Summer 8-19-2017

Improving Health Literacy of Colonoscopy Patients Through Reinforced Teaching of Bowel Preparation Using Pre-Procedure Phone Calls

Mindy Peterson
mle83@hotmail.com

Improving Health Literacy of Colonoscopy Patients Through Reinforced Teaching of Bowel Preparation Using Pre-Procedure Phone Calls

Mindy L. Peterson, RN, ADN

University of San Francisco

Improving Health Literacy of Colonoscopy Patients Through Reinforced Teaching of Bowel Preparation Using Pre-Procedure Phone Calls

Healthcare is constantly evolving to meet the demands of complex healthcare issues. Although this is the case, there are still inequities prevalent in healthcare accessibility and status. Health literacy is a prime culprit for today's health care challenges with only 12 percent of adults in America that possess the necessary health literacy skills (U. S. Department of Health and Human Services, 2000). Health literacy is the ability to obtain, process, and comprehend basic health information and services required to make health decisions. Health literacy is crucial to patient outcomes as it equips patients with the know-how to protect themselves, maintain health, and advocate for their own health and well-being. Without proper health literacy, our patients may face more adverse outcomes, increased hospitalizations, poor health status, and higher mortality rates (Green, Gonzaga, Cohen, & Spagnoletti, 2014).

At East Bay Endoscopy Center (EBEC), an estimate of 4,500 endoscopy patients were served last year, in which majority of these procedures were colonoscopies. Among these patients are Medicare/MediCal patients, who are among the most vulnerable populations served in the area. Vulnerable populations comprise of older adults, racial and ethnic minorities, low socioeconomic status, less than high school degree or GED certificate, non-native English speakers, and people with chronic illness/disability (U.S. Department of Health and Human Services, 2000). According to the Bass (2005), low health literacy is most prevalent in elderly and low-income Americans. In a study done of Medicare patients ages 65 years and older, more than one half were found to have lower health literacy (Flowers, Noel-Miller, & Okrent, 2013).

Poor health literacy affects patient at EBEC when there is non-compliance to instructions that leads to poor bowel prep. Cancelled or aborted procedures leads to delays in care and higher

chance for missed polyps that could eventually become colon cancer. This is important, as colon cancer is the 3rd leading cancer among both men and women (American Cancer Society, 2017). Colonoscopy procedures are the gold standard for detecting colorectal cancer (Vashi, 2014). The following project aims to improve health literacy among East Bay Endoscopy Center (EBEC) colonoscopy patients with Medicare/MediCal insurance through pre-calls that reinforce teaching of colonoscopy preparation. When health literacy needs are met, there would be an increase in patient understanding and compliance to prep instructions and completion of colonoscopy procedures.

Clinical Leadership Theme

Clinical nurse leaders (CNL) have the capability to play a vital role in re-shaping health literacy. In this instance, the CNL role is an educator, as the objectives of this project would be to educate staff on different colon prep instructions in order to meet health literacy needs of patients during pre-calls. The leadership theme would be clinical outcomes management and the goal would be the completion of all colonoscopy procedures from patient compliance and adherence to prep instruction.

Global Aim Statement

We aim to improve health literacy for Medicare/MediCal patients at East Bay Endoscopy Center. The process begins with nursing staff education on all colonoscopy prep instructions and ends with pre-calls made to patients prior to their procedures. By working on this process, we expect to improve patient compliance and adherence to colon prep, observe a 100% completion rate of colonoscopy procedures, and eliminate wasted time and costs from cancelled procedures. It is important to work on this now because health literacy is a rising problem in health care and has the potential to negatively impact patient safety, compliance, and outcomes.

Statement of the Problem

According the American Cancer Society (2017), colorectal cancer is among the most common types of cancer. Colonoscopy procedures are the gold standard for detecting and removing cancerous polyps. The success of colonoscopy procedures is highly dependent on patients and their understanding of the prep instructions and procedures.

Based on pre-calls, patient satisfactions surveys, and pre-op assessments there was an identifiable learning need when it came to patient understanding of prep instructions. For example, through a prep instructions survey, patients reported that they found prep instructions to be somewhat confusing and sometimes contradictory. Other times patients didn't understand why they had to split their oral prep solutions and take it early in the morning making them lose hours of sleep. Doctors have also reported that patients failed to follow the low-residue diet days prior to the exam which led to the patient having retained fecal residue. A study done at EBEC on pre-call efficiency found that questions related to prep instructions was the leading questions asked by patients. The purpose of this project is to highlight health literacy needs as it pertains to colon prep instructions for Medicare/MediCal patients and how these needs will be met.

Project Overview/Methodology

East Bay Endoscopy Center (EBEC) is a fast-paced, high demand 6-bed clinic specializing in upper endoscopy, sigmoidoscopy, and colonoscopy procedures. The facility comprises of a pre-operative area, a post-operative/recovery room, and two procedure rooms. There are 10 GI doctors in East Bay Sutter network that use this facility to perform their endoscopic procedures. There are about 15 different anesthesiologists that all belong to a group called, Monitored Anesthesia Care (MAC). The clinic comprises of a chief of staff, medical director, administrator, business office manager, nurse director, a surgical tech, and 15 registered

nurses. The team members come from different cultural backgrounds from Vietnamese, Chinese, Caucasian, and Indian decent. In a given day with maximum capacity, there would be 4 doctors using the facility booking up to 30 patients per day. The workflow of the clinic needs to be quick and efficient in order for the microsystem to work properly. If one area of the clinic is running behind schedule, the whole clinic is affected which leads to delay in treatment and disgruntled patients who have been fasting for over 24 hours.

During the CNL coursework, several studies were conducted by director of nursing, Laura Alexander that helped identify learning deficiencies regarding patients' understanding of colonoscopy prep instructions. A colonoscopy prep instructions survey (see appendix A) was randomly given to colonoscopy patients of the all the GI doctors. The information was analyzed to identify the areas of high learning needs and improvement. Another study was done on pre-call efficiency (see appendix B), in which majority of calls were placed 2 days prior to procedure. The study determined that majority of the questions asked by patients were based on colon prep instructions (Alexander, 2017).

The CNL project aims to improve health literacy among EBEC patients with Medicare/MediCal insurance as they are among the most vulnerable populations. The project will start with educating all nursing staff on the different prep instructions done by in-service. During the 3-hour in-service, staff will be educated on the different prep instructions emphasizing areas of high learning need found from patient and staff feedback. The last hour of the in-service will be dedicated for staff to ask questions and provide feedback.

Pre-calls will be done a week in advance as this is when colon prep usually begins. The nurse doing pre-calls will have a script available (see appendix C) through the patient EMR to help assist with the phone call. During pre-calls to patients, nursing staff will give basic

instructions and assess for understanding of prep instructions. There will be a resource guide book with all the prep instructions for the staff to refer to in the case any learning deficiencies are identified.

Prior to implementation of interventions, data will be collected to determine the number of patients with cancelled/aborted procedures due to non-compliance of prep instructions resulting in poor bowel prep. The information will be compared to post-implementation of interventions the following year to measure the impact of the project.

The specific aim is to improve patient compliance with prep instructions as evidenced by a 100% rate of completed procedures by April 31, 2018. By doing so, there will be higher success rate in colonoscopy procedures and tremendous benefits as depicted in the global aim statement.

The change theory best utilized for this project is the Kotter's change theory (1996). This theory outlines the following eight steps:

1. Establishing a sense of urgency
2. Creating the guiding coalition
3. Developing a vision and strategy
4. Communicating the change vision
5. Empowering broad –based action
6. Generating short-term wins
7. Consolidating gains and producing more change
8. Anchoring new approaches in the culture (King & Gerard, 2016, p.188).

Kotter's theory (1996) approaches change by establishing a sense of urgency, creating the guiding coalition, developing a vision, and communicating the vision (as cited by King &

Gerard, 2016). These elements are important for this project as it will help convince the stakeholders, which are the physicians, nurses, patients, and GI office staff, with the validity of this project.

Rationale

Poor health literacy affects 90 million Americans and as a result people have a more difficult time following healthcare regimens and utilizing health care services (Bass, 2005). Health literacy is a challenge at East Bay Endoscopy Center (EBEC) when it comes to patients understanding their prep instructions. A root-cause analysis was done (see Appendix E) to shed light on the areas needed for improvement. Based on a pre-call efficiency study (Alexander, 2017) it was found that there were learning deficiencies in patient understanding of prep instructions. The study focused on 300 patients scheduled for future endoscopy appointments. These pre-calls were made 2-3 days prior to the procedure date and each call averaged about 2-3 minutes in length. Most inquiries (about 36% overall) were about prep instructions. Instructions that needed clarification were regarding fasting start times, food restrictions, clear liquid diet, and timing of oral intake of prep solution.

Another study done at EBEC was the prep instructions survey (Alexander, 2017), which rendered feedback from colonoscopy patients about their experience with prep instructions. The survey had a series of questions and Likert-type formatted questions. Again, similar learning deficiencies were identified as the ones in the pre-call study. In addition, patients reported that they didn't understand why there was a split dose of prep solutions. The problem patients had with split dose medications was that the second dose was required to be taken during the middle of the night or early in the morning which patients reported caused them to lose sleep. According to Kahi & Rex (2015), failure of patient compliance to bowel prep may be attributed to the

failure of realizing the importance of bowel preparation in the overall success of colonoscopy, and/or lack in understanding preventive health measures.

The importance of this project is significant and is supported by national research committees dedicated to healthcare. One such entity is The National Academy of Medicine (2004), who are proponents to improving health literacy in America. The National Academy of Medicine (2004), supports health literacy through governmental support in the development of health literacy standards, funding for health literacy research, and by supporting new measures of health literacy. Improving health literacy would also require the incorporation of health literacy topics in the curriculum of professional schools and health care continuing educations programs. Institute for Healthcare Improvement (2011) is another organization that seeks to improve health literacy. Their vision is to improve health literacy with a greater emphasis on empowerment and engagement rather than mere compliance.

Cost Analysis

In support of my CNL project I have researched the costs, reimbursement, and charges of a colonoscopy procedure to make a business case. This business case will determine the extent of how beneficial my project would be for the microsystem.

According to Medicare.gov (n.d.) and American Association of Retired Persons (2013), Medicare reimbursement is determined by whether the colonoscopy is considered screening or diagnostic. Medicare Part B covers routine colorectal screening for patients that are 50 years and over and every 10 years thereafter. They also provide coverage for high risk patients with a personal history of polyps, family history of colon cancer/polyps every 2 years. On the contrary, once a polyp is found during the colonoscopy, a screening procedure will be deemed diagnostic and a 20% coinsurance charge will apply to the patient (Flowers, Noel-Miller, Okrent, 2013).

Also, if a patient presents GI symptoms (ex. Abdominal pain, rectal bleeding, anemia, etc.) they would also fall under these diagnostic charges.

At East Bay Endoscopy Center, a colonoscopy screening would cost approximately $1543 and a colonoscopy with biopsy $1714. These costs include facility and physician fees (Healthcare Bluebook, n.d). Anesthesia fees are not included, as fees (deductible/coinsurance) are waived for Medicare/MediCal patients under the Affordable Care Act Provisions (Centers for Medicare & Medicaid Services, 2015).

When colonoscopy procedures are aborted, meaning that the procedure was aborted before the endoscope reaches the splenic flexure, the reimbursement would be 1/3 of the cost of a completed colonoscopy, therefore, the Medicare patient would face up to $1028-$1143 in fees (Pyenson, Pickhardt, Sawhney, & Berrios, 2015). For procedures that are cancelled due to non-compliance to prep, there are no cancellation fees for all patients, however, there is a waste of time for patients, families, physicians, and staff. There is also a waste of prep process, medications, materials, and loss in revenue when colonoscopy procedures are cancelled. For MediCal patients that have cancelled/aborted procedures, there is a non-refundable co-pay fee that may range from $50-$100 depending on their healthcare plan (C. Hulegaard, personal communication, June 23, 2017).

An estimate of $55,548 was spent on cancelled procedures and there were no student costs associated with this project as this is based on voluntary work. The cost of a 3-hour in-service organized by the CNL student will be $2700 to train all 15 staff nurses. The costs of pre-calls that include prep instructions would be $18,000 a year. From the implementation of pre-calls, it is anticipated that there will be a 100% compliance rate and success in colonoscopies. As

a result, there was an estimated cost savings of $55,548. With cost/benefit analysis there is $1.61 savings for every dollar spent (See Appendix F for explanation of costs).

Data Source/Literature Review

Literature that supports this project emphasizes the idea that pre-calls/enhanced instructions can improve patient understanding of bowel prep instructions for a colonoscopy procedure. According to Guo, et al, (2017), enhanced instructions in conjunction with routine instructions for bowel prep led to significant improvements in bowel cleansing for a colonoscopy procedure. The enhanced instructions include phone calls, cartoon pictures, social media applications and smart phone applications. Not only did these enhanced instructions lead to better colonoscopy exams, it improved patient morale and willingness to repeat the preparation in patients undergoing a colonoscopy procedure. A study done by Liu, et al (2014), further explains that telephone re-education on the day before colonoscopy, resulted in better quality of bowel preparation. Another study by Kahi & Rex (2015), reported that education, motivation, and reminders were important in the success of patient compliance to bowel prep. The interventions included were 1:1 teaching sessions, bowel preparation classes, instructional videos, online tutorials, or patient navigators. Comparison of different teaching modalities such as illustrated brochures, videos, education groups, and re-education phone calls were all proven to be beneficial to the quality of bowel prep, however, none of these interventions proved to be more superior than the other (Kuriander, et al, 2016). Barriers to adequate bowel prep include Medicaid health insurance, non-English primary language, lower educational background or health literacy, low patient motivation, and a longer wait time between scheduling and performing a procedure led to poor compliance to bowel prep. Simplified and clear patient instructions and nurse teaching in high risk, vulnerable populations are indicative of improved

bowel prep (Chua, et al, 2015). Furthermore, according to Miller, Itzkowitz, Shah, & Jandorf (2016), when patients of low socioeconomic status received a language-matched (language-preferred help) patient navigator the quality of bowel prep substantially improved. This particular study entails a (2-week prior to procedure) call in which patient navigators reviewed the bowel prep instructions with the patients. Another reminder call done 3 days prior to procedure was made by patient navigators to allow patients to ask questions regarding bowel prep. Throughout the study the navigators would document the process (i.e., total number of call attempts, number of completed calls, minutes spent on calls). The overall consensus of literature review revealed that when there was more staff support to patient education of prep instructions, the results were in favor of improved patient outcomes.

Timeline

The improvement project will be conducted from May 2017 to April 2018 (see Appendix E for timeline). Using the Kotter's Change Theory, we can see the improvement project unfold. From the beginning, we are establishing a sense of urgency through chart audits that identify aborted/cancelled procedures due to non-compliance to colon prep. It is anticipated that by the end of the timeline in April 31,2018 goals will be met and plans for successful interventions will be streamlined into everyday work processes.

Expected Results

With changes to the timing of the pre-calls and staff education of prep instructions, expected results from this improvement plan would be for Medicare/MediCal patients to have a better understanding of prep instructions, therefore, higher compliance rates of colon prep, as evidenced by 100% rate of completed colonoscopy procedures.

Nursing Relevance

Although the project takes place on a microsystem level with a specific population, it is applicable to overall healthcare in improving health literacy for all patients. By improving health literacy among our patients, we improve patient outcomes. With the involvement of other staff and physicians in this process, we can open doors for others to exercise healthy communication behaviors and dialogue with patients. When patients understand health literature, they are better able to empower themselves to inquire and be proactive about their own medical decisions.

Summary Report

In summary, the aim of the CNL Internship Project is to improve health literacy among East Bay Endoscopy Center (EBEC) colonoscopy patients with Medicare/MediCal insurance through pre-calls that reinforce teaching of colonoscopy preparation. Medicare/MediCal patients are the focus population of this project because they are among the most vulnerable populations to high health literacy needs. (U.S. Department of Health and Human Services, 2000). When health literacy needs are met, there would be an increase in patient compliance to prep instructions and completion of colonoscopy procedures.

Data collected by Alexander (2017) from prep instructions surveys and pre-calls identified the learning needs of patients regarding prep instructions. In the pre-call efficiency study, 300 patients scheduled for future endoscopy appointments were used to screen for efficiency during pre-calls. The study identified that most questions asked (about 36% overall) were about prep instructions. From the prep instructions survey (Alexander, 2017), colonoscopy patients provided feedback about their experience with prep instructions. The findings of this study also identified learning deficiencies regarding colonoscopy prep instructions.

The improvement project consists of staff training in regards to the different prep instructions offered by all the doctors. This 3-hour training session would address areas of high learning need, healthy communication behaviors, communication barriers (i.e., cultural, language, hearing, etc.), and open discussion for staff input. Once staff training is completed, enhanced pre-calls will be done using a revised pre-call script that includes prep instructions. This script will provide a chance for staff to reinforce instructions, assess for understanding, and patients to ask questions regarding prep instructions (see Appendix C). There will be a prep instructions resource binder available to nursing staff when pre-calls are being done.

Changes to the original prospectus was the data on cancellations from a year prior to implementation of the CNL project. The information prior was an estimate number of cancellations the current data is accurate and will reflect a more valid comparison to post-implementation data. This information will help show trends of whether there was an improvement from the project's interventions or not.

After implementation of the project, cancellations of colonoscopy procedures still occurred, resulting in the project not meeting the goal of 100% compliance rate (see Appendix G). Several factors may have contributed to non-compliance and cancellation of colonoscopy procedures. The biggest challenge to the project were time constraints. For example, there was initial push back from the physicians in sharing prep instructions with the EBEC staff. With email correspondence and phone calls from the director of nursing at EBEC, the prep instructions were finally made accessible to staff.

The only intervention that was implemented from the project was a resource guide book with standard instructions used by nursing staff during pre-calls. Also, during the timeline of the CNL project, the clinical site was being surveyed by Centers for Medicare & Medicaid Services

(CMS) interrupting plans for implementing this project. With unforeseen events and barriers to implementation, the project had a slow progression.

Another challenge was nursing staff not being able to reach patients during pre-calls (due to disconnected numbers, busy signals, wrong numbers, etc). Missed pre-calls results in patients not exchanging dialogue between nursing staff that could potentially identify questions that the patients had or didn't know they had. Colonoscopy prep instructions consists of many details, therefore, information could be lost if not reinforced through patient education. Focus for improvement in the future may include follow-up that includes telephone appointments, email, or smartphone applications that patients could access at their convenience.

Based on chart audits, patients with cancelled procedures were prescribed Trilyte which is a cheaper oral preparation covered by Medicare/MediCal. The prep requires them to drink 8 ounces of Trilyte every 10-15 minutes until 4 liters of completed or until stools are clear and watery. The tremendous amount of oral intake may be a daunting task for individuals. Prep instructions could include strategies and tips on making this task more manageable for patients. For example, mixing prep solutions with a clear liquid beverage to help with taste or waiting for nausea to subside before restarting the oral intake, etc.

In order to sustain my improvement project into everyday workflow, I plan to propose the idea for my Nursing Director (DON) to be the champion of the project. The DON at EBEC is an individual that is a frontline staff, has a prominent role, and is highly influential among staff and physicians. She will continue the effort to utilize this improvement project and improve the process in order to meet patients' health literacy needs. I also plan to use benchmarking tools to measure the credibility and help evaluate areas that still need improvement. If the project

improves patient outcomes, benchmarking data would reflect this and help sustain support from stakeholders.

The CNL improvement project was a process that helped me gain valuable insight to the world of a Clinical Nurse Leader. Through the lens of a CNL, I was able to see myself as an advocator, risk anticipator, team manager, system analyst, care coordinator, information systems analyst, etc. What I appreciate about the CNL, is the emotional intelligence that encompasses the role, as it is the driving force to my ambitions. My endeavors for this project were to focus on improving health outcomes for the most vulnerable populations, to improve staff awareness of health literacy needs and strengthen compassion through interactions with patients.

References

Alexander, Laura. (2017). Pre-op call efficiency. *East Bay Endoscopy Center: QAPI focused study.*

Alexander, Laura (2016). Prep instructions survey. *East Bay Endoscopy Center: QAPI focused study.*

American Cancer Society. (2017). Key statistics for colorectal cancer. Retrieved from https://www.cancer.org/cancer/colon-rectal-cancer/about/key-statistics.html

Bass, L. (2005). Health literacy: Implications for teaching the adult patient. *Journal of Infusion Nursing.* 28(1), 15-22.

Centers for Medicare & Medicaid Services. (2015). Preventative and screening services update-intensive behavioral therapy for obesity, screening digital tomosynthesis mammography, and anesthesia associated with screening colonoscopy. Retrieved from https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNMattersArticles/Downloads/MM8874.pdf (Links to an external site.)Links to an external site.

Chua, D.L., Srisarajivakul, N.C., Williams, R., Leigh, L., Ou, A…Goodman, A.J. (2015). 637 Quality improvement in bowel preparation for colonoscopy in a high risk inner city patient population. *Gastroenterology.* 148(4). 124-125. Doi: https://doi.org/10.1016/S0016-5085(15)30430-3

Flowers, L., Noel-Miller, C., & Okrent, D. (2013). Colonoscopy screening after the Affordable Care Act: Cost barriers persist for Medicare beneficiaries. Retrieved from http://nccrt.org/wp-content/uploads/colonoscopy-screening-after-aca-insight-AARP-ppi-health.pdf (Links to an external site.)Links to an external site.

Green, J.A., Gonzaga, A.M., Cohen, E.D., & Spanoletti, C.L. (2014). Addressing health literacy Through clear health communication: A training program for internal medicine residents. *Patient Education and Counseling.* 95(1), 76-82. Doi: https://doi.org/10.1016/j.pec.2014.01.004

Guo, X., Zhiping, Y., Zhao, L., Leung, F., Luo, H…Guo, X. (2017). Enhanced instructions improve the quality of bowel preparation for colonoscopy: A meta-analysis of randomized controlled trials. *Gastrointestinal Endoscopy.* 85(1). 90-97.

Healthcare Bluebook. (n.d.) Colonoscopy (with biopsy). Retrieved from https://www.healthcarebluebook.com/page_ProcedureDetails.aspx?cftId=73&directsearch=true

Hulegaard, C. (2017, June 23). Interview by M. Peterson

Institute of Healthcare Improvement. (2011). WIHI: Health literacy: New skills for health professionals. Retrieved from http://www.ihi.org/resources/Pages/AudioandVideo/WIHIHealthLiteracy.aspx

Kahi, C.J., & Rex, D.K. (eds.). (2015). Advances in Bowel Preparation for Colonoscopy. *Gastrointestinal endoscopy clinics of North America.* 25(2). 1052-5157

King, C.R., & Gerard, S.O. (2016). Clinical nurse leader: Certification review. New York: Springer Publishing Company.

Kuriander, J.E., Sondhi, A.R., Waljee, A.K., Menees, S.B., Connell, C.M...Saini, S.D. (2016). How efficacious are patient education interventions to improve bowel preparation for colonoscopy? A systemic review. *PLos One.* DOI:10.1371/journal.pone.0164442

Liu, X., Luo, H., Zhang, L., Leung, F.W., Liu, Z…Guo, X. (2014). Telephone-based

re-education on the day before colonoscopy improves the quality of bowel preparation and the polyp detection rate: a prospective, colonoscopist-blinded, randomized, controlled study. *Gut.* 63(1), 125-130. Doi: 10.1136/gutjnl-2012-304292

Medicare.gov. (n.d.) Your Medicare coverage: Colorectal cancer screenings. Retrieved from https://www.medicare.gov/coverage/colorectal-cancer-screenings.html (Links to an external site.)Links to an external site.

Pyenson, B., Pickhardt, P.J., Sawhney, T.G., & Berrios, M. (2015). Medicare cost of colorectal cancer screening: CT colonography vs. optical colonoscopy. *Abdominal Imaging.* 40 (8), 2966-2976. doi:10.1007/s00261-015-0538-1

The National Academies of Medicine. (2004). Health literacy: A prescription to end confusion. Retreived from http://www.nationalacademies.org/hmd/~/media/Files/Report%20Files/2004/Health-Literacy-A-Prescription-to-End-Confusion/healthliteracyfinal.pdf

U.S. Department of Health and Human Services. (2000). Quick Guide to Health Literacy. Retrieved from https://health.gov/communication/literacy/quickguide/factsbasic.htm

Vashi, P.G., (2014). Colonoscopy still the 'gold standard' for colorectal cancer screening. Retrieved from http://www.cancercenter.com/discussions/blog/colonoscopy-gold-standard-for-colorectal-cancer-screening/

Appendix A

Prep Instructions Survey

1. **GI Physician (Circle one)**

Doc1 Doc2 Doc3 Doc4 Doc5 Doc 6 Doc7 Doc8 Doc9 Doc10

(names have been omitted for anonymity)

2. **Age**

<40 40-50 50-60 60-70 70-80 >80

3. **Appointment time: _____**

4. **Name of prep solution: (Circle one)**

Suprep Prepopik Movieprep Trilyte Half-lytely Golytely Unknown

Other:_____

5. **I took: (Circle one)**

Both doses at night

One dose at night and one dose in the morning

Both doses in the morning

Other: (please explain)_____

6. **On a scale of 1-5 how clear were your prep instructions? (Circle one)**

1	2	3	4	5
extremely confusing	somewhat confusing	neutral	somewhat clear	extremely clear

7. **If instructions unclear, were you able to get answers to your questions before the day of your procedure?**

Yes No If no, please comment_____

Appendix A

Prep Instructions Survey

8. If your instructions were unclear, which part of the instructions did you not understand? (Circle all that apply.)

1- Where/How to get my prep solution

2- Timing of the two doses of prep solution

3- Instructions regarding the week previous to the procedure

4- Instructions regarding the liquid diet the day before the procedure

5- Instructions regarding my daily medications

6- Expectations as to what the prep should do

7- Instructions regarding when I need to stop everything by mouth the day of the procedure

8- Other (please explain)_____

(Alexander, L., 2016)

Appendix B

Pre-Calls Data Collection Form

			Check one			Questions asked (choose all that apply)	
MRN	**Physician**	**# of days before procedure, call completed**	**Left message**	**Patient contacted**	**# of minutes spent on call**	**1-prep 2-parking 3-directions 4-appt time 5-billing 6-medications 7-other**	**Comments**

(Alexander, L., 2017)

Appendix C

Pre-call script

Hi, my name is _____, I am calling from East Bay Endoscopy center to confirm your appointment with Dr._____ on _____for a _____procedure. Arrival time is _____ and pick-up time is _____. Please bring your insurance cards, photo ID, and a list of medications and vitamins that you are taking on a regular basis. Please wear warm comfortable clothes and leave all jewelry at home. Follow your prep instructions carefully which includes _____

_____.

Please drink plenty of clear liquids the day before your procedure, but remember to have nothing by mouth 2 hours before your arrival time which will be at _____. Keep in mind, you may receive a courtesy phone call from your anesthesia the night before your procedure.

We are located at 5858 Horton St. Suite 100 in Emeryville. Parking is located next door in the parking garage, just pull up to the gate and press the button that reads, "East Bay Endoscopy Center" and someone should buzz you in. Also, remember to leave a parking pass on the dashboard of your car, there should be one included in your paperwork from your doctor's office.

If you have any questions, please feel free to call us back at East Bay Endoscopy Center our number is 510-654-4554 or Dr. _____at_____. Thank you and have a great day.

Appendix D

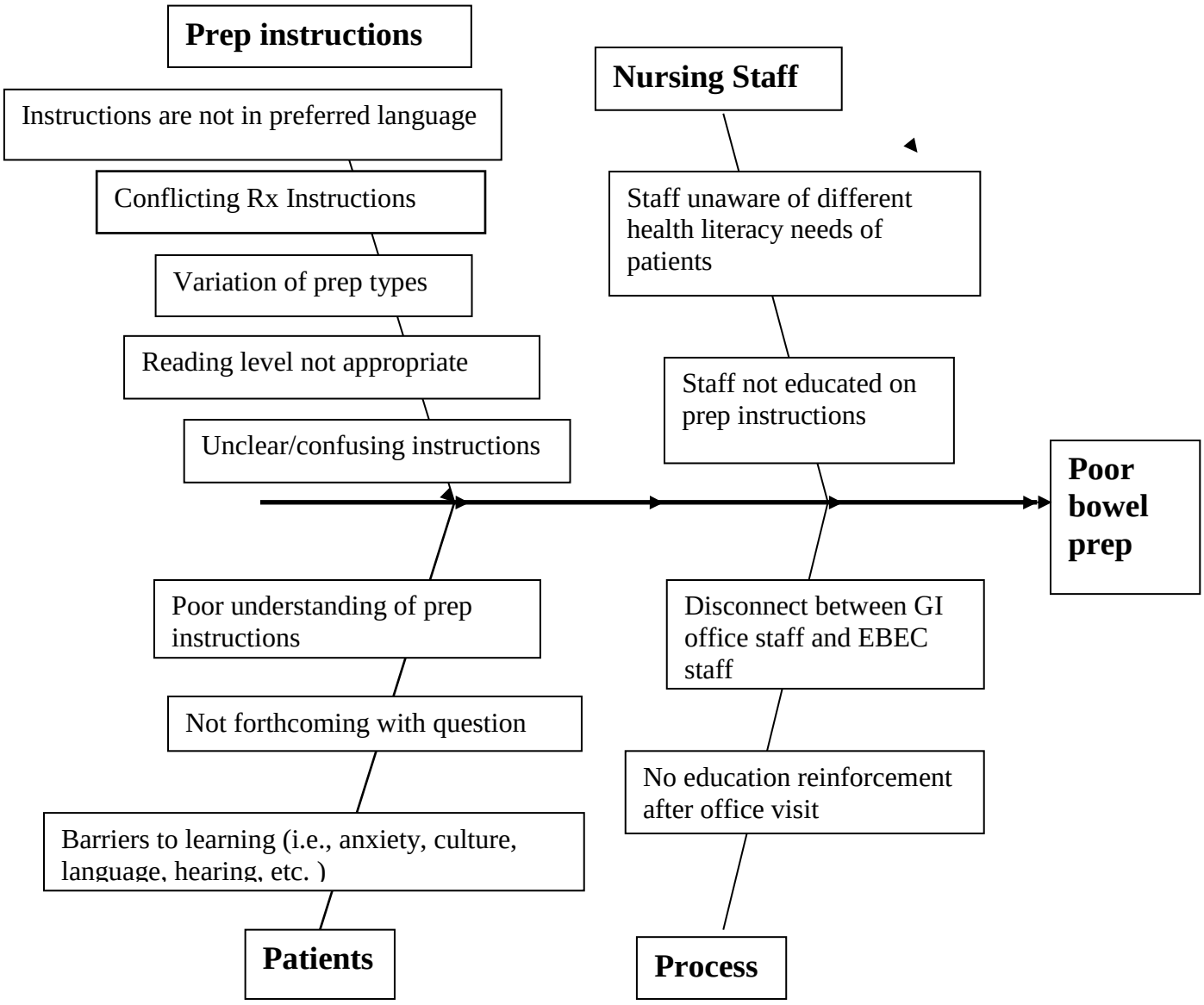
Gantt Chart Timeline

	May-2017	June 2017	July 2017	Aug 2017	Sept 2017	Oct 2017	Nov 2017	Dec 2017	Jan 2018	Feb 2018	Mar 2018	April 2018
Diagnosing problem – chart audits for cancelled/aborted procedures due to non-compliance												
Gather evidence from prep instruction surveys and pre-calls to create urgency and recognize need for change												
Create a guiding coalition												
Develop a vision and strategy												
Meet with stakeholders to communicate change vision												
Start recruiting leaders to help with the implementation change												
Nursing in-service regarding prep instructions												
Implementation of enhanced pre-calls												
Evaluation of effectiveness of improvement plan through monitoring of chart review for cancelled/aborted procedures												
Meet goal of 100% reduction in cancelled/aborted colonoscopy procedures												31st
Streamline process that work into everyday work flow												

Appendix E

Root Cause Analysis

Fishbone Chart



Appendix F

Explanation of Cost Analysis

Cost of aborted procedure a year pre-intervention:

- Cancelled procedures last year (pre-intervention): 22
- Cost of procedure= $1543

  -1543x22=$33,946 spent on cancelled procedures last year

Student costs to implement project:

none

Cost of in-service:

- Nurses' starting wage $60 per hour
- In-service duration 3 hours

  -$60x3=$180 per nurse for in-service training. $180x15 (nurses) =**$2700** cost of inservice

Cost of pre-calls/ year:

- Average time per call: 4 minutes
- Total patients in 2016: 4500

  -4500x4=18,000 minutes/60=300 hours spent a year on pre-calls

  -300hoursx$60/hr (RN wage)=$**18,000 per year on pre-calls**

Total cost:

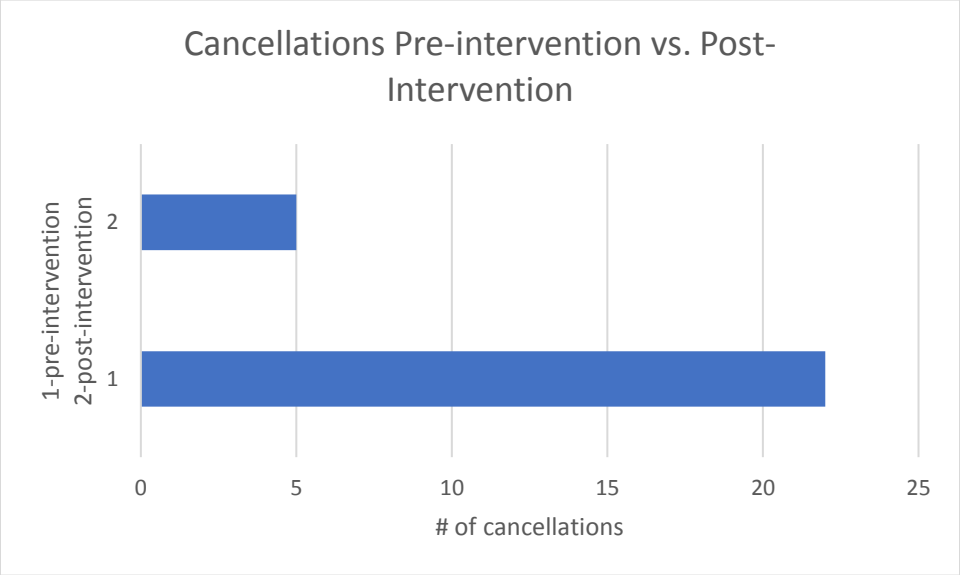
$33,946+2700+18,000**=$54,646**

Benefit

100% compliance rate to prep instructions= $**33,946 in savings (does not include money from prep materials, time off work, etc.)**

Cost/benefit ratio: $54,646/$33,946**=$1.61 for every dollar spent Hotmail.com**

Appendix G



Goal post-intervention: 0 cancellations