

NURSE PRACTITIONER-LED TELEHEALTH TO IMPROVE OUTPATIENT PEDIATRIC
TRACHEOSTOMY MANAGEMENT IN SOUTH TEXAS

A Doctor of Nursing Practice Project Report

by

LAURA MORENO

MSN, Texas A & M University – Corpus Christi, 2013

Submitted in Partial Fulfillment of the Requirements for the Degree of

DOCTOR OF NURSING PRACTICE

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This Doctor of Nursing Practice Project Report meets the standards for scope and quality of Texas A&M University-Corpus Christi College of Nursing and Health Sciences and is hereby approved.

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August 2018

DEDICATION

I would like to dedicate this work to my family and friends who have provided unending support throughout this educational journey. To my parents for being my biggest fans and giving me unconditional love. To my husband and my children for always loving me, being patient with me, and believing in me. Their constant motivation and words of encouragement gave me the strength to keep going until the very end. Words cannot express the gratitude I have for each and every one of you. Lastly, to my great God above for placing me in this career path of helping others and leading me to better educational opportunities that will transcend into my daily practices.

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ABSTRACT

Introduction: Pediatric tracheostomy patients are a medically complex population with increased incidence of emergency room (ER) use, hospital readmissions, tracheostomy-associated complications, and caregiver anxiety, especially the 30 days following discharge. The objective of this quality improvement (QI) initiative was to improve access to and quality of care for vulnerable, underserved populations by providing a Nurse Practitioner-led telehealth intervention. **Method:** This pilot feasibility study utilized a one-group, pre-test, post-test, quasi-experimental, retrospective cohort design in a free-standing pediatric hospital serving underserved populations using the Caregiver Knowledge Checklist, Care Transitions Measures Survey, Telehealth Satisfaction Survey, and Trach Care Behavior Scale. **Results:** Participants experienced no post-surgical tracheostomy complications or hospital readmissions with improved scores on all survey instruments, resulting in changed department clinical practice guidelines using telehealth. **Discussion:** Telehealth is effective in managing outpatient tracheostomy patients, supporting caregivers, and refining proficiency caring for tracheostomy-dependent children. Telehealth is accessible, affordable, and effective in improving outcomes.

Key Words: Telehealth, tracheostomy, immigration, pediatric, quality improvement, readmissions

PROJECT REPORT

Nurse Practitioner-Led Telehealth to Improve Outpatient Pediatric Tracheostomy Management in South Texas

Introduction

The occurrence of patients requiring tracheostomy tube placement continues to rise across the nation. In the United States alone, there are over 100,000 tracheostomies performed every year with approximately 4,000 occurring within the pediatric population (McCormick et al., 2015). Many of these pediatric patients require an artificial airway because of prematurity, neurological impairment, congenital heart disease, respiratory insufficiency, or inability to maintain airway patency (Zhu et al., 2014). Patients with tracheostomies who rely on medical technology and multi-specialty care to sustain life have a 40% incidence of emergency room (ER) use and hospital readmission within 30 days of hospital discharge (McCormick et al., 2015). The discharge process and transition to home setting for complex post-operative tracheostomy patients have proven to be challenging for health care providers as well as caregivers (Yu, Mamey, & Russell, 2017).

Increasing caregiver anxiety, adverse events, and emergency room visits among recently discharged tracheostomy patients seen in the Ear, Nose, and Throat (ENT) clinic of a rural, underserved community in South Texas initiated exploration of a telehealth quality improvement (QI) strategy to enhance outpatient care. Subjective reports from caregivers supported by hospital records identified a need for a more innovative approach. According to Marcin, Shaikh, & Steinhorn (2016), telehealth for otolaryngology and pulmonary patients yielded improved patient satisfaction, reduced health care costs, less travel time, mitigated ER use for non-

emergent issues, and enhanced overall population health. This pilot study sought to determine feasibility in implementing a telehealth visit at 2 weeks' post-hospital discharge compared to the usual outpatient visits at 4 weeks for newly placed tracheostomy tubes in pediatric patients, with goals to improve caregiver knowledge, satisfaction, self-efficacy, and competence in tracheostomy skills. The specific aims include an increase in the caregiver knowledge responses by a minimum score increase of 2, an overall telehealth satisfaction score of more than 14, a minimum score of 25 in caregiver self-efficacy with improvement on subsequent scoring, and an improvement in caregiver knowledge of routine tracheostomy skills among the treatment group when compared to the control group using retrospective data collection.

Background

Driscoll Children's Hospital (DCH) is the leading tertiary pediatric center serving patients throughout South Texas including Corpus Christi, Laredo, and the Rio Grande Valley. The ENT department at DCH provides a critical access point to care, performing an average of 20 pediatric tracheostomies each year. Pediatric patients with newly placed tracheostomy tubes often experience an increased incidence of hospital readmissions and adverse events after discharge. Many patients and families at DCH come from rural communities in which access to care is limited. Rural residents who are of low health literacy and educational level describe a lack of access to general pediatric, specialty, and preventative services (Marcin et al., 2016). Follow-up care is challenging due to immigration, financial, transportation, and employment issues. The influx of undocumented immigrants into the U.S. and perceived threats of national safety has caused immigration policy changes and intense focus on state border security. In 2014, an estimated 1.7 million undocumented immigrants lived in Texas (American Immigration Council, 2014). Current immigration issues have significantly hindered medical care to

susceptible and medically dependent individuals who find themselves confined in bordering towns with limited access to specialized health care. There are at least six border checkpoints south of Corpus Christi for those traveling from the Rio Grande Valley and Laredo, intended to ensure national safety and prevent illegal entry (Lutz, 2018). Many individuals struggle with the choice of seeking medical care across these checkpoints for fear of detainment, deportation, and separation from family (Lutz, 2018). This dynamic creates a challenge for affected patient populations in maintaining compliance with designated follow-up appointments. The decision to refrain from soliciting advanced care to avoid permanent legal consequences such as deportation can outweigh valuation of medical and humanitarian needs (Hacker, Anies, Folb, & Zallman, 2015). Additionally, the difficulty in traveling and transporting a child dependent on sophisticated medical technology poses additional strain on outpatient care and compliance with follow-up visits.

The DCH strategic plan involves commitment to improving the health of young individuals using high-quality, evidence-based initiatives to enhance patient outcomes. The vision of the DCH team is to evaluate needs of vulnerable populations and incorporate a culture of innovation through technology-based measures and information systems resources to shape the delivery of current practice (Driscoll Children's Hospital, 2016). The purpose of this QI study is to further the DCH mission by improving the post-hospital tracheostomy protocol with a post-discharge telehealth intervention to families of children living outside Corpus Christi who have undergone their first tracheostomy tube placement.

Telehealth involves the use of telemedicine technologies to facilitate patient care and establish better access to care through remote monitoring, allowing patient and provider to be connected using a phone, computer, or other web-based measure during the health encounter

(Stevens, 2015). Telehealth includes a broad range of clinical and non-clinical services for patients and health care providers including education and training while telemedicine is specific to only remote clinical services (Smith, 2015). Telehealth incorporates electronic health resources for delivery of virtual medical, health, and educational services to enhance patient care and improve outcomes. Texas Senate Bill 1107 signed by Governor Greg Abbott in May 2017 expands technology within the healthcare realm to provide enhanced standard of care to Texas patients, especially in underserved communities (Texas Medical Association, 2017). The adoption of telehealth and a smooth discharge process for patients with tracheostomies as they transition to home care are two best practice elements aimed at preventing hospital readmissions, improving health outcomes, and refining organizational standards of care. The Global Tracheostomy Collaborative is a QI objective supported by the American Academy of Otolaryngology to improve patient-family experience during hospitalization to optimize post-discharge support as well as care coordination (McCormick et al., 2015). In pediatrics, readmissions occurring in a one-year period post-discharge have a significant healthcare cost of more than one billion dollars annually (Bardach et al., 2013). Effective communication with hospital staff and caregivers allows for more efficient delivery of modern health care to reform current practice standards with an ultimate goal of improving outcomes and costs, especially for medically complex individuals.

Theoretical Framework

The Transitional Care Model (TCM) is a nationally identified nursing model developed by Mary Naylor at the University of Pennsylvania to improve the transitional care process of patients from hospital to home. The TCM emphasizes utilization of a comprehensive hospital-based discharge design with a post-hospital follow-up process led by a transitional care nurse or

an advanced practice nurse who integrates coordination of care with other specialties and conducts follow-up phone calls or home visits with caregivers (Rennke & Ranji, 2015). The model highlights coordination of care, prevention of complications, patient engagement, and clinical treatment agendas through interactions between caregiver and healthcare provider (Transitional Care Model, n.d.). Caregiver confidence, active engagement, self-efficacy, and trust encouraged by the TCM contributed to parental acceptance of a new role as primary provider for their child (Callans, Bleiler, Flanagan, & Carroll, 2016). Hospital-initiated transitional care interventions through the TCM were a bridging strategy within the pre- and post-discharge process for vulnerable patient populations who have a higher incidence of complications and readmission rates (Rennke & Ranji, 2015).

Methods

This QI initiative used a one-group, pre-test, post-test, quasi-experimental design, as well as a retrospective cohort design comparing previous patients who did not receive the intervention to those receiving the intervention. Hospital administrative approval for project planning and implementation was obtained verbally and through an official letter of support signed by the Vice President of Clinic and Physician Practices at DCH; (Appendix A). Consent was not required for this QI study or retrospective chart review audits. Any personal health information collected was de-identified. IRB approval for this QI study was not required as it was deemed non-research by the Texas A & M - Corpus Christi Institutional Review Board; (Appendix B).

The setting is a free-standing pediatric hospital serving medically underserved populations offering a multitude of primary and specialty services to vulnerable pediatric patients. The ENT clinic is a subset specialty of the hospital, providing inpatient and outpatient

specialty services with on-going supportive assistance to hospital staff and caregivers. Clinic staff includes two physicians, one Nurse Practitioner (NP), two registered nurses (RNs), three Medical Assistants (MAs), and two medical office specialists. The telehealth visit occurred at DCH outlying clinics in McAllen and Laredo. These outlying clinics have staff appropriately trained in telehealth as well as rooms equipped for telehealth, although these resources had not been previously used in the pediatric ENT clinic.

The population of interest was pediatric patients who underwent tracheostomy tube placement between February-June 2018 and their caregivers who were discharged from DCH and transitioned to home care. The decision for tracheostomy tube placement among the pediatric population is made as a result of life-threatening, unforeseen circumstances as a method to sustain life and maintain quality of life; therefore, a small sample size was expected but justified given the complexity, high stakes, and associated cost of complications. Exclusion criteria included patients with previous tracheostomy tube placement and patients who lived within a 50-mile radius, not requiring crossing of a border checkpoint for follow-up care.

Recruitment of participants was done by medical providers who refer their patients to DCH ENT for tracheostomy surgery. Providers were informed of the need and purpose of the initiative as well as inclusion and exclusion criteria for participants. A retrospective chart review was used to screen patients who met criteria for the comparison group. Five patients underwent tracheostomy placement during the allotted time and two met criteria for inclusion.

Implementation of a discharge protocol and a telehealth intervention two weeks following hospital discharge was intended to encourage communication and caregiver support as well as address any issues related to routine care contributing to tracheostomy-associated complications requiring medical attention or unnecessary ER visits (Robinson, Gund, Sjoqvist, & Bry, 2016).

The telehealth visit was scheduled prior to discharge at two outlying clinics in Laredo and McAllen. This visit allowed for identification of any caregiver concerns, review of treatment plan, demonstration of routine skills and survey administration. Another follow-up visit was scheduled four weeks following discharge, providing an opportunity for face-to-face interaction with caregivers, full physical assessment with a focus on the tracheostomy site, and discussion of the telehealth experience.

The NP held the primary role for planning and implementing the telehealth intervention. Communication with caregivers was established to ensure telehealth visits and follow-up clinic visits were scheduled appropriately following hospital discharge. The nurse and MA at the outlying clinical site ensured the patient was assigned to the telehealth-equipped room and met any needs such as visual or hearing impairments prior to the telehealth interaction on visit day. The Information Technology (IT) coordinator at DCH ensured all telehealth equipment was appropriately prepared and functioning well at both facilities. Any training of the staff at both sites was under the direction of IT personnel. Because telehealth was currently being utilized in other patient populations at the outlying facilities, additional training was only necessary for new staff or those inexperienced in telehealth.

Data collection commenced once acceptance of participation was validated. Prior to discharge, caregivers were given the Caregiver Knowledge Checklist (CKC) questionnaire, measuring their knowledge about tracheostomy care and routine procedures. The DCH-adopted Pediatric Handbook for Tracheostomy Care along with the Plymouth Hospitals clinical practice guidelines for tracheostomy care were utilized to develop the CKC which was based on tracheostomy education and hands-on training for the purpose of accomplishing caregiver learning goals (adapted from: Plymouth Hospitals, 2017 & DCH, 2007). The guidelines were

combined from both hospital organizations because there are no national standard guidelines currently available for pediatric tracheostomy care. Collectively, they have been classified as grounded and developed from two reputable hospital systems which serves as an evaluation of the learning needs of caregivers and their comprehension of tracheostomy management skills using a standardized educational tool and a competency checklist. It was repeated at the 2-week telehealth visit (prior to the intervention) and at the 4-week follow-up visit to measure the impact of the telehealth intervention. An additional Telehealth Satisfaction Survey (TSS), measuring satisfaction of the telehealth visit and overall experience, was completed after the telehealth visit during the 4-week follow-up visit. The survey had ten questions with response options of satisfied versus unsatisfied. Morgan et al. (2011) included a telehealth satisfaction survey in their study and revealed the use of telehealth in the delivery of quality care to patients resulted in high satisfaction, however - because of the specialized population and lack of generalization, reliability and validity – have not been established. Morgan et al. (2011) showed satisfaction scores were higher among patients who continued to use telehealth for outpatient care compared to those who did not ($p = 0.013$). The Care Transitions Measure Survey (CTMS) tool was given to caregivers at the 2-week telehealth visit to evaluate their preparedness for home care following discharge as well as the 4-week follow-up visit to evaluate effectiveness of the telehealth visit. A study by Berry et al. (2013) revealed a correlation between the care transitions measure scoring with the adequacy of hospital discharge and the patient needs for hospitalization; reliability and validity were not clearly stated.

Retrospective data collection using chart audits of ten tracheostomy patients seen over the last two years during their initial 4-week follow-up using the Trach Care Behavior Scale (TCBS)

was used to measure routine performance of home tracheostomy skills including the frequency of tracheostomy care, site assessment, and tube change. This scale was also given at the 4-week follow-up visit to telehealth participants. Appendix C provides a visual representation of the measurement tools used in this study.

Caregiver compliance with patient care instructions as well as keeping the telehealth appointment were major concerns potentially contributing to detrimental outcomes. Immigration constraints posed a potential variable for follow-up care for caregivers who were unable to travel for their face-to-face visit. Unpredictability of the sample size was a concern with project outcomes, especially with the added consideration of the primary ENT surgeon being on medical leave with return during the initial implementation phase. Building trust with caregivers, engaging staff in supporting telehealth, and providing comprehensive telehealth education were strategies to ensure compliance in the telehealth intervention and participation in completing measurement surveys/questionnaires. It was important to gain administrative support by educating hospital leaders and providing supportive resources demonstrating improved outcomes and fiscal benefits of incorporating telehealth into outpatient management of tracheostomy patients.

Implementing a telehealth intervention involves indirect and direct costs. A major expense of incorporating the intervention involved telehealth equipment at both facilities, with an estimated cost of \$3,000. One method of cost effectiveness was to utilize equipment currently used by other providers. An additional expenditure is staff involved in the intervention, however; staff involved was kept minimal and included the NP, clinic RN at each facility, and the IT representative. The staff involved, with the exception of the NP, were already fully trained in telehealth and no additional training was required.

QI using telehealth has capacity for significant benefit to the financial structure of the DCH health system. The overall cost of the proposed project is justified in addressing the current issue of increasing prevalence of unplanned hospital readmissions and tracheostomy-associated complications among patients with newly placed tracheostomy tubes, particularly within 30 days of hospital discharge. Readmissions occurring among the pediatric population one year following hospital discharge have led to health care costs of more than one billion dollars annually (Bardach et al., 2013). Telehealth services increased from 350,000 patients in 2013 to over seven million in a two-year time frame with an estimated health care savings of over \$6 billion dollars a year (Hecht, Shin, & Matousek, 2014). This telehealth visit was billed under appropriate state law and guidelines to garner billing revenue by insurance reimbursement.

Ten retrospective chart audits were reviewed to determine the efficiency of caregivers in following recommendations for performing routine tracheostomy care. The chart audits represent the most recent ten patients over the last 2 years whose caregivers were present at their initial four-week follow-up visit. All data from questionnaires and surveys was collected and kept on an Excel spreadsheet with alphanumeric patient identifiers used. The key identifiers were kept in paper format by the NP (sole data collector) and locked in a file cabinet, to which only the NP had access, and shredded once all data was collected. Results were reported in aggregate form to facility providers and administrators to inform and improve the pediatric tracheostomy protocol for discharged patients residing outside of the Corpus Christi area.

Results

Two patients met inclusion criteria for participation. The caregivers of these patients completed designated surveys and questionnaires prior to discharge, during the two-week

telehealth visit, and at the face-to-face visit four weeks later. Patient 1 was born at 37 weeks' gestation with multiple cardiac anomalies, DiGeorge syndrome, and seizure disorder.

Tracheostomy tube placement was required due to respiratory failure and ventilator dependence. The patient was discharged approximately 4 weeks later. Patient 2 was born full-term with a prenatal diagnosis of cardiac insufficiency requiring surgical intervention. The patient developed tracheomalacia and unilateral vocal cord paresis, most likely the result of multiple and prolonged periods of intubation as well as a complication of cardiac surgery. A tracheostomy tube was placed following numerous failed extubations and inability to wean off ventilator support. The patient was discharged eight weeks following tracheostomy surgery.

The initial step was arranging the telehealth intervention with assistance from the IT representative to ensure all equipment at DCH as well as the Laredo and McAllen satellite clinics was available for use. Establishing communication with staff at these outlying clinics was done once the decision for discharge was made and several occasions until the telehealth visit. A practice-run was done at both clinics the week before the actual patient encounter. Inter-professional contact with other disciplines was key in facilitating the concept of telehealth, obtaining support of DCH providers, and patient recruitment. Organizational approval was granted from administrative leaders. Retrospective chart audits were done once the first patient underwent surgical intervention. Patient caregivers, home health nurse, and outlying clinic staff were all present during the visit.

The process measures included implementation of the telehealth visit. The overall telehealth experience was successful and provided an opportunity for open dialogue between caregiver and provider on any tracheostomy-associated concerns. The caregivers and nurse were

observed as they provided routine care including tracheostomy tube suctioning and tube re-insertion following accidental decannulation. The outcomes indicated there were no tracheostomy-associated complications, ER visits, or unnecessary hospitalizations. Both patients' caregivers completed all questionnaires and surveys. Compliance with telehealth visit and face-to-face visits was satisfactory. Telehealth equipment was fully functional and adequate for use during each of the visits.

The contextual elements interacting with the interventions were medical complexity of the two participants and their need for intensive medical support. The demographic situation of both families allowed them to fulfill the requirement for study participation. Additionally, immigration status of one family validated need for the intervention and ability to avoid interaction with border checkpoint requirements. Unplanned dislodgement of the tracheostomy during one telehealth visit allowed for the observation of home health nurse and caregiver providing both routine and emergent tracheostomy care. At each of the patient encounters, caregivers expressed gratitude for ongoing communication with continuity of quality care. Patient 2's mother, who is an undocumented immigrant, conveyed a sense of relief in the ability to have direct access to her child's health care provider through telehealth without fear of crossing a border checkpoint.

Caregiver knowledge in providing high-quality tracheostomy care at home post-tracheostomy placement was evaluated using the CKC. The results indicate knowledge increased each time the checklist was given and the goal to increase the score a minimum of two points per administration was achieved (Figure 1). Caregiver self-efficacy of tracheostomy care before and after the intervention was analyzed using the CTMS. The results reflect parental

preparedness for discharge with scores meeting minimum goals of 25 and nearly doubled on subsequent administration (Figure 2). Caregiver satisfaction with the telehealth experience after the intervention was assessed using the TSS. The minimum goal of 14 was exceeded after both telehealth visits (Figure 3). Comparison between the ten retrospective patients and the two intervention patients after the 4-week follow-up visits was not completed because of insufficient sample size but the two participant scores were promising (Figure 4). All completed questionnaires and surveys reflect an improvement in post-intervention scores compared to the pre-intervention scores.

The two patients enrolled had various medical issues including congenital, respiratory, cardiac, and neurological anomalies which required an artificial airway and dependence on medical devices, supplemental oxygenation, and daily medications to sustain life. Despite this, the telehealth intervention was successful in preventing any complications, ER visits, or hospitalizations within 30 days following hospital discharge. The caregivers were fully cooperative with their participation in the communication process, showed compliance with their scheduled visits, and expressed gratitude in the opportunity for remote follow-up care. The organizational support of the telehealth intervention provided additional sustainability to the intended practice change. This pilot program shows initial signs of early success. These results support a change in practice guidelines at DCH to improve the overall health care quality of vulnerable patient populations using telehealth.

Discussion

Tracheostomy patients have an increased incidence of hospital readmissions and adverse events which poses additional strain on their overall health status, increased costs, and

overwhelming demands on the entire health care system. This QI intervention changed outpatient management and follow-up care for tracheostomy patients at DCH. Specific populations who meet criteria for telehealth will now be given the opportunity to implement remote care in their discharge plan. An obvious limitation was the fact only two participants met inclusion criteria, disqualifying results from statistical significance. More data on telehealth for tracheostomy patients is needed to support the impact on health care. Further research is necessary to provide additional evidence on the effectiveness of remote care for patient populations with challenging health, financial, transportation, and immigration needs.

Telehealth is increasingly becoming an essential element within our health care system and an effective component in the delivery of patient care with the potential to achieve improved outcomes (Brophy, 2017; Stevens, 2015). It is estimated telehealth services will grow from 250,000 patients in 2013 to over 3.2 million by the year 2018 (American Hospital Association, 2015). As of 2013, more than 50% of U.S. hospitals had incorporated some form of telehealth into their practice strategies as a method to improve patient outcomes and decrease ER visits (Brittan et al., 2015). To implement telehealth, it is important for each NP to adhere to their individual scope of practice and licensure requirements as well as review relevant state laws governing telehealth provisions and restrictions, including those governing billing practices. There are many resources available to assist in planning and executing a telehealth initiative at www.healthit.gov, including the Telehealth Start-Up and Resource Guide from the Great Plains Telehealth Resource & Assistance Center (2014), a resource for organizations seeking to incorporate telehealth initiatives into their practice agendas (Table 1). An effective telehealth program is developed and implemented using best practices to ensure optimal patient outcomes.

Telehealth is an accessible, affordable, and valuable health care service applicable to many healthcare arenas in working to improve patient outcomes.

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Figure 1. Caregiver Knowledge Checklist. Results of caregiver knowledge on routine tracheostomy skills. Participants' scores increased by a minimum of 2 points at each subsequent evaluation which indicated the telehealth intervention made a difference in their overall tracheostomy knowledge.

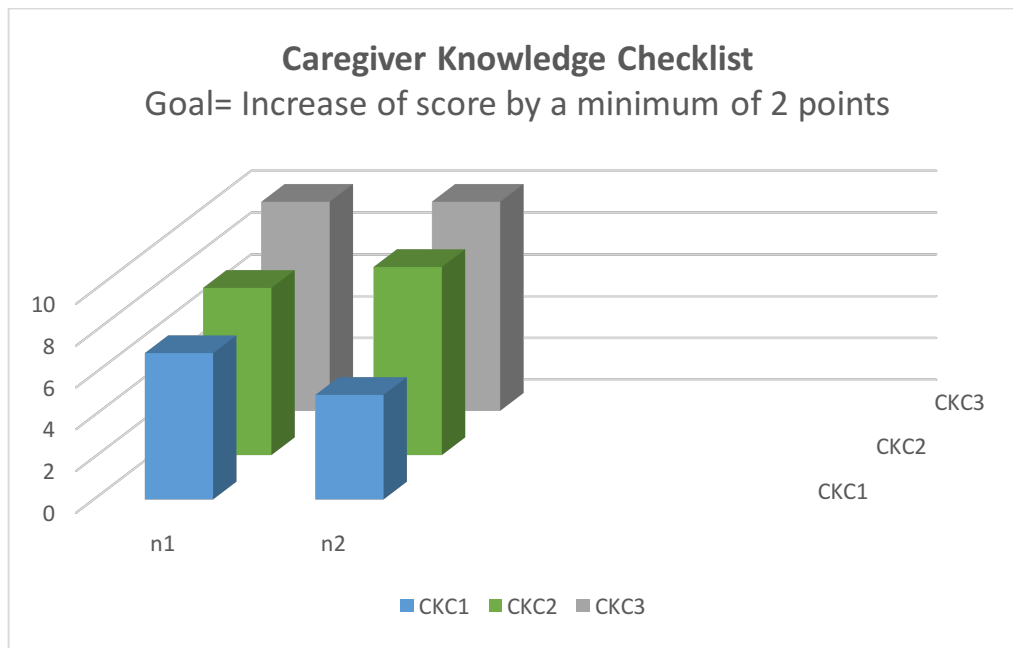


Figure 2. Care Transitions Measure Survey. Results of participants' readiness for discharge and continued preparation for home care during the follow-up visits. Minimum goal of 25 was met on initial scores and nearly doubled at subsequent evaluation.

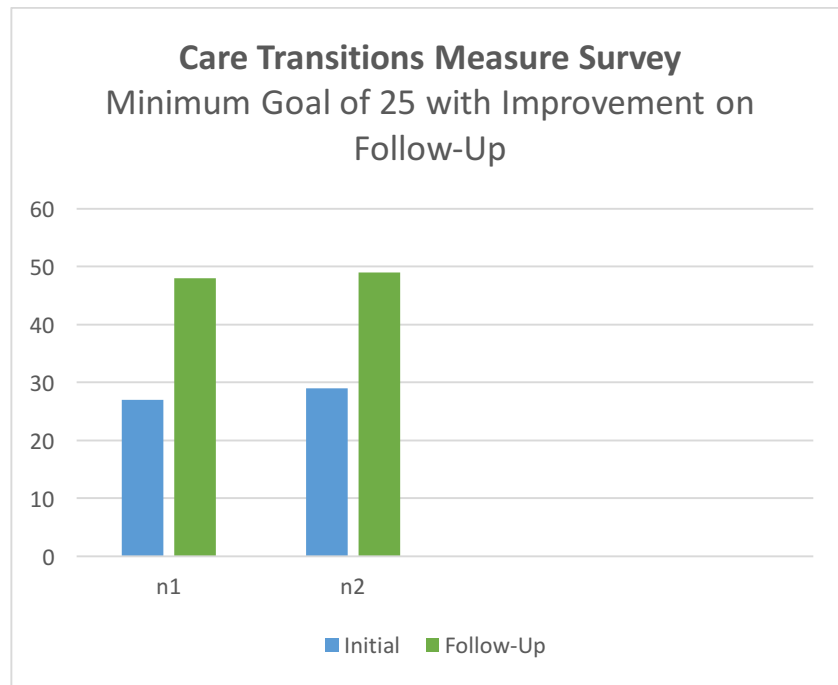


Figure 3 Telehealth Satisfaction Survey. Telehealth satisfaction results among participants who received the telehealth intervention. The target goal of 14 was met by the participants at the 4-week follow-up visit.

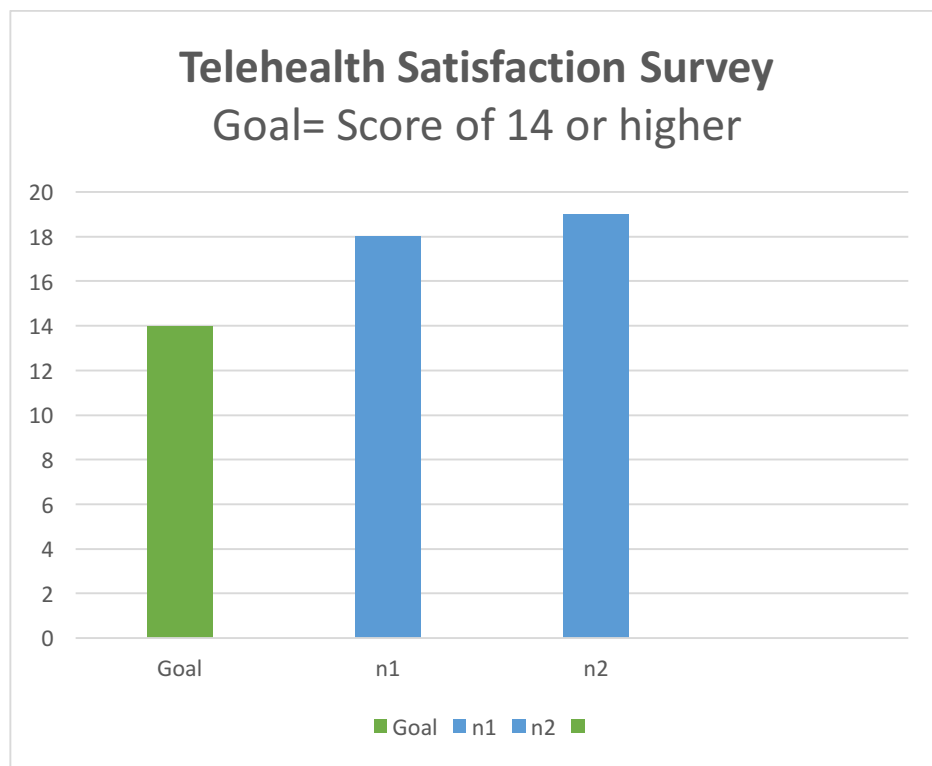


Figure 4 Trach Care Behavioral Scale. Comparison of routine tracheostomy behavior between retrospective patients who did not receive the telehealth intervention to those patients who did receive the intervention.

Results at the 4-week follow-up visit indicate the intervention made a difference in routine care performance including changing the tracheostomy tube every 2 weeks, daily trach care, and daily site assessment.

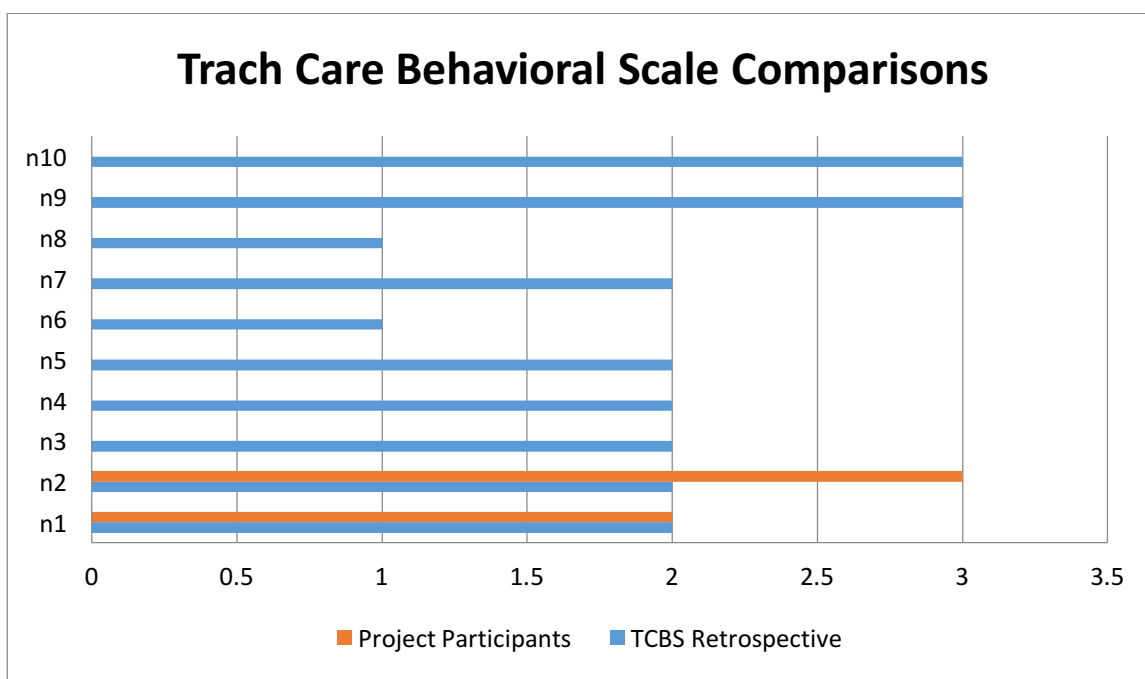


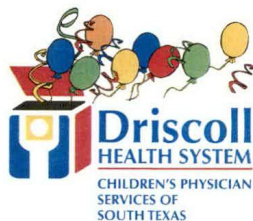
Table 1. Best Practice Steps. Sample best practice steps for implementing a telehealth initiative for use in clinical practice settings.

BEST PRACTICE STEPS
1. Assess and confirm organizational readiness for telehealth
2. Define services, program model and technology models
3. Business model development
4. Development of detailed implementation plan
5. Development of performance monitoring plan
6. Program implementation
7. Monitor and improve

LIST OF APPENDICES

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Appendix A: Letter of Support



November 21, 2017

Dr. Susan Dyess
Associate Dean for Graduate Nurse Programs
College of Nursing and Health Sciences
Texas A&M University – Corpus Christi
6300 Ocean Drive
Corpus Christi, TX 78412

Dear Dr. Dyess,

The purpose of this letter is to provide Laura Moreno, a Doctor of Nursing Practice student at Texas A&M University College of Nursing and Health Sciences, support in conducting a quality improvement project at *Driscoll Children's Hospital*. The project, Telehealth for Outpatient Pediatric Tracheostomy Management, entails the implementation of a telehealth visit following hospital discharge to improve the transitional process from hospital to home and decrease the incidence of emergency room visits, hospital readmissions, and tracheostomy-associated complications within 30 days of hospital discharge.

The purpose of this project is to improve the current post-hospital tracheostomy protocol by implementing a 2-week post-hospital telehealth visit prior to their usual 4-week outpatient follow-up visit in the Ear, Nose, and Throat Clinic. Driscoll Children's Hospital was selected for this project because of its ongoing commitment to improve the health of young individuals using high quality, evidence-based initiatives. Laura Moreno is employed at this institution and has an interest in improving care at this facility.

I, Dale Obermueller, Vice President of Clinic and Physician Practices, do hereby fully and enthusiastically support Laura Moreno in the conduct of this quality improvement project, Telehealth for Outpatient Pediatric Tracheostomy Management at Driscoll Children's Hospital.

Sincerely,

Dale Obermueller
Vice President Clinic and Physician Practices

3533 S. Alameda, Furman Building, Suite 203; Corpus Christi, TX 78411

Appendix B: Institutional Review Board Document



TEXAS A&M UNIVERSITY
CORPUS CHRISTI

OFFICE OF RESEARCH COMPLIANCE
Division of Research, Commercialization and Outreach
6300 OCEAN DRIVE, UNIT 5844
CORPUS CHRISTI, TEXAS 78412
O 361.825.2497 • F 361.825.2

Human Subjects Protection Program	Institutional Review Board
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Date: January 10, 2018

TO: Laura Moreno, DNP student
College of Nursing and Health Sciences, TAMU-CC

CC: Dr. Theresa J. Garcia, PhD, RN
Assistant Professor, Doctor of Nursing Practice Program Coordinator

Jessica L. Peck, DNP, RN, CPNP-PC, CNE, CNL
Associate Professor, College of Nursing & Health Sciences

FROM: Office of Research Compliance Institutional Review Board

SUBJECT: Not Human Subjects Determination

Activities meeting the DHHS definition of research or the FDA definition of clinical investigation and involves one or more human subjects are subject to IRB review and approval.

On January 10, 2018, the Texas A&M University-Corpus Christi Institutional Review Board reviewed the following submission:

Type of Review:	Not Human Subjects Determination
Title:	Telehealth for Outpatient Pediatric Tracheostomy Management
Project Lead:	Laura Moreno, DNP student
IRB ID:	NHS 03-18
Funding Source:	None
Documents Reviewed:	Human Ethics Oversight Review Form dated 11/29/2017 Driscoll Health System Letter of Support dated 11/21/2017 Recruitment Letter

Texas A&M University-Corpus Christi Institutional Review Board determined that the proposed activity does not meet the DHHS definition of research or the FDA definition of a clinical investigation. Therefore, **this project does not require IRB approval**. You may proceed with this project.

This determination applies only to the activities described in the documents reviewed. **Any planned changes requires submission to the IRB to ensure that the research continues to meet criteria for a non-human subject research determination.**

Please do not hesitate to contact me with any questions at Rebecca.Ballard@tamucc.edu or 361-825-2497.

Respectfully,
Rebecca Ballard, JD, MA, CIP
Director, Research Compliance
Division of Research, Commercialization and Outreach

Appendix C: Measurement Tools

Caregiver Knowledge Checklist: Given to caregivers at discharge and at the 4-week follow-up visit. The goal was to improve their score by a minimum of two on the second evaluation.

1. Why is suctioning of the tracheostomy tube necessary?
2. What signs indicate suctioning is necessary?
3. How long should each suction pass attempt take?
4. What supplies or equipment should be kept with the child at all times?
5. How often is tracheostomy care needed?
6. Identify some signs that indicate trach care needs to be done more often.
7. What are things to look for when performing trach care?
8. What are signs of breathing problems?
9. What are things to do to help keep your child from getting an infection?
10. How often should you change the tracheostomy tube?

Additional retrospective questions using the Trach Care Behavior Scale were given to caregivers of previously seen tracheostomy patients during their initial 4-week follow-up visit who did not receive a telehealth intervention and compared to caregiver responses from patients in the study who received the telehealth intervention. The goal was a score of 3 particularly among the patients receiving the telehealth intervention.

Trach Care Behavior Scale:

QUESTION 1	Daily = 1	Less than daily = 0
How often do you perform tracheostomy care?		

QUESTION 2	Every 2 weeks = 1	More than every 2 weeks = 0
How often do you change the tracheostomy tube?		

QUESTION 3	Daily = 1	More than daily = 0
How often do you assess the trach site/stoma?		

Telehealth Satisfaction Survey: Given to caregivers at 4-week follow-up visit. The satisfaction goal was based on a minimum score of 14.

	Not satisfied = 1	Satisfied = 2	
Voice quality			
Visual quality			
Personal comfort			
Wait time for appointment			
Length of Visit			
Explanation of treatment plan by ENT provider/clinic team			
Interaction with ENT provider/clinic team			
Thoroughness/skillfulness of team			
How well privacy was respected			
Overall treatment experience with telehealth			

Care Transitions Measure Survey: Given to caregivers at the 2-week telehealth visit and 4-week follow-up visit. The goal was a survey score of more than 25 with improvement in score with the second attempt.

	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
I had all the information I needed to be able to take care of my child when we left the hospital.					
I had a good understanding of what would make my child's health condition better or worse when we left the hospital.					
I understood which warning signs and symptoms meant I should call one or more of my child's healthcare providers right away when we left the hospital.					
I had a good understanding of the things that I was responsible for in managing my child's health when we left the hospital.					

I had an easily understood written plan that described how my child's healthcare needs were going to be met when we left the hospital.					
I had a good understanding of how to use my child's medical equipment and supplies when we left the hospital.					
I understood who to call if I had questions or concerns about my child's health at home when we left the hospital.					
I understood how to manage my child's health over the weeks after going home when we left the hospital.					
I understood who to call if I have questions or concerns about my child's health at home when we left the hospital.					
I feel comfortable contacting my child's primary care physician or emergency services for help if my child's health worsened after leaving the hospital.					

