Fall 12-14-2015

Videoconferencing for Improved Access to Care

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Prospectus: Videoconferencing for Improved Access to Care

N653: Internship: Clinical Nurse Leader

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Clinical Leadership Theme

The Institute of Healthcare Improvements (IHI) describes access as the ability for patients to "have unlimited access to the care and information they need, when they need it" (IHI, 2015). As the microsystem meets the challenge of providing care to a rapidly expanding patient population, the theme of access becomes an area of focus for the Clinical Nurse Leader (CNL). Functioning through the CNL role of Team Manager, I will be working to implement a process improvement project geared towards the global aim of increasing patient education access in a chemotherapy infusion clinic.

Statement of the Problem

The microsystem is a specialized pharmacy partnered with a large healthcare institution. The pharmacy employs nurses (Pharmacy Nurses) to provide education, equipment, and medication to patients being treated for various cancers. Patient care is delivered in an outpatient infusion clinic that is located within the main hospital. Recently, the institution opened two new clinics located twenty-five miles from the hospital. The expectation was that Pharmacy Nurses would support the new clinic's patients, in addition to their current population. This is an issue for Pharmacy Nurses as their small staff, totaling two and a half full time equivalents, cannot meet expansion demands. Herein lies the problem with poor provider access to patients.

Currently, the new clinics have their own staff nurses (Clinic Nurses) employed under a different department of the larger organization. Clinic Nurses have been providing temporary help to pharmacy patients since July 2015 by fulfilling patient education and medication needs. The Clinic Nurses recently reported that continuing to support pharmacy patients is too heavy a burden and that patient education quality is suffering.

After reviewing patient charts, scheduling logs, and interviewing staff, it was discovered that Pharmacy Nurses have provided zero support to the new clinic patients. Pharmacy management has been working to fulfil staffing needs and has recently secured funding to hire a per diem nurse. However, due to union contract, it is not clear whether the new nurse's availability will cover patient needs. Additionally, the new hire is not set to begin work until January 2016.

Another major access barrier to patient education has been the method by which education is provided. Traditionally, nurses administer patient teaching in person. Carrying this method into the new clinic requires Pharmacy Nurses to travel twenty five miles, commuting up to three hours for a single teaching. Teaching five to seven times per week would equate to significant time spent on commuting. Apart from the fact that commuting is being met with strong resistance from Pharmacy Nurses, there is greater concern that commuting would drain both financial and human resources. Wasting energy and resources is an area the Institute of Medicine (2001) describes as inefficient. An improvement in education delivery is needed.

Project Overview

The global aim of this project is to improve access of pharmacy teaching in the outpatient infusion clinic. The target cohort are patients scheduled to leave the clinic who are connected to a portable home infusion pump, and require infusion of 5-fluouracil (5-FU) chemotherapy through their central line. By applying telehealth solutions such as videoconferencing paired with asynchronous video, we intend to provide nursing care to a greater number of these patients without sacrificing quality and resources. Collaboration with multiple members of the healthcare team (the information technology (IT) department, pharmacy, Clinic Nurses, Pharmacy Nurses,

and patients) will ensure all aspects of care are met and delivered at the institution's high standard of quality and safety.

This is a dual-method telehealth project that offers asynchronous video and videoconferencing. First, an education video will be shown to patients at the clinic prior to meeting with a Pharmacy Nurse. The video explains how patients can manage chemotherapy at home and shows simple solutions to troubleshoot their infusion pump. Patients are given a pump, printed directions, and are encouraged to follow along and practice using their pump while watching the video. The technique of watching pre-visit education videos has been shown to increase patient understanding, recall, and satisfaction (Armstrong et al., 2010 & Kinnane et al., 2008). The education video requires a script that must to be developed by Pharmacy Nurses and approved by the large institution's education committee and stakeholders. After the script is finalized, the video can be produced, edited, and the final product sent to the committee for approval.

The second element of telehealth is videoconferencing. Videoconferencing has been shown to improve care access, and provide safe, quality care to the right patient, at the right place and right time (Krupinski & Bernard, 2014; AHRQ, 2008). Pharmacy Nurses will employ videoconferencing through an internet-based platform using standard computer equipment to deliver pharmacy education. Visits will take place in private exam rooms that are furnished with necessary equipment: a standard computer with monitor (or laptop), a webcam, a microphone, and speakers. The process flow will begin with the Pharmacy Nurse initiating a secure videoconferencing connection. A Clinic Nurse will then connect the patient to the internet-based platform using secure institutional login credentials. Once patients are bridged to the secure session, the Pharmacy Nurse will deliver teaching in the same manner it is provided in person.

After the visit is complete, a Clinic Nurse will end the conference and continue per their usual plan of care. See Appendix A: Telehealth Process Flow Map for visual reference.

Outcomes will be measured by auditing charts and schedule logs to determine the number of patient visits completed by pharmacy nurses. A second set of data will measure 1) patient satisfaction via surveys, and 2) teaching efficacy through troubleshooting call log audits (Appendix H and Appendix I). After these measures are analyzed, a decision will be made whether to continue the intervention or to reevaluate the approach.

The project's specific aim is to increase the number of Pharmacy Nurse-completed patient education visits at the new clinic location by thirty percent within two months after project implementation. The specific aim narrows the focus of the project so that outcomes have clear quantitative measures. A thirty percent increase would show access to care is increasing, meeting the project's global aim.

Rationale

Data collected from the microsystem substantiates the purpose of this project. The data collection process began in late August 2015 when I first assessed the microsystem 5Ps and created a process flow map of how patients are admitted into pharmacy care (Appendix B). I then audited charts and schedules, patient satisfaction survey scores, and pharmacy call logs to establish a baseline that reflects the current level of care (Appendix G, Appendix H and Appendix I). I interviewed staff and management from both the pharmacy and the infusion clinic to gain a better understanding of staff perspectives and management concerns. The fishbone diagram (Appendix C) shows cause and effect for each component of the access issue.

After analyzing the data, both staff and management agreed that an increase in nursing personnel was necessary to ensure patient needs were being met. They also agreed that the

greater institutional expansion would require a modification in how patient education is delivered so that the existing resources may be utilized more fully. This analysis allowed me to understand several contributing factors that compound the current issues:

- Unpredictable patient admittance makes scheduling difficult
- Hiring process is lengthy and takes months to finalize
- New hire hours may not be adequate to cover teaching needs
- Commuting to the new clinic would be a burden for staff nurses
- The extra workload for temporary help (Clinic Nurses) has become a burden
- The teaching provided by temporary help is inadequate, and temporary help is ending sooner than expected

From the beginning, telehealth was the favored option to solve logistic and staffing issues without foregoing quality and safety. To further validate this idea, a cost-benefit analysis for telehealth was performed and showed hard savings of approximately 76% (see Appendix D: Cost-Benefit Analysis for details). This is largely attributed to a substantial savings in nursing salaries when compared with usual care (annually: $63,600 for usual care vs. $15,120 for videoconferencing). Soft savings that will be generated are increases in nurse satisfaction, stabilized high patient satisfaction, and increases in the agency's reputation for quality and innovation. These savings are more difficult to quantify and will take time to measure, but will add value to the micro- and macro-systems. Note: the cost of the CNL is not included in this cost-benefit draft, nor was my value as a student volunteer. However, I did include this benefit in other analyses of my project.

I created a SWOT analysis diagram to summarize all areas of data analysis and team discussion (see Appendix E). The analysis shows solid strengths and opportunities, when

compared to the project's weaknesses and threats. This is mainly due to significant endorsements from staff, as well as minimal costs, implementation feasibility, and the fact that this solution can be sustained indefinitely. The major weaknesses and threats stem from the relatively uncharted nature of telehealth. Much of this project has been a learning process – from with whom to speak, to which equipment and software to use, to how one goes about engaging a patient over the internet. My in-depth research has provided management, staff and stakeholders with this information.

Methodology

As a frontline change agent, the CNL functions in a diversity of roles and takes on different perspectives throughout the change process. Because of this, I will be utilizing multiple change theories to collaboratively direct the project. Further, adopting different frameworks will hopefully allow for a smoother transfer of leadership responsibility when my practicum is complete. Roger's Diffusion of Innovation theory allows for this type of flexibility by underscoring the role of the unit champion. He explains how influencers carry change through a series of five stages: 1) Knowledge; 2) Persuasion; 3) Decision; 4) Implementation; and 5) Confirmation (Cain and Mittman, 2002). After some time, an individual becomes an adopter and implements the innovation after they have passed through the all five stages.

Another important component to Roger's theory is how change spreads through different communication channels over time. Cain and Mittman (2002) describe the factors of this process as Roger's "ten critical dynamics" (p. 5):

1) Relative Advantage: The greater the perceived advantages, the quicker the innovation will diffuse.

2) Trialability: Ability to try something out without having to completely commit increases adopters and pace of diffusion.
3) Observability: Ability to see others use the innovation increases commitment, adoption and diffusion.
4) Communication Channels: The way opinion leaders communicate about innovation (channels used) affect pace of diffusion.
5) Homophilous Groups: Groups of like characteristics diffusion changes faster than heterophilous groups.
6) Pace of Innovation/Reinvention: It's ok to adapt or not adapt the intervention to suit users along the way.
7) Norms, Roles and Social Networks: The constructs shape innovation.
8) Opinion Leaders: People that are well-connected and respected can influence innovation adoption.
9) Compatibility: Innovations that are familiar looking and easily injected into existing patterns or technologies are more successfully adopted.
10) Infrastructure: Innovation needs a supportive infrastructure to diffuse.

These dynamics summarize the concept that well-connected influencers optimize the successful spread of change. The most practical and reasonable influencer to carry this project is my preceptor. She has been part of every aspect of planning and developing so transitioning would be seamless.

For development and implementation, I have selected Kotter's eight step framework. This approach emphasizes the importance of developing a sense of urgency and then harnesses that urgency to propel change. The eight steps include:

1) Establishing a sense of urgency
2) Creating a powerful guiding coalition
3) Developing a vision
4) Communicating the vision
5) Empowering others to act on the vision
6) Planning for and creating short-term wins
7) Consolidating improvements and producing more change
8) Institutionalizing new approaches (USF, 2015)

The ultimate change I will be measuring is how well telehealth improves access in the microsystem, as well as teaching efficacy for patients. At a process flow level, several small changes will be implemented that affect current planning, communication, and follow-up of nursing practices (see Appendix A). To ease integration of telehealth, Pharmacy Nurses and Clinic Nurses will trade assignment of some aspects of care. For example, Pharmacy Nurses will now be responsible for completing time-consuming paperwork, while Clinic Nurses will enable a secure internet connection and provide privacy for patients. Pharmacy Nurses will also use videoconferencing to complete patient evaluations previously done over the phone. These small adjustments streamline processes, and will likely be adapted and modified after many tests of change that follow diffusion.

Two data sets will be collected after implementation. The first set measures the number of teachings completed by staff nurses via videoconferencing. This will be performed through chart and schedule audits. The second set of data is an audit of the pharmacy call logs and patient satisfaction scores. These measures show how effective telehealth is at meeting care needs (increasing access), delivering chemotherapy management education, and the patient's ability to troubleshoot a home-infusion pump independently. I have collected both of these data sets at baseline, and will compare them after two months of implementation. Any positive deviations from baseline data will be considered success, while negative deviations will require reevaluation of the project. Negative deviations include 1) too few teachings completions by Pharmacy Nurses using telehealth, 2) a decrease in patient satisfaction scores, and 3) an increase in troubleshooting calls. In addition, weekly reviews throughout the process will safeguard quality and safety, as well as document early experiences.

In the planning stage, I focused on developing strategies to avoid common pitfalls when implementing technology and change. This is largely because the microsystem did not have an existing protocol to help guide microsystem staff as the project moved forward. A resource that has been foundational in developing a new videoconferencing protocol has been the American Telemedicine Association (ATA, 2014), the leading advocacy agency for the development and employment of protocols in telemedicine. The ATA recommendations detail the importance of having written protocols in settings that utilize telemedicine, knowing the nuances in telemedicine HIPPA compliance, and also suggest the type of equipment to use for best resolution/connectivity. I took the main concepts from their recommendations and factored them in throughout the course of my planning.

I am anticipating issues with this project. The most cumbersome barrier thus far has been organizational bureaucracy that slows forward progress. This has led to times of discouragement. Working within such a large institution makes the process of change a practice in patience. I also had reservations related to how staff would feel about using technology, given the electronic health records conversion experience was not a pleasant one. I was surprised to see how willing Pharmacy Nurses were to use telehealth. The general consensus was that Pharmacy Nurses would rather use telehealth than commute for three hours. Nevertheless, I plan to optimize ease of use and participation at both the provider and patient level.

Data Source/Literature Review

Evidence for project support comes from the microsystem and research literature. Audits of patient charts, schedules, call logs, and patient satisfaction survey scores were used to establish a microsystem baseline, as well as to acquire a working body of microsystem knowledge. It also was important to examine the process flow of patient education and admission so the intervention could be integrated systematically.

A review of literature support was obtained by conducting a search of the CINHAL, PUBMED and GoogleScholar databases using the PICO search strategy of patients, videoconferencing OR telehealth, and access. Of the articles with dates that range from 2010 to 2015, six were selected for review. The articles included in this literature review describe videoconferencing as a successful way to access patients compared to usual in-person care. As a bonus, most articles outlined telehealth efficacy, implementation strategies, and cost-efficiency.

The studies suggest that videoconferencing is at least equivalent to usual care, increases access, and most were cost-effective. Costs were primarily dependent upon type and availability of equipment used. Finding literature that mirrored the elements of the project situation (distance

to travel, videoconferencing, and positive outcomes with strong statistical significance) was a strategy I utilized when I found few studies that matched my original terms. This search led me to find the broadest developer of telehealth guidelines, the American Telemedicine Association (ATA). This agency gave credence to the value of my project and that I would not have to try and reinvent the wheel at every turn.

Singh, Accursi and Black (2015) discuss the success of videoconferencing in community based clinics as a way to make specialized care more accessible in hard to reach rural areas. Using specially equipped community clinics dually functioning as anticoagulation clinics, pharmacists connected to patients via videoconferencing to manage warfarin therapies. Results after the implementation of satellite clinics include a comparable patient INR, patient satisfaction score of 4.77/5, and a reduction in pharmacist FTE from 0.6 to 0.3. The results support the suggestion that videoconferencing is a viable alternative to face-to-face visits without foregoing quality. This study also provided a good amount of detail on process flow management that will be very helpful in developing videoconferencing nursing tools for implementation.

Watanabe et al. (2013) investigated the feasibility of videoconferencing in a virtual clinic to provide specialized palliative care consultations for cancer patients in rural areas. The authors also examined symptom, cost and satisfaction outcomes finding a reduction in 6 of 9 symptoms, patient savings of 1) $192.71 CnD ($145.58 USD) per visit; 2) nearly 293 miles in travel; and 3) approximately 8 hours of time. Eighty-four percent of patients strongly agreed that they were satisfied with their overall telehealthcare. The authors determined that this method of palliative care delivery is feasible, satisfactory, may improve outcomes and is savings generating. Although this study improved access to those patients who would not normally be able to attend palliative care consultations, access was not quantified – an indicator I will be measuring in my

project. This study provides my project with evidence that shows success in videoconferencing accessibility and feasibility.

Moreno, Chong, Dumbauld, Humke, and Byreddy (2012) discuss the use of standard equipment and the internet to facilitate a series of sessions with a psychiatrist for treatment of depression. After therapy completion, patient depression was measured using a standardized scoring scale. Findings showed a decrease in depression, greater improvements in quality of life and functional ability, and that it was acceptable to employ non-specialized equipment as a way to videoconference. The authors also suggest this method as a way to "close the gap in access to culturally and linguistically congruent specialists". This is a great study that shows the use of technology to bridge cultural gaps in care, an ethical consideration other studies do not exclusively focus on. Using specialists that can communicate in a patient's native language is culturally sensitive, patient centered and now feasible. This is a unique selling point for both stakeholders and nurses.

Lindsay et al. (2015) examine the use of videoconferencing to improve access to psychotherapy for posttraumatic stress disorder (PTSD) patients of the Veterans Affairs (VA) healthcare system. Findings show equivalence in efficacy between videoconferencing and traditional visits. The authors also describe increases in access of care by an averaged 3.2-fold increase in patients seen, and a 6.5-fold increase in sessions via videoconferencing for PTSD. This is an excellent study that quantifies gains in access, and that provides a solid support for my project.

In their randomized controlled trial, Mark, Ikehara, Matsuura, Hara, and Li (2013) validate the feasibility of videoconferencing (Skype) to teach pursed-lip breathing (PLB) to patients with COPD. This study heavily examines the efficacy of PLB as an intervention in

reducing dyspnea, activity and quality of life for COPD patients. The authors found the implementation of Skype to be feasible and helpful, especially in isolated areas. Although they noted this form of communication did no harm, they identified a risk for security breach with voice-over-internet methods like Skype. I wanted to gather data that demonstrated videoconferencing as a teaching tool, and I believe this study is a good reference because PBL is a teach-back skill. Another point this study touched on was security. The platform the microsystem will use at implementation is a secure bridge, recognized as HIPPA compliant by industry leaders.

Viers et al. (2015) aimed to investigate the utilization of videoconferencing compared to traditional office visits in the urologic population. They measured timing efficiency, patient and provider satisfaction, and patient cost. They found equivalence in timing efficiency, patient and provider satisfaction, but that videoconferencing incurred lower costs (noting less traveling and missed work). In addition, the authors concluded videoconferencing a feasible option to traditional visits, especially if cost containment is an issue.

Timeline

The timeline for this project progresses in eight phases (see Appendix F: Gannt Chart & Project Timeline). The first begins with the launch of the project. This happened in early August 2015, before I was assigned to the microsystem. During this time, the faintest concept of what kind of change was needed started to take shape. My arrival in mid-August marked the second phase of assessment. Over approximately two weeks' time, I gathered and analyzed the bulk of the microsystem data, as well as performed a needs assessment. Beginning on the first of September the third phase began. The unit champion and I discussed my assessment findings and formulated a "diagnosis" of the access issues.

In phase four (intervention development), I curated an evidence base of literature to determine how telehealth would operate in the microsystem. This process led to developing an implementation plan, coordinating with many other disciples of the care team, and gathering materials supported by the literature. Because considerable collaboration was needed during this phase, we encountered slow forward progress that drew out the timeline nearly one and a half months.

Once the intervention and implementation plan was developed, it was time to generate a prototype (phase 5). The prototype would include an asynchronous video and a secure internet-based platform for videoconferencing. The unit champion and I used the educational video script previously approved by the education committee to film and edit the patient education video, and worked closely with the IT department to complete testing of the videoconferencing application and equipment. We then presented the video to management and the education committee for approval. During this waiting period, we implemented a small test of change by remotely instructing a Pharmacy Nurse on how to use the videoconferencing software to enable a secure connection bridge. This test was done to answer the "will it work?" question. It absolutely did, and also revealed areas that we needed to improve. We worked out some minor instruction issues, and completed phase 5 after two weeks.

Next is the most exciting phase, implementation. To begin, management from both the pharmacy and the clinic agreed that rollout should happen gradually, on a case-by-case basis. This is to ensure the patient needs come first. For example, if it is determined that a particular patient is not a candidate for tele-teaching because of poor vision, in-person education will be selected as a more appropriate patient-centered option. The videoconferencing portion of the

project was approved for rollout on November 2nd. The video was approved the following week, and was successfully embedded in the institution's patient education resource library.

My presence on this project ended at this point. Full implementation rollout, as well as the advancement of the two remaining phases, have been transferred to the unit champion. The last two phases (monitoring and evaluating) will be completed between November 2015 and January 2016. Once complete, the overall findings will be evaluated and a decision will be made to continue, modify or end implementation of telehealth and/or the patient education video. This date is projected to be January 11, 2016.

Expected Results

I am optimistic about the project outcome. The literature shows telehealth is a viable and successful option to solving access problems, and nurses are motivated and willing to work with creative alternatives. For the microsystem, success translates into more patients being taught by Pharmacy Nurses, and that patients are satisfied with the new delivery method. This is why collecting pre and post intervention satisfaction survey data is critical.

From a planning perspective, it will be interesting to see how this project affects microsystem attitudes toward telehealth. Brewster and colleagues (2014) examined the factors affecting frontline staff acceptance of telehealth at 4 clinical sites. Along with identifying major themes that influence acceptance, they suggest it is a slow and fragile process that hinges on addressing barriers and clinical buy-in. I devoted considerable efforts in the planning of implementation of this project because I understand these issues. I am curious to see if my efforts will pay off.

It would be far too optimistic of me to expect just a few issues. Smooth sailing depends on each individual's level of comfort with technology, and how this impacts perception and

successful use. It would be a vast and extensive task to extrapolate just how many possible issues would occur. There is nothing left to do except watchfully wait and see where the process leads.

Nursing Relevance

Telehealth is a relatively new domain. While it is true that I found statistically significant outcomes as I worked through the research, many areas I wished to explore simply did not exist in the literature. This shows a gap in knowledge/evidence within the technology-healthcare interaction. More research is needed before the benefits of videoconferencing and telehealth can be fully realized. The ATA advocates for this research and that telehealth be utilized more in healthcare. This project contributes to our present understanding, and may help to spur the development of more telehealth bridges in the larger macrosystem.

Health information technology is an interesting concept. On one hand, it is exciting to see how integrated technology has become, but on the other, where will these advances leave the human experience? Further, just because we can do things, does that mean we should? While working on this project, I noticed a few looks from others that reminded me how fragile acceptance can be. I do not think this is the beginning of the end of human-to-human care, but it is interesting to think about it. I imagine some nurses are wondering the same ideas I am. As nurses, we are concerned for our patients and will advocate for their best interests in care. To this, I found two studies that addressed the idea that patients and providers need to be mutually ready to use technology and engage each other in this discussion. This project may be one that helps this discussion advance.

Summary Report

The aim of this project is to increase the amount of education visits completed by Pharmacy Nurses in an outpatient infusion clinic for patients receiving 5-fluoracil chemotherapy.

To achieve this, two simultaneous approaches have been applied: securing additional nursing staff; and implementing a telehealth delivery system that utilizes asynchronous video and videoconferencing. After initial microsystem assessments were complete, two sets of data were collected at baseline. The first set of findings were from an audit of schedules and patient charts to track the number of education visits completed by Pharmacy Nurses between July and August 2015 (Appendix G). The second set were audits of 1) patient surveys scores from September to November 2015 to gauge the current level of patient satisfaction with usual care for approximately thirty patients (Appendix H); and 2) the pharmacy troubleshooting call log to measure teaching efficacy by totaling the number of times patients called the pharmacy hotline for help (Appendix I). The first set of data showed Pharmacy Nurses completed 0% of pharmacy patient education visits, while the second set showed patients were highly satisfied (average score reported 4.7/5) and had little trouble managing their infusion pump at home (two calls in six months). After implementation, all data sets will be reassessed using the same method and compared using a paired T-test. It is projected that the number of visits will increase by 30% and that satisfaction scores and teaching efficacy remain stable. An overview of the project to this point can be seen in Appendix J: Scope and Overview of Project.

Although my practicum experience ended before the project was implemented, my preceptor (the unit champion) continues her commitment to diffuse innovation. She has been instrumental in anchoring change with excellent communication and influence that garners support from all involved. Having known it was not likely that I would be part of implementation, I focused on sustainability and creating a framework for change. I developed materials that could assist the unit champion in integrating telehealth processes into existing procedures such as videoconferencing bridging instructions and a cheat-sheet, and a proposed

telehealth protocol I adapted from the ATA guidelines. My reporting charts and graphs are also user-friendly and can be edited to include post-implementation data when it becomes available.

I anticipate telehealth to become part of the standardized procedures in the microsystem. This is largely due to telehealth's practicality and perceived staff and client benefits. Videoconferencing allows client care to be delivered more timely. Previously, nurses have had to delay care because of short staffing. Videoconferencing solves this problem by enabling the nurse to provide care without leaving the main clinic, the main barrier caused by lack of adequate staffing. This leads to more efficient utilization of nursing hours and greater staff satisfaction. I am interested to see if telehealth empowers patients in the face of cancer, as it has been shown in the literature. What an immeasurable honor it would be to have been a part of improving quality of life to that level.

While the intervention cycles through a series of plan-do-study-act ramps, it will be important for the unit champion to report results to demonstrate the decision process is data driven and microsystem derived – there are no hidden agendas. Reinforcing this type of transparency, as well as actual use, will increase acceptance and sustainability. A transition into the standardize-do-study-act phase will again require the same type of communication and transparent diligence.

Another factor in sustainability will be continued buy-in from stakeholders and staff. Aiding this from the beginning is that the concept of telehealth is very much aligned with the organization's mission and values: individualized healing through science and compassion. Using the latest information and technology to provide superior healthcare is not only an objective of the organization, but is also the purpose of telemedicine as discussed by the ATA

(ATA, 2014). Support from frontline staff can also be strengthened by ensuring telehealth remains individualized. This allows for a patient-centered approach and mitigates barrier-producing misconceptions that the project will eventually replace one-to-one nursing care. In a promising development, management has recently endorsed the project further by supporting its implementation to another clinic in the healthcare network.

Reflecting upon this entire process, I understand the role systems thinking and planning has in earning project support and enhancing acceptance and long-term sustainability. This is the real goal, a chance to diffuse and convert change into sustainable gains for better patient outcomes. The Clinical Nurse Leader (CNL) is positioned both professionally and academically to lead change. I used several facets of the CNL role to this point (see Appendix K: CNL Roles Utilized During Internship), and the unit champion will use more throughout the tests of change that will follow. It is not a simple process to make changes in healthcare, and cultivating change agents is a specialty worth investing in. I hope this project helps to illustrate how useful the CNL can be in the complex adaptive system that is healthcare.

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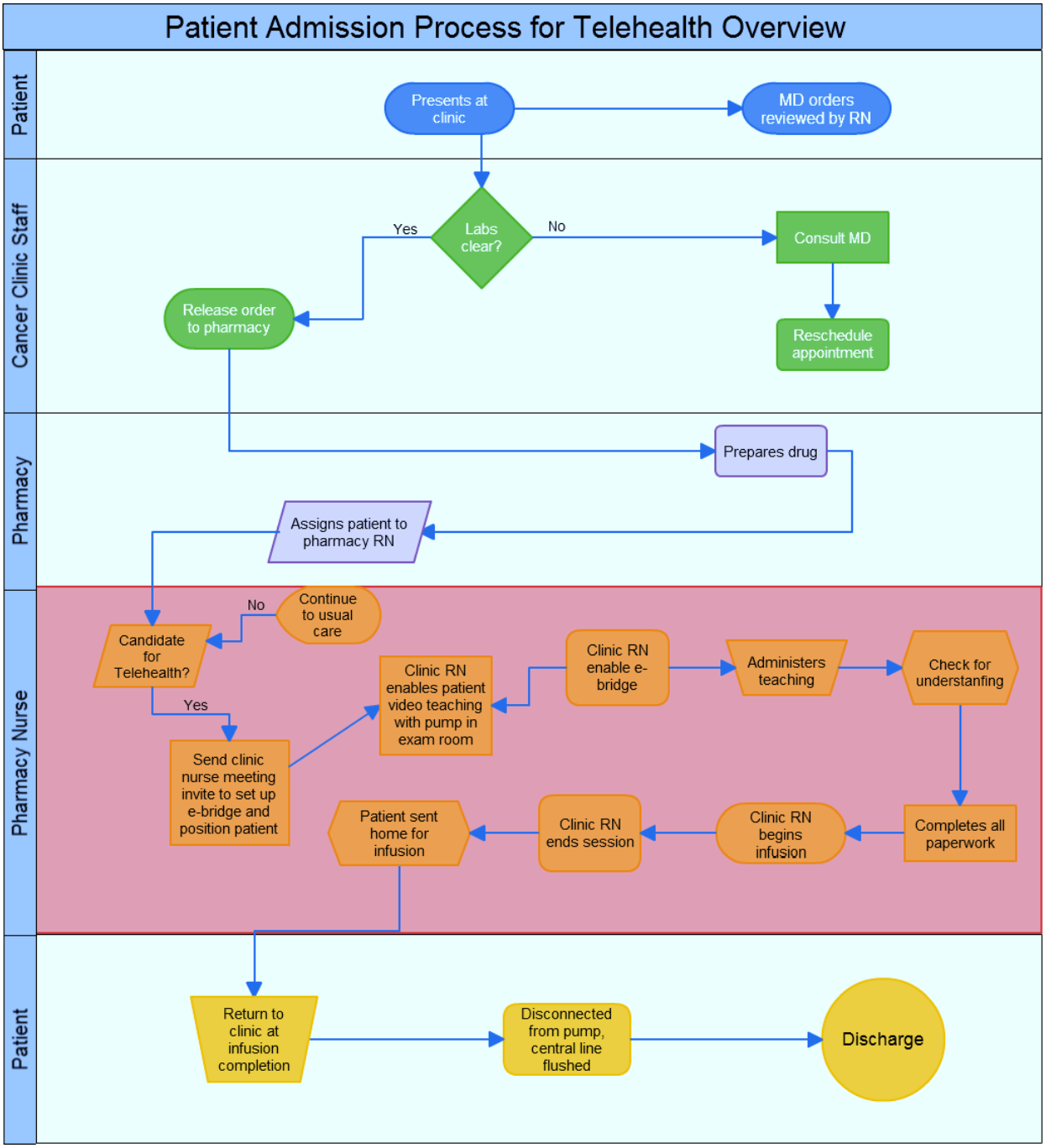
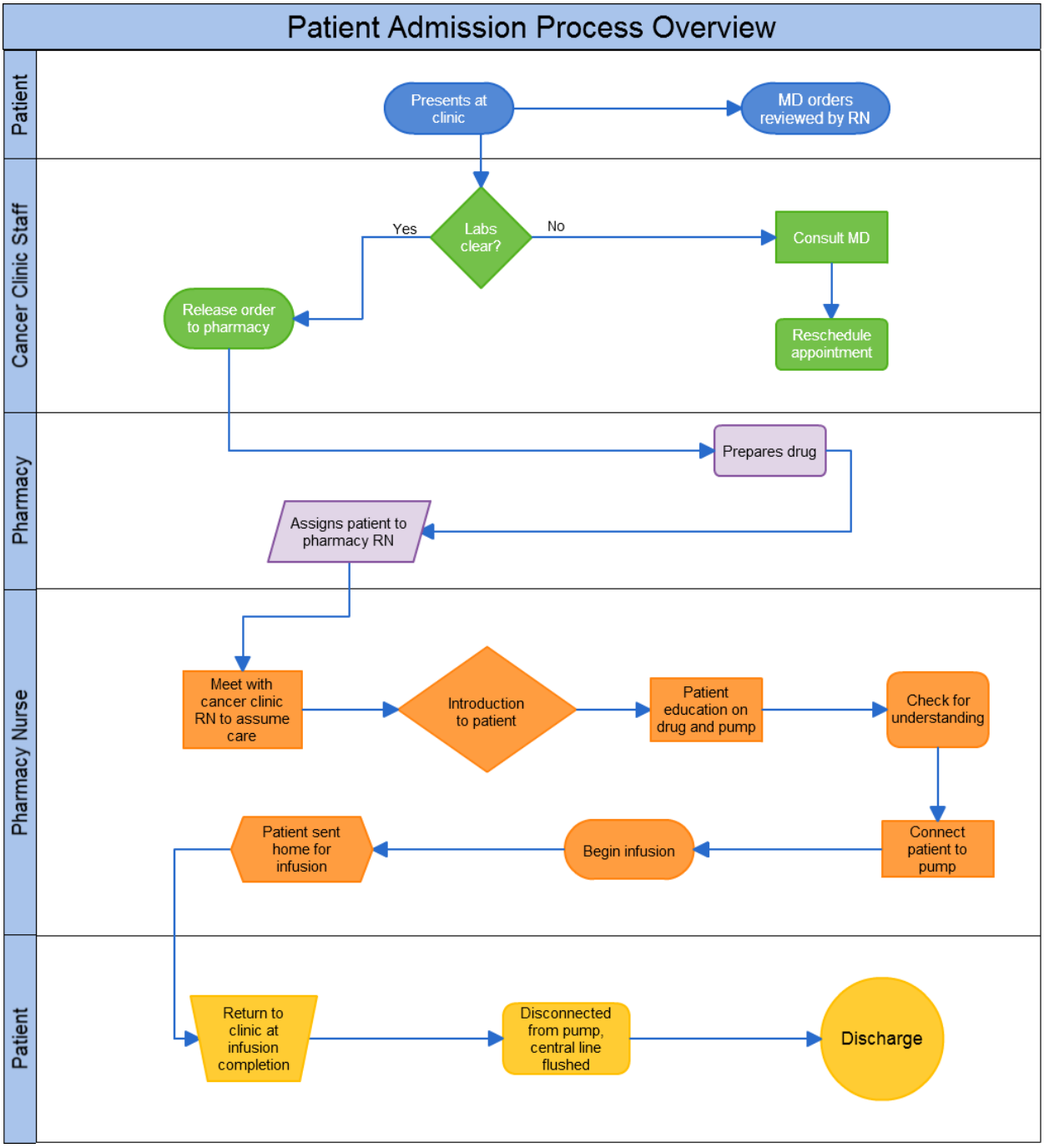
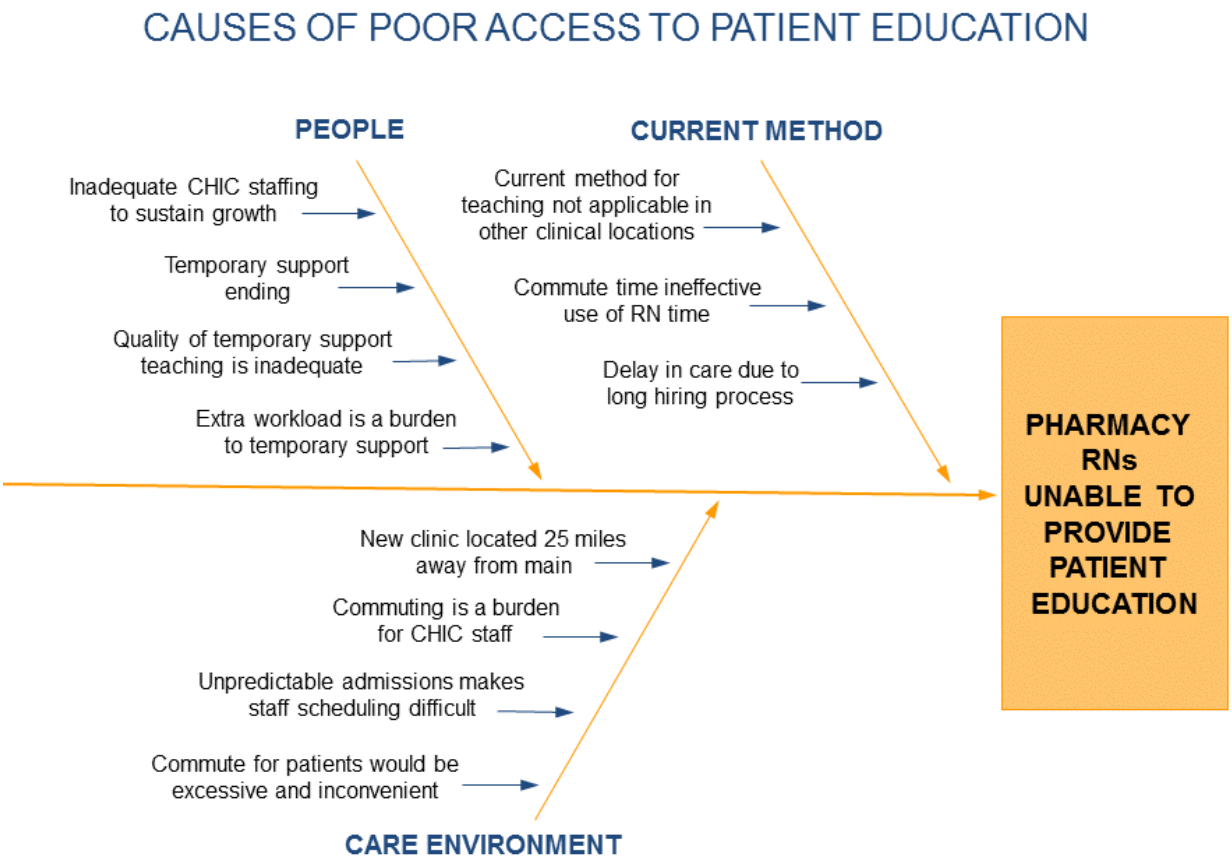
Appendix A
Telehealth Process Flow Map



Appendix B
Process Map: Patient Admission Process



Appendix C
Root Cause Analysis Fishbone Diagram



Appendix D
Cost-Benefit Analysis

Direct Cost of Usual Care	Direct Cost of Videoconferencing
Travel	
Mileage Rate: $0.575 per mile[1]	Mileage Rate: $0.575 per mile[1]
Number of Mile: 50	Number of Mile: 0
Total Amount Reimbursed = **$28.75**	Total Amount Reimbursed = **$0**
Time	
Commute Time: 3 hours	Commute Time: 0 minutes
Teaching: 30 minutes	Teaching: 30 minutes
Documentation: 15 minutes	Documentation: 15 minutes
Hourly wage: $63[2]	Hourly wage: $63[2]
Total Amount of Time in Dollars = **$236.25**	Total Amount of Time in Dollars = **$63**
Monthly Costs	
Per visit Cost = $265	Per visit Cost = $63
Visits per Week = 5 ($1325 per week)	Visits per Week = 5 ($315 per week)
Weeks per Month = 4	Weeks per Month = 4
Total Monthly Cost = **$5300**	Total Monthly Cost = **$1260**
Yearly Costs	
Months in a Year = 12	Months in a Year = 12
Cost per Year = **$63,600**	Cost per Month = **$15,120**
	NET YEARLY SAVINGS: $48, 480

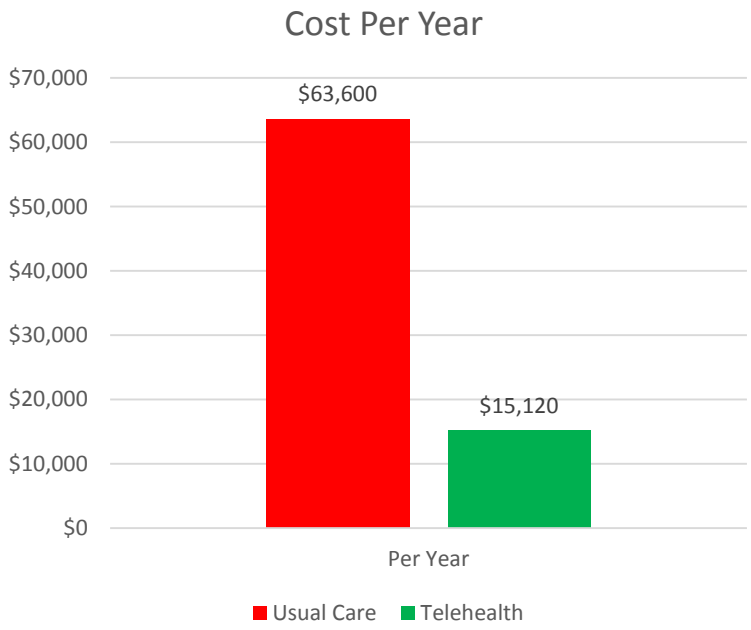
[1] California Chamber of Commerce (2014). IRS announces 2015 standard mileage rates; business rate increases. Retrieved from http://www.calchamber.com/headlines/pages/12122014-irs-announces-2015-standard-mileage-rates-business-rate-increases.aspx
[2] Glassdoor.com (2015) Stanford Hourly Salary. Retrieved from http://www.glassdoor.com/Hourly-Pay/Stanford-Health-Care-Registered-Nurse-Hourly-Pay-E11884_D_KO21,37.htm

Indirect Cost of Usual care

- Decrease staff morale and satisfaction leading to loss of staff or patients

Benefits of Videoconferencing

- Light green dollar (savings): ability to increase access to care for patients and nurses, increases nurse satisfaction, and propels larger organization into the technology forefront (bragging rights).
- Dark green dollars (savings): reduced waste and inefficient use of nursing time, thereby saving money. Reduces need for additional hours of the per diem nurse.
- Does not sacrifice quality

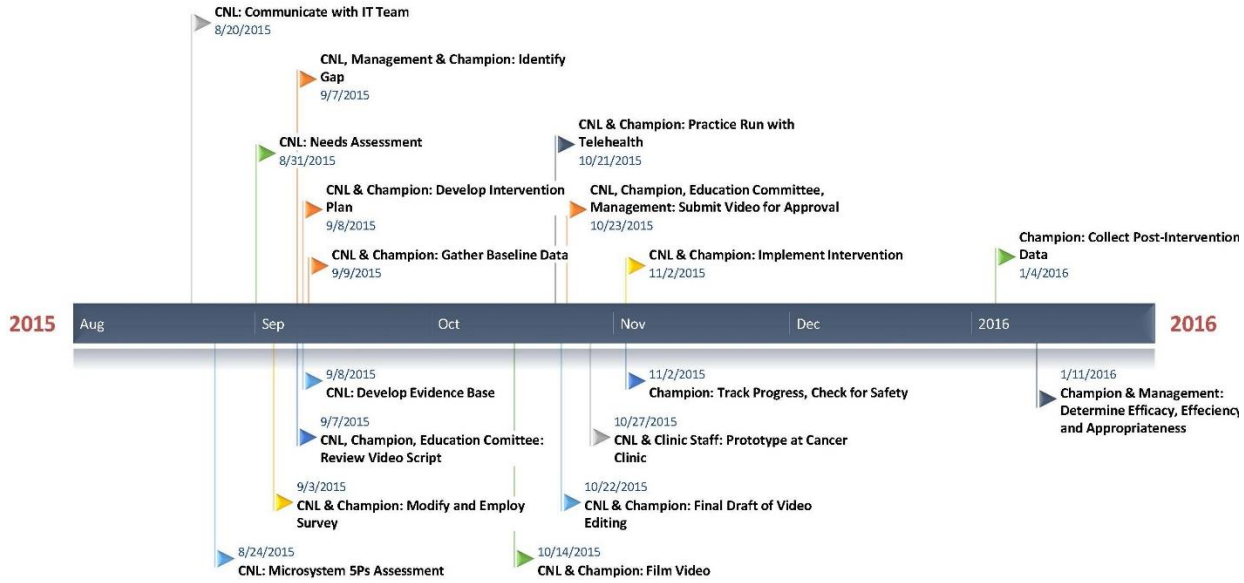

Cost Per Year
$70,000
$60,000
$50,000
$40,000
$30,000
$20,000
$10,000
$0
$63,600
$15,120
Per Year
Usual Care
Telehealth

Appendix E
SWOT Analysis

Appendix F
Gannt Chart and Project Timeline

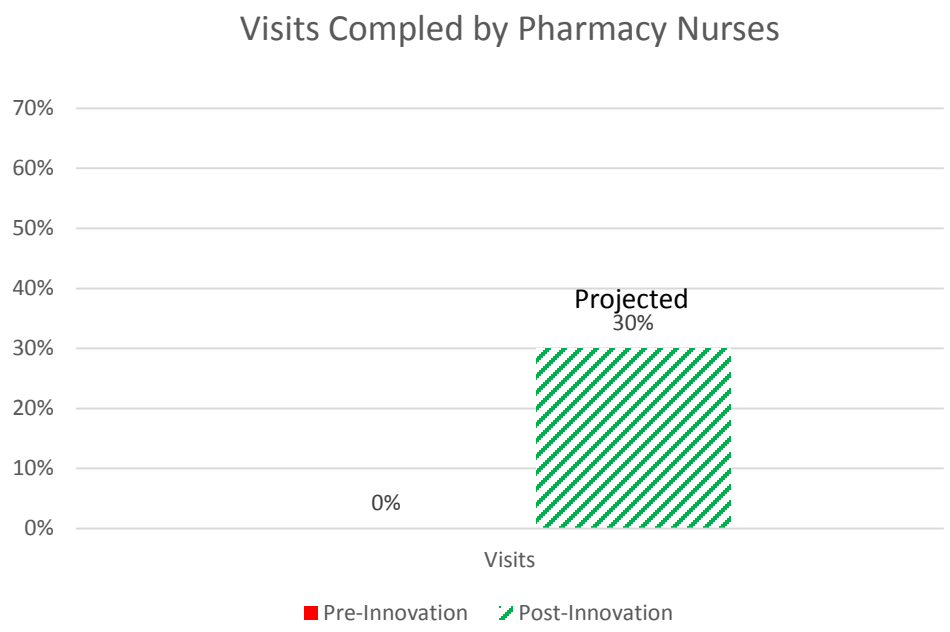
Item A: Gannt Chart

Item B: Project Timeline



Appendix G
Chart and Schedule Audit Results

Item A: Actual and Projected Results from Chart and Schedule Audits



Appendix H
Survey Results

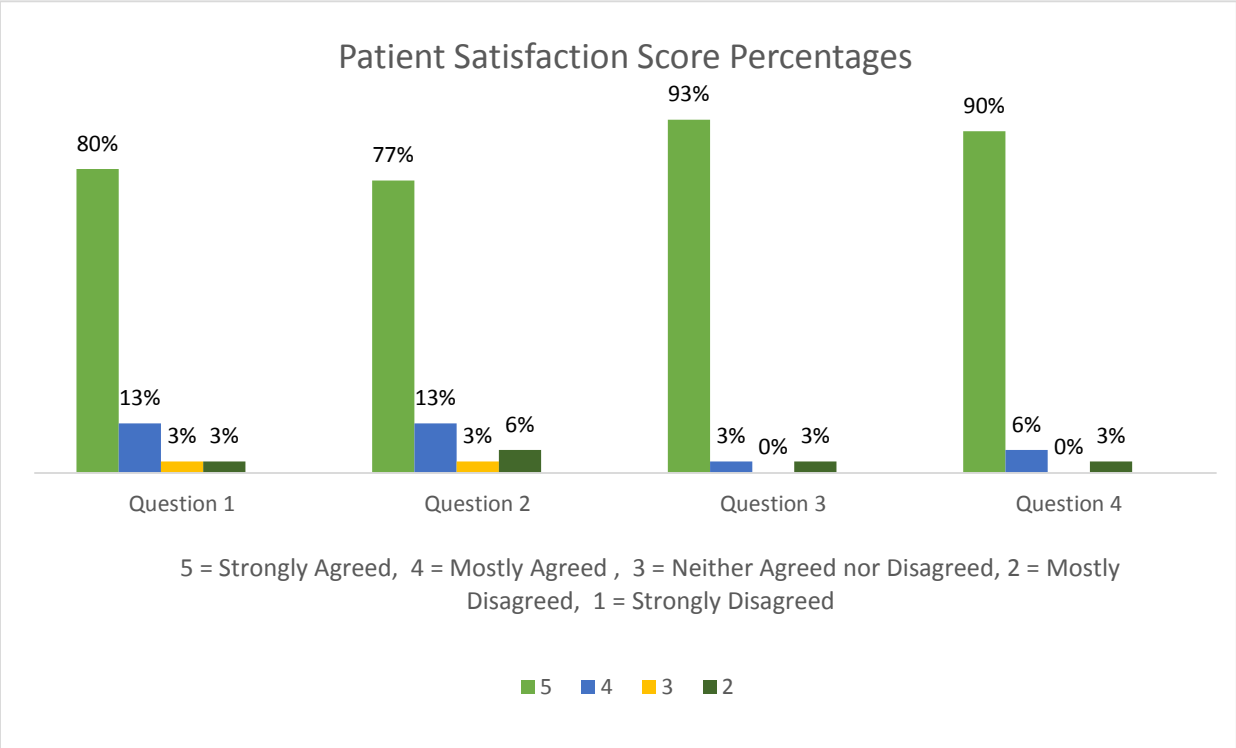
The following data represents 30 pre-intervention surveys collected from September 1, 2015 to November 10, 2015. The surveys asked patients to rank their level of satisfaction of in-person education for Curlin home infusion pump operation on a 5-point Likert scale. Scores were totaled, averaged and graphed for visual reference below. Overall, patients reported a high level of patient satisfaction with the quality of in-person education (4.7/5).

*Note: Post-intervention data is to follow. Findings will be illustrated beside pre-intervention data for ease of comparison.

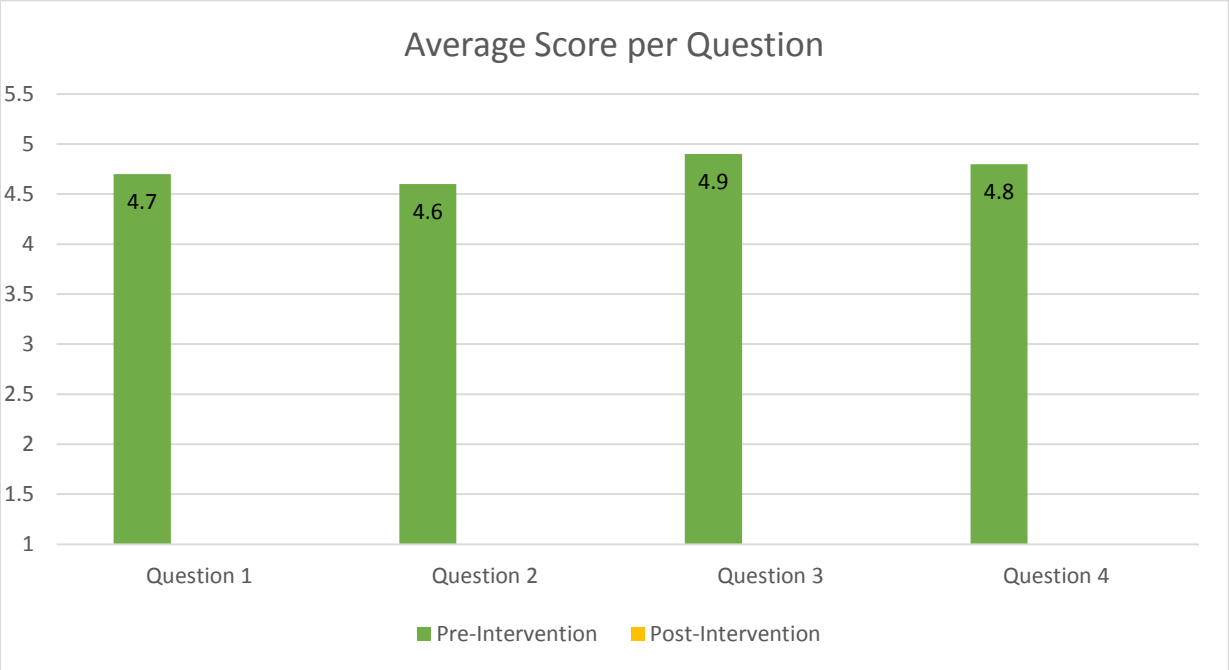
Item A: Patient Satisfaction Survey Results-Pre-Intervention

Patient Satisfaction Survey Results						
Surveys based on 4 questions rated on a 5-point Likert scale: 5 = Strongly Agreed, 4 = Mostly Agreed, 3 = Neither Agreed nor Disagreed, 2 = Mostly Disagreed, 1 = Strongly Disagreed						
Questions	**5-Point Likert Scale Score Totals**					**Average Score**
	5	**4**	**3**	**2**	**1**	
1. The staff explained what to expect during your therapy.	24 (80%)	4 (13%)	1 (3%)	1 (3%)	0 (0%)	141/30= **4.7**
2. The instructions were adequate for safe use of the equipment.	23 (77%)	4 (13%)	1 (3%)	2 (6%)	0 (0%)	138/30= **4.6**
3. You were told who to call if you had problems with your intravenous (IV) medications.	28 (93%)	1 (3%)	0 (0%)	1 (3%)	0 (0%)	146/30= **4.9**
4. I received information about possible side effects caused by my medications.	27 (90%)	2 (6%)	0 (0%)	1 (3%)	0 (0%)	145/30= **4.8**

Item B: Patient Satisfaction Score Percentages Pre-Intervention



Item C: Average Score per Question-Pre- and Post-Intervention



Appendix: I
Call Log Audit

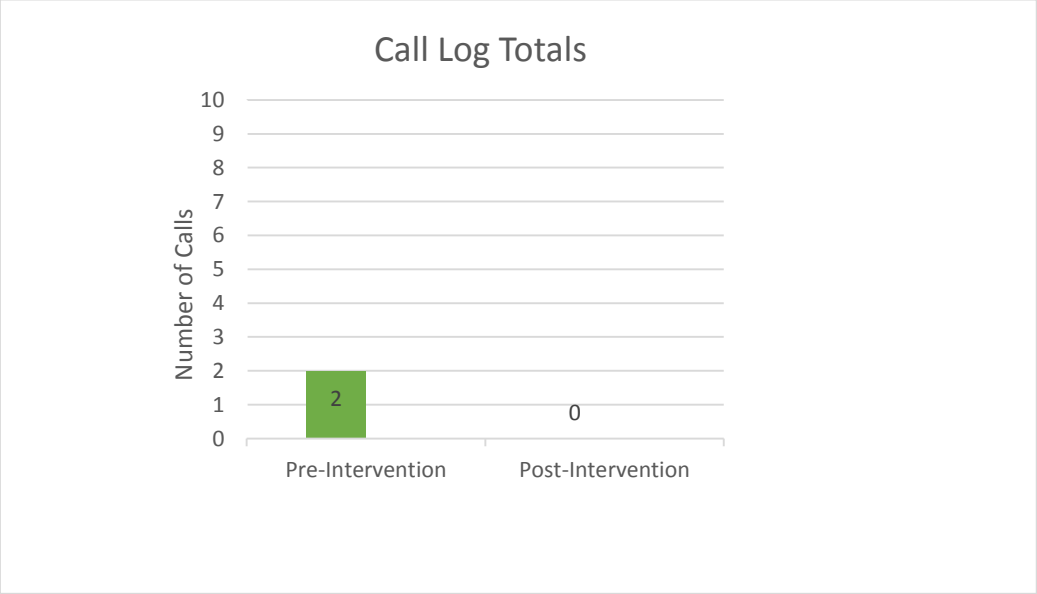
This data represents patient requests for device support, via telephone call, over a six-month period. In these calls, patients were assisted in solving common errors with equipment operation, pump troubleshooting, and/or counseling for medication side effects. The numerical value represents how effective in-person patient education was in helping patients solve issues independently. Each call was assigned a point and then a total was calculated. Overall, in-person patient education was determined to be very effective.

*Note: Post-intervention data is to follow. Findings will be illustrated beside pre-intervention data for ease of comparison.

Item A: Call Log Scores, Pre- and Post-Intervention

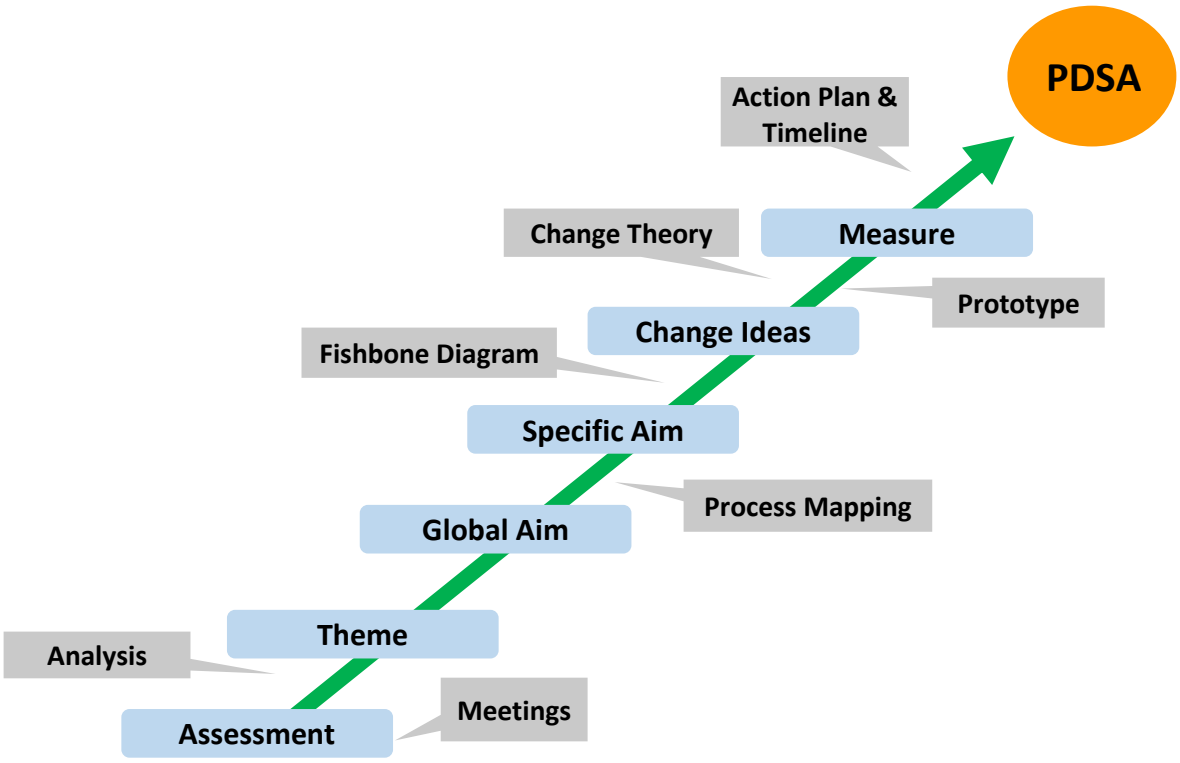
Patient Satisfaction Survey Results		
Calls that pertained to equipment operation, pump troubleshooting, and/or medication side effects were allotted a point.		
Pre-Intervention Data		
Concern	**Point Given**	**Total points**
Pump alarm	1	**1**
Pump alarm	1	**2**
Pre-Intervention Data		
Concern	**Point Given**	**Total points**

Item B: Graph of Call Log Scores, Pre- and Post-Intervention



Appendix J
Scope and Project Overview

Item A: Scope of Project and Current Standing



*Adapted from The Dartmouth Institute (2014).

Item B: Plan-Do-Study-Act (PDSA) Cycle

Appendix K
CNL Roles Utilized During Internship