation*

### **Communication Plan: Critically Ill Patients with COVID-19**

The Corona Virus (COVID-19) is a global novel virus that has resulted in a dramatic loss of life, leading to unprecedented changes and challenges across the nation. There have been many efforts made to slow the virus, including social distancing, self-quarantining, use of Remdesivir, and vaccines. The biggest hope for change is the newly introduced vaccines. However, experts have not yet been able to determine the required amount of vaccinated people to establish herd immunity; therefore, it is unknown how long it will take (Center for Disease Control and Prevention, 2021a). While vaccines are a sound solution, they are not a cure, and hospitals have continued to be saturated with COVID-19 patients. Due to the virus's transmittable nature, many hospitals have implemented a strict no visitor policy for patients with suspected COVID-19 (Dhahir et al., 2021; Rosenbluth et al., 2020; Valley et al., 2020). This has led to detaching family members and medical decision-makers from the patient's bedside. An urgent need for a new communication plan for patients with suspected COVID has emerged.

#### **Problem Statement**

The Center for Disease Control and Prevention (2022) provides the most recent data showing there are currently over eighty million cases of COVID-19 and over nine hundred and eighty thousand deaths to date in the United States. Arizona alone has had over two million cases of COVID-19 (Arizona Department of Health Services, 2022; Center for Disease Control and Prevention, 2021b). These staggering numbers highlight the urgency in evaluating the current communication strategies for patients who do not have bedside familial support at the start of their Emergency Department (ED) visit. Evidence shows removing families from the bedside of isolated patients impacts the patient's mental health and recovery (Fang et al., 2020; Pursell, 2020). Families are also affected and suffer when their the loved one dies isolated and alone

(Billingsley, 2020). When families can remain at the bedside, they can better understand the patient's status, make medical decisions, advocate, follow recovery status, and better prepare for discharge (Valley et al., 2020). This shows it is crucial to develop an effective communication plan, from the start of the patient's stay, for the isolated patients to connect with their families and improve patient and family satisfaction.

### **Purpose and Rationale**

Patients who are critically ill cannot communicate with clinicians due to the nature of their illness (Valley et al., 2020). This means families assume the role of becoming the decision-makers. However, the COVID-19 pandemic has led to visitor restrictions no longer allowing family members to remain at the bedside, making it a challenge to be involved in the patients' care (Kennedy et al., 2020; Negro et al., 2020; Valley et al., 2020). This results in virtual communication between the family members, the patient, and healthcare workers. The purpose of this paper is to explore how virtual video communication among isolated patients, families, and the interdisciplinary team affects patient and family satisfaction.

### **Background and Significance**

#### **Critically Ill Patients with Suspected Corona Virus**

Coronavirus is a novel virus that emerged in December of 2019 (American Journal of Managed Care, 2020). The first suspected case was in Wuhan City, China, and made its way to the United States by January of 2020. The United States Trump administration declared a public emergency in early February 2020. Shortly after, in March, they announced a national emergency as the death tolls continued to rise (American Journal of Managed Care, 2020). The COVID-19 virus was first accompanied by cough, sore throat, shortness of breath, body aches, fever, and chills. As the virus continued to spread and researchers began learning more, more

symptoms came to the surface, including new loss of taste or smell, congestion, nausea, vomiting, and diarrhea (Center for Disease Control and Prevention, 2020). All symptoms are highly variable, with a wide range from mild to severe or life-threatening depending on the individual (Silven et al., 2020). An estimated five percent of patients deteriorate after only a few days of symptoms requiring respiratory support and admission into a critical care unit (Silven et al., 2020). Most critically ill patients enter the hospital through the emergency department, and as previously mentioned, there are no visitors allowed removing the family from the bedside. It is vital to establish a communication plan early on to ensure the family is kept up to date on the patient's status and create patient and family-centered care (Brilli et al., 2014; Wittenberg et al., 2021). Virtual conferences among caregivers and families allow for all parties' engagement to express concerns, receive information from all of the interdisciplinary team members, and align care goals (Wu et al., 2020).

### **Virtual Video Technology**

Fostering a life-like experience through video technology can allow the family to feel present, involved, and overall have a more satisfactory experience (Webb et al., 2020). When the family cannot be present at the bedside, the next best communication option is video.

Additionally, this allows multiple family members to be present and see the patient versus having one point of contact (Webb et al., 2020). A study by Kennedy et al. (2020) showed that video communication was more effective than telephone communication from both the family and clinicians' perspectives. An added benefit of video communication is that it allows families to visualize the nurse caring for the patient, further enhancing the connection, rapport, and confidence in the nurse caring for their family member (Lindsay et al., 2021; Webb et al., 2020).

Video technology has the power to change the communication landscape of healthcare during a global pandemic.

### **Telephone Communication**

It is essential to preserve the connection between the healthcare staff, the patient, and families to continue to provide quality care. Telephonic communication has shown to be the least desired form of communication when video technology is available (Kennedy et al., 2020). Clinicians are challenged with relaying the deterioration of a patient to the family, and visual cues are missed when conversing over the phone (Webb et al., 2020). Additionally, clinicians express that it is difficult to have important conversations over the phone, ensure the family understands the information, and successfully convey empathy (Kennedy et al., 2020). The most real connection during a strict visitor policy is virtual video communication. This allows providers to use verbal communication while visualizing and identifying emotional cues that are not recognized over the phone (Fang et al., 2020). Not only does the patient suffer when isolated, but caregivers can have long-lasting effects as a result of missing communication with a sick loved one, such as anxiety, depression, and complicated grief (Billingsley, 2020; Feder et al., 2021).

### **Video Communication**

Historically, families have played a considerable role in patients improvements. Family-centered care includes the family in the morning rounds with the interdisciplinary teams. Multiple studies discussed one of the benefits of having virtual visitation allows for families to better advocate for their loved ones when visiting restrictions are in place (Creutzfeldt et al., 2020; Dhahri et al., 2021; Rose et al., 2021; Wu et al., 2020). Family involvement results in positive outcomes for patients, and the inclusion benefits the hospitals (Brilli et al., 2014).

Multiple studies showed through video visiting patient and/or family satisfaction scores improved (Brilli et al., 2014; Kennedy et al., 2020; Nardo et al., 2020; Sasangohar et al., 2020; Wu et al., 2020).

When sick isolated patients improve, visitor restrictions remain in place, and the family cannot be present for discharge instructions. Lack of family support during discharge teaching where vital information is reviewed, including tracheostomy care, the antibiotic regimen, and emergent signs/symptoms, leads to an unsafe discharge and increases readmission risk (Houchens & Tipirneni, 2020). The video device, such as an iPad, can be utilized as an educational tool to include families, parents, and caregivers in the discharge instructions. A study showed implementing the device in the discharge process fosters engagement, improves the quality of discharge teaching, and decreases readmission rates (Lerret et al., 2020). Communicating through video allows the provider and family to recognize non-verbal cues, make eye contact, and the family can visualize the patient to better understand discharge instructions (Houchens & Tipirneni, 2020). Additionally, studies show that families are able to better cope with grief and reduce stress through virtual visiting (Creutzfeldt et al., 2020; Dhahri et al., 2021; Nardo et al., 2020; Rose et al., 2021; Wu et al., 2020). It is vital for patients to connect with their families during crises to avoid the negative effects of isolation during a hospital stay (Fang et al., 2020).

### **Internal Evidence**

J. Cobos (personal communication, February 11, 2021), the emergency department nursing director at a hospital in central Phoenix, Arizona, reports that, on average, during a peak of COVID-19 cases, there were forty-three COVID intensive care unit (ICU) patients being cared for daily from December 2020 through mid-March 2021. On average, thirty-eight of these

patients were on ventilators. The emergency department had an average of one COVID ICU patient holding in the unit. This means there are no available ICU beds, and the patient must remain in the emergency department until a bed becomes available. This central Phoenix hospital does not allow these patients to have visitors except for 'end of life' visitation. There have been thirty-two iPads deployed across the hospital, excluding the emergency department. Many patients were admitted through the emergency department, which is where the communication plan must be initiated. Initiating the plan early on will allow the family to understand the process and manage communication expectations.

This inquiry has led to the PICOT question, in patient with suspected COVID-19, how does an early communication plan among patients, families, and the healthcare team, compared to no communication plan, affect patient and family satisfaction scores over the duration of a four-week period?

### **Search Strategy**

An exhaustive search was conducted to answer the PICOT question. The search databases utilized include Cumulative Index to Nursing and Allied Health (CINALH), PubMed, and Scopus. Each of the search engines allows for advanced searches to ensure the result aligns with the picot question. In the advanced search, keywords are entered and combined by the Boolean connector 'AND,' and similar phrases are added by the Boolean connector 'OR.' This advanced search technique was implemented when searching each database. The Medical Subject Headings (MeSH) terms and keywords used to narrow the search include *COVID-19, coronavirus, 2019-ncov, sirs, sars, SARS-CoV-2-, pandemic, critically ill, patients, emergency department, ED, emergency room, ER, hospital, inpatient, acute setting, acute care setting, intensive care unit, ICU, communication, Facetime, iPad, WhatsApp, video conference,*



*teleconference, video call, video communication, virtual communication, online communication visitor policy, no visitor policy, visiting hours, isolated, alone, restrictions, family, relatives, caregiver, spouse, emergency contact, patient satisfaction, and family satisfaction.* All searches were filtered to exclude research that was non-English and not published within the past five years.

### **CINAHL**

The initial CINAHL search resulted in 238 articles. Once limiters including, only English language and a publication date between 2016-2021, were applied to the search, the number of articles decreased to 72. The remaining number of articles selected for review was 16.

### **PubMed**

The PubMed search yielded 547 articles. Once limits were applied, including only English language and a publication date between 2016-2021, there number decreased to 132 remaining articles. After further review, there was a total of 32 articles selected to consider further.

### **Scopus**

When utilizing the Scopus database, there were an initial 169 results from the search. After applying the limitations of only the English language and a publication date between 2016-2021, the number of articles remaining was 56. A total of 22 articles were selected for further review.

The final chosen articles among CINAHL, PubMed and Scopus related closely to the topic and were the most relevant. The ten final chosen studies resulted in high levels of evidence and the studies were qualitative to allow for clear understanding of benefits and areas of improvement.

### **Critical Appraisal and Synthesis**

Melnik and Fineout-Overholt (2019) developed a rapid critical appraisal process to identify the strengths, weaknesses, and quality of studies. This process was utilized when reviewing the chosen articles. Altogether, the appraisals reflected high-quality evidence with minimal bias and high levels of evidence. Most of the studies conducted averaged an intervention length between one to three months (see Appendix A, Table A2). The longest study, two years and two months began prior to the COVID outbreak and assessed the communication modifications during covid. The shortest intervention lasted three weeks and measured families' experiences during virtual visiting. The studies' sample sizes ranged from nine to three-hundred and twenty-eight. All of the studies measured either the patient and family experiences and/or staff experiences. The smallest study of nine participants measured the nurses' experience of the changing visitation policies. All additional studies had relatively large sample sizes. There was heterogeneity among the studies as four were conducted outside of the United States. Six studies included the families' perspectives, and the remaining studies provided insight, including patient or staff experiences. Regardless of the participant types involved in the study, there was valuable feedback reported from all studies.

### **Literature Search Conclusions**

There is sufficient evidence to suggest that virtual visiting among families, caregivers, and the next of kin is beneficial for these individuals, patients, and healthcare workers. When strict no visitor policies are in place, virtual video communication is an effective alternative (Kennedy et al., 2020; Sasangohar et al., 2020). The implementation of video communication is likely to improve family satisfaction, mental health outcomes and increase family involvement at end-of-life. Virtual video also allows staff to include families in the patient plan of care. Using

the information from the studies, implementing video communication in an acute care setting when there are visitation restrictions in place or family is not present is a feasible intervention and has the potential to increase family and patient satisfaction.

### **Theoretical Framework**

The caring theory was developed by Jean Watson to enhance education and nursing practice (Watson, 2008). Watson identified that health professionals impact patient's development through social and moral contributions and individual caring practices. The theory places patients and families at the center of the framework. The main components of the caring theory that align with this project include creating a healing environment, sensitivity to self and others, helping and trusting relationships, expression of negative and positive feelings, creative problem solving and teaching-learning (Watson, 2008).

First, *creating a healing environment* by making the patient more comfortable in their space and providing them with their support system virtually. Second, *sensitivity to self and others* by being sensitive to the emotional needs of the patient and family. Third, *helping and trusting relationships* by ensuring staff follows through when family requests to use the device for virtual visiting. Fourth, *expression of negative and positive feelings* by allowing the patients to give authentic feedback through the satisfaction surveys. Fifth, *creative problem solving* when devices are not functioning a plan will be in place to troubleshoot and fix the problem. Lastly, *teaching- learning* relates to the project as the family will be present throughout the visit and nursing staff can modify the education based on the learners needs. The restrictions put in place due to the pandemic have presented moral dilemmas in healthcare. Through the caring theory these dilemmas can be addressed, and patients and families can be holistically cared for.

### Implementation Framework

The Model for Improvement fits this project because it is simply applied among Quality Improvement projects (Langley et al., 2009). There are two parts to the framework. The first part is to determine the goal of the intended change by asking these three questions, *what are we trying to accomplish?* Then, *how will we know that a change is an improvement?* And lastly, *what changes can we make that will result in improvement?* Answering these questions initiates the second part of the framework which focuses on the change from a small scale utilizing the ‘Plan- Do- Study- Act’ cycle. This is an action-oriented technique of learning that outlines the steps for testing the change idea. Now that the change is identified the first step is to put a plan in place. Second, the plan is implemented. Third, the results are reviewed. Lastly, the reviewed results identify areas that need continuous improvements. The model works in a cyclical nature and is designed to accelerate improvement and ensure continued progress. Once initially implemented, the model can impact change across multiple domains while continuously making necessary changes (Langley et al., 2009). The model was created to be used in diverse settings, including healthcare. Therefore, this model will be used for this project in the emergency room, then expanded to more settings while continually improving the process.

The Model for Improvement will be implemented in the Emergency Department utilizing the ‘Plan-Do-Study-Act’ cycle. To address the first part of the framework the three questions must be answered. The literature review led to the answers to the questions which include improving communication among isolated patients by allowing virtual visiting measured by patient satisfaction scores. The second part of the framework, *Plan-Do-Study-Act*, is the outline of the project. First, the *plan* is to build a team, education material and buy-in from the stakeholders. Second, is *do* which is the implementation of providing communication devices

(iPad) for virtual visiting over a four-week period. Third, is to *study* the results by comparing them with the patient satisfaction scores before the implementation of the devices. Lastly, to *act* means adjustments are made based on the feedback from the patients, families, and healthcare staff.

### **Implication for Practice Change**

The COVID pandemic has created barriers among patients and families when individuals are hospitalized with COVID symptoms (Fang et al., 2020; Pursell, 2020). The no visitation policy results in not only patients but families suffering without their loved ones. This evidence has led to bridging this communication gap by implementing video visitation. This is a sound solution and allows for the closest connection when in-person visits are not possible. In order to implement video communication, devices will be deployed among the emergency department to be utilized as a virtual communication tool for suspected COVID patients. This will be conducted at a hospital in central Phoenix, level one trauma center emergency department. As the Model for Improvement framework recommends formulating a team, this team will be made up of stakeholders. The key stakeholders are invested in the change that has the aim to improve patient and family satisfaction scores. These members include the rapid increase of critically ill patients, family members, the nursing staff, the social workers, the information technology staff the senior nursing directors, the emergency medical director, and case managers.

The data collected includes patient and family satisfaction scores, which will be compared with scores obtained before implementing the communication devices and after. The project site currently measures patient satisfactions scores through an emailed survey which will be the survey utilized. This will provide insight and allows for outcomes to be measured via comparison. The evidence shows that video communication is beneficial to the patient, family,

and healthcare staff; implementing devices in the emergency department will allow patients to feel supported and families to remain connected. Comparing the satisfaction scores from before the devices were implemented to after will show whether or not the devices made an impact on the patient and family's satisfaction.

### **Ethical Consideration, Human Subject Protection, and IRB approval**

Five ethical principles guided this project: autonomy, justice, respect for persons, beneficence, and non-maleficence. Autonomy is a person's ability to act freely and independently (American Nurse Association, 2015). The project adhered to this principle by providing patients the freedom to communicate with their families, a right they do not have due to the no visitor policy in place. Justice is the principle that everyone should be treated equally, although all people are different (ANA, 2015). This project adhered to this principle by providing means of communication to all patients, including those under strict isolation. Respect for persons means understanding that all people are worthy, valued, and respected (ANA, 2015). The project adhered to this principle by respecting all individuals included in the project, including patients, family members, nursing staff, stakeholders, and all others involved. Beneficence is the principle of preventing and removing harm and benefiting people by exceeding expectations (ANA, 2015). This project adhered to this principle by exceeding the communication efforts currently in place. Finally, non-maleficence is the principle not to inflict harm and achieve a safe environment when harm is unavoidable (ANA, 2015). This project adhered to this principle as there was little risk of harm involved including confidentiality concerns. To ensure confidentiality, staff worked closely with social work to determine the next of kin/ medical power attorney of the patient. Faculty and mentors reviewed and approved the project's methodology. The project received IRB exemption from both Arizona State University (ASU) and the project site.

This project had voluntary participation therefore consent was implied. The project was explained to the patient and family then the iPad was offered as an optional communication device. The patient and family were provided with the choice to participate or refuse to protect the participant's rights. Consent was implied when the patient and family request to use the iPad for a virtual visit. Both the patient and family had the option to complete the post visit satisfaction survey. Completion of the survey was voluntary and did not impact their ability to use the iPad to communicate.

### **Setting and Stakeholders**

The project site is a hospital in the southwestern United States. The hospital is a nonprofit level one trauma center. It is the largest hospital in the capital having 746 beds. The Emergency Department is the setting of this project. This large department consists of 60 beds, eight psychiatric beds, and six beds in the trauma bay. They serve both insured and uninsured individuals.

The stakeholders are the drivers of the project. This includes the patients, families/caregivers, providers, nursing staff, ED technicians, social workers, health unit secretaries, patient experience coordinator, and information technology support. The patients and families will utilize the communication device. The nursing staff, ED technicians, social workers, patient experience coordinator, and providers managed device implementation when the family or patient voiced interest. The social workers have added responsibility to connect the staff with the medical power of attorney (MPOA) or next of kin of the incapacitated patients before utilizing the device and ensuring HIPAA privacy compliance.

### **Participants and Recruitment**

The inclusion criteria of the population consist of all patients who present to the emergency department with suspected COVID-19 and do not have any visitors. Exclusion criteria include patients under 18 years old, patients undergoing procedures, in acute distress, actively performing lifesaving measures, patients who do not wish to participate, or patients who have visitors at the bedside. The exclusion criteria are in place due to time constraints, liability, and patient and family rights.

The process for recruitment will be done in a team effort. The nursing staff, emergency department (ED) tech, patient experience coordinator, and/or provider will offer the devices to alert and oriented patients. The social workers will offer the video form of communication to the family/MPOA for critically ill patients. The social worker is the first to contact with critically ill patients' families; therefore, they will most likely be the first person to offer the iPads to this population. The registered nurse, ED tech, and provider can also inform the family of the option to utilize the video communication tool. The patients are not required to complete a survey in order to use the communication devices. The optional patient and family satisfaction surveys will be completed in person and via email after the virtual visit.

### **Project Description**

To address the concerns associated with the visitation policy among isolated patients, three iPads will be deployed throughout the department to allow for virtual communication among patients, families, and healthcare workers. To start, an email containing education will be sent to inform the nursing staff, emergency department techs, patient experience coordinator, health unit coordinators, providers, and social workers of the importance of communication among patients, families, and healthcare workers. Additionally, the email will contain a step-by-



step guide on how to set up the virtual visit and a script that can be read to introduce the project and optional survey to the patient and family members.

Once the education, guide and script are sent the implementation will begin. Patients who present to the emergency department complaining of COVID-19 symptoms are placed on airborne and contact precautions. The staff is alerted of their precautions by the electronic medical record. The nursing staff, ED technicians, or patient experience coordinator will bring a communication device to the patient's bedside and determine who, if anyone, the patient would like to communicate with during their ED stay. They will follow the script and explain there is an optional survey at the end of the virtual visit. The patient will provide the family members email to then follow the step-by-step guide of how to set up the visit on the iPad and at home. Once the visit is started the iPad will remain within the patient's room during the duration of their conversation.

After the virtual visit is complete the patient experience coordinator will send the optional survey to the family members email from a generic ED email if the family member states they would like to complete the survey. The patient experience coordinator will also locate the survey on the iPad and offer it to the patient for them to complete, if aggregable. The patient can make additional calls upon request. The tablet will be disinfected per department protocol, returned to its designated area and plugged in until its next use.

### **Data Collection and Outcomes Measurement**

The effectiveness of the intervention was measured by two satisfaction surveys. The instruments include two Likert scale surveys measuring patient (1) and family (2) satisfaction. The project lead created a patient survey and a family survey that achieved face validity via ASU faculty and mentors (see Appendix C, Figure C1 & C2). The family survey aims to measure the

families (1) understanding of the patient's condition, (2) confidence in the patient's care, (3) satisfaction of the length of the video call, (4) ability to advocate, and (5) the impact on their emotional stress. The patient survey aims to measure the patients (1) satisfaction with the tool, (2) satisfaction with the staff's involvement with the tool, (3) satisfaction with the involvement of the family in the care plan, (4) satisfaction with the involvement of the medical staff, (5) coping with being in the ED alone, and (6) emotional stress. Both surveys did not have any patient or family identifiers and were completely anonymous. The surveys were stored on Microsoft forms and destroyed one week post intervention. The data was analyzed with the Intellectus Statistics software using descriptive analysis.

### **Budget and Funding**

The educational material, step-by-step guide, script, and surveys for this project was created by the project lead on her personal computer requiring no funding. The estimated cost for the time the staff spent on the education and implementation was calculated to be around \$900 (Appendix D). This includes the time spent reviewing the information contained in the email, setting up the virtual visit, sending the surveys, and disinfecting the iPads. The department will compensate each employee who spent time participating in the project. The iPads were readily available and given to the emergency department from the intensive care unit.

### **Results**

After the four-week intervention period there was a total of nine participants who completed the satisfaction surveys. The participants included four patients and five family members. The data was analyzed using descriptive analysis for both surveys.

Each patient survey question was analyzed, and the results showed the observations for the question 'I did not experience any technical problems' had an average of 5.00 ( $SD = 0.00$ ,

$SE_M = 0.00$ , Min = 5.00, Max = 5.00, Skewness = Undefined, Kurtosis = Undefined). The observations for the question 'Using the iPad for virtual visiting helped me to cope with being in the emergency department alone' had an average of 5.00 ( $SD = 0.00$ ,  $SE_M = 0.00$ , Min = 5.00, Max = 5.00, Skewness = Undefined, Kurtosis = Undefined). The observations for the question 'The instructions for how to use the iPad were simple to understand' had an average of 5.00 ( $SD = 0.00$ ,  $SE_M = 0.00$ , Min = 5.00, Max = 5.00, Skewness = Undefined, Kurtosis = Undefined). The observations for the question 'Using the iPad and having my family present virtually has decreased my emotional stress had an average of 4.50 ( $SD = 1.00$ ,  $SE_M = 0.50$ , Min = 3.00, Max = 5.00, Skewness = -1.15, Kurtosis = -0.67). The observations for the question 'Staff included my family in the care plan during the virtual visit' had an average of 4.50 ( $SD = 1.00$ ,  $SE_M = 0.50$ , Min = 3.00, Max = 5.00, Skewness = -1.15, Kurtosis = -0.67). The observations for the question 'The iPad was easy to use' had an average of 5.00 ( $SD = 0.00$ ,  $SE_M = 0.00$ , Min = 5.00, Max = 5.00, Skewness = Undefined, Kurtosis = Undefined). The observations for the question 'The medical staff offered to have my family present via the iPad when the doctor was discussing sending me home or admitting me to the hospital' had an average of 3.00 ( $SD = 0.00$ ,  $SE_M = 0.00$ , Min = 3.00, Max = 3.00, Skewness = Undefined, Kurtosis = Undefined). When the skewness is greater than 2 in absolute value, the variable is considered to be asymmetrical about its mean. When the kurtosis is greater than or equal to 3, then the variable's distribution is markedly different than a normal distribution in its tendency to produce outliers (Westfall & Henning, 2013). The summary statistics can be found in Appendix E.

Each family survey question was analyzed, and the results showed the observations for the question 'The duration of the video call was sufficient, and the staff took enough time to answer my questions' had an average of 5.00 ( $SD = 0.00$ ,  $SE_M = 0.00$ , Min = 5.00, Max = 5.00,

Skewness = Undefined, Kurtosis = Undefined). The observations for the question 'The video communication reduced my emotional stress' had an average of 4.40 ( $SD = 1.34$ ,  $SE_M = 0.60$ ,  $Min = 2.00$ ,  $Max = 5.00$ ,  $Skewness = -1.50$ ,  $Kurtosis = 0.25$ ). The observations for the question 'I did not experience any technical problems when communicating with the patient' had an average of 5.00 ( $SD = 0.00$ ,  $SE_M = 0.00$ ,  $Min = 5.00$ ,  $Max = 5.00$ ,  $Skewness = Undefined$ ,  $Kurtosis = Undefined$ ). The observations for the question 'The video communication made me feel comfortable about the care the patient was receiving' had an average of 5.00 ( $SD = 0.00$ ,  $SE_M = 0.00$ ,  $Min = 5.00$ ,  $Max = 5.00$ ,  $Skewness = Undefined$ ,  $Kurtosis = Undefined$ ). The observations for the question 'The video communication helped to reassure me about the patient's condition' had an average of 5.00 ( $SD = 0.00$ ,  $SE_M = 0.00$ ,  $Min = 5.00$ ,  $Max = 5.00$ ,  $Skewness = Undefined$ ,  $Kurtosis = Undefined$ ). The observations for the question 'The video communication allowed me to better advocate for the patient' had an average of 5.00 ( $SD = 0.00$ ,  $SE_M = 0.00$ ,  $Min = 5.00$ ,  $Max = 5.00$ ,  $Skewness = Undefined$ ,  $Kurtosis = Undefined$ ). When the skewness is greater than 2 in absolute value, the variable is considered to be asymmetrical about its mean. When the kurtosis is greater than or equal to 3, then the variable's distribution is markedly different than a normal distribution in its tendency to produce outliers (Westfall & Henning, 2013). The summary statistics can be found in Appendix F.

Overall, both the patient and family surveys showed high levels of satisfaction. The lowest rating was on the patient survey regarding the question 'The medical staff offered to have my family present via the iPad when the doctor was discussing sending me home or admitting me to the hospital'. The average answer was 'neither agree nor disagree'. Otherwise the satisfaction was high on all other survey questions. Providing devices to allow for communication among the patients and families when visitation is not possible will bridge the

communication gap among the patients, families, and the healthcare staff. Bridging this gap will allow for high levels of patient and family satisfaction.

This project had a positive impact on both the patient and family by implementing iPads as it provided the emergency department with the ability to change the new standards that began with the pandemic and improve communication in healthcare. Evidence shows this can result in high levels of patient and family satisfaction and improve patient and family mental health. Communication is a continuum throughout the patients' stay in the emergency department, whether between the patient and healthcare staff, the family and healthcare staff, or the family and patient. Changing the communication platform in healthcare during a critical time, a pandemic, will enforce new standards and lay the foundation for future expectations of continued change.

### **Discussion**

The results of this project showed high levels of satisfaction from both the patient and family surveys. The results combined with the literature review supports the continued use of iPads with virtual visiting capabilities in the emergency department. Providing virtual visiting devices in the acute care setting allows those who are not able to connect with their family or caregiver the opportunity to have someone advocate for them, decreases stress, and increases the ability to cope with having a sick loved one.

Limitations of this study include a short intervention, small sample size, technical issues/barriers, changes in the visitation policy, and minimal baseline data. There were many technical barriers including downloading the software to the iPads and downloading the patient surveys to the iPads. This led to delays in the start of the intervention and ultimately having a short four-week intervention. By the time the intervention began visitation restrictions were

lifted which led to a small sample size. Lastly, there was not baseline data available as the project site does not collect data surrounding satisfaction related to virtual visitation.

Future research and implications should include lengthening the timeframe of the intervention to allow for more data to be analyzed. It should include all patients with or without visitors for example those traveling from out of town, pediatric patients, and the patients who have caregivers who are unable to come to the emergency department. Lastly, the project site currently uses a software on the iPads throughout the hospital that does not allow the healthcare staff to be included in the virtual visit. Downloading the software that was used on the iPads in this project to the remaining iPads throughout the hospital will allow for the staff to be involved.

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Appendix A

Evaluation and Synthesis Tables

Table A1

Qualitative Evaluation Table

Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
<b>Citation:</b> Dhahri et al., (2021). The benefits and risks of the provision of a hospital wide high-definition video conferencing virtual visiting service for patients and their relatives.	<b>Theory:</b> Grounded theory methodology	<b>Design:</b> Thematic analysis 1,009 visits were delivered. 138 feedback responses  <b>Demographic:</b> Family members and staff of pts admitted to covid ward.	<b>N=</b> 138 <b>n1=</b> 108 (relatives) <b>n2=</b> 30 (staff)  <b>Setting:</b> 419- bedded hospital; implemented within five dedicated COVID-19 wards	<b>IV- VV</b> <b>DV-</b> Email responses (broken into 5 themes) <b>DV1-</b> appreciative factors <b>DV2-</b> Organizational skills <b>DV3-</b> Palliative care	<b>Instruments:</b> Responses were in a form of reflection. There was no formal survey questionnaire. The responses were emailed post VV. The responses were unaltered, checked for duplication, coded manually, by a single doctor. Data validation	<b>Data analysis:</b> analyzed by two independent assessors.  Thematic analysis was used to draw conclusions .	<b>Findings/Results:</b> VV is a valuable way to connect patients with their loved ones; however, there are risks of mental health and well-being among healthcare workers who are assigned with	This study was reported in line with the SQUIRE. <b>LOE:</b> III <b>Strengths:</b> reliable cyber security, widespread feedback <b>Weaknesses:</b> High attrition rate (around 90%), small sample size, not RCT, no CG. Informal analysis. Funding not

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<p><b>Funding:</b> Not disclosed</p> <p><b>Bias:</b> No recognized conflicts or bias</p> <p><b>Country:</b> United Kingdom</p>		<p><b>Method:</b> Institute of Healthcare Improvement methodology</p> <p><b>Purpose:</b> determine the impact of VV on staff and patients’ loved ones (visitors).</p> <p><b>Exclusion:</b> None explicitly stated. Must be on covid ward, cannot be from another unit.</p>		<p><b>DV4-</b> Staff communication</p> <p><b>DV5-</b> VV process issues</p>	<p>was done by a second analyst. Responses were categorized in 5 themes</p>		<p>facilitating the calls</p> <p><b>Themes:</b> Appreciative factors</p> <p>Organizational skills</p> <p>Palliative care</p> <p>Staff communication</p> <p>VV process issues</p>	<p>disclosed.</p> <p><b>Conclusion:</b> Moderate evidence demonstrating the benefits of VV during visitor restrictions in an acute healthcare setting.</p> <p><b>Feasibility:</b> Recommended for use in practice because of increased satisfaction of family, staff and pt (94.9% positive feedback); decreases the risk of long-term psychological harm. Increases support.</p>

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Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
<p><b>Citation:</b> Wu et al., (2020). Smartphone-enabled, telehealth-based family conferences in palliative care during the COVID-19 pandemic: Pilot observational study</p> <p><b>Funding:</b> not disclosed</p> <p><b>Bias:</b> There may be observational bias in the study considering the family</p>	Inferred to be caregiving dynamic theory	<p><b>Design/Method</b> : Three phase design: pre visit, during-visit, post-visit. The model integrates principles from the concept of SDM and the VALUE approach</p> <p><b>Purpose:</b> to establish a smartphone-enabled telehealth model for palliative care family conferences</p>	<p>N= 14</p> <p><b>Setting:</b> Palliative care unit &amp; virtual visits</p> <p><b>Demographics</b> : PT mean age: 73                      Female: 6                      Male: 8                      41-60 YO: 2                      61-80 YO: 6                      Over 80 YO: 6                      Married: 12                      Single: 1                      Widowed: 1                      Illiterate: 2                      Primary caregiver: Spouse: 5                      Son or daughter: 5                      Sibling: 2                      Other: 2</p>	<p><b>IV-</b> telehealth video conferences  <b>DV1-</b> family attitudes  <b>DV2-</b> Family satisfaction</p>	<p><b>Questionnaire:</b> Post conference questionnaire with three yes/no questions. Measuring family attitudes &amp; satisfaction towards telehealth use during family conferences.</p>	<p><b>Analysis:</b> chi-square test logistic regression analysis</p>	<p><b>Findings:</b> Care goals/ decisions were reach successfully in 93% of cases in family conferences. 36% of families gave a <i>good</i> or <i>very good</i> rating and 64% gave a <i>neutral</i> rating.</p> <p><b>DV1:</b> 9, 64%  <b>DV2:</b> 5, 36%</p>	<p><b>LOE:</b> III  <b>Strength:</b> Detailed feedback in from patients and caregivers in addition to the questionnaire  <b>Weakness:</b> small sample size, only done in one setting (palliative care), attrition not addressed.  <b>Conclusion:</b> High caregiver satisfaction using video conferencing; No negative feedback, only <i>very good, good, or neutral</i>.  <b>Feasibility/Applyability:</b> This would be easily duplicated</p>

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conference process was not recorded to be reviewed.  <b>Country:</b> Taiwan			Spouses or children: 10 Terminally ill PT with cancer: 13 PT had a stroke: 1  <b>Exclusion:</b> must be over 20 years old. Families must be able to use smartphone.					for inpatient use. The study show pt and family satisfaction is improved with no negative comments associated with utilizing video conferencing. This would be especially true considering the alternative when visitors are not allowed.

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Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentatio n	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
<p><b>Citation:</b> Feder et al., (2021). “Why couldn't I go in to see him?” Bereaved families' perceptions of EOL communication during COVID-19. <b>Funding:</b> One author received funding from Project grant K12HL138037 from the National Heart, Lung, and Blood Institute and the Yale Center for</p>	<p>Inferred to be peaceful EOL theory</p>	<p><b>Design/Method</b> : Mixed methods study  <b>Purpose:</b> identify families perception/ concerns with EOL communication during a pandemic</p>	<p><b>N</b>=328 <b>Setting:</b> 37 Veterans Affairs medical centers <b>Demographics</b> : -mean age: 76 YO - male 96% - white, non-Hispanic 46.7% - COVID-19 diagnosis 40%. - died in an intensive care or other acute care unit 66% - document goal of care conversation for life-sustaining treatment preferences at the time of</p>	<p><b>IV-</b> communication <b>DV1-</b> care quality</p>	<p><b>Questionnaire:</b> 3 open-ended questions on the BFS: 2 standard questions on care quality, a 3rd question to understand perceptions of care quality plus suggestions for how EOL care communication could improve during the pandemic.</p>	<p><b>Analysis:</b> Directed content analysis - coded and analyze the three BFS open-ended questions. Responses analyzed in Microsoft Excel. Two authors reviewed and coded 37% of respondent rows independently and jointly. Then met to create, revise, and complete</p>	<p><b>Findings:</b> high-quality communication through EOL while restricted visitation is possible and should be promoted using video technology. This will allow face-to-face communication among family and caregivers with patients.  <b>Themes:</b> - subject (staff &amp; patient). - perceived quality (high-</p>	<p><b>LOE:</b> III <b>Strength:</b> findings transferable to other populations, open ended questions allowing unwavering feedback. <b>Weakness:</b> Response rate of 37.1%, the research team analyzed and coded the results. Interviewers did not probe, this limits interpretation of data. <b>Conclusion:</b> High quality communication during EOL is feasible through</p>

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Implementation Science. <b>Bias:</b> none <b>Country:</b> USA (VA medical centers)			death 94% <b>Exclusion:</b> Must be next-of-kin of Veterans who died in one of 37 VA medical centers of: -acute care -intensive care -nursing home -hospice units			the code key.	quality & low-quality)	video technology and allows for face-to-face communication. <b>Feasibility/Applicability:</b> These results show the importance of implementing a communication plan for critically ill, during EOL in an acute care setting.

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<p><b>Citation:</b> Kennedy et al., (2020). Perspectives on telephone and video communication in the ICU during COVID-19</p> <p><b>Funding:</b> Two authors received grants through NIH grant 5K23NS097629 grant NIH-NHLBI K24 HL148314</p> <p><b>Bias:</b> None</p> <p><b>Country:</b> Southwestern</p>	<p>Inferred to be transition care model</p>	<p><b>Design/ Method:</b> Semi structured qualitative interviews</p> <p><b>Purpose:</b> Understand perspectives and attitudes between family members and ICU staff in regard to phone and video interactions</p>	<p><b>N1-</b> 21 (family) <b>N2-</b> 14 (clinician) <b>Setting:</b> medical center, ICUs <b>Demographic:</b> <b>PT:</b> F 43%, M 67% W 71%, other 29% neuro injury 67% cardiac arrest 14% Ventilated 71% Survived to hospital discharge 57% <b>Family members:</b> F 76%, M 24% W 95%, B 5% Spouse 47% Child 33% Parent 14%</p>	<p><b>IV-</b> phone and video conferencing <b>DV1</b> experiences perspective and attitudes of family members <b>DV2</b> understand ICU clinicians phone and video interactions</p>	<p>Semi-structured qualitative interviews</p>	<p><b>Analysis:</b> Codebook was developed via content analysis approach and then analyze interview transcripts; followed by two additional investigators who reviewed the coding independently.</p>	<p><b>Findings:</b> Benefits include communication goals were met and family saw general impression of the patient. Families felt they were kept well informed. Drawbacks include phone conversations result in difficulties using silence effectively and ensuring families understand high stake conversations <b>Themes:</b> Effectiveness</p>	<p><b>LOE: II</b> <b>Strength:</b> clinicians with many years of experience, nurse with training in communication <b>Weakness:</b> Small study, majority of patients did not have covid, majority of families were white and well-educated. <b>Conclusion:</b> Video conferencing is more effective than phone communication from a clinician and family standpoint. Importance of</p>

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Pennsylvania, USA			HS grad or less 24% Some college 33% Bachelors or more 43% <b>Clinicians:</b> Female 36% Years in specialty 7.4 average Attending 21% Fellow 36% Resident 21% Nurse 21% <b>Exclusion:</b> Must be ICU (family/clinicia n) no visitor policy, except actively dying pt's.				2 Benefits and limitations 3Communication strategies 4 Discordant perspectives between families and clinicians r/t remote discussions	mimicking an in person experience with the camera positioning for the family. <b>Feasibility:</b> This study shows the benefits and effectiveness of video communication when there is a no visitor policy in place from the family and clinicians perspective.

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<p><b>Citation:</b> Sasangoahar et al., (2020). Use of tele-critical care for family visitation to ICU during the COVID-19 pandemic: An interview study and sentiment analysis</p> <p><b>Funding:</b> None stated</p> <p><b>Bias:</b> None</p> <p><b>Country:</b> Texas, United States</p>	<p>Inferred to be grounded theory</p>	<p><b>Design/ Method:</b> interview study and sentiment analysis</p> <p><b>Purpose:</b> document families experiences of VV including feelings, barriers and opportunities for improvement</p>	<p><b>N-</b> 230 <b>Setting:</b> acute care setting- ICU</p> <p><b>Demographic:</b> There was not any demographical data collected d/t the private and emotional nature of the visits</p> <p><b>Exclusion:</b> Must be ICU pt</p>	<p><b>IV</b> virtual visiting <b>DV1</b> feelings and sentiments <b>DV2</b> barriers concerns and challenges <b>DV3</b> potential improvements to VV</p>	<p>Post-visit Phone interviews</p>	<p><b>Analysis:</b> inductive thematic analysis, Valence-based and manual sentiment analysis</p>	<p><b>Findings:</b> over 86% positive sentiments, with some neutral (7.3% and 6.8%) and negative (4.5% and 6.4%) sentiments. Four primary concerns: not able to communicate, technical difficulties, lack of touch and physical presence, &amp; frequency and clarity of communication</p> <p><b>Theme 1</b></p>	<p><b>LOE:</b> II <b>Strength:</b> large amount of participants, the Consolidated criteria for Reporting Qualitative research guidelines were utilized for the reporting of the methods, analysis and results. <b>Weakness:</b> no demographical data was collected; interviews were not recorded therefore could not be reviewed. Documenting of interviews was completed in real</p>

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							1. Feelings barriers, challenges or concerns faced using this service 2. opportunities for improvement <b>Theme 2</b> 1. on-demand access 2. improved communication with the care team 3. improved scheduling processes 4. improved system feedback and technical capabilities	time by interviewer. <b>Conclusion:</b> When in person visitation is restricted the best option is VV. Family involvement in ICU is very important and this is the best way to ensure involvement. <b>Feasibility:</b> This study identifies the importance of family involvement in the ICU and offers a great solution during ‘no visitor policy’. VV is a feasible solution!

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Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
<p><b>Citation:</b> Creutzfeldt et al., (2020). Family presence for patients with severe acute brain injury and the influence of the COVID-19 pandemic</p> <p><b>Funding:</b> career development award; NINDS grant number K23 NS099421</p> <p><b>Bias:</b> None</p> <p><b>Country:</b> USA</p>	<p>Inferred to be the transition care model</p>	<p><b>Design/ Method:</b> larger single-center prospective longitudinal cohort study</p> <p><b>Purpose:</b> To explore family experience of loved ones with severe acute brain injury with a focus on impact of family presence.</p>	<p><b>N-</b> 19 <b>N2-</b> 22 <b>Setting:</b> ICU <b>Demographic Patient:</b> mean age: 54.8, F 37%, W 79%, neuro diagnosis 95%, cardiac arrest 5%, average LOS 35 days, avg. GCS at TOI 9 <b>Family:</b> Avg age 51, F 59%, W 86%, spouse 41%, parent 23%, child 32% <b>Exclusion:</b> must be ICU pt three or more days, diagnosis of stroke, traumatic brain injury, or</p>	<p><b>IV</b> family presence <b>DV1</b> explore family experience <b>DV2</b> Impact of family presence</p>	<p>In-depth semi-structured interviews audiotaped and transcribed.</p> <p>in person and over the phone interviews</p>	<p><b>Analysis:</b> Qualitative description with thematic analysis</p>	<p><b>Findings:</b> Virtual communication is beneficial to families and patients; the results are broken into themes. <b>Themes:</b> 1 cope by being at the bedside 2 protect and advocate for the patient 3 build trust with clinicians 4 receive emotional support in the ICU</p>	<p><b>LOE:</b> II <b>Strength:</b> large cohort study, interview was done amidst visitor restrictions being placed allowing for insight on the change. <b>Weakness:</b> limited generalizability, family members were present before visitor restrictions causing differences in their response resulting in potential bias <b>Conclusion:</b> Family at the bedside</p>

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			hypoxic ischemic encephalopathy after cardiac arrest, a Glasgow Coma Scale (GCS) score $\leq 12$ , and have a family member at bedside or available by phone.					contributes to patients needs. <b>Feasibility:</b> when family at the bedside is restricted, VV is beneficial to the patient, family and healthcare team; implementing VV is feasible.

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<p><b>Citation:</b> Rose et al., (2021). Communication and VV for families of patients in intensive care during COVID- 19: A UK national survey.</p> <p><b>Funding:</b> facilitated by King’s Health Partners and philanthropic funding to Life Lines</p> <p><b>Bias:</b> possible selection and social reliability bias</p>	<p>Inferred to be transition care model</p>	<p><b>Design/ Method:</b> Multi-centre, cross-sectional</p> <p><b>Purpose:</b> 1 understand how communication between families, patients and the ICU team was enabled during the pandemic</p> <p>2 understand strategies used to facilitate virtual visiting and associated benefits and barriers</p>	<p><b>N-</b> 117 <b>Setting:</b> ICUs of the UK and the Isle of Man <b>Demographic:</b> none stated</p> <p><b>Exclusion:</b> UK hospitals with at least one ICU.</p>	<p><b>IV1</b> communication <b>IV2</b> VV <b>DV1</b> understand communication during pandemic <b>DV2</b> Understand strategies of VV, benefits and barriers</p>	<p>Self-administered electronic survey sent</p>	<p><b>Analysis:</b> summative content analysis</p>	<p><b>Findings:</b> Visitor restrictions under no circumstance in 16% of hospitals, 63% allowed visitors at EOL, family liaison in 50% of hospitals, 2% of hospitals did not institute VV. <b>Benefits</b> reducing patient psychological distress (78%), improving staff morale (68%) and reorientation</p>	<p><b>LOE:</b> III <b>Strength:</b> large sample among many hospitals <b>Weakness:</b> potential of bias, no data on family perspectives of benefits and barriers. <b>Conclusion:</b> VV and dedicated communication teams were common innovations. Valuable benefits regarding patient recovery and staff morale. <b>Feasibility:</b> Is feasible during a pandemic and outside of pandemic conditions</p>

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Country: United Kingdom							of delirious patients (47%) <b>Barriers:</b> insufficient staff time, rapid implement of video technology, & challenges of family member ability to use videoconferencing technology or have access to a device.	

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<p><b>Citation:</b> Ersek et al., (2021). End-Of-Life care in the time of COVID-19: Communication matters more than ever.</p> <p><b>Funding:</b> not explicitly stated.</p> <p><b>Bias:</b> nonresponse bias</p> <p><b>Country:</b> USA</p>	<p>Inferred to be peaceful EOL theory</p>	<p><b>Design/ Method:</b> Retrospective, cross-sectional, mixed methods study</p> <p><b>Purpose:</b> examine the impact of remote communication on families' evaluation of EOL care during the COVID-19 pandemic</p>	<p><b>N-</b> 328 <b>Setting:</b> 37 VA medical centers with the highest numbers of COVID-19 cases <b>Demographic</b> Pt average age 77, male 316, W 153, other race 167, relationship: spouse 113, child 116, COVID dx 132, VOD: ICU 122, acute 93, DNR order 287. <b>Exclusion:</b> must be next of kin of veteran patient who died inpatient</p>	<p><b>IV</b> Measures of Remote Communication Effectiveness</p> <p><b>DV</b> Bereaved families' evaluation of Care</p>	<p>after-death survey addressing the next of kin's global assessment of care of the patients last month of life</p>	<p><b>Analysis:</b> deductive open coding, data was analyzed from three questions using a priori rules</p>	<p><b>Findings:</b> Excellent care reported = 69.5% vs. 35.7% reported <i>mostly, Somewhat, or Not at All Effective.</i> 81.3% family had positive feedback regarding communication with the Veteran or the health care team. Reported excellent overall EOL care. 28.4% negative comments</p>	<p><b>LOE:</b> III <b>Strength:</b> large range of hospitals (37 VA medical centers) diverse geographic location <b>Weakness:</b> Response rate of 37%, questions were not formally tested/validated. <b>Conclusion:</b> supports remote communication, w/family, pt, and health care teams. <b>Feasibility:</b> This can be implemented when visitor restrictions are in place to improve the EOL experience for the pt and family.</p>

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<p><b>Citation:</b> Maaskant et al., (2021). Strict isolation requires a different approach to the family of hospitalized patients with COVID-19: A rapid qualitative study.</p> <p><b>Funding:</b> No external funding</p> <p><b>Bias:</b> possible bias related to documented information reviewed in patients charts</p>	<p>Inferred to be transition care model; Utilized CALMER framework</p>	<p><b>Design/ Method:</b> two focus-groups, RADaR method</p> <p><b>Purpose:</b> investigate how family involvement took place, and to explore the experiences of nurses with family involvement during the COVID-19 outbreak; formulate recommendations for the involvement of family</p>	<p><b>N-</b> 189 <b>n</b> – 9</p> <p><b>Setting:</b> five COVID-19 wards of Amsterdam University Medical Centres</p> <p><b>Demographic:</b> M (64%), mean age 63 years, The median LOS five days, (26%) were transferred to the ICU, (8%) died on a COVID unit, (7%) pts readmitted. 9 nurses participated in</p>	<p><b>IV</b> family involvement <b>DV1</b> experience of nurses <b>DV2</b> recommendations for involvement of family</p>	<p>online focus-group interviews</p>	<p><b>Analysis:</b> RADaR method</p>	<p><b>Findings:</b> Infrequent and unstructured communication regarding the pt physical condition. Family involvement was increased at EOL. Nurse experienced moral distress d/t visitor restrictions and felt family contact was too much. <b>Themes:</b> 1 nurses' emotions &amp; dilemmas  2 family involvement in</p>	<p><b>LOE:</b> IV <b>Strength:</b> open and honest feedback from nurses, results allow for long term effects and improved family centered care <b>Weakness:</b> records were retrospectively reviewed; the focus group may create reluctance from the nurses to discuss experiences. <b>Conclusion:</b> The communication and family involvement changed drastically during COVID</p>

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<p><b>Country:</b> Netherlands</p>			<p>interviews, (89%) F, median age 32, median experience 9 years.</p> <p><b>Exclusion:</b> must be adult pt (≥18 years) with a confirmed COVID-19 infection, admitted to one of the COVID-19 wards. The nurses must have worked for at least four days on one of the COVID-19 wards during the study period.</p>				<p>care was limited</p> <p>3communication was mainly focused on the physical condition</p> <p>4communication changed</p>	<p><b>Feasibility:</b> the formulated recommendations for family-centered care in hospitals during periods of restricted visiting policy can be utilized and implemented into standard practice.</p>

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<p><b>Citation:</b> Nardo et al., (2021). WhatsApp video call communication between oncological patients and their families during COVID-19 outbreak.</p> <p><b>Funding:</b> No funding</p> <p><b>Bias:</b> none <b>Country:</b> Cosenza, Italy</p>	<p>Inferred to be transitional care model</p>	<p><b>Design/Method:</b> 4-point likert scale</p> <p><b>Purpose:</b> verify if the use of WhatsApp facilitates communication, improves health information, perception of safe &amp; security, reduce emotional stress during the pandemic</p>	<p><b>N-</b> 34 <b>n-</b> 15 <b>n-</b> 121</p> <p><b>Setting:</b> oncological surgical unit</p> <p><b>Demographic:</b> pre-covid mean age 70.1 years, 7/21 minor post-operative complication</p> <p><b>During covid</b> mean age 77.7 years, 5/15 minor post-operative complication,</p> <p><b>Exclusion:</b> must be elective Surgical patient and family</p>	<p><b>IV</b> communication with use of WhatsApp</p> <p><b>DV1</b> facilitate communication</p> <p><b>DV2</b> improve health information</p> <p><b>DV3</b> perception of safety and security</p> <p><b>DV4</b> reduce emotional stress</p>	<p>Anonymous Satisfaction questionnaire from patients and families</p>	<p><b>Analysis:</b> X<sup>2</sup> and Kruskal Wallis/ mann-whitney test</p>	<p><b>Findings:</b> 20% reduction of emotional stress among family, 73.3% reduction of emotional stress among pt</p>	<p><b>LOE:</b> II</p> <p><b>Strength:</b> 100% pt response rate.</p> <p><b>Strength:</b> pre-post covid surveys, large sample size</p> <p><b>Weakness:</b> only used one app</p> <p><b>Conclusion:</b> questionnaire - good reliability and large % of pt &amp; fam satisfaction, privacy protection and reduced emotional stress.</p> <p><b>Feasibility:</b> use app during pandemic/ no visit is feasible but must consider family capabilities</p>

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**Table A2***Synthesis Table*

<b>Study Characteristics</b>	Creutzfeldt et al.	Dhahri et al.	Ersek et al.	Feder et al.	Kennedy et al.	Maaskant et al.	Nardo et al.	Rose et al.	Sasangohar et al.	Wu et al.
<b>Year</b>	2020	2021	2021	2021	2020	2021	2020	2021	2020	2020
<b>Country</b>										
Italy							•			
Netherlands						•				
Taiwan										•
United Kingdom		•						•		
USA	•		•	•	•				•	
<b># of Subjects</b>										
Patient	220	138	14				34, 15			
Family	276	108	14	328	21		34, 15		230	14
Staff		30			14	9		117		
<b>Theory</b>										
Caregiving dynamic theory										•
Grounded theory		•							•	
Peaceful EOL theory			•	•						
Transition care model	•				•	•	•	•		
<b>Intervention Length</b>										
Months	26	7	3	3	1	3	2	1	3 weeks	2
<b>Setting</b>										
ICU	•		•	•	•	•		•	•	
Step-down		•	•	•		•	•			
Long Term Care			•	•						•
<b>Intervention</b>										
Video Visiting		•	•	•	•	•	•	•	•	•
Phone Visitation	•		•	•	•	•		•		
<b>Measurement</b>										
Interview/ survey/ reflection/ questionnaire	In person & phone interviews	Emailed reflection	Phone survey	Open-ended questionnaire	Qualitative interviews	Online interview	Satisfaction questionnaire	Electronic survey	Phone interviews	Yes/No Questionnaire
<b>Demographics</b>										
Median LOS	35 days	-	-	-	9 days	9 days	-	-	-	-

Key: **Comm.** – communication; **EOL** – end of life; **ICU** - intensive care unit; **LOS** – length of stay; **PT-** patients; **USA-** United States of America; **VV** – virtual visiting

Independent Variables										
Family presence/ involvement	•					•				
Remote comm./ VV		•	•	•	•		•	•	•	•
Dependent Variables-Themes										
Family attitudes & experiences	•	•	•	•	•	•	•		•	•
Healthcare staff interactions/comm.	•		•		•	•				
Barriers/concerns		•	•				•	•	•	•
Findings										
<b>Positive comments</b>		94.9% ↑	81.3% ↑				20% reduction of family stress 73.3% reduction of pt stress	78% reduction pt psychological distress	86% ↑	<i>Good/very good (36%), 9 neutral (64%)</i>
Cope with grief/ reduce stress	•	•					•	•		•
Advocate for loved one	•	•						•		•
Comm. with healthcare team	•	•	•	•	•	•	•	•		•
Increase satisfaction scores					•		•		•	•
Improved EoL care			•	•				•		
<b>Negative comments</b>		22%, 4%	28.4	12%					4.5%-6.4%	
Technology challenges					•	•	•	•	•	•
Increase stress						•				

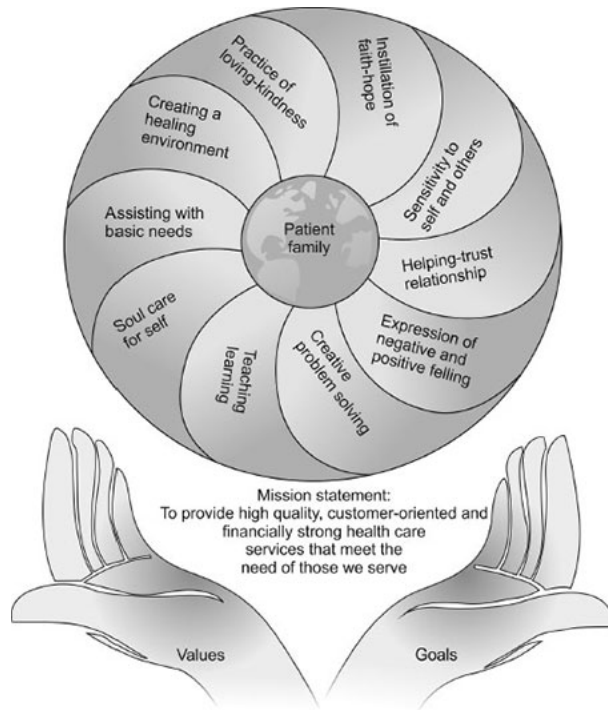
Key: **Comm.** – communication; **EOL** – end of life; **ICU** - intensive care unit; **LOS** – length of stay; **PT-** patients; **USA-** United States of America; **VV** – virtual visiting

## Appendix B

### Models and Framework

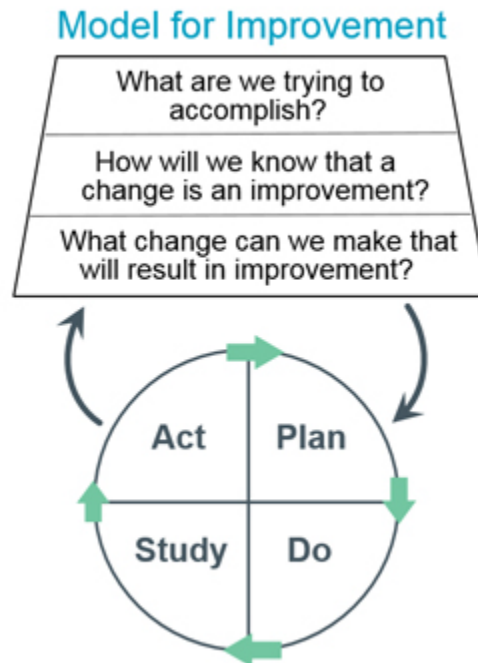
**Figure B1**

*Theory of Human Caring*



(Watson, 2008).



**Figure B2***Model for Improvement*

(Langley et al., 2009).

## Appendix C

### Patient and Family Satisfaction Surveys

#### Figure C1

##### *Patient Satisfaction Survey*

**Patient Satisfaction Questionnaire**

This project is piloted by a DNP student/emergency room registered nurse. The purpose of this project is to expand communication among patients, their families, and healthcare staff during an emergency room visit. Completion of the survey and participation in this project is voluntary. If you complete the survey, you are confirming that you voluntarily consent to participate in this project, and you understand that participation in this project is not a condition of receiving current or future care at Banner Health.

Thank you for the opportunity to expand communication and for participating in this survey.

1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, and 5 = Strongly Agree

1. The instructions for how to use the iPad were simple to understand.

1 2 3 4 5

2. The iPad was easy to use.

1 2 3 4 5

3. I did not experience any technical problems.

1 2 3 4 5

4. Staff included my family in the care plan during the virtual visit.

1 2 3 4 5

5. The medical staff offered to have my family present via the iPad when the doctor was discussing sending me home or admitting me to the hospital.

1 2 3 4 5

6. Using the iPad for virtual visiting helped me to cope with being in the emergency department alone.

1 2 3 4 5

7. Using the iPad and having my family present virtually has decreased my emotional stress.

1 2 3 4 5

Submit

**Figure C2***Family Satisfaction Survey*

## Family Satisfaction Questionnaire

This project is piloted by a DNP student/emergency room registered nurse. The purpose of this project is to expand communication among patients, their families, and healthcare staff during an emergency room visit. Completion of the survey and participation in this project is voluntary. If you complete the survey, you are confirming that you voluntarily consent to participate in this project, and you understand that participation in this project is not a condition of receiving current or future care at Banner Health.

Thank you for the opportunity to expand communication and for participating in this survey.

1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, and 5 = Strongly Agree

1. I did not experience any technical problems when communicating with the patient.

1 2 3 4 5

2. The video communication helped to reassure me about the patients condition.

1 2 3 4 5

3. The duration of the video call was sufficient, and the staff took enough time to answer my questions.

1 2 3 4 5

4. The video communication made me feel comfortable about the care the patient was receiving.

1 2 3 4 5

5. The video communication allowed me to better advocate for the patient.

1 2 3 4 5

6. The video communication reduced my emotional stress.

1 2 3 4 5

Submit

**Appendix D****Budget Plan**

<b>Phase</b>	<b>Activities</b>	<b>Cost</b>	<b>Subtotal</b>
<b>Direct Cost</b>	Printing Paper (20 pages)	-\$8.50	-\$8.50
	Ink (1 cartridge)	-\$35.99	-\$44.49
<b>Indirect Cost</b>	IPad x3	-\$897 (299 x3)	-\$941.49
	Time- Quarterly Meeting	~\$400	-\$1341.49
	Stakeholders Time	~\$500	-\$1841.49
<b>Funding</b>	Project Site	+\$1797	-\$44.49
	Self	\$44.49	\$0.00
<b>Potential Revenue/Cost Savings</b>	The potential cost savings/revenue stems from the increased patient satisfaction scores resulting in better overall ratings for the hospital system leading to increased customers/patients.		

**Total: \$0.00**

## Appendix E

## Patient Survey Data Analysis

*Summary Statistics Table for Interval and Ratio Variables*

Variable	<i>M</i>	<i>SD</i>	<i>n</i>	<i>SE<sub>M</sub></i>	Min	Max	Skewness	Kurtosis
I did not experience any technical problems	5.00	0.00	4	0.00	5.00	5.00	-	-
Using the iPad for virtual visiting helped me to cope with being in the emergency department alone	5.00	0.00	4	0.00	5.00	5.00	-	-
The instructions for how to use the iPad were simple to understand	5.00	0.00	4	0.00	5.00	5.00	-	-
Using the iPad and having my family present virtually has decreased my emotional stress	4.50	1.00	4	0.50	3.00	5.00	-1.15	-0.67
Staff included my family in the care plan during the virtual visit	4.50	1.00	4	0.50	3.00	5.00	-1.15	-0.67
The iPad was easy to use	5.00	0.00	4	0.00	5.00	5.00	-	-
The medical staff offered to have my family present via the iPad when the doctor was discussing sending me home or admitting me to the hospital	3.00	0.00	4	0.00	3.00	3.00	-	-

*Note.* '-' indicates the statistic is undefined due to constant data or an insufficient sample size.

## Appendix F

### Family Survey Data Analysis

*Summary Statistics Table for Interval and Ratio Variables*

Variable	<i>M</i>	<i>SD</i>	<i>n</i>	<i>SE<sub>M</sub></i>	Min	Max	Skewness	Kurtosis
The duration of the video call was sufficient, and the staff took enough time to answer my questions	5.00	0.00	5	0.00	5.00	5.00	-	-
The video communication reduced my emotional stress	4.40	1.34	5	0.60	2.00	5.00	-1.50	0.25
I did not experience any technical problems when communicating with the patient	5.00	0.00	5	0.00	5.00	5.00	-	-
The video communication made me feel comfortable about the care the patient was receiving	5.00	0.00	5	0.00	5.00	5.00	-	-
The video communication helped to reassure me about the patient's condition	5.00	0.00	5	0.00	5.00	5.00	-	-
The video communication allowed me to better advocate for the patient	5.00	0.00	5	0.00	5.00	5.00	-	-

*Note.* '-' indicates the statistic is undefined due to constant data or an insufficient sample size.