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Step Model for Managing Chronic, Non-Malignant Pain in Primary Care

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Executive Summary

Step Model for Managing Chronic, Non-Malignant Pain in Primary Care

Problem

Patients managed in primary care have more opportunity for aberrant behaviors due to the additional time and resource requirements needed for careful monitoring and risk mitigation (Veterans Administration, 2016). Not only do primary care providers lack the time to monitor patients closely by random drug screening, checking the PDMP, and frequent appointments they also lack sufficient training in medical and nursing schools to manage the chronic pain patients (Lincoln, Pellico, Kerns, &Anderson, 2013). This project was selected due to the growing opioid crisis. According to data from the Centers for Disease Control (CDC), from 1999 to 2015, more than 183,000 people died in the U.S. from overdoses related to prescription opioids (CDC, 2017; Rudd, Puja, David & Scholl, 2016).

Purpose

Following a thorough literature review, the PICO question was: Will primary care providers who prescribe opioids for chronic non-cancer pain provided with an education module and step model for managing chronic, non-cancer pain improve their knowledge and confidence and utilize the CDC guidelines in managing the chronic non-cancer patient as evidenced by reported improvement in knowledge, confidence and improved prescribing practices compared to knowledge, confidence, and prescribing practices before the education module and step model?

Goals

The project goal was to contribute to nursing practice by utilizing the CDC recommendations to help with the opioid epidemic by identifying the educational gap for primary care providers with respect to chronic pain management and thereby reducing the number of inappropriately prescribed opioids by primary care.

Objective

This project sought to improve provider knowledge and confidence in managing chronic pain patients in the primary care setting as well as improving utilization of the CDC guidelines for managing chronic pain patients. This was a quality improvement project.

Plan

The study design was a quantitative pre-test-post-test design. The participating primary care providers completed a pre-education assessment of their knowledge and confidence levels managing chronic pain patients. After the providers completed the online education module and had sufficient time to use the step model in treating chronic pain patients, they completed a post-implementation assessment on their knowledge and confidence levels for comparison, n=7.

Outcome, Results, and Recommendations

The intervention made a statistically significant difference in five of the seven questions. Question one exhibited the most improvement ($Z=21.00$, $p=.020$) indicating a statistically significant improvement in their knowledge managing chronic, non-malignant pain (CNMP) in their primary care practice. This project can serve as the framework for additional research on the step model with a larger sample size and more nurse practitioner participation.

Acknowledgements

I would like to take this opportunity to acknowledge those who contributed to my success. First and foremost, I would like to thank my husband, Rick. Without his continued support throughout this program as well as my master's program, I would not have been successful. He took on my role in our family as well as continued his. I am blessed to have such a wonderful partner in marriage. I also want to thank my children Megan, A.J., Tommy, and Eleanor for you love and encouragement that has meant so much to me throughout this journey. Your love sustained and encouraged me more than words can express.

I want to thank my project chair, Dr. Cris Finn, PhD, APRN, FNP, for her help, encouragement, and support. I feel truly blessed to have been able to work with Dr. Finn. I also want to thank my mentor, Bonnie A. Wilensky, CNS. Her continued encouragement and guidance helped me develop a project that will hopefully make an impact for not only providers but also for those who suffer from chronic pain. I would also like to thank all of the professors that I have had the great privilege to work with at Regis University. Their encouragement and guidance helped me to achieve my dream.

Finally, I would like to thank God for His continued wisdom and guidance throughout this program. He revived me, comforted me, and encouraged me.

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This doctoral project explored the problem recognition and definition, review of evidence, project plan and evaluation, findings and results, limitations, recommendations, and implications for change; improved knowledge and confidence of primary care providers in managing chronic non-cancer pain.

Problem Recognition and Definition

Statement of Purpose

The National Institutes of Health Medline Plus (2011) defines chronic pain as "often defined as any pain lasting more than 12 weeks. Whereas acute pain is a normal sensation that alerts us to possible injury, chronic pain is very different. Chronic pain persists—often for months or even longer…" (p.5-6). In 2015 report about the prevalence of chronic pain in the United States (U.S.) from the National Center for Complimentary and Integrative Health "an estimated 25.3 million adults (11.2 percent) experience chronic pain—that is, they had pain every day for the preceding 3 months. Nearly 40 million adults (17.6 percent) experience severe levels of pain…" (para. 1). According to an article by Daubresse et al. (2013) as cited on the Centers for Disease Control (CDC) website,

> From 2007 – 2012, the rate of opioid prescribing has steadily increased among specialists more likely to manage acute and chronic pain. Prescribing rates are highest among pain medicine (49%), surgery (37%), and physical medicine/rehabilitation (36%). However, primary care providers account for about half of opioid pain relievers dispensed (CDC, 2016, para. 2).

According to data available from the CDC from 1999 to 2015, more than 183,000 people have died in the U.S. from overdoses related to prescription opioids (CDC, 2017; Rudd, Puja, David & Scholl, 2016). The purpose of this project was to provide training on the CDC

guidelines for prescribing opioids for chronic pain as well as implementation of a step model for primary care providers.

Problem Statement

Primary care providers are unprepared in medical and nursing schools to treat subacute and chronic pain (Ponte & Johnson-Tribino, 2005). There are many non-opioid medications that should be prescribed before opioid therapy is initiated (Dowell, Haegerich & Chou, 2016). Many primary care providers (PCPs) need guidance when caring for chronic pain patients but lack access to pain management specialists (Lincoln, Pellico, Kerns, &Anderson, 2013). According to Lincoln, Pellico, Kerns, and Anderson (2013), "PCPs experience substantial difficulties in caring for patients with pain while acknowledging certain positive aspects. There is a need for strategies that mitigate the barriers to pain management while bolstering the positive aspects to improve care and provider satisfaction" (p. 1).

PICO Question

This project utilized the acronym "PICO", rather than stating a formal research hypothesis. The acronym stands for: The population (P), intervention (I), comparison (C), and outcome (O) and is usually framed as question (Melnyk & Fineout-Overhold, 2011). The question for this project was as follows:

P: Primary care providers who prescribe opioids for chronic non-cancer pain

I: An education module and step model for managing chronic, non-cancer pain based on the CDC guidelines

C: Knowledge, confidence, and prescribing practices compared to before the education module and step model

O: As evidenced by reported improvement in knowledge, confidence and improved prescribing practices

Will primary care providers who prescribe opioids for chronic non-cancer pain who are provided with an education module and step model for managing chronic, non-cancer pain improve their knowledge and confidence in managing the chronic non-cancer patient as evidenced by reported improvement in knowledge and confidence compared to knowledge and confidence before the education module and step model?

The PICO question originates from and specifically relates to the role of the Doctor of Nursing Practice (DNP) role as an advanced health care leader with the ability to integrate objective data with the knowledge gained from a group's subjective experience, as well as, the ability to apply scientific knowledge to the processes of program development, management, and evaluation (Chism, 2010).

Significance, Scope, and Rational

This is a quality improvement project aimed to yield several outputs. First, this project sought to improve provider knowledge and confidence in managing chronic pain patients in the primary care setting. Secondly, chronic pain patients will be managed using CDC guidelines improving patient outcomes. Finally, there will be a decrease in inappropriately prescribed opioids by primary care providers that will result in a decrease in overall pill burden in community and decrease nonmedical use of opioids.

Theoretical Foundation

Advanced practice nurses use knowledge from a variety of domains allowing nursing practice to develop a full, rich body of knowledge. According to Zaccagnini and White (2017) nursing uses knowledge from many domains including biology, physiology, zoology, medicine,

psychology, sociology, physics, mathematics, chemistry, communication, philosophy, and theology (p.4). By utilizing a wide breadth of knowledge, nurses are able to develop knowledge that informs nursing practice with a very holistic approach. The scientific underpinnings of nursing knowledge are based on the way nurses view the world as well as how nurses view patient care.

There are several domains that make up the scientific foundations of nursing. First, the philosophical foundation is the base on which nursing knowledge is built. There are different philosophical views but according to Burns and Grove (2001) there are several themes common to the nursing profession; holism, quality of life, and the relativity of truth based on each person's perspective. Zaccagnini and White (2017) other fundamental foundations include ethical knowledge, historical knowledge, biophysical and psychosocial knowledge, analytical knowledge, and organizational knowledge.

Scientific research and nursing research is guided by a framework. This framework provides the researcher with "the base from which we seek to understand patients and their health problems and from which we plan interventions to help them" (Zaccagnini & White, 2017, p. 14). Nursing theory helps the researcher produce higher quality work by providing the framework from which we develop a "systematic way to explain or describe nursing practice" (Zaccagnini & White, 2017, p. 15). According to Association of Critical-Care Nurses (AACN), "The DNP graduate knows how to integrate nursing science with knowledge from ethics, the biophysical, psychosocial, analytical, and organizational sciences as the basis for the highest level of nursing practice" (AACN, 2006, p. 9).

The Synergy Theory was developed by the American Association of Critical-Care Nurses (AACN) credentialing arm to better describe nursing practice in 1998. The Synergy Model

describes what nurses do, thus this theory describes the essence of nursing; namely nurses undertaking what the patient needs them to do. The fundamental premise of the theory is "patient characteristics drive nurse competencies. When patient characteristics and nurse competencies are in synergy, optimal patient outcomes are more apt to occur…" (Curley, 2007, p. 25).

The Synergy Model is a middle range nursing theory. The theory describes eight patient characteristics and eight nurse competencies. The patient characteristics that span the continuum from health to illness are stability, complexity, vulnerability, predictability, resiliency, participation in decision-making, and resource availability (Curley, 2007). The nursing dimensions span from competent to expert are clinical judgment and inquiry, caring practices, response to diversity, advocacy/moral agency, facilitation of learning, collaboration, and systems thinking (Curley, 2007). The model proposes optimal patient outcomes occur when the patient and the nurse synergize. The theory requires three levels of outcomes, nurse outcomes, patient outcomes, and system outcomes (Curley, 2007).

There are four assumptions in the synergy model. First, a holistic view of the person is used; mind, body, and spirit. Second, nurse patient interactions affect each dimension. Third all dimensions are considered collectively. And finally, the goal of nursing is to restore the patient to health. The underlying tenants are "patient characteristics are important to nurses, nurses' competencies are important to patients, patient characteristics drive nurse competencies, and when patient characteristics and nurses' competencies match and synergize, outcomes for the patient are optimal" (Kaplow & Reed, 2008).

All of the concepts of the theory are theoretically and operationally defined in, *Synergy, The Unique Relationship Between Nurses and Patients, the AACN Synergy Model for Patient*

Care by Martha A. Q. Curley (2007). The theory is extensively and meticulously defined, and examples of outcomes are presented for patient/family, unit, and systems-level outcomes. The theory statements are theoretically and operationally defined. The linkages are explicit and clear. The model diagram adds to the clarity of the theory. The major concepts are represented in the model. The concepts, statements, and assumptions are all used consistently and appropriately in the body of text. The outcomes are predicted based on the context of the interactions.

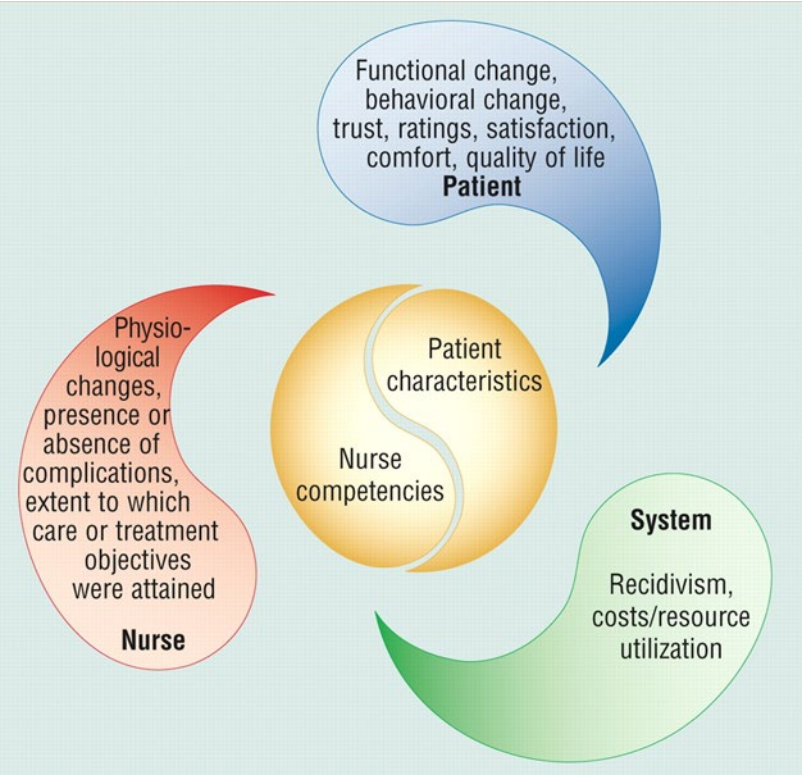
The theory is congruent with current nursing standards. It is a widely utilized theory and utilized as the model of AACN certification testing. The theory is congruent with current nursing interventions. The model is used for patient care in outpatient and inpatient settings, professional nursing, staff development, system building, and nursing education. The model has been widely used for nursing practice, research, and education. In a study by Cypress (2013) the model was used to conceptualize the data and served as the framework to recommend practice improvements for patients in the emergency room. This is well researched and vetted theory useful for many different areas of research, education, and nursing practice.

The theory is socially relevant to patients/individuals and families regardless of gender, age, or socioeconomic status. The theory has transcultural relevance because it explores the relationship between the nurse and the patient irrespective of culture.

This theory is appropriate to serve as the theoretical framework of this project for several reasons. First, it was used to describe the relationship between the chronic pain patient and the advanced practice nurse, thereby helping to guide practice improvement. Secondly, the theory informed the project and helped develop the step model. Finally, the book authored by Martha Curley is very detailed and informative about how to use the model in a variety of different

settings such as an ambulatory clinic, as well as nursing practice, patient care, and even within a healthcare system. The theory was informative in most areas of the project.

Figure 1: Synergy Theory (Curley, 2007)



The second theory to inform this study was the Lewin Change Theory which was developed by Kurt Lewin in the 1940's. This is a three-stage change model, unfreezing, change, refreeze. Lewin viewed change behavior as a "dynamic balance of forces working in opposing directions" (Kritsonis, 2005, p. 1). The model requires prior learning to be rejected and replaced (Petiprin, 2016).

There are three major concepts, driving forces, restraining forces, and equilibrium. Driving forces are forces facilitating change. Restraining forces are forces that counter the driving forces and hider change because they push in the opposite direction. Equilibrium is a

state in which driving forces equal restraining forces to maintain stability and no further changes occur (Petiprin, 2016).

Unfreezing is the process in which an intervention makes it possible for people to change an old counterproductive pattern (Petiprin, 2016). Change, which is also called movement to a new level, involves a process with change in thoughts, feelings, behaviors, or all three to a more productive state (Petiprin, 2016). Refreezing stage establishes the change with a new norm, or the new standard (Petiprin, 2016).

Review of Evidence

Systematic Review

The literature review was performed using the databases CINAHL, Google Scholar, Cochrane Database, and PubMed. The initial search reference time frame was August 2016 to February 2017. The key words of opioid, chronic pain management, primary care, pain management guideline, provider attitude and provider were used. The level of evidence was determined by utilizing a grading system developed by Ackley, Swan, Ladwig and Tucker (2008) (figure 2). Inclusion criteria were limited to studies in English available electronically and limited to the past five years. After reviewing abstracts, articles were excluded if they did not contain clear recommendations for pain management or were not related to primary care providers and pain management. Many articles were found using data mining.

The initial searches produced large quantities of literature. Each was narrowed down using Boolean phrases as well as the inclusion criteria listed previously. The key word opioid was searched using Google Scholar yielding 48,400 results, opioid guidance yielded 22,800 results, and chronic pain yielded 17,100 results. Primary care attitudes and beliefs about opioids yielded 5,530 results, primary care attitudes and beliefs about chronic pain management

yielded 6,060 results; opioid step model yielded 17,200 results and opioid stepped care model yielded 1,710 results. Of those searches only three articles were used. The search in Google Scholar yielded many articles not relevant to this project.

Figure 2: Literature Grading System

Level of Evidence (LOE)	Description
Level I	Evidence from a systematic review or meta-analysis of all relevant RCTs (randomized controlled trial) or evidence-based clinical practice guidelines based on systematic reviews of RCTs or three or more RCTs of good quality that have similar results.
Level II	Evidence obtained from at least one well-designed RCT (e.g. large multi-site RCT).
Level III	Evidence obtained from well-designed controlled trials without randomization (i.e. quasi-experimental).
Level IV	Evidence from well-designed case-control or cohort studies.
Level V	Evidence from systematic reviews of descriptive and qualitative studies (meta-synthesis).
Level VI	Evidence from a single descriptive or qualitative study.
Level VII	Evidence from the opinion of authorities and/or reports of expert committees.

The key word chronic pain was searched using CINHAL yielding 38,914 results, chronic pain management yielded 7,341 results, chronic pain guideline yielded 647 results, opioids yielded 23,589 results, opioid guideline yielded 1,360 results, pain management yielded 305 results, primary care provider plus chronic pain yielded 21 results, primary care provider plus chronic pain plus opioid guideline yielded only three results. A total of 23 publications were used from the CINHAL database.

The key word chronic pain was searched in PUBMED yielding 1,213 results, chronic pain management plus opioid guideline yielded 31 results, chronic pain and primary care yielded 2,016 results, chronic pain plus primary care plus opioid yielded 302 results and chronic pain plus primary care plus opioid plus guideline yielded 65 results. A total of eight publications

were used from the PUBMED database. Overall, a total of 34 articles were used to inform this project as listed in table one.

Table 1: Levels of Evidence

Levels of Evidence	# articles
Level 1	12
Level 2	2
Level 3	0
Level 4	8
Level 5	2
Level 6	2
Level 7	8

Evidence and Background

After a thorough literature review, several themes were identified. These themes included: close monitoring, clinical practice guidelines, safeguards, barriers, Prescription Drug Monitoring Program, drug testing, and education of providers about pain management (see Appendix A: Systematic Review of Literature Sample).

Ponte and Johnson-Tribino (2005) identified several barriers to managing chronic pain patients. They recognized that caring for pain patients was time consuming and frustrating, physicians were fearful of patient harm and scrutiny from regulatory agencies, knowledge gaps, and formal medical training did not prepare them to manage pain effectively. The authors concluded the results should be used to expand education for students and practicing providers.

Dorflinger et al. (2014) suggested primary care providers use a step model for chronic pain treatment help to lower opioid use and increase the use of non-opioid medications, as well as the use of complementary approaches to pain management. The research occurred in the Veterans' Administration (VA) Health System and only used electronic health records utilized in the VA system however; it illustrates the effectiveness of the intervention and the potential usefulness for other populations. There were no similar studies found that utilized a step model for managing chronic pain in the civilian population which highlighted a gap in the literature.

It is very difficult for a primary care provider to properly monitor a patient who is being prescribed opioids. Their time is very limited for each patient and when they are faced with a patient who has complaints of severe, chronic pain they naturally want to help. According to McCrorie et al. (2015), "Problematic prescribing occurs when patients experience repeated consultations that do not meet their needs and GPs [General Practitioners] feel unable to negotiate alternative approaches to treatment" (p.1). Without proper monitoring of pain patients, it can lead to diversion or addiction. On the other hand, fear of prescribing pain medication can leave the patient with untreated pain. According to Daubresse et al. (2013) primary care providers accounted for almost half of opioid pain medications dispensed. They also noted during the years 2000-2010, although prescribing of opioids increased, a similar increase in non-opioid medications was not noted.

Vijayaraghavan, Penko, Guzman, Miaskowski and Kushel (2012) looked at primary care providers (PCP) views on chronic pain among high-risk patients, PCPs "reported low confidence and satisfaction levels in treating chronic pain" (p.1141). The study results exposed that PCPs are likely to prescribe opioids to current illicit substance abuse patients, highlighting their lack of

knowledge concerning opioid therapy. The low confidence scores and lack of adequate education put patients' lives and the providers' licenses in danger.

In a qualitative analysis by Lincoln, Pellico, Kerns, and Anderson (2013) looking at the barriers and facilitators to chronic non-cancer pain management in primary care provider's experiences and attitudes, 11 themes were identified. One of the barriers included inadequate training. Providers who do not feel confident either avoid managing CNMP or may inappropriately manage these patients.

Finally, Ponte and Johnson-Tribino (2005) looked at the attitudes and knowledge about pain in West Virginia Family Physicians, "The majority of respondents felt that their formal medical training did not prepare them to effectively manage pain" (p. 477). These articles provide insight into why there is such wide variation in provider attitudes about pain management and the inconsistencies in managing chronic pain.

Patients who experience acute pain are often treated first by their primary care providers (Lincoln, Pellico, Kerns, &Anderson, 2013). The pain may be related to recent surgery, injury, or disease. There are many factors contributing to the phenomena of opioid misuse. Often the patients are either undertreated due to provider fear of patient drug addiction and/or lack of understanding and fear of federal regulations regarding the prescribing of pain medications (Ponte & Johnson-Tribino, 2005). Conversely, patients may be over-treated due to insufficient knowledge of treating pain and lack of evidenced based practice guidelines regarding treatment of CNMP (Ponte & Johnson-Tribino, 2005).

Project Plan and Evaluation

Market/Risk Analyses

A full market/risk analysis was performed for this project including identifying strengths, weaknesses, opportunities and threats in the form of a SWOT analysis (strengths, weakness, opportunities, threats). A SWOT analysis helps the researcher discover and utilize strengths and to control and reduce or eliminate weaknesses if possible. Additionally, there was a full analysis of the driving and restraining forces.

Project strengths, weaknesses, opportunities, threats (SWOT)

When considering the strengths, weaknesses, opportunities, and threats related to this project, there are several things contemplated. There are several strengths associated with this project. First, this is a subject of great concern and very relevant at this time. This project was a practice improvement project with the potential to directly impact the opioid epidemic in a positive manner. Also, there was very little cost associated with this project. The costs consist of time and minimal recourses such as paper and ink. The research team consisted of committed and collaborative members. The major weakness of this project was the time commitment. The time commitment was great, and the project was implemented while the DNP student was working full time. Further, the expert collaborators and mentor also maintained full time employment. Additionally, there was the potential lack of stakeholder buy-in.

The opportunities of this project include the fact this is a timely project and the Centura Health System reached out to the DNP student about this project. There is a potential opportunity of having this project published in a professional journal and the potential for additional research of the step model. Finally, the threats to this project were the potential lack of participation of primary care providers and a limited sample size.

Table 2: SWOT Analysis of Capstone Project

Strengths	Weakness
• Timely, relevant topic • Practice improvement • Evidenced based interventions • Low cost • Research team • Potential for practice improvement	• Time commitment DNP student and mentor • Potential lack of stakeholder buy-in
Opportunities	**Threats**
• Centura Health System interest in project • Potential publication in a professional journal • Potential for additional research of step model	• Provider participation • Limited sample size

Driving/Restraining Forces

This project had a time line adhered to in order to meet the requirements and deadlines set forth by the Regis University DNP program (see Appendix B: Timeline). This was a driving force for this project. The restraining force was the time commitment as well as provider participation. Finally, the sustaining force was the collaboration of the DNP student and the mentor as well as the deadlines set by Regis University. The DNP student and the mentor met

regularly to discuss the project keeping it on a forward trajectory. The due dates helped keep the project moving forward at an anticipated pace.

Stakeholders and Project Team

The stakeholders of this project included Centura Health Systems, primary care providers, as well as patients. The benefit of having a tool easily accessible and easily comprehended will help with evidenced based management of chronic pain. Additionally, by utilizing evidenced based guidelines easy to access and apply should decrease the number of opioids prescribed (Doreflinger et al., 2014). Further, the mentor for this project was contacted by the State of Colorado Public Health Department to develop a training module for chronic pain management. If successful, this project could potentially be used for this purpose.

The project team consists of the DNP student the mentor, Bonnie Wilensky, CNS. Bonnie has over 40 years of experience in pain management. She is considered to be an expert in her field. She has been asked to speak on many occasions for peer to peer trainings as well as speaking for pharmaceutical companies about pain management. She has been an expert witness for the Colorado State Board of Nursing.

The DNP student and the mentor were responsible for development and implementation of the project including the step model and educational module. They were also responsible for developing the evaluation tool. Other members of the team include practicing pain management providers, Dr. Leif Sorensen, Dr. Bryan Wernick, and Tina Snyder, DNPc. They were responsible for reviewing the step model and educational module and making recommendations before implementation and establishing validity. The DNP capstone Chair, Cris Finn, PhD, FNP worked with the pain management team.

Cost-benefit Analysis

The cost of this project was nominal. Since the project team based the step model and educational module from the CDC guidelines there was very little cost involved other than time. The CDC gave permission for the utilization of the guidelines. There was the cost of coping (estimated at 10 cents per page) and purchasing a storage box with locks ($50). The equipment needed to produce the educational module is Power Point software and a computer, which was already owned by the DNP student. The potential benefits of the project far outweigh the minimal costs (see Appendix C: Budget).

The benefit analysis is difficult to determine on a per patient basis. However, the cost of the opioid epidemic is astronomical. The health and social costs of opioid abuse is approximately $55 billion each year in the United States (HHS, 2016). The cost of emergency department and inpatient treatment is approximately $20 billion per year in the United States (HHS, 2016). Most importantly, the benefit of this project is the potential to reduce the number of lives lost each year to opioid poisonings. In 2015 in Colorado, 259 people died from prescription opioid overdoses. That means that in 2015 approximately one Coloradan died every 36 hours from and opioid overdose (Colorado Department of Healthcare Policy and Finance, 2017). There is some good news for Colorado, the number of opioid overdose deaths decreased 6% in 2016 (Colorado Department of Healthcare Policy and Finance, 2017). However, heroin overdose deaths increased 23% in 2016 (Colorado Department of Healthcare Policy and Finance, 2017). How can we put a cost on the value of an abuse free life? Priceless.

Mission/Vision/Goals

The mission of this project was to provide education and easily accessible and comprehensible guidance for primary care providers in managing chronic, non-cancer pain

utilizing the newly updated CDC guidelines. The vision of the project is to improve provider satisfaction in caring for patients with chronic, non-cancer pain as well as improving patient outcomes by utilizing best practices.

According to Terry (2015), the DNP "applies knowledge in the solution of a problem…" (p. 16). The proposed project utilized scholarly works and evidenced based practice recommendations to help solve the problem of primary care providers' decreased knowledge and confidence to manage chronic pain patients. The goal of this project was to increase provider knowledge and confidence with the implementation of the step model and the education module and ultimately evidence to support a need for increased education in pain management for nurse practitioners and physicians as the providers.

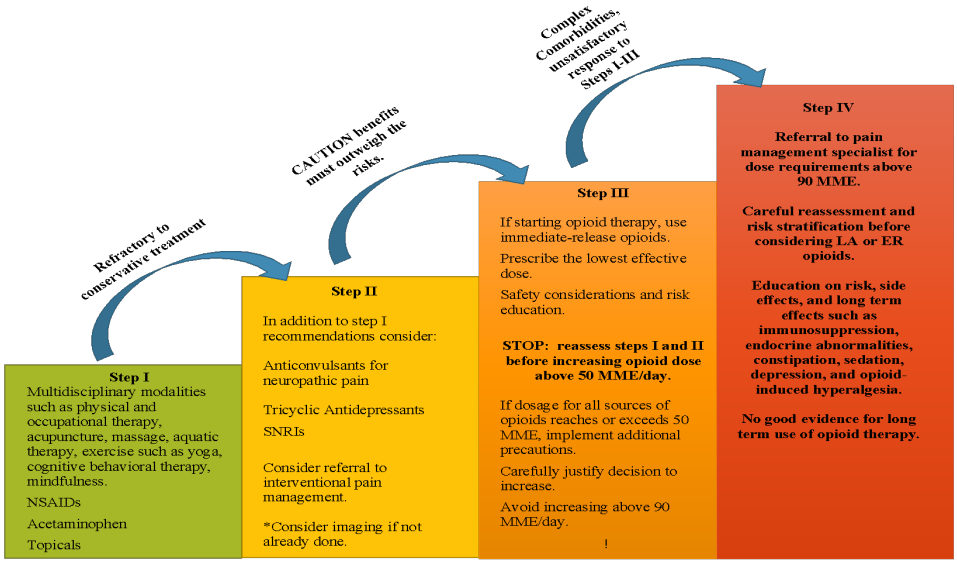
The DNP aimed to contribute to nursing practice by utilizing evidenced based practice recommendations to help with the opioid epidemic by identifying the education gap for primary care providers with respect to chronic pain management and thereby reducing the number of opioids prescribed by primary care. Vijayaraghavan, Penko, Guzman, Miaskowski, and Kushel (2012) demonstrate PCP lack of confidence with pain management and need for intervention. The authors suggest developing a similar model to the VA model of pain management. Lincoln, Pellico, Kerns, and Anderson (2013) richly describe several themes related to provider views on pain management. The authors discuss inadequacy of education and lack of evidenced based guidelines to be used for treatment supporting a gap in the literature.

Process/Outcomes

A step model was developed which was easy to follow and available for quick reference (Figure 3: Step Model). Additionally, there was also an online training video for primary care providers to access produced by the CDC (see Appendix D: CDC Education Modules). The

project outcomes were improved knowledge and confidence for primary care providers managing chronic pain patients, increased understanding and utilization of the CDC guidelines, increased provider satisfaction when managing chronic pain patients in the primary care setting, and a decrease in the overall prescribed opioids by each provider. The Step model was sent to Dr. Deborah Dowell at the CDC who offered updates and approval for utilization (see Appendix E: CDC Response).

Figure 3: Step Model



Logic Model

According to the W.K. Kellogg Foundation Logic Model Guide (2004) the logic model "and its processes facilitate thinking, planning, and communications about program objectives and actual accomplishments" (p.III). The logic model helps the researcher focus on the specific areas of planning, design, implementation, analysis, and outcomes (W.K. Kellogg Foundation, 2004). The W.K. Kellogg Foundation defines a logic model as "a systematic and visual way to present and share your understanding of the relationships among the resources you have to

operate your program, the activities you plan, and the changes or results you hope to achieve" (W.K. Kellogg Foundation, 2004, p. 1) (see Appendix F: Conceptual Model).

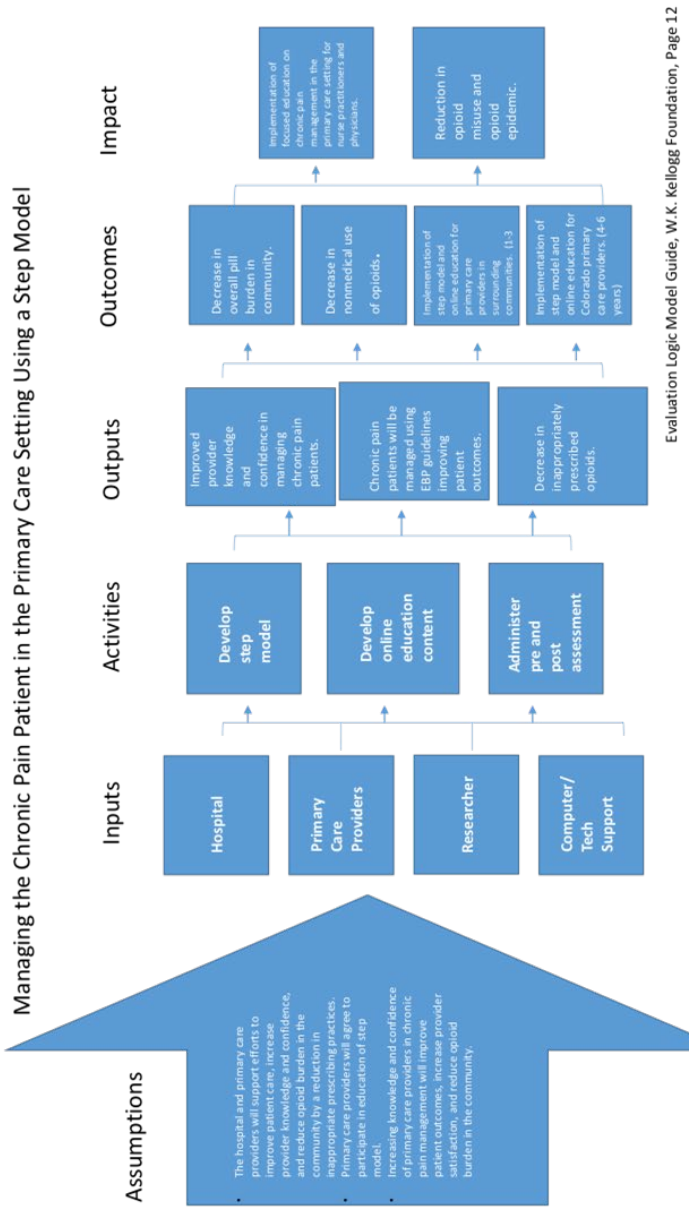
Through the use of the logic model, key elements of the project were evaluated. There were several considerations to be addressed to accomplish the goals for this project. The first step was to identify needed resources. For this project that included identifying evidenced based practice guidelines for managing chronic pain. The CDC developed a comprehensive guideline for managing chronic pain (MMRW, 2016) a step model and an education module was developed based on those CDC guidelines (Figure 3: Step Model).

There were several constraints for this project. The first constraint was the willingness of primary care providers to participate in the study. In order for the study to be meaningful, the study required at least 20 participants which was the total available population of primary care providers in the research site. Centura needed to approve the study, be willing to participate, and obtain Institutional Review Board (IRB) approval through the Catholic Health Initiative. Additionally, the current attitudes and practices of primary care providers may influence their willingness to participate.

Next, the constraints and activities to benchmark targets were identified. The expected outcomes were improved provider knowledge and confidence, improved patient outcomes, and a decrease in inappropriately prescribed opioids thereby increasing patient and community safety. There were several expected short- and long-term outcomes. First, create a decrease in the overall pill burden in the community as well a decrease in nonmedical use of opioids. Over the course of one to three years, the goal is for the step model and education module to be implemented in the surrounding communities with state-wide implementation within four to six years. The long-term impact of the project is to illuminate the need to implement focused

education on chronic pain management in the primary care setting for nurse practitioners and physicians. The ultimate goal of the project is to reduce opioid misuse and impact the opioid epidemic.

Figure 4: Logic Model (format depicting Conceptual Model for project)



Population/Sampling/Setting

In order to define the number of providers needed to determine if the intervention produces the expected effect, a power analysis was performed. Using a calculator from National Statistical Service (2017), it was determined to obtain a 95% confidence level with a 0.05 confidence interval, with an available population of 20 primary care providers, 19 primary care providers was required to achieve a 0.80 power. This will also help to minimize the threat of a Type I and Type II errors. However, using the total available population was ideal. A type I error for this project would be to make a false positive conclusion that the intervention resulted in a statistically significant improvement due to sampling fluctuations. A type II error would be a false negative conclusion preventing the implementation of the step model and education module.

According to the World Health Organization (WHO) and the University of Amsterdam the sample size for a descriptive study "needs to be large enough to reflect important variations in the population, but small enough to allow for intensive study methods" (World Health Organization, 2004, p. 65). Having a sample of at least 20 primary care providers was large enough to accurately assess the step model using quantitative methods. Further, since there was limited access to primary care providers, the sample size needed to be small.

The sample size needed for quantitative data generally requires a larger sample size. In order to obtain a 95% confidence level with a 5% margin of error, the total available population of primary care providers should be used. According to Terry (2015) the best course of action is to use the entire accessible population since it is under 100. Participants were recruited through a presentation to primary care providers at a hospital in Denver, Colorado. The setting of the

project was in primary care practices in the Centura Health system.

Protection of Human Subjects

The responsibilities of an investigator are to insure all ethical and legal considerations are considered before implementing a research study. "It is the responsibility of each investigator to seek review by the IRB for any study involving human subjects prior to beginning the project…" (Regis University, 2015, p.5). The IRB not only protects the human subjects, but also protects the researcher from making ethical errors. Regis University's (RU) policy on using human participants' states:

> Projects such as program evaluation, policy analysis, or quality assurance studies conducted for the purpose of providing information only to the organization studied do not require IRB review, provided they meet the following conditions: (1) They are not intended to produce knowledge that contributes to the general base of human knowledge or publishable; (2) They involve no more than minimal risk as defined in Federal regulations and RU policy; (3) They do not involve vulnerable populations (Regis University, 2015, p. 5).

According to RU policy, the study was considered a quality improvement project, and therefore exempts status through the IRB (see Appendix G: Regis University IRB Exemption Letter). The study was also awarded exempt status from Centura Health/Catholic Health Initiatives (see Appendix H: Catholic Health Initiative IRB Exemption Letter).

Additionally, the pre-and post-tests were de-identified and given an assigned number to match the pre-test to the post-test. The key was kept on a password protected computer and the completed tests are kept in a locked file cabinet for three years after the completion of the project per Regis guidelines (see Appendix I: CITI Certificates).

Instrumentation Reliability/Validity and Intended Statistics

This project used data from a Likert scale, which is ordinal data, obtained from pre-test and post-test (intervention) questionnaires from the same participants (see Appendices J: Pre-test Questionnaire and K: Post-test Questionnaire) . The data was evaluated using Wilcoxon Signed Ranks Test. This allowed the data from both groups to be paired for comparison linked by pre-assigned identifiers. Arifin (2014) states the goal for pre-post studies is "to determine whether there is any significant difference or change in values for a particular numerical variable between two occasions for same subjects" (p. e62). By analyzing the data with the Wilcoxon Signed Ranks Test it can be determined if the education module and step model were effective in increasing knowledge and confidence of each provider and as a group in managing chronic pain patients in the primary care setting. To measure changing prescribing patterns and practices, true/false questions were utilized, which is nominal data. This data was evaluated using descriptive statistics.

There are several potential threats to validity and reliability that must be addressed. In a pre- and post-test study, the threats to internal validity include selection, maturation, mortality/attrition, history, testing, and instrumentation. Internal validity ensures the independent variable caused the change in the dependent variable, meaning the education module and step model caused a change in the knowledge and confidence of primary providers caring for patients with CNCP.

When analyzing the data, one thing that must be considered is the possibility other events effected the change in the dependent variable other than the independent variable, which is the history effect (Polit & Beck, 2017). By choosing primary care practices in one hospital system, it will be easier to monitor for other influencing factors such as required education. Further, the

time between pre- and post-test was only four to six weeks to limit exposure to other influencing factors. To control for maturation, which is the change in the dependent variable due to normal developmental process, the pre-test Likert scale will determine each individual provider's knowledge and comfort level managing chronic pain patients prior to the intervention (Polit & Beck, 2017). The same providers were included in the pre- and post-test and there was not a control group which will avoid selection bias (Polit & Beck, 2017). To control for testing bias the pre- and post-test were the same and to control for instrumentation bias a validated Likert scale for the pre- and post-test was used (Polit & Beck, 2017).

External validity refers to the degree to which the results of a study can be generalized across populations. To control for this, primary care providers from several different practices who see a variety of patients should be included in the study (Polit & Beck, 2017). Additionally, the Step Method was reviewed and approved by the CDC (see Appendix E: CDC Response).

If there is missing or incomplete data, it was acknowledged in the study where limitations are discussed. Available data was analyzed and excluded any missing or incomplete data. There were no call backs. This is not a blinded study and therefore, not tied to the individual participant.

A data dictionary with all definable data elements was developed. The dictionary explained the contents of the context-specific database. According to American Health Information Management Association (AHIMA 2012), "…lack of data consistency can create challenges for data comparison and reporting" (p.48). For these reasons, a table of data definitions is included (see Appendix L: Data Dictionary).

Data Collection/Treatment Procedure

Participants were recruited via direct contact at a provider meeting at a Denver hospital. Project details and rationale were given to the attendees along with instructions for participation. Packets with project materials including informed consent were provided for all interested providers. A recruitment flyer was also displayed in the Denver area hospital (see Appendix M: Recruitment Flyer).

The participants were given the informed consent, pre- and post-test, step model, education, and module instructions in a self-addressed interoffice mail envelope. Reminder emails were sent mid-February to encourage the participants to continue using the step model and to complete the pre-test, consent, and watch the education modules if they had not already done so. They were returned at the end of February through mid-March through interoffice mail. The Likert Scale and true/false questions were developed using the steps described in *Nursing Research: Generating and Assessing Evidence for Nursing Practice* by Polit and Beck, 2017. The items included were subjected to internal review by the DNP student and subject matter expert mentor. The items were also evaluated by members of the target population, primary care providers. Items were subjected to review by the expert consulting team to ensure validity. Finally, the reliability of the items was verified using Cronbach's alpha.

Project Findings and Results

Data Analysis and Results

There were 22 primary care providers who initially agreed to participate in the project and of those, there were eight pre-tests returned and seven post-tests returned. The demographic data was collected on the pre-test. For data analysis, the missing data was not included. 100% of the participants were physicians (Table 3: Participant Education). The most represented age group of the study participants was between 21 and 30 years (n=7) (Table 4: Participant

Age). Additionally, 85.7% of the participants were female (Table 5: Participant Gender). The pre-test and post-test consisted of 7 items that could be directly compared. Again, one case was missing so it was excluded in the data analysis. Cronbach's Alpha for the 7 items was ($\alpha = .892$) (Table 6: Cronbach's Alpha Score). The pre- and post-test were found to be highly reliable.

Table 3: Participant Education

Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MD	7	100.0	100.0	100.0

Table 4: Participant Age

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-30	4	57.1	57.1	57.1
	31-40	2	28.6	28.6	85.7
	41-50	1	14.3	14.3	100.0
	Total	7	100.0	100.0	

Table 5: Participant Gender

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	1	14.3	14.3	14.3
	female	6	85.7	85.7	100.0
	Total	7	100.0	100.0	

Table 6: Cronbach's Alpha Score

Reliability Statistics

Cronbach's Alpha	N of Items
.892	14

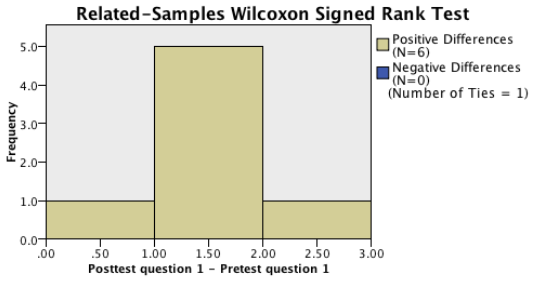
Results

Analysis of the first seven questions of the pre- and post-test was analyzed using the Wilcoxon Signed-Ranks Test. The participants could choose (1) strongly disagree, (2) disagree, (3) uncertain, (4) agree, or (5) strongly agree. They indicated their choice by checking a corresponding box. For these questions n=7. One post-test score was missing and excluded in the analysis. An alpha level of .05 was used for all statistical tests.

Question one stated: I have sufficient knowledge to manage chronic, non-malignant pain (CNMP) in my primary care practice. The Wilcoxon Signed-Ranks Test indicated post-test ranks were statistically significantly higher than the pre-test ranks ($Z=21.00$, $p=.020$) for question one indicating provider's perceived knowledge improved after the intervention (Table 7: Wilcoxon Question 1). Analysis of the pre-test descriptive statistics indicated 42.9% were uncertain if they had sufficient knowledge to manage chronic, non-malignant pain, 42.9% agreed they had sufficient knowledge, and 14.3% felt they did not have sufficient knowledge (Table 8: Pre-test Question 1). Post-test analysis displays 71.4% agreed they had sufficient knowledge to manage chronic non-malignant pain and 28.6% strongly agreed (Table 9: Post-test Question 1).

Table 7: Wilcoxon Question 1

I have sufficient knowledge to manage chronic, non-malignant pain (CNMP) in my primary care practice.



Total N	7
Test Statistic	21.000
Standard Error	4.500
Standardized Test Statistic	2.333
Asymptotic Sig. (2-sided test)	.020

Table 8: Pre-test Question 1

I have sufficient knowledge to manage chronic, non-malignant pain (CNMP) in my primary care practice.

Pre-test question 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	14.3	14.3	14.3
	uncertain	3	42.9	42.9	57.1
	agree	3	42.9	42.9	100.0
	Total	7	100.0	100.0	

Table 9: Post-test Question 1

I have sufficient knowledge to manage chronic, non-malignant pain (CNMP) in my primary care practice.

Post-test question 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	5	71.4	71.4	71.4
	strongly agree	2	28.6	28.6	100.0
	Total	7	100.0	100.0	

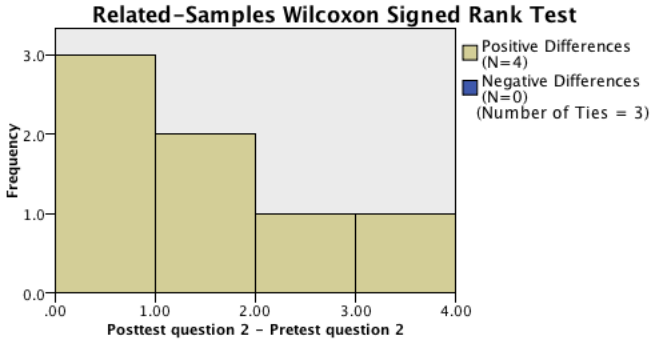
Question two states: I have access to education regarding how to manage opioids for CNMP. The Wilcoxon Signed-Ranks Test indicated post-test ranks were not statistically significantly higher than the pre-test ranks (Z=10.000, p=.066) for question two which indicated there was no difference in access education between the pre- and post-test scores (Table 10: Wilcoxon Question 2).

Descriptive statistical analysis of pre-test scores indicated 28.6% disagree, in other words, they felt they did not have access to education, 14.3% were uncertain if they had access to education, and 57.1% agreed they had access to education regarding how to manage opioids for CNMP (Table 11: Pre-test Question 2).

Descriptive statistical analysis of post-test scores displayed 71.4% agreed they had access to education regarding how to manage opioids for CNMP and 28.6% strongly agreed. Although the improvement was not statistically significant, it was a positive improvement nonetheless from a clinical perspective. Pre-test scores indicated 42.9% disagreed or were uncertain, post-test scores highlighted that all the participants felt they had access to education regarding how to manage opioids for CNMP (Table 12: Post-test Question 2).

Table 10: Wilcoxon Question 2

I have access to education regarding how to manage opioids for CNMP.



Total N	7
Test Statistic	10.000
Standard Error	2.716
Standardized Test Statistic	1.841
Asymptotic Sig. (2-sided test)	.066

Table 11: Pre-test Question 2

I have access to education regarding how to manage opioids for CNMP.

Pre-test question 2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	2	28.6	28.6	28.6
	uncertain	1	14.3	14.3	42.9
	agree	4	57.1	57.1	100.0
	Total	7	100.0	100.0	

Table 12: Post-test Question 2

I have access to education regarding how to manage opioids for CNMP.

Post-test question 2

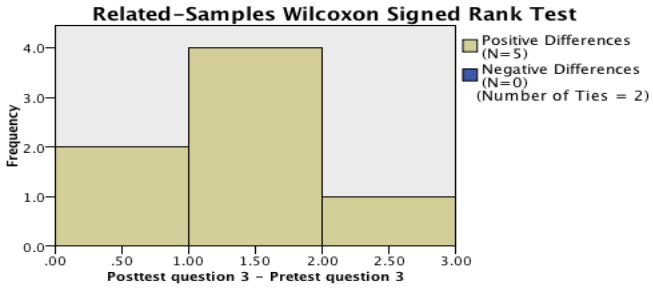
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	5	71.4	71.4	71.4
	strongly agree	2	28.6	28.6	100.0
	Total	7	100.0	100.0	

Question three states: I have confidence in my ability to manage CNMP in primary care. The Wilcoxon Signed-Ranks Test indicated that post-test ranks were statistically significantly higher than the pre-test ranks (Z=10.000, p=.034) for question three which indicates the participants confidence in their ability to manage chronic non-malignant pain improved after the intervention (Table 13: Wilcoxon Question 3).

Descriptive statistical analysis of pre-test scores indicated 87.5% felt a lack of confidence in their ability to manage CNMP and 14.3% had confidence in their ability to manage CNMP in primary care (Table 14: Pre-test Question 3). Descriptive statistical analysis of post-test scores displayed 28.6% were uncertain of their confidence in their ability to manage CNMP, 42.9% agreed and 28.6% strongly agreed they had confidence in their ability to manage CNMP (Table 15: Post-test Question 3).

Table 13: Wilcoxon Question 3

I have confidence in my ability to manage CNMP in primary care.



Total N	7
Test Statistic	15.000
Standard Error	3.536
Standardized Test Statistic	2.121
Asymptotic Sig. (2-sided test)	.034

Table 14: Pre-test Question 3

I have confidence in my ability to manage CNMP in primary care.

Pre-test question 3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	uncertain	6	85.7	85.7	85.7
	agree	1	14.3	14.3	100.0
	Total	7	100.0	100.0	

Table 15: Post-test Question 3

I have confidence in my ability to manage CNMP in primary care.

Post-test question 3

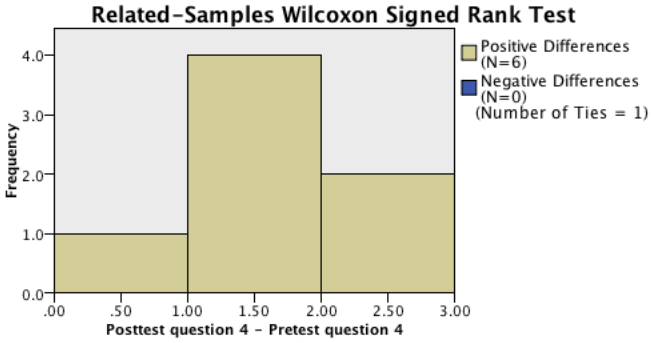
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	uncertain	2	28.6	28.6	28.6
	agree	3	42.9	42.9	71.4
	strongly agree	2	28.6	28.6	100.0
	Total	7	100.0	100.0	

Question four states: I have a good understanding of the Centers for Disease Control (CDC) guidelines (2016) on managing CNMP. The Wilcoxon Signed-Ranks Test indicated that post-test ranks were statistically significantly higher than the pre-test ranks (Z=21.000, p=.023) for question four which indicates the participants' understanding of the CDC guidelines for management CNMP improved after the intervention (Table 16: Wilcoxon Question 4).

Descriptive statistical analysis of pre-test scores indicated that 14.3% strong disagreed that they had a good understanding of the CDC guidelines, 57.1% were uncertain, and 28.6% agreed they had a good understanding of the CDC guidelines for managing chronic pain in primary care (Table 17: Pre-test Question 4). Descriptive statistical analysis of post-test scores revealed 14.3% were uncertain if they had a good understanding of the CDC guidelines, 57.1% agreed they had a good understanding of the guidelines and 28.6% strongly agreed (Table 18: Post-test Question 4).

Table 16: Wilcoxon Question 4

I have a good understanding of the Centers for Disease Control (CDC) guidelines (2016) on managing CNMP.



Total N	7
Test Statistic	21.000
Standard Error	4.623
Standardized Test Statistic	2.271
Asymptotic Sig. (2-sided test)	.023

Table 17: Pre-test Question 4

I have a good understanding of the Centers for Disease Control (CDC) guidelines (2016) on managing CNMP.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	14.3	14.3	14.3
	uncertain	4	57.1	57.1	71.4
	agree	2	28.6	28.6	100.0

	Total	7	100.0	100.0	

Pre-test question 4

Table 18: Post-test Question 4

I have a good understanding of the Centers for Disease Control (CDC) guidelines (2016) on managing CNMP.

Post-test question 4

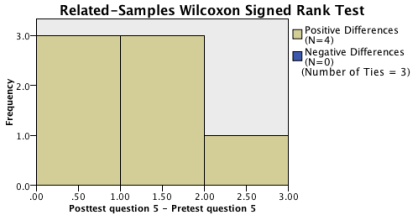
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	uncertain	1	14.3	14.3	14.3
	agree	4	57.1	57.1	71.4
	strongly agree	2	28.6	28.6	100.0
	Total	7	100.0	100.0	

Question five states: I am comfortable with where to find the CDC guidelines (2016). The Wilcoxon Signed-Ranks Test indicated that post-test ranks were not statistically significantly higher than the pre-test ranks (Z=10.000, p=.059) for question five which indicates there was no difference in the participants comfort levels in finding the CDC guidelines after the intervention (Table 19: Wilcoxon Question 5).

Descriptive statistical analysis of pre-test scores revealed 14.3% disagree, which means they are not comfortable with where to find the CDC guidelines, 87.5% agreed they are comfortable with where to find the CDC guidelines (Table 20: Pre-test Question 5). Descriptive statistical analysis of post-test scores indicated 57.1% agreed and 42.9% strongly agreed that they were comfortable with where to find the CDC guidelines (Table 21: Post-test Question 5). Although the difference between the pre- and post-test scores was not statistically significant, there was still positive improvement from a clinical perspective.

Table 19: Wilcoxon Question 5

I am comfortable with where to find the CDC guidelines (2016).



Total N	7
Test Statistic	10.000
Standard Error	2.646
Standardized Test Statistic	1.890
Asymptotic Sig. (2-sided test)	.059

Table 20: Pre-test Question 5

I am comfortable with where to find the CDC guidelines (2016).

Pre-test question 5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	14.3	14.3	14.3
	agree	6	85.7	85.7	100.0
	Total	7	100.0	100.0	

Table 21: Post-test Question 5

I am comfortable with where to find the CDC guidelines (2016).

Post-test question 5

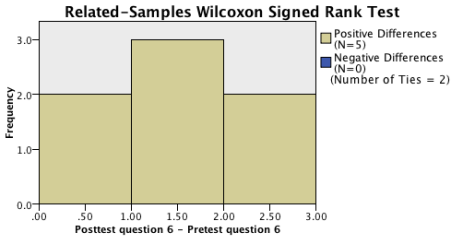
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	4	57.1	57.1	57.1
	strongly agree	3	42.9	42.9	100.0
	Total	7	100.0	100.0	

Question six states: I have a sense of satisfaction when managing CNMP. The Wilcoxon Signed-Ranks Test indicated that post-test ranks were statistically significantly higher than the pre-test ranks (Z=15.000, p=.038) for question six which indicates the participants sense of satisfaction when managing CNMP improved after the intervention (Table 22: Wilcoxon Question 6).

Descriptive statistical analysis of pre-test scores indicated 14.3% strongly disagreed that they felt a sense of satisfaction when managing CNMP, 71.4% disagreed, and 14.3% were uncertain if they had a sense of satisfaction when managing CNMP (Table 23: Pre-test Question 6). Descriptive statistical analysis of post-test scores displayed 28.6% disagreed that they felt a sense of satisfaction when managing CNMP, 42.9% were uncertain, and 28.6% agreed they had a sense of satisfaction when managing CNMP (Table 24: Post-test Question 6).

Table 22: Wilcoxon Question 6

I have a sense of satisfaction when managing CNMP.



Total N	7
Test Statistic	15.000
Standard Error	3.623
Standardized Test Statistic	2.070
Asymptotic Sig. (2-sided test)	.038

Table 23: Pre-test Question 6

Pre-test question: I have a sense of satisfaction when managing CNMP.

Pre-test question 6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	14.3	14.3	14.3
	disagree	5	71.4	71.4	85.7
	uncertain	1	14.3	14.3	100.0
	Total	7	100.0	100.0	

Table 24: Post-test Question 6

I have a sense of satisfaction when managing CNMP.

Post-test question 6

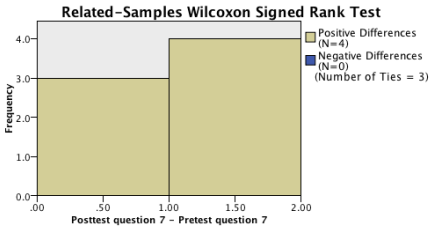
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	2	28.6	28.6	28.6
	uncertain	3	42.9	42.9	71.4
	agree	2	28.6	28.6	100.0
	Total	7	100.0	100.0	

Question seven states: My CNMP patients are satisfied with the treatment they receive from me. The Wilcoxon Signed-Ranks Test indicated that post-test ranks were statistically significantly higher than the pre-test ranks (Z=10.000, p=.046) for question seven which indicates the participants felt their patient's satisfaction with their treatment for CNMP improved after the intervention (Table 25: Wilcoxon Question 7).

Descriptive statistical analysis of pre-test scores revealed 14.3% disagreed that their patients are satisfied with the treatment they receive, 71.4% were uncertain, and 14.3% agreed their patients are satisfied with the treatment they receive (Table 26: Pre-test Question 7). Descriptive statistical analysis of post-test scores indicated 42.9% were uncertain and 57.1% agree their CNMP patients are satisfied with the treatment they receive (Table 27: Post-test Question 7).

Table 25: Wilcoxon Question 7

My CNMP patients are satisfied with the treatment they receive from me.



Total N	7
Test Statistic	10.000
Standard Error	2.500
Standardized Test Statistic	2.000
Asymptotic Sig. (2-sided test)	.046

Table 26: Pre-test Question 7

My CNMP patients are satisfied with the treatment they receive from me.

Pre-test question 7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	14.3	14.3	14.3
	uncertain	5	71.4	71.4	85.7
	agree	1	14.3	14.3	100.0
	Total	7	100.0	100.0	

Table 27: Post-test Question 7

My CNMP patients are satisfied with the treatment they receive from me.

Post-test question 7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	uncertain	3	42.9	42.9	42.9
	agree	4	57.1	57.1	100.0
	Total	7	100.0	100.0	

There were seven items on the post-test that were not included on the pre-test. These items were directly related to the CDC education module and the step model. Since these were not paired items, descriptive statistics were used to analyze the data.

Post-test item eight states: the step model increased my understanding of treating CNMP. 85.7% agreed and 14.3% strongly agreed with this statement (Table 28: Post-test Question 8). Post-test item nine states: The CDC education modules increased my understanding of opioids. 71.4% agree and 28.6% strongly agree with this statement (Table 29: Post-test Question 9). Post-test item ten states: The CDC education modules increased my understanding of the CDC guidelines. 71.4% agree and 28.6% strongly agree with this statement (Table 30: Post-test Question 10). Post-test item 11 states: I referred to the step model for guidance when treating patients with CNMP. 28.6% were uncertain, 57.1% agreed, and 14.3% strongly agreed with this statement (Table 31: Post-test Question 11). Post-test item 12 states: The step model helped me when treating patients with CNMP. 28.6% of the participants were uncertain and 71.4% agreed with this statement (Table 32: Post-test Question 12). Post-test item 13 states: I would recommend the step model to my colleagues. 71.4% of the participants agreed and 28.6%

strongly agreed (Table 33: Post-test Question 13). Finally, post-test item 14 states: I would recommend the CDC education modules to my colleagues. 57.1% of the participants agreed and 42.9% strongly agreed (Table 34: Post-test Question 14). Overall the feedback from the participants about the step model and the education modules was positive indicating they were helpful.

Table 28: Post-test Question 8

The step model increased my understanding of treating CNMP.

Post-test question 8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	6	85.7	85.7	85.7
	strongly agree	1	14.3	14.3	100.0
	Total	7	100.0	100.0	

Table 29: Post-test Question 9

The CDC education modules increased my understanding of opioids.

Post-test question 9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	5	71.4	71.4	71.4
	strongly agree	2	28.6	28.6	100.0
	Total	7	100.0	100.0	

Table 30: Post-test Question 10

The CDC education modules increased my understanding of the CDC guidelines.

Post-test question 10

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	5	71.4	71.4	71.4
	strongly agree	2	28.6	28.6	100.0
	Total	7	100.0	100.0	

Table 31: Post-test Question 11

I referred to the step model for guidance when treating patients with CNMP.

Post-test question 11

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	uncertain	2	28.6	28.6	28.6
	agree	4	57.1	57.1	85.7
	strongly agree	1	14.3	14.3	100.0
	Total	7	100.0	100.0	

Table 32: Post-test Question 12

The step model helped me when treating patients with CNMP.

Post-test question 12

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	uncertain	2	28.6	28.6	28.6
	agree	5	71.4	71.4	100.0
	Total	7	100.0	100.0	

Table 33: Post-test Question 13

I would recommend the step model to my colleagues.

Post-test question 13

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	5	71.4	71.4	71.4
	strongly agree	2	28.6	28.6	100.0
	Total	7	100.0	100.0	

Table 34: Post-test Question 14

I would recommend the CDC education modules to my colleagues.

Post-test question 14

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	4	57.1	57.1	57.1
	strongly agree	3	42.9	42.9	100.0
	Total	7	100.0	100.0	

Descriptive statistics were used to analyze the true/false items. Items one through seven were on both the pre- and post-test. Items eight and nine were only on the post-test since they only pertained to the intervention. There was minimal change in the overall prescribing habits of the sample providers as measured with the true/false questions.

The most significant items on this portion of the questionnaire were the responses for items seven through nine. Item seven states, I use the CDC guidelines (2016) for CNMP. The pre-test scores indicated that 42.9% of the participants used the CDC guidelines and 57.1% did not use the CDC guidelines before the intervention. After the intervention all of the participants

used the guideline, 100% (Table 35: Pre-test Use CDC Guidelines, Table 36: Post-test Use CDC Guidelines, Table 37: Pre-test Use CDC Guidelines Bar Chart, Table 38: Post-test Use CDC Guidelines Bar Chart). Item eight states: the step model helped me treat patients with CNMP. All of the participants felt the step model helped them treat CNMP (Table 39: Post-test Step Model Useful). Finally, item nine reads: the CDC education modules (2017) helped me treat patients with CNMP. Again, all of the participants felt the education modules helped them when treating CNMP (Table 40: Post-test Education Module Useful).

Table 35: Pre-test Use CDC Guidelines

Pre-CDC guidelines

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	true	3	42.9	42.9	42.9
	false	4	57.1	57.1	100.0
	Total	7	100.0	100.0	

Table 36: Post-test use CDC guidelines

Post-CDC guidelines

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	true	7	100.0	100.0	100.0

Table 37: Pre-test use CDC Guidelines Bar Chart

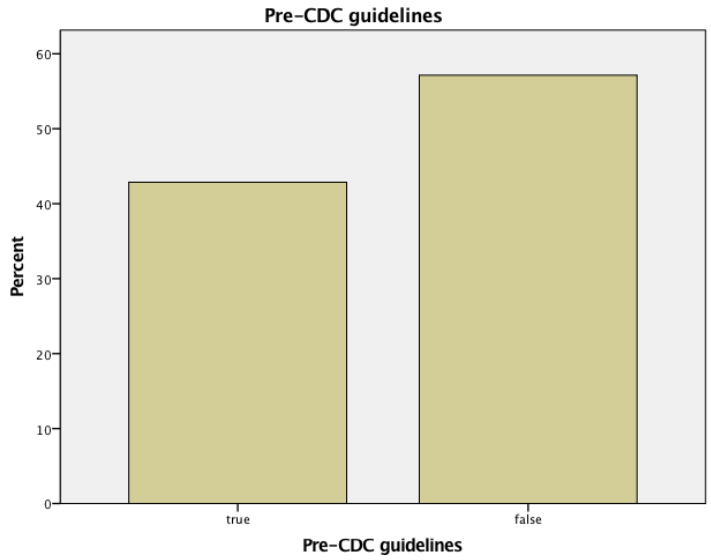


Table 38 Post-test use CDC Guidelines Bar Chart

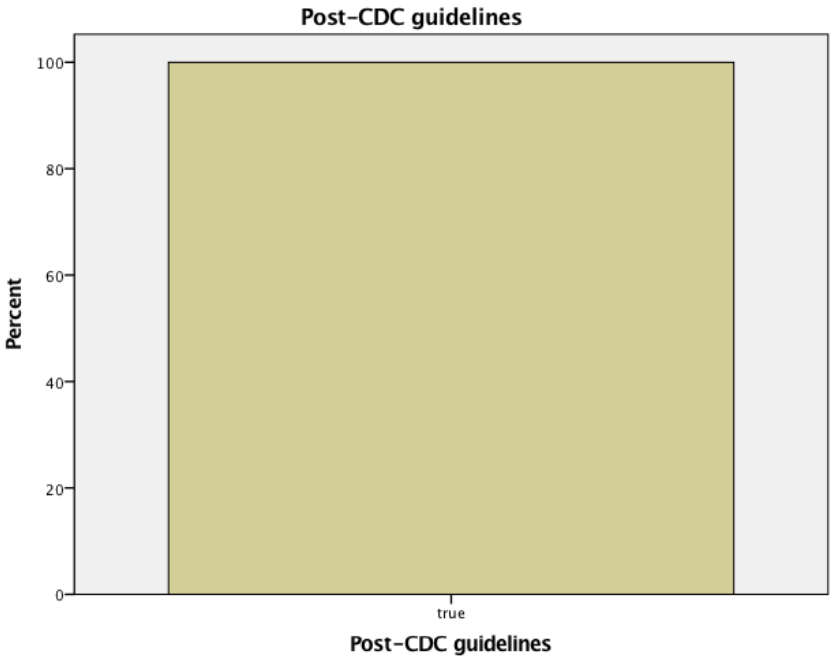


Table 39 Post-test Step Model Useful

Step model

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid true	7	100.0	100.0	100.0

Table 40 Post-test Education Modules Useful

Education module

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid true	7	100.0	100.0	100.0

The final analysis of the project data suggests the education module and step model increased knowledge and confidence in managing CNMP and prescribing opioid medication for this population. It also demonstrated a lack of education related to management of CNMP and opioid medications highlighting the need for increased education on chronic pain management and opioid therapy for physicians in the sample population.

The step model developed for this project was helpful as a visual representation of the CDC guidelines on prescribing opioids for chronic pain in the primary care setting for the sample population. This project exhibited the benefit of having a tool that is easily accessible and easily comprehended which could help with evidenced based management of chronic pain.

The mission of this project was to provide education and easily accessible and comprehensible guidance for primary care providers in managing chronic, non-cancer pain utilizing the updated CDC guidelines. Although there was a small sample, the results suggest the mission was achieved.

The vision of the project was to improve provider satisfaction in caring for patients with chronic, non-cancer pain as well as improving patient outcomes by utilizing best practices. The results of the project support the vision for this project was achieved.

Limitations

There were several limitations noted for this study. The first, and probably most significant, is the small sample size. The project materials were given to 22 primary care providers with only seven returned. Additionally, the study was conducted only in the Centura Health System, north metro Denver area. The homogeneity of the sample group may not account for factors that could change the outcomes. The study is not transferable to other locations based on the small sample size.

Additionally, there were no nurse practitioners who returned the project materials for analysis. The homogeneity of the sample does not allow for generalization to all primary care providers. Finally, due to the academic nature of this project, time constraints for data collection limited the number of participants. A repeat study with a larger sample population and more participants might produce stronger data for practice improvement.

Recommendations

Repeating the study with at least 50% nurse practitioners or even, 100% nurse practitioners could highlight the potential educational gap in nurse practitioner programs. While the data indicated statistically significant improvement in several areas in the sample population, the results cannot be generalized to all primary care providers. Additional research about the utilization of the Step Model is recommended. Additionally, a larger recruitment area could increase heterogeneity and therefore allow for increased reliability and adaptability of the model.

Implications for Change

Further studies might elicit more information from providers on personal prescribing habits to account for factors influencing prescribing other than knowledge and confidence plus what role the lack of knowledge and confidence of the providers plays in the current opioid crisis. Determining if primary care providers are indeed prescribing opioids inappropriately will be difficult due to the lack of agreed upon guidelines, subjective nature of chronic pain, and personal philosophy. Prescribing is largely based on individual clinical decision making.

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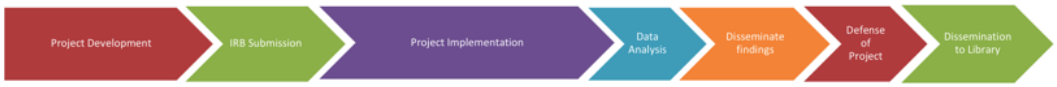
Appendix A

Systematic Review of Literature Sample

Article/Journal	Vijayaraghavan, M., Penko, J., Guzman, D., Miaskowski, C., & Kushel, M. B. (2012). Primary care providers' views on chronic pain management among high-risk patients in safety net settings. *Pain Medicine, 13*(9), 1141-1148 8p. doi:10.1111/j.1526-4637.2012.01443.x	Ponte, C. D., & Johnson-Tribino, J. (2005). Attitudes and knowledge about pain: An assessment of west virginia family physicians. *Fam Med, 37*(7), 477-480.	Barrett, K., & Chang, Y. (2016). Behavioral interventions targeting chronic pain, depression, and substance use disorder in primary care. *Journal of Nursing Scholarship, 48*(4), 345-353. doi:10.1111/jnu.12213	Dorflinger, L., Moore, B., Goulet, J., Becker, W., Heapy, A. A., Sellinger, J. J., & Kerns, R. D. (2014). A partnered approach to opioid management, guideline concordant care and the stepped care model of pain management. *JGIM: Journal of General Internal Medicine, 29*, 870-876. doi:10.1007/s11606-014-3019-2	Lincoln, L. E., Pellico, L., Kerns, R., & Anderson, D. K. (2013). Barriers and facilitators to chronic non-cancer pain managment in primary care: A qualitative analysis of primary care providers' experiences and attitudes. *Journal of Palliative & Medicine, S3* doi:10.1046/j.1526-4637.2001.01045.x
Author/Year	Vijayaraghavan, Penko, Guzman, Miaskowski & Kushel (2012)	Ponte, C. D., & Johnson-Tribino, J. (2005)	Barrett, K., & Chang, Y. (2016)	Dorflinger, L., Moore, B., Goulet, J., Becker, W., Heapy, A. A.,	Lincoln, L. E., Pellico, L., Kerns, R., & Anderson, D. K. (2013)

Appendix B

Timeline



Development: July 2016 to May 2017

IRB Submission: September 2017 to November 2017

Implementation: December 2017 to February 2018

Data Analysis: March 2018

Disseminate Findings: April 2018

Defense of Project: April 2018

Dissemination to Library: April 2018

Appendix C

Budget

Cost Analysis		
Cost Category	**Description**	**Total Cost**
Primary Care Providers (Based on goal of 20 participants)	Time spent on surveys and education module at $50/hour (2-hour average).	$2,000.00
Project Researchers	Time spent designing project and education module and data analysis at $50/hour (approximately 200 hours).	$10,000.00
Printing Costs	Step model and questionnaires @ 0.10/page	Est. $50.00
Statistical analysis software	SPSS	$60.00
Storage Box	To keep questionnaires locked	Est. $50.00
Statistician	Data analysis at approximately $50/hour for 3 hours	Est. $150.00

Appendix D

CDC Education Modules

Addressing the Opioid Epidemic: Recommendations from CDC

WB2857
Module 1

PROGRAM DESCRIPTION: This module will look at the CDC recommendations regarding the prescription of opioids for chronic pain. Given that it is sometimes hard to determine when acute pain becomes chronic pain, recommendations are also included related to prescribing opioids for acute pain. You will have the opportunity to examine the implications of these recommendations for treating your patients, and to practice making the best choices for their overall health and well-being.

Please refer to the *CDC Guideline for Prescribing Opioids for Chronic Pain* for additional information as needed during this training.

OBJECTIVES:

At the conclusion of the session, the participant will be able to:

1) Explain why a guideline for prescribing opioids is needed
2) Describe the key recommendations in the CDC guideline for prescribing opioids
3) Explain potential benefits of implementing the CDC recommendations for prescribing opioids

FACULTY/ CREDENTIALS:
Deborah Dowell, MD, MPH
Senior Medical Advisor, Division of Unintentional Injury Prevention
National Center for Injury Prevention and Control (NCIPC)
Centers for Disease Control and Prevention (CDC)
Office of Noncommunicable Diseases, Injury and Environmental Health (ONDIEH)

Debra Houry, MD, MPH
Director
National Center for Injury Prevention and Control (NCIPC)
Centers for Disease Control and Prevention (CDC)
Office of Noncommunicable Diseases, Injury and Environmental Health (ONDIEH)

Treating Chronic Pain Without Opioids

WB2859
Module 2

PROGRAM DESCRIPTION: This module will look at the CDC recommended options for treating chronic pain without opioids. You will have the opportunity to examine the benefits and expected outcomes of prescribing nonopioid medications and nonpharmacologic treatments to your patients.

Please refer to the *CDC Guideline for Prescribing Opioids for Chronic Pain* for additional information as needed during this training.

OBJECTIVES:

At the conclusion of the session, the participant will be able to:

1) Recognize that nonopioid medications and nonpharmacologic treatments are the preferred methods for treating chronic pain
2) Describe communication techniques that facilitate a patient-centered approach to manage chronic pain
3) Describe risks and benefits of first-line treatments for chronic pain
4) Identify nonopioid medications for various types of chronic pain
5) Identify nonpharmacologic treatment options for various types of chronic pain

FACULTY/ CREDENTIALS:
Deborah Dowell, MD, MPH
Senior Medical Advisor, Division of Unintentional Injury Prevention
National Center for Injury Prevention and Control (NCIPC)
Centers for Disease Control and Prevention (CDC)
Office of Noncommunicable Diseases, Injury and Environmental Health (ONDIEH)

ORIGINATION DATE: August 4, 2017
EXPIRATION DATE: August 4, 2019

URL: https://www.cdc.gov/drugoverdose/training/nonopioid

HARDWARE/SOFTWARE: Computer Hardware; Internet connection; Browser

Appendix E

CDC Response to Step Model

From: **Dowell, Deborah (Debbie) (CDC/ONDIEH/NCIPC)** gdo7@cdc.gov
Subject: RE: Research question
Date: November 17, 2017 at 9:06 AM
To: Smith, Melissa J msmith036@regis.edu

DD

Hi Melissa,

Sorry for my long delay in responding to this. I received your voicemail earlier this week.

I think the step model you sent makes sense and has value. It also fairly accurately reflects the recommendations in the 2016 CDC Guideline for Prescribing Opioids for Chronic Pain. There are just 2 modifications I'd suggest if you want it to align more completely with CDC's Guideline:

1. We did not specifically state that patients on ≥ 90 MME/day of opioids needed to be referred to a pain specialist, although we suggested it as a consideration. Other guidelines have made a stronger recommendation on this, and we considered it, but we decided not to because of concerns about inadequate access to pain specialists in many areas and because it would not be certain that every pain specialist would always carefully evaluate benefits and risks consistent with the evidence summarized in the Guideline. Instead, we recommended avoiding or carefully justifying increasing opioid dosage to 90 MME or more. We noted that justification could include the following factors: "individualized assessment of benefits and risks and weighing factors such as diagnosis, incremental benefits for pain and function relative to harms as dosages approach 90 MME/day, other treatments and effectiveness, and recommendations based on consultation with pain specialists". For patients already receiving high dosages of opioids, we recommended that "patients should be offered the opportunity to re-evaluate their continued use of opioids at high dosages in light of recent evidence regarding the association of opioid dosage and overdose risk. Clinicians should explain in a nonjudgmental manner to patients already taking high opioid dosages (≥90 MME/day) that there is now an established body of scientific evidence showing that overdose risk is increased at higher opioid dosages. Clinicians should empathically review benefits and risks of continued high-dosage opioid therapy and should offer to work with the patient to taper opioids to safer dosages. For patients who agree to taper opioids to lower dosages, clinicians should collaborate with the patient on a tapering plan."
2. This is a very minor point, but we did not include massage in recommended nonopioid treatments for pain in the Guideline, because we did not find studies documenting long-term efficacy. However, it is very unlikely that massage will harm patients and it may help some, so I think reasonable to include among suggested approaches.

Thank you for undertaking this important work!

Best wishes,

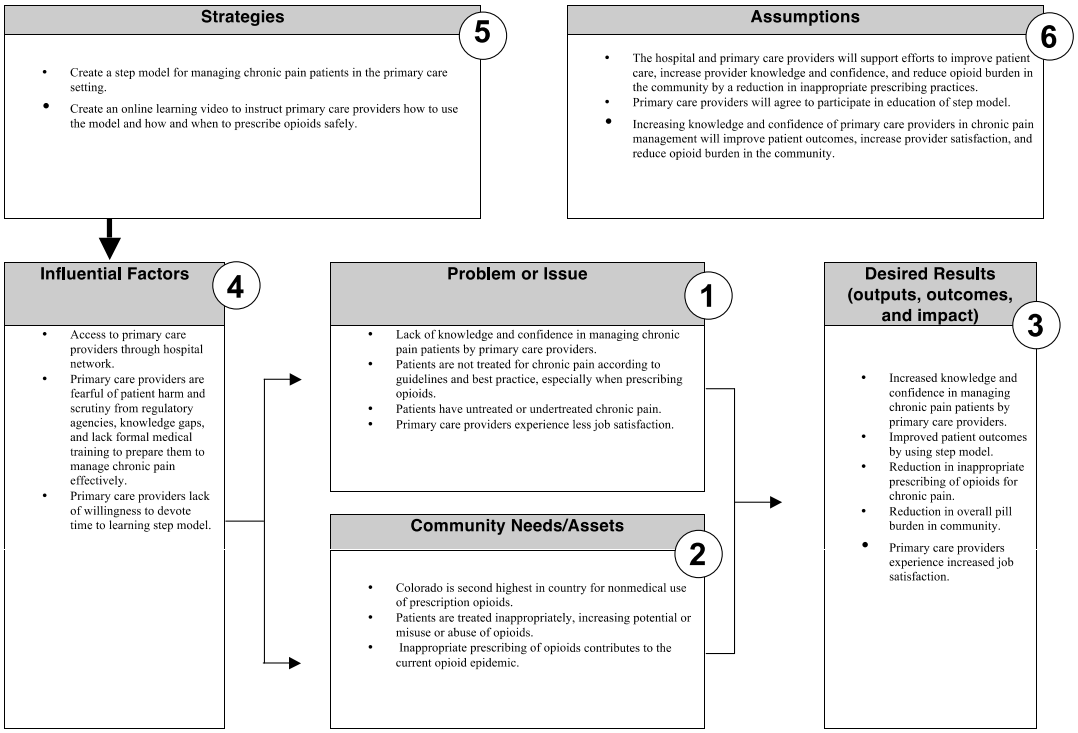
Debbie

Deborah Dowell, MD, MPH
CDR, US Public Health Service
Senior Medical Advisor, Division of Unintentional Injury Prevention
CDC - National Center for Injury Prevention and Control

Appendix F

Conceptual Model

Logic Model Development
Program Planning Template



Evaluation Logic Model Guide, W.K. Kellogg Foundation, Page 57

Appendix G

Regis University IRB Exempt Letter

REGIS UNIVERSITY

REGIS.EDU

Institutional Review Board

DATE:	October 17, 2017
TO:	Melissa Smith, MSN
FROM:	Regis University Human Subjects IRB
PROJECT TITLE:	[1121681-1] Step model for managing chronic, non-cancer pain in primary care
SUBMISSION TYPE:	New Project
ACTION:	DETERMINATION OF EXEMPT STATUS
DECISION DATE:	October 17, 2017
REVIEW CATEGORY:	Exemption category # *(7)*

Thank you for your submission of New Project materials for this project. The Regis University Human Subjects IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations 45.CFR46.101(b).

We will retain a copy of this correspondence within our records.

If you have any questions, please contact the Institutional Review Board at irb@regis.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Regis University Human Subjects IRB's records.

Appendix H

Catholic Health Initiatives (CHI) IRB Exempt Letter

CHI Institute for Research and Innovation

FWA Number: FWA 00019514
OHRP IRB Number: IRB00009715

DATE:	December 5, 2017
TO:	Melissa Smith, DNPc
PROJECT TITLE:	[1146024-1] Step model for managing chronic, non-cancer pain in primary care
SUBMISSION TYPE:	New Project
ACTION:	DETERMINATION OF EXEMPT STATUS
DECISION DATE:	November 27, 2017
REVIEW TYPE:	Exempt Review
REVIEW CATEGORY:	Exemption category # *1, 2*

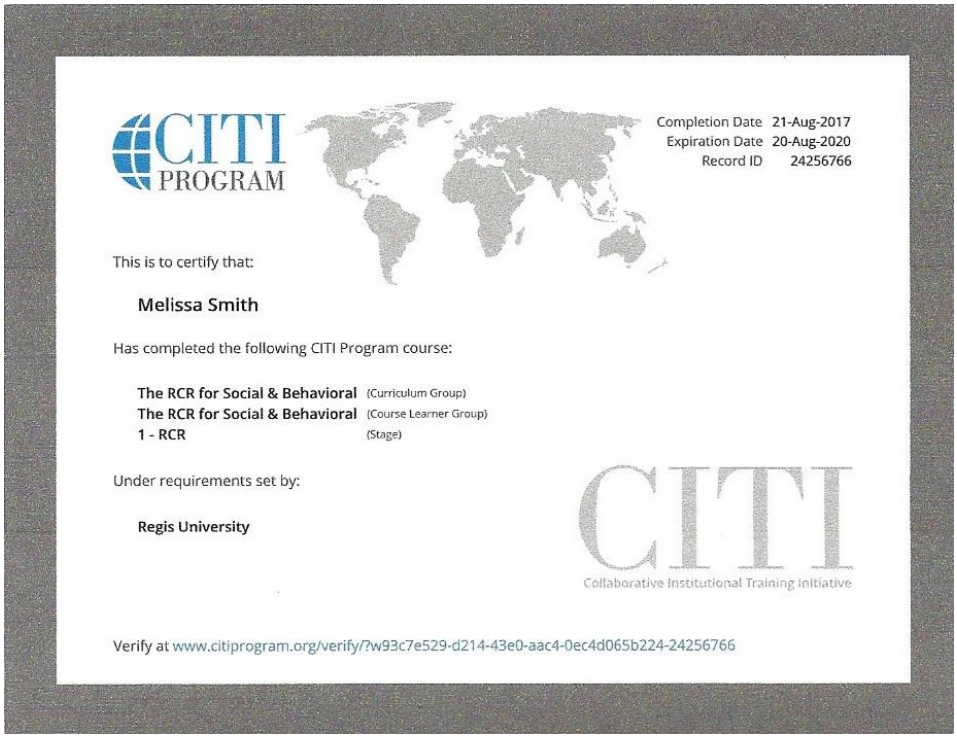
Thank you for your submission to the Catholic Health Initiatives Institute for Research and Innovation Institutional Review Board (CHIRB). An individual designated by the CHIRB determined this project to be EXEMPT FROM IRB REVIEW according to federal regulations. The following documents were reviewed in making this determination of exemption:

- Abstract/Summary - MelissaSmithFCOIDisclosure (UPDATED: 10/21/2017)
- Abstract/Summary - IRBnet Exempt Approval.pdf (UPDATED: 10/21/2017)
- Abstract/Summary - Adult Informed Consent Form Centura.docx (UPDATED: 10/21/2017)
- Abstract/Summary - Recruitment Flyer Final.pdf (UPDATED: 10/21/2017)
- Abstract/Summary - CDC training video module 1.pdf (UPDATED: 10/21/2017)
- Abstract/Summary - CDC training video module 2.pdf (UPDATED: 10/21/2017)
- Abstract/Summary - Pre-Test Questions Final.docx (UPDATED: 10/21/2017)
- Abstract/Summary - Post Test Questions final.docx (UPDATED: 10/21/2017)
- Abstract/Summary - Centura Approval.pdf (UPDATED: 10/21/2017)
- Advertisement - CHIRB Information Sheet - Recruitment Script v. 27 FEB 2015.docx (UPDATED: 10/21/2017)
- Amendment/Modification - Dowell Response PDF.pdf (UPDATED: 11/26/2017)
- Amendment/Modification - Appendix C Step Model 1.4 PDF.pdf (UPDATED: 11/26/2017)
- Application Form - Expedited Regis University Application (UPDATED: 10/21/2017)
- CHI - Research Application - CHI - Research Application (UPDATED: 10/21/2017)

Should you wish to amend this project in any way that might impact this exempt determination, please contact the CHIRB. Please note that all personnel who will interact with research subjects or access identifiable data will need to have completed HIPAA and human subject protection courses as specified in the CIRI Research Education Plan prior to initiating research activities. For assistance, contact the CHIRB or the CIRI Training Manager. Please also note that the PI must maintain documentation of all required personnel trainings, and understands that training records, among other study documents, are auditable.

Appendix I

CITI Certifications



CITI PROGRAM

Completion Date 21-Aug-2017
Expiration Date 20-Aug-2020
Record ID 24256766

This is to certify that:

Melissa Smith

Has completed the following CITI Program course:

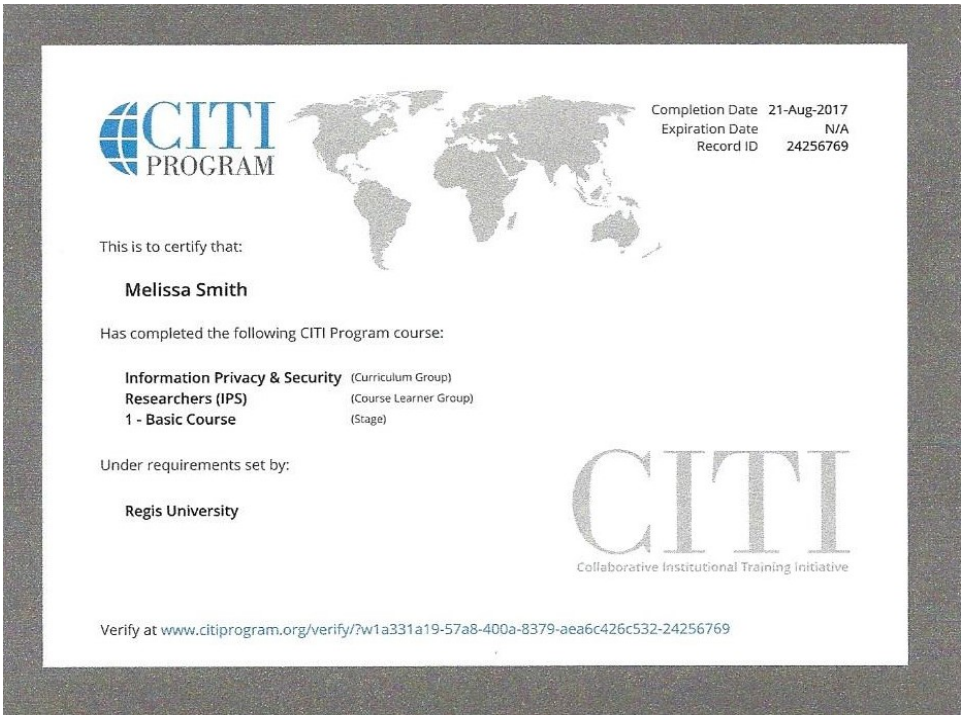
The RCR for Social & Behavioral (Curriculum Group)
The RCR for Social & Behavioral (Course Learner Group)
1 - RCR (Stage)

Under requirements set by:

Regis University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w93c7e529-d214-43e0-aac4-0ec4d065b224-24256766



CITI PROGRAM

Completion Date 21-Aug-2017
Expiration Date N/A
Record ID 24256769

This is to certify that:

Melissa Smith

Has completed the following CITI Program course:

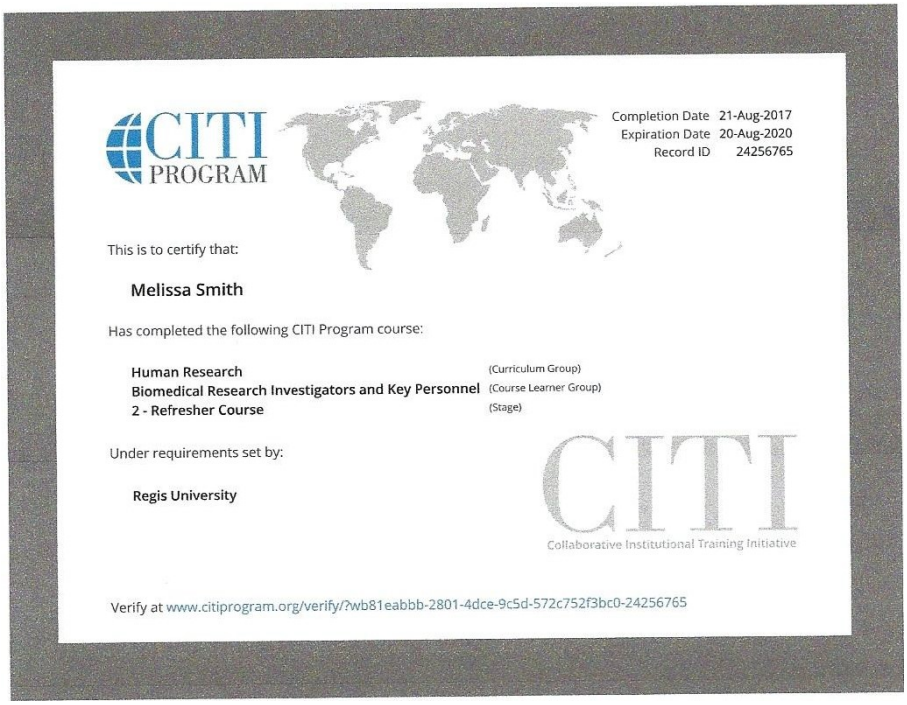
Information Privacy & Security (Curriculum Group)
Researchers (IPS) (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Regis University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w1a331a19-57a8-400a-8379-aea6c426c532-24256769



CITI PROGRAM

Completion Date 21-Aug-2017
Expiration Date 20-Aug-2020
Record ID 24256765

This is to certify that:

Melissa Smith

Has completed the following CITI Program course:

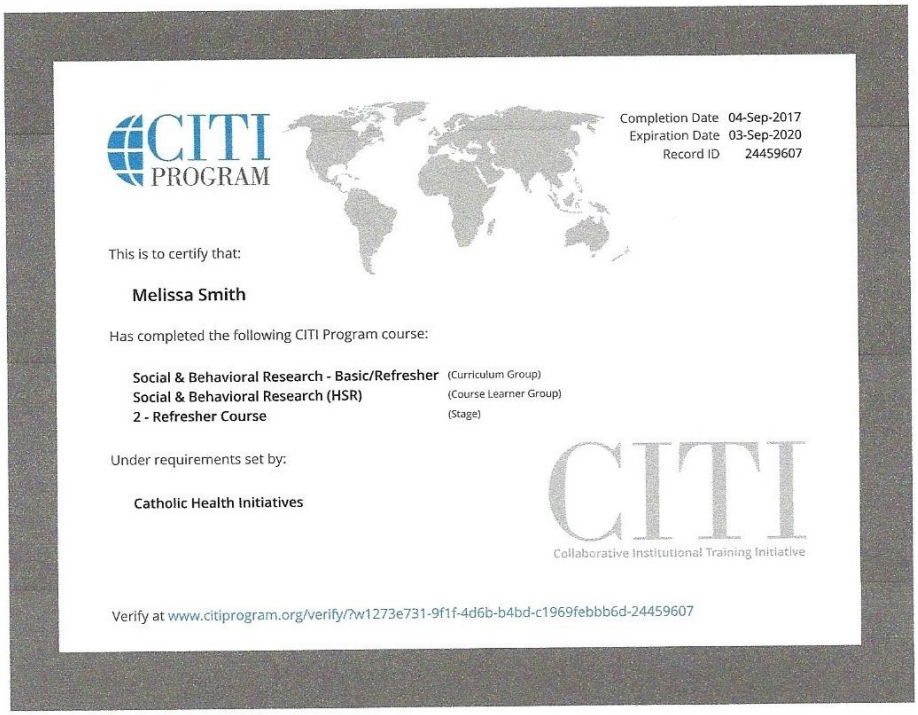
Human Research (Curriculum Group)
Biomedical Research Investigators and Key Personnel (Course Learner Group)
2 - Refresher Course (Stage)

Under requirements set by:

Regis University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wb81eabbb-2801-4dce-9c5d-572c752f3bc0-24256765



CITI PROGRAM

Completion Date 04-Sep-2017
Expiration Date 03-Sep-2020
Record ID 24459607

This is to certify that:

Melissa Smith

Has completed the following CITI Program course:

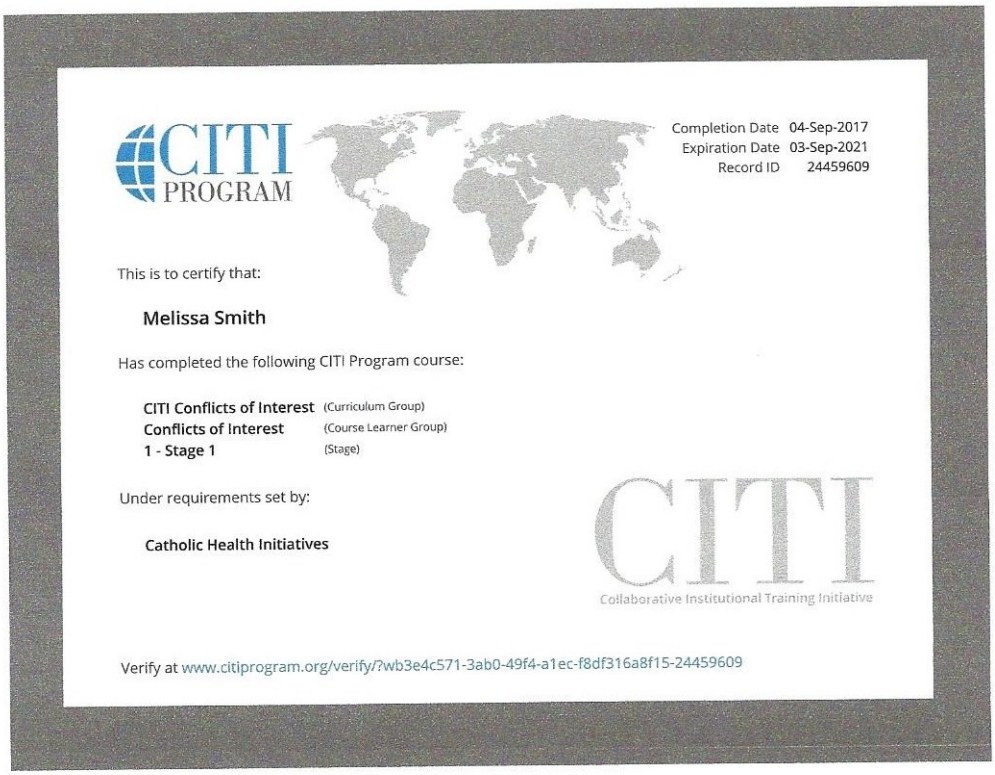
Social & Behavioral Research - Basic/Refresher (Curriculum Group)
Social & Behavioral Research (HSR) (Course Learner Group)
2 - Refresher Course (Stage)

Under requirements set by:

Catholic Health Initiatives

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w1273e731-9f1f-4d6b-b4bd-c1969febbb6d-24459607



CITI PROGRAM

Completion Date 04-Sep-2017
Expiration Date 03-Sep-2021
Record ID 24459609

This is to certify that:

Melissa Smith

Has completed the following CITI Program course:

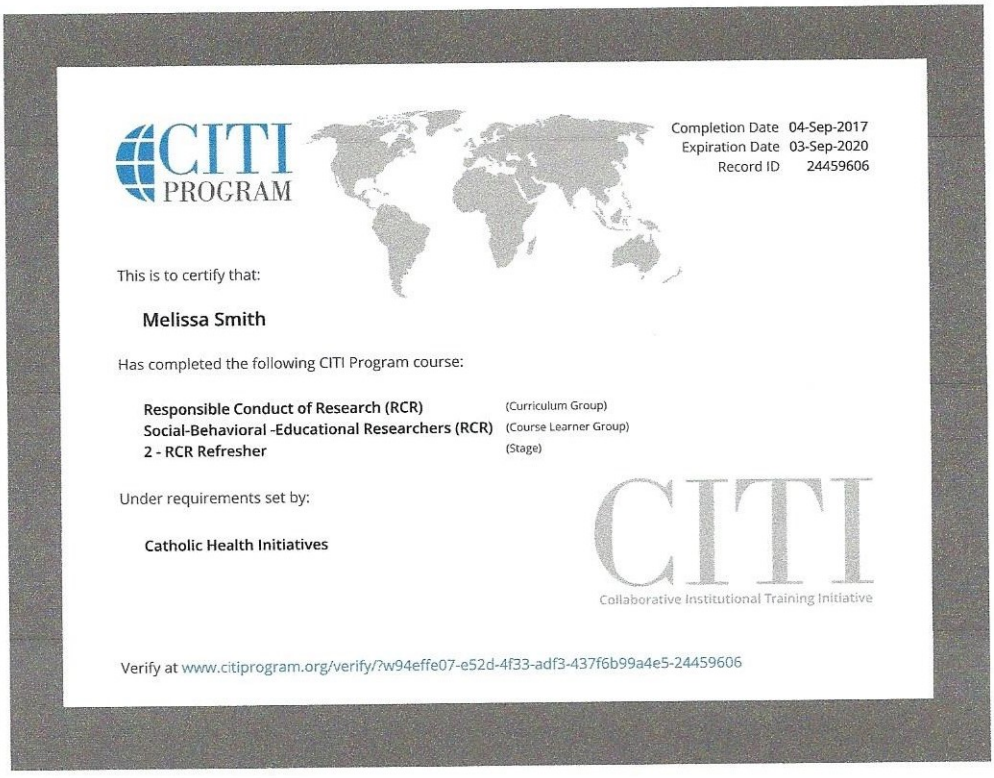
CITI Conflicts of Interest (Curriculum Group)
Conflicts of Interest (Course Learner Group)
1 - Stage 1 (Stage)

Under requirements set by:

Catholic Health Initiatives

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wb3e4c571-3ab0-49f4-a1ec-f8df316a8f15-24459609



CITI PROGRAM

Completion Date 04-Sep-2017
Expiration Date 03-Sep-2020
Record ID 24459606

This is to certify that:

Melissa Smith

Has completed the following CITI Program course:

Responsible Conduct of Research (RCR) (Curriculum Group)
Social-Behavioral -Educational Researchers (RCR) (Course Learner Group)
2 - RCR Refresher (Stage)

Under requirements set by:

Catholic Health Initiatives

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w94effe07-e52d-4f33-adf3-437f6b99a4e5-24459606

Appendix J

Pre-test Questionnaire

Pre-test Questions

Code number:

INSTRUCTIONS: Please rate how strongly you agree or disagree with each of the following statements by circling the appropriate number.

	1 – strongly disagree	2 – disagree	3 – uncertain	4 – agree	5 – strongly agree
1. I have sufficient knowledge to manage chronic, non-malignant pain (CNMP) in my primary care practice.	☐1	☐2	☐3	☐4	☐5
2. I have access to education regarding how to manage opioids for CNMP.	☐1	☐2	☐3	☐4	☐5
3. I have confidence in my ability to manage CNMP in primary care.	☐1	☐2	☐3	☐4	☐5
4. I have a good understanding of the Centers for Disease Control (CDC) guidelines (2016) on managing CNMP.	☐1	☐2	☐3	☐4	☐5
5. I am comfortable with where to find the CDC guidelines (2016).	☐1	☐2	☐3	☐4	☐5
6. I have a sense of satisfaction when managing CNMP.	☐1	☐2	☐3	☐4	☐5
7. My CNMP patients are satisfied with the treatment they receive from me.	☐1	☐2	☐3	☐4	☐5

Continued on next page

INSTRUCTIONS: Read each statement. Circle true if the statement applies to your practice or false if the statement does not apply to your practice.

1. I prescribe opioids for CNMP.	☐True	☐False
2. I prescribe ≤ 50 morphine milligram equivalents (MME) per day for CNMP.	☐True	☐False
3. I prescribe between 50 MME and ≤ 90 MME per day for CNMP.	☐True	☐False
4. I prescribe > 90 MME per day for CNMP.	☐True	☐False
5. I prescribe non-opioid medications for CNMP.	☐True	☐False
6. I prescribe multidisciplinary interventions for CNMP.	☐True	☐False
7. I use the CDC guidelines (2016) for CNMP.	☐True	☐False

Comments:

Please describe your unique attitude toward managing the chronic pain patient in the primary care setting.

Please check your educational preparation: ☐ MD ☐ Resident ☐ NP ☐PA

Age range: ☐21-30 ☐ 31-40 ☐41-50 ☐51-60 ☐61-70

Gender: ☐male ☐female

Appendix K

Post-test Questionnaire

Post-test Questions

Code number:

INSTRUCTIONS: Please rate how strongly you agree or disagree with each of the following statements by circling the appropriate number.

	1 – strongly disagree	2 – disagree	3 – uncertain	4 – agree	5 – strongly agree
1. I have sufficient knowledge to manage chronic, non-malignant pain (CNMP) in my primary care practice.	☐1	☐2	☐3	☐4	☐5
2. I have access to education regarding how to manage opioids for CNMP.	☐1	☐2	☐3	☐4	☐5
3. I have confidence in my ability to manage CNMP in primary care.	☐1	☐2	☐3	☐4	☐5
4. I have a good understanding of the Centers for Disease Control (CDC) guidelines on managing CNMP (2016).	☐1	☐2	☐3	☐4	☐5
5. I am comfortable with where to find the CDC guidelines (2016).	☐1	☐2	☐3	☐4	☐5
6. I have a sense of satisfaction when managing CNMP.	☐1	☐2	☐3	☐4	☐5
7. My CNMP patients are satisfied with the treatment they receive from me.	☐1	☐2	☐3	☐4	☐5
8. The step model increased my understanding of treating CNMP.	☐1	☐2	☐3	☐4	☐5
9. The CDC education modules (2017) increased my understanding of opioids.	☐1	☐2	☐3	☐4	☐5
10. The CDC education modules (2017) increased my understanding of the CDC guidelines (2016).	☐1	☐2	☐3	☐4	☐5
11. I referred to the step model for guidance when treating patients with CNMP.	☐1	☐2	☐3	☐4	☐5

12. The step model helped me when treating patients with CNMP.	☐1	☐2	☐3	☐4	☐5
13. I would recommend the step model to my colleagues.	☐1	☐2	☐3	☐4	☐5
14. I would recommend the CDC education modules (2017) to my colleagues.	☐1	☐2	☐3	☐4	☐5

INSTRUCTIONS: Read each statement. Circle true if the statement applies to your practice or false if the statement does not apply to your practice.

1. I prescribe opioids for CNMP.	☐True	☐False
2. I prescribe ≤ 50 morphine milligram equivalents (MME) per day for CNMP.	☐True	☐False
3. I prescribe between 50 MME and ≤ 90 MME per day for CNMP.	☐True	☐False
4. I prescribe > 90 MME per day for CNMP.	☐True	☐False
5. I prescribe non-opioid medications for CNMP.	☐True	☐False
6. I prescribe multidisciplinary interventions for CNMP.	☐True	☐False
7. I use the CDC guidelines (2016) for CNMP.	☐True	☐False
8. The step model helped me treat patients with CNMP.	☐True	☐False
9. The CDC education modules (2017) helped me treat patients with CNMP.	☐True	☐False

Comments:

Please describe your unique attitude toward managing the chronic pain patient in the primary care setting has or has not changed since completing the education modules.

Please describe your unique attitude toward managing the chronic pain patient in the primary care setting has or has not changed since using the step model or why not using.

Please check your educational preparation: ☐ MD ☐ Resident ☐ NP ☐ PA

Age range: ☐ 21-30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ 61-70

Gender: ☐ male ☐ female

Appendix L

Data Dictionary

Table	**Field**	**Data Type**	**Description**
Provider			Include MD, Resident, NP, or PA currently practicing in the primary care setting in the Centura Hospital System.
Provider	PROVIDER_ID	Integer	Unique number given to each provider.
Provider	PROVIDER_TYPE	Integer	A unique ID for each specialty:1-MD, 2-Resident, 3-NP or 4-PA.
Age Range	AGE	Integer	Age range: 1- 21-30; 2- 31-40; 3-41-50; 4- 51-60; 5-61-70
Pre-Test			A Likert-scale test and true/false questions to be administered before the education module and introduction to step-model.
Pre-Test	PREQUESTION_1 - 7	Integer	A unique response for each question numbered 1-7 for each provider.
Pre-Test	PREQUESTION_1-7	Category	True/false response for each question numbered 1-7 for each provider.
Pre-Test	PREQUESTION_COMMENT	Text	An open-ended question to allow for the participant

			to describe their unique attitudes toward managing the chronic pain patient in the primary care setting.
Post-Test			A Likert-scale test and true/false questions to be administered after the education module and introduction to step-model.
Post-Test	POSTQUESTION_1-14	Integer	A unique response for each question number 1-14 for each provider.
Post-Test	PostQUESTION_1-9	Category	True/false response for each question numbered 1-9 for each provider.
Post-Test	POSTQUESTION_COMMENT	Text	An open-ended question to allow for the participant to describe their unique attitudes toward managing the chronic pain patient in the primary care setting.

Appendix M

Recruitment Flyer