

REDUCING PATIENT EMERGENCY DEPARTMENT VISITS AT A  
LOCAL COMMUNITY HEALTH CENTER

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## Abstract

Repeated inappropriate and non-urgent emergency department (ED) visits can lead patients to diminishing quality of life. The lack of initiative for a health center to implement strategies encouraging patients to seek follow-up care for their symptoms with their patient care providers (PCPs), increases the risk for fragmented care. The aim of this Doctoral in Nursing Practice (DNP) quality improvement (QI) project was to implement evidence-based (EB) practice interventions with the multidisciplinary staff algorithm for repeated ED visits and the wallet-sized patient information flyers, in reducing frequent ED visits at Kalihi- Pālana Health Center (KPHC). The Stetler Model framework was utilized for this project. The interventions were implemented from November 2018 to January 2019 at KPHC. Four care coordinators (CCs) participated in an education program discussing the approach for frequent utilizers of the Queens Medical Center (QMC) ED with  $\geq$  three visits in the past six months, who were coming in for follow-up care to KPHC post-discharge from the ED. Three of four CCs were involved in the implementation period, passing out wallet-sized information cards and simultaneously utilizing the KPHC education program algorithm as a guide, to manage patient care. Two of the 10 total patients assigned to the three CCs were able to be reached and received the wallet information cards. They followed-up for self- care management of their symptoms throughout the implementation period at KPHC. Results revealed that a 100% of the two individuals involved in the project stopped going to the ED in the two -month period and yielded a 20% decrease in repeat ED visits.

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## Reducing Patient Emergency Department Visits at A Local Community Health Center

While the health center strives to provide optimal care for all of its patients, it faces a challenge with patients who frequently seek medical care at the local emergency departments (ED) for ‘inappropriate’ and ‘non-urgent’ reasons; some more than three times in the past six months. Inappropriate and non-urgent attendances are conditions not requiring urgent attention or specialized input for which may divert ED resources from time-sensitive or life-threatening situations (e.g. stroke, major traumas, acute myocardial infarction (MI)) (Doran et al., 2014; Van den Heede & Van de Voorde, 2016). However, the issue for increased prevalence to multiple ED visits also extends to a national level. According to the Agency for Healthcare Research and Quality’s (AHRQ) current Healthcare Cost and Utilization Project’s (HCUP) nationwide emergency department sample from 2015, there were approximately 143,469, 670 visits to the emergency department in community, non-rehabilitation hospitals within the U.S (AHRQ, 2015). Additionally, Schoenman and Chockley (2011) discussed the U.S. healthcare spending has doubled over the past decade. AHRQ (2014) estimated average spent per person at the ED was \$44,665. Hunt et. al (2006) contended the increased usage of EDs in the U.S over the years resulted in overcrowded facilities such that they were over capacity 50% of the time. Weinick, Burns, and Mehrota (2010) stated that between 13.7 and 27.1 percent of all ED encounters were for conditions that could have been addressed at outpatient clinics, saving approximately \$4.4 billion annually.

Appropriate patient education for self-management of their illnesses, combined with facilitated care from the multidisciplinary Kalihi-Pālāma Health Center (KPHC) staff, is vital to decrease multiple yearly ED visits. Therefore, an evidenced-based quality improvement (QI) Doctorate of Nursing Practice (DNP) project to reduce ED visits for patients with multiple ED

visits was implemented at KPHC.

### **Description of Problem/Need**

Kalihi-Pālama Health Center (KPHC) is a federally qualified community health center located in Honolulu, Hawai'i. KPHC is in a community that is the home to over 63,000 residents, many consisting of impoverished Asian, Native Hawaiian, and Pacific Island minorities (Kalihi-Pālama Health Center, 2018). It has been a challenge for KPHC to reduce patient multiple ED visits. On a weekly basis, KPHC providers see many patients from various socioeconomic backgrounds who present with different illnesses. The total health cost accrued per patient seen at the health center was approximately \$816.94 (HRSA, 2016). AHRQ (2014) estimated Hawai'i had 490, 830 patient ED visits with mean ED charge per person to be \$37,360 statewide. Locally, KPHC had approximately 48 adult patients who had repeat multiple visits to the ED out of 312 who went to the ED at least once within the past six months (I2i Population Health, 2018). The reasons why patients choose to go to the ED multiple times stems from several prominent issues that were analyzed via a preliminary needs assessment surveys completed by the KPHC multidisciplinary staff (see Appendix B). There were 24 staff members who completed the survey. Their roles included: medical assistant (MA), physician, clinical health worker (CHW), front desk staff, call center staff, health projects coordinator, clinical/non-clinical care coordinator (CC). Data from the survey revealed the top three reasons for going to the ED (see Appendix C).

There were 21% of the staff who felt that the patients were not aware of the available services at KPHC including: hours of operation (8 AM to 4:30 PM Monday through Saturday); after-hours line; physician exchange line; nurse advice line; and ability to make same day walk-in appointments in first-come-first serve basis. Approximately 17% reported a few patients with

opioid dependence and/or behavioral health problems came in to seek refills on their medications or felt that they need mental health care/treatment. However, patients who had suicidal thoughts were referred by the health center's physician and staff to the ED. Another 17% reported patients had difficulties managing their symptoms due to one or more reasons: homelessness; uninsured; needed medication refills; no money to buy/pay for clinic health services and other health needs; inability to ambulate; did not seek help to obtain transportation services to health center; and lived alone at home (especially geriatric patients) and lacked a support system to manage symptoms/treatments. Other reasons for ED visits were: miscellaneous body pain (13%); respiratory disorders (eight- percent); skin disorders (eight -percent); heart disease/disorders (four -percent); diabetes mellitus (DM) (four- percent); fractures/injury/multiple trauma (four-percent); and nausea and vomiting (four- percent). Thus, there was a need to strong address the reasons for patient multiple ED visits. Continuance of patient multiple ED visits leads to diminishing quality of life and ultimately death. Additionally, failure for medical staff to implement strategies to encourage patients to seek follow-up care with their patient care providers (PCPs) to treat their symptoms can increase the risk for fragmented care between KPHC and its patients.

## **Review of Literature**

### **Methods of Literature Search**

An electronic literature search was conducted in PubMed and CINAHL. The following terms were searched utilizing Boolean operators or MeSH terms: “frequent users of the emergency department,” “reasons for frequent ED use,” and “interventions to reduce ED visits.” The search was limited to the years ranging from 2013-2018 and articles written in English.

The exclusion criteria included pediatric and adolescent patients. A total of 249 identified articles were reviewed and four pertinent articles were synthesized for the purpose of this project, revealing that multiple interventions are suggested to reduce frequent utilizers of the ED. Approximately 98% of the articles were exclusively pertaining to children and adolescents. The Mosby's Research Critique Tool was utilized to appraise and grade the level of evidence (see Appendix A).

### **Summary of Literature Based on Themes**

**Interventions to reduce ED utilization.** There were a couple pertinent articles discussing interventions that resulted in significant reductions in ED utilizations. In one article, two out of five studies with interventions that included use of booklets or in-person education sessions on medical conditions in out-patient clinics outside the ED or hospital setting, led to a reduction in use of ED with percentages ranging from 21% to 80% (Morgan et al., 2013, Level I). Additionally, Morgan et. al. (2013) reported that four out of six studies with interventions that expand capacity of community clinics or expanding appointments/hours of care led to reductions in ED use ranging from 9% to 54%.

In the second article, the intervention of implementing a patient-centered medical home model in an outpatient clinic was another strategy to lower probability of patient ED visits. The model follows the National Committee for Quality Assurance (NCQA) guidelines that include: enhanced access and continuity of care; identifying various patient populations; planning and managing care; providing self-support and community resources; tracking and coordinating care; and measuring and improving clinic practice performance (David et al., 2015, Level VI). There was a significant reduction in avoidable ED visits among patients with chronic illnesses (diabetes

hypertension, and coronary artery disease) ranging from 3.50 to 9.62% (David et al., 2015, Level, VI).

Similarly, a third article discussed how case management (care management or CM), individualized care plans, and information sharing were integral interventions to reduce frequent ED utilizations. Out of 10 cohort studies for CM implementation, nine studies reported outcomes, and eight of those observed a decrease in the mean or average number of ED visits compared to the control groups or before the CM intervention was launched (Soril et al., 2015). Additionally, individualized care plans employed interdisciplinary care strategies; however, this was limited to the health services available and the availability of a case manager at a facility (Soril et al., 2015). One RCT and one comparative cohort study was conducted on information sharing, which was sharing patient information amongst healthcare providers through an electronic medical records (EMR) system. The results from the 12-month comparative cohort study led to consistent identification and management of frequent ED utilizers, as well as a significant decrease in mean ED visits, compared to the six-month duration randomized controlled trial (RCT).

The fourth article reported targeting messages conveyed to patients by PCP and staff clinic served as an intervention to change patient behaviors, encouraging patients to see their PCP rather than visit the ED for their illnesses. Raven, Kotchko, & Gould (2013) discussed in their study the message with the greatest impact to persuade patients to contact their PCP instead of the ED was:

“Waiting in line at the Emergency Room in the middle of the night is a hassle—especially if you’re not sure you even need to be there. Use your primary care doctor’s 24-hour

on-call number to speak to your doctor or one of their colleagues and find out if you really need to go to the Emergency Room. It will save you time and stress.”

The message holds promise in capability of PCPs and clinic staff to encourage frequent ED users to contact their PCP instead of going to the ED. Additionally, the patients’ PCP would create after-hours referrals as appropriate. The message also challenges whether the ED was more convenient in all cases, and it determines whether a trip to the ED was necessary (Raven, Kotchko, & Gould, 2013, Level VI).

### **Application to DNP Project**

It was determined that the literature search revealed evidentiary support (to align with this project’s aim) in healthcare settings with PCP staff who utilize interventions to reduce ED visits during their patient encounters. It is anticipated that similar interventions could be used in the long-term, to encourage patients who make frequent visits to the ED to appropriately book appointments to follow -up with their PCP at KPHC and receive better self-management of their chronic illnesses. However, it is the educational training of the clinical staff on a KPHC staff-inspired algorithm to direct care and distributing wallet-sized information flyers for repeated ED utilizers, which facilitated in a reduction in repeated patient ED visits.

### **Theoretical/Conceptual Framework**

The Stetler model was chosen as the framework for this DNP project (Figure H1). It has five phases: 1) Preparation, 2) Validation, 3) Comparative Evaluation/Decision-making, 4) Translation/Application, and 5) Evaluation (see Appendix H). This model includes a series of decision-making steps to facilitate in the use of safe, as well as effective research findings (Stetler, 2001).

Decreasing patients’ multiple yearly ED visits was one of the priorities for KPHC. The

project was evaluated for attained goals and outcomes via electronic medical records (EMR) to determine the number of ED visits made by “repeat” user visits pre-implementation (six months prior) and post-implementation (six months after) on patients with repeated ED visits  $\geq$  three times within six months.

### **PICO Question**

The following PICO question was developed to guide the evidenced-based QI practice change. Will the multi-disciplinary clinical care coordinators (CCs) at KPHC (P) who go through a staff education program (I) as compared to current practice (C) have (a) a better understanding of strategies to care for patients frequently utilizing the ED, leading to a reduction in patient repeated ED visits (O)?

### **Purpose and Goals/Aims**

#### **Purpose and Goals**

The purpose of this DNP project was to implement evidenced-based interventions at KPHC that resulted in fewer repeated ED visits by patients who overused the ED. The main goal of this project was to train the KPHC clinical staff on the education program, and determine if the implementation was effective in reducing ED visits for adult patients with repeated ED visits  $\geq$  three times in the past six months due to their chronic disease symptoms. The multidisciplinary staff of select CCs had to change their clinical practice in several ways: by establishing new patients to KPHC, providing clinical services to patients’ priorities, and guidance on when it was appropriate to go to the ED. The timeline to complete the objectives included several steps. Initially, the plan was that by the end of March 2018, 90% of the multidisciplinary staff (non-clinical and clinical CCs; CHWs; and MAs) had participated in a one-time pre- assessment survey that was given to each employee. The next step was that by the end of July 2018, the

interventions for this DNP project were to have been identified based upon responses from the pre- assessment surveys. At the beginning of September 2018 to November 2018 the plan was for 90% of the multidisciplinary team of CCs to have participated in a training for the education program. At the beginning of November 2018, preliminary data from the electronic medical records (EMR) would have been obtained from the KPHC facility and the Queen's Medical Center (QMC) list for the number of patients who had repeated ED visits  $\geq$  three times over the past six months. By the middle of November 2018, we had planned that 100% of the CCs participated during implementation by passing out wallet-sized information cards for follow- up care to QMC patients who had recently been discharged from the ED. Finally, between November 2018 until January 2019, 100% of CCs should have participated in monthly individual huddles, to facilitate strategies they used to reduce repeated patient ED visits. In January 2019, post- implementation EHR data was to be obtained for the number of patients who have gone to the ER  $\geq$  three times over six months from KPHC and the QMC list. The final outcome objective was that by the end of February 2019, there would be at least a three percent reduction of patients with chronic illnesses within the intervention period.

## **Methods and Procedures**

### **Project Design**

This DNP project utilized a QI design. The Health Resources and Services Administration (HRSA) stated that QI consists of systematic and continuous workflow processes that lead to measurable improvements in health care as well as the health status of a targeted patient population (as cited in Baker, 2017). The QI design and application aligned with this DNP project, as the author has reviewed and chose pertinent evidenced-based literature that facilitated the implementation of the staff education program at KPHC. The QI design had its

advantages and limitations. Advantages to the QI design were that it included evidentiary implementations to improve patient outcomes that were both clinically important and render cost benefits (Gillam & Siriwardena, 2014). However, a challenge to the QI was that the outcomes were often reported internally (Baker, 2017). This means that changes were effective in only one setting rather than all settings.

Since January 2018, the DNP project author and KPHC CCs brainstormed what interventions based on EBP literature would benefit the health center. As a baseline for the interventions, the CCs and head of clinical operations recommended a preliminary needs assessment survey to determine the top three problems the staff often observed and suggestions for how to reduce repeated ED patient visits. In March 2018, the CCs suggested an education program algorithm designed to help them navigate patient care for repeated ED utilizers who follow-up to KPHC after post-discharge from a local ED (see Appendix L). Additionally, they suggested an information flyer card (one small sheet to place in their wallet) patients could use for information on KPHC after- hours services and when it was appropriate for them to go to the ED (see Appendix F).

### **Human Subjects Consideration**

This DNP project was exempt from requiring IRB approval. The author completed the University of Hawai'i required Collaboration Institutional Training Initiative (CITI) course in Human Subjects Protection. The author educated the multidisciplinary team who interacted with patients. Therefore, it was not necessary to obtain consent from the patients. This QI initiative was reviewed by KPHC head of clinical operations and the CCs, protecting the rights of human subjects involved in it. Its implementation was aligned with the missions of KPHC including: protecting the patients' rights; providing quality integrated healthcare to those in need; and

focusing on preventative healthcare in a respectful, caring, and culturally- appropriate manner (KPHC, 2018).

Additionally, the KPHC values upheld throughout this project included but were not limited to the following: performance excellence; respect and recognition; integrity; dedication; as well as equality and education (KPHC, 2018). The confidentiality of participants (i.e., patients, staff, and providers) were protected, with no reported person-identifiable information. This was a low-risk analysis project. KPHC will utilize the results to enhance their continual commitment to provide patient-centered care and maintaining the highest level of recognition by the National Committee for Quality Assurance (NCQA).

### **Sampling Plan**

**Sample.** The target population for this project were the clinical CCs at KPHC. The secondary sample from whom we collected outcome data were frequent users who utilized the ED at Queens Medical Center (QMC) but had affiliations for being either an established or a new patient at KPHC. The KPHC CCs determined that the QMC patient list given to the organization every three months was a more accurate representation of high utilizers to the ED. Therefore, a purposive sample was conducted on the aforementioned list from QMC. As of November 2018, there were 36 patients on the list who had  $\geq$  three repeated ED visits. The sample was only conducted on patients who came to KPHC location, building address #915, for follow-up appointments after discharge from any regional ED.

**Inclusion/Exclusion criteria.** Clinic staff included in this project were the three CCs from the Adult Medicine Department KPHC location # 915 from November 2018 to January 2019. The CCs were educated on the education program during the pre-implementation period

and utilized it as a guide during the implementation period. Pediatric and adolescent patients were excluded in the criteria for this project.

**Recruitment.** The multidisciplinary staff CCs at KPHC participated in an education training session. The customized algorithm served as an additional template to their current practice and was helpful to staff in the management repeat ED patients receiving follow-up care post-discharge from the ED. Additionally, the staff were educated on the KPHC wallet-sized information flyer card which listed the assigned CC, PCP, and the telephone numbers the patients called for management of their chronic illnesses. The proposed algorithm was placed in each staff's corresponding work stations for accessibility. A wallet -sized information sheet was handed to the patient prior to leaving the clinic.

### **Data Sampling**

**Chronological order of data collection procedures.** To align with the DNP project purpose and evaluation questions, the main group included the KPHC Adult Medicine care coordinators (CCs). These frontline staff members had direct interactions with patients on a daily basis. Project implementation was conducted from November 2018 to January 2019. The CCs received educational training in skills for intervention strategies to reduce ED visits. There were individual meeting huddles every month for no more than one- hour and staff discussions and evaluations from November 2018 to January 2019. A Gantt chart provides a visual overview of the project timeline (see Appendix D).

### **Results**

The i2i track is an interoperable population health management (PHM) system tracker utilized by KPHC to gather and analyze patient population data. This project used this system to determine the number of patients who had at least one ED visit, as well as three or more repeat

ED visits in the past six months, during pre- and post- implementation. This data was analyzed to determine whether there was a reduction in return ED visits for all KPHC patients, regardless if they were on QMC list or not.

During pre-implementation in November 2018, 9% of KPHC patients had  $\geq$  three ED visits compared to 91% with at least one ED visit in the past six months, respectively. During post-implementation, 6% of KPHC patients with  $\geq$  three ED visits compared to 94% with at least one ED visit in the past six months, respectively. The data showed a three percent decrease in repeat ED visits in the entire duration of this project. This may be the probable impact from prior- established KPHC mixed interventions utilized among CCs with other multidisciplinary staff on patients following -up with their post-discharge from any ED. These interventions utilized within KPHC included the following: external case management from hospital of patient's ED admission gives hand-off of patient information to KPHC CCs prior to subsequent follow-up of their care at KPHC; patients designated KPHC CCs prior to facility visit in order to coordinate and navigate their management of care; KPHC non-clinical staff making patient follow -up calls within seven days of local hospital ED discharge while simultaneously initiating patients to make KPHC appointments; and KPHC PCPs discussing patient plan of care with CCs.

As prior mentioned, this project utilized the QMC patient repeat ED visit list to analyze and implement the interventions of the education program and of the wallet-sized informational flyer cards given to patients particularly seen in KPHC location #915. During pre-implementation in November 2018, all KPHC CCs were working on follow-up care for 36 patients of which one patient had expired. During post-implementation, there were 35 needing follow-up care from the list, and two had expired during that time. The implementation analyzed

data from three CCs, which totaled 10 patients. Ten wallet-sized information cards and one education algorithm were printed out and given to each CC, totaling 30 wallet cards and three education algorithms. Three total wallet cards were given to the patients. However, two is a more accurate representation to the total amount given, because two CCs who concurrently worked on the same patient mistakenly gave two wallet -sized information cards on two separate occasions. In all two months, only two out of the 10 people assigned to the them received intervention and were given the information flyer, as well as being able to follow-up with self-management of care at KPHC instead of going to the ED. During the implementation, both patients did not return to the ED. This resulted in a 20% decrease in repeat ED visits for this project. Additionally, this led to 100% follow through from both patients during the implementation of the DNP project.

The sample size was only two people, because the majority of the patients that the three CCs attempted to reach were either confirmed deceased; no phone or phone number had changed; homeless; incarcerated; transferred to a different facility for care; confirmed appointment but was a “no-show” to facility on scheduled day; or “nowhere to be found”.

During the implementation period, both patients had no recurring ED visits and were able to maintain contact with their respective CCs for management of care and sought plans to see their PCP as needed. Both retained the wallet-sized information flyer cards given to them during the implementation period and expressed its helpfulness in reaching appropriate resources for their health needs. For anonymity, when referencing these individuals, they were either identified as patient number one or patient number two.

Per CC for patient number one, she had been agreeing to scheduling appointments with her specialists and her PCP at KPHC. With exception to one ED visit in November 2018 during implementation period, she followed through with self-care management and has not had any

further ED visits during the duration of the implementation period. However, patient number one had a prior history of repeat ED visits dating back since 2016. From 2016 to 2018, she had a total of 18 repeat ED visits, of which six repeat visits happened up to six months prior from pre-implementation period. Her past medical history included Type II diabetes (DM II); diabetic foot ulcer; right below the knee amputation (BKA); hypertension (HTN); cerebrovascular accident (CVA); chronic kidney disease stage three; constipation; bladder obstruction; and generalized weakness. Her recent problems to the ED consisted of abdominal pain, urinary tract infections (UTI), weakness, and constipation. Since implementation of this project, her CC created successful referral arrangements for her to see an urologist, for her bladder obstruction and will have a suprapubic catheter in place to prevent recurrent issues of the same problem. Additionally, patient number one will have reestablished care to see an ophthalmologist, endocrinologist, nephrologist, and a cardiologist for her other comorbidities. The CC is also currently arranging for patient to go to a long-term care facility, so that she has better management of care of her health daily.

Patient number two has been managing his care with his KPHC PCP and had no repeat ED visits during the implementation period. He had been an established patient with KPHC since 2013. From 2013-2018, he had a total of 10 repeat ED visits, of which six of them were in the past six months from pre-implementation period. Patient number two had a history of hyperlipidemia, gout, alcohol dependence, cellulitis, hypertension, homelessness, and foot ulcers. Majority of his previous ED visits were due to inflicted wounds from physical assaults, gout, and cellulitis. Per CC, the patient had been coming in to KPHC for routine appointments for wound care treatment to his left foot from cellulitis and medication refills as needed for his gout.

The three CCs who were involved with the project were given pre-and post-implementation surveys for their skillset on management of high ED utilizers. There were four questions: 1) ability to determine the number of times a patient went to the ED in the EMR, 2) ability to recognize high ED utilizers, 3) ability to inform patients of when it is appropriate to go to the ED, and 4) ability to connect and provide follow-up care for post-discharge from an ED. The ratings were categorized by three comfort levels: 1) “I do not understand this skill yet,” 2) “I understand the skill with help,” and 3) “I understand the skill and can work independently.” At pre-implementation and post-implementation of the project, 100% of the CCs understood and could work independently on all four questions asked on the survey.

### **Discussion**

In October 2018, the author of this DNP project notified the head of clinical operations and the CCs at KPHC to set up a meeting to prepare for the pre-implementation period. This was a one-day event in October 2018 that consisted of a one- hour meeting discussing with the CCs the plans for launching the implementation over the next three months. During this period the wallet-sized information flyer cards were given to patients on the QMC list and the education algorithm was used as a guide by the CCs when seeing the patients who are booked for a follow-up appointment to KPHC after being discharged from the ED. The information cards and the education algorithm were passed out to the CCs in the meeting. Pre-implementation data for KPHC and QMC, respectively, for the past six months were taken one month later in November 2018. These data were utilized to show overall reduction of ED visits from all KPHC patients regardless of location for repeat ED visits, and compared to repeat patient visits from just the QMC list. Also, the CC pre-implementation survey (see Appendix G) assessing their skillset for identifying and reaching out to patients who had repeated ED visits were completed. This survey

assessment was also given to the CCs during post-implementation in January 2019 to evaluate their skillset once more after the launch of the project.

Two CCs were originally planned to be involved with the implementation. However, one of the CCs, also known as the head supervisor managing the QMC list of frequent ED users, foresaw that the sample size for final data results would be small, so two other CCs were added, totaling four coordinators for the project. Of the four CCs, only two were able to attend the pre-implementation meeting, due to conflicts with their care-coordinating schedule. The two CCs who did not make it to the meeting were educated on the plans for implementation by the CCs in the meeting. Throughout the implementation, only three CCs were involved, because one of the CCs performed more phone calls and telehealth to follow-up with patients while simultaneously overlooking work of other CCs. Additionally, this CC suggested there was a limitation to the opportunity for her to personally see patients in -person at KPHC after their discharge from ED.

The implementation for the DNP project was initiated in November 2018. Due to the various schedules for the CCs, it was best to meet with them individually for huddles during the two months to facilitate the initiation of the implementation during the first month and transition subsequently to the second month. These meetings lasted from 30 minutes to one -hour increments. Additionally, it was necessary to work around the schedules of the CCs due to their individual vacation requests for paid time off (PTO) and mandatory KPHC holidays or meeting times.

The facilitators to the project implementation were the KPHC multidisciplinary staff who saw potential and need for reducing repeat ED visits in established and non-established patients at KPHC. In this DNP project, the CCs were the frontline staff to coordinate care for the patients and ensure patients follow-up at KPHC after their ED discharge. Additionally, the CCs were the

individuals who were frequently consulted during the early stages of the DNP project, as well as pre- and post -implementation.

The primary barrier for implementation was the amount of time to run the project. The implementation ran for two months. It initially took multiple attempts and meetings with the CCs and head of clinical operations at KPHC to identify and find suitable interventions for implementation that would not impede the CCs daily workflow. This challenging time took a span of 10 months, from January 2018 to October 2018. Subsequently, the implementation periods could only be conducted over middle November 2018 to January 2019. The patients from the list were frequent utilizers of the ED in 2018. With a longer implementation, the trend and duration in which the patient was able to maintain seeking care with their PCP instead of going to the ED could have been evaluated. The motivation to change is variable, depending on an individual's past or present circumstances. In other words, a patient can be motivated to change for the better closer in time to a near life-threatening experience. Additionally, a patient may feel motivated to change their behavior to manage their health or seek KPHC's resources for assistance for a short period of time, but they may revert back to their prior behavior after a while. This DNP project acknowledged that there were limitations that are beyond one's control, even with coordination of care and health management at KPHC. Ultimately, it is the patient that initiates the steps to break the cycle for their repeated ED visits.

Another barrier was the conflicts in the CCs' schedules for project-related discussions during pre-implementation, implementation, and post-implementation. The head of clinical operations wanted the DNP author to autonomously engage with the CCs for the project and for inquiries to implementation of the project. Scheduled times to meet were not concrete, because CCs were often pulled to work several areas at the facility simultaneously to fulfill the high-

volume demands of the health center operations that day. Therefore, it was necessary for the author of this project to be flexible in his schedule, as it can be 30 minutes or more from the proposed scheduled time before the CCs had a chance meet with him.

Although the CCs from QMC collaborated with the patient and KPHC CCs prior to discharge from the ED, it often remains difficult for the CCs at KPHC to follow-up with them post discharge. Though there were health disparities aforementioned in this project (e.g. homeless, uninsured, need medication refills, no money, no transportation, cannot walk, no support at home), the primary barrier for follow-up, even for other CCs working with patients off the QMC list, was patient homelessness.

Despite the barriers prior mentioned from the CCs, they continued to show their motivation and perseverance to facilitate reducing ED visits for KPHC throughout the project. They made all efforts to be flexible with the author of this project, from transitioning to work-related tasks followed by helping answer any questions for the project. Also, they felt that the interventions were easily implementable in reaching out to frequent ED users, because it minimally modified their workflow.

This DNP project compares and contrasts to the literature reviewed articles. Morgan et. al (2013), found a reduction in use of EDs with percentages ranging from 21% to 80% from the utilization of booklets or in-person education sessions on medical conditions in outpatient clinics outside the ED or hospital. This project similarly resulted in a 20% reduction in ED visits from the two patients followed during implementation from use of the education algorithm and the wallet-sized information flyer cards. David et al. (2015) followed the National Committee for Quality Assurance (NCQA) guidelines that include: enhanced access and continuity of care; identifying various patient populations; planning and managing care; providing self-support and

community resources; tracking and coordinating care; and measuring and improving clinic practice performance. KPHC also followed these guidelines in their facility. However, KPHC resulted in a higher reduction to ED visits from the DNP project implementation compared to the article, which ranged in a reduction from 3.50 to 9.62%.

Soril et al. (2015) utilized case management to create individualized care plans, and information sharing were integral interventions to reduce frequent ED utilizations. KPHC utilizes care coordinators in their facility. Also, the studies performed in the article consisted of a 12-month comparative cohort study and a six-month RCT. KPHC had a two-month implementation duration for the project.

Raven, Kotchko, & Gould (2013) utilized targeting messages conveyed to patients by PCP and staff clinic served as an intervention to change patient behaviors, encouraging patients to see their PCP rather than visit the ED for their illnesses. The author of this project was influenced by the article and thus implemented a similar strategy, giving the information wallet-sized cards to patients and educating them on seeing their PCP versus going straight to the ED for their symptoms.

There were several implications for this project. The literature mentions the high number of patients in the ED on public holidays (Sun et al., 2009; Tai et al., 2007). This was due to the outpatient primary care offices being closed on holidays (Kam et al., 2010; Sun et al., 2009; Tai et al., 2007). Surprisingly, many of the people who go to the ED during the prior mentioned times have less acute complaints.

In the past two months, the project was able to save KPHC \$448,320. The two patients had an average of six ED visits in the past six months. Recall from AHRQ (2014) that the mean ED charge per person was \$37,360 statewide. If one patient continued to have the same number

of visits in the upcoming six months, the total costs for their ED visits would be \$224,160. That would be \$448,320 total for both patients with mean of six ED visits within a six- month period.

The author felt it is recommended to exhaust all interventional resources (e.g. information flyers, currently utilized facility interventional protocols) within KPHC to mitigate reducing patient repeat ED visits, as well as establishing care with a PCP at the facility. Although the author believed that statewide and nationwide hospitals would also like to reduce unnecessary repeated ED visits, the interventions to each hospital would vary. For example, KPHC sees a high volume of people, serving individuals who are predominantly destitute and have social barriers to care as prior mentioned. Whereas, another facility may see a variety of patients, with only a fraction of them being a destitute population. A suggestion for KPHC (and for nationwide hospitals) is to educate non-clinical and clinical staff on identifying high-risk patients when they do present to the health center for check-up, so that these patients can receive the appropriate care before their symptoms worsen. Another option is to create on KPHC's EMR system a pop-up reminder, to alert medical staff of a high-risk patient and to subsequently give them the wallet-sized information card on their visit. Additionally, the facility can be innovative and create a magnet containing the phone numbers from the wallet-sized information card to place on the patients' home refrigerator.

Additionally, the author felt that if he could redo this DNP project, he would have wanted more time for implementation. Reasons include for a more accurate representation to analyze acute patterns in patients' symptoms who return to the ED. It could well be that the symptoms for the patients were "appropriate" for them to go to the ED. For example, one of the patients followed in this project routinely returns to the clinic for proper treatment of his foot wounds. However, if the patient developed complications on his wound from a rare flesh-eating bacterial

skin condition like necrotizing fasciitis, then it would be necessary and appropriate to treat aggressively at the ED or a hospital.

### **DNP Essentials**

The American Association of College of Nursing (AACN) developed *The Essentials of Doctoral Education for Advanced Nursing Practice*, which signifies the foundational competencies and curricular elements for nurses practicing at the doctoral level. This DNP project met the implications of the eight competencies outlined by the *DNP Essentials* as will be explained in the following passages.

**Essential I: Scientific Underpinnings for Practice.** This essential guides DNP graduates for practice through preparation by integrating foundational nursing sciences (i.e. organization, biophysical, analytical, and psychological) with nursing concepts. This DNP project utilized foundational nursing science principles; healthcare systems and delivery; as well as developed and evaluated new practice approaches to reduce ED visits among vulnerable populations in healthcare. Majority of the patients with ED visits  $\geq$  three in the past six months required health management and coordination of care for their comorbidities.

**Essential II: Organizational and Systems Leadership for QI and Systems Thinking.** Leadership in the health care systems and organization are pivotal to practicing quality care to health systems and the organization; patient safety; and cultural competence to various populations. With facilitated monthly huddles and correspondences with an interdisciplinary team of care coordinators and the Director of Clinic Operations, this evidence-based QI project helped improve the delivery of healthcare and eliminate health disparities in a few patients, while simultaneously mitigating ED reduction rates.

**Essential III: Clinical Scholarship and Analytical Methods for EBP.** Key activities for DNP graduates include the application of EBP, translating research into clinical practice through clinical scholarship and quality methodology in patient-centered healthcare settings. This DNP project involved an extensive literature review and critiquing of the level of evidence. Additionally, the Stetler Model was utilized to collect data; design evidence-based interventions; examine and analyze data in a practice setting; implement; evaluate outcomes; and promulgate findings to KPHC.

**Essential IV: Information System/Technology and Patient Care Technology for the Improvement and Transformation of Health Care.** Informatics and patient care technology were essential elements to implement project change, collecting data for analysis, and means to improve healthcare management. The i2i Track program was utilized to generate, collect, and analyze data from KPHC's electronic medical record (EMR) system for visits during pre- and post- implementation to patients with  $\geq$  three ED visits in the past six months.

**Essential V: Health Care Policy for Advocacy in Health Care.** Health care policy is critical to the delivery of health care communities and its patients. This DNP student engaged proactively with KPHC stakeholders, identifying patient health disparities and barriers to access of care. The student also served as an influencer for change not only for overall reduction of patient ED visits but advocating for improved delivery in quality of care, access, and efficiency (IOM, 2001).

**Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes.** A key to this essential is being effective in leadership and creating interdisciplinary teams within a fluid healthcare environmental setting. An interdisciplinary team involving KPHC's head of clinical operations, health care professionals, and supportive staff

were essential to addressing the challenges to problem of increased patient ED visits and for coordination of care for health outcomes. This DNP student collaborated and consulted with the aforementioned KPHC interdisciplinary team through monthly huddles to facilitate a practice change.

**Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health.** Two main ideas to this essential are for health promotion and population health. These aspects are intended to address the national goal as prevention interventions for improving populations' health status (AACN, 2006, p.15). The ultimate goal for this DNP project was to encourage patients from QMC list to follow-up with their PCP appointment at KPHC after discharge to encourage continuity of care and necessary health care services and screenings, rather than going straight to the EDs. By reducing ED visit rates, patients were able receive preventive and necessary health care services from their PCP at KPHC without wasting time and stress going to the ED.

**Essential VIII: Advanced Nursing Practice.** The role of an advanced practice nurse includes application to multiple disciplinary sciences and learning experiences from various patient health care systems. Thus, advanced practice nurses will need to continue evolving, refining their advanced assessment skills to operate independently in their clinical nursing practice. DNP- prepared RNs should manifest advanced practice level of clinical thinking, judgment, and skills; and EBP interventions to improve health outcomes (Brown, 2005). This DNP student with a specialty in Family Nurse Practitioner utilized advanced practice level of clinical judgment and EBP to strengthen and influence a QI project for change at KPHC to the increased ED rates process by integrating a staff education algorithm and an information flyer for repeat ED patients with  $\geq$  three ED visits in the past six months.

## Appendix A

### Mosby's Level of Evidence and Synthesized Articles

Table A1.

Mosby's Level of Evidence with Number of Synthesized Articles

Level of Evidence	Descriptions	Number of Articles
I	Systematic Review or Meta-analysis of all relevant RCTs	2
II	Experimental design/Randomized	0
III	Control Trials	0
IV	Quasi-experimental design	0
V	Case-controlled studies, cohort studies, longitudinal studies	0
VI	Correlation studies	2
VII	Descriptive including surveys, cross sectional design, developmental design and qualitative studies	0
	Authority opinion or expert committee reports	
Other	Performance improvement, review of literature	0

Appendix B

Needs Assessment Preliminary Survey

Table B1.

Needs Assessment Preliminary Survey with Questions to Staff

<b>What is your role at KPHC? Please place checkmark next to position.</b>
MA _____
Physician _____
Clinical health worker _____
Front desk staff _____
Call center staff _____
Health projects coordinator _____
Clinical or non-clinical care coordinator _____
<b>What are the top 3 problems that you come across for patients who frequently go to the emergency department (ED)?</b>
1. _____
2. _____
3. _____
<b>What are suggestions/ solutions for KPHC to reduce frequent ED visits?</b>

*Note.* This Needs Assessment Preliminary Survey was created with assistance from the non-clinical/clinical care coordinators and suggestions from the head of clinical operations from KPHC.

Appendix C

Preliminary Needs Assessment Survey Data

Table C1.

Frequent ED Problems from Preliminary Needs Assessment Survey Data

Frequent ED problem	# of People Who Added Problem to List
Patients unaware of offered KPHC Health Services	5
Behavioral Health/ Opioid dependence	4
Difficulties managing symptoms due to one or more reasons:  -Homelessness -Uninsured -No money -Cannot ambulate -Does not seek help for transportation services to health center -Lack support system	4
Miscellaneous Body Pain	3
Respiratory Disorders	2
Skin Disorders	2
Heart Disease/Disorders	1
Diabetes (DM)	1
Fractures/Injury/Multiple Trauma	1
Nausea and Vomiting	1

## Appendix D

### The Timeline of DNP Events in a Gantt Chart

Table D1.

The Timeline of DNP Events in a Gantt Chart

Timeline of Events	2017			2017			2018			2018			2018			2018			2019			2019	
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May	
Engaged Content Expert, Opinion Leaders	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	
Engaged Stakeholders (staff & providers)	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	
Distribute pre-implementation preliminary needs assessment surveys to staff							Completed																
Brief Key Stakeholders for project proposal											Completed	Completed	Completed	Completed	Completed								
Organization Approval to Implement														Completed									
Successful Proposal Defense												Completed											
Staff Training													Completed	Completed	Completed								
Generate pre-implementation of KPHC ED report from June 2018 – Nov 2018															Completed	Completed							
Generate pre-implementation of QMC ED report from Nov 2018															Completed	Completed							
Implement Pilot Study																Completed	Completed						
Generate post-implementation of KPHC ED report from Aug 2018 – Jan 2019																		Completed	Completed	Completed			
Generate post-implementation of QMC ED report from Jan 2019																		Completed	Completed	Completed			
Staff check-in huddles																Completed	Completed	Completed	Completed				
Collect Data														Completed	Completed	Completed	Completed	Completed					
Enter Data														Completed	Completed	Completed	Completed	Completed					
Distribute post-implementation surveys to CCs																Completed	Completed	Completed	Completed				
Analyze/Interpret Data																Completed	Completed	Completed	Completed				
Written & Oral Defense																				Completed	Completed		
Prepare & Submit Dissemination Products																					Completed	Completed	
Graduation																						Completed	

Completed   
 Projected

*Note.* Timeline of events show project development, implementation, evaluation, and dissemination.

Appendix E  
Evaluation Plan Table

Table E1.

The Evaluation Plan Table for DNP project.

Evaluation Question	Evaluation Method	Type of Data Collected	Variable(s)	Level of Measurement	Analysis	Person(s) Responsible	Timeline (When)
Was there a reduction in ED visits for the target population (patients with chronic illnesses going to ED $\geq$ three times in past six months) when comparing pre-and post-implementation of education program?	Post - implementation evaluation questionnaire	EMR data	Outcome variable  Predictor variable	Categorical	Univariate	Project developer <b>(DNP student)</b>	Prior to implementation (November 2018)  After implementation (January 2019)
Were all stakeholders identified and project developer was able to receive feedback from them for project ideas and planned interventions?	Evaluation program pre-assessment survey	Count data	Outcome variable	Categorical	Univariate  Descriptive	Project developer, KPHC multi-disciplinary staff (CCs, physicians, MAs, CHWs)	Prior to implementation (January 2018)
<b>Care-coordination</b>							
Were the scheduled education program training sessions helpful in building their skillset for frequent ED utilizers?	Staff CC Survey	One group with pre-and posttests documentation	Antecedent variable  Predictor variable  Outcome variable	Ordinal	Univariate	CCs	Prior to implementation (November 2018)  After implementation (January 2019)
Were the patients being followed-up appropriately throughout the program process?	EMR data	One group time-series assessment	Outcome variable	Categorical	Univariate	CCs	During implementation (November 2018-January 2019)

Appendix F

KPHC Information Flyer Wallet Size

Table F1.

KPHC Information Flyer Wallet Size

<b>KPHC Services</b>	<b>Phone Number</b>	<b>Notes:</b>
<b>KPHC Care Coordinator:</b>		
<b>Service Coordinator (insurance):</b>		
<b>Case Manager:</b>		
<b>KPHC PCP:</b>		
<b>KPHC #915 Hours of Operation: 8am to 4:30 pm Mon to Sat; Wed. 8am-7pm</b>	(808) 848-1438	
<b>After Hours Services (4:30pm- 8am Sun-Mon)</b>	(808) 524-2575	
<b>Physician Exchange Line</b>	(808) 524-2575	
<b>Nurse Advice Line</b>	(808) 791-6307	
<b>Same Day Appointment</b>	(808) 848-1438	
<b>Medication Refills</b>	(808) 791-6307	
<b>Ho' ō la Health &amp; Urgent Care</b>	(808) 208- 8700	

*Note.* This wallet- sized KPHC Information Flyer was created with assistance from the non-clinical/clinical care coordinators and head of clinical operations from KPHC.




Appendix G

KPHC Care-Coordinator Pre- and Post-Implementation Survey

Table G1.

KPHC Care-Coordinator Pre- and Post-Implementation Survey

Please mark where you would rate yourself for the following skills:

	<b>I Don't Understand This Skill Yet</b> 	<b>I Understand the Skill with Help</b> 	<b>I Understand the Skill and Can Work Independently</b> 
<b>1. Knowing in EMR the number of times the patients have visited the ED?</b>			
<b>2. Able to recognize high ED utilizers?</b>			
<b>3. Providing information and/or educate patients on appropriate use of ED?</b>			
<b>4. Provide follow-up (visits, communication) with patients who have recently visited the ED?</b>			

*Note.* This KPHC Pre- and Post- Implementation Survey was created with assistance from the non-clinical/clinical care coordinators and head of clinical operations from

## Appendix H

### The 2001 Stetler Model of research utilization to facilitate EBP

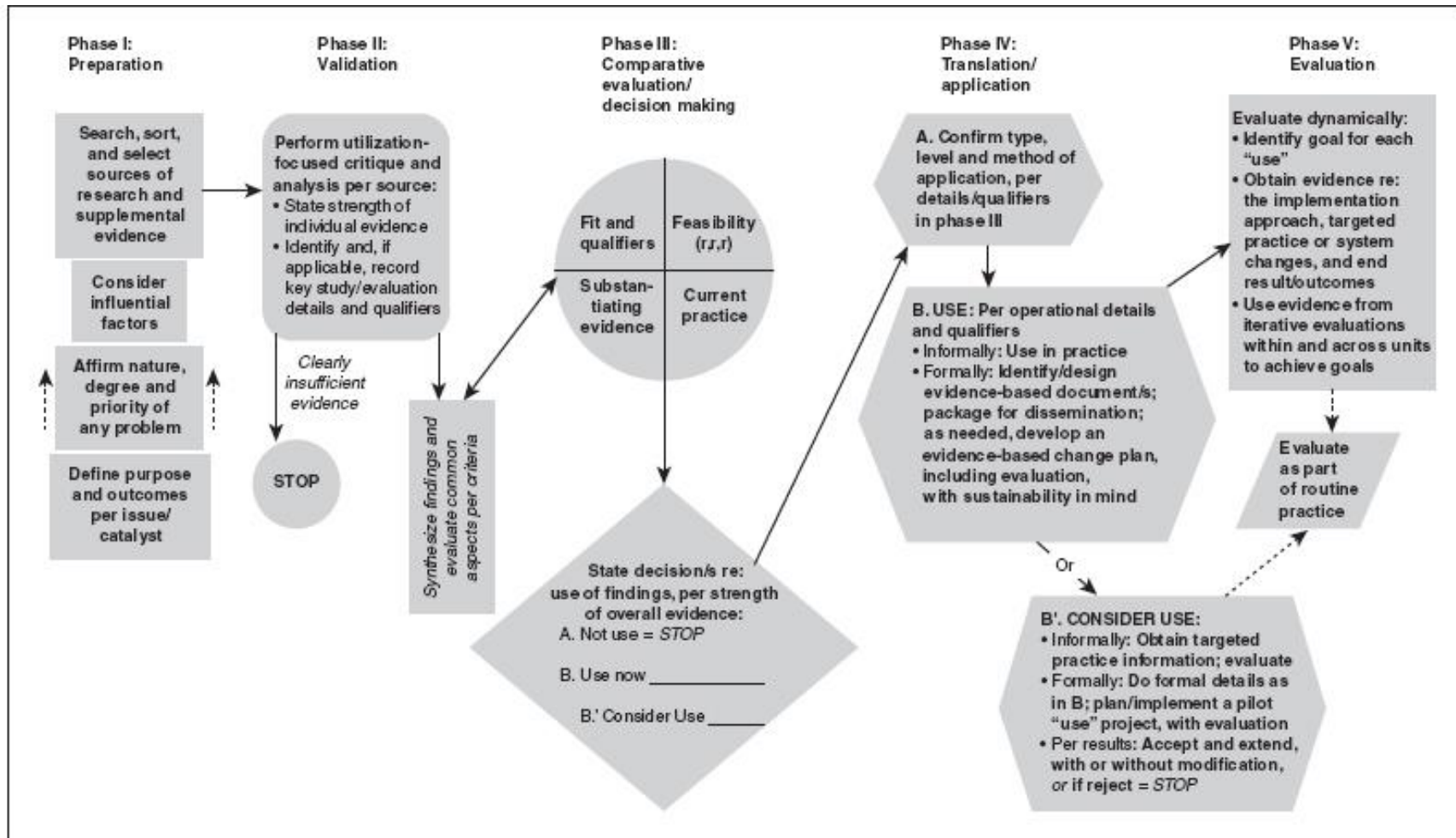


Figure H1. The Stetler Model of research utilization to facilitate EBP (Stetler, 2001).

Appendix I

KPHC Original Flow Chart #1: Patient Service BEFORE the Patient Comes into the Clinic (Call-in)

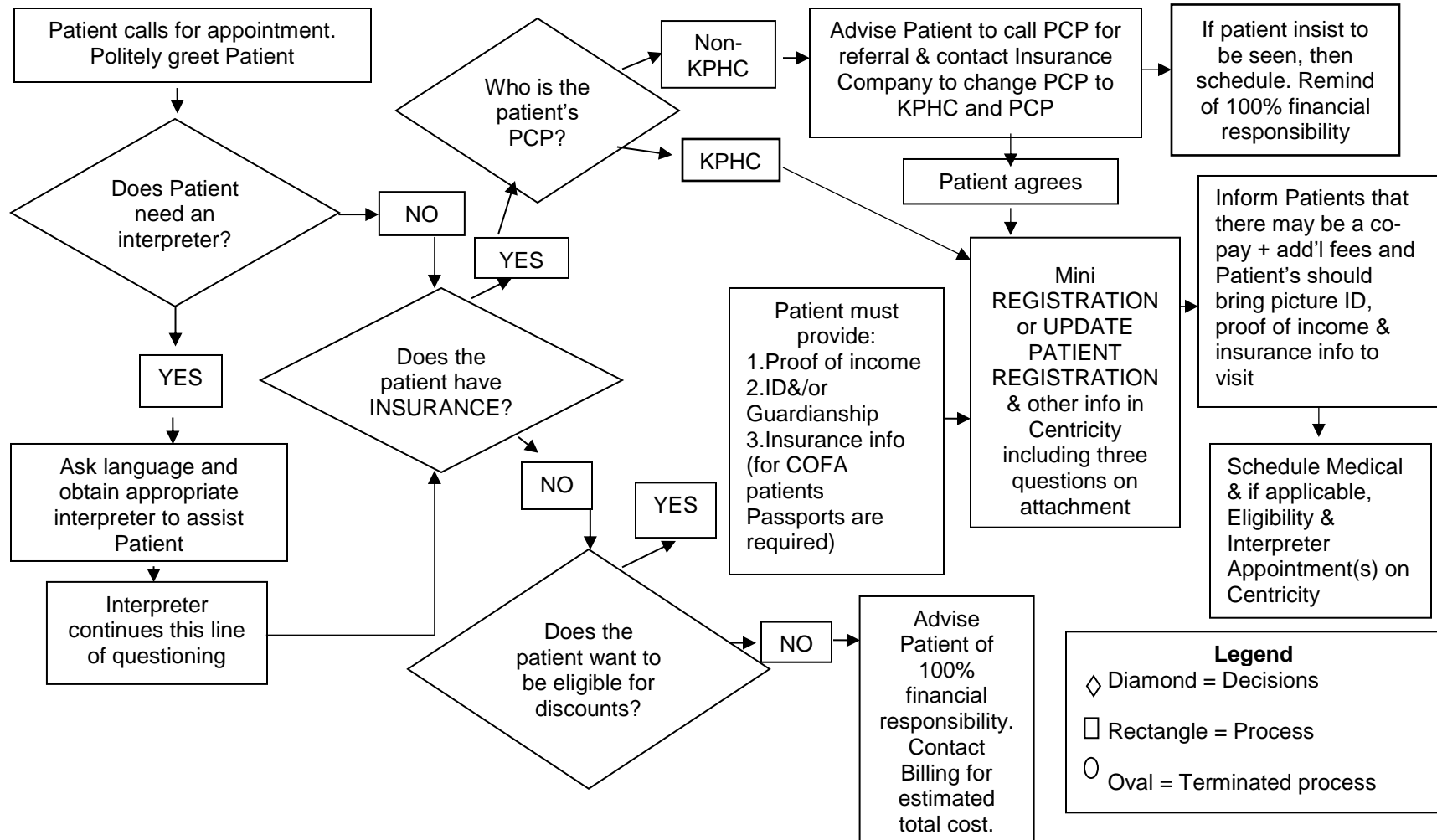


Figure II. This KPHC Flowchart (2018) was created with assistance from KPHC staff members.

Appendix J

KPHC Original Flow Chart #2: Patient Service at the Clinic

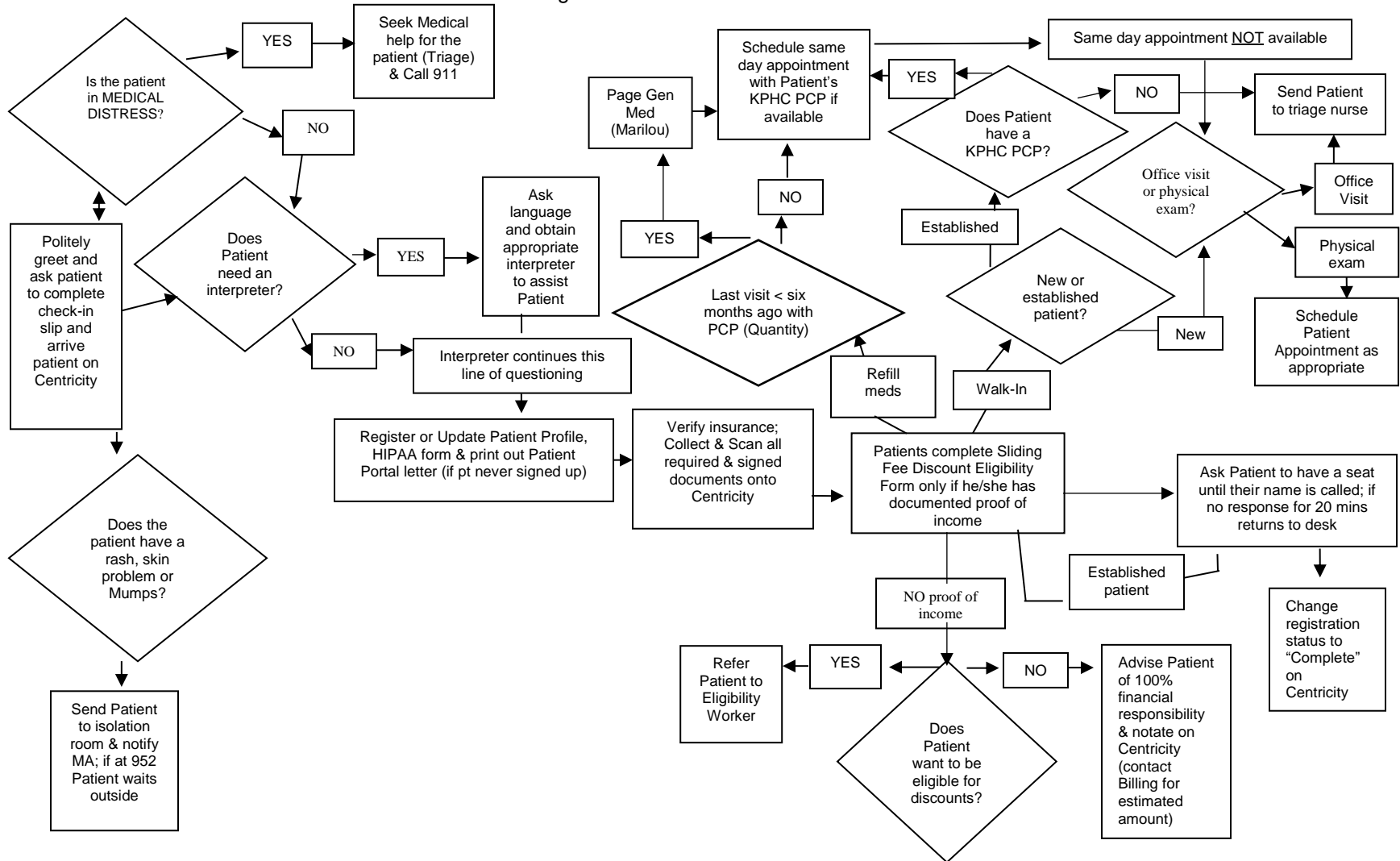


Figure J1. This KPHC Flowchart (2018) was created with assistance from KPHC staff members.

Appendix K

KPHC Original Flow Chart #3: Patient Additional Fees and Check-Out at the Clinic

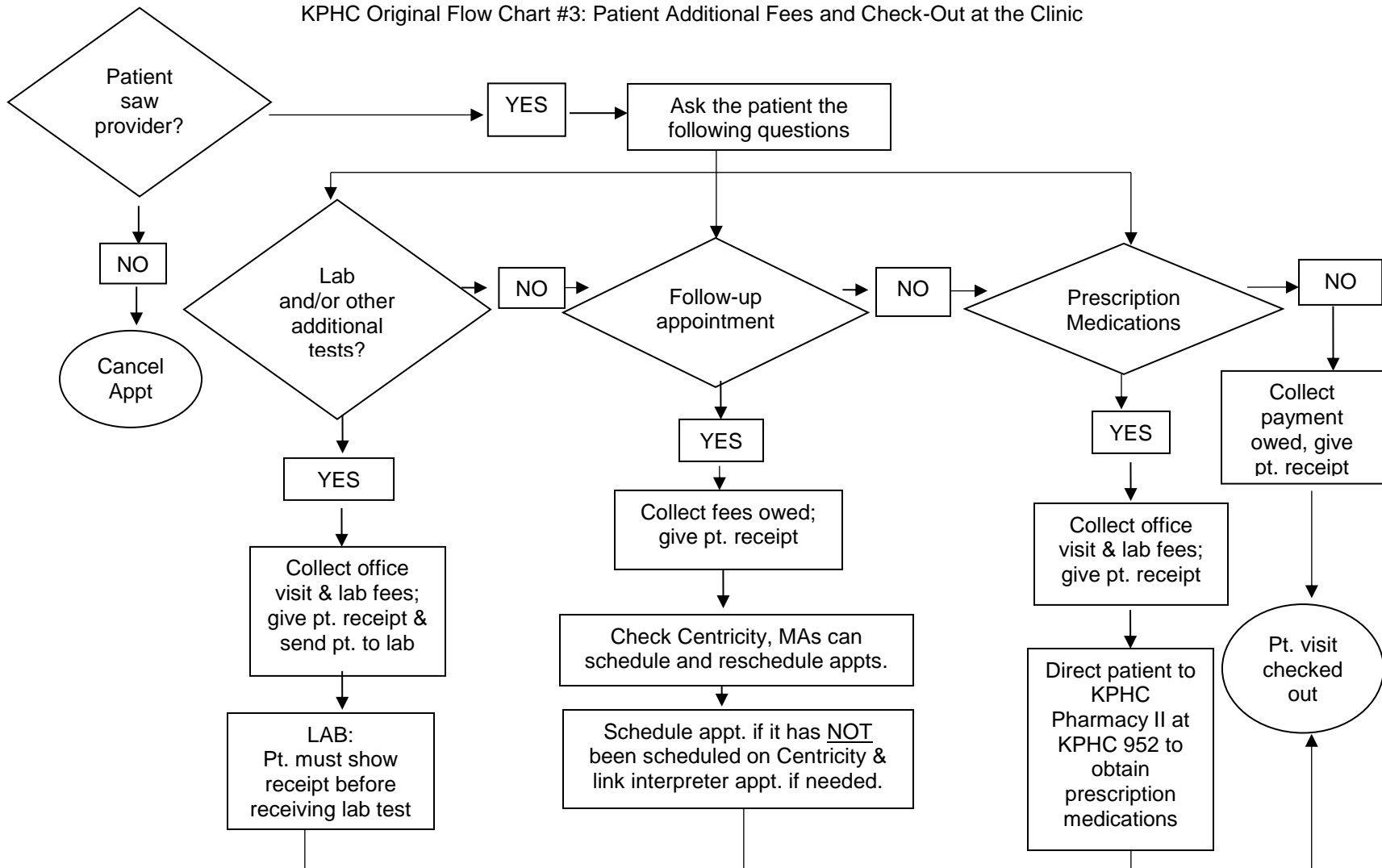


Figure K1. This KPHC Flowchart (2018) was created with assistance from KPHC staff members.

## Appendix L

### KPHC Education Program Change Algorithm for Queen's Medical Center List of Frequent ED Utilizers

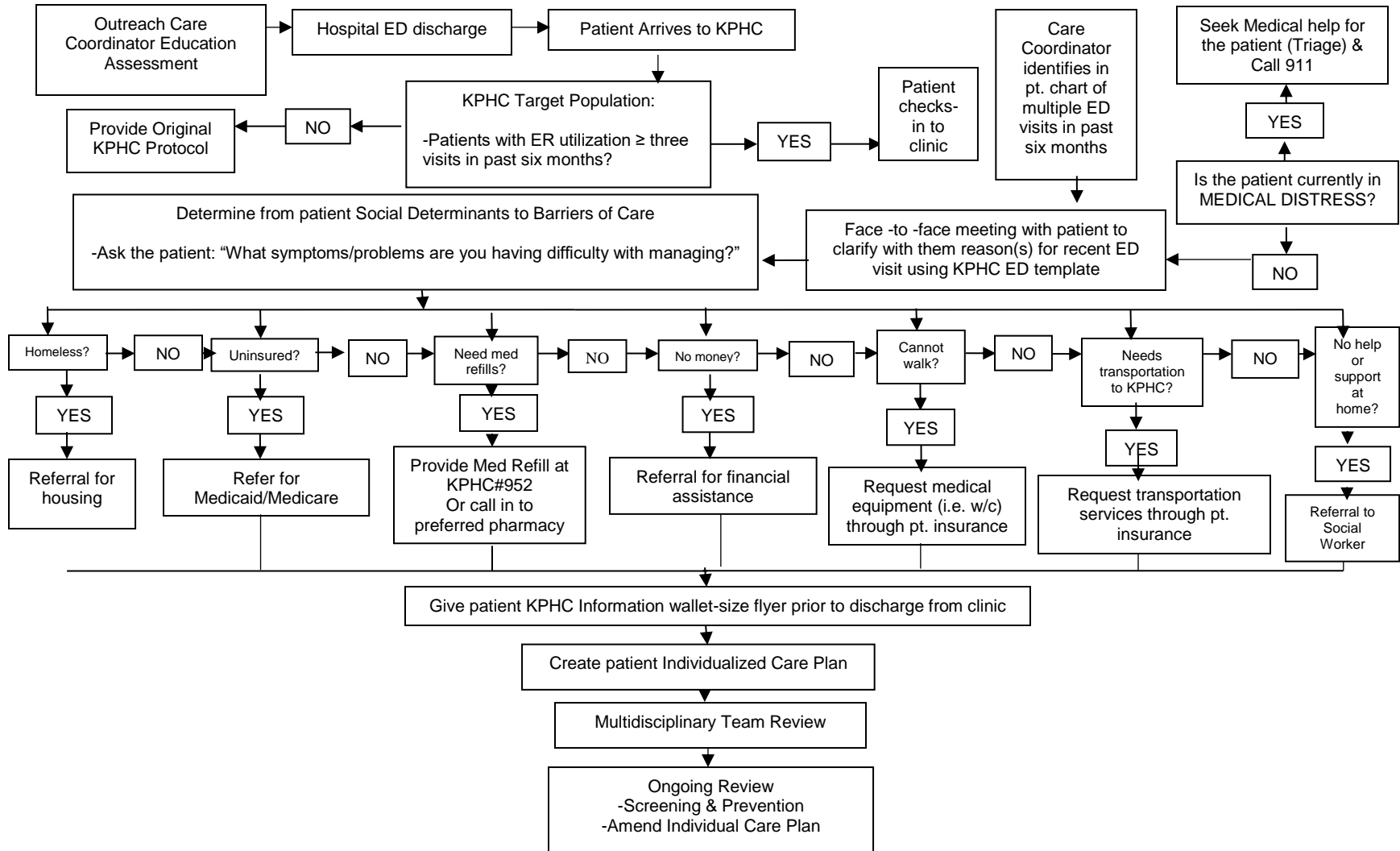


Figure L1. KPHC Education Program Algorithm was created with assistance from the non-clinical/clinical care coordinators, KPHC CC Flow Chart, and (Enard and Ganelin, 2013).

Appendix M

KPHC Facility Pre-Implementation Data

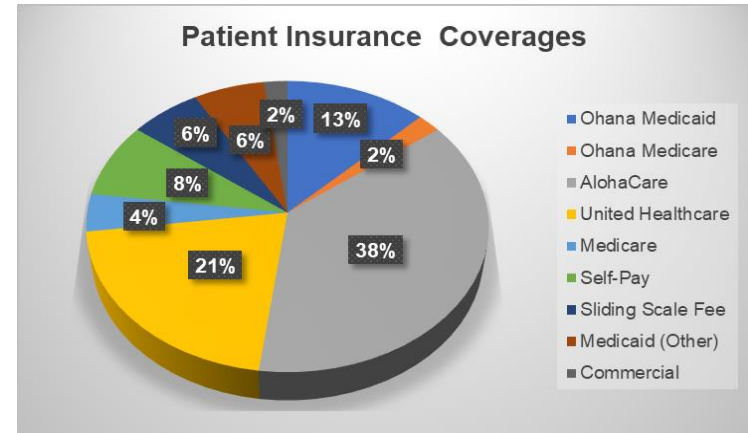
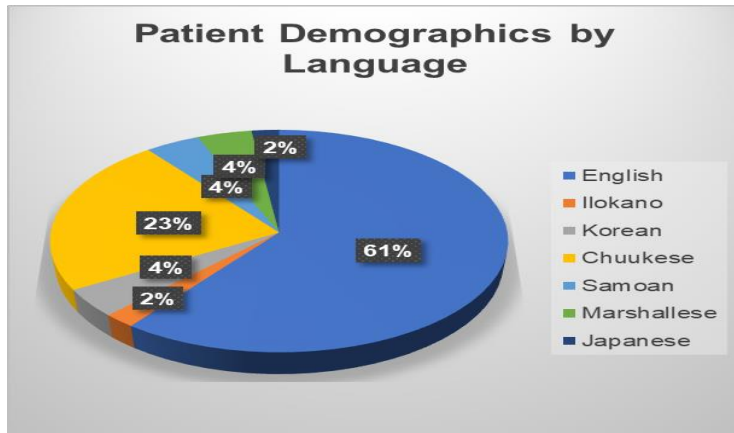
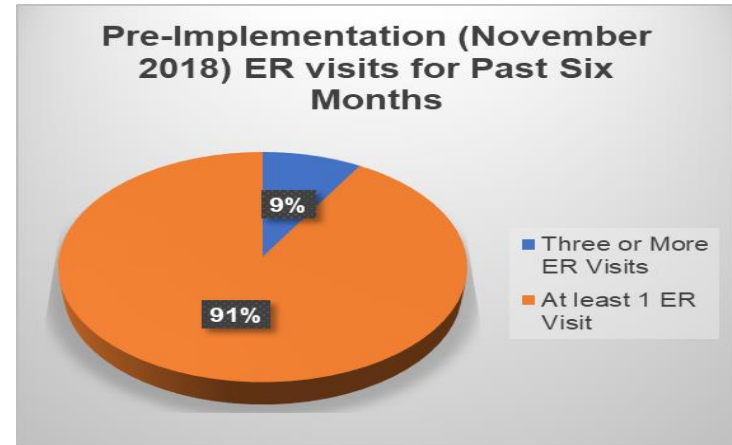
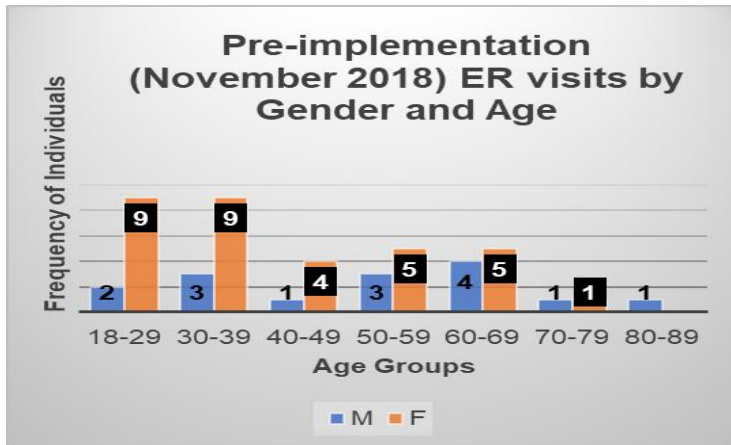


Figure M1. KPHC facility pre-implementation data for patients with  $\geq$  three ER visits in the past six months.

Appendix N

KPHC Facility Post -Implementation Data

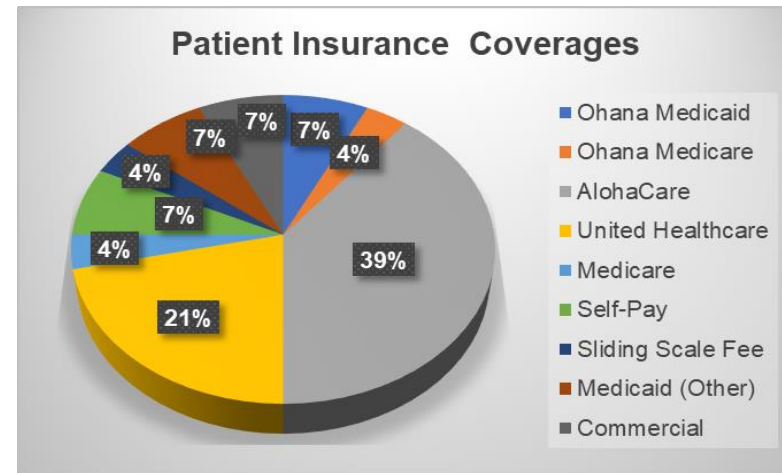
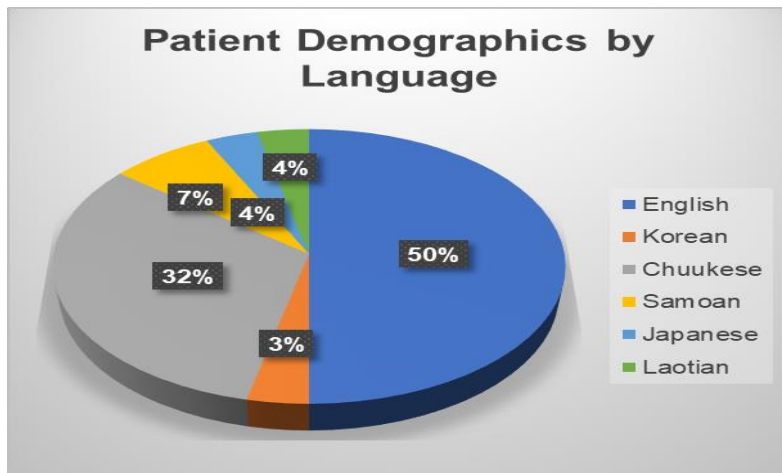
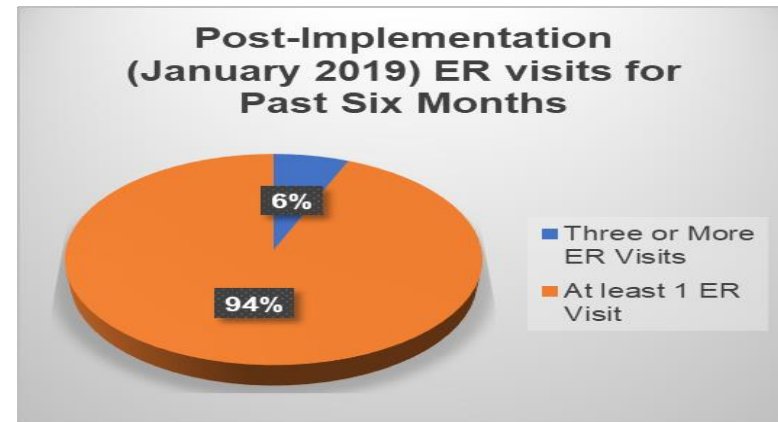
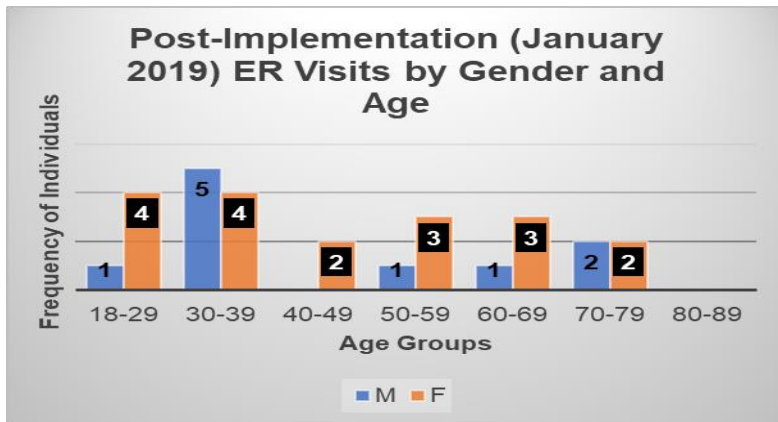


Figure N1. KPHC facility post-implementation data for patients with  $\geq$  three ER visits in the past six months.

Appendix O

QMC Facility Pre-Implementation Data

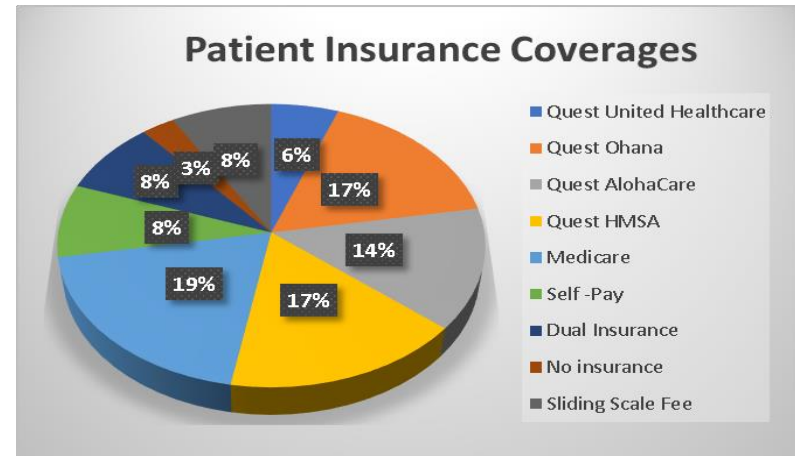
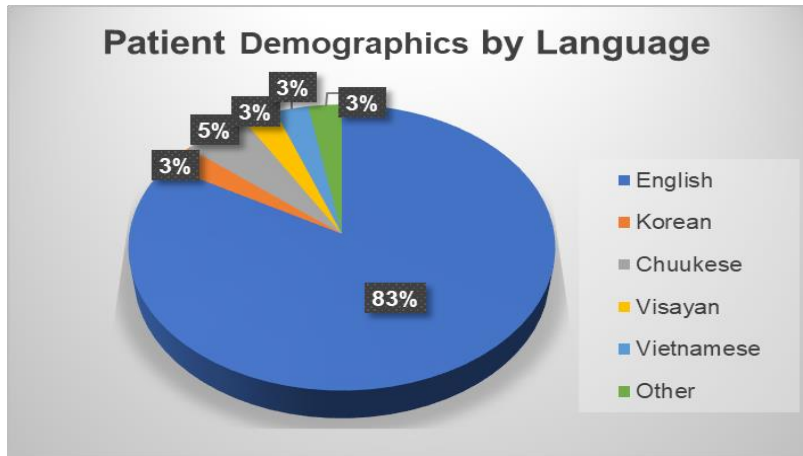
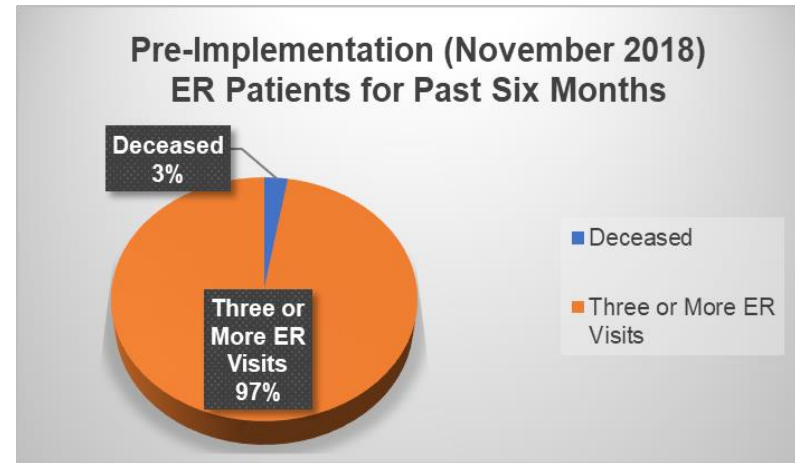
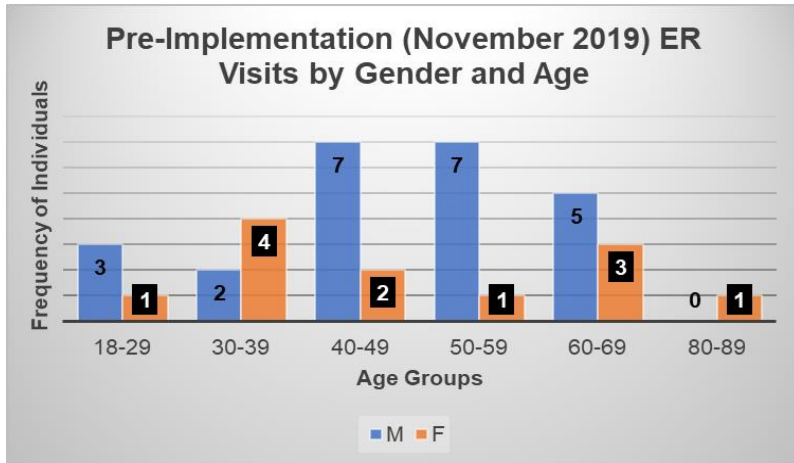


Figure O1. QMC facility pre-implementation data for patients with  $\geq$  three ER visits in the past six months.

Appendix P

QMC Facility Post -Implementation Data

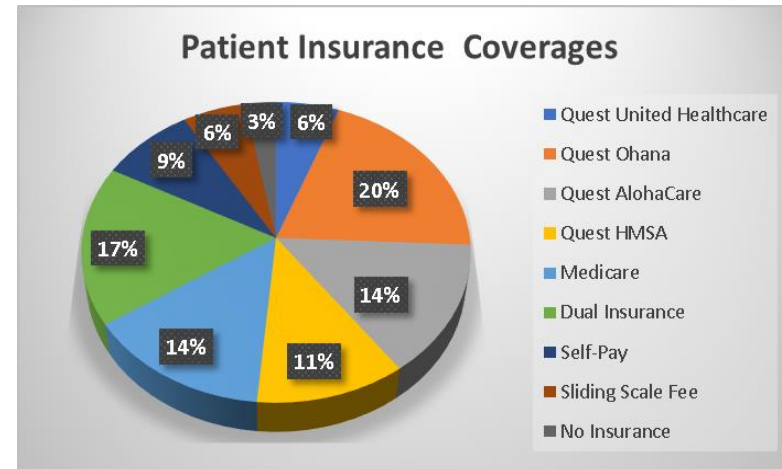
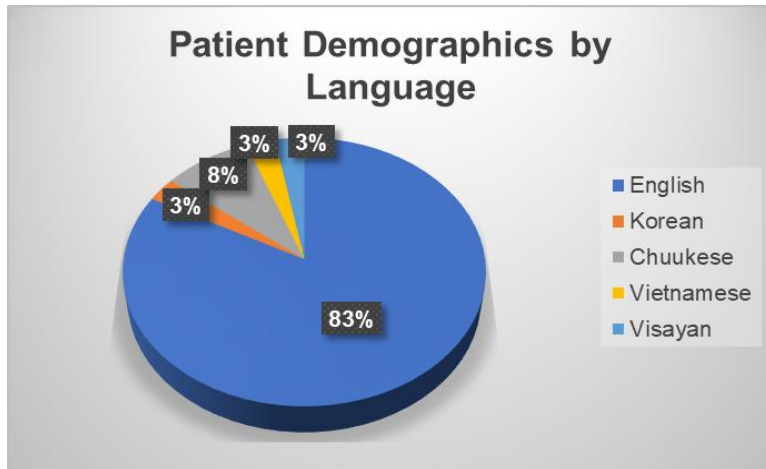
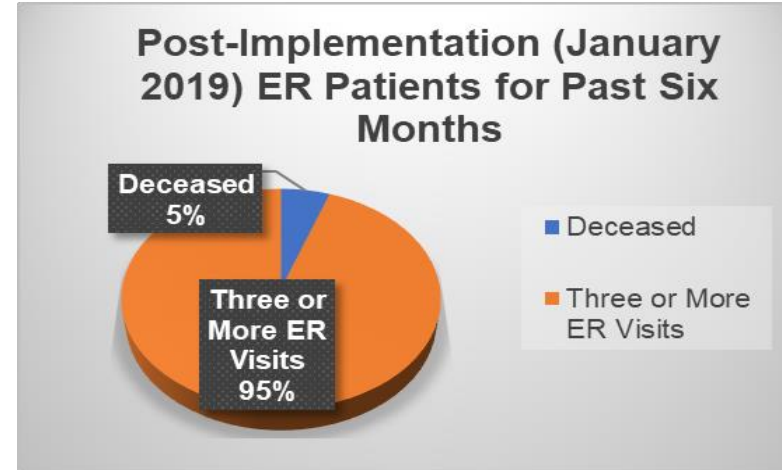
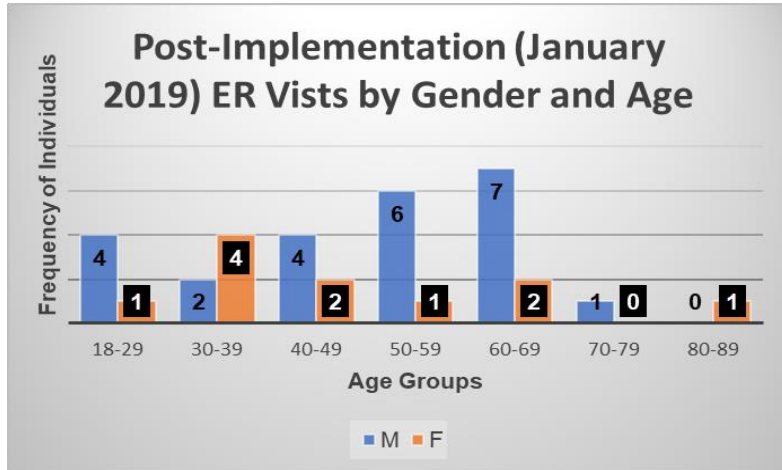


Figure P1. QMC facility post-implementation data for patients with  $\geq$  three ER visits in the past six months.

## References

- Agency for Healthcare Research and Quality. (2014). *HCUPnet: Emergency department state statistics*. Retrieved from <https://hcupnet.ahrq.gov/#query/eyJBTkFMWVNJU19UWVBFJjpbIkFUX00iXSwiT1VUQ09NRV9NRUFTVVJFUyI6WyJPTV9OVU1CRVliXSwiWUVBUiMiOlsiWVJfMjAxNCJdLCJTVFURVMiOlsiU1RfSEkiXSwiUFJkTkJUEjE0iX09SX0FMTCi6WyJQ09V9QUklOQ0lQTEUiXSwiQ0FURUdPUklaQVRJT05fVFIQRSi6WyJDVF9BTEwiXSwiREFUQVNFVF9TT1VSQ0UiOlsiRFNfU0VERCJdfQ==>
- Agency for Healthcare Research and Quality. (2015). *Introduction to the HCUP Nationwide Emergency Department Sample (NEDS) 2015* [PDF document]. Retrieved from <https://www.hcup-us.ahrq.gov/db/nation/neds/NEDS2015Introduction.pdf>
- American Association of Colleges of Nursing. (2004). *The essentials for doctoral education for advanced nursing practice*. Washington, DC: Author.
- Baker, J.D. (2017). Nursing research, quality improvement, and evidenced-based practice: The key to perioperative nursing practice. *AORN Journal*, 105(1), 3-5. <https://doi.org/10.1016/j.aorn.2016.11.020>
- Brown, S. J. (2005). Direct clinical practice. In A.B. Hamric, J. A. Spross, & C. M. Hanson (Eds.), *Advanced practice nursing: An integrative approach* (3rd ed.) (pp. 143-185). Philadelphia, PA: Elsevier Saunders.
- Burns, T. R. (2017). Contributing factors of frequent use of the emergency department: A synthesis. *International Emergency Nursing*, 35, 51-55. doi: <https://doi.org/10.1016/j.ienj.2017.06.001>

- Community Care of North Carolina. (n.d.) *Methods to help tackle emergency department visits practice tool kit* [PDF document]. Retrieved from <http://www.ccwjc.com/Forms/QI%20Forms/Practice%20ED%20Toolkit.pdf>
- David, G., Gunnarsson, C., Saynisch, P. A., Chawla, R., & Nigam, S. (2015). Do patient-centered medical homes reduce emergency department visits?. *Health Services Research, 50*(2), 418-439. DOI: <https://doi.org/10.1111/1475-6773.12218>
- Doran, K. M., Colucci, A. C., Wall, S. P., Williams, N. D., Hessler, R. A., Goldfrank, L. R., & Raven, M. C. (2014). Reasons for emergency department use: Do frequent users differ?. *The American Journal of Managed Care, 20*(11). Retrieved from <http://www.ajmc.com/journals/issue/2014/2014-vol20-n11/reasons-for-emergency-department-use-do-frequent-users-differ>
- Enard, K. R., & Ganelin, D. M. (2013). Reducing preventable emergency department utilization and costs by using community health workers as patient navigators. *Journal of Healthcare Management, 58*(6), 412-428. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4142498/>
- Faryar, K. A. (2013). The effects of weekday, season, federal holidays, and severe weather conditions on emergency department volume in Montgomery County, Ohio, 1-60. Retrieved from <https://corescholar.libraries.wright.edu/mpH/94/>
- Gillam, S., & Siriwardena, A.N. (2014). Evidenced-based healthcare and quality improvement. *Quality in Primary Care, 22*(3), 125-32. Retrieved from <http://primarycare.imedpub.com/evidencebased-healthcare-and-quality-improve>

- Health Resources and Services Administration. (2016). *2016 Kalihi-Pālama Health Center Profile*. Retrieved from <https://bphc.hrsa.gov/uds/datacenter.aspx?q=d&bid=096010&state=hi&year=2015>
- Hunt, K. A., Weber, E. J., Showstack, J. A., Colby, D. C., & Callaham, M. L. (2006). Characteristics of frequent users of emergency departments. *Annals of Emergency Medicine*, 48(1), 1-8. <https://doi.org/10.1016/j.annemergmed.2005.12.030>
- Institute of Medicine. (2001). *Crossing the quality chasm: A new health system for the 21<sup>st</sup> century*. Washington, DC: National Academies Press.
- I2i Population Health. (2018). *I2itracks*. Retrieved from <https://www.i2ipophealth.com/solutions/>
- Issel, L.M., & Wells, R. (2018). *Health program planning and evaluation: A practical, systematic approach for community health* (4<sup>th</sup> ed.). Burlington, MA: Jones & Bartlett Learning.
- Kalihi-Pālama Health Center. (2018). *Mission & values*. Retrieved from <http://www.kphc.org/about/mission-values/>
- Kalihi-Pālama Health Center. (2018). *Quick facts*. Retrieved from <http://www.kphc.org/about/quick-facts/>
- Kam, H. J., Sung, J. O., & Park, R. W. (2010). Prediction of daily patient numbers for a regional emergency medical center using time series analysis. *Healthcare Informatics Research*, 16(3),158-165.
- Morgan, S. R., Chang, A. M., Alqatari, M., & Pines, J. M. (2013). Non-emergency department interventions to reduce ED utilization: A systematic review. *Academic Emergency Medicine*, 20(10), 969-985. <https://doi.org/10.1111/acem.12219>

National Committee for Quality Assurance. *Patient-centered medical home (PCMH) recognition*.

Retrieved from <http://www.ncqa.org/programs/recognition/practices/patient-centered-medical-home-pcmh>

Raven, M. C., Kotchko, S. M., & Gould, D. A. (2013). Can targeted messaging encourage PCP contact before ED visits?. *The American Journal of Managed Care*, 19(1), 41-45.

Retrieved from <http://www.ajmc.com/journals/issue/2013/2013-1-vol19-n1/can-targeted-messaging-encourage-pcp-contact-before-ed-visits>

Schoenman J., & Chockley N. (2011). *Understanding U.S. Healthcare Spending: NIHCM*

*Foundation Brief July 2011* [PDF document]. Retrieved from

<http://healthcareandreform.blogs.wm.edu/files/2012/02/NIHCM-Health-Care-CostBrief.pdf>

Soril, L. J., Leggett, L. E., Lorenzetti, D. L., Noseworthy, T. W., & Clement, F. M. (2015).

Reducing frequent visits to the emergency department: A systematic review of interventions. *PLOS One*, 10(4), 1-18. doi:10.1371/journal.pone.0123660

Stetler, C. B. (2001). Updating the Stetler Model of research utilization to facilitate evidence-based practice. *Nurs Outlook*, 49(6), 272-9. doi:10.1067/mno.2001.120517

Sun, Y., Heng, B. H., Seow, Y. T., & Seow, E. (2009). Forecasting daily attendances at an emergency department to aid resource planning. *BMC Emergency Medicine*, 9(1), 1-9.

Tai, C. C., Lee, C. C., Shih, C. L., & Chen, S. C. (2007). Effects of ambient temperature on volume, specialty composition and triage levels of emergency department visits.

*Emergency Medicine Journal*, 24, 641-644. doi: 10.1136/emj.2006.045310.

Van den Heede, K., & Van de Voorde, C. (2016). Interventions to reduce emergency

department utilisation: A review of reviews. *Health Policy*, 120(12), 1337-1349. DOI:  
<https://doi.org/10.1016/j.healthpol.2016.10.002>

Vinton, D. T., Capp, R., Rooks, S. P., Abbott, J. T., & Ginde, A. A. (2014). Frequent users of US emergency departments: Characteristics and opportunities for intervention. *Emerg Med J*, 31, 526-532. doi:10.1136/emermed-2014-203674

Weinick, R. M., Burns, R. M., & Mehrotra, A. (2010). Many emergency department visits could be managed at urgent care centers and retail clinics. *Health Affairs*, 29(9), 1630-1636.  
<https://doi.org/10.1377/hlthaff.2009.0748>