An Evidence-Based Implementation Project on High Utilizers in the Emergency Department

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An Evidence-Based Implementation Project

On High Utilizers in the Emergency Department

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Abstract

Challenges have been presented to the Emergency Department (ED) over the last several years as the dramatic rise in health insurance enrollment continues. Although, with the Republican bill, the American Health Care Act, changes to Medicaid may alter the health program leaving many uncertainties (Kaplan & Pear, 2017). Evidence reflects EDs are inundated with even more patients taking advantage of the availability of a one-stop shop for their care and treatment. Costs of ED services and resource allocation are rising as a result of these unnecessary visits contributing to a total healthcare expenditure of approximately 17.6% of the US Gross Domestic Product (GDP) (Horst, Martin, Gambler, & Coco, 2011). Various quality improvement measures have been implemented across the nation to reduce these costs such as the utilization of PreManage ED™. The PreManage ED™ implementation pilot in Alameda County enables identification of patients frequently using ED services within a shared geographical region (Azar, Pressman, Oehmke, & Xu, 2017). This quality improvement project sought to educate the nursing staff, increasing their knowledge and awareness of PreManage ED™, health care resources, and assisting the health care team to provide improved access for patients’ non-urgent healthcare needs. Prior to the education, a pre and post survey obtained a direct correlation between assessment and knowledge as a result of the education which was reflected utilizing the Wilcoxon Signed-Ranks Test with a Z=278, \( p < .0001 \), indicating that the intervention nurses scored higher on the posttest increasing their knowledge basis. Additional research is needed to understand the underlying causes that contribute to ED utilization and improved outcomes to facilitate data-sharing within regions across different health systems.

Keywords: emergency care, frequent flier, non-urgent high utilizers, one-stop shop
An Evidence-Based Implementation Project on High Utilizers of the Emergency Department

Section II. Introduction

Challenges are presented to the Emergency Department staff daily to meet a patient’s triage needs. Emergency Departments (EDs) are “becoming increasingly crowded, with the number of visits nationwide estimated at 129.8 million in 2010 and rising.” (Brennan, Chan, Hsia, Wilson, & Castillo, 2014, p. 1015). “US healthcare spending has nearly doubled over the past decade” (Vinton, Capp, Rooks, Abbott, & Ginde, 2014, p. 526). In 2016, $1.2 trillion was spent on health care, which was 31% of the $3.85 trillion budget (Samuelson, 2017). Individuals known as “high utilizers” often present with chronic complaints while others are referred from their primary provider for diagnostic and therapeutic interventions. Inappropriate and costly visits to the ED result from medically uninsured and underserved patients. Therefore, many people without access to a primary care provider present to the ED, lacking another resource. With both personnel and funding resources shifting toward clinics and urgent care centers accompanied by changes in reimbursement to hospitals, there will be an increased need to see more patients on an outpatient basis. Care in the ED has since become known for its convenience and array of complex workups. These gaps in the health system combined with the social disparities encourage vulnerable patients to create an environment in which they rely on this disjointed emergency care to meet their primary care needs. (Azar, Oehmke, Byrd, Moskowitz, Alter, Pressman, 2017).

Problem Description
Health Care Background. The evolution of the ED transformed patient care after World War II. Beginning with the creation of Medicare and Medicaid in 1965, increased utilization of EDs became a turning point for the 1960’s (Thomas, 2013). Studies confirmed observations that patients with Medicaid and Medicare coverage were more likely to use the ED for medical care (Lucas & Stanford, 1998). An analysis done at George Washington University using a convenience sample of 6,523 patients discovered vulnerable and low-income patients had a higher percentage of presenting to the ED than the general emergency department population (Lucas & Sanford, 1998). This study concluded that the increased utilization of the ED by these patients indicated their health care needs were not being met in the usual primary care setting. Concern soon arose that the EDs were refusing to treat uninsured patients with emergency conditions. This led to the enactment of a new law.

The Emergency Medical Treatment and Labor Act of 1986 (EMTALA) established an obligation requiring all hospitals receiving Medicare funding to provide initial assessment screening and stabilization to all individuals presenting to the ED seeking medical care (McDonnell, Gee, Mecham, Dahl-Olsen, & Guenther, 2013). Since EMTALA legislation was passed, EDs have experienced an increased deluge of patients. McDonnell et al. (2013) proposed a survey study to assess patients’ and parents’ perceptions of the legal obligations of two hospitals to provide emergency care in the EDs. The setting comprised EDs from an urban academic pediatric hospital with a volume of 43,000 pediatric patients annually and an urban academic university hospital with an annual volume of 38,000 adult patients. Inclusion criteria consisted of parents of minor patients from the pediatric hospital with adult patients from the university hospital. Patients with five or more visits in 12 months were described as frequent
users. With 4,136 subjects, results of this study showed 72% (majority of both pediatric parents, n=1637 and the university adults, n=1351) of patients were aware of the obligatory nature of the hospital as defined by EMTALA and were more likely than other patients to have at least one additional ED visit (61%) in a year (McDonnell et al.). Similarly, patients informed of EMTALA principles were more likely than other patients to have at least five additional ED visits (8%) in a year (2013). The authors concluded regardless of ability to pay, ED patients have an increased awareness that the law requires hospitals to provide emergency care. As access to care continued to emerge from the core of ED crowding and frequent utilization, a long-overdue remedy had been in the process. The goal was to provide individuals with broader insurance coverage.

The Patient Protection and Affordable Care Act of 2010 (PPACA) is another attempt to improve health care reform and has been responsible for the increase in health insurance. This reliance on ED services will likely increase as health insurance enrollment expands under the PPACA. The PPACA has provided insurance to more than 20 million Americans (McKee, Greer, & Stuckler, 2017). These Americans receiving public insurance under the PPACA increased their utilization of the ED prior to being insured (Janke et al., 2015). Utilizing data from the 2013 National Health Interview Survey (NHIS) of American adults, Janke et al. (2015) posed questions to 1,072 survey respondents to characterize reasons for ED visits by insurance status and usual source of care. NHIS provided national estimates of community adult civilian dwellers through telephone responses and face-to-face interviews (Janke et al., 2015). The data retrieved suggested many Americans viewed the ED as an option for receiving health care due to its accessibility. Reasons commonly cited for ED selection have been given as the convenience
of ED care, affordability, around-the-clock staffing, and access to a range of diagnostic and therapeutic interventions. These sophisticated diagnostics and interventions would not be feasible in a private physician office. Hence, the ED has become known for its one-stop shop for healthcare. Regardless of race/ethnicity, age, and socioeconomic status, use of the ED for non-urgent, lower acuity problems continued to contribute to overcrowding, creating functional and financial problems for health care (Janke et al., 2015).

In light of the most recent change in the administration of the government, President Donald Trump has vowed to overturn the PPACA, known as Obamacare (Barlas, 2017). After the 2016 election, pharmaceutical and biotechnology stocks rose, while hospital and health insurance shares became erratic. There is a high level of uncertainty for the future, however there may be potential opportunity for the healthcare workforce. In May 2017, the House approved legislation to repeal and replace the PPACA. Many have alluded to fewer services for patients and higher cost as primary care coverage is removed. What is left of the PPACA (if not repealed) will be similar to catastrophic coverage forcing more individuals to seek ED services as primary care.

The Senate recently proposed to allow tax credits based on income level rather than age criteria as determined by the House, providing greater generosity to older Americans (Ryan, 2017). It would repeal tax increases under the PPACA and reduce federal funding for Medicaid (Pear & Kaplan, 2017). Medicaid insured 70 million people in 2016 (Rosenbaum, Rothenberg, Gunsalus, & Schmucker, 2017).

This uncertainty, with its most recent defeat for Republicans, may potentially improve patient access to care or disrupt the entire infrastructure among clinics, hospitals, and health
plans, especially the many provisions under the Medicare Program (Jost, 2016). Based on the ensuing outcome of political decisions, the ED will continue to evolve as greater than 100,000 individuals enrolled in health coverage the day after the election (Levey, 2016). It is anticipated that poor states, especially those in the Southeast with the highest poverty rates and poorest healthcare outcomes, will be the most affected.

It has been well documented that a few high utilizing, medically and psychosocially complex patients, who frequently visit the ED as a primary source of healthcare access, are a large contributor to rising health care costs. The Centers for Medicaid and Medicare define high utilizers as patients with complex, unaddressed health issues who accumulate large numbers of emergency visits. These visits may have been prevented with early intervention and primary care (http://www.medicaid.gov). Several models are being tested to better identify and meet the needs of high utilizers. One of many national initiatives to address the needs of high utilizer patients is the Camden Coalition established by Dr. Jeffrey Brenner (http://www.camdenhealth.org). Through a collaborative approach involving a multidisciplinary team, comprising doctors in the community, hospital staff and social workers, improved care has been offered to these vulnerable citizens in the impoverished community of Camden, NJ. This has been commonly referred to as “hot spotting,” while attempting to decrease health care costs (Gross, Brenner, Truchil, Post, & Riley, 2013). This initiative results from data driven technology utilizing geographical mapping of discharged patients found in local community hospitals (Gross et al., 2013). The Care Management Team is made up of a registered nurse (RN), multiple licensed vocational nurses (LVNs), a health coach and a social worker all dealing with patients with complex medical and social problems (MacArthur Foundation, 2013).
One local pilot program in Alameda County, in northern California (http://wwwbetterhealtheastbay.org) is sharing patient health records and other real time data among various EDs. Four Sutter Health and two Alameda Health System hospitals, can identify frequent ED utilizers within a shared geographic region and across different health systems. An innovative data sharing platform called “PreManage ED”, owned by parent company Collective Medical Technologies, enables the sharing of pertinent information regarding recent hospitalizations, medication, and care plans. Alta Bates Summit Medical Center (ABSMC), ABSMC Summit Campus, Sutter Delta Medical Center in Antioch, and Sutter Health Eden Medical Center in Castro Valley, California are the participants in this shared data integration. These hospitals are participating in a PreManage ED™ pilot program designed to identify people who frequently visit EDs within the region. This information integrates with the electronic health record (EHR) in which all the facilities utilize EPIC and extracts information to assess the utilization patterns of a patient. This data sharing platform will benefit hospitals by facilitating a collaborative approach to avoid high utilizer visits, reducing healthcare costs and improving coordinating care for these patients (Azar, Pressman, Oehmke, & Xu, 2017).

Implementing this pilot across two health systems enables communication for those high utilizers frequenting multiple hospitals. PreManage ED™ has categorized high utilizer patients as three visits in 30 days and five visits in 12 months. Improved communication and coordination of care within and between these health systems enables identifying patients with chronic health problems to provide the education and care needed. When a patient meets a pre-established threshold for frequent utilization upon registering at a participating ED, registration information is cross-referenced within the database. An alert notification including a summary
of the patient’s history is sent to the ED in real time interfacing with the EHR. This functionality utilized primarily by the ED provider enables additional clinical, diagnostic or social information changing orders or diagnostic and therapeutic recommendations. In addition, this data sharing platform enables nurse care coordinators and other case managers at various EDs to further share care plans for these complex patients. The health care team can better manage these patients through the utilization of these care plans to coordinate their care and extending beyond the limited resources offered for these complex patients in the ED. Besides hospital EDs, health clinics and other social service organizations will be utilized as well to receive alerts from these facilities of patients seeking emergency care. The intent with this data is to create a coordinated engaged community to build a healthcare safety net for these patients providing them with continuity of care while keeping them out of the ED.

**Setting.** Utilizing key demographics of frequent ED utilizers as identified from data provided by PreManage ED™, the value of this innovative platform facilitates data-sharing within a region. The setting for this practice improvement project included one of the local emergency departments in Alameda County, northern California. Alta Bates Summitt Medical Center (ABSMC). In 2015, the population for Alameda County was 1.6 million with the majority of residents White (33%) followed closely by the Asian (29%) race. Berkeley, CA with a population of 121,000 (see Table 1), is home to most residents of the same race with White (59.5%) and Asian (19.3%). In 2015, Alta Bates Summit Medical Center known as the Ashby campus had 527 beds with a 22 bed ED (approximately 5 overflow beds), and had greater than 39,000 ED encounters. This information (see Table 2) pertains to the statistical analysis from [www.census.gov](http://www.census.gov) for Alameda County (2015). A further statistical breakdown related to Alta
Bates Summit Medical Center selected in Alameda County based on information from (www.oshpd.ca.gov) regarding treatment encounters and other demographics is also listed in Table 2.

According to statistics from 2015 (www.oshpd.ca.gov), this ED had 40,430 patient visits in 2015. The majority of all patients seen were female. The category from 20-29 years of age was the largest group of visitors to the ED. Regarding race, ABSMC saw mostly White and African American individuals. Payer grouping was primarily Medicaid (Medi-Cal) (see Table 2).

Key demographics of frequent utilizer ED patients can be summarized from the utilization of PreManage ED™ (see Table 3). Comparable with the county, ABSMC shows a majority of utilizers to be female with the highest racial grouping as White and Black to be contributory to frequent visits of 3 plus or greater.

Available Knowledge

For this review of evidence, eleven articles were reviewed using The Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) Research and Non-Research Appraisal Tools (Johns Hopkins Hospital/The Johns Hopkins University, 2012). Several studies defining frequent users in the ED were selected as a review of evidence-based characteristics (see Appendix A).

The online catalogue for Gleeson Library at University of San Francisco was utilized to search for articles for this topic as well as Cochrane, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Medline, PubMed, and Scopus. Searchable terms included emergency care, Affordable Care Act, frequent flier, unnecessary visits, non-urgent, high
utilizers, and one-stop shop in various combinations. A second part of the search comprised terms such as primary care provider, nurse call coordinator, transition liaison, primary care, emergency, information exchange, and continuity of patient care. Initially, inclusion criteria were extracted on full-text articles, systematic reviews, cohort studies, qualitative studies, narrative reviews, editorials, and commentaries. These were easily accessible within the constraints of the university library system. Reference lists related to some were also reviewed for potential inclusion. The following is a brief review of several themes discovered on frequent visitors in the ED.

**PICO(T).** Does evidence-based intervention of an educational workshop improve the ability of the ED nurses at ABSMC to effectively link high utilizer patients to primary and alternative resources of care, hence reducing improper use of the ED?

**Impact of Frequent ED Use.** A systematic review of 63 articles completed by Uscher-Pines et al. (2013) discovered “no two articles used the same exact definition of non-urgent visits” (Uscher-Pines et al., 2013, p.3). The authors also suggested that on average 37% of ED visits were considered non-urgent as a result of a search across a systematic literature review of multiple databases. The limited evidence suggested by the authors from the review yields individuals of younger age, convenience of the ED, referrals by a physician, and negativity of alternative resources contribute to non-urgent ED use (Uscher-Pines et al., 2013). Soril, Leggett, Lorenzetti, Noseworthy, & Clement (2016) also defined frequent ED users as those having 4 or more ED visits over one year. The authors included 20 retrospective, observational comparative cohort studies examining ED utilization. Soril et al., (2016) identified five healthcare systems including National Health Insurance, Private Health-Care, National Health Service, Social
Health Insurance, and Etatist Social Health Insurance. Additional discussion by the authors revealed frequent ED users were over the age of 65, and female, often with a mental health diagnosis suggesting these users may not differ across healthcare systems. LaCalle & Rabin (2010) showed parents revealed the main reason for using the ED included the free and expedited care. The authors reviewed 11 studies with predominantly university hospitals or affiliated public hospitals with data representing local, state, and national levels. Vinton, Capp, Rooks, Abbott, & Ginde compared characteristics of 157,818 U.S. adult participants and their frequency of ED utilization in a nationally representative sample from 2004-2009. The authors reported 54.6% of individuals 18-44 years of age were found to have greater or equal to ten ED visits per year preferring the ED as their primary source of healthcare (2014).

Demographics. Demographics revealed the most frequent users to be white with a high proportion of Medicare and Medicaid patients frequenting the ED (LaCalle & Rabin, 2010). Individuals between 25 to 44 and older than 65 demonstrated the peak ages within these patients’ groups (LaCalle & Rabin, 2010). Based on the U.S. National Health Interview Survey (NHIS) categorical data, Vinton et al. (2014) defined their study groups as frequent users (4-9 visits/year) and super-frequent users (≥10 visits/year). Frequent and super-frequent users were young in age, female, and of racial/ethnic minorities. Higher ED utilization was exhibited among those with lower rates of employment, lower poverty-income ratios, and those with less education. In addition, a higher proportion of frequent and high ED utilizers were covered by Medicaid, with a lower proportion covered by private insurance (Vinton, et al., 2014). Finkelstein, Taubman, Allen, Wright, & Baicker (2016) in a randomized controlled evaluation of approximately 25,000 individuals utilized a lottery to allocate a limited number of Oregon Medicaid enrollments. The
authors examined the impact of health insurance on increased health utilization. Expanded over a period of 2007-2010, results have shown that, with the impact of gaining Medicaid coverage, healthcare use continued to remain high two years after the coverage was obtained. The authors discovered Medicaid enrollees increased ED visits by 40% over the first 15 months. In addition, results showed insurance coverage was associated with a 30% increase in the probability of having a hospital admission and 15% increase in the probability of taking prescription drugs.

**Acuity.** Health disparities of patients with frequent ED visits have often been portrayed as uninsured and unnecessary non-urgent conditions. Many frequent users have been associated with public and private insurance with a burden of comorbidities. Several studies reported exacerbations of chronic illness such as renal failure, chronic obstructive pulmonary disease/asthma, and sickle cell disease with individuals receiving Medicare and greater than 65 years of age (LaCalle & Rabin, 2010). Patients chronically disabled, less than 65 years of age, and receiving Medicare were associated with higher rates of mental health diagnoses than other groups. Another study by Thakarar, Morgan, Gaeta, Hohl, and Drainoni (2015) revealed greater frequency of ED visits by homeless patients with hepatitis C as opposed to housed patients in a homeless program.

**Pediatric Frequent Users.** Pediatric patients often visit the ED for healthcare reasons. These visits are often related to growth and development including wellness visits, frequent antibiotic prescriptions, delayed immunizations, and inadequate nutrition. In addition, several studies describe the necessity of a doctor’s note before a child returns to day care or school programs. LeDuc, Rosebrook, Rannie, & Gao (2006) (as cited in LaCalle and Rabin, 2010), reported (N=237) 80% of parents at a large, urban, academic children’s hospital described a lack
of availability of primary care providers to be the main reason for using the ED. The increase in visits during the evening and weekend hours resulted in 20% from primary care providers. An additional sample of 60% was related to family member insistence. The authors also looked at return visits. This data suggested age, health insurance, and the seriousness of symptoms were not predictors of return visits to the ED. Morrison, Schapira, Gorelick, Hoffmann and Brousseau (2014) hypothesized that low health literacy has been related to a greater number of prior ED visits and a higher likelihood of non-urgent pediatric ED visits. The authors discovered there was an association found between low caregiver’s health literacy and child emergency department ED use with number and frequency of visits. This cross-sectional study revealed these caregivers were foreign born, of minority ethnicity/race, had lower educational attainment, were teenagers and those in their early twenties, and were individuals with public insurance (Morrison et al., 2014).

**Primary Care Providers.** A large majority of healthcare reform has focused on sources outside of the ED. Most important to reducing the cost of resources, overcrowding, wait time, and the stress on the staff is for emergency providers to work with primary care providers (PCP) for a better consistency of care for the high utilizer patients. Varying mechanisms of sharing information with PCPs through development of high-risk care plans, specialized protocols, and other such reforms can offer these patients direct access for follow up, interventions, education, preventive medicine and an individual with whom the patient can develop a rapport and trust. The ED cannot continue to provide the continuity of care that the primary care system can offer.

Irrespective of insurance status or age, patients bypass their PCP thinking their problem is too serious to be handled in an office setting. Other reasons have included healthcare provider
referral and insufficient office hours to accommodate an appointment among others. These are categories of patients that could have been treated elsewhere, instead of the ED. Inappropriate and costly visits to the ED are more common among medically uninsured and underserved patients. Many people without access to a regular primary care provider more often than not end up in the ED. Initiatives through ED-based care coordinators, often case managers, are attempting to intervene with patients linking them to a medical home and other resources to address these complex needs prior to their departure from the ED.

According to the U.S. Department of Health and Human Services, (http://www.hrsa.gov/healthit/toolbox/Childrenstoolbox/BuildingMedicalHome/whyimportant) a medical home is a partnership between the patient, family, and primary provider in cooperation with specialists and support within the community. Features such as accessibility, family-centered, continuous, comprehensive, coordinated, compassionate, and culturally centered care are important goals offered to the patient.

Without reducing the quality of patient care, The New England Healthcare Institute (NEHI) assessed the shortfalls as related to primary care services. These included limited access to timely provider services, convenient after-hours and weekend care, immediate reassurance about their medical condition, primary care referrals to the ED, and legal obligations of the facility. Also reported, the demand for services among the aging population is greater than the supply of PCP. The institute further reported fragmentation of care in consideration of not having a PCP (NEHI, 2010).

Several strategies were identified including, redesigning primary care services such as telephone access to after-hours consultation, extending primary practice hours to offer evening
and weekend hours, open access schedule to offer same-day services and facilitating access to more appropriate services. Another attempt for patients to access PCP involved hiring a “primary care coordinator” to work in the ED to assist patients with identifying their primary care provider (NEHI, 2010). Other facilities sent letters to primary care providers to make them aware of their patients seeking care in the ED.

Voices of Detroit Initiative in Wayne County Michigan demonstrated collaborative partnership in connecting patients with primary care medical homes (U.S. Department of Health & Human Services, 2012). Patient navigators and community outreach workers were placed in the ED. From 1999 to 2004, this program identified 6,535 individuals eligible for public insurance programs and connected them to primary care services. Overall, the program has transitioned 55% of active enrollees out of the ED into primary care settings, resulting in a 42% reduction in preventable ED visits and avoidable hospitalizations. The authors estimated the program has saved approximately $22 million annually, with a total cost savings of $168 million (U.S. Department of Health & Human Services, 2012).

Doyle, Emmett, Crist, Robinson, & Grome (2016) utilized care coordinators and clinical pharmacists to improve the care experience and health care outcomes of dual eligible patients. Dual eligible patients are individuals with higher healthcare costs and fragmented care due to poorer, sicker, and more serious mental health conditions than other Medicare and Medicaid patients. Three practice facilities from Federally Qualified Community Health Centers (FQCH) in West Virginia assigned a care coordinator to its eligible patients. These individuals conducted a structural review of the medical record, an in-person interview, and regular telephone contact with each patient. Results revealed 502 enrollees of which 65% were female with a median age
of 69. For all sites combined they discovered a five and a half percent reduction in total medications, 31% in ED visits and 18% in hospitalizations (Doyle, Emmett, Crist, Robinson, & Grome, 2016).

Yoon, Cordasco, Chow, & Rubenstein (2015) investigated the impact of ED visits as related to same day access in primary care in 71,296 patients in 22 Veterans’ Health Administration (VHA) clinics over three years. Utilizing multi-level regression models, the authors reported fewer ED visits for all non-emergency care within one day of the request for primary care appointments.

Understanding factors that affect non-urgent ED visits by both insured and noninsured patients or care recipients is necessary to address healthcare needs and costs. Interventions to decrease the avoidable visits and reduce unnecessary health care spending are essential. It is imperative for all individuals to know their primary care provider and equally important for these individuals to contact (PCP) before presenting to the ED. It is also relevant for the PCP to refer patients to other alternative resources when they cannot accommodate them for an office visit.

PreManage ED™. An interim pilot evaluation was completed in Alameda County in March 2017. At the four Sutter Health facilities participating in the pilot to date, 9,366 users had been identified by PreManage ED™ in real time, while 6,979 patients were identified by summarizing EHR data (Azar, Pressman, Oehmke, N., Xu, 2017). Specific to ABSMC, an illustration of an automatic feed between EPIC and PreManage ED™ is shown in Table 4. ABSMC is depicted as Alta Bates in this particular graph. A total of 58,193 alerts were made at all four Sutter Health sites during the pilot period. Between March 2015 and June 2016, 186,534 ED encounters with 104,472 patients were recorded at participating hospitals. Of these patients,
5,734 patients had greater than five or more visits. With the availability from other non-Sutter Health sites, an additional 1,749 (31%) patients were identified as frequent users. A weekly ED census of frequent utilizers, had identified 848 patients with a margin greater than 10% having three plus visits in the prior 30 days. Frequent utilizers of approximately 30% had five plus visits in the last 365 days (see Table 5 for specific data regarding frequent users at ABSMC). Although, there was no evidence that the implementation and utilization of PreManage ED™ alone resulted in substantial cost saving initiatives due to a decrease in frequent user patients in the ED. Qualitative evidence has indicated that PreManage ED™ has added clinical value by influencing the subsequent care provided, though difficult for the provider to quantify. In addition, no workflows have been formally changed as a result of PreManage ED™ (see Table 6 for patient patterns of utilization).

In 2014, The Washington State Health Care Authority (WSHCA) reported that the utilization of an Emergency Department Information Exchange (EDIE), a data sharing platform by hospital EDs, has helped save the state approximately $31 million annually (Rath, 2014). This collaborative effort has aimed to curtail the non-essential use of the ED by Medicaid recipients by saving the state greater than 10% in Medicaid fee-for-service emergency costs (Brooks, 2013). The WSHCA reported a 23% visit reduction in unnecessary ED visits by Medicaid patients with greater than five visits in 12 months (Rath, 2014). Preliminary state legislature proposed limitations on Medicaid payments to EDs for conditions not appropriate for the emergency setting (Brooks, 2013). To reciprocate, emergency providers, in collaboration with other partnering groups and hospitals, proposed a program outlining the seven best practices as described below.
• Adoption of an EDIE to share information about patient visits with other hospitals
• Education for patients about use of the ED
• A process for disseminating lists of frequent users to be identified by EDIE
• A process to equip frequent users with care plans and assist them to see their primary care providers (PCPs) within 72 to 96 hours of their ED visit
• Adoption of strict guidelines for the prescribing of narcotics
• Provider enrollment in a state Prescription Monitoring Program (PMP) to visualize previously filled prescriptions
• Regular review of feedback reports on the ED utilization

The report revealed the overall impact of the seven best practices in the ED had increased patient satisfaction over time while conserving resources. Based on the success to improve ED information flow, the Oregon Health Authority’s Office of Health IT has implemented EDIE.

An initial EDIE/PreManage ED™ progress report was completed in 2016 in the majority of hospitals in Oregon to assess the use of EDIE, including benefits, workflows, and suggestions for improvement (http://www.orhealthleadershipcouncil.org/wp-content/uploads/2017/01/OHLC-2016-EDIE-PreManage-Progress-Report.pdf). These findings were significant in providing specific patient information to assist the ED providers. Over half of the organizations have utilized the information to coordinate care with other organizations.

Rationale

The Aday framework of vulnerability, Knowles andragogy theory and Drucker management theory guided this intervention of conceptual framework to determine characteristics of the high utilizers of the ED. These theories are discussed below.
**Aday Framework of Vulnerability.** Aday (2001) studied vulnerable populations and identified them as at risk for poor physical, psychological, or social health as defined by the high utilizers of the ED. Variables of access, cost and quality are needed for understanding health care needs in vulnerable populations. Access refers to being able to pay for health care. Aday termed cost as either direct or indirect; direct costs were the amount spent by the organization while indirect costs losses are experienced by the patient’s decreased productivity such as loss of employment. Quality was defined as the inadequacy, adequacy, or superiority of services (Aday, 2001). This framework was helpful in justifying the need for this education to assist the nurses in a collaborative multidisciplinary approach while expanding their knowledge of broader initiatives within the environment of the ED, as they tend to be of low-income population, many in poor health or with behavioral problems.

**Knowles Andragogy Theory.** Knowles’ (1983) concept of andragogy, better known as the theory of the art and science of adult learning, attempts to create a theory to differentiate learning amongst adults. Knowles proposed the andragogic model through five assumptions which will assist with a perspective on educating adults (see Appendix B for these five assumptions). Utilization of the andragogy theory in this practice improvement project assisted in educating the adult staff nurses utilizing a self directed approach through a focus on the four conditions of learning as further explained in this theory. Including the nurses in implementing their education, provision of life experience in the educational activity, creating value with relevance to daily life, and providing an interest in learning for problem solving have enabled them to further identify ways to work collaboratively in a multidisciplinary approach to address the unmet needs of these frequent utilizer patients.
Drucker’s Management Theory. Drucker (1954) described management theory as a process in which managers measure performance and results against clearly stated measurable goals through strategic decision-making outlined in five phases (See Appendix B for distinct phases of decision-making). This is a process by which management and employees attain personal goals and organizational objectives. By incorporating employee involvement in goal setting and following the course of action, Drucker stated they are then more likely to be responsible. This theory was utilized while initiating the project with the stakeholders.

The combination of these theories provides a foundation for nurses to communicate to the high utilizer patients that their daily care, health outcomes, and their unmet needs are important enough to initiate collaborative efforts with the healthcare team.

Specific Aims

The aim of this project implemented May 2017 was to reduce improper usage of the ED with the framework to educate the nursing staff in the ED of Alta Bates Summit Medical Center (ABSMC).

Staff nurses were educated to increase their awareness and knowledge basis of high ED utilizers and PreManage ED™ individuals by 80%. Resources and evidence-based practice initiatives were discussed to assist nurses in decreasing high utilization for non-urgent care by collaborating efforts with providers, social work, and case managers teaching to assist this patient population. Through information provided in the educational workshop, nurses identified improved ways to work collaboratively with members of the Sutter Health care team to address unmet needs of frequent utilizers and reduce avoidable ED admissions. The nurses were much more aware in identifying these patients in the EHR and had gained ability to acknowledge the
PreManage ED™ data initiating follow-up with the health care team. The project sought to decrease the fragmented care patients are experiencing and assist with better healthcare outcomes. The intended outcome was to improve the knowledge and job satisfaction for nursing staff, increase knowledge of healthcare resources and assist the health care team to better identify and provide access for primary care services for non-urgent healthcare needs.

**Section III. Methods**

**Context**

Research, Development, & Dissemination (RD&D) of Sutter Health was initially introduced to the doctoral candidate in March, 2016 at an event sponsored by San Francisco Business Week. After months of negotiation between legal entities of Sutter Health and University of San Francisco (USF) an agreement or memorandum of understanding (MOU) was implemented in September, 2016. The stakeholders for this improvement project included Community Health Research, Development & Dissemination (RD&D) Director at Sutter Health, Kristen Azar, RN, MSN, MPH, and the Senior Project Manager, Nicole Oehmke and the Project Coordinator, Nasiera Byrd while Executive Director, Joshua Lieberman, Ph.D. was also included in all communication (See Appendix C). In addition, further stakeholders from ABSMC included Nurse Manager, ED, Brenda Tiernan, RN, MS, CEN, CCRN, FAWM and Director of Administrative Supervisor for Social Work, Tracy Schrider, LCSW, ACM, and ED Social Worker, Rina Breakstone, MSW. Prior to implementation, the flow of communication was presented to the Chair of the DNP Committee, Brian M. Budds, RN, MS, JD. The DNP student reported directly to Brian M. Budds, RN, MS, JD, while keeping the second reader apprised of the project. Nancy W. Selix, DNP, FNP-C, CNM, Assistant Professor served as the second
reader for this project. All feedback was initially evaluated and then implemented accordingly regarding the project.

Preceding the implementation, multiple discussions of the educational need for the nurses were addressed with the stakeholders, PreManage ED™ was previously implemented within the East Bay region in various EDs to improve care coordination of frequent utilizer patients. However, the nursing staff was not included in the initial introduction of the pilot for unknown reasons. Despite implementing PreManage ED™ in the other three facilities, the ABSMC nursing staff was selected at the request of Tracy Schrider, considering the extensive involvement of administration in the pilot initiative with elements of the gap analysis and SWOT analysis. Weekly meetings were held with Kristen Azar, RN, MSN, MPH. These discussions for the educational workshop were in relation to format, curriculum, environment, time element, and necessary tools for distribution. An educational tri-fold brochure, entitled “High Utilizer Patients in the ED” was designed by the doctoral student under Community Health Research and the leadership for ABSMC for accuracy of data (See Appendix D).

**Intervention**

An educational workshop was selected as the best modality to communicate the information to the nurses at ABSMC. Various emails were sent to the stakeholders for further clarity to define the objectives, content of the presentation, location and time frame. The Director of the ED recommended Wednesday for the presentation since it was the lightest day of the week with lower acuity census to accommodate the nursing staff. The presentation as decided by the Director of the ED, took place in the break room of the ED prior to every change of shift including 0600, 0700, 0900, 1000, 1100, 1400, 1500, 1700, and 1900 on Wednesday,
May 10, 2017. The Director of the ED recommended a time frame of ten minutes without the utilization of audio-visual technology in lieu of the time commitment. An educational brochure was selected as the most appropriate means to communicate significant information in a short period of time while also leaving the nurses with the information after the presentation. Inclusion criteria consisted of voluntary participation, with exclusion criteria subject to unmatched data pairs. Thereby, nurses insufficiently completing either the pre-test or the posttest survey. Prior to the workshop, the participants randomly selected a card from a 52 card deck. This numeric selection process enabled matching the pre-test and posttest surveys to each participant. The nurses wrote their card selection on the top right corner of the page. Then, completed a five question pre-test survey to assess knowledge base regarding high utilizers in the ED. In addition, the nurses also completed five demographic questions to be utilized for statistical analysis at another time. Upon completion of the presentation, the nurses wrote the same chosen numeric card selection on the top right corner of the page; completing a five question posttest survey administered for evaluative purposes.

The pre-test survey and posttest survey questions were identical to obtain a direct correlation between the assessment and knowledge as a result of the intended education. The assessment survey was in the form of a multiple-choice question and answer template (see Appendix E).

The material, including the data utilized in the design of the tri-fold brochure and curriculum for the educational workshop, resulted from the PreManage ED™ East Bay Pilot Evaluation. Qualitative interviews were conducted at the four various Sutter Health facilities participating in the pilot interim report prior to the documentation of the evaluation.
After approval from the stakeholders the design for the educational material comprised these objectives:

- Discuss high utilizer patients within the context of health care reform and broader initiatives.
- Describe ongoing efforts about PreManage ED™ pilot and initiatives within Sutter Health.
- Identify ways to work collaboratively with members of the health care team within Sutter Health to address unmet needs of frequent utilizers.

The content for the brochure encompassed the background terminology, overview of PreManage ED™ data sharing platform, and results from the pilot evaluation and additional resources for the nurses.

**Gap Analysis.** A gap analysis was utilized to observe the current and future performance under Community Health Research as well as a review of the literature. The author identified existing gaps regarding access to care and insufficient resources to assist frequent high utilizer patients on issues related to avoiding the ED (See Appendix F).

**Gantt Chart.** A Gantt chart displayed the various phases in tracking the schedule for this performance improvement initiative (See Appendix G). The overall project was over a six-month period with completion in May 2017. The process of assessment began with the data analysis to identify high utilizer individuals presenting to the ED. Analysis reflected diagnosis, frequency of visits, various EDs encountered, among others. This DNP student educated the nursing staff to assist the health care team intending to reduce frequency of vulnerable patients’
visits to the ED. Training material in a tri-fold brochure assisted with the education of the nursing staff.

**SWOT Analysis.** A SWOT analysis assessed the environment, people, and processes in an analytical framework to identify the strengths, weaknesses, opportunities, and threats within the healthcare organization. The main purpose of this analysis was to assess the needs of the Emergency Department and to perform strategic planning for project improvement. The aim was to educate the nursing staff and assist patients with additional resources in a more coordinated system to build a safety net for these patients. Information obtained was separated into internal strengths and weaknesses and external opportunities and threats (See Appendix H).

The strengths identified to the Emergency Department included an established emergency room open 24 hours to the community with the availability of fast track, rapid medical examination (RME) and Pit Doc. This service was provided by physicians, physician assistants, and nurse practitioners. A collaborative team of providers assist with the care and treatment of patients. The high utilizer, non-urgent patients were identified in the electronic health record (EHR) through the utilization of the EHR via EPIC. Upon presentation to triage, patients are assigned an Emergency Severity Index (ESI) classification (Gilboy, Tanabe, Travers, & Rosenau, 2012).

The weaknesses assessed comprised the high turnover rate in the nursing staff limiting the number of open beds. Short staffing produced overcrowding in the department and extended wait time to see a provider. After evaluation by a provider and disposition to home, the high user population rarely follows up with the primary care provider. Hence, the patient’s care is often fragmented. Primary care providers, if known, are notified when their patients have presented to
the ED. Inadequate collaboration of the team was identified as making the sharing of
information within the system difficult for further follow up. In addition, services were limited
particularly regarding behavioral health, pediatrics, and those identified to have chronic illnesses
such as diabetes, asthma, or others.

Opportunities identified included the need for improvement of health care delivery,
quality and reduction in cost of health care in the ED. Enhanced communication among the
interdisciplinary team included encouraging preventive care and self-management. Another
opportunity was the potential for further education for both providers and patients, particularly
for caregivers of pediatric patients and those patients with chronic illnesses. Additional quality
improvement projects may further educate patients on various appropriate utilizations of the ED.
By introducing this quality improvement project to assist with the recognition of these frequent
user patients, a reduction of avoidable ED visits may be anticipated, and improved patient
satisfaction scores also achieved.

Since the new Presidential administration significant threats such as the increasing
burden of chronic illness among the aging population and the increased volume of
uninsured/underinsured may dramatically reduce healthcare services to the poor and working
poor. Further economic downturns and unemployment will limit healthcare access affecting all
areas of healthcare. The impact of these factors will be increased demand for ED services as a
safety net, reduced capacity due to the increased volume of those seeking services, and escalating
healthcare costs. Identified internal and external forces interrupting continuity of care in patient
flow through the health care system have been identified based on this SWOT analysis.
Understanding the characteristics of frequent users may help to improve medical care in the ED and primary setting, potentially reducing the volumes presenting to the ED.

**Budget Return on Investment Plan.** This project existed to educate the nursing staff to increase their knowledge and awareness of healthcare resources and assist the health care team to better identify non-urgent healthcare needs. Creating this necessity of education provided a return on investment (ROI) of 23%, paying for itself in year one based on various assumptions with a cost savings of $17,684 (See Appendix I).

**Cost Benefit Analysis.** As part of the business plan various options were identified to accomplish the primary goal of this educational workshop. By increasing awareness and knowledge of nurses within Alta Bates Summit Medical Center (ABSMC) and assisting with coordination of care through a better understanding and utilization of PreManage ED™, the nurses would be better equipped to address the unmet needs of high utilizer patients by collaborating efforts with the health care team.

**Option #1: No Change in Standard of Care.** Without changing current ED initiatives, this dramatic rise in health insurance enrollment, will likely continue to see an increase in their volume and utilization of resources and cost. The availability to offer a one-stop shop for care and treatment would only continue without intervention. Practice improvement initiatives would be needed to assist patients in identifying their assigned primary care providers and accessibility to primary care services.

**Option #2: The Preferred Solution.** The value of this project was realized by improving patient awareness and access to primary care providers, including primary care services, and improving health care outcomes for vulnerable patients that are frequent users of ED services for
non-urgent health issues. Further assistance by nursing in a collaborative effort with the health care team to recognize these individuals, particularly when individuals have already been discharged and case management has left for the day.

**Option #3: Plan B: Back Up Plan.** This option would require utilization of Fast Track, Rapid Medical Response (RME), and other mid-level providers in existence. Utilization of case managers and social workers could continue to assist individuals on a limited basis.

The project itself was cost effective with a positive cash flow in year one. The most expensive cost was $5,000 per month, a cost incurred by the facility paying for the PreManage ED™ data sharing platform. Other costs such as the electronic health record (EHR) (EPIC) were mandated without additional cost for this existing system. The project manager was estimated at a cost of $15,000, while another cost was the price of the brochures necessary for the nursing educational initiative. Additional cost included the utilization of office supplies such as computer and paper products for a total project cost of $76,180 (see Appendix I for details of all project costs).

According to Sutter Health 2015 audited financial statements, current net revenue for operations at ABSMC are about $1,098,000,000, with expenses estimated at $1,071,000,000. Therefore, income from operations was $27,000,000. Based on the proposed educational initiative and five visits in 12 months, these data metrics were utilized:

- ER visits 40,430
- Repeat visits per year (1) 15,834
- Convert to Number of Patients 3,167
- Medicaid Reimbursement $300 per visit
• Average cost per ED visit $1288

The financial impact of the plan would yield a decrease in net revenue in year one of $28,501. A corresponding decrease in expenses of $122,365 yields a net income from operations of $93,864. Year one estimates a pro forma net revenue of $1,097,971,499 with corresponding expenses of $1,070,877,635 resulting in an increase in net income from operations of $27,093,864. With a net increase in operating income of $93,864 divided by the total project cost of $76,180 yields a 1.23 (23%) return on investment (ROI). This project will pay for itself in year one based on the assumptions utilized with a cost savings of $17,684 ($93,864 minus $76,180), (see Appendix J for financial analysis). Other ROI’s that may not reflect cost or generate savings may include positive patient and nurse satisfaction outcomes, less utilization of diagnostics reflecting significant clinical value, reduced wait time, ED throughput, and number of ED visits, among others (Waxman, 2013).

Year two, estimated financial results (with the assumption of applying an inflation factor of 1.03 percent) derived net revenues of $1,187,300,000 with expenses of $1,150,300,000 yielding income from operations totaling $37,000,000. Based on the assumptions, PreManage ED\textsuperscript{TM} will provide a decrease in net revenue of $29,356 and corresponding decrease in expenses of $126,036 yielding an increase in income from operations of $96,680. Therefore, year two pro forma income from operations is $37,096,680 (see Appendix J for financial analysis).

**Responsibility/Communication Matrix Plan.** The DNP candidate assumed the role of the project leader with support from Community Health Research, RD&D and the chair of the DNP committee. All changes as well as concerns were communicated with the DNP chair through email or zoom video conferencing prior to implementation of the project.
Weekly, in-person meetings with the RD&D committee occurred regularly with Kristen Azar, RN, MSN, MPH and frequent correspondence with Brenda Tiernan, RN, MS, CEN, CCRN, FAWM and Tracy Schrider, LCSW, ACM.

Work Breakdown Structure (WBS). The WBS identified the deliverables and work elements involved in this project. Beginning with level one, the nursing staff was educated on various variables related to the frequent utilizer presenting to the ED. From the information provided in the educational workshop, the nurses could better assist patients in collaboration with case managers, social workers, and ED providers to identify their primary care providers, reducing the avoidable admissions to the ED as noted in level two. In addition, this project’s intent was to decrease the fragmented care these patients are experiencing and assist with better healthcare outcomes. The intended outcome would be to increase the knowledge of the nursing staff, better nursing staff satisfaction, and improve education on resources of the patient presenting to the ED. Within level three are further sub-deliverables and tasks (See Appendix K). Upon evaluation of this project, the long term goal was to assess a reduction in volume of these high utilizer patients, and perform cost analysis to determine if educational interventions are correlated with reduced number of non-urgent visits, compared to the cost of salary and benefits for additional full time equivalent (FTE) positions utilized to assist these patients during peak volume times during the off shifts. Although, much of these secondary outcomes could not be measured during the time frame by this author.

Study of the Intervention

Change of practice initiative was introduced based on a data assessment of ABSMC, utilizing OSHPD.gov comprising demographic and statistical data related to the ED and an
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assessment during the pilot evaluation of PreManage ED™ from RD&D, including the qualitative interviews for evaluative purposes.

Upon determination of these assessments, an opportunity presented itself as a practice initiative with a systematic review. Initially, several proposals were introduced with one in particular, to educate the nurses in the ED. Another suggestion by case management included educating the nurses on the medical-surgical units. Still another, offered by one of the ED MDs, suggested primary care provider (PCP) capture via a patient-centered educational tool to be distributed in the ED prior to discharge.

For this project, an educational tri-fold brochure was developed and designed by the DNP candidate. Various brand templates from Sutter Health were utilized for the educational brochure for the nurses in the ED. With the guidance of Community Health Research, RD&D Director, Kristen Azar, the document was reviewed and edited on numerous occasions. The statistical analysis data in the brochure of PreManage ED™ was directly from RD&D and CMT. Upon approval of the brochure, an email was sent to Brenda Tiernan and Tracy Schrider with consultation from Rina Breakstone. A final copy was sent for professional production upon approval.

During the presentations from 0530 to 1930 on Wednesday, May 10, 2017, the colorful glossy tri-fold brochure was distributed to each participating nurse. A flyer and a brochure, with a copy of the pre and posttest survey were sent to the Nurse Manager ED, Brenda Tiernan several days prior to the assigned date.

Measures
The initial measure selected for studying the process and outcomes of the intervention was based on the pre-test and posttest assessment distributed during the presentation. Initially, the pre-test and posttest surveys were written in a Likert scale. However, upon review with the RD&D Director, it was determined a more extensive test of knowledge would be assessed in a format utilizing a multiple choice arrangement. The material utilized for the questions was written to the adult student and skill set as a registered nurse in the ED. The initial pre-test reflected the entry baseline for their knowledge of PreManage ED™. The posttest assessment revealed the knowledge gained was due to the education, but also enabled the nurses to assess their progress of learning.

The multiple choice questions of the pre and posttest surveys were identical to obtain a direct correlation between the assessment and knowledge as a result of the intended education. The best choice among the five options was selected by each nurse. The format for each multiple choice question comprised the stem, the correct answer, and several incorrect answers. The questions did not reflect the use of words such as ‘not’ or ‘except.’ To decrease the probability of guessing the correct answer, an increase in the number of alternatives in each question was suggested by the RD&D Director. The answers were formatted in a vertical position for ease of reading each option. Due to the objectivity of the scoring, the reliability was able to be measured. Although, the true reliability and validity of the survey could not be obtained correctly without the utilization of a pilot study prior to implementation nor was the data collection instrument an established tool with proven reliability and validity. Therefore, the pilot study was measured by the Director of RD&D and the DNP candidate as a result of time
constraints. Interpreting the test re-test may have been influenced in practice and memory and the brief time element between each test.

Validity of the instrument reflects the degree to which the instrument measured what was intended to measure (Sylvia & Terhaar, 2014). Face validity was addressed by the consistency of the writing in terms of instrument clarity, readability, and ease of administration. The nonexistence of spelling, grammar, and punctuation errors also added to the validity. Construct validity was measured by the intended knowledge examined. Although, without a structured design, validity and reliability were not established through rigor or a scientific process limiting the measure of the tool.

Secondary measures used to evaluate the success of this potential project included: number of ED visits, ED throughput, ED wait times, and cost. As part of the East Bay Pilot Evaluation, the interim findings in terms of ED visits the project evaluated the total of ED visits in a one-year period. It was anticipated to measure ED visit encounters with patients with an Emergency Severity Index (ESI) four and five rapid triage classification. However, RD&D did not further divide the results of the research to this triage classification per patient. Other measures such as throughput and ED wait times may be expected to be evaluated within the future of RD&D.

Analysis

The pre test and posttest survey results were collected and then analyzed utilizing Excel version 15.17 (151206) and IBM SPSS 23 to examine the effect of the intervention on the practice improvement project. The independent variable of educating the nurses influenced the test scores, while the dependent variable and secondary outcomes of other variables included the
degree to which the nurses are listening or whether they are eating while participating in the educational opportunity, or their lack of sleep from the night before. Other distractors may also have been present in the environment utilized for the educational setting, described further as barriers to the project.

The two measurements in a classic paired dataset were made with the pre-test measurement prior to the intervention. After the education, the posttest measurement was completed within minutes after the intervention. The data was separated by each question from the multiple choice survey. A unique identification number was assigned for each correct answer (1) or incorrect answer (2).

Standard descriptive statistics were utilized for the demographic data. Descriptive statistics allowed for describing, comparing, and characterizing relationships. Descriptive statistics with the coding of 1 through 5 was selected based on the most applicable answer such as gender, age difference, race, years of experience, and highest degree in nursing. The uniqueness of each row in the data set enabled linkage among multiple data sets for similarity of individuals. These variables may be related or affect the outcome of the evaluation.

Inferential statistics, such as index of central tendency were reported through the mean, median, and mode. Range, being the simplest measure of variability, displayed the difference between the pre-test and posttest results. Interquartile range (IQR), a variability index, was calculated on the basis of quartiles, describing 50% of the participants (Polit, 2010). Another measure utilized to quantify the variation in a data set was the standard deviation.
To compare the significance of the difference between the pre-test and posttest scores, a Wilcoxon Signed-Ranks test was utilized. This test compared the difference between the paired observations of the pre-tests and posttests.

**Ethical Considerations**

As registered nurses, there is a duty to the public to protect the health, safety, and welfare of patients as defined by the Nurse Practice Act. In addition, the American Nurses Association (ANA) *Guide to the Code of Ethics for Nurses* further serves as a basis for advocacy of nursing practice. Ethical principles of beneficence, non-maleficence, justice, autonomy, veracity and fidelity are the guidelines to affirm actions regardless of clinical specialty (Grace, 2014).

Improving access and quality of care while reducing ED costs and wait time for patients with true emergencies is in alignment with the essential nursing role and of most importance as change agents. The role of the advanced practice nurse is to serve as an advocate for distributive justice to these high utilizer complex patients. Failure to provide these individuals with adequate education, assessment and treatment for continuity of care, and community resources directly opposes nursing goals.

The Emergency Nurses Association, in their code of ethics under the Jesuit mission and values of USF “tending to the whole person; uniting the mind and heart; amplifying the voices of the underserved, disadvantaged, and poor,” drive this DNP candidate in pursuit to direct nurses to maintain high competence levels, to exercise sound judgment in protecting the lives and privacy of patients and their families, to practice with compassion with respect to human dignity.

Advocating beneficence is becoming more challenging with the many conflicts existing, regardless of their gender, race, socioeconomic status, culture, or ability to pay. Nurses inform
the public and promote health. Educational endeavors such as this practice improvement project can only improve the quality of care and patient safety.

A DNP statement of non-research determination form, as part of the USF curriculum, was completed prior to implementation of this project (See Appendix L). Also, within the structure of USF curriculum, the National Institute of Health (NIH) module on Protecting Human Persons Research was completed. Prior to involvement with Community Health Research Development and PreManage ED™, Collaborative Institutional Training Initiative, Biomedical Human Subjects Research (HSR) and Conflicts of Interest were completed in October 2016 through the CITI program.

It was determined after submission of documentation, this project did not meet the regulation designated of research involving human subjects and waived Internal Review Board (IRB) approval. The profession of nursing as guided by theory and conscious clinical practice within the environment, as driven by caring, kindness, and compassion, assisted in the outcome of this intervention within this morally, challenging, stressful, and chaotic environment. These common characteristics, integrated with healing, provide the necessary services to all patients, including those with special circumstances, especially individuals with health disparities and the underserved population.

Section IV. Results

Results

When examining the pre-test scores for the nurses (N=41), it was determined the average score was 56.59%, with a range of 80. Range, being the simplest measure of variability, displayed the difference between the highest and lowest scores (see Table 7). Inferential
statistics, such as index of central tendency, were reported through the mean, median, and mode with 56.59, 60, and 40 percent. Mean, being the average was 56.59. Median divided the distribution into two equal halves, making it 60 (Polit, 2010). Mode, known as the most popular score or the scored highest frequency was 40. In a normal distribution, a fixed percentage lies within a certain distance from the mean. Although, this was not a normal distribution (see Table 8). Variability is the dispersed data values in a distribution described via the range, interquartile range (IQR), standard deviation (SD), and variance. Range for the pre-test was 80. Interquartile (IQR), a variability index calculated on the basis of quartiles, the point which 50% lie, 20 (Polit, 2010). Lower quartile is the point in which 25 percent of the scores fall, 40. Upper quartile is the point below in which 75 percent of the scores lie, 60. Standard deviation conveys how much the average scores in a distribution vary, 17.83. It is calculated by subtracting the mean from each individual score (Polit, 2010). The variance, 318.05 on the pre-test and 596.10 for the posttest is the standard deviation squared (SD$^2$) reflecting the influence of outliers.

While examining the posttest scores for the nurses (N=41), the average score was 81.95%, with a range of 100. The posttest averages were left-skewed which indicated a shift in the positive direction. The mean of the posttest increased from the pre-test 57 to 82%, with an increase in variance from 318 to 596 (see Table 7).

Comparing the pre-test and posttest scores for the nurses (N=41), the average pre-test percentage was 56.59 and the average posttest percentage was 81.95, yielding a percent difference of +25.36. This is a positive difference and statistically significant. The Wilcoxon Signed-Ranks Test was utilized for analysis in this project as this tested for differences in ordinal-level measures for the same individuals measured twice, in paired groupings (Polit,
Since the data was not normally distributed, a t-test would not be appropriate and the Wilcoxon Signed-rank was utilized instead. When a correlation was performed using Wilcoxon Signed-rank test on the pre-test and posttest scores, a significant correlation was determined at the .0001 level (p < .0001). This meant for the nurses, that the difference between the pre-test average score and posttest average score was statistically significant. For N > 10, this test follows a normal distribution, so the test statistic is Z. The Wilcoxon Signed-rank test indicated a difference between the pre- and posttest scores was significant, Z=278, p < .0001, indicating that the intervention participants scored higher on the posttest than on the pre-test. This significance in the survey scores revealed the majority of nurses in the ED participating in the educational endeavor increased their awareness and knowledge basis of high ED utilizers and PreManage ED™.

Details regarding missing data reflected for only one posttest in which the entire data was discarded.

Section V. Discussion

Summary

To assist with the goals of PreManage ED™, the project aim was accomplished as the nursing staff at ABSMC were educated on health care terminology, initiatives affecting the ED, PreManage ED™, and ways to collaborate with the health care team to assist high utilizers with their unmet needs. As described by the analysis of the data, pre-test and posttests reflected a learning curve based on the educational initiative. Although there is no follow up evaluative assessment regarding the impact on the numbers of patients affected by the nurses’ increased
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awareness, they will now recognize the frequent users and any additional care plans from either their facility or within the geographical area from within the EHR.

The success of the education was directed from the case management department with their encouragement for educating the nursing staff. They recommended further follow-up with the remainder of the nursing staff in other areas within the hospital which could potentiate a future DNP project. The ED Nurse Manager was also greatly responsible as without her support, this initiative would not have been possible.

With the increased awareness of the nurses and their ability to note a frequent visitor with access greater than three or five visits in a period of time, case management and/or social work can get involved sooner with additional care plans to manage the continuity of their care. As a result of the interim evaluation, it was determined that without night shift coverage with case management many frequent users were lost within the system upon discharge and without appropriate follow-up contact during the day. Based on this analysis, per diem staff were added to the case management department to obtain coverage for the night shift patients that trigger alerts from PreManage ED™. The patterns of utilization varied between sites. One hospital within the pilot has chosen not to utilize the benefit of the care plan initiative and will continue to expend further unnecessary resources until a mandate with the Sutter Health organization is initiated. In addition, it became apparent that PreManage ED™ cannot synchronize with the EHR EPIC system secondary to legalities. This has created additional workflow patient care guidelines for the case management department with the duplication of care plans into the portal. Despite further mandates that may arise in the future, the value of this platform lies in its ability to expand to the other Sutter Health EDs and the surrounding hospitals within the geographical
regions across different health systems and hospitals. Under the influence of the case management department, the nursing staff of the facilities could be included within the training during this implementation of PreManage ED™.

**Interpretation**

Many characteristics related to the frequency or urgency of ED visits among various patient populations was presented during this evidence-based project as revealed with this evidence from 1998 through 2017. According to the (JHNEBP) evidence tool, this systematic review utilized 11 bodies of evidence with six studies designated as Level III (LaCalle & Rabin, 2010; Morrison et al., 2014; Soril et al., 2016; Thakarar et al., 2015; Uscher-Pines et al., 2013; Vinton et al., 2014). Two studies were designated as Level I and II (Finkelstein et al., 2016; Yoon et al., 2015). Three reviews were designated with a rating of V (Doyle et al., 2016; NEHI, 2010; U.S. Department of Health & Human Services, 2012).

Overall, this review was determined to be insufficient as a result of the inconclusive data in summarizing decisions to seek care in the ED. There is a paucity of higher-level evidence, which revealed the inability to determine the reliability of the overall findings. Internal validity of the findings is limited by the quality of included articles. Sample size of participating organizations were evident across the review, also threatening internal validity. Many hospitals were narrowed to one geographic location without the ability to generalize to multiple EDs or even general populations as confirmed in the Level III studies.

Despite the lesser quality of evidence found in this review, much of the information had been utilized for further investigations to analyze patterns influencing a patient’s decision to seek care in the ED. Regardless of additional access to medical care, patient populations such as
pediatrics, behavioral health including the homeless population, and chronic illness were found to utilize the ED for reasons believed to be serious and in need of immediate attention. The ED was often seen as the usual place to obtain care. Referral from primary care providers with many other often-overlapping characteristics were apparent. Interestingly enough, there was no definitive number of visits in the literature to define high utilizer patients.

The East Bay pilot evaluation established utilization criteria for these frequent utilizers. However, there was no evidence that implementing PreManage ED™ resulted in cost savings from a decrease in ED utilization by frequency of these visitors as shown in the states of Washington and Oregon.

As a result of the qualitative interviews from assisting RD&D with their interim evaluation of PreManage ED™, it became apparent that the utilization of the platform has definitely reduced further unnecessary tests when the system is accessed. However, if the provider only utilizes the EHR medical record through EPIC, then there is a potential of miscommunication regarding alternative care and treatment as patient’s multiple visits to the ED are missed.

Overall, research findings demonstrate increased demands on the ED will continue to rise. Understanding the characteristics of various frequent users may help to improve medical care in the ED and primary care setting or medical homes. This potentially may ease the volumes presenting to the ED and decrease costs by providing information to this patient population on their PCP and how to access care from that provider. As part of this project initiative, stakeholders must provide funding for these type of projects so nurses can educate the population on utilizing a primary resource for non-emergent primary care treatable conditions. Driving this
educational initiative was the conceptual framework as defined by the theories provided by Aday, Knowles, and Drucker. Using evidence-based strategies to educate ED staff nurses on ways to assist with the collaboration in finding these high utilizer patients better access to continuity of primary care providers may be an effective means to reduce barriers to care while reducing high volume non-urgent ED visits. Implementation improvement projects as described will improve patient care and promote knowledge of necessity for a visit to the ED. In addition, patient satisfaction will improve with better preventive care management. Continued interventions will contribute better efficiency in primary care treatable conditions, eliminating fragmentation of care, and providing enhanced communication among providers and patients.

The implications for advanced nursing practice continues to be needed for preventive care and injury prevention, improved quality and continuity of primary care, and collaborative networking to build a healthcare safety net for these complex, vulnerable patients who frequent the EDs.

**Limitations**

Several barriers existed prior to the educational workshop for the nurses. Initially, the Nurse Manager of the ED defined the limitation for the education to a maximum of 10 minute sessions secondary to relevant patient care variables impacting the ED. She had also requested no utilization of power point slides for the presentation as the education would take place in the break room during the beginning of each shift change. Other issues involved the lack of staff nurses support secondary to union issues, disinterest, inconvenience of educational opportunity, and times of classes. The time for each session limited the volume of information that could be discussed as related to PreManage ED™. Other variables existed that minimized the
effectiveness of the educational experience, such as timeliness of arrival of the nurses initially of the shift, completeness of the schedule by the charge RN, extraneous variables of the ED at the time of the presentation such as acuity of the patients. In addition, limitations to the location of the presentation include multiple interruptions as individuals were constantly coming and going for breaks, meal times, utilization of the bathroom, locker necessity, among others. Other limitations affected the content of the presentation, such as the inability of RD&D to extrapolate ESI acuity criteria for each high utilizer patient presenting to the ED as related to PreManage ED™. The educational tool regarding Primary Care Physician (PCP) capture for the patients to be distributed from the ED upon discharge never made it to fruition for multiple reasons, which limited the education communicated to the nurses in assisting the patients with primary care provider information.

Another limitation during the design of the brochure comprised the miscommunication of data reflected in a pie chart from Sutter Health patients by ED visits frequency from 6/1/2015 to 5/31/2016 by which the DNP candidate was sent a draft instead of a final copy. Seasonal issues (flu season) were known barriers that previously existed prior to implementation, and have also been identified through various gaps that interrupt continuity of care in patient flow in the health care system existing with ineffective ED utilization.

The reliability and validity of the instrument were threatened without pilot testing prior to initiation. In addition, the sample size of participants reflected greater than half of the nursing staff, but may have limited the generalizability of the work. Efforts to minimize these limitations were made during the presentation. Prior to the beginning of the presentation, the DNP candidate waited for the most nurses to be in attendance.
Conclusions

As a result of this implementation project, additional research is needed to understand the underlying causes contributing to ED utilization as demonstrated in the non-urgent user (Brennan, et al., 2014). Without restricting access to the ED, availability of more open access clinics, additional resources, such as stable environments for the homeless, must be addressed. Federal funding and policy initiatives for alternative settings with reduced health care spending will enable EDs to focus on acutely ill and injured patients. Mandates similar to the states of Washington and Oregon with limitations to Medicaid payments to hospital EDs would prove most beneficial. In addition, availability of increased providers for the greater community urgent care needs is a necessity, as well as payment insurance reimbursement measures to ensure the primary care involvement.

Section VI. Other Information

Funding

This project did not receive any financial assistance, scholarship, awards, grants, contributions, or other donations from any individuals, organizations, or other commercial entities. This practice improvement project was funded solely by the DNP candidate.
Section VII. References

References


Barlas, S. (2017). 2017 presages dramatic change for federal health care policies republicans are likely to face hiccups along the way. *Pharmacy and Therapeutics, 42*(1), 24-27.


Doyle, D., Emmett, M., Crist, A., Robinson, C., & Grome, M. (2016). Improving the care of
dual eligible patients in rural federally qualified health centers: The impact of care coordinators and clinical pharmacists. *Journal of Primary Care & Community Health*, 7(2), 118-121. doi: 10.1177/2150131915617297


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Section VIII. Tables
Table 1.

*Statistics for Alameda County*

<table>
<thead>
<tr>
<th>2015</th>
<th>Alameda County</th>
<th>Berkeley, CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approximate census population</td>
<td>1,638,215</td>
<td>121,240</td>
</tr>
<tr>
<td>Median household income</td>
<td>$73,775</td>
<td>$66,237</td>
</tr>
<tr>
<td>Without health insurance</td>
<td>11.8%</td>
<td>7.6%</td>
</tr>
<tr>
<td>Poverty</td>
<td>12.5%</td>
<td>20.4%</td>
</tr>
<tr>
<td>High School Education</td>
<td>86.7%</td>
<td>95.7%</td>
</tr>
</tbody>
</table>

Note. Adapted from [http://www.census.gov](http://www.census.gov)
Table 2.

**OSHPD Data, 2015**

<table>
<thead>
<tr>
<th>2015</th>
<th>Demographics</th>
<th>Alta Bates Ashby</th>
<th>Alta Bates Summit</th>
<th>Delta</th>
<th>Eden</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED Encounters</td>
<td></td>
<td>40430</td>
<td>37936</td>
<td>52331</td>
<td>38120</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Female</th>
<th>23230/57.46%</th>
<th>21836/57.56%</th>
<th>30410/58.1%</th>
<th>21807/57.2%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>17196/42.53%</td>
<td>16099/42.44%</td>
<td>21920/41.8%</td>
<td>16313/42.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>(01-09)</th>
<th>8769/21.69%</th>
<th>6762/17.82%</th>
<th>10046/19.2%</th>
<th>6856/17.9%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(10-19)</td>
<td>6910/17.09%</td>
<td>6313/16.64%</td>
<td>7983/15.2%</td>
<td>6230/16.3%</td>
</tr>
<tr>
<td></td>
<td>(20-29)</td>
<td>6138/15.18%</td>
<td>5044/13.30%</td>
<td>7690/14.69%</td>
<td>6105/16.50%</td>
</tr>
<tr>
<td></td>
<td>(30-39)</td>
<td>5524/13.66%</td>
<td>5573/14.69%</td>
<td>5350/14.0%</td>
<td>5350/14.0%</td>
</tr>
<tr>
<td></td>
<td>(40-49)</td>
<td>6910/17.09%</td>
<td>5573/14.69%</td>
<td>6924/14.65%</td>
<td>6924/14.65%</td>
</tr>
<tr>
<td></td>
<td>(50-59)</td>
<td>5924/14.65%</td>
<td>6668/17.58%</td>
<td>6230/16.30%</td>
<td>6230/16.30%</td>
</tr>
<tr>
<td></td>
<td>(60-69)</td>
<td>7636/14.59%</td>
<td>7324/18.07%</td>
<td>7324/18.07%</td>
<td>7324/18.07%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race</th>
<th>Asian</th>
<th>15724/38.89%</th>
<th>8118/21.40%</th>
<th>23561/45.0%</th>
<th>18939/49.6%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
<td>13825/34.19%</td>
<td>21059/55.51%</td>
<td>15173/28.9%</td>
<td>7763/20.36%</td>
</tr>
<tr>
<td></td>
<td>Black</td>
<td>6773/16.75%</td>
<td>4354/11.48%</td>
<td>10581/20.2%</td>
<td>7267/19.06%</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>16313/42.7%</td>
<td>16099/42.44%</td>
<td>21920/41.8%</td>
<td>16313/42.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Principal Diagnosis</th>
<th>Symptoms</th>
<th>9109/22.53%</th>
<th>8839/23.30%</th>
<th>8314/21.81%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injuries/Poisoning</td>
<td>6138/15.18%</td>
<td>5044/13.30%</td>
<td>7690/14.69%</td>
<td>6105/16.02%</td>
</tr>
<tr>
<td>/Complications</td>
<td>3280/8.11%</td>
<td>3444/9.08%</td>
<td>12074/23.0%</td>
<td>7259/13.87%</td>
</tr>
<tr>
<td>Mental Disorders</td>
<td>3280/8.11%</td>
<td>3444/9.08%</td>
<td>12074/23.0%</td>
<td>7259/13.87%</td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>3280/8.11%</td>
<td>3444/9.08%</td>
<td>12074/23.0%</td>
<td>7259/13.87%</td>
</tr>
<tr>
<td>Respiratory</td>
<td>3280/8.11%</td>
<td>3444/9.08%</td>
<td>12074/23.0%</td>
<td>7259/13.87%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Payer Source</th>
<th>Medicaid (Medi-Cal)</th>
<th>14558/36.01%</th>
<th>17239/45.44%</th>
<th>32072/61.2%</th>
<th>18099/47.4%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Medicare Part B</td>
<td>7570/18.72%</td>
<td>8739/23.04%</td>
<td>6228/11.90%</td>
<td>6023/15.80%</td>
</tr>
<tr>
<td></td>
<td>PPO</td>
<td>8459/20.92%</td>
<td>5324/10.17%</td>
<td>6034/15.83%</td>
<td>6034/15.83%</td>
</tr>
</tbody>
</table>

Note. Highlighted areas reflect majority demographics for each facility.
Table 3.

*PreManage ED*<sup>TM</sup> Demographics of Frequent ED Utilizers

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>3+ Visits</th>
<th>5+ Visits</th>
<th>Alameda County Census</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (% of females)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>53.3%</td>
<td>57.6%</td>
<td>47.4%</td>
<td></td>
</tr>
<tr>
<td>Age 25-39</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>24.3%</td>
<td>24.7%</td>
<td>20.0%</td>
<td></td>
</tr>
<tr>
<td>Age 40-64</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>39.2%</td>
<td>40.0%</td>
<td>36.1%</td>
<td></td>
</tr>
<tr>
<td>Race Black</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>39.7%</td>
<td>45.7%</td>
<td>12.9%</td>
<td></td>
</tr>
<tr>
<td>Race White</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>36.6%</td>
<td>33.2%</td>
<td>40.2%</td>
<td></td>
</tr>
<tr>
<td>Race Asian</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.9%</td>
<td>4.3%</td>
<td>25.3%</td>
<td></td>
</tr>
<tr>
<td>Race Hispanic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>17.2%</td>
<td>16.6%</td>
<td>25.3%</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.

EPIC Encounters Populate PreManage ED™

Table 5.

ABSMC Frequent Users
Table 6.

*Patient Patterns of Utilization, 4/4/2016-1/22/2017*

<table>
<thead>
<tr>
<th>Total ED Volume</th>
<th>Number of Alerts for Patients Meeting 3+ Visits in 30 day Threshold</th>
<th>Number of Alerts of Patients Meeting 5+ Visits in 365 day Threshold</th>
<th>Average Weekly Unique Patients</th>
<th>Number of Care Guidelines Entered</th>
<th>Average number of ED visits to facility among patients with a care guideline</th>
<th>Average number of ED visits to any PreManageED™ Hospital among patients with a care guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ABSMC</strong> 37,733</td>
<td>3,650</td>
<td>11,006</td>
<td>848</td>
<td>88</td>
<td>13</td>
<td>25</td>
</tr>
</tbody>
</table>

Table 7.

*Pre-Test and Posttest Statistics*

<table>
<thead>
<tr>
<th></th>
<th>Pre-Test</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>41</td>
<td>41</td>
</tr>
<tr>
<td>Mean</td>
<td>56.59</td>
<td>81.95</td>
</tr>
<tr>
<td>Median</td>
<td>60.0</td>
<td>100</td>
</tr>
<tr>
<td>Mode</td>
<td>40.0</td>
<td>100</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>17.83</td>
<td>24.42</td>
</tr>
<tr>
<td>Variance</td>
<td>318.05</td>
<td>556.10</td>
</tr>
<tr>
<td>Range</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>Interquartile range</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Percentile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>95th percentile</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>75th percentile</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>50th percentile</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>25th percentile</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>5th percentile</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>
Table 8.

Distribution
Section IX. Appendices
### Appendix A

#### Evaluation Table

<table>
<thead>
<tr>
<th>Citation</th>
<th>Conceptual Framework</th>
<th>Design/Method</th>
<th>Sample/Setting</th>
<th>Study Variables and Definitions</th>
<th>Measurement</th>
<th>Data Analysis</th>
<th>Findings</th>
<th>Appraisal: Worth of Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doyle et al. (2016). Improving the care of dual eligible patients in rural federally qualified health centers: The impact of care coordinators and clinical pharmacists. <em>Journal of Primary Care Community Health</em>, 7(2), 118-121.</td>
<td>None</td>
<td>Quality Improvement Project; Cohort study;</td>
<td>N-502 patients; Network of three rural primary care systems and a tertiary care referral hospital in southern West Virginia,</td>
<td>Independent: Care coordination (contact with patient to discuss discharge medications, follow-up appointments, and answer questions) Pharmacological management</td>
<td>Each practice assigned 0.5 FTE care coordinator to its dual eligible patients selected. Care coordinator conducted a structured review of the medical record, an in-person interview and telephone contact. Reviewed daily notifications of hospital admissions and ER visits and to contact the patient within 2 working days.</td>
<td>Set of baseline and outcome measures along with scannable data collection instruments; Data cleaned; Descriptive statistics, t-test, chi-square, Fisher’s Exact test, and McNemar test. P Value &lt;0.05 significant.</td>
<td>502 patients had one contact with a care coordinator. 65% female; median age 69, range of 29-93; 19% of patients on 15 or more medications; 56% psychotropic medication and 33% chronic opiates; One site showed reductions of 18% in hospitalizations and 31% in ER visits.</td>
<td>Limitations: Small sample size; Measureable outcomes Strengths: Suggests modest investment in care coordination and clinical pharmacy review can produce significant reductions. Level: V Quality: B</td>
</tr>
</tbody>
</table>
**Evaluation Table**

<table>
<thead>
<tr>
<th>Citation</th>
<th>Conceptual Framework</th>
<th>Design/Method</th>
<th>Sample/Setting</th>
<th>Study Variables and Definitions</th>
<th>Measurement</th>
<th>Data Analysis</th>
<th>Findings</th>
<th>Appraisal: Worth of Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finkelstein, et al. (2016). Effect of Medicaid coverage on ED use – further evidence from Oregon’s experiment. <em>The New England Journal of Medicine</em>, 375, 1505-1507.</td>
<td>None</td>
<td>Randomized Experimental</td>
<td>Oregon: 2007-2010; 25,000 participants enrolled in a lottery allocation of Medicaid benefits.</td>
<td>Independent: Low-income adults offered Medicaid</td>
<td>Used lottery to implement controlled evaluation of causal effect of Medicaid coverage on health care use.</td>
<td>Analyzed data applying standard instrumental variables used with Bayes’ rule.</td>
<td>Medicaid coverage increased the mean number of ED visits per person by 0.17 (standard error, 0.04) over the first 6 months or about 65% relative to the mean in the control group of individuals not selected in the lottery.</td>
<td>Limitations: GeneralizabilityStrengths: Initial analysis including increasing use of primary care, Medicaid coverage may increase use of ED</td>
</tr>
<tr>
<td>Citation</td>
<td>Conceptual Framework</td>
<td>Design/Method</td>
<td>Sample/Setting</td>
<td>Study Variables and Definitions</td>
<td>Measurement</td>
<td>Data Analysis</td>
<td>Findings</td>
<td>Appraisal: Worth of Practice</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------------</td>
<td>-------------------------------------------------</td>
<td>----------------</td>
<td>----------------------------------</td>
<td>-------------</td>
<td>--------------</td>
<td>------------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>LaCalle, E. &amp; Rabin, E. (2010).</td>
<td>None</td>
<td>Systematic literature review</td>
<td>Medline search yielded 14 single sites; 11 studies multisite or population-level data USA</td>
<td>Independent: Sex, racial, age, insurance, status, acuity</td>
<td>Inclusion criteria based on Population (Adult/Pediatric) Setting;</td>
<td>Unknown</td>
<td>Frequent ED users: 4.5% to 8% of all ED patients, account for 21% to 28% of all visits; white, insured; age 25-44 years, over 65; higher acuity complaints, risk of hospitalization; Pediatrics, 80% of parents cited lack of availability of PCP</td>
<td>Limitations: Generalizability National data bases deficient in demographic variables, objectivity, outcome and cost data; deficiency in describing how various studies were selected; lack of inclusion/exclusion criteria</td>
</tr>
</tbody>
</table>

**Evaluation Table**
<table>
<thead>
<tr>
<th>Citation</th>
<th>Conceptual Framework</th>
<th>Design/Method</th>
<th>Sample/Setting</th>
<th>Study Variables and Definitions</th>
<th>Measurement</th>
<th>Data Analysis</th>
<th>Findings</th>
<th>Appraisal: Worth of Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morrison et al. (2014). Low caregiver health literacy is associated with higher pediatric emergency department use and non-urgent visits. <em>Academy of Pediatrics, 14</em>(3), 309-314.</td>
<td>None</td>
<td>Cross-sectional study</td>
<td>Caregivers of children &lt; 12 yrs presenting to the ED at a Midwest children’s hospital serving urban and suburban. Trained research assistants enrolled patients during pre-determined blocks of time between June 1, 2011 and May 31, 2012.</td>
<td>Independent: Caregiver health literacy and child ED use</td>
<td>Health literacy/numeracy; Newest Vital Sign (NVS); 6 question test to assess health literacy. The Children with Special Health Care Needs (CSHCN) questionnaire determined chronic illness status. Prior ED use utilized a regional ED data base incl 29 ED sites; Non-Urgent Index ED visits utilized resources during visit classified as urgent or non-urgent.</td>
<td>Descriptive statistics; low and adequate health literacy were compared with ED use outcomes using chi-square and a Poisson regression model for count data. Multivariate analysis using logistic regression with bidirectional stepwise entry r/t health literacy and ED use.</td>
<td>Low health literacy: 55.6% (95% CI 51.2, 59.9) of caregivers associated with foreign born minority/ethnicity/race, lower education; Prior ED use: low health literacy associated with higher rate of prior ED visits (IRR 1.7; 95% CI 1.4, 2.0) as black race, Hispanic, child age &lt; 1 yr public insurance, chronic illness. Multivariate: low health literacy 50% higher rate of prior ED visits (aIRR 1.5, 95% CI 1.2, 1.8)</td>
<td>Limitations: Generalizability; reluctance to consent; triage levels within study population differed from overall triage levels in ED; missing data for prior ED use. Strengths: Threshold for the NVS; First study to measure literacy using the NVS in the pediatric ED</td>
</tr>
</tbody>
</table>
Evaluation Table

<table>
<thead>
<tr>
<th>Citation</th>
<th>Conceptual Framework</th>
<th>Design/Method</th>
<th>Sample/Setting</th>
<th>Study Variables and Definitions</th>
<th>Measurement</th>
<th>Data Analysis</th>
<th>Findings</th>
<th>Appraisal: Worth of Practice</th>
</tr>
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<tbody>
<tr>
<td>New England Healthcare Institute. (2010, March). A matter of urgency: Reducing emergency department overuse. (A NEHI Research Brief, 1-15).</td>
<td>None</td>
<td>Quality Improvement initiative survey form.</td>
<td>Neighborhood Health Plan (NHP) Managed Care Organization serving Medicaid members in Massachusetts. ED visits for Medicaid population 570/1000</td>
<td>Independent: Number of visits Dependent: Frequent users; non-frequent users</td>
<td>Health Information Technology (HIT) to monitor ED use among its members</td>
<td>Unknown</td>
<td>Identified 15 sets of strategies to reduce avoidable ED visits; identified five causes of ED overuse; patients have limited access to timely primary care services; ED provides convenient after-hours and weekend care; ED offers immediate reassurance about medical conditions; Primary care providers refer patients to ED.</td>
<td>Limitations: Generalizability; Unknown data analysis Strengths: Literature Review</td>
</tr>
</tbody>
</table>

Level: V Quality: C
<table>
<thead>
<tr>
<th>Citation</th>
<th>Conceptual Framework</th>
<th>Design/Method</th>
<th>Sample/Setting</th>
<th>Study Variables and Definitions</th>
<th>Measurement</th>
<th>Data Analysis</th>
<th>Findings</th>
<th>Appraisal: Worth of Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soril et al. (2016).</td>
<td>None</td>
<td>Systematic Review of the literature</td>
<td>20 Retrospective Observational Comparative Cohort studies between 1950 and 2015 during a 12-month period; 12 single center, public/academic hospitals, urban and rural regions 8 large multi-center studies assessing national samples n=3 Canada n=1 Australia n=1 Ireland n=10 USA n=1 Sweden n=1 Switzerland n= 1 Netherlands</td>
<td>Independent: Number of visits</td>
<td>Healthcare systems were classified using the Rothgang and Wendt (R-W) typology; three dimensions to define a healthcare system; regulation, financing and service provision</td>
<td>Each study was assessed for quality using the Downs and Black checklist; includes 27 criteria covering areas reporting quality, external and internal validity and power</td>
<td>Five healthcare Systems identified; Adult frequent ED users &gt;65 yrs, previous in-patient acute care admissions, psychiatric hospitalizations and have been a previous frequent ED user; High primary care use (&gt;3 visits/year) associated with future frequent ED use.</td>
<td>Limitations: Generalizability; English articles, English speaking countries bias; specialized populations excluded (elderly)</td>
</tr>
</tbody>
</table>
## Evaluation Table

<table>
<thead>
<tr>
<th>Citation</th>
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<th>Sample/Setting</th>
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<th>Findings</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Thakarar et al. (2015). Predictors of frequent emergency room visits among a homeless population. <em>PLOS One</em>, 10(4), e0124552.</td>
<td>None</td>
<td>Retrospective Analysis</td>
<td>Boston-based Health Care for the Homeless Program (HCH). Purpose: Identify risk factors for frequent ED visits and to examine the effects of housing status and HIV serostatus on ED utilization. Second purpose: Identify risk factors for frequent ED visits in patients with a history of illicit drug use.</td>
<td>Independent: Number of visits, Dependent: Frequent users; non-frequent users</td>
<td>Descriptive and multivariable analysis; chi-square statistics; univariate and multivariate logistic regression; STATA version 13.1 was used for analysis.</td>
<td>Data from July 1, 2011 – June 30, 2013 from EMRs; Multivariate analysis. Hepatitis C significant predictor of frequent ER visits. Pooled multivariate analysis using unclustered and clustered data, no differences. Hepatitis C significant predictor of ED visits in unclustered (OR 2.84, p&lt;0.001) and clustered (adjusted OR 2.49, p&lt;0.001).</td>
<td>Homeless patients, Hepatitis C, frequent ED visits (OR 4.49, p&lt;0.01). HIV not predictive (engaged in care). History of illicit drug use, mental health (OR 2.53, 95% CI 1.07-5.95) and Hepatitis C (OR 2.85, 95% CI 1.37-5.93) predictors of frequent ED use. Supportive house may prevent ED use.</td>
<td>Limitations: Generalizability; Illicit drug use subgroup significant but not representative of unstable housed and homeless individuals who use illicit drugs. Missing data. Episodic homelessness difficult to define to one housing category.</td>
</tr>
</tbody>
</table>
### Evaluation Table

<table>
<thead>
<tr>
<th>Citation</th>
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<th>Design/Method</th>
<th>Sample/Setting</th>
<th>Study Variables and Definitions</th>
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<th>Findings</th>
<th>Appraisal: Worth of Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uscher-Pines et al. (2013). Deciding to visit the emergency department for non-urgent conditions: A systematic review of the literature. <em>American Journal of Managed Care</em>, 19(1), 47-59.</td>
<td>Theoretical model of the decision making process and factors that may influence a patient’s decision to visit the ED for a non-urgent condition.</td>
<td>Systematic literature review</td>
<td>Multiple databases after 1990, U.S. assessed factors associated with non-urgent ED use</td>
<td>Independent: Age, race, gender, income, insurance, social support, health status, previous healthcare experiences, culture/community, perceived severity, convenience, cost, access, referral/advice, belief about alternatives</td>
<td>None stated</td>
<td>Hand reviewed with two reviewers; standardized data form; observational articles and majority did not use multivariate statistics</td>
<td>Younger age, convenience of ED compared to alternatives, referral to the ED by an MD and negative perceptions about alternatives (primary care providers) play a role in driving non-urgent ED use</td>
<td>Limitations: No two studies with same definition of non-urgent; limited evidence; results inconclusive due to inconsistent results; weak evidence</td>
</tr>
</tbody>
</table>
## Evaluation Table

<table>
<thead>
<tr>
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<th>Design/Method</th>
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<th>Measurement</th>
<th>Data Analysis</th>
<th>Findings</th>
<th>Appraisal: Worth of Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Department of Health &amp; Human Services (2012). Connecting underserved patients to primary care after emergency department visits. <em>AHRQ Health Care Innovations Exchange.</em> Retrieved from: //…</td>
<td>None</td>
<td>Interview with Herbert C. Smitherman Jr., MD, MPH, President and CEO Health Centers Detroit Foundation</td>
<td>Detroit; 1998 received 5 year grant from W.K. Kellogg Foundation to develop the infrastructure needed to link 27,500 underserved patients (14% of the uninsured population in the city) to primary care providers.</td>
<td>Independent: None stated</td>
<td>Dependent: None stated</td>
<td>Unknown</td>
<td>1999 to 2004 identified 6535 people eligible for public insurance, linked to primary care services; connected another 18,838 people lacking health insurance to providers; access for 74,578 underserved; transitioned 55% out of ED into primary setting; 42% reduction in ED visits; saved $22 million annually</td>
<td>Limitations: Unknown</td>
</tr>
<tr>
<td>Citation</td>
<td>Conceptual Framework</td>
<td>Design/Method</td>
<td>Sample/Setting</td>
<td>Study Variables and Definitions</td>
<td>Measurement</td>
<td>Data Analysis</td>
<td>Findings</td>
<td>Appraisal: Worth of Practice</td>
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</tr>
<tr>
<td>Vinton et al. (2014).</td>
<td>None</td>
<td>Secondary analysis from U.S. National Health Interview Survey (NHIS); stratified multi-stage probability study design with unequal probabilities of selection.</td>
<td>2004-2009; 157,818 adults, greater than 18 years of age; annual response rate is approximately 90% of the eligible households in the sample</td>
<td>Independent: Number of visits</td>
<td>Queried the number of ED visits per year; Self reported health status; Type of healthcare facility most often visited for illness; health insurance (private/ Medicaid/ Medicare/ Other)</td>
<td>Stata V. 10.1 (College Station, Texas, USA) Primary analysis descriptive Logistic regression</td>
<td>Frequent ED users, chronic (coronary artery disease, stroke, asthma) diseases requiring outpatient resources; &gt;4 visits to ED; Super-frequent use by 2% and infrequent ED use by 19%; &gt;4 ED visits Medicaid; &gt;10 outpatient visits in past 12 months frequent ED use v. outpatient</td>
<td>Limitations: Generalizability (no survey homeless, nursing homes, prisons or mental health facilities; underestimate prevalence of mental illness, substance abuse and distribution of socioeconomic status; inconclusive results</td>
</tr>
</tbody>
</table>
## Evaluation Table

<table>
<thead>
<tr>
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<th>Findings</th>
<th>Appraisal: Worth of Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yoon et al. (2015). The relationship between same-day access and continuity in primary care and emergency department visits. <em>PLoS One</em>, 10(9), e013274.</td>
<td>None</td>
<td>Cohort Study over three-year period; Used differences over time and between clinics continuity measures to determine the associations with ED visits.</td>
<td>22 Primary Clinics in three VHA medical systems in Southern CA. Patients who visited these clinics at least twice during fiscal year (October 1, 2008 to September 30, 2009); 71,296 primary care VHA patients in the study cohort.</td>
<td>Independent: Clinic-level measures of access and provider continuity; also measured patient-level variables including health status that can increase ED use.</td>
<td>Validated algorithm, obtained primary diagnosis for each ED visit, assigned visit a probability in categories. Established national clinic-level measures to track progress. Measured same day access as percent of patients receiving appointment in one day. Measured patient level variables. Measured presence of several chronic conditions.</td>
<td>One-way ANOVA examined time trends in mean number of ED visits per patient by type of ED visit and mean clinic access across study years. Bivariate analyses compared mean annual number of ED visits of any type across study years. Multivariate analysis. Six separate regressions. Incidence rate ratios. Stata 13.0</td>
<td>Same-day access in primary care related to fewer ED visits for all-cause non-emergent care. ED rates higher 45-54 years, female, black, not married, below VHA, three or more primary care visits, patients receiving telephone care</td>
<td>Limitations: Generalizability Not measureable (access and continuity); unable to determine causality. Strengths: Consistent results with others Level: II Quality: C</td>
</tr>
</tbody>
</table>
Appendix B

Conceptual Framework

<table>
<thead>
<tr>
<th>Five assumptions proposed by Malcolm S. Knowles</th>
<th>Management decision-making as defined by Peter F. Drucker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept of the learner</td>
<td>Defining the problem</td>
</tr>
<tr>
<td>Self-Concept</td>
<td>Identifying the problem, finding the right question, setting measurable objectives</td>
</tr>
<tr>
<td>Maturity brings about self direction, independence</td>
<td></td>
</tr>
<tr>
<td>Role of the learner’s experience</td>
<td>Analyzing the problem</td>
</tr>
<tr>
<td>Experiences provide resources for learning</td>
<td>Classifying the problem and finding the facts</td>
</tr>
<tr>
<td>Readiness to learn</td>
<td>Developing Alternative Solutions</td>
</tr>
<tr>
<td>Interest lies in learning subjects with</td>
<td>Means of bringing basic assumptions up to the conscious level, forcing examination and testing validity</td>
</tr>
<tr>
<td>immediate relevance to personal life and jobs</td>
<td></td>
</tr>
<tr>
<td>Orientation to learn</td>
<td>Finding the best solution</td>
</tr>
<tr>
<td>Perspectives change over time from gathering knowledge for future use to immediate application of knowledge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Weigh the risks against the expected gains</td>
</tr>
<tr>
<td></td>
<td>• Economy of effort, giving the greatest results with the least effort</td>
</tr>
<tr>
<td></td>
<td>• Timing</td>
</tr>
<tr>
<td></td>
<td>• Limitation of resources</td>
</tr>
</tbody>
</table>
### Five assumptions proposed by Malcolm S. Knowles

<table>
<thead>
<tr>
<th>Motivation to learn</th>
<th>Management decision-making as defined by Peter F. Drucker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maturity peaks various internal incentives as self-esteem, curiosity, desire to achieve and satisfaction of accomplishment</td>
<td>Making the decision effective Selling the decision points through the action of others via communication</td>
</tr>
</tbody>
</table>


Date: June 19, 2017
To: University of San Francisco
2130 Fulton Street
San Francisco, CA. 94117
Subject: Letter of Support

To whom this may concern:

Bernadette Martin, RN MSN, began an internship with Sutter Health Research, Development, & Dissemination in October 2016. The scope of this internship was to participate in 1,000 hours of work with the Community Health team and provide education to nurses at Sutter Health Alta Bates Summit Medical Center (measuring pre and post-training knowledge). The terms were outlined in a contract between Ms. Martin and Sutter Health in September, 2016.

Ms. Martin provided the nurse education at ABSMC on May 10, 2017 and is currently completing analysis of the data collected in conjunction with the intervention. She will also finish her 1,000 hours of internship before July 30, 2017.

Should you have any questions, please contact Nicole Oehmke, Sr Research Manager for Community Health at RDD at oehmkenf@sutterhealth.org or (925) 287-4077 ext 84077.

Sincerely,

Joshua Liberman, PhD
Executive Director
Research, Development, & Dissemination
In March 2016, a data sharing platform was implemented within the east bay region to improve care coordination of frequent utilizer patients in the Emergency Department (ED).

The purpose of this educational endeavor is to communicate the following:
1. Discuss high utilizer patients within the context of health care reform and broader initiatives.
2. Describe ongoing efforts about PreManage™ pilot and initiatives within Sutter Health.
3. Identify ways to work collaboratively with members of the health care team within Sutter Health to address unmet needs of frequent utilizers.

Educational Goal

Increase awareness and knowledge within Sutter Health and local community to address needs of high ED utilizers.

Resources:
www.betterhealtheastbay.org
secure.edicareplan.com
www.complexcare.com

PreManage
East Bay Pilot
High Utilizer
Patients in the ED

Internal Partners
Better Health East Bay
Sutter Health Research, Development & Dissemination
ED Physician & Case Management Leadership
Alta Bates Summit Medical Center (ABSMC)
Sutter Health Eden Medical Center
Sutter Delta Medical Center

External Partners
California Health Care Foundation
Collector Medical Technologies
Alameda Health System

Project Locations
ABSMC Summit Campus
ABSMC Alta Bates Campus
Sutter Health Eden Medical Center
Sutter Delta Medical Center

Please contact your ED Social Worker or Case Manager for further information.

Created by:
Bernadette M. Ruggles, DNP(c), MSN, RN
Email: MarthinBB@sutterhealth.org
Background Terminology

- Medicare & Medicaid (1965)
  
  With eligibility of government coverage elderly, disabled, and low income patients had greater access to the ED.

- Emergency Medical Treatment and Labor Act (EMTALA) (1985)
  
  Established obligation requiring all hospitals receiving Medicare funding to provide initial assessment screening and stabilization.

- The Patient Protection & Affordable Care Act (2010)
  
  Improved health care reform with the intent to provide access and quality of care, but directly affected the demand for ED care despite the expansion of health insurance.

- The Camden Coalition (2003)
  
  One of many national initiatives to address the needs of high utilizer patients presenting to the ED utilizing geographical data mapping known as “hot spotting.”

- PreManage ED™ (2015)
  
  Local initiative in Alameda Contry providing four Sutter Health hospitals with an innovative data sharing platform to enable identification of patients frequently presenting to the ED within a shared geographic region.

Overview of PreManage ED™ Data Sharing Platform

- Patient presents at check-in for registration
- Hospital EMR alerts PreManage ED™
- PreManage ED™ identifies patient, references visit history, and other clinical meta data
- PreManage ED™ triggers pre-set criterion and notifies provider and case manager
- Health care team generate workflow to influence care outcome

Sutter Health Patients by ED Visits Frequency
6/1/2015 to 5/31/2016

1% of Patients Accounted for 11% of All ED Visits

31% of the Patients Who Met the 5+ Visit Threshold during 03/2015 to 06/2016

Recommendations

Upon encountering a high utilizer patient, please notify the following:

- Case Manager
- Social Worker
- Provider

If unable, document in EHR.
High Utilizer Patients in the ED  
Wednesday, May 10, 2017  
Pre-Test

Instructions: Please select the most appropriate answer.

1. The health care initiatives that established an obligation requiring all hospitals receiving Medicare funding must provide initial assessment screening and stabilization is known as:
   a. CMS
   b. ESI
   c. HIMSS
   d. ACA
   e. EMTALA

2. PreManage ED™ is a data sharing platform providing the following information for high utilizer patients:
   a. Health related information from a hospital external to the Sutter system
   b. Health related information from other EDs within the Sutter system
   c. Health related information from inpatient Behavioral Health
   d. A and B
   e. All the above

3. Identify the following ways nursing can work collaboratively with members of the health care team within Sutter Health to address unmet needs of frequent utilizers.
   a. Coordinate patient care initiatives with Providers
   b. Proactively locate the Case Manager
   c. Collaborate with Social Worker
   d. B and C
   e. All the above

4. High utilizer patients in the ED trigger an alert by PreManage ED™ upon:
   a. 3 visits in 45 days
   b. 3 visits in 365 days
   c. 5 visits in 30 days
   d. 5 visits in 365 days
   e. 8 visits in 365 days

5. In Alameda County, how many additional patients were identified who met the 5+ visit threshold between March 2015 and June 2016 with the utilization of PreManage ED™
   a. 40%
   b. 13%
   c. 27%
   d. 30%
   e. 80%
Demographics:

1. Gender Status
   a. Female
   b. Male
   c. Transgender

2. Age
   a. Age 19-39
   b. Age 40-54
   c. Age 55 or greater

3. Race
   a. African American
   b. Asian
   c. Caucasian
   d. Indian or Alaskan Native
   e. Native Hawaiian or Other Pacific Islander

4. Years of Experience
   a. Less than 5 years
   b. 5-10 Years
   c. 10-19 Years
   d. 20-29 Years
   e. 30 or More Years

5. Highest Degree in Nursing
   a. Diploma
   b. Associate’s Degree
   c. Baccalaureate Degree
   d. Master’s Degree
   e. Doctoral Degree
HIGH UTILIZERS

High Utilizer Patients in the ED
Wednesday, May 10, 2017
Posttest

Instructions: Please select the most appropriate answer.

1. The health care initiatives that established an obligation requiring all hospitals receiving Medicare funding must provide initial assessment screening and stabilization is known as:
   a. CMS
   b. ESI
   c. HIMSS
   d. ACA
   e. EMTALA

2. PreManage ED™ is a data sharing platform utilized by the health care team in the ED to identify:
   a. Health related information from a hospital external to the Sutter system
   b. Health related information from other EDs within the Sutter system
   c. Health related information from inpatient Behavioral Health
   d. A and B
   e. All the above

3. Identify the following ways nursing can work collaboratively with members of the health care team within Sutter Health to address unmet needs of frequent utilizers.
   a. Coordinate patient care initiatives with Providers
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   c. Collaborate with Social Worker
   d. B and C
   e. All the above

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5. In Alameda County, how many additional patients were identified who met the 5+ visit threshold between March 2015 and June 2016 with the utilization of PreManage ED™
   a. 40%
   b. 13%
   c. 27%
   d. 30%
   e. 80%
Appendix F

Gap Analysis

<table>
<thead>
<tr>
<th>Future</th>
<th>Current</th>
<th>Next Action/Proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess percentage and characteristics of non-urgent utilizers of ED</td>
<td>Increased percentage of high frequent utilizers presenting to the ED</td>
<td>Utilize data base to determine individuals frequently presenting to the ED and various characteristics</td>
</tr>
<tr>
<td>Improve flow of patients with primary care provider refer only those patients of necessity</td>
<td>Inconsistent provider policy regarding flow of patients through health system.</td>
<td>Develop means of education of community providers</td>
</tr>
<tr>
<td>Respond to patient needs for preventative care measures</td>
<td>Inability to respond to patient needs timely (missed appointments, lack of same day appointments)</td>
<td>Develop means of education of patients on available community resources</td>
</tr>
<tr>
<td>Provide additional resources for f/u to further integrate into the health care system</td>
<td>Various populations with health needs that are difficult to treat (lack of mental health beds, increased bed capacity in ED)</td>
<td>Develop means of education of resources for patients in need of mental health referrals; address bed utilization with stakeholders for community wide initiatives</td>
</tr>
<tr>
<td>Improve additional resources for follow up (i.e., laceration repair f/u with Primary care provider for suture removal) Preventative care management utilizing resources such as case management, social services, dietary</td>
<td>Insufficient provider follow up</td>
<td>Develop means of education for patients on available resources for f/u</td>
</tr>
<tr>
<td></td>
<td>Lack of preventative care; treating illness</td>
<td>Develop means of education on nutrition, stroke, Cardiovascular (heart attacks), health fair participation involving additional hospital staff resources</td>
</tr>
<tr>
<td>Easily accessible information with community resources for urgent care, acute care clinics</td>
<td>Insufficient awareness of healthcare alternatives</td>
<td>Develop means of education regarding locations, on various urgent care and acute care clinics</td>
</tr>
<tr>
<td>Initiate identified hours where gaps exist to provide resources</td>
<td>Hours of operation of various resources in the community</td>
<td>Survey various hours, location of urgent care, providers office hours within</td>
</tr>
</tbody>
</table>
### HIGH UTILIZERS

<table>
<thead>
<tr>
<th>Future</th>
<th>Current</th>
<th>Next Action/Proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify gaps needed and present to stakeholders (i.e., dental)</td>
<td>Insufficient providers for various patient populations contributing to frequent utilization of ED</td>
<td>the community for consistency and identify gaps in service availability Identify characteristics of frequent ED users such as percentage of dental patients and present data to stakeholders (administration, staff, providers)</td>
</tr>
</tbody>
</table>
Appendix G

Gantt

<table>
<thead>
<tr>
<th>Item #</th>
<th>Milestone</th>
<th>Start Date</th>
<th>Months</th>
<th>End Date</th>
<th>Duration</th>
<th>Incomplete</th>
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<tbody>
<tr>
<td>1</td>
<td>Qualifying Course</td>
<td>8/27/16</td>
<td>Sept</td>
<td>12/5/16</td>
<td>94</td>
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<tr>
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<td>Assessment of the Process</td>
<td>9/12/16</td>
<td>Sept</td>
<td>12/5/16</td>
<td>84</td>
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<tr>
<td>3</td>
<td>Analyze metrics</td>
<td>9/12/16</td>
<td>Sept</td>
<td>12/5/16</td>
<td>84</td>
<td>0</td>
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<tr>
<td>4</td>
<td>Identify Project Team</td>
<td>10/1/16</td>
<td>Oct</td>
<td>10/25/16</td>
<td>14</td>
<td>0</td>
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<td>5</td>
<td>Interview Staff Team</td>
<td>10/11/16</td>
<td>Oct-Nov</td>
<td>10/25/16</td>
<td>14</td>
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<td>Define Project</td>
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<td>Sept-Oct</td>
<td>10/25/16</td>
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<td>Define Scope</td>
<td>9/12/16</td>
<td>Sept-Oct</td>
<td>10/25/16</td>
<td>43</td>
<td>0</td>
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<tr>
<td>8</td>
<td>Estimate Time and Cost</td>
<td>9/12/16</td>
<td>Sept-Oct-Nov-Dec</td>
<td>12/9/16</td>
<td>95</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>Meeting with additional stakeholders (SW, CM)</td>
<td>10/11/16</td>
<td>Oct-Nov-Dec</td>
<td>12/9/16</td>
<td>59</td>
<td>0</td>
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<tr>
<td>10</td>
<td>Project Implementation (IT Data Mgmt)</td>
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<td>Sept-Oct-Nov-Dec-Jan</td>
<td>5/9/17</td>
<td>249</td>
<td>0</td>
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<td>11</td>
<td>Develop Teaching Modules Staff</td>
<td>12/9/16</td>
<td>Dec-Jan-Feb-Mar-Apr</td>
<td>5/9/17</td>
<td>161</td>
<td>0</td>
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<td>12</td>
<td>Develop Teaching Modules Patients</td>
<td>12/9/16</td>
<td>Dec-Jan-Feb-Mar-Apr</td>
<td>5/9/17</td>
<td>161</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>Develop Training Modules &amp; Tools</td>
<td>12/9/16</td>
<td>Dec-Jan-Feb-Mar-Apr</td>
<td>5/9/17</td>
<td>161</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>Promote Training Staff</td>
<td>1/20/17</td>
<td>Jan</td>
<td>1/23/17</td>
<td>3</td>
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<tr>
<td>15</td>
<td>Evaluate Training and make changes</td>
<td>1/20/17</td>
<td>Jan-Feb</td>
<td>2/13/17</td>
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<td>16</td>
<td>Grant Writing</td>
<td>9/12/16</td>
<td>Sept-Oct-Nov-Dec</td>
<td>12/16/16</td>
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<td>17</td>
<td>Evaluation</td>
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<td>Sept-Oct-Nov-Dec-Jan</td>
<td>6/23/17</td>
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<tr>
<td>18</td>
<td>Project Results/Review</td>
<td>6/23/17</td>
<td>Jun-Jul-Aug</td>
<td>8/11/17</td>
<td>49</td>
<td>0</td>
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<tr>
<td>19</td>
<td>Project Writing</td>
<td>6/23/17</td>
<td>Jun-Jul-Aug</td>
<td>8/11/17</td>
<td>49</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>Disseminating Results</td>
<td>8/25/17</td>
<td>Aug</td>
<td>8/25/17</td>
<td>25</td>
<td>0</td>
</tr>
</tbody>
</table>
## Appendix H
### SWOT Analysis

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal</strong></td>
<td><strong>Weaknesses</strong></td>
</tr>
<tr>
<td></td>
<td>• Nursing Staff Shortage, high turnover</td>
</tr>
<tr>
<td>• Established ED for over 100 years, 27 beds</td>
<td>• Limited open beds</td>
</tr>
<tr>
<td>• Availability of Fast Track, Rapid Medical Examination (RME), Pit Doc with MDs/PAs/NPs</td>
<td>• Extended wait to see provider</td>
</tr>
<tr>
<td>• Interdisciplinary team (Case Management, Nutrition)</td>
<td>• Lack of follow up with patients</td>
</tr>
<tr>
<td>• Collaborative team of providers (MD, PA, NP, RN, Tech)</td>
<td>• Scope of services limited in specialties (behavior health, pediatrics, chronic diseases)</td>
</tr>
<tr>
<td>• Utilization of EPIC EHR</td>
<td>• Inadequate collaboration throughout the system</td>
</tr>
<tr>
<td>• Scope of available services (one-stop shop)</td>
<td>• Inadequate mechanism for sharing information and service coordination between providers</td>
</tr>
<tr>
<td>• Utilization of triage classification</td>
<td>• Fragmented care</td>
</tr>
<tr>
<td>• Open 24 hours</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Opportunities</strong></td>
</tr>
<tr>
<td>• QI project, evidence-based practice to reduce avoidable ED visits</td>
<td><strong>Threats</strong></td>
</tr>
<tr>
<td>• Improve health care delivery</td>
<td>• Aging population</td>
</tr>
<tr>
<td>• Reduce cost of health care in ED</td>
<td>• Increasing burden of chronic illnesses</td>
</tr>
<tr>
<td>• Encourage preventative care and self management</td>
<td>• Volume of uninsured/underinsured/demand/capacity/finance costs</td>
</tr>
<tr>
<td>• Follow up care with chronic illness (i.e., Diabetes, Asthma)</td>
<td>• Lack of support by providers/patients outside the ED</td>
</tr>
<tr>
<td>• Utilization of primary care physician and other Specialties (Diabetes, Wound, Nutrition/Dietary)</td>
<td>• Limited number of urgent care clinics in geographic area</td>
</tr>
<tr>
<td>• Enhance communication</td>
<td>• Limited number of appointment availability in provider offices</td>
</tr>
<tr>
<td>• Improved provider and patient knowledge</td>
<td></td>
</tr>
<tr>
<td>• Improved patient satisfaction</td>
<td></td>
</tr>
</tbody>
</table>
ROI = the net increase in operating income/Total cost of the program as noted above.

Net increase operating income is $93,000/76,180 = 1.23 (23%) ROI

This particular project pays for itself in year 1 based on the assumptions used.

Savings of $17,684 (93,864 – 76,180)

Feasibility study is not needed due to similar programs in other institutions across the country.
Appendix J

Financials

PreManage ED™

<table>
<thead>
<tr>
<th>PreManage ED™</th>
<th>Year 1(1)</th>
<th>PreManage ED™(3)</th>
<th>Year 1</th>
<th>PreManage ED™</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Original</td>
<td>Impact</td>
<td>Proforma</td>
<td>Original</td>
<td>Proforma</td>
</tr>
<tr>
<td>Net Revenues</td>
<td>1,098,000,000</td>
<td>(28,501)</td>
<td>1,097,971,499</td>
<td>1,187,300,000</td>
<td>(29,356)</td>
</tr>
<tr>
<td>Expenses</td>
<td>1,071,000,000</td>
<td>(122,365)</td>
<td>1,070,877,635</td>
<td>1,150,300,000</td>
<td>(126,036)</td>
</tr>
<tr>
<td>Income from Operations</td>
<td>27,000,000</td>
<td>93,864</td>
<td>27,093,864</td>
<td>37,000,000</td>
<td>96,680</td>
</tr>
</tbody>
</table>

Assumptions:

- ER Visits: 40,430
  - 1. Based on 10% consolidated audited results
- Repeat visits per year (2): 15,834
  - 2. 5 Visits in 12 months
- Convert number of patients: 3,167
  - 3. Inflation factor 1.03
- Medi-Cal reimbursement: 300
- Assume 3% effective rate for: 95
- Reduction in ED visits
- Average Cost/ED visit: 1288
## Appendix K

### Work Breakdown Structure (WBS)

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 Educate the nursing staff on the high utilizers presenting to the ED</td>
<td>1.1 Initiation</td>
<td>1.1.1 Assessment &amp; Recommendations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.1.2 Develop Project</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.1.3 Deliverable: Submit Project</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.1.4 Project Proposal Signed/Approved by Director</td>
</tr>
<tr>
<td></td>
<td>1.2 Planning</td>
<td>1.2.1 Create AIM Statement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2.2 Determine Stakeholders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2.3 Project Meeting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2.4 Develop Project Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2.5 Develop Project Timeline</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2.6 Submit Project Plan to Director</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2.7 Project Plan Approval</td>
</tr>
<tr>
<td></td>
<td>1.3 Execution</td>
<td>1.3.1 Meeting One-on-One with Director</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.3.2 Verify &amp; Validate PreManage ED™ platform in ED</td>
</tr>
<tr>
<td></td>
<td>1.4 Oversight</td>
<td>1.4.1 Project Management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.4.2 Project Status Meeting with Stakeholders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.4.3 Risk Management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.4.4 Update Project Management Plan</td>
</tr>
<tr>
<td></td>
<td>1.5 Evaluation</td>
<td>1.5.1 Evaluate Pre-Test/Posttest</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.5.2 Evaluate knowledge basis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.5.3 Document Lessons Learned</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.5.4 Communicate results to Director</td>
</tr>
</tbody>
</table>
EDUCATE NURSES ON AVOIDABLE USERS TO ED

"Per diem Case Manager for night shift"

INITIATION  PLANNING  EXECUTION  EVALUATION
DNP Statement of Non-Research Determination Form

Student Name: Bernadette Martin Ruggles

Title of Project: High utilizers in the Emergency Room

Brief Description of Project:
Many aspects of health care have been affected across the nation since the introduction of the Patient Protection and Affordable Care Act. As a result, many more Americans will acquire health insurance coverage with increased access to health care services. Due to this dramatic rise in health insurance enrollment, it is likely that Emergency Departments (EDs) will continue to see an increase in their volume. In addition, by law EDs are required to evaluate every individual regardless of their severity of injury. Theoretically, if more individuals have access to greater availability to outpatient providers, then these preventative services could potentially reduce ED visits. Unfortunately, based upon a recent literature review, this is not the current practice. Evidence reflects EDs are inundated with even more patients often taking advantage of the availability to offer a one-stop shop for their care and treatment. As a result of these unnecessary visits to the EDs, costs of ED services and resource allocation are rising reaching approximately 17.6% of the US Gross Domestic Product (GDP) (Horst, Martin, Gambler, & Coco, 2011). Literature has shown this is a very vulnerable population many with chronic significant medical conditions. In an attempt to reduce healthcare costs various quality improvement measures must be implemented to increase patient satisfaction, preventative
care management, reduce time spent in the ED, diminish overcrowding in the ERs and enhance communication amongst patients and providers with better education. The goal of this project is to reduce unnecessary visits of the high utilizer patients to the emergency room (ER).

A) Aim Statement:

The aim of this project proposal is by May 2017 high utilizer patients presenting to the Emergency Room will decrease by 10%. Measurable goals discussed as follows: a) identify the frequent ED users utilizing a data management system amongst various hospitals b) define risk factors of frequent ED use, c) synthesize characteristics associated with high utilizers of the ED, including Emergency Severity Index (ESI) Scores of 4-5 triage classification and d) educate staff and patients on evidence based practice initiatives as it is related to frequent use of the ER.

B) Description of Intervention:

Interventions to include changing all discharge instructions to reflect following up with primary care providers unless an emergency necessity as approved by the stakeholders. Secondly, distributing educational brochures to all patients triaged with an ESI of 4 and 5. Finally, educating all nursing staff and providers on available resources within the community to convey information to the patients. With the EPIC EHR, frequent utilizers of the system will be identified along with their characteristics for presenting to the ED. Educating the stakeholders and staff nurses as well as the patients regarding
the severity of illness and preventative care within context of available resources.

C) How will this intervention change practice?

Understanding the characteristics of various frequent users may help to improve medical care in the ER and primary setting, potentially easing the volumes presenting to the ED and decreasing costs. As part of this project initiative stakeholders will need to educate the population regarding severity of injury and preventative care within context of available community resources. The ER staff nurse and providers will need to be continually educated in order to reduce this population of frequent users by 10%. Collaborative efforts with dietary, social services and case management will provide further support for preventative care initiatives. Implementation improvement projects as described will improve patient care and promote knowledge of necessity for a visit to the ED. In addition, patient satisfaction will improve along with better preventative care management. Thereby, eliminating fragmentation of care by providing enhanced communication amongst providers and patients.

D) Outcome measurements:

Two measures used to evaluate the success of this potential project include: ED visits and Cost. In terms of ED visits the project will evaluate the total number of ED visits in a 6 month period and the number of ED visits with patients with an Emergency Severity Index (ESI) 4 and 5 triage classification in a 6 month period.
To qualify as an Evidence-based Change in Practice Project, rather than a Research Project, the criteria outlined in federal guidelines will be used:
(http://answers.hhs.gov/ohrp/categories/1569)

XX This project meets the guidelines for an Evidence-based Change in Practice Project as outlined in the Project Checklist (attached). Student may proceed with implementation.

☐ This project involves research with human subjects and must be submitted for IRB approval before project activity can commence.

Comments:

EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST *

<table>
<thead>
<tr>
<th>Instructions: Answer YES or NO to each of the following statements:</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Title: The aim of the project is to improve the process or delivery of care with established/accepted standards, or to implement evidence-based change. There is no intention of using the data for research purposes.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>The specific aim is to improve performance on a specific service or program and is a part of usual care. All participants will receive standard of care.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>The project is NOT designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective comparison groups, cross-sectional, case control). The project does NOT follow a protocol that overrides clinical decision-making.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does NOT develop paradigms or untested methods or new untested standards.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does NOT seek to test an intervention that is beyond current science and experience.</td>
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<td></td>
</tr>
<tr>
<td>The project is conducted by staff where the project will take place and involves staff who are working at an agency that has an agreement with USF-SONHP.</td>
<td>X</td>
<td></td>
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<tr>
<td>The project has NO funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.</td>
<td>X</td>
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</tr>
<tr>
<td>The agency or clinical practice unit agrees that this is a project that will be implemented to improve the process or delivery of care, i.e., not a personal research project that is dependent upon the voluntary participation of colleagues, students and/or patients.</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

DNP Department Approval 5/8/14
If there is an intent to, or possibility of publishing your work, you and supervising faculty and the agency oversight committee are comfortable with the following statement in your methods section: "This project was undertaken as an Evidence-based change of practice project at X hospital or agency and as such was not formally supervised by the Institutional Review Board."

**ANSWER KEY:** If the answer to ALL of these items is yes, the project can be considered an Evidence-based activity that does NOT meet the definition of research. **IRB review is not required. Keep a copy of this checklist in your files.** If the answer to ANY of these questions is NO, you must submit for IRB approval.

* Adapted with permission of Elizabeth L. Hohmann, MD, Director and Chair, Partners Human Research Committee, Partners Health System, Boston, MA.

---

**STUDENT NAME (Please print):** Bernadette Martia Ruggles

Signature of Student: [Signature]

Date: 08/14/2016

---

**SUPERVISING FACULTY MEMBER (CHAIR) NAME (Please print):**

Signature of Supervising Faculty Member (Chair): [Signature]

Date: 8/15/2016