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Telemedicine as a Tool to Provide Family Conferences and Palliative Care Consultations in Critically Ill Patients at Rural Health Care Institutions: A Pilot Study

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Abstract

Background: Many critically ill patients who transfer from rural hospitals to tertiary care centers (TCCs) have poor prognoses, and family members are unable to discuss patient prognosis and goals of care with TCC providers until after transfer.

Aim: Our TCC conducted teleconferences prior to transfer to facilitate early family discussions.

Design/Setting: We conducted a retrospective review of these telemedicine family conferences among critically ill patients requested for transfer which occurred from December 2008 to December 2009 at our TCC. Outcomes for each patient and detailed descriptions of the conference content were obtained. We also assessed limitations and attitudes and satisfaction with this intervention among clinicians.

Results: During the 12-month period, 12 telemedicine consultations were performed. Of these patients, 10 (83%) died in the 30 days following the request for transfer. After the telemedicine consultation, 8 (67%) patients were transferred to our TCC from their respective hospitals, while 4 (33%) patients continued care at their regional hospital and did not transfer. Of the patients who transferred to TCC, 7 (88% of those transferred) returned to their community after a stay at the TCC.

Conclusion: This study demonstrates that palliative care consultations can be provided via telemedicine for critically ill patients and that adequate preparation and technical expertise are essential. Although this study is limited by the nature of the retrospective review, it is evident that more research is needed to further assess its applicability, utility, and acceptability.

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Declaration of Conflicting Interests

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Keywords

telemedicine; palliative care; communication in the ICU; telemedicine and communication; rural health care

Background

Critically ill patients have a high risk of death and are often first seen at smaller rural hospitals and subsequently transferred to tertiary care intensive care units (ICUs) for a higher level of care.¹ These transferred critically ill patients are at very high risk of adverse events due to the interhospital transport and the nature of their illness.² Early and open communication about prognosis, palliative care, and end-of-life (EOL) issues is very important to such critically ill patients and their families.^{3,4} Studies have shown that early prognostic communication increases perceived quality of death and dying among family members of loved ones who die in the ICU.³ There is a high rate of posttraumatic stress disorder in family members of critically ill patients,^{5–9} and this rate has been reduced with early, effective communication.³ Due to the long transfer times and the need for family members to travel to the receiving hospital, families of these patients may not be able to participate in discussions regarding disease processes, prognosis, and goals of care until after the patient has been transferred, sometimes even days into their loved one's critical illness. This lack of early communication with clinicians created by the transfer process may add additional burden to family members who are already experiencing stress and anxiety due to their loved one's illness. In addition, pretransfer evaluation of the medical condition, treatment options, prognosis, and discussion of goals of care could help with early identification of situations where treatment plans delineate comfort-directed EOL care. In such situations, the added burdens of transfer and increasing distance between patients and family at EOL may outweigh benefits of transfer if EOL care could be successfully delivered in their home community.

Our hospital is the only tertiary care center (TCC) for a large catchment area that comprises all of Vermont and most of upstate New York. Our medical ICU (MICU) has approximately 900 admissions per year, and about one-third of these are direct transfers from rural hospitals in the region. At our institution, Fletcher Allen Health Care (FAHC) in Burlington, Vermont, we have been using telemedicine to provide a variety of subspecialty consultations to rural institutions throughout Vermont and much of upstate New York. Our clinicians have used telemedicine as a tool to provide family members and treatment teams the opportunity for early family conferences and palliative care consultations prior to transfer of critically ill patients. Telemedicine has been increasingly used for educational and clinical purposes to overcome distances between participants, especially in rural communities, but to our knowledge, we are the first center to use it for early clinician–family communication in critically ill patients prior to transfer to a tertiary center ICU.

We hypothesize that telemedicine family conferences may ultimately lead to decreased burden on family members and provision of care in alignment with patient wishes. In order to fully explore this hypothesis, a prospective qualitative and comparative study is needed.

This study describes a retrospective review of telemedicine palliative care conferences at our hospital as an initial step to assess feasibility of using this tool for patients who are critically ill transferring from smaller community hospitals to our TCC.

Methods

The purpose of this retrospective review was to investigate the feasibility and to describe patient outcomes of palliative care consultations via telemedicine in critically ill patients. We also sought to identify any immediate barriers to conducting such conferences. Telemedicine has been used as a method of communicating and conducting palliative care consultations at our institution since late 2008 as a result of a communication quality improvement initiative. To gather information on using telemedicine in a palliative care setting, we retrospectively examined telemedicine palliative care conferences that occurred from December 2008 to December 2009 at FAHC. For this study, we focused on palliative care consultations that occurred via telemedicine for critically ill patients with a high risk of death who were being prepared for transfer to our MICU.

Patient Population

In this review, we included patients who had been requested for transfer to our MICU from several rural community hospitals. Additionally, we included patients with one or more of the following diagnoses that may have served as a trigger for the accepting physician to offer a teleconference prior to transfer: prolonged multisystem organ failure; metastatic cancer with respiratory or cardiac failure; severe anoxic encephalopathy; very advanced age (>90 years) with organ failure; advanced dementia; or end-stage heart, liver, or lung disease with less than 6 months estimated survival or with a poor baseline quality of life.

Intervention

All accepting physicians of TCCs had received in-service training about palliative care teleconferences when the local quality improvement initiative began. Referrals were typically generated when accepting physicians from the TCC ICU determined that patients being requested for transfer were at high risk of death and had at least one of the above-mentioned inclusion diagnoses. Accepting physicians then asked the referring physicians to consider a telemedicine family conference. If the transferring physician and the family members/loved ones of the critically ill patient agreed, a telemedicine palliative care family conference would occur. Conferences usually included the transferring physician and family member/loved ones of the patient to be transferred conferenced in with several team members at our TCC including the MICU attending physician accepting the transfer, a social worker, a member of the palliative care team, and trainees in Internal Medicine or Pulmonary and Critical Care Medicine.

The goals of the teleconference were to assess family/surrogate understanding of illness and expectations, discuss treatments and prognosis, and ascertain goals of care including discussion of EOL care goals if the illness was felt not to be survivable. If transfer was consistent with the patient's goals, the aim was to facilitate smooth transition of care, in both

medical and social domains. If goals of care were focused on comfort-directed EOL care, our providers supported appropriate care planning at the patient's home institution.

Technology

Our site's telepalliative care consultations are performed with state-of-the-art videoconference equipment including both stationary and roving units, which can be moved to any part of the hospital. Videoconference apparatuses at rural transferring hospitals are either stationary units located in the emergency department or roving units that are moved to the local ICUs for teleconferencing.

Analysis

To gain a better understanding of this novel intervention, we performed a retrospective descriptive analysis assessing the number of consultations provided during the study period, whether the patients in question transferred to FAHC or remained at their home institution, patient demographics, and mortality and disposition of patients after hospitalization. Potential barriers were assessed by review of conference notes made by participating clinicians. Data sources included the electronic health record as well as informal documentation by the physician running the conferences which were maintained outside of the health record for the purpose of tracking data during the quality improvement initiative. We obtained institutional review board approval prior to reviewing these data.

Results

During the 12-month study period, 12 telepalliative care consultations were performed for critically ill patients who had been requested for transfer to FAHC. The age of the patients ranged from 46 to 84 years, with a mean age of 65.6 ± 10.6 years. Detailed descriptions of these 12 patients are shown in Table 1. Of the 12 patients who received a telepalliative care consultation, 8 (67%) transferred from the referring hospital to our institution, while 4 (33%) remained at their home institution. After transfer to FAHC, 7 (88%) of the 8 transferred patients ultimately transferred back to their local hospital for ongoing care; 10 (83%) of the 12 patients died within 30 days of the conference. Two conferences were delayed due to inability of the TCC physician to participate at a specific time. All patients who transferred from the referring institution were admitted to the TCC ICU; none were stable enough for admission to the medical ward.

On review of notes taken by conference participants at FAHC, the most common documented barriers to conducting a telemedicine conference were technical limitations including problems with starting the telemedicine units and connecting between both institutions. Another perceived limitation by clinicians at our TCC was the belief that it would generally not be feasible to conduct telemedicine conferences during "off" hours in the evenings and on weekends, when dedicated telemedicine technicians were unavailable to assist with setup and to troubleshoot, unless they were appropriately trained on using the equipment and its use was relatively easy and expeditious. They were also concerned about the perceived loss of "value of in-person, physician-patient relationships," and the possible

change in the perception of the local physician's role. Many TCC clinicians also expressed concern over time involved in conducting these conferences.

Discussion

This small retrospective study of telemedicine as a method of conducting MICU/palliative care consultations for critically ill patients with a high risk of death revealed that it is feasible to conduct telepalliative care consultations in this patient cohort. Studies have shown that early communication about prognosis and goals of care can lead to increased rates of formalization of advance directives and utilization of hospice services as well as lower use of nonbeneficial life-prolonging treatments for critically ill patients who are at the end of life.¹⁰ Proactive palliative care consultations are associated with a significantly shorter ICU length of stay without any significant differences in mortality rates or discharge disposition.¹⁰⁻¹⁴ For these reasons, if telemedicine can be proved to be a useful method of early communication, it may be a valuable tool to improve these parameters among rural patients.

Among the 12 patients receiving a telepalliative care conference in our study, 83% died within 30 days of the conference, suggesting that the patients selected by their clinicians for these conferences are those at very high risk of death based on their admission diagnosis and other factors.¹⁵ Despite receiving an early palliative care consultation, the majority of these patients still transferred to our facility for further care. However, it is notable that 7 (88%) of 8 patients who transferred to FAHC eventually transferred back to their initial transferring hospital or another care facility closer to home for ongoing medical care and/or EOL care. Because this study was a retrospective chart review, the reasons for transferring back to the referring hospital are not clear, as these details were not always available in the medical record. Possible reasons include (1) patients/families received the care they expected at FAHC and no further tertiary level care was needed, (2) patients/families preferred to receive the remainder of their care closer to home, and (3) after a period of evaluation and treatment, the MICU team at FAHC concluded that further intensive or tertiary care interventions would no longer provide benefit. Further evaluation is warranted to determine whether early discussion of prognosis and goals of care as outlined in this project has a direct impact on the decision and timing of transition of goals and location of care preferences. A study conducted by Yun et al found that patients who were aware of their terminal status were more likely to use palliative care (70.6%) services and less likely to use the ICU (50.0%).¹⁶ Previous studies have also reported that patients who are dying usually prefer to die at or near home,^{17,18} and the patients/families in our study who transferred to FAHC may have realized, through their care and communication at our institution and prior to transfer, that death was imminent and thus chose to spend their final days at or closer to home.

In this study, 33% of the patients did not transfer after receiving a telepalliative care consultation, possibly due to the patient's family feeling reassured that care that would be provided at our TCC beyond what was received at the transferring hospital would be unlikely to provide benefit and that death was imminent. In addition to the potential impact on health care cost, another important potential benefit of the telemedicine intervention may be that it decreases the psychosocial burden on patients and families in cases where transfer

of patients expected to die within a short time is avoided. However, a prospective study with participant interviews would be necessary to reliably determine the reasons for not transferring and impact of that decision on care and satisfaction.

Technological issues were the most commonly cited barrier to conducting these conferences. Although using formal telemedicine equipment is useful in that the units allow for greater clarity and visualization, we may be able to overcome this limitation using simpler and widely available Web conferencing services. However, palliative care consultations typically involve quite sensitive discussions, and using Web-based services may be currently limited due to privacy concerns.

There are several limitations to this study. First, because it was retrospective, we are not able to assess the quality of the telemedicine conference and we do not have any qualitative/experiential data from conference participants. For example, we do not have data on the types of questions that the family members asked or the responses from physicians. Additionally, there are no data regarding the number of participants on each side of the telemedicine conference. Therefore, although we can infer that conducting these conferences is feasible, the perceptions of participants and utility of such an intervention cannot be evaluated. Another limitation of this study is that we did not have access to data from the transferring hospitals so we are not able to gain a better understanding of why patients transferred back to their local hospital. In addition, we do not have any experiential data from the 4 patients who chose not to transfer to our site after the telemedicine conference. From a quantitative standpoint, we do not know how long it took from initial referral to initiation of the conferences or how many requests for telemedicine conferences were made during the study period but did not occur. Furthermore, the sample in this study is small so generalizations and inferences need to be made cautiously. Despite these limitations, this pilot study does show some important preliminary findings using a novel intervention. Providing earlier communication and addressing palliative domains prior to MICU transfer via teleconferencing are feasible and doing so offer an opportunity to assess if transfer is consistent with goals, prognosis, and patient/family preference.

Future Directions

In view of these data and taking into consideration the limitations of this pilot study, we are now conducting a prospective qualitative study of telemedicine family conferences in critically ill patients in rural hospitals with a high risk of death prior to transfer to a TCC ICU. We will be assessing further feasibility questions such as timing of conferences, technological limitations, and overall acceptability of this form of communication by all participants. We will also assess perceptions of family members/loved ones and clinician participants in the conferences as well as gauging family satisfaction and quality of communication during the teleconferences.

Conclusion

This study demonstrates that palliative care consultations can be provided via telemedicine for critically ill patients and that adequate preparation and technical expertise are essential. In this study, most patients who received this type of telemedicine conference still

transferred to our TCC but ultimately transferred back to their community for the remainder of their care (community hospital, skilled nursing facility, or home). This is important information because telemedicine in this setting is a novel approach to communication and may improve rural communities' access to palliative care and MICU consultations. These critical care/palliative care telemedicine conferences may also reduce costs of care through early identification and limitation of nonbeneficial intensive therapies and optimization of community-based EOL resources. Palliative care/critical care telemedicine is a new approach to delivering high-quality patient care by providing excellent communication and by better aligning care with patient and family wishes. More research is needed to further assess its applicability and utility.

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Table 1.

Patient and Conference Descriptions.

Case	Age, years	Sex	Diagnosis	Description	Transfer status	Death within 30 days
1	46	M	Brain injury	Admitted with large cerebrovascular accident (CVA) and fall, hospitalized at a community hospital for 15 days. After minimal improvement and inability to wean from mechanical ventilation, a request to transfer to TCC for further management was made. The teleconference established that family hoped for restorative goals with an ultimate goal to return home. Patient transferred and remained at TCC for 20 days before transferring to a long-term acute care facility near home	Transferred	No
2	70	F	Multisystem organ failure (MSOF)	Admitted with sepsis from a urinary source with bacteremia and subsequent multisystem organ dysfunction. Request to transfer for further management of sepsis. The teleconference with 2 sons and daughter present discussed patient had felt his quality of life was excellent prior to acute illness. Established restorative goals. Transferred to TCC and remained for 10 days. Transferred back to referral hospital for end-of-life care	Transferred	Yes
3	76	F	MSOF/end-stage renal disease (ESRD)	Admitted with sepsis of unclear etiology with multisystem organ dysfunction. Request to transfer to TCC for end-stage renal disease and need for acute dialysis. The teleconference details were not documented. Patient remained at TCC for 12 days. Family decided to discontinue or withhold life-prolonging treatments (ie, dialysis, no tracheostomy, no mechanical ventilation). Transferred back to local hospital for hospice services	Transferred	Yes
4	74	M	Colectomy/postoperative complications	Admitted with intestinal obstruction, underwent exploratory laparotomy with subsequent postoperative complications, and failure to liberate from the ventilator. Request to transfer to TCC due to inability to wean patient from ventilator. During the teleconference family described that the patient perceived his baseline quality of life to be poor. Family desired transfer to TCC for a second opinion from surgery and medical consultants for hopes of achieving restorative goals. Patient was transferred to TCC for 1 week and then transferred back to referral hospital once efforts proved to be ineffective. Patient died 1 week later after withdrawal of life-sustaining measures	Transferred	Yes
5	64	M	Cirrhosis/acute renal failure	Admitted with liver failure and progressive hepatorenal syndrome. Request to transfer to TCC for dialysis. The family teleconference revealed history of alcoholism and Hepatitis C infection. Very poor quality of life prior to admission. Wife wanted trial of dialysis. Patient transferred to TCC, underwent dialysis for 2 days. The patient had a rapid clinical decline in clinical status requiring increasing life support measures. Due to failure to improve, family decided to transition to treatment therapies directed at primarily at comfort. After withdrawal of life-sustaining measures, the patient was transferred home with hospice.	Transferred	Yes
6	67	F	Meningitis/cerebrovascular accident (CVA)	Admitted with bacterial meningitis to a local hospital. Course complicated by multiple large areas of stroke and progressive decline in clinical status despite therapies. Request to transfer to TCC for further management. During the family teleconference the patient's children and spouse discussed with palliative care the patient's poor prognosis and decision to withdraw life-sustaining measures at transferring hospital was made	No	Yes
7	55	M	Advanced amyotrophic lateral sclerosis (ALS)	Admitted with progressive ALS and respiratory failure. Intubated and request to transfer to TCC to assist with management. The family teleconference established goals to return home if possible. Agreed to palliative care support throughout hospitalization. The patient was transferred to TCC for 14 days then transferred back to local hospital with a long-term ventilator. Acute decline at patient's local hospital and died within a week of transfer	Transferred	Yes
8	84	F	MSOF/ESRD	Admitted with sepsis and ESRD. Transfer requested for management of renal failure. Family teleconference: established patient was a nursing home resident prior to admission due to multiple chronic medical problems. Family goals were to return to previous functional status. The patient was transferred to our TCC and had acute decline in the first 24 hours. Family changed status to do-not-resuscitate (DNR) and patient died in the TCC intensive care unit	Transferred	Yes
9	57	M	CVA/pneumonia	Admitted with cerebrovascular accident at local hospital and subsequently developed acute pneumonia and respiratory failure. Transfer was requested for further subspecialty experience. The family teleconference confirmed that family wanted short-term intubation and trial of all therapies. The patient transferred to the TCC and was extubated on TCC	Transferred	Yes

Case	Age, years	Sex	Diagnosis	Description	Transfer status	Death within 30 days
10	64	F	Chronic obstructive lung disease (COPD)	hospital day #4, status changed to DNR/DNI transferred to floor and subsequently back to referral hospital for further management. The patient died at the local hospital several days later (reason not documented in TCC records) Admitted with COPD exacerbation and respiratory failure. Transfer was requested for further management with subspecialty experience. The family teleconference established that the patient had severe oxygen-dependent COPD, and although they had restorative goals they did not want the patient transferred if no additional therapies were available. The patient was ultimately extubated at the referral hospital and survived to discharge. Died at transferring hospital 7 months later after another COPD exacerbation	No	No
11	58	M	Metastatic esophageal and lung cancer	Admitted with respiratory failure. Request for transfer for further management. The family teleconference revealed history of metastatic esophageal and lung cancer. Goals were restorative and after discussion with family, palliative care and oncology specialists it was determined that further therapies did not align with this goal. Decision to transfer the patient to hospice services	No	Yes
12	73	M	COPD/congestive heart failure (CHF)	Admitted for COPD/CHF exacerbation and respiratory failure. Request for transfer to TCC was made for management of respiratory failure. Family teleconference established that the patient was in a nursing home prior to admission and had a poor quality of life. After discussion with palliative care, the family decided to continue with therapy with no escalation of care at their local hospital, changed status to DNR/DNI. Remained at the local hospital for care and died 3 days later	No	Yes

Abbreviations: CVA, cerebrovascular accident; TCC, tertiary care center; MSOF, multisystem organ failure; ESRD, end-stage renal disease; DNR, do-not-resuscitate; DNI, do-not intubate; COPD, chronic obstructive pulmonary disease; CHF, congestive heart failure.