Exploring the Relationship of Patients' Opioid Knowledge and the Transitional Experience of Postoperative Pain Management: A Mixed Method Study

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Abstract

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Postoperative pain management can be a significant challenge after surgery. It is clear from the literature, however, that adequate discharge teaching does not always happen, or happens when patients are groggy, stressed, and possibly cognitively impaired.

The purpose of this study was to determine if there was a correlation between: 1) the change in patients' opioid knowledge from admission to discharge from the hospital, and 2) the quality and experience of pain management for the patient after they return home.

This research involved mixed methods methodology. The first phase comprised a convenience sample of 37 surgical patients who completed a quantitative Admission and Discharge survey measuring the change in *opioid knowledge*, an indication of the teaching received from all sources prior to discharge. The second phase was conducted in the patient's home with 12 volunteers from the first phase. It included qualitative data collection using patient journal entries and a final semi-structured interview. The interview was conducted two weeks after the patient had completed all opioid pain medication.

At the conclusion of data collection for the second phase, a phenomenological analysis was done, followed by a mixed methods analysis. The measurement of the change in opioid knowledge from the surveys was analyzed with the coded themes from the qualitative data to

determine if there was a relationship between the experience of pain management and opioid knowledge at the time of discharge from the hospital.

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GLOSSARY

Admission Survey – survey given prior to receiving the surgery packet and teaching

Addiction – characterized by compulsive drug seeking and use, despite harmful consequences; considered a brain disease because the drugs change the brain's structure and how it works; can be long-lasting and lead to self-destructive behaviors (NIDA)

Dependence – when a person can function normally only in the presence of the drug and manifests a physical disturbance when the drug is removed (NIDA)

Discharge Survey – survey given after discharge teaching but before going home

Iatrogenic Addiction – refers to addiction that is the result of legitimate treatment for pain

Narcotics – pertains to a group of medications that produce insensibility or narcosis; opioids fall under this category but because of the association of this term with illegal use, it has fallen out of favor in recent years; opioids are a subclass of narcotics and opiates are a subclass of opioids.

Opiate* – natural substance extracted from the opium poppy, e.g. morphine and codeine

Opioids* – includes both semi-synthetic and synthetic products that bind to the same receptors as opiates but do not occur naturally as opiates do; synthetic opioids are chemically produced, e.g. fentanyl and methadone; semi-synthetic opioids are a result of chemical modifications to opiates, e.g. oxycodone and hydrocodone

Pain Management – includes the various medications and alternative therapies that lead to the management of postoperative pain, such as acetaminophen, NSAIDS, narcotics, ice/heat, massage, etc.

Pain Medications – includes all pain medications that will affect a patient's pain, not just opioids (e.g. NSAIDS, muscle relaxants, etc.).

Tolerance – a physical aspect of drug/substance dependence; the body no longer responds to the original dose and requires a higher dose of medication to get the same effect it had on the lower dose (NIDA)

***** Opiate and opioid are used interchangeably in the literature as well as in popular communication – hence, the label Opioid Crisis/Epidemic. For ease of readability, the term opioid will be used in this document and will refer to both opiate and opioid medications.

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Cheryl Boone, my niece extraordinaire, whose encouragement and prayers buoyed me when I felt like I was going to go under. I am so grateful for "unlimited minutes", making it possible to enjoy the many hours of phone calls from Connecticut that cheered me just when I needed them. Also, my great-nieces and -nephews whose artwork is all over my house and reminds me that I must never forgot the creative part of myself that needs nurture when everything around me is concrete, logical, and scientific.

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Computer Vets. No one completes a dissertation without a functioning computer. Although I wanted, many times, to throw mine out the window, restraint prevailed and I made the trips to the Computer Vets in Odegaard Library, always with incredible success. The week before this tome was due, my computer froze. Thanks, to an amazingly computer-savvy young man named Griffin, I was able to finish – a little late – but I did finish.

Garland Wood, was a Medical IT doctoral student and great friend, whom I met during my first quarter at UW. When the computer glitches were not severe, he succeeded in keeping my computer and software functioning during the many tech challenges that tried to derail me from this most auspicious project. I will always remember our stimulating discussions, breakfasts at the Pancake House, and his interminable belief that "Yes, you can do this!" I will ever be in his debt.

The nurses at UWMC who were willing to alter their schedules enough to allow me to administer Discharge Surveys to their patients after they had completed their discharge teaching. Being a nurse, I know how chaotic it is when a patient is discharged and so many people need to see them before they go. It makes me appreciate their support all the more. I also appreciated the great conversations in the Nurses' Lounge while I was waiting for the teaching to end. You just cannot have a boring conversation with someone as versatile as a nurse – there is always something interesting to discuss!

Much appreciation goes to the 37 participants in my research, without whom I would have had no study at all. Their generosity of time, sharing of stories, and dedication to the goal of the research will always be a special memory for me.

To a loving, patient, and ever-present God who made all of this possible. Many times I was comforted and encouraged by the verse, "I can do all things through Christ who strengthens me." (Philippians 4:13).

DEDICATION

To Marjorie Fecas, my mom, who was my greatest cheerleader and whose encouragement, prayers, and devotion have helped me to remain steadfast in the face of adversity so that I might eventually arrive at this point in time. Your voice may have been silenced but your love inspires me now and forever.

To Carole Fontaine, mentor and friend, the first professor who helped me to believe that I could attain more academically than the sum of the many educated ones who came before and thought otherwise. Her courage, her academic scholarship, and her innovative teaching style taught me to be brave in all things, to formulate an academic scholarship that embraces a global perspective, and to think outside of the box when designing a course that will not only educate students but also motivate and inspire them to grow towards the sun.

Chapter 1: Introduction and Literature Review

Chapter Abstract

Postoperative pain management can be a significant challenge after surgery. During the hospital stay, nurses assume responsibility for determining the patient's level and quality of pain and how best to treat it. The transition to home, where patients are now required to perform this function themselves, can be a daunting task, especially in the midst of an opioid crisis of which most, if not all, patients are aware. This chapter will discuss why postoperative pain management is so crucial and why preparation for discharge requires more than just knowing the names of the medications, the actions, and side effects. When patients are ready for discharge, the question that needs to be answered is, "Have the patients learned what they need to know in order to take over these functions themselves?"

Statement of the Problem

Postoperative pain management can be a significant challenge after surgery. Although patients receive pre-surgery teaching packets to read at home as well as a teaching session from a nurse during the clinic appointment, this researcher's experience with patients has shown that other less professional teaching resources also educate patients in post-operative pain management such as, the experiences of friends and family, the internet with its variety of educational options, television with ads and medical programs, and libraries which offer books on just about any topic one may choose.

During the hospital stay, nurses assume responsibility for determining the patient's level and quality of pain and how best to treat it. It is an expectation of their practice that nurses will explain to patients how they are making these assessments and determinations, thereby teaching the patients how to make these decisions for themselves (Costello & Thompson, 2014). Nurses

are also expected to educate patients about their medications, i.e. uses, actions, side effects, safe storage, disposal, and weaning from opioid use when the medication is no longer necessary (Costello & Thompson; Currie & Wild, 2012; Herdman & Kamitsuru, 2014; Kankkunen, Vehviläinen-Julkunen, Pietilä, & Halonen, 2003; Smith, 2014). When the patients are ready for discharge, the question that needs to be answered is, "Have the patients learned what they need to know in order to take over these functions themselves?"

Discharge teaching should be provided before discharge. Ideally, this planning and teaching should begin on admission (Atwal, 2002; London, 2004; Zeng-Treitler, Kim, & Hunter, 2008). The goal is to have patients discharge from the hospital with a strong sense that they, and a significant other if possible, know their medications, treatments, appointments, and disease/surgical processes well (Costello & Thompson, 2014; Samuels-Kalow, Stack, & Porter, 2012). Inadequate discharge teaching can result in: 1) increased stress levels during a time when healing needs to be the focus, 2) the possibility that errors will occur as patients attempt to "guess" the correct thing to do because they are not certain about what to do, 3) improper use of opioids, whether deliberate or not, and 4) the ultimate compromising of patient self-esteem and self-efficacy (Corbett, Setter, Daratha, Neumiller, & Wood, 2010; LeClerc, Wells, Craig, & Wilson, 2002; Maloney, & Weiss, 2008).

The literature is replete with papers detailing the procedures for planning and directing a patient's discharge (Altfeld, et al., 2013; Clancy, 2009; Walker, Hogstel, & Curry, 2007; Weiss, & Piacentine, 2006). However, this study will attempt to measure just one of the discharge factors that must be taken into consideration after surgery – the change in patient's knowledge of their opioid medications from the time of admission to the time of discharge. By measuring the level of knowledge patients have about their opioid medications and, then,

following a segment of this population while they are at home, it will be possible to see if there is a correlation between patients' knowledge of opioid medication and the level of success they have with self-medication – directly on their pain, and indirectly on their quality of life.

Research Background and Significance

The Importance of Discharge Medication Teaching

There are several reasons for concentrating on discharge teaching for opioid medications after surgery. First, and most obvious, is that opioids are helpful in relieving surgical pain as patients heal. However, numerous studies have shown that patients express fear over the potential for the tolerance, dependence, and addiction associated with their opioid medications, even though they may not understand the definitions of these terms, and that this fear may prevent them from choosing to use the medication at all, preferring to suffer instead (Borgsteede, et al, 2011; Chan, Blyth, Nairn, & Fransen, 2013; Dawson, et al., 2005; Samuels & Woodward, 2015; Sauaia, et al., 2005). Unless the patient's beliefs concerning pain management are explored, the nurse responsible for the patient's education may not realize this fear and miss an opportunity to help the patient understand and overcome it (Apfelbaum, Chen, Mehta, & Gan, 2003; Vadivelu, Mitra, Hines, Elia, & Rosenquist, 2012).

Approximately one hundred million surgeries are performed every year in the U.S., and four out of every five of these patients complain of postoperative pain (Apfelbaum, et al., 2003; Vadivelu, et al., 2012). Of the patients who complain of pain, 86% experience a severity of pain at the moderate to severe level upon discharge from the hospital (Vadivelu, et al.). Unrelieved pain raises stress hormones, which can have deleterious effects on every organ system in the body (Christian, Graham, Padgett, Glaser, & Kiecolt-Glaser, 2006). Pain can also 1) decrease the effectiveness of the immune system, 2) interfere with the body's ability to heal itself (McGuire,

et al., 2006), 3) disrupt the sleep cycle—the time during which the most postoperative healing and tissue repair occurs (Chouchou, Khoury, Chauny, Denis, & Lavigne, 2014; House, 2015), and 4) alter moods which may lead to a sense of hopelessness, and lead to the development of long-term pain syndromes mentioned above (Eisenberg, Suzan, & Pud, 2015; Reynolds, 2009; Samuels &Woodward, 2015). Patients who are in pain do not want to move, and decreased mobility is responsible for postoperative pneumonia, deep vein thrombosis, and decreased range of motion, especially serious for joint replacement patients (Hoogeboom, Dronkers, Hulzebos, & Van Meeteren, 2014; Samuels & Woodward).

Poor wound healing and infection (36%) are the major causes for postoperative patients to be readmitted to the hospital within thirty days of discharge (House, 2015; Leape, 2015; Reynolds, 2009). Since Medicare and Medicaid have focused increasing amounts of attention on 30-day readmission rates, pain medication education that leads to successful pain management after discharge, can be an important factor in decreasing readmission statistics by facilitating healing (Joynt, & Jha, 2012; Kassin, et al., 2012; Ma, McHugh, & Aiken, 2015) and helping to maintain a stable economy for the medical institution.

Pain management is a more complex task for patients than might be realized until the process is taken apart step by step (Costello & Thompson, 2014; Samuels & Woodward, 2015). This topic will be covered in more detail further on in this dissertation but briefly, it involves: assessment of pain, determination of treatment, monitoring of treatment reaction, definition of activity limitations, and the ability to build on knowledge and experience throughout the pain management process (Pasero & McCaffery, 2011). It is not realistic to expect patients to manage their pain successfully without some oral and written education (McCarthy, et al., 2014; Zeng-Treitler, et al., 2008).

Finally, as previously stated, opioid pain medication can cause tolerance, dependence, and addiction with prolonged use (Beauchamp, Winstanley, Ryan, & Lyons, 2014; Clarke, Soneji, Ko, Yun, & Wijeysundera, 2014; Daum, Berkowitz, & Renner, 2015; Pasero & McCaffery, 2011). The term, *iatrogenic addiction* refers to addiction that is the result of legitimate treatment for pain and its appearance in the literature has been increasing exponentially since it was first seen in the 1950s. A cursory Google Scholar search of the term by decades has revealed that the frequency of articles is more than doubling during some decades.

Table 1 Number of References to Iatrogenic Addiction by Decade: 1941-2018

Date	**Number of References for Iatrogenic Addiction**
1941-1950	0
1951-1960	Iatrogenic Addiction (4) Iatrogenic Barbiturate Intoxication (2)
1961-1970	152
1971-1980	421
1981-1990	744
1991-2000	1,370
2001-2010	4,820
2011-2018	7,150

Since it is beyond the scope of this study to check each of the references in the table above, it is likely that the words "iatrogenic" and "addiction" were used separately as well as together in this search. The scope and breadth of research on the topic as well as the accumulation of scientific and research journals over this period can also be responsible for the steadily increasing numbers.

It has been observed, through recent research, that the term "iatrogenic" is beginning to be used for other medical manifestations e.g. iatrogenic effects of viewing suicide and self-injury stimuli (Cha, et al., 2016) or iatrogenic ICD [impulse control disorder] (Weiss & Marsh, 2012). The

term “addiction” can also refer to nonpharmacological addictive behaviors. Though the totals in the table above may not be considered accurate, per se, they may be evidence of a trend that requires further research and analysis.

Review of Literature

The Opioid Crisis and Iatrogenic Addiction

Morbidity and Mortality. Much of the urgency for discharge opioid teaching is due to the increasing numbers of overdose deaths resulting from prescription opioid medications. The United States and Canada rank as the two largest per capita consumers of prescription opioids (Costello & Thompson, 2014). The United States comprises 4% of the world’s population, yet we consume 86% of all the opioids and 99% of the hydrocodone available (Bates, Laciak, Southwick, & Bishoff, 2011; Jawad, et al., 2015). According to the National Center for Health Statistics, as of 2011, opioid drug overdose deaths had increased for the 11th consecutive year (U.S. Department for Health & Human Services, 2014). This report demonstrates that deaths from opioid-poisoning (intentional and unintentional) have increased from 1.4 per 100,000 persons in 1999 to 5.4 per 100,000 persons in 2011 (age-adjusted). During the last ten years, the greatest increase in deaths occurred among adults aged 55-64 and non-Hispanic white persons. Deaths from prescription opioids are occurring at a greater rate than heroin and cocaine combined (U.S. Department of Health & Human Services, 2011). Jones, Mack, & Paulozzi (2013) have stated that due to the limitations of death certificates, these figures probably represent an undercount. These figures may also be changing due to the recent opioid prescription regulations causing those with SUD to move to street drugs, like heroin, to avoid the throes of withdrawal. The National Institute for Drug Abuse (NIDA) has provided the following most recent statistics for opioid deaths in the U.S.:

Table 2 Mortality Data for Opioid Use: 2010-2018

Opioid	Number of Deaths	Percentage Deaths
Fentanyl	19,413	45.9
Prescription Opioids	17,087	40.4
Heroin	15,469	36.6
TOTAL	42,249	

*NIH – National Institute on Drug Abuse (NIDA)

This is a substantial increase from 2010 when deaths from Fentanyl were only 3,007 (14.3%). NIDA has estimated that at least 50% of all opioid-related deaths involve fentanyl because it is compounded with many other illicitly-obtained drugs such as cocaine, barbiturates, and antidepressants (National Institute for Drug Abuse, 2018).

In the state of Washington alone, opioid prescriptions increased 500% from 1997-2006. In 2006, the Centers for Disease Control and Prevention (2009) identified Washington State as having the highest tertile of mortality (10.8 deaths/100,000) in the United States. In that same year, it was noted that 10,000 persons on public assistance in Washington, were taking at least 120mg MED (morphine-equivalent dosing) per day (Franklin, et al., 2015). These statistics leave us wondering how it could get so badly out of control – and so quickly.

Historical Timeline. During the 1980s, the rate of iatrogenic addiction was only 0.03% to 0.1 %, so it was not considered a serious problem and physicians became more comfortable prescribing opioids for their patients (Beauchamp, et al., 2014). This was further encouraged by a five-sentence letter in the New England Journal of Medicine (Porter & Jick, 1980). Rummans, Burton, & Dawson (2018) summarize:

> In 1980, a 1-paragraph letter to the editors of the New England Journal of Medicine challenged the practice of using opioids only for relief of <u>acute pain</u> [emphasis added]. The authors of the letter, after a retrospective review of their records, stated that only 4 of

> 11,882 patients who had pain and were given opioids became addicted to them. Subsequently, this 5-sentence letter was referenced over 600 times in support of using opioids for chronic pain [emphasis added]. (p. 345)

During this time, the World Health Organization (1986) touted opioid medication as an appropriate and effective treatment for all forms of pain. Journals and textbooks followed suit. The American Academy of Pain Medicine and the American Pain Society advocated the safe use of opiates for chronic pain (Rummons, Burton, & Dawson, 2018).

It was in 1995, when Purdue Pharma developed a long-acting oxycodone (Oxycontin©), which was subsequently approved by the Food and Drug Administration, that the real marketing began. Physicians were lured with free trips to exotic locations to hear representatives describe the wonders of Oxycontin©, with its low incidence of side effects, for the relief of severe chronic pain. A short video, "I Got My Life Back" told the stories of six patients who had been successfully treated for chronic, noncancer pain with Oxycontin©. It was then that the number of prescriptions for oxycodone increased from two to three million per year in 1990 to eleven million by the end of the decade (Rummans, Burton, & Dawson, 2018).

A search of the literature has shown that there have not been enough randomized clinical trials or enough longitudinal research to accurately document the nature and extent of the problem of iatrogenic addiction (Beauchamp, et al., 2014; Cicero, & Ellis, 2017; Reynolds, 2009), though a systematic review and meta-analysis of 12 studies (involving 310,408 participants) done by Higgins, Smith, & Matthews (2018) reported an iatrogenic addiction rate of 4.7%. Cicero and Ellis (2016) reported the results of 125 interviews with patients who had developed SUD (substance use disorder):

> …relatively few studies have looked at the progression of use from very first exposure to an opioid to a formal DSM-5 diagnosis of substance use disorder (SUD), and most important, whether there were differences in those whose first exposure to an opioid was a prescription for pain as contrasted to those who simply experimented with opioids for their mood-altering effects…our results suggest that self-treatment of co-morbid psychiatric disturbances is a powerful motivating force to initiate and sustain abuse of opioids and that the initial source of drugs—a prescription or experimentation—is largely irrelevant in the progression to a SUD (p. S4).

Since the United States is in the midst of an opioid crisis that some believe is caused by the over-prescription of opioid medications, especially after surgery, one of the indicators of successful management of pain must include the patient's ability to discontinue opioid medications when they no longer need them. This will be discussed in more detail in Chapter Three.

Barriers to Discharge Teaching

The barriers to patient education for adequate pain management are multifactorial and include: 1) *patients* – under-reporting their pain and reacting to their fears of tolerance, dependency, and addiction; 2) *providers* (nurse practitioners and physicians/PAs) – insufficient knowledge of pain assessment and therapy; 3) *health care system* – abbreviated hospital stays, inadequate hospital staffing, insufficient follow-up after discharge, lack of appropriate preoperative preparation (Vadivelu, et al., 2012). The fears and concerns of patients have been discussed and the problems with the health care system are straightforward and well-known to health care providers. What is interesting and receiving recent attention in research is the inadequacy of pain management knowledge for health care providers – physicians and nurses. Literature describing advanced practice nurses' comfort level with managing acute postoperative

pain was not available but there have been several studies on physician confidence with pain management and nurses' knowledge of narcotics and pain assessment/relief. Both groups of professionals have been described as lacking in both knowledge and confidence in dealing with patients' pain, both chronic and acute.

Physician barriers. A Canadian study of pain management education in medical school curricula found that medical students received 16 hours of pain management teaching while veterinary students received 87 hours (Beauchamp, et al., 2014). This lack of knowledge and confidence can result in iatrogenic addiction and undertreated pain (Beauchamp). It can also lead to "pseudoaddiction," a controversial and unsubstantiated behavioral disorder (Guastella, Latchman, & Tofthagen, 2017; Higgins, et al., 2018) that is the result of undertreated chronic pain. It is manifested when the patient exaggerates pain symptoms, is constantly asking for pain medication, knows when all the medications are due, and asks for them right on time—symptoms easily confused with addiction and which must be ruled out whenever addiction is suspected (Kirsh, et al., 2014; Kwon, Tanco, Hui, Reddy, & Bruera, 2014; Weissman & Haddox, 1989).

A recent paper on pain relief in the United States noted, "half of primary care physicians report feeling only 'somewhat prepared' to counsel patients about pain, and 27% feel 'somewhat unprepared' or 'very unprepared'" (Pizzo & Clark, 2012, p. 198). A study in Norway with physicians and nurses demonstrated that "31% of the participants reported only low or basic understanding of postoperative pain management and 81% reported only low or basic understanding of neuropathic pain" (Rognstad, et al., 2012, p. 551). These figures raise concern, given the numerous studies that demonstrate inadequate postoperative pain management (Apfelbaum, et al., 2003; Pizzo & Clark; Wahowiak, L., 2014; Zalon, 2014).

Until recently, medical education did not set a priority on educating for pain management, as seen in the studies below, so it was up to physicians to utilize continuing education resources to gain additional knowledge in this aspect of patient care. Unlike the nursing profession, which has been carrying out research all over the world on nurses' knowledge and attitudes toward acute pain management (See "Nurse Barriers" below), studies of this type have not been done in medicine, making it difficult to ascertain how much of a knowledge deficit exists among physicians in this area or how many utilize continuing education to learn about management of chronic pain.

A deficiency of adequate education in pain management does not just affect treatment, it also affects attitudes, frequently seen by patients as lacking empathy and caring. Webster, et al., 2018, described their study of databases and journals related to medical education, "The findings highlight significant discrepancies between the prevalence of chronic pain in society and the low priority assigned to educating future physicians about the complexities of pain and the social context of those afflicted" (p. 1467). Loeser & Schatman, 2017, found similar concerns in their study, "The prevalent negative attitudes of physicians toward patients with chronic noncancer pain begins early in medical school. The literature supports the notion that undergraduate medical students are concerned about treating patients with chronic pain, as a qualitative study found that most medical students had a negative perception of their encounters with pain patients, with chronic pain being the condition most difficult with which to deal" (p.332).

In 2009, twenty senior medical students from Yale University Medical School attended a 5-hour symposium on pain and when they were surveyed at the close of the symposium, most stated that until they had attended these presentations on pain management, they had not realized how inadequately prepared they were to manage the different types of pain experienced by

patients. Based on this study, Yale immediately made courses on pain management mandatory in their curriculum for the medical school (Lukachko, 2009; Vadivelu, et al. 2012).

In 2011, Johns Hopkins School of Medicine did a study on pain education in North American medical schools (Mezei, Murinson, & Johns Hopkins Pain Curriculum Development Team, 2011) and found that:

> Using a novel systematic approach to assess educational content, we examined the curricula of Liaison Committee on Medical Education-accredited medical schools between August 2009 and February 2010. A total of 117 U.S. and Canadian medical schools were included in the study. Approximately 80% of U.S. medical schools require 1 or more pain sessions. Among Canadian medical schools, 92% require pain sessions. Pain sessions are typically presented *as part* [emphasis added] of general required courses. Median hours of instruction on pain topics for Canadian schools was twice the U.S. median. Many topics included in the International Association for the Study of Pain core curriculum received little or no coverage (p.1199).

It is important to note that issues of adequate pain management education are not confined to the United States and Canada. In their review article on undergraduate medical education, Vadivelu, et al. (2012) studied education in Finland, the United Kingdom, Australia, New Zealand, India, and other developing countries, and found that the lack of pain management education existed among all to greater or lesser degrees.

Progress is being made. According to the American Association of Medical Colleges (AAMC), as of 2014, 137 of 140 medical schools surveyed (97.9%) now have a required course for pain management. This is an increase from 3% in 2001 (AAMC, 2015). The United States Medical Licensing Examination (USMLE) has indicated a desire to include questions on pain

management in it licensing exam. The have arranged for a panel of experts in pain to design questions for the exam. It is expected that medical schools will be motivated to provide this education since it will affect the licensing scores of their graduates (Loeser & Schatman, 2017).

Nurse barriers. There has been an increasing number of studies exploring the knowledge and attitudes that nurses, student nurses, and faculty members in schools of nursing have toward pain. One research project involved a quasi-experimental, pre- and post-test educational intervention design that was conducted in one institution in Kentucky. The sample consisted of 340 medical-surgical and critical care nurses who took the Brockapp-Warden Pain Knowledge/Bias Questionnaire before and after the intervention. Sixty patients (30 pre-intervention and 30 post-intervention) numerically assessed their pain every two hours and recorded the assessments in a diary. Their medical records were examined to compare the nurses' assessments with the patients'. Post-intervention demonstrated that: 1) there was a 50% decrease in mean difference between patients' and nurses' assessments, 2) there was no significant difference in knowledge or bias scores, 3) patients with non-physiological pain issues received less attention than did patients with clearly defined physical problems. This hospital, concerned with the results, initiated a Pain Steering Committee to better evaluate and institute changes in the way they assessed and managed patients' pain (Schreiber, et al., 2014)

Another study took place in Texas and examined nursing faculty knowledge and attitudes about pain management using a descriptive correlational design. The sample consisted of 96 faculty members from sixteen schools in one mid-western region. Along with collecting demographic and professional data from faculty, they also were given the 38-item Knowledge and Attitudes Survey Regarding Pain (KASRP). Although most participants taught pain management in their classes, fewer than 50% used specific guidelines in planning this segment

of their teaching (See Arnstein & St. Marie, 2017). Fewer than 50% of faculty felt adequately prepared to deal with pain management. The major areas of weakness demonstrated by KASRP responses involved knowledge on the topics of medications, interventions, and addiction. Younger faculty remembered being taught pain management in school and were more likely to use pain management standards that included these topics in their teaching*. This was also true of older faculty who utilized continuing education of various means to supplement their knowledge of pain and pain management (Voshall, Dunn, & Shelestak, 2013).

Moceri and Drevdahl (2014) employed a descriptive design using the KASRP and a demographic survey with a sample of 91 emergency department nurses from five emergency departments. The mean score was 76%, somewhat higher than other studies using this tool. However, eight questions were answered incorrectly by more than 50% of the RNs in the study; 1) five questions dealt with opioid pharmacology and dosage, 2) two questions dealt with addiction and dependence, and 3) one question dealt with assessment and patient's level of reported pain. In the analysis, it was noted that experience did not correlate with correct responses and higher education levels had only a weak positive correlation. These results support the *Pain in America* recommendation to increase pain management education for all health care providers (Moceri & Drevdahl, 2014).

* Several organizations offer guidelines for pain management in general, as well as guidelines for specific types of pain, e.g. the American Society for Pain Management Nursing (Drew, Gordon, Morgan, & Manworren, 2018), the Joint Commission on the Accreditation of Hospitals (2017), the American Academy of Pain Management (2013), the National Institutes of Health (Garimella & Cellini, 2013), and the American Pain Society (National Pharmaceutical Council, 2001).

The knowledge deficit for adequate pain knowledge and management is not exclusive to nursing in the United States. With the recent interest in this topic, many other countries are also conducting studies to determine the extent of the need for increased education among their own professionals. Abdalrahim, Majali, Stomberg, and Bergbom (2011) conducted pre- and post-questionnaires with 65 nurses to assess the educational aspect of a postoperative pain management intervention in a Jordanian hospital. The scores on the questionnaires increased 75% after the educational program was completed.

Aziato and Adejumo (2014) interviewed 14 nurse educators and leaders in Ghana and the results showed that inadequate knowledge of pain management involved many factors: "curriculum gaps during training; inadequate clinical supervision, study days, and workshops for practising nurses; lack of funding for organising regular workshops; and, negative attitudes of nurses whereby new information learned at workshops was not readily applied in clinical practice" (p. 195). They concluded that credit courses for pain management need to be incorporated into the nursing curricula in Gahanian nursing programs.

Eid, Manias, Bucknall, and Almazrooa (2014) administered the KASRP survey to 593 national and international nurses employed in Saudi Arabia. The mean score was 16.9 out of a possible score of 40. The findings identified areas of both "inadequate knowledge and inappropriate attitudes" in the management of patients' pain. The researchers recommended the development of pain programs and a change in policies that would involve national and international nurses.

Kiekkas, et al, (2015) recruited 182 multi-departmental postoperative nurses in Greece to complete a three-part questionnaire that included the KASRP, modified for postoperative pain. The results provided evidence of inadequate education and negative attitudes regarding pain

management, “Average scores were 45.35% for modified KASRP tool; 28.57% for pain assessment; 55.44% for general pain management; and 47.13% for use of analgesics. Four of the five most commonly missed items referred to use of analgesics” (p. 2). They also noted that nurses who had more experience and education scored higher than their colleagues who had less, highlighting the need for undergraduate and continuing education for nurses in the area of pain management.

Lui, So, & Fong (2008) conducted a cross-sectional study using the Chinese version of the KASRP (NKASRP-C) with 143 nurses working in medical units at a public hospital in Hong Kong. A deficit in the knowledge and attitudes toward pain was described as “prominent” (p. 2014). The ranges of scores was 47-72 and they noted that the higher scores were consistent with more experience in the clinical area.

Quality of Discharge Education

Health care providers write the discharge prescriptions and the nurses ascertain that the patients understand their medications prior to discharge. Depending on the hospital, it could be the physician, physician’s assistant or nurse, the pharmacist, or the patient’s assigned nurse who does discharge medication teaching (Tarn, et al., 2009), but the final responsibility for confirming that patients have all the information they need does, indeed, lie with the discharging nurse (Pasero & McCaffery, 2011). It is clear from the literature, however, that adequate discharge teaching does not always happen (Kane, Shamliyan, Mueller, Duval, & Wilt, 2007; Stamp, Flanagan, Gregas, & Shindul-Rothschild, 2014; Weiss, Yakusheva, & Bobay, 2011). Even when patients do receive teaching, they are receiving it “under the influence”, while they are groggy, stressed, and, in the case of the older patient, possibly cognitively impaired

(McCarthy, et al., 2014). It is also not clear that they are being taught all the information that they need to know.

Studies have shown that patients often do not feel prepared for discharge (Ashbrook, Mourad, & Sehgal, 2013; Flacker, Park, & Sims, 2007; Maloney, & Weiss, 2008; Tocher, Rodgers, Smith, Watt, & Dickson, 2012; Ziaeian, Araujo, Van Ness, & Horwitz, 2012). Some patients who expressed satisfaction with the medication information they received demonstrated that they really knew very little about their medications (Borgsteede, Karapinar-Carkit, Hoffmann, Zoer, & Van den Bemt, 2011; Kerzman, Baron-Epel, & Toren, 2005; Micheli, et al., 2007). Other studies have investigated the medication adverse events that occur after discharge and have noted that some are related to opioids (Costello & Thompson, 2014; Krumholz, 2013; Oderda, Gan, Johnson, & Robinson, 2013; Pizzi, et al., 2012). Prominent causes suggested for insufficient discharge teaching are the rapid turn turnaround from admission to discharge for the patient, lack of consistency in nurse assignments, inadequate nurse-patient ratios in nurse staffing, and inadequate nurse knowledge of opioids (Kalisch, & Xie, 2014; Kankkunen, et al., 2003; Matthews & Malcolm, 2007; Papastavrou, Andreou, & Efstathiou, 2014).

A Canadian qualitative study that used a purposive and convenience sample of 18 participants with a mean age of 58.1 years, investigated how patients' expectations of their medications influence how they take them and found that "many participants acted on their expectations by changing their medication regimens on their own…" (Dolovich, et al., 2008, p. 384) – this is information that is extremely important for the health care provider to know if the patient's medications include opioids. A study in Switzerland demonstrated that patients knew significantly less about their newly prescribed medications (438/588; 75%) five days after discharge than they did about the medication they had been taking prior to admission to the

hospital (944/1105; 85%). In this same study, analgesics were mentioned but no distinction was made between acetaminophen and opioids (Micheli, et al., 2007, p. 617).

Research has been published for some time on the topic of the discharge teaching about medications in general (Borgsteede, et al, 2011; Costello & Thompson, 2014; Louis-Simonet, et al., 2004; Tarn, et al., 2009). However, over the last few years, articles focusing on the discharge teaching about opioid medications have been increasing (Clarke, Soneji, Ko, Yun, & Wijeysundera, 2014; Cochran, et al, 2014; Costello & Thompson, 2014; McCarthy, Engel, Courtney, Adams, & Cameron, 2013).

Only recently has the concept of educating patients with respect to the addictive potential of opioids been seen in the literature – this does not mean that it has not been discussed with patients, it only means that it has not been written about (Beauchamp, et al., 2014; Clarke, et al., 2014; Pasero & McCaffery, 2011; Reynolds, 2009). Journal articles have included discussions of iatrogenic addiction written specifically for health care providers (Beauchamp; Higgins, et al., 2014; Weissman & Haddox, 1989; Waljee, Brummett, & Englesbe, 2017). However, as was stated previously, patients have told this researcher that they find some of their information in the media, in books, or through the experience of friends and family—information that is not always reliable. It is possible that many patients do not know the difference between tolerance, dependence, and addiction, but no reference was found to indicate that this had ever been measured.

Another serious issue is the combination of opioids and acetaminophen. If patients are not clear that their prescription pain medication has acetaminophen in it, it would be very easy for them to overdose on the acetaminophen when they are using it alone for headaches or arthritis, in addition to taking Percocet (oxycodone/acetaminophen) or Norco

(hydrocodone/acetaminophen) for postoperative pain (Costello & Thompson, 2014). A search to find studies that have attempted to discover a correlation between what patients know about their opioid medications and whether or how, this knowledge assists them in making the complex decisions they need to make during post-operative self-medication was unsuccessful.

Research has been published on the topic of discharge teaching about medications in general (Borgsteede, et al, 2011; Costello & Thompson, 2014; Louis-Simonet, et al., 2004; Tarn, et al., 2009) and while helpful, many of these studies have older patients as the focus, presumably because they have more comorbidities and therefore more medications than younger patients. The studies do not, however, provide useful data regarding the teaching of opioid medications—information that concerns the Postoperative Pain Management Study.

Research Purpose and Questions

The purpose of the Postoperative Pain Management Study (PPMS) is to determine if there is a correlation among: 1) the change in patient opioid knowledge, comparing scores at the time of admission to scores at the time of discharge from the hospital, 2) patient opioid knowledge alone at the time of discharge, 3) the quality of pain management for the patient, and 4) the experience of pain management for the patient when they return home. The research questions include quantitative, qualitative, and mixed methods questions. The first phase of this dissertation study is quantitative and is focused on the data to be obtained through the Admission and Discharge surveys. The second phase will have quantitative and qualitative data collected concurrently (See Figure 5).

Phase 1 Questions

The Phase 1 hypotheses for the postoperative pain study are:

RQ1) What is the change in opioid knowledge from admission to discharge from the hospital? It was hypothesized that participants would demonstrate an increase in opioid knowledge from admission to discharge.

RQ2) What is the level of opioid knowledge at the time of discharge from the hospital? It was hypothesized that participants would score at least 75% on the Discharge Survey, thereby demonstrating adequate opioid knowledge at the time of discharge.

The first question involves comparing scores from both surveys and will be indicative of the amount of knowledge the participant acquired between the clinic visit and hospital discharge, from all sources. The second question refers to the actual knowledge with which the patient leaves the hospital, regardless of how it was obtained, and demonstrates whether the patient knows what they need to know in order to medicate themselves in a safe manner. It is expected that the quality and experience of pain management will be described by participants as more successful in those who have the highest change scores and in those who have the highest Discharge Survey scores.

Phase 2 Questions

The Phase 2 questions for the postoperative pain study are listed below. It is important to note that since this is a mixed methods study, the information obtained from the Phase 1 of the research informed the questions in Phase 2 of the study

RQ3) How has their ability to control their pain affected their perceived quality of life? It was hypothesized that there would be a correlation between daily number of opioid doses and daily pain relief with quality of life (QOL scales).

RQ4) How did the patient perceive their experience of pain management after discharge from the hospital?

RQ5) What does the patient wish they had known, but did not know, prior to beginning self-medication for pain at home?

Mixed Methods Questions

The *mixed methods questions* were developed with the entire study in mind and include quantitative and qualitative elements. The mixed methods questions are *linked conceptually* and are stated in a content-focused format:

RQ6) Is there a relationship between the amount of change in opioid knowledge during hospitalization and the quality and experience of pain management?

RQ7) Is there a relationship between opioid knowledge at the time of discharge and the quality and experience of pain management?

Significance of Research Hypotheses and Questions

It is clear from the research that patients are being under-medicated either by their own choice, inadequate discharge teaching, or because they are not being prescribed the correct medications or dosages for their type of pain (Chan, et al., 2013; Reynolds, 2009; Vadivelu, et al., 2012). The literature shows that some providers do not feel that they have the knowledge to deal with the complex pain issues experienced by their patients or that they do not spend much time discussing these issues with the patient (Beauchamp, et al., 2014; Pizzo & Clarke, 2012). This study may serve as a source of reflection for all providers who regularly treat patients in pain.

Professionals become accustomed to medicating patients, going through the process automatically, and do not always consider just how complex a process this is for patients once

they return home. It is difficult to imagine how patients negotiate this process without sufficient discharge teaching and easy to see how mistakes can be made. Below is just a sample of questions patients may ask themselves as they make decisions on how to manage their pain at home, some of which this researcher has discussed with patients during many discharge teaching sessions in her practice. The five constructs were drawn from Pasero & McCaffery, (2011):

1) *Assessing the pain* – How bad is the pain? Does it feel different or is it the same as before? It hurts worse today. Is this normal or did I do something wrong?

2) *Determining treatment* – Do I need medication or will something else work just as well? Should I use an NSAID, an opioid, or a muscle relaxer? Should I apply ice or heat? Maybe I just need some exercise.

3) *Monitoring the reaction to the treatment* – This is not working. Should I take an extra dose? Every time I take this medication, I feel queasy, should I keep taking it? I have not had a bowel movement in two days, what would be the best thing to do?

4) *Defining activity limitations* – No one can drive me to my doctor's appointment this afternoon. Should I take my pain medication and just drive slowly or should I go without any medication? I don't think I could walk without the medication.

5) *Building on knowledge and experiences* – When I felt this way last week, a muscle relaxer and some heat helped me. It was difficult climbing those stairs but the last time I did them, I felt much better that evening so I think I will climb them again.

As mentioned previously, Medicare and Medicaid are closely monitoring patients who return to the hospital within thirty days and will not pay for diagnoses for which the hospital was responsible (Joynt, & Jha, 2012; Kassin, et al., 2012; Ma, et al., 2015). Medication errors that occur because of inadequate discharge teaching, especially those involving opioid medications,

could have serious economic and legal repercussions for the institution (Leape, 2015). It is hoped that results of the pain management study will assist nurses, health care providers, and institutions with developing preventative interventions to increase the safety for patients, who will be taking opioids postoperatively, and thereby prevent adverse events post-discharge.

When patients understand the complications of prolonged opioid treatment, they can work with their health care providers to develop a plan to move from opioids to milder pain medications when they are ready. This is why the practitioner-patient relationship is so important as the patient moves through this complex transition. Patients will be more likely to confide in a practitioner or home care nurse whom they feel will take the time to listen to their concerns and fears, will not judge them, and who appears to understand their perspective. With these simple practices, a provider may prevent what might be the beginning of a life-long dependency on prescription pain medications.

The Postoperative Pain Management Study (PPMS) measured the opioid knowledge that patients had when they were first seen in the clinic and, again, when they left the hospital. The PPMS also followed a subset of patients after discharge and measured their pain control and quality of life, as well as obtaining patient descriptions of their experience with the process of learning self-medication for pain management. The Theory of Transitions was used to explain how patients make the transition from professional pain management to self-management of pain and will be discussed in the next chapter.

Chapter 2: The Transitions Theory Model

Chapter Abstract

Using a pragmatic worldview, the Postoperative Pain Management Study (PPMS) was designed as a explanatory sequential mixed method study that sought to determine how much patients knew about their opioid pain medications prior to hospital discharge and consequently, whether there was a relationship between that knowledge and the patients' experiences of pain as they medicated themselves at home. The experience of the patient was elicited through quantitative means (medication records and quality of life scales) and qualitative means (daily journal entries and a phenomenological, semi-structured interview) after their discharge to home. The foundation of this experience is a "transition" so the middle-range Transitions Theory of Afaf Ibrahim Meleis (2000) was used as the basis for this research.

Transitions Theory

Pragmatism

Pragmatism has been described as the one of the most appropriate worldviews for Mixed Methods Research (MMR) because it draws on "what works." It has been discussed by many historical scholars, such as John Dewey (American philosopher, psychologist, educational reformer), William James (American philosopher, psychologist, and physician), and Charles Sanders Pierce (American philosopher, logician, mathematician, scientist, and the "Father of Pragmatism"). Pragmatism uses diverse approaches, multiple ideas, and equally values subjective and objective knowledge in the following ways (Creswell & Plano Clark, 2011):

1) both quantitative and qualitative research methods may be used in a single study,
2) the research question should be of primary importance—more important than either the method or philosophical worldview that underlies the method,

3) the forced-choice dichotomy between post-positivism and constructivism should be abandoned,
4) the use of metaphysical concepts such as "truth" and "reality" should also be abandoned, and
5) a practical and applied research philosophy should guide methodological choices (Also Teddlie & Tashakkori, 2009).

These points make it possible for MMR to support transformative and emancipatory research without further marginalizing participants.

Looking at some of the key issues in social science research methodology from a pragmatic perspective demonstrates why pragmatism works very well with mixed methods. Morgan (2007) chose the three issues and described each issue according to qualitative, quantitative, and mixed methods approaches (presentation will be in this order of approaches). *Connection of theory and data* is described as induction – deduction – abduction. Abductive reasoning "moves back and forth between induction and deduction—first converting observations into theories and then assessing those theories through action" (p.71). *Relationship to research process* is described as subjectivity – objectivity – intersubjectivity. Intersubjectivity represents a pragmatic reaction to the notion of incompatibility. Morgan explicates, "In a pragmatic approach, there is no problem with asserting both - that there is a single "real world" and that all individuals have their own unique interpretations of that world" (p. 72). *Inference from data* is described as context – generality – transferability. Transferability was borrowed from Lincoln & Guba (1985) and asserts that we cannot assume that our research is transferable from one context to another. It might well be transferable, however, this is a concept that needs to be investigated in the context of the data obtained. These concepts are particularly important

when the research involves issues of pain and its management which may have varied meanings and contexts depending on age, sex, culture, class, the existence of multiple comorbidities, etc.

The Ladder of Abstraction

To understand theory development and the role of middle-range theories in nursing, it is helpful to use the Ladder of Abstraction (Smith & Liehr, 2014). The ladder has three rungs (Figure 1). These levels of abstraction can be compared with Morgan's (2007) key issues above. The top rung is the most abstract and deals in paradigms – worldviews that include the perspectives and values of the discipline on the philosophical level. There is a horizontal aspect to the abstraction on each level, moving from left (least abstract) to the right (most abstract). The three paradigms on the top rung are, from left to right: 1) *particulate-deterministic paradigm* – the human being is viewed as an isolated entity – an entity with concrete properties that can be measured; relationships within and without the entity are linear and causal; change is a consequence of antecedent conditions that when defined and understood have the ability to predict and control the change; nursing care involves a knowledge base grounded in the biophysical sciences (Newman, Sime, & Corcoran-Perry, 1999), 2) *interactive-integrative paradigm* – the human being is a reciprocal interacting entity; the paradigm takes into account context, experience and subjective data; reality is multidimensional; change is a unpredictable and a phenomenon that can be precipitated by multiple prior events and probabilistic relationships; nursing care is based on the principles of the social sciences (Newman, et al.), 3) *unitary transformative paradigm* – the human being is unitary; the inner self is a reflection of how one views the world around him/her; change is inevitable, creative, and unpredictable; nursing care is based on holistic practices and interventions (Levin, 2006).

The second rung of the ladder is the Theoretical Level and explicitly comprises theories of the human health experience, such as: meaning, self-transcendence, experiencing uncertainty, suffering, vulnerability, and symptoms. The theories are again placed in order of abstraction from left to right. Grand theories are on the right, then comes middle-range theories, and the micro-range theories are on the left. Micro-range theories have been defined as, "those that closely reflect practice events or are more readily operational and accessible to application in the nursing practice environment" (Smith, 2014, p. 9). Im & Meleis (1999) described micro-range theories as theories that focus on "specific nursing phenomena that reflect clinical practice and that are limited to specific populations or to particular fields of practice" (p.13). For example, if this current study on postoperative pain management involved working with a Native American population instead of a convenience sample from a large metropolitan hospital, everything about the conduct of the study would change. It is likely that the experience of pain in this population would have different meanings and their beliefs would be predicated on antecedent events that shape how they understand the treatment of pain. This specificity brings the level of theory to a more concrete level than middle-range theories in general – thus, bringing it to a lower level of abstraction.

On the lowest rung of the ladder, we have the Empirical Level. The elements of this level include the instruments by which measurements in research are obtained. Again, the research measurements move from the least abstract (physiologic indicators) to the most abstract (narrative). Other versions (Figure 2) of the abstraction model have nursing practice on the left of the empirical rung as a natural, and even more concrete, outworking of the results of research (Smith & Liehr, 2014, pp. 24-33). When one is having difficulty with understanding a certain research design, it helps to investigate the philosophical and theoretical perspectives forming the

foundation for the research. Alternatively, if one cannot grasp a theory, it helps to move up the ladder to study the philosophical roots and move down to examine the research formed by this theory. It is important that nurses consider the ladder of abstraction when designing a study since all three levels should be within the same level of abstraction (Smith & Liehr, 2014).

Having looked at the way philosophical and theoretical knowledge work in tandem to inform research and practice, it will be easier to understand where and how middle-range theories fit into the scheme of nursing research in general, and the Postoperative Pain Management Study in particular.

Middle-Range Theory

Middle-range theory is not a type of theory but is a way to approach the construction of theory. The term was developed by Robert K. Merton, a sociologist, who wanted to move away from general social theorizing and to integrate theory with empirical research—a very new concept at that time. He believed that, "Sociological theory, if it is to advance significantly, must proceed on these interconnected planes: 1) by developing special theories from which to derive hypotheses that can be empirically investigated, and 2) by evolving a progressively more general conceptual scheme that is adequate to consolidate groups of special theories" (Merton, 1968, p. 51).

Similarly, from a nursing perspective, middle range theories contrast with the broad, grand theories in that they have clearer boundaries, focusing on more concrete concepts and relationships within nursing knowledge. Since they have links to research and practice, they can be developed inductively through qualitative research or deductively through quantitative research. As the knowledge of middle-range theories expands, development of research and practice is enhanced (Smith, 2014).

Transitions Theory and Self-Management of Pain

A return to the ladder of abstraction will show how the theory of transitions fits into the various rungs of the ladder (Figure 2). The philosophical basis for the transitions theory is the interactive-integrative paradigm. This paradigm reflects the interactions of patient-nurse, patient-family/friends, patient-community, and patient-environment. The theory embraces several assumptions (Figure 3). First, there are four categories of transitions: developmental, situational, health-illness, and organizational. The category for the PPMS is *health-illness* since it is dealing with discharge from the hospital and the assumption of a new role by the participant who will now be managing their pain and pain medications. Second, transitions patterns are dynamic and complex, depending on the person, situation, and resources involved. The second part of the PPMS used the participant's journal and the final interview, to evaluate the complexity of the participant's transition and to determine the resources available and whether they have helped or hindered the transition. Third, meanings attached to health-illness situations are influenced by the transition conditions and these conditions, in turn, influence the health-illness meanings. This includes a host of influences: age, sex, race, ethnicity, personality characteristics, attitudes, beliefs, values, marital expectations, and degree of idealization, etc. (Kralik, et al. 2006). The demographic questions from the Admission Survey in Phase 1 of the PPMS and the interview from Phase 2 of the study provided information as to the meanings that pain and pain medications have for the patient. It also provided some insight into how the patient interpreted their beliefs about pain and pain medication and how this interpretation affected how they understood the transition process.

Finally, the relationship between nurse and patient is a reciprocal one that shapes the transition. For those who completed the entire study, a series of nurses provided portions of their

care – preoperative nurses, postoperative nurses, home care nurses (if this was ordered) and, possibly, physical and occupational therapists as well. The participant interactions with each nurse/therapist influenced, to varying degrees, the tone and movement of the transition process. How participants interpret these interactions when in the hospital, determined how they viewed their discharge, their transition, and the self-confidence they had that they would be able to successfully manage their pain at home. The home care nurse was responsible for assessing the participant's knowledge of discharge instructions and their progress, until it was determined that physician follow-up was sufficient. The home care nurse was also a resource when questions arose. The rapport that develops between the nurse and the patient determined how comfortable the participant felt calling with questions and how they perceived the significance of the information given to them by the nurse.

The second rung of the ladder comprises the entire transitions theory model and lists each of the six concepts: type and patterns, properties, conditions (facilitators and inhibitors), process indicators, outcomes indicators, and nursing therapeutics. The definition of these concepts was integrated with the way in which they were understood and measured for the PPMS (See Figure 2 and Figure 3 for comparison).

The first section of the transitions model deals with the **Nature of the Transition**. The Type of transition for the PPMS is a health/illness transition. It follows a Pattern of multiplicity and complexity since the participant may be dealing with other transitional issues besides the pain management under study, evidence that transitions are "not discrete or mutually exclusive" (Meleis, et al., 2000, p. 18). Depending on the surgery, the person may need teaching and assistance with dressings, activity limits, diet, physical/occupational therapy (PT/OT), general medications, and physician visits – not only with keeping track of the visits but also with having

an available mode of transportation and the finances to pay for it. This may or may not have been a problem, depending on the existence and quality of the participant's medical insurance and their living situation. Each of the above issues was viewed with an eye to the participant's progressive independence in assuming their activities of daily living as they recovered from surgery.

The transition for the PPMS was sequential in some respects and simultaneous in others. For example, when the participant arrived home after discharge, immediate concerns about medication(s), mobility for toileting, and diet occurred simultaneously, but as the participant recovered, activity limits likely became more important, as did follow-up visits to the physician. The possible transitional issues for the participant are listed above and in Figure 4 (Patterns). The pain management study concentrated only on the process of self-medication for pain management. Five constructs of *opioid knowledge* were measured with the Admission and Discharge surveys (Appendices A & B). The definitions, expectations, and utility of these constructs for the patients are as follows (Appendix C1):

1) *Pain scale use*: It was expected that participants were taught how to measure their pain using a 10-point Likert scale—0 (*none*) to 10 (*extreme*)—prior to self-medication and knew how to use the scale to determine which medication and dosage (if range is given) to administer.
2) *Identification of prescribed pain medications*: Participants were expected to know the trade and generic names of the pain medications they were prescribed after discharge. It was not necessary for them to know the dosage, frequency, and how it should be taken, but they were expected to be able to independently find the information on the medication container or in their discharge information.

3) *Opioid side effects*: Participants were given the option to choose the most common side effects from a list of medication side effects.

4) *Opioid precautions*: Precautions include safety concerns, such as knowing any interactions their pain medications might have with their regular medications and how this should be handled (i.e. taking the medications at different times; having their blood checked more frequently if they are on a blood-thinner, etc.); not operating machinery; not driving a car; not sharing medications with those for whom they are not prescribed; not drinking alcohol with opioids; checking with the physician before taking opioids with OTC (over-the-counter) medications; how to dispose of unused opioids in their city/town; able to distinguish between opiate tolerance, dependence, and addiction; and taking medications exactly as prescribed.

5) *Alternative treatments for pain* – participants were expected to be able to list at least three non-pharmaceutical means of relieving their pain, e.g. heat/cold, distraction, massage, deep breathing, listening to music or relaxation recordings, or going for a walk (Borgsteede, et al., 2011).

The Properties of the transition experience are equally multidimensional. Meleis, et al. (2000) describe them as not being discrete but rather "interrelated properties of a complex process" (p. 18). *Awareness* is the recognition that one is going through a transition, coupled with their perception of the process and the knowledge they bring to the process. Chick and Meleis (1986) believed that awareness was requisite for the initiation of the transition, however, Meleis, et al. (2000) posit that a transition can begin without the patient's awareness of it as such, e.g. menopause is a transition, but in some cultures, it is perceived only as the cessation of menstruation (Im, 1997). So, the question is, "Whose awareness of the transition process initiates

the transition – the nurse's or the patient's?" The answer to that question is up for discussion but for most transitions, without patient awareness, the process stalls (Meleis, et al., 2000). For the PPMS, it was expected that since the patients volunteered to participate in the project, they were aware of their transition process. *Engagement* occurs when the participant takes an active role in each aspect of the transition process. This might involve searching for information, practicing a skill, modeling, or modifying activities for the situation. The level of awareness influences the patient's level of engagement (Meleis et al., 2000). Using the postoperative study as an example, a participant who is not engaged with their new role, may relegate their care to another person, depending on this person to make decisions about their pain. The participant may decide to stay in bed rather than having to make decisions about what medications to take for pain, what dosages (if there is a range), or what alternative therapies may work just as well.

Change and Difference are important properties of transition but, contrary to what one might think, they are not interchangeable terms. A necessary component of identifying the changes involved in a transition is exploring the nature and perceived importance of the change for the patient. A certain change may seem minor to the caregiver but can be one of enormous proportions for the patient. The expected duration of the transition process as well as personal, familial, and societal norms and expectations, have great influence on the how the "change" is defined by the patient. Meleis, et al. (2000) explicate, "Change may be related to critical or disequilibrating events, to disruptions in relationships and routines, or to ideas, perceptions, and identities" (p. 20).

Difference may be perceived as a positive or negative experience, depending on the patient's expectations and situations. This may be noted when a patient's actual transitional experience is vastly different from what they had expected. A patient dealing with a colostomy is

going to feel differently or be perceived as different from others as they move through the transition process. Depending on the illness/surgery a patient experiences, their own journey may cause them to see themselves, others, and the world in a very different light than they had previously (Meleis, et al., 2000).

The change and difference properties were defined by five constructs (Appendix C2) for Phase 2 of the PPMS and were measured with quantitative tools—QOL scales (Appendix D) and medication records (Appendices E1 & E2) and qualitative tools—journals (Appendix D) and unstructured interviews (Appendix F). The constructs are defined as follows (Pasero & McCaffery (2011):

1) *Assessing the pain*: It was expected that participants had been taught how to measure their pain on the 10-point pain scale and the pain quality scale. They were also expected to have been taught to locate the pain and determine if it was more muscular or maybe due to inflammation. The quality, measurement, and location of the pain were to assist them in determining the treatment for the pain.
2) *Determining treatment*: Participants were expected to be able to determine which medications and which dosages to take for pain relief based of their pain assessment. It is not unusual for physicians to order an array of pain medications from acetaminophen to NSAIDS to muscle relaxants and opioids after surgery. With discharge teaching being a requirement most, if not all, hospitals, it was expected that
3) *Monitoring the reaction to the treatment*: It was expected that participants must understand when a medication effect (e.g. drowsiness) is something you just deal with and when it becomes a safety issue and requires them to notify their physician, e.g. a rash on their chest. Therefore, it is important for them to be aware of how they are

responding to their medications. This can be difficult for some people since everyone has varying degrees of adeptness at listening to what their bodies are telling them. For example, participants may find that they have greater pain relief with ibuprofen than they do with oxycodone. If this is the case, it is important for them to stop taking or wean off the opioid so they will not develop tolerance or dependence. It is important that patients taking opioids understand the difference between tolerance, dependence, and addiction (See glossary). If they will be taking narcotics regularly for an extended duration, they will, at some point, become dependent on these meds and should know the side effects of withdrawal (which are similar to the cold or flu) and they should know how to properly wean off these medications should these signs and symptoms occur.

4) *Defining activity limitations*: Participants should know that it is normal to be lightheaded or dizzy while on narcotics and that their judgment can be altered. They should, therefore, avoid activities that require balance, coordination, memory, and good judgment. There may be episodes of postural hypotension (change in blood pressure related to body position) and they should be cautioned to carefully stand up from a sitting position to avoid this.
5) *Building on knowledge and experiences*: Trial and error are good teachers. As participants went through the process of self-medication, they may have made decisions that had excellent results and others that did not work. Some may have had past experiences where a certain treatment worked particularly well for them, e.g. alternating hot and cold packs. Computer-savvy participants may have gone online to seek assistance with their transition experiences and questions. All of these, and

more, have been discussed with this researcher by patients in the past. Participants should be encouraged to keep track of what alternative therapies and medications work for them and to keep notes as reminders for the future.

The *transition time span* indicates a process that is characterized by movement over time. Though they are often interpreted as having beginnings and endings, it may be counterproductive to think of transition time spans in these terms. Even patients with the same surgeries will not follow the same chronological trajectory and given the cyclical and back-and-forth-nature of some transitions, it is not wise to place boundaries on them. Doing so may set the participant up for feelings of failure and might result in an interruption in the flow of the transition experience. For example, for patients diagnosed with chronic illness, the transition could be "an ongoing, undulating, unending" process (Meleis, et al., 2000, p. 20). It is important to remember that the more prolonged the transition process, the greater variety and fluctuation that will be experienced by the patient – a type of ebb and flow that characterizes the stable-unstable-stable events of a long-term situation. The PPMS participants had varying time spans that were dependent on the surgery that the patients experienced as well as on their ages, co-morbidities, personal characteristics, and how they perceived their transition process.

Probably all transitions can be said to have *critical points and events* associated with them. Noted activities such as births and deaths are critical markers that indicate that major change is in the future. For two participants in Phase 1 of the PPMS, a critical marker was going back for further surgery and for two participants in Phase 2, it was readmission to the hospital (these Phase 2 participants were withdrawn from the study). However, not all events are as obvious and everyday events can be perceived as critical or noncritical depending on the person experiencing the event and the significance the event has for them (Meleis, et al., 2000). Though

it is not possible to determine what will be a critical event for any patient, the researcher can anticipate what events might have special significance for a patient. For the postoperative patient being discharged on opioid medications, these occasions might be the discharge teaching and discharge experiences, the first experiences of medicating themselves for pain, and the point at which they feel confident that they have acquired the skill of managing their pain adequately. Specifically, for the PPMS, one participant had a birthday celebration during her transition for which she had to accept, "…no cake." (P1-due to dietary restrictions). For another, she received a visit from her sister and spent the week before cleaning for this event, in spite of fatigue and pain (P22).

The **Transition Conditions** (Figure 3) section of the model describes the facilitators and inhibitors of the transition experience. Meleis, et al. (2000) have included personal, community, and social conditions that may enhance or interfere with the transition process. The Postoperative Pain Management Study (PPMS) added the conditions of family/friends and environment as seen in Figure 4. The results of the PPMS for this concept map will be discussed in detail in Chapter Five. However, there are general conditions that may inhibit or facilitate any transition.

The first condition is the *personal* – this involves the meanings, cultural beliefs, socioeconomic status, and preparation and knowledge that influence the type of transition a patient will experience. The meaning a patient places on the events precipitating the transition, as well as the transition process itself, can influence the experience by helping the patient to move forward or by holding them back. For example, if the nurse discharges the patient to home with minimal discharge teaching, this will leave the patient with unanswered questions and a paucity of confidence that they will know how to manage all their new medications when they return home. Since the extent of the opioid crisis is covered in the media daily, it is possible that a

patient could become scared by what they hear or read. If they do not feel comfortable taking their pain medications, they probably will not take them at all, or if they do, they will under-medicate themselves. Adequate discharge teaching that provides patients with verbal and written explanations of their pain medications has been shown to be most desired by patients and most effective (Borgsteede, et al., 2011).

Cultural beliefs and attitudes can greatly affect the process of transition for the patient recovering from surgery. There are many different beliefs regarding pain and how it should be treated. It is incumbent upon professional health care providers to seek to understand the beliefs that the patient has regarding this phenomenon. Both men and women may think that it is a sign of weakness to show pain or to take medication for pain. It may be a generational reaction as well. It is not unusual to hear parents, grandparents, and older patients exclaim that this "younger generation takes a pill for everything!" Some religions look upon opioid medications in the same way that they view alcohol and will therefore request more moderate and traditional forms of pain relief. For example, the Amish will only accept opioids as an absolute last resort (Ryder, 2012). Patients that have a history of substance abuse issues may be very reluctant to take opioids again. Depending on their surgical procedure, their physicians may determine that it would be better for them to be followed by a pain physician if a painful recovery is anticipated.

With the increase in homelessness and job loss in the United States, socioeconomic problems are increasing at an alarming rate. Despite the Affordable Care Act, many still do not have adequate health insurance (approximately six million or more), and if they do, may not have reached their deductible (O'Donnell & Ungar, 2015). Fortunately, most hospitals have discharge planners, especially since Medicare can refuse to pay for visits that occur within thirty days of discharge. But the discharge plans do not always work and when they do not, the patient

is left on their own. If the patient cannot afford to pay for medications, they will not be able to adequately manage their pain, and when other discharge goals (diet, activity) are not met, it can affect the overall transition. Without insurance, the patient may not qualify for physical therapy, home nursing care, or home health aides. Special diets cannot be adhered to if the patient cannot afford to buy the required foods. This is a stressful way for these patients to live and this dissertation has already discussed the effects of stress on the health of the patient.

Knowledge and preparation. It goes without saying that the patient who knows what to expect after their discharge will most likely have a smoother transition than the patient who is not prepared. Some hospitals offer pre-operative classes for surgical patients so they will know what they need and will be able to prepare before coming into the hospital.

Discharge planning and a discharge teaching program that begin on the day of admission have more to do with preparing the patient for the impending transition than just about anything else. One of the greatest difficulties with the abbreviated hospital stays in the United States is the fact that socioeconomic problems are getting bigger, but the time frames the discharge planners are given to work on them are getting smaller (Kangovi, et al., 2014; Kohlnhofer, Tevis, Weber, & Kennedy, 2014).

Nurse-patient ratios have not changed much in the last forty years but the acuity of the patients a nurse may have in an assignment has increased several-fold (Shekelle, 2013). Combine this reality with a short patient stay and it is difficult for a nurse to provide patients with the education they need to successfully cope with opioid self-medication after discharge (Shekelle).

Community conditions can be a hindrance to a patient's ability to make a healthy transition when there are not enough support networks to assist them. If a patient lives alone and has difficulty getting to a pharmacy to renew their pain medications, they will not be able to

control their pain. Pharmacies that deliver would assist patients in their transition but not all communities have this service. If a person is wheelchair bound and there are no para-transit services, how will they advance in their activities of daily living, e.g. shopping for food on a special diet? This may not directly affect the issue of pain management but it has a definite indirect effect on the patient's stress level, emotional state, and physical health—and those aspects do affect a patient's experience of pain. Close-knit communities in which the neighbors watch out for each other and assist in times of need, foster a support system for those who live alone that is better than most government agencies.

Societal conditions can marginalize certain groups of people— women, older people, disabled persons, certain racial and ethnic groups, certain religions, different sexual identities, etc. Feeling isolated in a society that has stigmatized them or defined them with painful stereotypes, can cause a person to neglect or ignore their transition experiences (Meleis, 2000). Not everyone who transitions from the hospital, transitions to a home. Many shelters will not take a homeless person in if they are recovering from an illness or surgery. Even in a shelter, patients may be afraid that their medications and personal belongings will be stolen while they sleep or that they will contract lice or an infection. Additionally, it is very difficult to get up from a mattress on a floor after abdominal surgery (Greysen, Allen, Lucas, Wang, & Rosenthal, 2012; Kisken, 2017).

Environmental conditions include a person's living situation and the safety of their location. A person who lives in a violent area and has decreased mobility may be afraid to venture outside because they feel too vulnerable to attack and may choose to go without pain medication rather than take a chance on their safety. Some patients have unhygienic living conditions (for whatever reason) that leave them vulnerable to infection of their surgical wound,

increasing the amount of time they will need to be on antibiotics and pain medications, possibly causing re-admission to the hospital, and interrupting the flow of their transition process.

Finally, friends and family can be a source of extraordinary comfort and assistance after surgery. Many older people and those who suffer from depression tend to isolate themselves and when they need help, have no one on which to call. Some patients live with dysfunctional family members who are unable to meet the patient's challenging needs during this recovery time. It is not helpful to the patient for nurses to assume that everyone who has a family will have the assistance they need upon discharge. Older patients may have a caregiver who has challenges of their own while other patients worry that their family members may take their pain medications while they are asleep. It is particularly difficult for those with cognitive changes since they will need some guidance in keeping track of the time that their pain medications were taken and what dosage they took (for range dosing).

Patterns of Response provide researchers with the *process indicators* necessary to determine how a patient is progressing through their transition experience. They allow the researcher to determine if the patients are moving in a healthy direction or in a direction toward vulnerability and risk. Process indicators make it possible for assessment and early intervention by nurses to move the patient in the path to health. Since PPMS participants were not followed during their transitions, the researcher used the journals and interviews to identify the possible process indicators retrospectively. This topic will be discussed in more detail in Chapter Five.

There are also *outcome indicators* to determine if the transition was healthy or unhealthy. There were three outcome indicators for the PPMS by which success was measured: 1) The participant had successfully completed their opioid regimen since interviews could not be done until the participant had been off opioid medication for at least two weeks, 2) The participants

were pain free at the time of the interview, and 3) The participants stated in the interview that they felt their transition had been successful.

Nursing Therapeutics are the interventions that are designed to assist a patient through a successful transition. Ideally, they begin prior to the start of the actual transition and are called "preventive intervention" by Chick & Meleis (1986). They also use the term "therapeutic intervention" to indicate those interventions that occur at the beginning of the transition and continue until a healthy transition is assured. Because it was not part of the research design to follow the PPMS participants through their transitions, the researcher will offer suggestions for preventive interventions in Chapter Five based on the journal comments and interviews with the participants. These suggestions will provide opportunities for future researchers to take them to the next level, improving the outcome indicators for pain management for postoperative patients in the years to come.

Chapter 3: Explanatory Sequential Mixed Method Design

Chapter Abstract

This research involved an explanatory sequential mixed methods methodology. The first phase comprised a convenience sample of 37 surgical patients who completed a quantitative Admission and Discharge survey measuring the change in *opioid knowledge,* an indication of the prior learning received from all sources prior to discharge. *Prior learning* will be used, instead of discharge teaching, throughout the rest of this dissertation. Since the goal of the PPMS is knowledge change, not an assessment of teaching, this descriptive seems more appropriate. The term, discharge teaching, will be used only when referring to the actual practice of discharge teaching per medical center protocol.

The measurement of the opioid knowledge from the surveys was analyzed and, based on the results, broad questions were designed for the phenomenological interviews for the second phase of the study. The second phase was conducted in the patient's home with 12 volunteers from the first phase. It included qualitative and quantitative data collection using patient journal entries, medication records, and a final semi-structured phenomenological interview. The interview was conducted at least two weeks after the patient had completed all opioid pain medication.

The first analysis examined the correlation between opioid knowledge at discharge and the quality of the pain management experience for the patient. The second analysis examined the correlation between discharge teaching and the quality of the pain management experience, since the change scores represent the teaching the patient received while in the hospital. The themes which developed from the phenomenology analysis (journals and interviews) were coded and the coded themes of the patient's experience of self-medication and pain management were analyzed

with the quantitative data to see the relationship between opioid knowledge and discharge teaching with the experience of the participants' pain management. The coding of themes was purely for analysis with the quantitative data and is not to be confused with the coding used in grounded theory.

Research Rationale

Research Purpose

This study addressed the relationship between what patients know about their opioid medications and whether this knowledge had any effect on their experience of managing their postoperative pain after discharge from the hospital. An explanatory sequential mixed methods design is ideal for this type of research question because the first phase not only answers the first part of the question, "What do patients understand…" but it informs and explains the second phase of the study, "How does this understanding affect…" (Creswell & Plano Clark, 2011).

Research Assumptions

Generally, one would expect that the more knowledge people have about a certain phenomenon, the better that knowledge will serve them when they need it. This may not, however, always be the case. The results from the Postoperative Pain Management Study (PPMS) were anticipated to demonstrate five potential situations: 1) Patient scores in Phase 1 did not improve from admission to discharge but the discharge scores showed sufficient opioid knowledge to safely self-administer their opioid medications resulting in a positive experience at the end of the second phase, 2) Patient scores did not change significantly, demonstrating less than desired opioid knowledge to safely self-administer their narcotic medications but their experience during transition was a positive one nonetheless, 3) Patient scores did not change significantly, demonstrating less than desired opioid knowledge to safely self-administer their

narcotic medications, resulting in a less than positive experience during transition, 4) Patient scores did improve, indicating that they had the knowledge to self-administer their opioid medications safely, resulting in a positive overall experience during transition, and 5) Patient scores did improve, indicating that they have the knowledge to self-administer their opioid medications safely, however, the patient described a less than desirable transition experience anyway.

Research Design

This research was conducted using an explanatory sequential mixed methods methodology (Figure 5). The first phase of the research was quantitative and occurred prior to surgery with a convenience sample of 37 surgical patients from a large Seattle medical center located in an area of the city that is socioeconomically diverse. The patients completed a pre-operative survey prior to any pre-operative teaching during the pre-surgery clinic visit. The timing was important since the Admission Survey needed to be completed before the patient received their written and verbal surgery information. The Admission Survey is composed of questions related to opioid medications, information that patients should know by the time they are discharged, as well as some patient demographics. As soon as possible after discharge teaching, the Discharge Survey was administered with the same questions as the initial survey, minus demographics, but including additional questions related to the discharge teaching experience. The final question asked the participants if they would be willing to participate in phase two of the study.

The second phase of the research occurred in the patient's home and include qualitative and quantitative data collection. This phase consisted of a smaller volunteer sample of 12

participants taken from the convenience sample of the first part of the study and included journal entries, a medication record, and a final semi-structured interview.

Research Methodology

Mixed methods research (MMR) produces sighs of relief for some researchers and total frustration for others. How one reacts depends on their worldview and their understanding of the term *paradigm* as it applies to research. It is also dependent on the type of research to which a scientist is committed and the kinds of questions a researcher is likely to ask. Some questions are better answered with the rigorous control afforded by a quantitative design, such as the Admission and Discharge Surveys used in the PPMS. However, other questions need a depth of understanding and meaning that can only be answered by entering the participant's world and observing reality as they experience it themselves, and there are many means for eliciting this information. The PPMS used the journals and interviews. As both paradigms have developed over the last century, it seems natural that at some point, there would be researchers who would discover questions that could only be answered with a mixture of both methodologies. For the PPMS, this has certainly been the case, and the information will offer data that can inform innovations in pre-operative teaching as well as suggestions for further research on this topic.

Research Method

During the fall of 2015, surgical nurse managers at three different medical facilities in the Pacific Northwest were contacted to arrange for permission to recruit their patients for the Postoperative Pain Management Study (PPMS). The hospitals were chosen based on the differences in their socioeconomic venues and their willingness to participate in the research study. During the intervening time between these discussions and the actual date to begin data collection, one medical center decided that they did not want to provide the lead researcher with

computer access to their facility and offered to choose patients for the study based on the inclusion/exclusion criteria. This was not an acceptable option for the PPMS. Another medical center announced that their surgeons would also be conducting a pain management study of their own and would be accessing the same sample population as the PPMS.

Consequently, the PPMS was done solely in the clinics of one metropolitan medical center in a socioeconomically diverse city in the Pacific Northwest. Of the six available clinics, three were willing to participate in the PPMS: the vascular clinic, the general surgery clinic, and the colo-rectal clinic.

Permission to conduct this study was obtained from the Institutional Review Board of the University of Washington – Seattle. Approval was received after review of the PPMS proposal and the Informed Consent for the PPMS. This permission was accepted by the medical center that participated in this study.

Informed Consent

After checking in for their pre-surgery visit with the surgeon and being brought to the exam room, patients who were pre-determined to be a fit for the PPMS were approached by the P.I. After an introductory greeting and brief explanation of the study (Appendix G), if the patient expressed no interest in participating in the study, the P.I. thanked them for their time and wished them a speedy recovery. If the patient expressed an interest in participating in the PPMS, the P.I. explained the Informed Consent (Appendix H) and HIPAA forms, then asked the patient to read and sign both documents prior to completing the Admission Survey. The consent process took place in an area of the clinic that provided the privacy and quiet needed to concentrate on what was being said. After the patient read the Informed Consent but before they signed it, the P.I. asked the participants to explain the PPMS to her and to describe their obligation for completing

the study. This was done as a validation that they did actually understand what the research involved.

After the participant signed the Informed Consent, the P.I. administered the Admission Survey (Appendix A). When the Admission Survey was completed, the P.I. thanked the participant for their time and wished them a speedy recovery, reminding them that she would return on the day of discharge from the hospital for the Discharge Survey (Appendix B).

Phase 1

Method. The participants were given an Admission Survey which they filled out on their own in the presence of the researcher. This occurred in the clinic exam room of the pre-surgery clinic appointment. The Discharge Survey was given in the same manner in the participant's hospital room at the immediate completion of the discharge teaching session by their assigned nurse. Some participants had already picked up their medications at the pharmacy and so benefitted from receiving additional medication teaching.

Sample. A power analysis was done through G*Power 3.1 which recommended a sample size of 80 participants. Time allowed for the goal of the recruitment of a sample size of 40 participants. After the study had closed, three persons withdrew leaving a final sample size of 37. In total, 2,159 patients were evaluated for the study, 336 patients were a fit for the study per inclusion/exclusion criteria, 51 patients were enrolled into the PPMS (14 withdrew after the Admission Survey was completed) and 37 participants completed both the Admission and Discharge Surveys. Patients who complete both surveys received a $10 gift card.

Inclusion criteria for the survey research included: 21-80 years of age; ability to read, write, and communicate in English; no cognitive impairment per medical record; no history of substance abuse; and undergoing surgery that required an overnight stay in the hospital since the

Discharge Survey could not be given on the same day as anesthesia. *Exclusion criteria* included: less than 18 years or greater than 80 years of age; inability to read, write, and communicate in English; cognitive impairment per medical record; history of substance abuse either by documentation or patient admission; and undergoing a day surgery procedure.

The process for recruitment required the researcher to examine the electronic medical records (EMRs) of the patients scheduled for the clinic the day before their visits. Those who fit the inclusion/exclusion criteria were placed on a list for the surgeons involved. After the surgeon saw the patients, they would let the researcher know if the patients were going to have surgery. If they were going to be scheduled, the researcher would meet with the patient and ask if they would be interested in hearing about the study. Only five patients refused. If they were interested in participating, they read and signed the Informed Consent and the HIPAA form. They, then, proceeded to take the Admission Survey. Once the survey was completed, the RN for that department would meet with the patient for pre-surgery teaching. The teaching packet mentioned pain management as a reminder to the patient to know the names, actions, and side effects of their medications but provided no other concrete information.

Many of the patients who fit the criteria for the study did not have surgery. Often, the surgeons were seeing these patients for the first time and often patients required further testing, weight loss, or smoking cessation before they could be scheduled for surgery. A good percentage of the patients were placed on medical treatment protocols in an attempt avoid surgery, if possible.

Originally, this study was to include only opiate naïve participants. *Opiate naïve* was defined as a person who had not had anything stronger than hydrocodone in the five years before surgery. After one month of data collection attempts, not one patient fit the criteria and so the

study was modified to exclude only those with a substance abuse history. The patients in the G.I. and colo-rectal clinics had moderate to long histories of pain, mostly from Irritable Bowel Syndrome and Crohn's Disease, so they not only may have had opioid pain medication off and on during their lives but may also have had diversional surgery to give the gut a chance to heal, some quite recent to the PPMS – a definite limitation.

The researcher monitored the participants' EMR for dates of surgery, locations within the medical center, progress after surgery, and discharge information. On the day of discharge, the researcher contacted the participant's assigned nurse and explained that the patient needed to complete a Discharge Survey after discharge teaching but before leaving the hospital. A time for teaching and the completion of the survey was coordinated between the nurse and the researcher and the nurse agreed to remind the patient that the researcher would be coming to see them after their teaching.

Once the Discharge Survey was completed, the nurse answered questions for the participant about Phase 2 of the PPMS. If they were interested, they checked "yes" on the last page of the survey and recorded their e-mail address. The researcher gave them a loose-leaf notebook with three sections (discussed in detail below) – unscheduled medications (Appendix E1), scheduled medications (Appendix E2), and the journal (Appendix D). There was a page in the front that explained how to use the notebook in case they were unable to remember the explanation given that day. All but three participants had someone present to listen to the explanation as well. At the close of this meeting, the participants received a $10 gift card.

Measures. Two surveys were designed for this study and were tested twice using a sample similar in age to the participants in this study. A cognitive interview was also completed between the first and second test.

Admission survey. The Admission Survey (Appendix A) is composed of ten questions that are related to opioid medications and information that patients need to know by the time they are discharged to medicate themselves adequately and safely. The last two questions ask patients by what methods they are best able to learn new information. This was for comparison to the actual methods that were used to teach them this new information while they were hospitalized. Patient demographics comprised part two of this survey (seven questions).

Discharge survey. As soon as possible after discharge teaching, a Discharge Survey (Appendix B) was administered in an attempt to decrease selective recall bias. This survey has eight questions identical to the admission survey on pain measurement and opioid medications, six questions that involve discharge teaching, one question that asks for surgery information (surgery, surgeon, and date), and the final question that asks patients if they would like to take part in the second phase of the study.

Analysis. Data was analyzed using SPSS version 19.0 computer software, and the level of significance for each test was preset at 0.05. After organizing and cleaning the data, analyses for Phase 1 included descriptive statistics and chi-square tests for goodness of fit. Given the varied nature of the survey questions: multiple choice, fill-in the blank, and Likert scales – these were considered to be the best methods of analysis for this study.

Phase 2

Method. During Phase 2, several data collection forms were used. Participants kept a medication record (Appendices E1 & E2) and a daily journal (Appendix D). At least two weeks after the participants had been off all opioid medication (or at the end of six weeks if they were still taking pain medication), an interpretive phenomenological interview with the participant occurred and was be recorded. After transcription of the interviews, copies were sent to the

participants to ascertain that these are indeed their words and that they were comfortable with what the records stated.

Sample. Twelve volunteers from Phase 1 of the PPMS took part in Phase 2. Of the twelve patients who participated, three did not do any recording in their notebooks. One person medicated themselves for pain only one time but did complete the journal. Another recorded no medications but completed the journal. These two participants were eliminated from the quantitative analysis for lack of data but the journal comments and their interviews were part of the qualitative analysis. The seven completed all sections of their notebooks, kept very accurate and concise records. Those who completed Phase 2 received a $50 gift card. The three who did not complete the notebook records but did the interview received a $25 gift card.

Measures. The measures for Phase 2 were designed for this study and explained to the participants in their hospital rooms the day they were discharged. All materials were collected by the researcher at the end of the interpretive interview.

Medication record. The medication record (Appendices E1 and E2) provided a record of pain medications used, the dosage taken, and the frequency of medication administration. In addition, patients were asked to record their pain score, pain quality score, and location of the pain. Patients were also asked to reassess these parameters one hour after medication to provide a record of the amount of pain relief they had received. The medical record showed: if patients medicated themselves with the correct medication for the type of pain they were having, how they used information from one medication experience to determine what they should take the next time they medicate themselves, if they were taking the medications as ordered, and if they were medicating themselves for pain that was actually related to their surgery. This information is important to note, especially if the patient did not feel that their pain was well-controlled.

***Patient journal*.** The patient journal (Appendix D) has two parts. The first part provides room for a 1-2 sentence description of the highlights of their day. The emphasis was on brevity though the patient could write as much as they wanted. The way pain was measured is very subjective. A pain score of 6/10 for one patient may be intolerable and disabling, while another patient may find 6/10 pain to be annoying and not worthy of interfering with their activities of daily living. Similarly, the assessment of pain could be more debilitating depending on the location, e.g. a 6/10 pain level for a knee replacement is probably going to feel very differently from a 6/10 pain level for abdominal surgery. Using the journal provided more information about how patients were functioning rather than just focusing on the pain level itself.

The second part of the journal is the quality of life scores which provided information as to whether the level of pain the patients were experiencing on any one day was affecting their quality of life (Reynolds, 2009). The quality of life scales have four components to them with each having a Likert Scale range of 1-10. The categories are: 1) Role Limitation, 2) Physical Limitation, 3) Social Limitation, and 4) Sleep/Energy. Each category was briefly defined for the participant to help them focus on aspects of that category.

***Interpretive phenomenological interview questions*.** The interview questions (Appendix F) were broad in scope to give participants ample leeway in describing their experience. Questions were added or subtracted as the researcher was informed by the results of the Phase 1 research.

Analysis. The analysis of the Phase 2 quantitative data—medication records and QOL scales—was done using partial correlations controlling for time. Each participant's number of doses of pain medication were totaled for each day. The pain scale for each dose was determined to have provided relief if there was at least a 1-point decrease in pain when comparing the pain

number before medication with the number one hour later. Relief was designated as a "1" for the day if there was pain relief at least 50% of the time. No pain relief >50% of the time was designated as a "2". The partial correlation was done with number of doses, pain relief, and each of the four QOL scales for each patient for each day that they were recording data. The phenomenological analysis involved the identification of codes and themes from the interviews and the short statements from the participants' journals. These were arranged into major categories that provided a verbal description of the experience of narcotic self-medication after surgery and which factors, positively or negatively, affect that experience.

After the phenomenological analysis, Fisher's Exact Test was used to find relationships between surveys scores and journal/interview themes. This analysis determined whether a relationship existed between the knowledge patients possessed about their opioids at the time of discharge and the quality of their self-medication and pain management after discharge.

Reliability and Validity

Reducing random error variance affects both validity and reliability (Green & Lewis, 1986a). There are three components to consider: 1) Physical condition of the instrument – checking the instrument for ambiguity and confusion in the wording, design, concepts, or question format was accomplished using two different tests of the survey and one cognitive interview, 2) Environmental testing conditions – an attempt was made to standardize the testing area as much as possible with seclusion, quiet, adequate lighting, adequate writing surface, comfortable temperature, and privacy, 3) Patient condition – there was no possible way to control this component due to the fact that patients may have been either nervous regarding their upcoming surgery or pending discharge; there was also the possibility that they were in pain and

that the character of this pain, along with the anxiety it may have produced, varied among participants (Green & Lewis, 1986b).

Content validity indicates the extent to which the surveys represent a compilation of the "total possible meanings" of a concept (Green & Lewis, 1986b, p. 104). As previously mentioned, the questions were developed from a literature search and specifically measure five constructs that were identified in the literature. There are two components that support content validity: 1) Face validity was satisfied as the instrument was judged by a pain management nurse who determined that the instrument appeared to measure what it is supposed to measure, 2) Consensual validity was confirmed by a panel of registered nurses who deal with pain and pain management on a regular basis. They evaluated the instrument at the completion of its development (Green & Lewis, 1986b). The General Supervisory Committee evaluating this research rendered expert feedback as well.

Chapter 4: Results

Chapter Abstract

This study examined two important questions central to postoperative pain management: 1) How much a patient's opioid knowledge changed from the pre-surgery clinic visit to discharge from the hospital, and 2) Whether this knowledge correlated with the patient's subsequent quality of pain relief and their experience of self-medication at home. This chapter describes the research findings to answer these questions.

Phase 1 included the quantitative surveys and Phase 2 involved brief daily journals to help patients record the highlights of the day. After the participants had completed their opioid therapy and had taken no opioids for at least two weeks, a semi-structured phenomenological interview was done.

Phase 1: Survey Research

The Postoperative Pain Management Study (PPMS) used an explanatory sequential mixed methods design to determine if there was a correlation between opioid knowledge and the experience of successful self- medication for postoperative pain. The study was sequential because Phase1 research findings informed the manner in which the Phase 2 research was conducted. Phase 2 interview questions were revised and informed by the results of the Phase 1 survey findings.

Demographic data

Admission and Discharge Surveys were completed by 37 participants to determine the change in opioid knowledge that occurred between the time of the pre-surgery clinic appointment and hospital discharge. Part I of the Admission Survey contained the seven questions that requested demographic information from the participants. This information had

two major focus areas: 1) Questions to determine the diversity of the participants which included sex, age, race, ethnicity, highest level of education, and 2) Questions that provided information on participants' ability to understand the materials that were used in the study—primary language spoken at home and fluency with written and spoken English.

Descriptive Statistics of Sample

Table 3 (below) presents demographic information about study participants. The age range for the PPMS allowed for those 21-80 years of age to participate. The actual age range was 24-74 years with $M = 49$ (SD = 15.5). Sex was almost evenly divided between women and men.

Statistics on ethnicity and race are roughly similar to the demographics for Seattle. However, the PPMS is a small study and any comparison to a large city is cursory, at best. The participants were largely white and non-Hispanic, however all racial groups listed in the survey were represented.

The largest educational level in the PPMS was the category for high school diploma though all educational groups listed in the survey were represented. Language and fluency supported an English-speaking population with one person identifying Spanish as their primary language and 100% of the participants stating that they were fluent in both spoken and written English.

Data Analysis

Admission Survey. Part II of the Admission Survey (AS) includes fourteen questions but not all are included in this analysis. The first two questions (2.1 and 2.2) ask about participants' pain levels and medications that were helpful for understanding the phenomenological concerns

Table 3

Demographic Descriptive Statistics for PPMS

	Frequency	Percent
Age		
21-30	5	13.5
31-40	10	27.0
41-50	4	10.8
51-60	8	12.6
61-70	7	18.9
71-80	3	8.1
Gender		
Female	20	54.1
Male	17	45.9
Ethnicity		
Hispanic	2	5.4
Non-Hispanic	34	91.9
No response	1	2.7
Race		
White	31	83.8
Black/African	2	5.4
Asian/S.E. Asian	4	10.8
American Indian/Alaska Native	2	5.4
Native Hawiian/Pacific Islander	3	8.1
Education		
Less than high school	1	2.7
High school diploma	17	45.9
Associates Degree	6	16.2
Bachelor's Degree	8	21.6
Master's Degree	3	8.1
Doctoral Degree	2	5.4
Primary Language		
English	36	97.3
Spanish	1	2.7
Fluency		
Spoken English	37	100
Written English	37	100

of pain management but did not help to answer the Phase 1 questions on opioid knowledge. Likewise, the last two questions (2.11 and 2.12) are ranking questions associated with discharge teaching. This information was used in the analysis of the Discharge Survey (DS) below. Only questions 2.3-2.10 (AS) and 1.3-1.10 (DS) were identical in both surveys and, therefore, analyzed with descriptive statistics and the chi-square test using SPSS 19.0. A comparison of the results for each question are provided in the table below:

Table 3 AS, DS, and Amount of Change for Number of Participants with Correct Scores for Each of the Questions Common to Both Surveys

Item	Admission Survey No. Correct (%)	Discharge Survey No. Correct (%)	Change from Admission to Discharge
Max Tylenol Dose	6 (16.2)	11 (29.7)	5
Meds w/ Tylenol	3 (8.1)	6 (16.2)	3
Opioid Side Effects	6 (16.2)	11 (29.7)	5
Take opioid when I want	22 (59.5)	25 (67.6)	3
Give opioid to a friend	33 (89.2)	35 (94.6)	2
Danger of Dependence	8 (21.6)	5 (13.5)	-3
Danger of Addiction	6 (16.2)	5 (13.5)	-1
Definition of Dependence (7 possible choices)	1 choice 11 (29.7) 2 choices 2 (5.4) 3 choices 1 (2.7)	1 choice 20 (54.1) 2 choices 0 3 choices 1 (2.7)	9 -2 0
Opioid Disposal	20 (54.1)	17 (45.9)	-3
Alternate methods of pain relief (3 possible choices)	1 choice 4 (10.8) 2 choices 2 (5.4) 3 choices 29 (78.4)	1 choice 3 (8.1) 2 choices 3 (8.1) 3 choices 31 (83.7)	-1 1 2

*(+) and (-) change scores are not intended to be mathematical but to signify improved (+) or not improved (-)

It was necessary to determine a total score for each survey so a change score could be calculated. Since each type of question had to be scored differently, the goal was to maintain a consistency in the format that would give a numerical score for questions that do not, by their nature, provide one. As the results of each question are discussed, the way in which they were scored will also be discussed. Appendix I provides a summary of the scoring method for each question. Since the results of the questions common to both surveys will be compared, it makes sense to discuss the results of bot the AS and the DS together. That will be done in this section

and the results related to discharge teaching will be discussed in the Discharge Survey section below. It is also important to note that the negative and positive signs in the change score are not related to the difference between the DS and the AS scores but is meant to signify if the change is "improved" or "not improved." Assignment of these symbols can be ambiguous. For example, did a participant move from "two choices" to "three choices" (improved) or from "two choices" to "one choice" (not improved). Since the PPMS is focused on the total scores of the group and not to individuals, the assumption was made that they, as a group, improved.

It should be noted that the amount of time between the AS and the DS was different for each patient. There was a range of 1 to 115 days (M = 28.22, SD = 23.42) between the AS and the DS among the participants. It is likely that this factor had some unmeasured effect on the participants responses on the DS. The days in the hospital had a range of 2 to 15 (M = 5.35, SD = 3.20) and may have had some effect as well since a longer stay would indicate a sicker participant.

Table 4 The Days Between the AS and DS with the Number of Days in the Hospital

	N	**Range**	**Minimum**	**Maximum**	***M***	***SD***
Days B/T AS and DS	37	114	1	115	28.22	23.42
Days in Hospital	37	13	2	15	5.35	3.20

As previously mentioned, acetaminophen (APAP or Tylenol) information is an important component of pain management teaching. Excessive use of APAP can cause hepatic damage which can lead to hepatic failure. For this reason, two questions were used to identify what patients understand about dosage and which opioid compounds contain Tylenol. In question 2.3, patients were asked to choose the FDA recommended maximum daily dosage for acetaminophen and their choices were: 2000 mg, 3000mg, 4000 mg, and 5000 mg. The maximum recommended

for APAP dosage by the FDA was and is 4000 mg (Food and Drug Administration, 2013). Most of the participants in the AS (28, 75.7%) chose 2000 mg. The DS showed improvement with most participants still choosing 2000 mg (20, 54.1%) but with a substantial rise in the number of correct answers. A chi-square test was performed to examine the relationship between prior learning about the Tylenol maximum dose prior to discharge and the change score at the time of discharge. The relationship between these variables was significant. The results are tabulated below. The title "DS Not Improved" indicates that the discharge score either stayed the same or was worse than the admission score.

Table 5 Chi-Square Test for Change in Knowledge of FDA Maximum Dose Recommendation

	AS Correct	**AS Incorrect**	**Total**
DS Improved	5	6	11
DS Not Improved	1	25	26
Total	6	31	**37**

χ^2 (1, N=37) = 9.85, p<.01

The learning that occurred prior to discharge from the hospital likely increased participant's knowledge of maximum Tylenol daily dose. The question was scored as one point for a correct response and zero points for an incorrect response.

Question 2.4 asked patients to review a list of six medications and identify the ones that contained Tylenol. Two of the medications, hydromorphone (Dilaudid) and oxycodone, do not contain Tylenol. One medication, Delvacet, is not a real medication but does have the same ending as Percocet. This was intended to see if participants were guessing or answering what they knew to be the correct answers. In the AS, no participants chose Delvacet even though eight participants correctly chose Percocet as a medication that contained Tylenol. In the DS, two participants did choose "Delvacet" and both of those participants also chose Percocet. The last

three medications all contained Tylenol—Norco (hydrocodone/APAP 325mg), Percocet (oxycodone/APAP 325mg), and Vicodin (hydrocodone/APAP 500mg).

The largest proportion of participants taking the AS (17, 45.9%) did not choose any of the correct responses. In the DS, the largest proportion was still the participants who had no correct responses (15, 40.5%) but three participants did improve their scores. One point was scored for each of the correct medications chosen, for a maximum score of three. The incorrect responses were not considered for purposes of scoring and the participants received a score of zero:

Table 6 AS, DS, and Amount of Change for Participants' Number of Correct Choices of Medications Containing Tylenol

Correct Choices	Admission Survey No. Chosen (%)	Discharge Survey No. Chosen (%)	No. Change (%)
None	17 (45.9)	15 (40.5)	-2 (5.4)
One	15 (40.5)	10 (27.0)	-5 (13.5)
Two	2 (5.4)	6 (16.2)	4 (10.8)
Three	3 (8.1)	6 (16.2)	3 (8.1)

*(+) and (-) change scores are not intended to be mathematical but to signify improved (+) or not improved (-)

Though not part of the actual scoring process, it is interesting to observe the number of participants who chose each of the medications. Delvacet has already been discussed. A larger percentage of participants correctly believed that hydromorphone and oxycodone did not contain Tylenol but fewer were as certain about the medications that actually did contain Tylenol—Norco, Percocet, and Vicodin. Of the three, a greater change was noted with Percocet, possibly because it was more frequently prescribed after surgery. See the table below for a more detailed presentation of the results:

Table 7 AS, DS, and Amount of Change for Participants' Choices of Medications That Contain Tylenol

Opioid	AS No. Chosen (%)	DS No. Chosen (%)	No. Change (%)
Hydromorphone contains Tylenol (incorrect)	6 (16.2)	5 (13.5)	1 (2.7)
Delvacet contains Tylenol (incorrect)	0	2 (5.4)	-2 (5.4)
Oxycodone contains Tylenol (incorrect)	11 (29.7)	12 (32.4)	-1 (2.7)
Norco contains Tylenol (correct)	8 (21.6)	10 (27.0)	2 (5.4)
Percocet contains Tylenol (correct)	8 (21.6)	14 (37.8)	6 (16.2)
Vicodin contains Tylenol (correct)	12 (32.4)	14 (37.8)	2 (5.4)

*(+) and (-) change scores are not intended to be mathematical but to signify improved (+) or not improved (-)

The format for the next question (AS 2.5, DS 1.5) is similar to the previous question and was scored exactly the same way. The participants had a choice of twelve side effects from which to choose and they were to choose those that were common to opioid medications. The last side effect listed is "sweating" and proved to be somewhat complicated because APAP can cause sweating, especially if a patient is experiencing even a mild rise in temperature. Since it is a component in some common opioid medications, participants may have assumed that sweating was caused by the opioid itself. However, since the incorrect responses do not count against the scoring process, it was of no consequence if a participant chose that response.

Of the twelve listed, six side effects are the most common (Benyamin, et al., 2008; Cepeda, Farrar, Baumgarten, Boston, Carr, & Strom, 2003; Stephan & Parsa, 2016), allowing participants a maximum score of six for this question:

Table 8 AS, DS, and Amount of Change for Participants' Number of Correct Choice for Opioid Side Effects

Number of Correct Responses	AS No. Chosen (%)	DS No. Chosen (%)	No. Change (%)
None	1 (2.7)	0	-1
One	6 (16.2)	3 (8.1)	3
Two	5 (13.5)	5 (13.5)	0
Three	5 (13.5)	8 (21.6)	3
Four	3 (8.1)	3 (8.1)	0
Five	11 (29.7)	7 (18.9)	-4
Six	6 (16.2)	11 (29.7)	5

*(+) and (-) change scores are not intended to be mathematical but to signify improved (+) or not improved (-)

The largest proportion of participants chose five correct responses in the AS and six correct responses in the DS. Many of these participants had experience with opioid medications and surgery in their pasts and it is possible that their answers were influenced by these events. The table below demonstrates the choices made by participants for each side effect:

Table 9 AS, DS, and Amount of Change for Participants' Choice of the Side Effects of Opioid Use

Side Effect	Admission Survey No. Chosen (%)	Discharge Survey No. Chosen (%)	No. Change (%)
Blurred Vision	23 (62.2)	16 (43.2)	7 (18.9)
Constipation*	29 (78.4)	31 (83.8)	2 (5.4)
Drowsiness*	30 (81.1)	35 (94.6)	5 (13.5)
Fluid Retention	34 (91.9)	30 (81.1)	4 (10.8)
Headache	26 (70.3)	23 (62.2)	3 (8.1)
Hiccoughs	35 (94.6)	32 (86.5)	3 (8.1)
Itching*	12 (32.4)	16 (43.2)	4 (10.8)
Lightheadedness*	20 (54.1)	24 (64.9)	4 (10.8)
Nausea/Vomiting*	22 (59.5)	25 (67.6)	3 (8.1)
Slower Breathing*	13 (35.1)	19 (51.4)	6 (16.2)
Sneezing	36 (97.3)	36 (97.3)	0
Sweating	9 (24.3)	13 (35.1)	-4 (10.8)

*Correct side effect

A chi-square test was performed on each of the twelve side effects to determine the relationship between learning before discharge and the change in knowledge for the individual side effect. Those that were significant were: blurred vision, constipation, headache, itching,

nausea/vomiting, and slower breathing. Participants' prior learning (see p. 43 for definition of this term) about these six side effects, from all sources, was more likely to increase change scores prior to discharge.

Table 10 Chi-Square Test for Change in Knowledge of Significant Side Effects of Opioids (*Correct side effect)

Blurred Vision	**AS Correct**	**AS Incorrect**	**Total**
DS Improved	14	2	16
DS Not Improved	9	12	21
Total	23	14	**37**

χ^2 (1, N=37) = 7.70, p<.01

Constipation*	**AS Correct**	**AS Incorrect**	**Total**
DS Improved	27	4	31
DS Not Improved	2	4	6
Total	29	8	**37**

χ^2 (1, N=37) = 8.57, p<.01

Headache	**AS Correct**	**AS Incorrect**	**Total**
DS Improved	20	6	26
DS Not Improved	3	8	11
Total	23	14	**37**

χ^2 (1, N=37) = 6.90, p<.01

Itching*	**AS Correct**	**AS Incorrect**	**Total**
DS Improved	8	8	16
DS Not Improved	4	17	21
Total	12	25	**37**

χ^2 (1, N=37) = 3.97, p<.05

Nausea/Vomiting*	**AS Correct**	**AS Incorrect**	**Total**
DS Improved	19	6	25
DS Not Improved	3	9	12
Total	22	15	**37**

χ^2 (1, N=37) = 8.75, p<.01

Slower Breathing*	**AS Correct**	**AS Incorrect**	**Total**
DS Improved	10	9	19
DS Not Improved	3	15	18
Total	13	24	**37**

χ^2 (1, N=37) = 5.246, p<.01

The next few questions dealt with how to take opioids (2.6a and 2.6b) and what patients think about the dependence/addiction potential of these medications (2.7a and 2.7b). The answers for all four are rated on a five-point Likert Scale (1 = Strongly Disagree to 5 = Strongly Agree). The questions were also worded so that in one set (2.6a and 2.6b) the desired response was Strongly Disagree response, and in the other (2.7a and 2.7b) the desired response was Strongly Agree response. This was not meant to be confusing but to avoid an "auto pilot" answer and require participants to focus on what the question was asking. The questions were scored one point for the correct response and zero for any other response.

The chi-square test to demonstrate the relationship between learning prior to discharge and change scores in each question at the time of discharge was significant for the question referring to the health care provider's instruction as being a guideline only. The relationship between prior learning and giving opioid medication to a friend was not significant.

Table 11 Chi-Square Test for Change in Knowledge of "Instruction as a Guideline Only"

Guidelines	AS Correct	AS Incorrect	Total
DS Improved	19	6	25
DS Not Improved	3	9	12
Total	22	15	**37**

χ^2 (1, N=37) = 8.75, p<.01

The second question (2.7a) has two parts that are identical except for one word. The question makes the statement that people who take prescription pain medications are in danger of becoming "dependent" on them (2.7a) or "addicted" to them (2.7b). Since one does not know before consuming opioid medications if one will become addicted, the possibility of this occurring once these medications are taken is a reality for each patient. Dependence is a given if

one takes the medication for a prolonged period (See Glossary). Therefore, the correct response for both parts of this question is Strongly Agree.

The chi-square test to determine the relationship between learning prior to discharge and change scores in each question at the time of discharge did not demonstrate a significant relationship between prior learning and the participants' change scores for knowledge of dependence and addiction.

A more definitive expression of the participants' understanding of the concept of opioid dependence can be elicited from their own words. The next question (AS 2.8, DS 1.8) is a short fill-in where the participant defines the term "narcotic dependence." As previously explicated, to provide a broad latitude for the many possible definitions that might be presented, a search of the literature determined the most consistently stated elements used in this definition (Appendix J). It is not expected that anyone would use all the elements in the definition. It is only a guide to suggest where gaps in patients' understanding lie. Member check of the elements of this definition was provided for accuracy, validity, and reliability by a researcher colleague. Participant responses and the researcher's perception of those responses based on the seven elements of the definition were compared with the researcher colleague with 95% accuracy.

In the Admission Survey, nineteen participants (51.4%) did not incorporate any elements of the accepted definition into their own. Some examples of these types of definitions are:

"The need for it to reveal the pain" (P1).

"Dependence on pain med to cope with pain" (P11).

"Addict" (P13 and P21)

"Over-dependence on a drug" (P18)

"Becoming addicted to narcotics and needing it as a heroine [heroin] user would need heroine [heroin]" (P20)

The participants received one point for each correct element included in their own definition of dependence. No participants were able to incorporate more than three elements into their definitions at any time. Element 4 "Withdrawal symptoms can be mild to severe" was the only element that was not chosen by any participant in either the AS or the DS. A breakdown of the number of responses are demonstrated in the table below:

Table 12 AS, DS, and Amount of Change for Participants' Choices of the Seven Elements of the Definition of Opioid Dependence

Elements	Admission Survey No. Chosen (%)	Discharge Survey No. Chosen (%)	No. Change (%)
Dependence is an adaptive state	2 (5.4)	1 (2.7)	-1 (2.7)
Requires repeated administration	2 (5.4)	0	-2 (5.4)
Withdrawal upon drug cessation	4 (10.8)	6 (16.2)	2 (5.4)
Withdrawal symptoms mild to severe	0	0	0
Withdrawal a result of tolerance	0	1 (2.7)	1 (2.7)
Opioid required for normal function	13 (35.1)	15 (40.5)	2 (5.4)
Hyperalgesia – increased sensitivity to pain	1 (2.7)	1 (2.7)	0

*(+) and (-) change scores are not intended to be mathematical but to signify improved (+) or not improved (-)

A chi-square analysis was conducted to determine the relationship of prior learning with knowledge change in each of the elements of the definition for dependence. Of the seven elements, the only element that demonstrated a relationship with prior learning was, "Person needs the drug to function normally" (Element #6).

Table 13 Chi-Square Test for Change in Knowledge of the Definition of Opioid Dependence (Element 6)

Element #6	AS Correct	AS Incorrect	Total
DS Improved	10	5	15
DS Not Improved	3	19	22
Total	13	24	**37**

χ^2 (1, N=37) = 11.01, p<.01

The disposal of opioid medications (AS 2.9, DS 1.9) is a topic of confusion since many different messages exist in all forms of media as to what one should do when one no longer needs their opioid medications. This question was multiple choice and requested the Food and Drug Administration's (FDA) recommendation for opioid disposal with the following offerings: 1) throw in the trash, 2) wash down the sink, 3) flush down the toilet, and 4) contact the police. According to the FDA (2018), most medications should be thrown in the trash after mixing with a noxious substance. Opioid medications should, however, be flushed down the toilet:

Table 14 Participants' Knowledge of FDA Recommendation for Opioid Disposal

Mode of Disposal	Admission Survey No. Chosen (%)	Discharge Survey No. Chosen (%)	No. Change (%)
Trash	2 (5.4)	4 (10.8)	-2 (5.4)
Sink	4 (10.8)	4 (10.8)	0
Toilet*	20 (54.1)	17 (45.9)	-3 (8.1)
Police	11 (29.7)	12 (32.4)	-1 (2.7)

*Correct response

The participants received one point for the correct response and no points for any other response. A chi-square analysis to examine the relation between prior learning and the appropriate disposal of opioid medications was significant.

Table 15 Chi-Square test for Change in Knowledge of Opioid Disposal

Opioid Disposal	AS Correct	AS Incorrect	Total
DS Improved	15	2	17
DS Not Improved	5	15	20
Total	20	17	**37**

χ^2 (1, N=37) = 14.08, p<.01

The final question (AS2.10, DS 1.10) for analysis examined what participants understood about alternate forms of pain relief. They were asked to list three non-pharmaceutical methods for relieving their pain. A complete listing of their alternate choices is provided in Appendix K. In the AS, two participants "couldn't think of anything" and in the DS, only one was unable to list any alternate methods. The large proportion of the participants were able to list three methods of pain relief (AS 29, 78.4%; DS 31, 83.7%) followed by one method (AS 4, 10.8%; DS 3, 8.1%) and two methods (AS 2, 5.4%; DS 3, 8.1%). The most common options chosen were heat/cold, walking/exercise, massage, and rest/sleep.

Discharge Survey

The first part of the Discharge Survey dealt with the questions common to both surveys and was discussed above. The second part covered experiences of discharge teaching in the hospital, which begins as soon as the patient is admitted to the unit and continues until the patient is discharged to home. The third part of the survey contained surgery information and asked the patient if they wanted to volunteer for Phase 2 of the PPMS. Only Part 2 results will be discussed.

The first question (DS 2.1) in the discharge teaching section of the survey sought to ascertain the time spent by the patient's nurse talking about the patient's pain medications. There are three parts to the question and there are six options: 1, 2, 3, 4, 5, and 6+ minutes. Besides teaching about pain medication, the two other questions asked how much time was spent

discussing the importance of proper rest after surgery and who to contact with questions during recovery at home. These latter two questions were distractors to keep the patient's answers from being influenced by the knowledge that the real concern was the teaching about pain medications. Most of the participants reported receiving either 4, 5, or 6+ minutes of teaching on pain medications. The time statistics for pain medication teaching tend to align with Phase 2 of the PPMS, in which 10 out of 12 participants stated in their interviews that they believed they knew all they needed to know to medicate themselves successfully. A summary of their responses was tabulated below:

Table 16 Number of Minutes Nurses Spent Reviewing Rest, Medication, and Who to Contact after Discharge

	Minutes Nurse Spent Teaching					
Action	**1**	**2**	**3**	**4**	**5**	**6+**
	No. (%)	**No. (%)**	**No. (%)**	**No. (%)**	**No. (%)**	**No. (%)**
Proper Rest	12 (32.4)	2 (5.4)	2 (5.4)	6 (16.4)	8 (21.6)	7 (18.9)
Pain Medication	5 (13.5)	7 (18.9)	2 (5.4)	5 (13.5)	6 (16.2)	12 (32.4)
Who to Contact	6 (16.2)	5 (13.5)	6 (16.2)	1 (2.7)	9 (24.3)	10 (27.0)

A similar format was used for the next question (DS 2.2) which asks participants about paperwork they received for insurance, pain medicine, and physical therapy. The only difference is that the question is a yes/no question. A total of 34 (91.9%) of participants responded that they had received paperwork for pain medication. The insurance and physical therapy questions were distractions and so will not be discussed further. As was noted previously, the surgery packet that patients receive prior to surgery instructs patients to make sure they know the names of their medications, actions, and side effects. There was no specific instruction on APAP or opioids. From the interviews in Phase 2, the paperwork participants received consisted of medication sheets that discussed names, actions, and side effects of the medications. There was a warning to

not exceed 4000 mg/day of APAP noted in the physician's order for APAP which was a component of the computerized order set that included an APAP order.

The number and types of providers of medication teaching comprised the next question (DS 2.3). Participants had three choices: nurse, pharmacist, and physician. They could check all that applied. In Part 2 of the Admission Survey, question 2.11 asked the participants to rank their preference for the person who would teach them prescription pain medicine information—the physician, the nurse, or the pharmacist. For first choice, the largest proportion of participants selected the physician (18, 48.6%), followed by the nurse (9, 24.3%) and the pharmacist (8, 21.6%). However, in the discharge survey the actual teaching rank order was different as nurses comprised the largest proportion (33, 89.2%), followed by physicians and pharmacists (11, 29.7% each). Some participants received teaching from more than one professional.

Question DS 2.4 is a three-part yes/no question that asks participants if they: 1) were taught disposal of unused medication (yes = 5, 13.5%), 2) had all their pain medication questions answered (yes = 35, 94.6%), and 3) were given a number to call if they had questions at home (yes = 35, 94.6%). The earlier question (AS 2.9/DS 1.9) referring to the disposal of unused medication demonstrated that a little over half of the participants could correctly identify the proper method for opioid disposal (AS 20, 54.1%; DS 17, 45.9%), yet, only five participants received any information on this timely concern. Participants believed that all their questions had been answered and they had a telephone number to call for questions or emergencies.

The following two questions were designed to be a check on the previous question that elicited a positive response to the information participants had received about their pain medications. One participant did not respond to these questions. The first question (2.5) was multiple choice (check all that apply) and it asked participants if they would have liked to receive

more medication information than they received about: 1) dosage, 2) when to take the medication, 3) how to take the medication, 4) side effects, 5) lifestyle changes, and 6) other information. The four participants who chose "other" would have liked information on the disposal of unused medications, onset of action, and when/how to wean.

Table 17 Topics of Self-Medication for Which Participants Wished They Had More Information

Topic	Desire for More Information	
	Yes **No. (%)**	**No** **No. (%)**
Dosage	2 (5.4)	34 (91.9)
When to take	1 (2.7)	35 (94.6)
How to take	1 (2.7)	35 (94.6)
Side Effects	4 (10.8)	32 (86.5)
Lifestyle changes	3 (8.1)	33 (89.2)

The second question (2.6) asked the participants how worried they were about medicating themselves for pain at home. It was designed with a five-point Likert Scale (1 = not worried at all; 5 = very worried). It covered each of the six topics from question 2.5. The one participant who chose "other," rated worry of "the security of meds from the kids" as a 5 or "very worried." The results are tabulated below:

Table 18 Level of Concern Participants Have Regarding Their Abilities for Each of the Topics for Self-Medication

Topic	How worried are you about…				
	1 **Not Worried** **No. (%)**	**2** **No. (%)**	**3** **No. (%)**	**4** **No. (%)**	**5** **Very Worried** **No. (%)**
Dosage	34 (91.9)	1 (2.7)	1 (2.7)	0	0
When to take	33 (89.2)	1 (2.7)	2 (5.4)	0	0
How to take	34 (91.9)	2 (5.4)	0	0	0
Sided effects	28 (75.7)	5 (13.5)	2 (5.4)	1 (2.7)	0
Lifestyle changes	33 (89.2)	3 (8.1)	0	0	0

It was mentioned earlier that, due to pain medications and anxiety about discharge, patients should have someone present to listen to their discharge instructions in case they should forget vitals bits of information. Question 2.7 asked participants if someone had been present for their teaching. It was a yes/no question and 25 participants (67.6%) did have someone present.

The last question in the DS was designed to see if patients remembered reading the surgery packets that they received in the surgery clinic. However, as mentioned previously, patients get their information in various formats in addition to those provided by professionals. This question was also a yes/no question, and 19 participants (51.4%) indicated that they had received information on opioid medication before coming to the hospital.

The Admission Survey, Discharge Survey, and Change Scores for each participant can be viewed in Table 20 below. An examination of the Change Scores revealed that a total of 20 participants (54.1%) improved their total scores from the AS to the DS, 11 participants (30%) received lower scores, and 6 participants (16.2%) had no change in the scores for AS and DS.

Descriptive statistics for the Admission Survey, Discharge Survey, and Change Scores indicated a slightly increased mean from the AS (M = 10.08, SD = 3.48) to the DS (M = 11.19, SD = 2.94) with a corresponding decrease in variance (Table 21). These changes demonstrated a narrower spread of the scores in the DS, centering them more closely around the mean than they had been in the AS. The mean of the change scores was (M = 1, SD 3.12). These values are consistent with improvement from AS to DS:

Table 19 Comparison of Descriptive Statistics for AS, DS, and Change Scores

	M	***SE_M***	***SD***	***VAR***	**Minimum**	**Maximum**
Admission Survey	10.08	.57	3.48	12.08	3	17
Discharge Survey	11.19	.48	2.94	8.66	6	16
Change Scores	1.00	.51	3.12	9.72	-5	8

Even with the improved scores, it is notable that 54.1% of participants scored below 50% on the Discharge Survey, and this is concerning:

Table 20 Distribution of Discharge Survey Scores

DS Score	Participants (number)	Percentage	Cumulative Percentage
20-29%	4	10.8	10.8
30-39%	6	16.2	27.0
40-49%	10	27.0	54.1
50-59%	12	32.4	86.5
60-69%	5	13.5	100.0
TOTAL	**37**	**100.0**	**100.0**

A final analysis of the total scores for the Admission Survey and Discharge Survey was conducted using a paired samples *t*-test, where $t(36) = 2.07$, $p < .046$, 95% CI [.023, 2.19] indicated a statistically significant gain in knowledge at the time of hospital discharge.

Table 21 Descriptive Statistics for Paired Samples Test

	Paired Differences							
				95% C.I. of the Difference				
	M	***SE_M***	***SD***	**Lower**	**Upper**	***t***	***df***	***Sig (2-tailed)***
DS Total Score – AS Total Score	1.11	.54	3.26	.023	2.19	2.07	36	0.46

Table 23

Admission/Discharge Survey Results

Participant	Admission Survey Score	% AS Correct	Discharge Survey Score	% DS Correct	Change Score	% Change
1	7	29.2	11	45.8	4	16.7
4	13	54.2	14	58.3	1	4.2
7	10	41.7	8	33.3	-2	-8.3
8	12	50.0	13	54.2	1	4.2
10	6	24.0	14	58.3	8	33.3
11	10	41.7	11	45.8	1	4.2
12	8	33.3	6	24.0	-2	-8.3
13	7	29.2	7	29.2	0	0.0
14	6	24.0	13	54.2	7	29.2
15	14	58.3	10	41.7	-4	-16.7
17	3	12.5	10	41.7	3	12.5
18	7	29.2	8	33.3	1	4.2
20	8	33.3	10	41.7	2	8.3
21	4	16.7	9	37.5	5	20.8
22	9	37.5	11	45.8	2	8.3
23	14	58.3	14	58.3	0	0.0
24	15	62.5	14	58.3	-1	-4.2
25	13	54.2	10	41.7	-3	-12.5
26	17	70.8	14	58.3	-3	-12.5
27	10	41.7	9	37.5	-1	-4.2
29	8	33.3	12	50.0	4	16.7
31	12	50.0	7	29.2	-5	-20.8
32	16	66.7	16	66.7	0	0.0
33	7	29.2	10	41.7	3	12.5
34	12	50.0	12	50.0	0	0.0
35	10	41.7	10	41.7	0	0.0
36	5	20.8	8	33.3	3	12.5
39	13	54.2	15	62.5	2	8.3
40	12	50.0	15	62.5	3	12.5
41	5	20.8	12	50.0	7	29.3
43	12	50.0	15	62.5	3	12.5
44	9	37.5	8	33.3	-1	-4.2
45	10	41.7	6	24.0	-4	-16.7
48	14	58.3	14	58.3	0	0.0
49	10	41.7	8	41.7	-2	-8.3
50	13	54.2	14	58.3	1	4.2
51	12	50.0	16	66.7	4	16.7

Phase 2 Quantitative, Qualitative and Mixed Methods Analysis

There were three analytic components to the Phase 2 study design—a quantitative component, a qualitative component, and a mixed methods component. Phase 2 participants took home a notebook in which they could record their pain medication doses, complete pain scales before and after each dose, and document the location of the pain (Appendix E1 and E2). One section of the notebook provided journal pages (Appendix D) in which they could write one or two sentences about the highlights of their day. Below this documentation were four quality of life (QOL) scales relating to basic features of that bring quality of life to people: role limitation, physical limitation, social limitation, and sleep/exercise. The four Likert scales had a range of 1-10, (1=poor and 10=terrific). The participants were asked to complete these four scales at the end of each day. Each of the four daily QOL scores for each participant was added to their daily summary of opioid doses and pain relief in SPSS prior to analysis. Higher scores indicated a higher level of functioning for each scale and lower scores indicated a lower level of functioning.

Although the journal entries functioned as qualitative data, the QOL scales provided quantitative data that could be analyzed to determine the number of times participants medicated themselves in a day and the pain relief they received when they did medicate themselves. This information allowed the researcher to examine the success of the participants' pain management quantitatively and determine if the qualitative data from the journal and interviews supported this success or was incongruent with it.

Quantitative Analysis

Notebooks were given to each of the twelve volunteers for Phase 2 of the PPMS. These were described in Chapter Three. Of those twelve, three participants did not complete the notebooks but did agree to the interview. Of the nine who used the notebook, one participant

took one dose of pain medication after arriving home from the hospital and took no more medication after that single dose. Another participant completed the journal section but did not record in the medication section. These participants were eliminated from this portion of the analysis. The seven remaining participants kept meticulous records and were included in this analysis ($n = 7$). Therefore, data represent repeated measures pooled time series across the seven individuals.

Opioid doses referred to the number of doses per day of the opioid medications for each participant for the number of days they were taking opioids. *Pain relief* was defined as a one point or greater decrease in pain an hour after pain medication was taken. The four QOL scales were entered as recorded by the participants in the journal section. Correlation analysis was done using SPSS, Version 19 (Tables 23 and 24 below – Pain Relief listed as "Pain" to avoid confusion). A bivariate correlation demonstrated significant relationships among the variables (Table 23). The number of doses per day of opioid medication and pain relief were weakly correlated $r(87) = .25$, $p < .05$. It was expected that the correlation would be stronger, however, a few participants did not get pain relief and did not respond by taking different measures that would have helped them, e.g. increasing dosage taken within dose range ordered or taking the medication more frequently.

The number of doses per day of opioid medication and role limitations were negatively and weakly correlated $r(88) = -.36$, $p < .001$. Pain relief and role limitations were also negatively and weakly correlated $r(88) = -.23$, $p < .05$. These inverse relationships indicate that as daily doses of opioids were decreased, and the participant's pain decreased, they were less fatigued, more comfortable, and able to gradually return to their role in the family and community.

Table 22 Opioid Daily Doses, Pain, and Quality of Life Scales: Bivariate Correlations (*N*=7; *df* 88)

Variables	1	2	3	4	5	6	7
1. Opioid Doses	--						
2. Pain	.25*	--					
3. QOL – Role	-.36***	-.23*	--				
4. QOL – Physical	-.40***	-.29**	.94***	--			
5. QOL – Social	-.39***	-.32**	.69***	.75***	--		
6. QOL – S/E	-.31**	-.30**	.84***	.88***	.83***	--	
7. Time	-.50***	-.53***	.20	.30**	.46***	.33***	--

*$p < .05$. **$p < .01$. ***$p < .001$

Table 23 Opioid Daily Doses, Pain, and Quality of Life Scales: Partial Correlations Correcting for Time (*N*=7; *df* 87)

Variables	1	2	3	4	5	6
1. Opioid Doses	--					
2. Pain	.03	--				
3. QOL – Role	-.31**	-.14	--			
4. QOL – Physical	-.31**	-.15**	.94***	--		
5. QOL – Social	-.20*	-.32**	.69***	.72***	--	
6. QOL – S/E	-.17	-.15	.84***	.87***	.80***	--

*$p < .05$. **$p < .01$. ***$p < .001$

The number of doses per day of opioid medication and physical limitations were negatively and moderately correlated $r(88) = -.40$, $p < .001$. Pain relief and physical limitations were negatively and weakly correlated with $r(88) = -.29$, $p < .01$. Again, there were inverse relationships between doses/pain and physical limitations indicating that as doses/pain decreased, the participants were able to increase their physical activity. A confounding factor exists in that it is not easy to disentangle the effects of opioids from relief due to gradual surgical recovery.

The number of doses per day of opioid medication and social limitations were negatively and weakly correlated $r(87) = -.39$, $p < .001$. Pain relief and social limitations were also negatively and weakly correlated $r(87) = -.32$, $p < .01$. A confounding factor exists in that social limitations were not just a function of pain. For participants who had ostomies placed, there were concerns about leakage, gas, bags falling off, and odor. Until they learned the intricacies of stoma management, many were afraid to leave the house for fear of "something happening" (P26).

The number of doses per day of opioid medication and sleep/exercise were negatively and weakly correlated $r(87) = -.31$, $p < .01$. Pain relief and sleep/rest were also negatively and weakly correlated $r(87) = -.30$, $p < .01$. The more doses of pain medication that one must take, the less likely one will be able to sleep through the night. One participant reported outside of the interview format that his pain would get so bad in the middle of the night that it would be incorporated into his dreams until he finally awakened to take something for it (P26).

A partial correlation was also provided to show the association between the variables when time was controlled for in the analysis. The bivariate analysis demonstrated that Time and Opioid Doses had 25% shared variance and Time and Pain had 28% shared variance. The inverse relationship shows that as time passed, the participants decreased the pain medications

and experienced less pain. When time was removed the coefficients decreased but the relationships that had been significant in the bivariate analysis remained so when time was eliminated with the exception of the relationship between opioid doses and pain and the relationship between doses/pain and sleep/exercise. The sample of patients entered in this analysis was $n = 7$. Some were on pain medication for as long as two weeks and others only three days though these participants continued to maintain their journals even after completing their opioid therapy. This may explain the variation between the two analyses.

Though the focus of the PPMS was on the relationship between pain medication/relief and quality of life, it was interesting to observe the strong positive and direct relationships that quality of life indicators had with each other (Table 23). Of course, it is expected that the better one feels physically, the better one will feel functioning within roles and social spheres, the more energy they would have and the better they would sleep at night. This is not always the case for every patient. However, these Phase 2 quantitative results support the assertions of the Phase 2 participants that their transitions into self-medication for pain, though they had bumps along the way as the next section demonstrates, were successful in the end.

Qualitative Analysis - Process

The Phase 2 qualitative data was collected from two sources: the journal comments completed by nine of the participants and the phenomenological interviews. The journals were an important component in this process because they described the transition as it was actually happening as opposed to a retrospective description of this experience in the interviews, which was totally dependent on participants' memories.

Journals. Each statement in the journals was examined for the meaning it seemed to communicate and how that meaning related to the participants' experience of pain management.

As this process progressed, series of codes began to emerge—some related to pain management and others related to the experience of recovering from surgery. As stated previously, it was often difficult to separate the two and many times they seemed to be inextricably connected.

Interviews. The interviews were transcribed by the researcher and taken apart sentence by sentence. Initially, the statements fit into the codes established based on the journal comments. As participants described different events during their transitions, other codes were added and soon it was possible to see categories forming that would eventually become the themes that would describe the experience of transitioning to self-medication for pain. The themes would also describe the experience of recovering from surgery and though these codes/themes will not be examined in this study, the themes and subthemes are listed in Appendix L. Member check was used to validate the coding process with a 94% accuracy rate between researchers.

Qualitative Analysis – Themes

The thematic development of the participants' comments from journals and interviews was an iterative process. Each statement had to be related to the major focus of the transitional journey to self-medication for pain, otherwise it may have been difficult to determine the success of the transition in the end and many important elements of the process might have been misinterpreted or misrepresented in the final analysis. Of the eighteen codes that began the analysis, four major themes evolved: 1) commute from the hospital, 2) activity, 3) pain and pain medications, and 4) daily routine management and support. The latter was most difficult to extricate from the surgical recovery process itself so some of the codes were shared between the two groups (Appendix L).

Commute from hospital to home. This was a traumatic period for the participants because of two things: dealing with the unknown and the pain involved in the commute. Since the medical center is a major hospital in the Pacific Northwest, patients come from all over Washington and nearby states for medical and surgical care. This can result in long and varied types of commutes for patients. The PPMS participants dealt with having to fly, to be driven distances of over two hours, to take ferries, to take cabulances – all unpredictable in terms of comfort and convenience for someone who recently had surgery:

> I flew home on Sunday, my surgery was on Saturday prior, so a week later I flew home… I was a little fatigued but pain-wise, no complaints and my activity level was pretty good, you know. (P10)
>
> Long drive home – took 4:30p to home at 8p. (P1)
>
> Drive home sucked! (P4)
>
> Tiring day. [commute day] (P22)
>
> Coming home, the car ride suck [sic]. So bouncy holding on the seatbelt not to touch my stomach. (P36)
>
> Overwhelming day. [First day home] (P26)

It was unfortunate that for some participants, this was their first introduction to the transition for self-management of pain. All participants received dosage ranges for their opioid medications so they could manage moderate to severe pain. The commute home was a significant experience for the participants who did not live within a reasonable distance to the hospital.

Activity. Participants' stories were replete with comments about activity limitations. Of course, after surgery, not all limitations were because of pain but pain did help participants to determine their daily activity boundaries. Some participants were quite adept at differentiating between the two:

> I mean obviously moving around, like, I don't know, walking a lot was hard for

> me, and we have a lot of stairs, so that was hard, but I don't think I had a lot of problems with pain management. I really don't feel I had an issue with that. (P4)
>
> The pain meds helped me but I was really tired… and didn't have all my faculties so I couldn't really think straight. And pretty much didn't want to do anything except sleep. (P25)
>
> Well, I was restricted because I had an ileostomy. I was restricted because of surgery so I couldn't bend, I couldn't lift, and I couldn't twist. So, I was limited. They gave me a stick [a grabber]. But in terms of moving around, I started moving around immediately
>
> when I got home…my bedroom was upstairs so I had to go up and down stairs, which
>
> was not a problem. I took walks. I was a little fatigued but pain-wise, no complaints and
>
> my activity level was pretty good, you know. (P10)

Other participants accepted that there would be pain and some were prepared to tolerate a certain

amount without using medication but by utilizing a self-imposed decrease in activity:

> I don't feel the need to use the pain medication because I am not in severe pain. I have discomfort which is just more or less like pressure, not pain, just pressure. But, I'm still able to do things just a little slower until I recover… (P25)
>
> …it wasn't about sittin' up, it was about moving and it was really hard to move, uncomfortable with the catheter in. (P12)
>
> So,…I feel …the pain a lot in my stomach. But if I stay still, in one position, and don't move, I can tolerate it. But once I'm starting to go up and down, or go to the rest room, and stuff like that, it, I mean it became more intense so that's when I start taking the pills, like every six hour as needed. (P36)
>
> I expect to be able to live with it and…be fairly normal…given the circumstances, level of activity…With the Foley I was pretty much limited because—every time I moved it was still rubbing and…So I was over there, usually in a very reclined position. (P8)

Participants expressed frustration at not being able to do more because they saw things not

getting done and because they were uncomfortable having to require so much assistance:

> I think it was the emotional part of it, you know, limited ability to do things, I mean, I don't know, our whole family had to revolve around me for the first few weeks. (P4)
>
> My house is a mess…I want company but then I do not because of my house. (P1)

> It may take a week but I will get this place back in order. (P1)
>
> Don went to Ephrata to watch McKenzie and Bobby play basketball, wish I would have felt better to go. [Names changed] (P22)
>
> Physically, I wish I could do more. (P26)

The fatigue caused by surgery and the medications used to relieve pain was a recurrent theme and it was impossible to differentiate the causes of the fatigue unless the participant was not taking any pain medication at all. Participants expected to have *pain* but some were surprised at the level of *fatigue* experienced:

> Ah, just being tired. That was my main, that's my main complaint. Just being tired so much. (P22)
>
> Tired of feeling like I can [? can't] do anything. (P1)
>
> Had to ask them [friends] to leave because I was exhausted. (P22)
>
> Doing okay except tired [secondary] painful night and [decreased] sleep. (P26)

There were occasions when participants would "overdo it" because they could not stand to see so much going undone while they were temporarily sidelined or just wanted to go out and do something enjoyable:

> I think I over did it on going to dinner but I had FUN. (P1)
>
> Really tired weak & light headed. [after extensive house cleaning] (P22)
>
> Came home and slept all afternoon. (P26)

Alternatively, there were the comments that expressed joy with the progress they experienced as they adjusted to being at home and learned how to manage their pain:

> …this weekend we did some shopping and so,…walking around was a little bit easier, … you get cooped up a little bit,…when you can't really go anywhere. (P4)
>
> I'm able to make breakfast, I'm able to make lunch, I'm able to make dinner, I'm able to do, housework, and water my plants,…still healing, (P25)

> Work today putting some of the small thing[s] left around the house back where they belonged. (P1)
>
> Getting easier to do required walking. (P11)
>
> Went to see my grandson play ball in a.m. (P22)
>
> Lots of energy. (25)
>
> Feeling better energy-wise. (26)
>
> So, for me it [the surgery] was like a new life. And I was so pleased I was, I think, I was depressed when I had Crohn's. Because there were times when I thought, "This is going to kill me. I'm going to die from this." But I just kept pushing forward so that depression – totally gone, totally lifted. You know, I'm hopeful now, and I realize that I'm [states age] so there's limitations to what I can do and there's a possibility that I will have another flare, or whatever, but it will never be what it was these last four years. So my whole outlook on life has changed with the surgery. (P10)
>
> My birthday! Went out to dinner. Worked on BSF [Bible Study Fellowship] class & walked on side. (P1)

Jim Loehr, performance psychologist, author, and co-founder of the Johnson & Johnson Human Performance Institute once said, "Even if you're ill, physical activity at a lower level will help you beat it." (2016). This fact is not only evidenced from the emphasis that physicians are now placing on regular activity after surgery, note the above quote referring to "required walking," but it was also evident in the comments participants made regarding exercise and pain management that will be examined in the next section.

Pain and Pain Medication. Pain and pain management have been the focus of this study and the participants had more to say about this theme than any of the others. For some, this was a repeat performance which they took in stride since they had undergone surgery in the past. Some who had surgery before said this time it was different, either more pain or less. A few participants were looking ahead to another surgical procedure in the future. A couple of participants had cancer and their pain was complicated with surgical pain superimposed upon

cancer pain that may or may not improve after the surgery. Appendix L provides a list of surgeries that the participants underwent.

The sub-themes ascribed to pain and pain medication evolved from concerns patients expressed about the pain they were experiencing, the medication side effects, and the way the medications made them feel physically and emotionally. As previously described, some of the side effects of opioid medications are so interwoven with the effects of the surgery that it was hard to know the actual source of the symptom, e.g. was the nausea and vomiting related to the oxycodone the patient took 3 hours ago or was it, instead, due to abdominal surgery and/or the development of an ileus?

Participants had varied responses to the pain they experienced after surgery. Some participants moved through it without pain medication, some took pain medication and stayed in bed all day, and others took pain medication and then moved on to activity. Their stories were as different as their surgeries. Some participants believed they had a high tolerance for pain and so expected to do well. Others were afraid of the surgery and the pain but after some trial and error, found a way to manage the pain using alternate methods of pain management, with or without opioid medications:

Participant 1

Researcher: Please tell me what it was like medicating yourself for pain after you got home from the hospital.
Participant: Nothing, really, other than the me-, ok, the pink pain pill he gave me, yellow one, what was it called? Morphine? I think he gave me morphine. I had allergic reaction to it and had to go on an inhaler.
Researcher: Oh?
Participant: Yeah.
Researcher: Did he change the medicine?
Participant: No.
Researcher: What did you do for your pain?

Participant: I was still doing the same thing… as soon as I got to the point where I didn't need as much, I went to just Tylenol, you know, weaned off of it. Cuz, you know, you don't want to be on an inhaler.

This participant was actually taking hydromorphone (Dilaudid) which can cause bronchospasm.

She weaned herself off the opioid by Day 10 and managed her pain with APAP (Tylenol)

thereafter.

Participant 4

Researcher: Please tell me what it was like medicating yourself for pain after you got home from the hospital.
Participant: I guess…I just tried my best to…breathe, do all the things I was supposed to do and I just know from being in the hospital,…know, that if you keep up on 'em, it keeps your pain down. And I just tried to wean my way off the pain medicine. I'm pretty good about that. I really didn't, I mean the pain was obviously there and I still have the soreness and all those kind of things, obviously because I was cut open, but I think that over all I did a pretty good job of the pain management…I think diet helps a lot too, so I don't know.
Researcher: How do feel the diet helped?
Participant: …because with this particular surgery if you don't eat a lot of solid food, it tends to be more liquidy which cause leakage, and those kind of things, skin breakdown, so there was some pain involved with that… but for the most part I think I did pretty good. I mean, obviously I tried to, like the doctor said, to take it so that you, cuz I went an hour or two over I noticed it was harder for me to get back to feeling like I could…actually move around.

This participant had an ostomy which is why the diet was so important to her pain management

and recovery. One of the most important ways to manage pain after surgery, and the participant

alluded to this, is "to stay on top of the pain." It is accepted practice in nursing to instruct

patients to call for pain medication when their pain becomes a 5/10 since it can be relieved with a

smaller dose of opioid than if they wait until it is an 8/10.

Participant 8

Researcher: Please tell me what it was like medicating yourself for pain after you got home from the hospital.
Participant: I didn't much. I used Tylenol mostly, an occasional oxy, one, 5mg of oxy. I don't think I ever did two. So, you know, probably three or four times. I wasn't in severe pain and the pain level I was at I was willing to tolerate, to avoid pain killers.
****

Researcher: What experiences stand out for your during this time of healing and dealing with the pain.
Participant: Mostly that the, the Foley [laughs] was the source of a lot of it. It was really hard to deal with surgery of that area and then having the Foley in there rubbing on it constantly. And, it ached from sitting on it, you know, the tube in your perineum when you're sitting down…So the biggest change since I've been home is getting rid of that Foley.
****
Researcher: …What was the hardest part of dealing with your pain?
Participant: At home, nothing. I mean it was pretty much clear cut. When it got to a certain level, I took it and it usually controlled it, well enough. I mean, I expect pain. I don't expect a pain-free experience after surgery…I expect to be able to live with it and be fairly normal level of, given the circumstances, level of activity. So, you know, which was pretty much nothing. With the Foley I was pretty much limited because it was—every time I moved it was still rubbing and…So, I was over there, usually in a very reclined position. I didn't really have any trouble or reactions to the drugs or anything. I'm pretty tolerant to things, even, you know, like, indigestion…I took the pain meds and they did what they're supposed to do and, so I just, you know, that was good. I would occasionally take ibuprofen too, or even Aleve.

This participant was one of those who did not record in his notebook and his management of his pain was difficult to follow as demonstrated in the interview excerpts above. He came back to the "Foley pain", which refers to his urinary catheter, several times during the interview. It is of note that he had this pain for a month and took only occasional doses of his opioid. It is also important to note that this participant had surgery again in a different hospital between his surgery of record and this interview. It was after the second surgery that the urinary catheter was removed.

<u>Participant 10</u>

Researcher: So tell me, how did you perceive your experience of pain management after your hospitalization?
Participant: Well, I did not leave the hospital with any kind of pain medication because they offered it to me but I didn't think I needed it. I also am scared to death of getting addicted to any kind of opioids. So I just said "No, I really don't need it." And I really didn't…You know, you expect a certain amount of pain when you have the surgery like I did, but it was not any type of pain that was extraordinary. I would say on a level of 1-10, it was maybe three. And, yeah, so it was, you know, now I was on prednisone at the time which I think helps a lot. This time I will not be on prednisone so who knows how I'm going to handle the pain [referring to a future surgery]. But, I had a hysterectomy when I was [states age] and I never pushed the pain button then either. So I think I have a high threshold for pain.

The future surgery the participant is referring to is the takedown of the ostomy she had just received. The placement of an ostomy is a common surgical treatment for severe Crohn's colitis. It diverts the contents of the small intestines, through an external stoma, to an external bag that covers the stoma. It allows the gut to rest and heal from the colitis. Once that occurs, the stoma is removed and the ileum is reattached to the lower intestines and the patient's digestive process is normalized.

Prednisone is a powerful steroid with anti-inflammatory properties. The participant correctly attributed her decreased need for opioids to the action of the prednisone. For this reason she expressed apprehension about the pain she will experience after the next surgery during which she will not be receiving prednisone.

Participant 25

Researcher: What was the most difficult part of managing your pain after surgery?
Participant: I think the most difficult part was after the surgery, I was having a lot of abdominal pain…due to the procedures that they did. And then after I was released, it was the moving around that was even more painful for me…just trying to stretch my muscles again. That was terrible, that was the worst pain I've ever had [laughs] – in comparison to all my other surgeries…
Researcher: Right.
Participant: …that was the worst.
Researcher: But it doesn't seem like you were on the pain medicine for very long, just a couple of days.
Participant: Yes. That is true. I was just on it for a couple of days just to help me for the first few days. I was having a lot of pain and then I managed to start getting up and moving to stretch out my stomach muscles just a little bit…I picked myself up, with the help of my husband, and walked a little bit in the house, and then sat down for a little bit, and then laid down to rest. And then just basically the pain was tolerable for me. I have a higher tolerance for pain…

The experience of headaches after the opioid wore off was the major stimulus that motivated this participant to wean off the opioid medication she was taking, "I just can't stand headaches.".

The experiences of pain among the participants in the PPMS were as varied as their methods for dealing with it. Most were fortunate enough to have someone living with them as a

solid emotional support providing physical assistance, feedback, suggestions, and love. This made it easier for them to move through this transition process and meet success on the other side. This support and the other resources assisting participants in their recovery and pain management will be explored in the next section.

Daily Routine Management and Support. Whether it was pain, diet, physical limitations, fatigue, or other any other issue, one thing participants knew very soon after arriving home was that, for a while, things would be different. Some had to change how they slept and what they did during the day. Others had to deal with temporary changes to their roles in the home. All participants had helpers either living with them, staying with them, or available for errands or assistance at all times, if need be.

Emotional support was very important to the participants whether because of the pain they experienced or because of the surgery itself. Health care providers talk about the mind-body connection. It begs the question, can emotional experiences ever be divorced from pain management, even if the source derives from the surgery? Some of the participants' practical, personal, and emotional responses to changes in their daily living experiences are presented below:

> Emotional. I think that was my hardest thing. Dealing with just having it [an ileostomy]. And it was, I'm starting to cry now [voice falters], it's just hard. [Crying] It was just all around hard to get used to. But, obviously, I had good days and I had bad days, but for the most part [sniffling], I think it was the emotional part of it, you know, limited ability to do things, I mean, I don't know, our whole family had to revolve around me for the first few weeks. I mean, still sometimes, you know, we go out to eat and I'm like, "Oh, my gosh, I'm leaking!" And then I have to find a bathroom, you know what I mean? [sniffs] It's just an emotional roller coaster, but that's not it. I think the emotional thing was the hardest part for me. While I'm not happy to have to change the bag – that was a whole new game [laughs]! But yeah, no, I think that was the hardest part for me – the emotional. (P4)

Researcher: What experiences during this time of pain management stand out for you?
Participant: The pain. The pain was kind of different cuz, from the surgery, I couldn't get up or get down and before, my bed was on the floor cuz I have a mat, a thin --, like a Korean flat mattress…It was hard for me to get up and down so I had to sleep on the sofa – the first week I was home. (P36)

I took the lead in my own pain management but I had plenty of people around me helping to make sure that I was comfortable, um, and making sure that if my meds were upstairs and I was in too much pain to get them, they'd grab them for me. (P32)

Researcher: Did you feel like you had adequate support when you came home?
Participant: Yes. Absolutely. Yeah. My--
Researcher: Is that your granddaughter or daughter?
Participant: That—that's my daughter. She was an MA prior to my surgery. And my wife's an RN and still working.
Researcher: You are all set!
Participant: Yeah. Maybe a little too easy. I don't know. [Smiling] (P26)

…my husband is a catastrophic thinker [laughing]. He thought of everything that could possibly go wrong and just prepared for it and would not let me do it. And just, like right now, I want to go play tennis but he's afraid I'm going to take a ball in the stoma, and I'm thinking, "I've never taken a tennis ball in the stomach, why would I start now?" But I see his point. He's very worried. He's a worrier, you know. Everything is like—He thinks of the worst-case scenario. So that's really helped us prepare for before the surgery, during the surgery, after the surgery. He pretty much thought of everything. (P10)

Researcher: How about the support you got while you were at home recovering?
Participant: Oh, perfect. My husband is amazing. And then my daughter and granddaughters came by too and helped a lot too. (P22)

My wife is a saint. She's a hard-working caregiver and I can tell she gets discouraged sometimes, but nothing you wouldn't expect and my kids, of course, are rallying around…In fact my, one of my daughters is moving home from [out of state] with her husband and kid, you know, resettling back here, be a little closer to home. That's something they wanted to do anyway but, I'm sure my being sick figured into it. So, no, I've got lots of family support – it's great. You know, so I [pause - voice louder] paid dearly. Never had the four [inaudible] trucks, and hunting trips, and toys, and stuff like that because of five kids but this is where the payback comes… (P8)

Researcher: What kind of support systems did you have while you were recovering?
Participant: My daughter and my husband. And they would not let me do anything. I had to sneak around to do stuff [laughs] because they were unbelievable!... So, they were wonderful. You know, my daughter helped me with chores and my husband did all the cooking and--
Researcher: Does your daughter live with you?

> **Participant:** No, she doesn't. She came and stayed with me for two weeks, which was very nice. But we were both glad to see each other go. It was time. (P10)
>
> Getting more comfortable with appliances. (P26)
>
> Very hard day. One of my incision came open today and would not stop leaking. Ended up gluing it so I could go to bed. Didn't get the shower I wanted due to leaking. Sister came over to help me w/ changing the bag…Glue worked! Dr. not happy I did that. (P4)
>
> Tried setting a daily routine – log RX (meds), what kind of day I had, start back on Isagenix Shake, start back on Isagenix Vitamins. (P1)
>
> Able to do planned easy cooking by myself…to the grocery store without issue. (P11)
>
> Sleeping on my back only w/ pain is something I will have to get used to. Plus everything else [ileostomy care]. (P4)

Overall, each participant believed that they had successful experiences with managing their own pain. They had completed opioid pain management and were pain-free at the time of the interview. The question to answer now is whether opioid pain knowledge had anything to do with these participants' success. This will be explored in the next section.

Mixed Method Analysis

The mixed method analysis attempted to determine if the knowledge change score had a positive or negative effect on the experience of pain management for the twelve participants in the study. Because of the small sample, Fisher's Exact Test was chosen for this analysis. The cross tabulation involved dichotomous categories: Improved Change Score and Not Improved Change Score, which indicated either that the AS and DS scores were the same (0 = no change) or that that the DS score was worse. The groups used for the analysis were the Four Major Themes – Yes (1) for participants whose comments/interviews included each theme, and No (0) for participants whose comments/interviews did not include these themes.

All twelve participants included themes of activity, pain/pain medication, and daily routine management and support in the journal comments and interviews. Because of this, it was not possible to compute Fisher's Exact Test. However, only six participants included the "commute from hospital to home" theme so the Fisher's Exact Test was calculated with a value of 0.24 which is not significant at $p < .05$. The cross tabulation is below:

Table 24 Fisher's Exact test for the Theme "Commute from the Hospital to Home" and the DS Total Score (Improved vs. Not Improved)

Theme #1	DS Total Score Improved	DS Total Score Not Improved	Total
Yes	5	1	6
No	2	4	6
Total	7	5	**12**

The result is not statistically significant for a relationship with knowledge change and the experience of self-medication for postoperative pain after discharge.

Chapter 5: Discussion and Conclusions

Chapter Abstract

The Postoperative Pain Management Study examined the change in knowledge of opioid medications from Admission to Discharge with 37 surgical patients and found that there was a significant increase in knowledge. The goal of Phase 2 of the PPMS was to learn about the experience of transitioning from hospital-management of pain to self-management of pain. The quantitative data for this phase examined opioid use and pain relief with four quality of life (QOL) scales for seven participants who completed all the data recording. Opioid use/pain relief was significantly correlated with all four QOL scales. The qualitative data generated four major themes: 1) commute from hospital to home, 2) activity, 3) pain and pain medications, and 4) daily routine maintenance and support. The participants were deemed to have had successful transitions based on the data that all twelve participants: 1) reported having completed their regimen of opioid therapy, 2) were pain-free at the time of the interview, and 3) identified their transitions as having been successful during the interview. Due to the small sample involved, Fisher's Exact Test of Independence was used for the mixed methods analysis. The relationship between knowledge change and the experience of self-medication for postoperative pain after discharge was not statistically significant. This chapter will discuss the implications of the results of the analyses in Chapter Four and the implications these results have for the profession of nursing.

Discussion – Transitions Theory Style

Introduction

The Transitions Theory Model was discussed in Chapter Two and appears in diagram-format in Figure 4. This model provides the basis for the discussion of the results obtained for

the Postoperative Pain Management Study (PPMS). The **Nature of Transitions** contains the quantitative information for the PPMS. The first two research questions were answered with the data from this section through the Admission and Discharge Surveys:

RQ1) What is the change in opioid knowledge from admission to discharge from the hospital? It was hypothesized that participants would demonstrate an increase in opioid knowledge from admission to discharge.

RQ2) What is the level of opioid knowledge at the time of discharge from the hospital? It was hypothesized that participants would score at least 75% on the Discharge Survey, thereby demonstrating adequate opioid knowledge at the time of discharge.

The third question was answered with data from the medication records and the journals:

RQ3) How has their ability to control their pain affected their perceived quality of life? It was hypothesized that there would be a correlation between daily number of opioid doses and daily pain relief with quality of life (QOL scales).

The **Transition Conditions** section, which followed the participants' experience of self-management of pain, includes the qualitative data obtained from participants through journals and interviews. It also identifies the importance of the themes that were developed through the analysis of this data (Appendix L). This information answered the fourth and fifth research questions:

RQ4) How did the patient perceive their experience of pain management after discharge from the hospital?

RQ5) What does the patient wish they had known, but did not know, prior to beginning self-medication for pain at home?

Patterns of Response identified the process indicators which would, if the participant had been followed throughout their transition, confirm that the transition had moved in a path toward health. The outcome indicators provide three essential objectives drawn from the qualitative data that support the successful transitions experienced by these participants. This section also discusses the mixed method analysis and its relationship with the final determination of the transition's movement in a healthy or unhealthy direction. Due to the dynamic nature of the transition experience, a transition in a less desirable direction would not be considered a failure since it can always turn around with the needed interventions and support. This section provides answers to the final mixed methods questions:

RQ6) Is there a relationship between the amount of change in opioid knowledge during hospitalization and the quality and experience of pain management?

RQ7) Is there a relationship between opioid knowledge at the time of discharge and the quality and experience of pain management?

The **Nursing Therapeutics** section discusses the interventions that are designed to assist a patient through a successful transition. Because it was not inherent to the research design to follow the participants through their transitions, the researcher will offer suggestions for "preventative interventions" (see page 43) based on comments from the journals and interviews. This dissertation will integrate the nursing therapeutics with the results summary of the PPMS.

Phase 1

Summary of results. The Admission and Discharge Surveys were discussed in detail in the last chapter. Of the ten common questions presented, seven could be analyzed using the Chi-Square Test. Of those questions, only four showed a significant difference between prior learning and increased knowledge: 1) acetaminophen maximum dosage, 2) opioid side effects, 3)

guidelines for taking opioids, and 4) opioid disposal. The remaining three questions were evaluated using descriptive statistics. Only the question on alternate methods of pain relief demonstrated increased knowledge with 31 (83.7%) of respondents able to list three methods in the DS, an increase from 29 (78.4%) in the AS.

The perfect total score was 24 points (Appendix I). The mean score for the AS was 10.1 (*SD* 3.48), and 11.1 (*SD* 2.94) for the DS—both less than 50%. Although a paired samples *t*-test comparing the AS and DS total group scores was statistically significant, clinical significance seems is less likely, since there still appeared to be a lack of understanding of important pain medication information; this was supported in the qualitative phase of the study.

Pain medication constructs. Participants showed mastery of the *pain scales* in both surveys (AS 2.1, DS 1.1). This is probably because pain assessment in hospitals is now considered to be the "fifth vital sign" along with temperature, pulse, respiratory rate, and blood pressure.

The participants who were on opioids prior to surgery were able to *identify what pain medications* they were taking at the AS (AS 2.2) and most knew what they were prescribed at the DS (DS 1.2) though a couple had to look at their discharge instructions to be sure. This was understandable given that they were getting ready to be discharged and were under the influence of the pain medications as they completed the DS. A different picture emerged with some participants during the interviews.

Twelve *side effects* were listed in the surveys (AS2.5, DS 1.5) of which six were correct common effects and six were not common. The Chi-Square test demonstrated a relationship between prior learning and six of the side effects—four that were common: constipation, itching, nausea/vomiting, and slower breathing; and two that were not common: blurred vision and

headache, both of which are possible but are, by no means, common. One participant did stop her opioid medication after the first few days due to a severe headache after the effect of the medication had subsided.

The number of correct responses, however, demonstrated the need for more education. The percentage of participants choosing all six correct responses went from 16.2% (6) in the AS to 29.7% (11) in the DS – only a 13.5% increase. The DS results also demonstrated that 43.2% of all respondents chose only three or fewer correct side effects compared with 45.9% in the AS. The implications for improved education of opioid side effects are strikingly clear from these statistics.

The *precautions of opioid therapy* involve several different issues. Questions # 6-9 on both surveys dealt with just a few of these precautions: instructions as guidelines only (6a), sharing opioids (6b), understanding opioid dependence, addiction, and tolerance (7 a, b & 8), and the disposal of unused opioids. Questions 6a and 9 demonstrated a statistically significant relationship between prior learning and "instructions as guidelines only" and "opioid disposal." The other questions did not, with the exception of #8 (definition of dependence) which had one positive relationship with prior learning and the element of "needing to take the drug to function normally." With an opioid crisis at play in the United States, it is imperative that patients understand all the implication of these powerful drugs.

The concerns of health care providers cannot be limited to just opioids because many opioids are compounded with APAP (e.g. Norco, Percocet, and Vicodin). Questions in both surveys asked the participants: 1) to identify the maximum daily dose of Tylenol (APAP) as recommended by the Food and Drug Administration (AS 2.3, DS 1.3), and 2) to identify which drugs out of six contained Tylenol (AS 2.4, DS 1.4). Though the participants' scores improved

from 6 (16.2%) correct on the AS to 11 (29.7%) correct on the DS, it is concerning that by the time of discharge, only 29.7% of participants could correctly identify 4000 mg as the maximum daily dose of Tylenol (Food & Drug Administration, 2018). For the sake of safety, it is encouraging that those participants who did not choose 4,000 mg all chose lower doses, indicating that they likely knew that there were issues related to taking too much Tylenol.

It is also important for patients to understand if their opioid medications contain APAP. In the discharge survey, 15 (40.5%) of participants were unable to identify any of the three medications that did contain APAP (Norco, Percocet, and Vicodin) out of six choices. In Phase 2, two participants indicated that they did not know if their pain medication contained any Tylenol. With the large number of over-the-counter allergy, cold, pain, and sleep medications that contain APAP, available to patients, it is imperative that they know whether or not their prescription opioids have APAP in them.

The last construct was highlighted in questions AS 2.10 and DS 1.10 where participants were asked to list three *non-pharmaceutical methods* of pain relief. As stated in Chapter Four, 83.8% were able to list three methods. A list of 33 alternate methods was compiled and is presented in Appendix K. Responses represent a broad cross-section of collective knowledge for alternative methods of dealing with pain, and the Phase 2 data provided evidence that participants did use some of these approaches in conjunction with their opioid pain therapy. If patients utilize alternative methods, they may be able to use less opioid medication, they may have more freedom, and might transition more quickly because their activity and healing will not be limited by the side effects of the opioid.

Discharge teaching/prior learning. The literature is replete with tomes written on the concept of discharge teaching. No one would disagree that it is a necessity to provide adequate

discharge teaching to patients. Chapter One described the consequences of sending patients home without the essential knowledge to fully participate in their own care. However, this researcher has been careful not to use the term discharge teaching in the design of this study except when referring to the actual procedure in the hospital. The research questions seek to measure what participants know, not what they were taught. Obviously, teaching is a part of the process, but it is what participants learn and how they utilize that knowledge that will ultimately make a difference in their transition experience.

The amount of time the participants' nurses spent teaching them about their opioid medications was very subjective and limited by memory. A large proportion of participants (62%) believed that they had received four minutes or more of teaching. However, as was discussed above, twenty participants (54.1%) did not score above 50% on the Discharge Survey. Is it the time, the teaching, or both that must change to improve opioid knowledge, or must health care professionals seek more innovative ways of educating patients before discharge from the hospital?

It was beyond the scope of the PPMS to listen to the nurses as they did discharge teaching with the participants. This researcher received a copy of the pre-surgery packet and saw the discharge instructions sent home with the participants. As was mentioned earlier, these were cursory at best. However, maybe expecting patients to know everything they need to know about opioid medications before discharge is not the best way to go about providing them with the information they need. Maybe just getting the information into their hands is a more realistic goal. Teaching should still take place, but with a triangulation of methods, since it is an accepted theory that patients learn more information when teaching is tailored to the ways in which they acquire and retain knowledge. This process is enhanced when there is repetition of information.

Maybe creating a concise pamphlet (reading) that they could take with them and providing a video (viewing) to watch while in the hospital—one that would reinforce the pamphlet—might be more effective. Puzzles could also be designed, using information in the pamphlet, that would give patients something to do if they become bored but provide education as well. Nurses can then supplement these tools by reviewing the items in the pamphlet prior to discharge (hearing). One nurse this researcher observed made it a point to tell her patients one new fact about opioid medications every time she brought them something for pain.

There was no evidence that the learning style of the participants was considered prior to discharge teaching for the PPMS because the teaching centered around reviewing the discharge instructions (per nursing). Teaching may have occurred spontaneously during nurse-patient interactions but the PPMS was not designed to measure this. It also may not be realistic, with abbreviated hospital stays, for patient learning styles to be ascertained. Perhaps just providing the important information in a variety of ways will accomplish the same thing.

Eighteen participants (48.6%) responded in the AS that they preferred learning about their pain medications from the physician, however 89.2% received most of their information from their nurses. In Phase 2 of the PPMS, all but two participants (83.3%) stated that they felt comfortable with the information they received. In retrospect, it would have been interesting to know why the participants preferred physicians over nurses. With a more consistent program of patient education, this researcher believes that nurses can change this perception. In the past, hospital units had "unit teachers" who were responsible for educating patients and staff and that was their sole responsibility. Maybe it is time to reconsider this important role. Additionally, the involvement of nurses in the design and production of public service announcements (PSAs) will allow patients to see nursing as not only care providers but also as educators.

The disposal of unused pain medications has been highlighted during the opioid crisis in the U.S. However, only one-half of the participants answered this question correctly in the AS, and in the DS, only five participants said they received information on what to do with their unused medications.

It is becoming more common to find drop boxes in pharmacies for all unused meds. This researcher spoke with a pharmacist from a major U.S. pharmacy chain and asked if all their stores provided these boxes, and he said that at this time only some stores have them, but he expects this will change soon. His own store's box fills almost as quickly as he can get it emptied (See also LaVito, 2018). Some police stations have drop-off slots similar to mail boxes (Thurston County, 2018). The Drug Enforcement Administration (DEA) offers the National Prescription Drug Take-Back Program twice a year in April and October during which police departments, pharmacies, and hospitals provide opportunities for people to return unused medications in many locations at the same time. Public service announcements are common the week before this program begins (Guza, 2018). Guidelines for disposal of unused medications are available online and patients should be encouraged to search these sites and provided with assistance, when necessary, in locating these informative resources. It would be helpful if hospitals provided patients with the information about local resources for the disposal of unused medications.

In addition to safe disposal, patients need to be taught safe storage of medications in the home. Relatives, friends, and people working in the home may have opioid use disorder (OUD) so opioid medication should never be left in the open or in medicine cabinets. It also must be secured from children and teens. Labels on empty medication containers need to be removed and shredded when discarding to prevent home break-ins (Dellwa, 2018).

In summary, a paired samples *t*-test using the total scores from the Admission Survey (M = 10.08, SD = 3.48) and the Discharge Survey (M = 11.19, SD = 2.94) was $t(36) = 2.07$, $p < .05$, which indicated a statistically significant gain in knowledge from the initial clinic visit to the time of discharge. There were significant relationships between prior learning and some questions in the surveys that were discussed in Chapter Four. The participants demonstrated knowledge improvement of opioid side effects with 16 (43.2%) improving their scores from the AS to the DS, even if they only moved from 3 correct choices to 4 correct choices. They also seemed knowledgeable regarding alternative forms of pain relief, with 31 (78.4%) of participants listing three forms in the AS and 83.7% (29) being able to do so in the DS. The largest improvement however, was seen in the definition of opioid dependence. The AS revealed that only 29.7% (11) of participants were able to correctly name one element of that definition, but this increased to 54.1% (20) for the DS.

Despite these positive statistics, the table on page 60 demonstrates that two other questions (maximum Tylenol dose [4,000 mg] and opioid side effects [6 correct choices]) had five people with improved scores between surveys while three questions (danger of opioid dependence/addiction and the disposal of unused opioids) had a negative change score with between one and three participants scoring lower on the DS than on the AS. The remaining questions demonstrated only one to three participants with improved scores.

In retrospect, weighting the questions in the survey for level of importance might have provided more accuracy to the total score, allowing for the opportunity to discover where gaps on the most important material lay. It is evident in the PPMS that the largest knowledge gaps for participants were: 1) the ways in which Tylenol is used to treat pain (above and beyond the two questions on the survey), especially in conjunction with opioids, and 2) the definitions of opioid

tolerance, dependence, and addiction. The ramifications of not understanding these concepts can lead to potentially lethal consequences that one does not expect with someone not knowing the proper disposal procedure for opioids or being able to name three alternative forms of nonpharmaceutical pain management. These knowledge gaps were supported by comments made by participants in their Phase 2 interviews.

Phase 2

Quantitative summary. The concept map for the PPMS (Figure 4) describes a participant's movement through the different phases of the transition. The Properties section under the **Nature of Transitions** contains the constructs for the quantitative measurements in Phase 2 which involved use of the medication records and the quality of life (QOL) scales for data analysis. Daily opioid doses and pain relief data were taken from the medications records and the four QOL scales were recorded by the participants in the journal section. They included Likert scales with ranges of 1-10 (1 = poor and 10 = terrific) for role limitations, physical limitations, social limitations, and sleep/exercise. A bivariate correlation demonstrated that significant relationships existed between opioid doses/pain relief and all four QOL scales (Tables 23 & 24, p. 79).

A partial correlation controlling for time was also provided to show the change in the relationship when time was not a factor. The bivariate analysis demonstrated that Time and Opioid Doses had 25% shared variance and Time and Pain had 28% shared variance. The inverse relationship shows that as time passed, the participants decreased the use of pain medications and experienced less pain. When time was removed the coefficients decreased but the relationships that had been significant in the bivariate analysis remained significant, with the exception of the relationship between opioid doses and pain and the relationship between doses/pain and

sleep/exercise. The sample of participants entered in this analysis was $n = 7$. Some were on pain medication for as long as two weeks and others only three days though these participants continued to maintain their journals even after completing their opioid therapy. This may explain the variation between the two analyses.

Though the focus of the PPMS was on the relationship between opioid doses/pain and quality of life, it was interesting to observe the strong positive and direct relationships that quality of life indicators had with each other (Table 23). Of course, it is expected that the better one feels physically, the better one will feel functioning within roles and social spheres, the more energy they would have, and the better they would sleep at night. This is not always the case for every patient.

Attaining the goal of successful opioid pain management requires initial success with five constructs defined in detail in Chapter One (Figure 4 and Appendix C2): 1) Assessment of pain, 2) Determination of medication, 3) Monitoring reactions, 4) Defining activity, and 5) Building on knowledge and experience.

The first is assessment of pain which involves the ability to use the pain scales in a consistent manner to identify one's pain level. This was observed in the participants' abilities to rate their pain in both the Admission and Discharge Surveys. They also include the location of their pain with each dose. It was important to note if they were medicating themselves for surgical pain or for pain from other areas of the body.

The ability of participants to determine which medication was appropriate for their pain at the time they were taking it was evident in the medication sheets. Although there was concern that a couple of patients might be under-medicating themselves, there was no indication that any participant was taking too much of the opioid medication. One participant stopped her opioid

because it was giving her moderately severe headaches—"Try not to take any pain med. Too much headache" (P36). She did not call her physician because she assumed any other medication would do the same thing. Another would not take her medication after a single dose because she was "scared to death" of becoming addicted (P10). A third patient (P12) was calling the clinic almost every day for almost a week because of "terrible" pain from the Foley catheter, yet only took Tylenol for the pain. When asked why oxycodone was not used, the participant shrugged and stated, "I didn't need it for the catheter."

The above issues that participants had with pain vs. medication can be identified as the *critical points/events* that can be experienced within the process of the transition. It does not mean that the transition will not ultimately be successful, but it can slow down progress depending on the impact it has on the participant.

The participants developed the ability to monitor reactions that occurred from the medications. The most common complaint was fatigue. Some participants "soldiered through" the fatigue because they believed it would help them heal more quickly or because they felt they would need less medication if they kept moving. Others decided that rest after surgery was not a bad thing and would lie down or take a nap. They demonstrated that they were able to do what they needed to do for themselves—very positive signs for a successful transition.

Building on monitoring reactions, participants then need to learn how to define activity limitations. From the scenarios above, it seemed clear that the participants were able to do just that. One participant (P22) had a different take on activity limitations. She had a sister coming to visit. She was determined to clean her house before her sister arrived and worked on it for six days in a row, recording increasing fatigue and pain in her journal as she did so. It was interesting that she never mentioned this endeavor in her interview, given that it made up a

significant portion of her recovery time. This reporting discrepancy was not observed until the researcher had a chance to examine the journal.:

> Started house cleaning for my sisters visit. Really tired weak & light headed. [Day 1]
> House cleaning. Clean a while then lay down & rest. Tired weak & light headed. [D2]
> House cleaning. Tired. But feeling good accomplished cleaning the kitchen. [D3]
> Now bathrooms. Weak and light headed. [D4]
> Couldn't sleep last night so stayed in bed this a.m. and slept 3 hrs. Rough day. [D5]
> Cleaned in a.m. Got my hair done. First time driving and out by myself. TIRED. [D6]
> Did a little cleaning. Visited with my sister & husband & niece & great niece. [D7]
> Had a quiet morning. Then barbecue for 20 people & boating. Great day. Exhausted at end. [D8 – last journal entry]

One might look at these entries and question this participant's judgement about the level of activity she could handle. However, she provided evidence of resting when she needed to and reported that she had a wonderful time in the end. It seems certain, given her last comment, that she believed it was all worth it. Just as the participants discussed above, she did what she needed to do for herself.

Many of these participants had surgery in the past and believed those experiences informed their current surgical recoveries. As one participant proudly exclaimed, "It's not like it's my first surgery, you know, I'm an old hand at this!" (P1). Some participants shared the fact that they used a little "trial and error" until they found a routine that worked for them. This was especially important for one participant (P32) who was waking up with pain in the middle of the night:

> **Participant:** Waking up was very challenging.
> **Researcher:** Did it happen frequently?
> **Participant:** Ah, for the first week or so, yes. Less so as I recovered.
> **Researcher:** And did you alter your routine as the days went on to try and manage it better at night?
> **Participant:** Ah, yes.
> **Researcher:** What did you do?
> **Participant:** Incorporated Aleve, the longer-lasting NSAID. Of course, that was much later on, come to think of it. What I did is I would plan out my medications throughout the day in order to make sure that I was scheduled to get some right as I planned to go to

> bed. And then I'd keep it by the bedside as needed for the middle of the night but that became less necessary later on.

The significant relationships between pain medication/pain relief and the four QOL scales are supported by the participants' incremental steps of the five constructs described above to move through the process to successful self-management of postoperative pain. The next section will highlight the inhibitors and the facilitators of this journey.

Qualitative Summary. Inherent in any process are elements that inhibit and facilitate the progress one can make as they move through it. The PPMS participants were able to describe some of them in interviews and others were noted in their journal entries. Inhibitors are elements of a transition that either bring it to a halt or slow it down substantially. The survey analysis demonstrated that knowledge deficit existed to differing degrees with the participants. One participant (P8) described taking Naprosyn for bladder inflammation because it was an anti-inflammatory, not knowing that non-steroidal anti-inflammatory drugs (NSAIDS) can cause bleeding. It is not known how much faster he would have healed had he not been taking this medication.

Being physically limited from an extensive surgery slows down movement and exercise, which was discussed in Chapter Four. The more one moves after surgery, the faster they progress, and the less pain medication will be needed. One participant (P12) had pain from his urinary catheter for 3 weeks and would not take an opioid for pain but chose instead to "not move". Had his pain been better controlled, he would have been able to move more and it might have had a significant effect on his progress to healing.

Participants all experienced some form of sleep disruption as they recovered, some more than others. But this was time-limited and usually stopped between 48-72 hours. Only one

participant had sleep complaints late into her transition because she was trying to clean her house for a sister's visit and was, by her own choice, pushing her activity limits.

A participant's emotional state, especially in relation to their surgery and their own expectations of their recovery process, had much to do with how quickly they progressed through their transition. Several participants received ileostomies during their surgeries and this required a whole new set of adjustments for them because they had to cope with body image issues, social apprehension, acquisition of new skills in managing the stoma and the appliance changes, and significant other relationship issues. One participant (P4), even by the interview, was still so sensitive about it that she cried while she expressed her acceptance process of this new reality. The comment bears repeating for this new context:

> Emotional. I think that was my hardest thing. Dealing with just having it (the ostomy). And it was, I'm starting to cry now (voice falters), it's just hard. (Crying) It was just all around hard to get used to. But, obviously I had good days and I had bad days, but for the most part (sniffling), I think it was the emotional part of it, you know, limited ability to do things, I mean, I don't know, our whole family had to revolve around me for the first few weeks. I mean, still sometimes, you know, we go out to eat and I'm like, "Oh, my gosh, I'm leaking!" And then I have to find a bathroom, you know what I mean? (sniffs) It's just an emotional roller coaster…

This participant was able to do her own care with the ileostomy by the time of the interview whereas her husband had to do it initially. She admitted that with each day it got better and she tried to concentrate on the good things in her life. Another participant (P8) who also had an ileostomy stated, "Just learning to live with it." One person (P26) kept writing each day in the journal "One day at a time." Often people who have the most positive outlook heal the quickest. So that makes the emotional state a negative inhibitor or a positive facilitator. It is all up to the person.

The comments above demonstrate the multiple and complex variables involved in a transition process. Patients are not just making physical transitions but, as integrated beings, they

are making personal, emotional, and social transitions as well (Figure 4). Given the nature of the human being, it is impossible to separate one from the other. Controlling pain, if the patient is suffering emotionally or finds him/herself socially isolated, may not be enough to make a successful transition, which is why family/Friends, Environment, Community, Personal, and Societal elements are incorporated, along with facilitators and inhibitors, into the **Transition Conditions**.

As was demonstrated in the PPMS, pain medications can allow one person to be up and active while another just wants to languish in bed all day from fatigue. Nurses can help by educating patients of the benefits taking the lowest amount of pain medication needed to control their pain. The PPMS participants either did not take their opioids or weaned off the medications within a week of their arrival home. Initially, a few succumbed to the fatigue but, for those who kept records, it was evident that by Day 3 they had significantly decreased the amount of medication they were taking.

Facilitators have the capacity to smooth the way for progress by cancelling out some of the inhibitors that might slow movement through transition. For the PPMS participants, the most important were physical support and emotional support. These two are discussed together because often they are accomplished by the same person. Having a significant other to carry on the day-to-day tasks of running a household so the participant can recuperate, is in and of itself, emotional support as well. One participant (P8) described how his significant other changed his dressings and his ostomy appliance because he could not bend over enough to get a good view of it. Another participant (P32) had a cadre of friends who took turns helping out until recuperation was complete. One person described how nice it was to have someone who would listen to rants on a bad day and not judge (P10).

Pain medications, as was stated under "inhibitors," can function to allow a patient to carry on with a normal routine and fewer limitations when their pain is adequately managed. A couple of participants mentioned their efforts to maintain low stress levels so it would not interfere with healing. One person stated that they went to great lengths to get as much as possible done ahead of their surgery date, so they could give themselves fully to the healing process.

The body needs rest to heal since most of the healing occurs while we are asleep. Most of the participants discussed some routine of rest and exercise balance in their recoveries. Movement was strongly encouraged by physicians, and the participants took it to heart. They described in their journals how they did a walk after lunch and then rested until it was time to make dinner. Many had companions to walk with which enhanced the experience. They all admitted that when they hurt the most, a walk usually made them feel much better.

Process Indicators are measures that the researcher can use to determine how a participant is progressing through their transition experience. The PPMS participants transitioned well after surgery. However, most had uncomplicated surgeries that made them feel much better postoperatively. Having not followed these participants through their journeys, more detailed or finely-tuned indicators are not possible. Future studies might include making scheduled visits throughout the recovery process to talk with participants as they are moving through their transitions. This type of design could yield some very rich data.

From the PPMS participants' comments, some Process Indicators that one might look for if this study were replicated and the transition was more closely followed would be to monitor for *incremental progress*. The researcher following the participant would want to follow the number of daily doses of medication and the pain scales before and after to see if pain is being well-controlled. A participant might be taking more medication because they are staying at the

lower end of the dosage range rather than moving to a higher dose when the lower one is not effective. It may also be that the participant is being under-medicated and a discussion with the physician might be indicated. By intervening early in the process, the researcher can prevent the transition movement from being stalled.

The researcher would expect to see QOL scores rising regularly. This does not need to occur daily since progress might move slowly, depending on the person and their type of surgery. If scores begin a downward trend, it is worth investigating. Note the word "trend," since patients can occasionally have a difficult couple of days during recovery, which is not unusual. Trends downward need to be investigated before they become serious issues for the participant.

Improving self-efficacy is an important component in transitioning after surgery. This is one of the reasons that pain management is so critical. Well-controlled pain allows the person to regain their independence sooner and is one of the hallmarks of a healthy transition. For all of the PPMS participants this was a key aspect – just to be able to do things for themselves and their significant others. Bandura's (1997) four elements of efficacy are: 1) mastery—of their ability to manage their own pain and other issues related to the surgery, 2) vicarious experiences—helpful if one is anticipating a prolonged recovery; this can be accomplished through the internet, Skype, or in-person support groups when the participant is able, 3) verbal persuasion—from the participant's significant other or people for whom the participant has respect; being reminded that "you can do this" is very motivating when a person feels overwhelmed, and 4) emotional and physiological states—which work in tandem; for some participants, the spiritual state can be equally as important; monitoring on a regular basis allows the researcher following the participant to provide resources to assist the participant in dealing with the issues that might be potential inhibitors.

Decreasing needs for assistance, in conjunction with incremental progress and improving self-efficacy, is an indicator that the transition is moving in a healthy direction. Concern is raised if after a certain amount of time no effort is being made to increase self-care activities. Assessment of the cause—physical, emotional, or spiritual—must be made to prevent a stall in the transition process.

The data from the journals and the interviews in Phase 2 of the PPMS were used to determine three key Outcome Indicators. Meleis et al. (2010) believe that mastery of the designed transition would be a leading outcome indicator. Given the scores on the DS, it would be inaccurate to say that the PPMS participants had "mastered" pain management. However, their movement through their transitions was successful. Therefore, the indicators of a healthy transition for this group of participants were: 1) the ability to discontinue the opioid medication when they no longer needed it —the requirement for participating in the interview was that they had to have been off their opioid medications for at least two weeks prior, 2) the freedom from surgical pain at the time of the interview, indicating that they were in the advanced healing stage and likely would not be regressing back into a transition phase, and 3) the statements that they believed they had managed their pain well during this transition.

Participants' successful transitions from hospital through self-management of their pain at home were supported in Phase 1 with quantitative data and in Phase 2 with quantitative and qualitative data. The mixed methods analysis did not yield a statistically significant relationship between knowledge change and the experience of self-medication for postoperative pain after discharge. However, the data may prove to be helpful in assisting with the design of future research studies and tools that will assist in educating patients in the management of postoperative pain. These will be discussed in the next section.

Mixed methods summary. The PPMS had a small sample size so the Fisher's Exact test was attempted to see if there was a relationship between the quantitative knowledge change and the four themes that developed from the qualitative journal comments and the interviews. All twelve participants included themes of: 1) activity, 2) pain and pain medication, and 3) daily routine management and support, either in the journal comments or the interviews. Because of this, it was not possible to compute Fisher's Exact Test for these variables. However, only six participants included the theme of "commute from hospital to home" so the Fisher's Exact Test was calculated with a value of 0.24 which was not significant at $p < .05$. The result did not indicate a statistically significant relationship between knowledge change and the experience of self-medication for postoperative pain after discharge.

Even though the mixed method analysis did not uncover statistically significant findings, all twelve participants did have a successful transition through their pain medication experiences as indicated by: 1) The participants ability to discontinue the opioid medication when they no longer needed it, 2) The participants stating that they were free of surgical pain at the time of the interview, and 3) The participants statements that they believed they had managed their pain well during this transition. Some were back to work and a normal routine by the time of the interview. Others, especially the ones expecting further surgery and/or who had cancer were taking their recovery more slowly. For this reason, level of activity was not used as a criterion for success. Some participants, at the time of the interview, were still within the 6-8 week healing window given to them by their surgeons.

Nursing Therapeutics are the interventions that are designed to assist a patient through a successful and healthy transition. Since it was not part of the design of the PPMS to follow the participants through their transitions, this researcher will use comments made by the participants

in their journal and interviews to suggest interventions that would have made their transitions easier and likely would be of assistance to patients with more challenging surgical outcomes through which to transition.

First, there was a knowledge deficit among the PPMS participants as was noted by some participants in their recorded comments in Chapters 3 and 4. If further studies were to prove that this knowledge deficit is more common than we know, nurses could assist patients at the beginning of their transitions with comprehensive education on opioid medications and narcotics. It might not be possible to teach them all they need to know, but having the information in written form that is reviewed at discharge would be a resource they could go back to when at home.

Second, the PPMS participants had questions about various aspects of their surgical recovery, that had someone sat down and talked with them, they might have brought up, as they did with this researcher during the interview (their questions were set aside until after the interview and then answered). This might seem unrealistic but a weekly visit, telephone call, or a Skype session during recovery would give the nurse the opportunity to discuss the patient's pain and how they are medicating themselves for it. For tech savvy participants, the medication records could be filled in online on a secured website so the researcher could monitor the participant's progress daily. It gives the nurse the opportunity to assess small issues before they become larger issues.

Third, one PPMS participant had an issue with bloody urine. When the researcher asked him if he had called his physician's nurse, the answer was that the participant did not want to ask the question over the telephone and to someone he did not know. Having a face-to-face relationship with a postoperative nurse who follows the patient regularly, may make it more

likely that the patient will call with questions. This concept would be an opportunity for future research since there is no data providing evidence of the specific issues that would encourage or discourage patients from seeking assistance after discharge from the hospital.

Future Research

Replicating this study, or parts of it, with a greater variety of surgeries, in two or three different institutions, and with a much larger sample, would increase confidence in study conclusions and lend more generalizability to the research results. Another possibility that was mentioned above would involve following the participant during their transition phase to track the trajectory. A longitudinal study to follow persons who have had extended illness involving opioids and/or trauma patients after discharge might provide some varied transitions just by the nature of the recoveries.

Given that the PPMS demonstrated a need for further opioid and Tylenol education among the participants, using focus group research to identify what people think about opioid medication/Tylenol and what they would being interested in learning, might provide information that could lead to an intervention study. Providing a pre- and post-test would generate data as to the effectiveness of the information shared in the group. Using a between-groups research design, a researcher might provide two or three different teaching modalities and see how participants respond to them. One might also design a study using learning theories as a foundation for interventions that could be used in educating people about opioid medications and Tylenol.

The Postoperative Pain Management Study provided important information to the fields of medicine and nursing. The study demonstrated in Phase 1, through the development of a survey tool that can measure opioid and Tylenol knowledge, that although there was a significant

increase in knowledge from the AS to the DS, this sample of participants would benefit from more comprehensive opioid and Tylenol teaching. Phase 2 demonstrated that there were significant inverse relationships between opioid doses/pain and the participants' quality of life, with significant direct relationships of the QOL scales with each other. The journals and interviews demonstrated that each of the participants met the criteria for a healthy transition from hospital through the process of self-management of pain. The mixed method analysis did not demonstrate a significant relationship between the opioid knowledge change at hospital discharge and the healthy transition through self-management of pain. It is hoped that this research might be replicated in the future with larger and more diverse samples to provide more generalizable evidence of the relationship between what patients understand about their opioid medications and their experience of transition through self-medication for pain.

Limitations of the PPMS

A major limitation for this study was low statistical power due to a sample considerably under the G*Power recommendation of 80. The PPMS utilized a relatively small convenience sample (n = 37) and included patients from one large medical center in the Pacific Northwest. These two factors alone altered the generalizability of the research results a great deal. The types of surgeries were all gastrointestinal in nature with half of the participants having some type of Irritable Bowel Syndrome (IBS) or Crohn's Disease. This was not the original intent of the study but the PPMS was limited in the clinics that could be used for this study.

The PPMS participants tended to be in a great deal of pain prior to surgery and often found substantial pain relief after surgery. This was a very different experience in comparison with someone who has had a total knee replacement or extensive abdominal surgery. The transitions would have been longer and the pain management more challenging.

Both the Admission Survey and the Discharge Survey were completed by participants who had varying levels of opioid medication in their systems. Although the Admission Survey venue was well-controlled, the Discharge Survey was often taken with family and/or friends present in the hospital room. Attempts to secure a quiet place on the unit were unable to be met.

As observed in Table 5, there was a range of 1 to 115 days (M = 28.22, SD = 23.42) between the AS and the DS among the participants. The effect this may have had on the scores of the participants is unknown, but it is expected that there was some effect.

The research was done in one institution, possibly with one style of teaching for discharge. The sample was comprised of all English-speaking participants, which further decreased the generalizability. Studies with other cultural groups and non-English speaking participants would broaden the range of responses within the research.

The PPMS was a rather homogeneous group of people from the Pacific Northwest who all had a similar gastrointestinal (G.I.) surgery. Adding orthopedic, neurological, or trauma patients to a nationwide study would provide research results that would be useful in designing interventions for teaching or in determining some of the difficulties with transitions that could occur with a larger, more socioeconomically and demographically diverse sample.

FIGURES

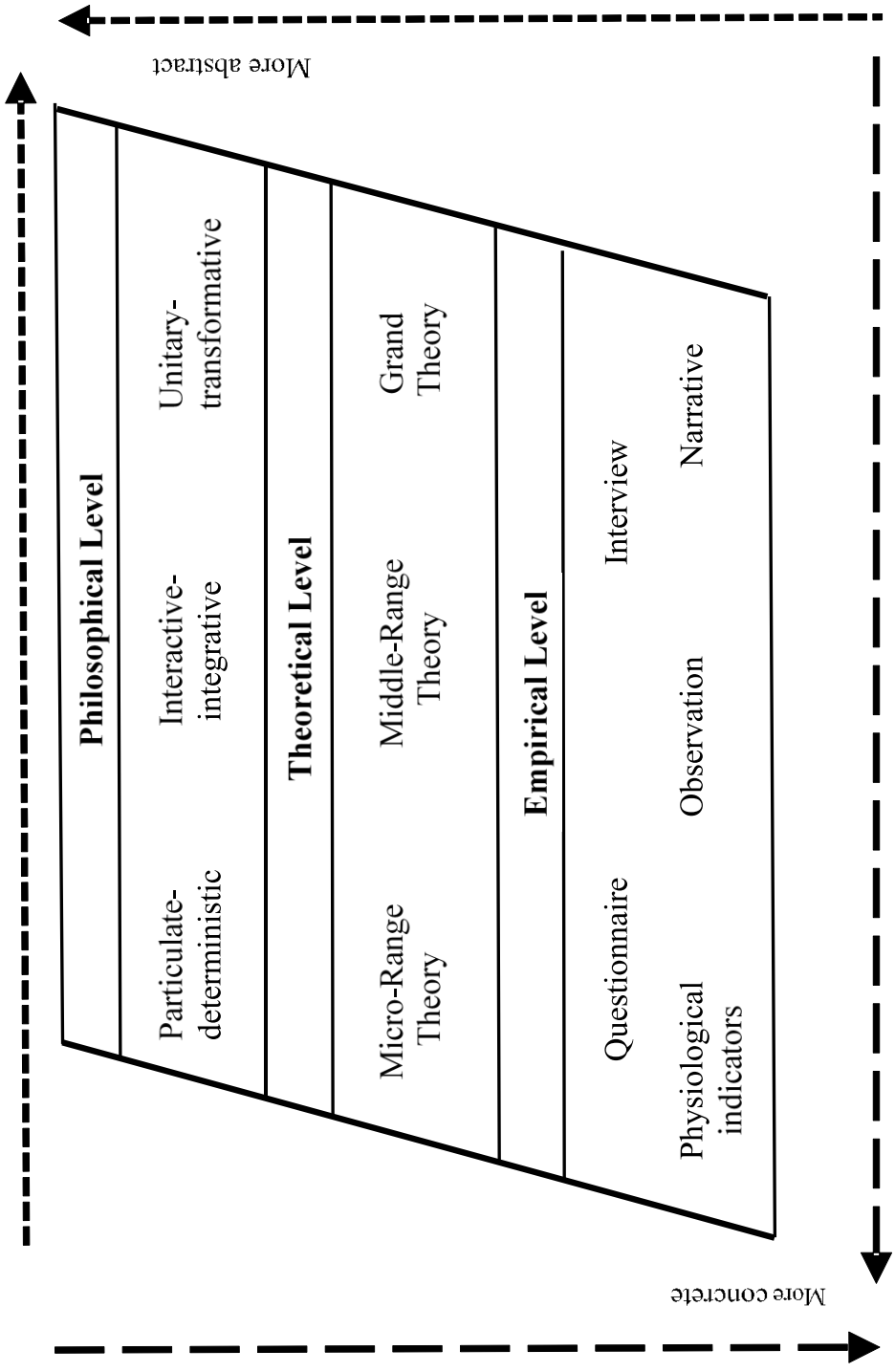


Figure 1. The Ladder of Abstraction
Smith & Liehr, 2014. Used with Permission

Figure 1. Ladder of Abstraction

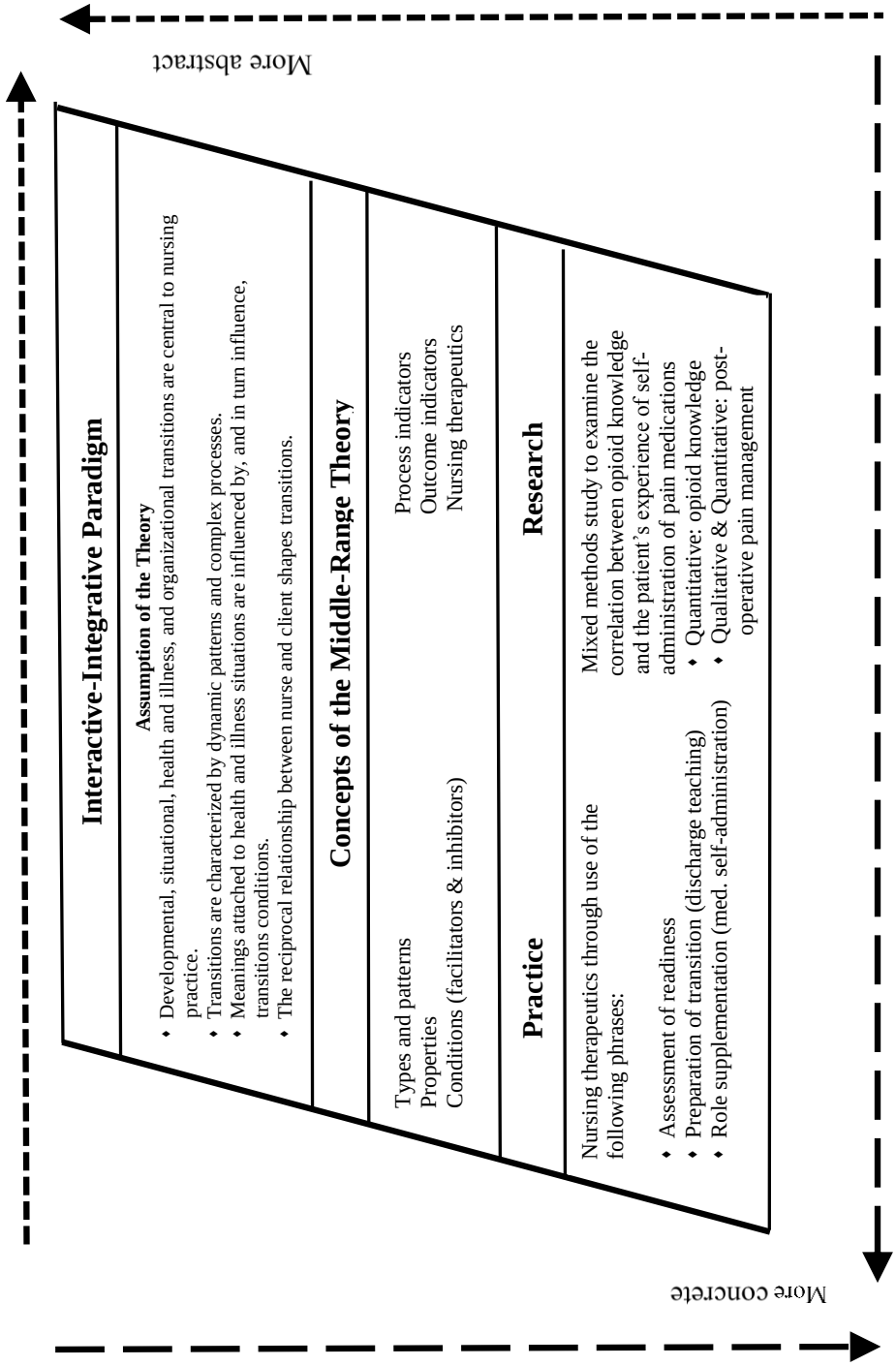


Figure 2. The Ladder of Abstraction: Transitions Theory for Postoperative Pain Management
Adapted from Smith & Liehr, 2014. Used with Permission

Figure 2. Ladder of Abstraction: Transitions Theory for the Postoperative Pain Management Study

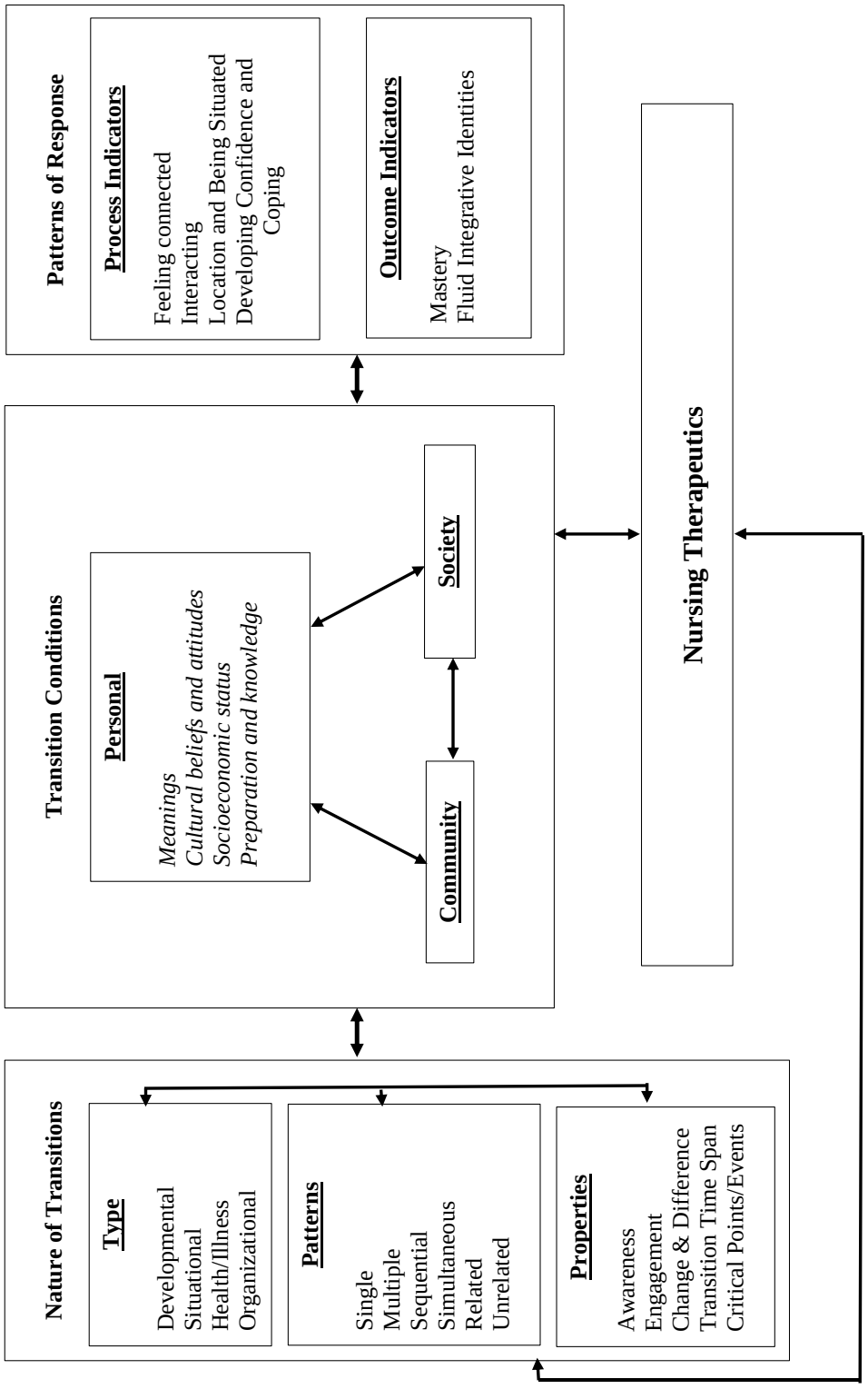


Figure 3. Transitions Theory Model
Meleis, et al., 2000. Used with Permission.

Figure 3. The Transitions Theory Model

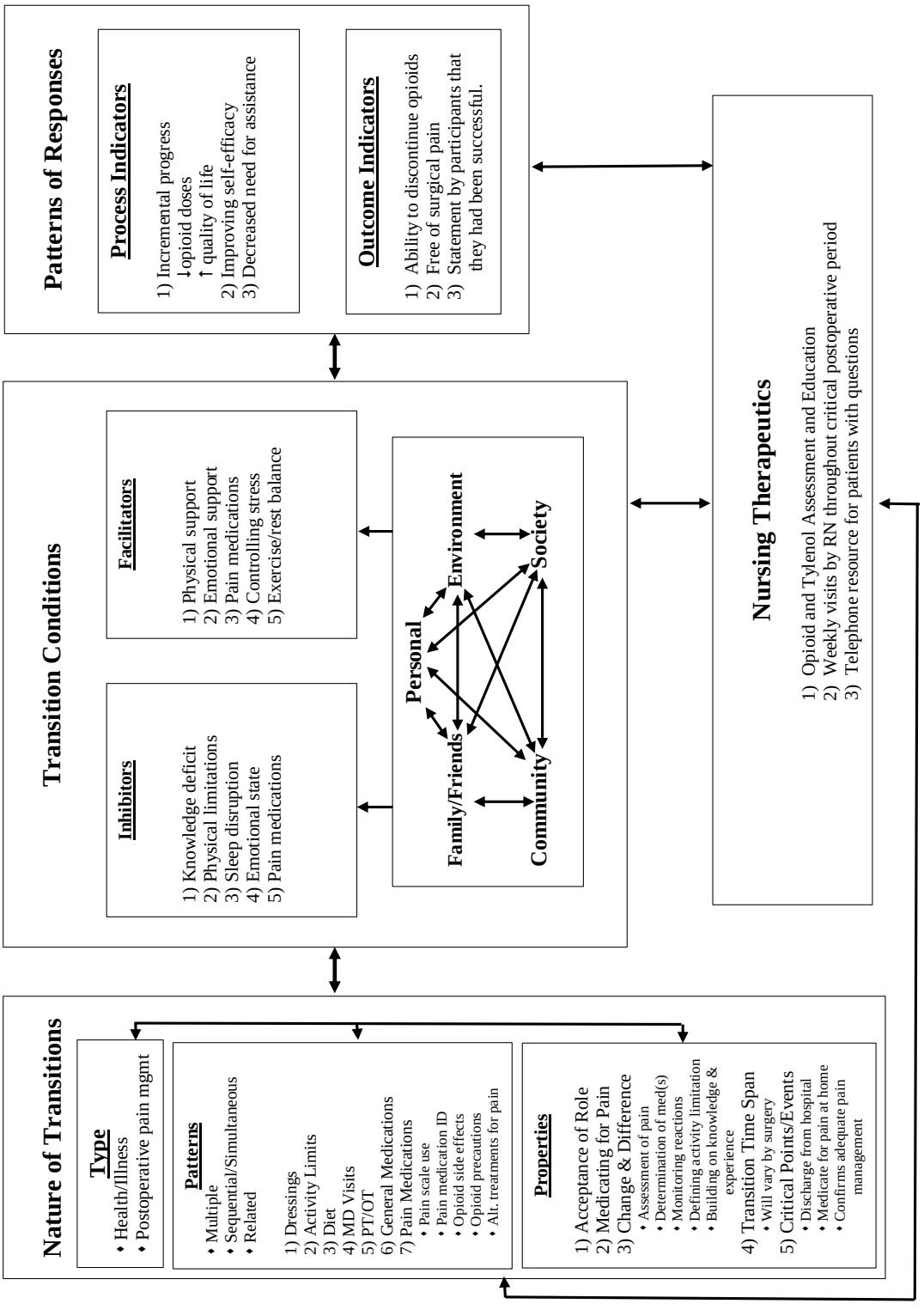


Figure 4. Transitions Theory: Postoperative Pain Management
Adapted from Meleis, et al., 2000. Used with Permission.

Figure 4. Transitions Theory: Postoperative Pain Management Study

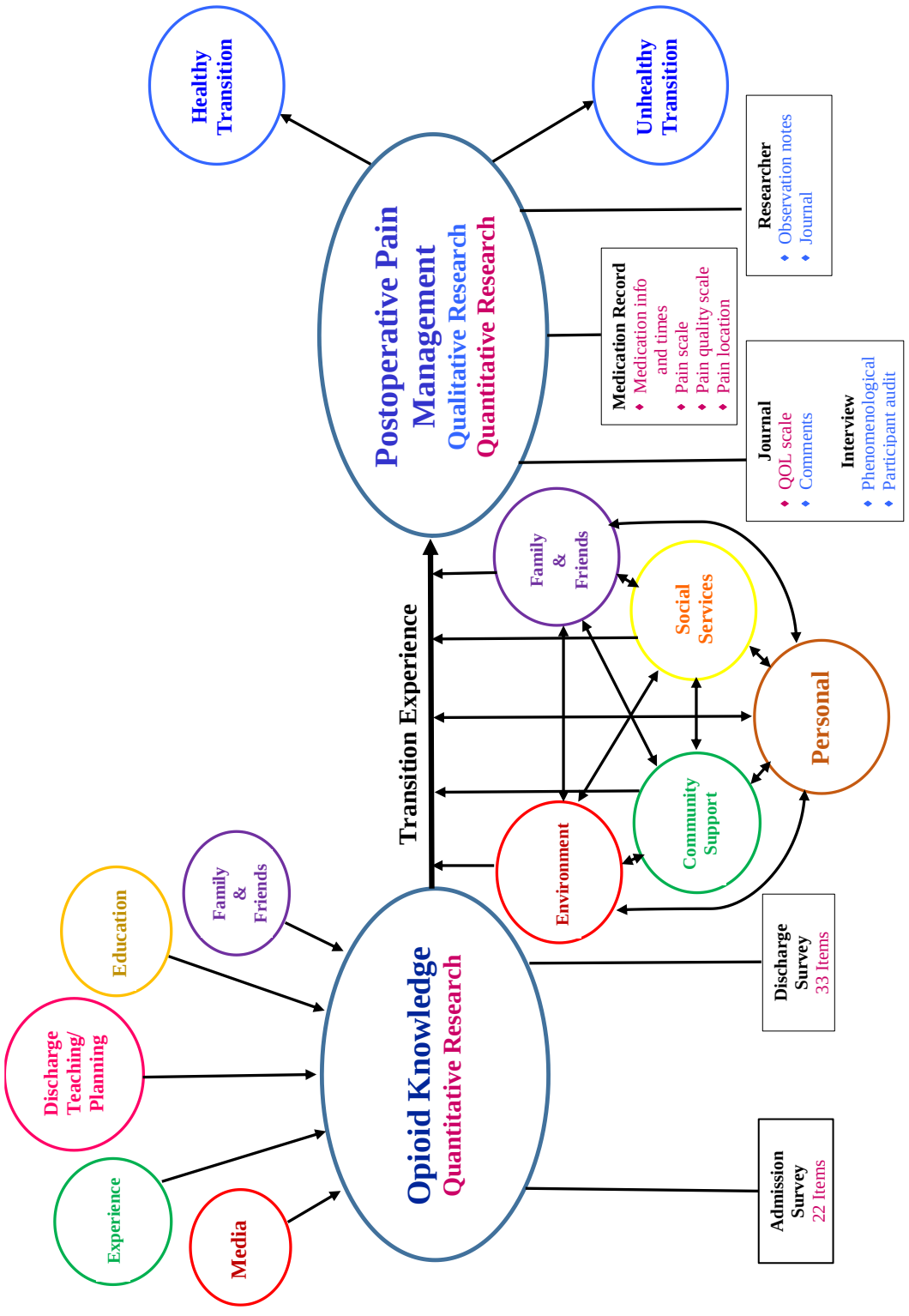


Figure 5. Postoperative Pain Management Mixed Methods Design

Figure 5. The Postoperative Pain Management Study: Explanatory Sequential Mixed Method Design

APPENDICES

Appendix A – Admission Survey

SCHOOL OF NURSING
UNIVERSITY of WASHINGTON

Admission Survey

Welcome to the Admission Survey of the Postoperative Pain Management Study. You have been selected to participate in this study because you will be having a surgical procedure very soon. The purpose of this research is to obtain a greater understanding about what patients think about pain medications in an effort to improve nursing education in the future. This survey is four pages long and should take about 15 minutes. You will receive a second Discharge Survey just before you leave the hospital. Your insight into this subject is greatly appreciated. *Thank you!*

Part I. Demographic Questions

1. **What year were you born?** ***(Write in)*** **19_____**

2. **What gender do you identify with?** ***(Write in)*** **_____**

3. **What ethnicity do you primarily consider yourself?** ***(Check one)***

   - ☐ Hispanic
   - ☐ Non-Hispanic

4. **Which races do you identify with?** ***(Check all that apply)***

   - ☐ White
   - ☐ Black/African
   - ☐ Asian/SE Asian
   - ☐ American Indian/Alaska Native
   - ☐ Native Hawaiian/Pacific Islander
   - ☐ Other *(Write in)*: _____

5. **What is the highest level of education that you have completed?** ***(Check one)***

   - ☐ Less than high school
   - ☐ High school diploma
   - ☐ Associates degree
   - ☐ Bachelor's degree
   - ☐ Master's degree
   - ☐ Doctoral degree

6. What is your <u>primary</u> language spoken at home? *(Check <u>one</u>)*

- ☐ English
- ☐ Chinese
- ☐ Spanish
- ☐ Tagalog
- ☐ Vietnamese
- ☐ Korean
- ☐ Farsi
- ☐ Other *(Write in)*: _____

7.

How fluent are you in English? ***(Circle <u>one</u> response for each)***	**Not at all Fluent**				**Extremely Fluent**
a) Fluency with **<u>spoken</u>** English.	1	2	3	4	5
b) Fluency with **<u>written</u>** English.	1	2	3	4	5

Part II. Pain-Related Questions

1. What pain medications are you taking at this time? *(Please include both over-the-counter and prescription medications.)*

_____

_____

2. At this very moment in time, what is your physical pain level? *(Circle <u>one</u>)*

None		**Mild**				**Moderate**				**Extreme**
0	1	2	3	4	5	6	7	8	9	10

3. What is the recommended <u>maximum</u> daily dose of Tylenol (acetaminophen)? *(Check <u>all</u> that apply; if you are not certain, please make your best guess)*

- ☐ 2,000 mg/day
- ☐ 3,000 mg/day
- ☐ 4,000 mg/day
- ☐ 5,000 mg/day

4. Which of the following pain medications do you think contain <u>Tylenol</u>?
(Check <u>all</u> that apply; if you are not certain, please make your best guess)

- ☐ Hydromorphone
- ☐ Delvacet
- ☐ Oxycodone
- ☐ Norco
- ☐ Percocet
- ☐ Vicodin

5. What do you think are the <u>common</u> side effects a person might experience when taking a prescription pain medication for pain relief? *(Check <u>all</u> that apply)*

- ☐ Blurred vision
- ☐ Constipation
- ☐ Drowsiness
- ☐ Fluid retention
- ☐ Headache
- ☐ Hiccoughs (hiccups)
- ☐ Itching
- ☐ Lightheadedness
- ☐ Nausea/vomiting
- ☐ Slower breathing
- ☐ Sneezing
- ☐ Sweating

6.

To what extent do you <u>agree</u> with each of the following statements? ***(Circle <u>one</u> response for each)***	**Strongly Disagree**				**Strongly Agree**
a) The Health Care Provider's instruction for taking a prescription pain medicine is just a guideline, I can actually take it any time I am having pain.	1	2	3	4	5
b) If my friend is in pain, it is OK to give him/her some of my prescription pain medicine if I no longer need it for myself.	1	2	3	4	5

7.

To what extent do you <u>agree</u> with the following statements? ***(Circle <u>one</u> response for each)***	**Strongly Disagree**				**Strongly Agree**
a) People who take prescription pain medications, as directed by their Health Care Providers, are in danger of becoming **dependent** on them.	1	2	3	4	5
b) People who take prescription pain medications, as directed by their Health Care Providers, are in danger of becoming **addicted** to them.	1	2	3	4	5

8. Please define *narcotic dependence* in your own words.

_____

_____

9. According to the Food and Drug Administration, what is the best way to dispose of narcotic pain medications when you no longer need them? *(Check one)*

- ☐ Throw in the trash
- ☐ Rinse down the sink
- ☐ Flush down the toilet
- ☐ Call the police

10. List three ways you can relieve your pain besides using medications (for example, massage or yoga)

a. _____

b. _____

c. _____

11. Who would you rather have to teach you about your prescription pain medications?
(Please rank your preference 1=highest preference, 2=next highest preference, etc.)

_____ Nurse

_____ Pharmacist

_____ Physician/Doctor

_____ Other *(Write in)*: _____

12. What is your preference for learning new information?
(Please rank your preference 1=highest preference, 2=next highest preference, etc.)

_____ Verbal Explanation

_____ Video Presentation

_____ Written Instructions

_____ Other *(Write in)*: _____

Thanks again for completing this survey!

Appendix B – Discharge Survey

SCHOOL OF NURSING
UNIVERSITY of WASHINGTON

Discharge Survey

Welcome to the Discharge Survey for the Postoperative Pain Management Study. You have been selected to participate in this study because you have had a surgical procedure in the last week. The purpose of this research is to obtain a greater understanding about what patients think about pain medications in an effort to improve nursing education in the future. This survey is four pages long and should take about 15-20 minutes to complete. Your insight into this subject is greatly appreciated. *Thank you!*

Part I. Pain-Related Questions

1. Which prescription pain medications were prescribed for you at the time of discharge from the hospital? *(Check all that apply)*

- ☐ MS Contin
- ☐ Oxycontin
- ☐ Oxycodone
- ☐ Dilaudid
- ☐ Valium
- ☐ Percocet
- ☐ Hydrocodone
- ☐ Norco
- ☐ Vicodin
- ☐ Other _____

2. At this very moment in time, what is your physical pain level? *(Circle <u>one</u>)*

None		Mild				Moderate				Extreme
0	1	2	3	4	5	6	7	8	9	10

3. What is the recommended <u>maximum</u> daily dose of Tylenol (acetaminophen)? *(Check <u>all</u> that apply; if you are not certain, please make your best guess)*

- ☐ 2,000 mg/day
- ☐ 3,000 mg/day
- ☐ 4,000 mg/day
- ☐ 5,000 mg/day

4. Which of the following pain medications do you think contain <u>Tylenol</u>?
(Check <u>all</u> that apply; if you are not certain, please make your best guess)

- ☐ Hydromorphone
- ☐ Delvacet
- ☐ Oxycodone
- ☐ Norco
- ☐ Percocet
- ☐ Vicodin

5. What do think are the <u>common</u> side effects a person might experience when taking a prescription pain medication for pain relief? *(Check <u>all</u> that apply)*

- ☐ Blurred vision
- ☐ Constipation
- ☐ Drowsiness
- ☐ Fluid retention
- ☐ Headache
- ☐ Hiccoughs (hiccups)
- ☐ Itching
- ☐ Lightheadedness
- ☐ Nausea/vomiting
- ☐ Slower breathing
- ☐ Sneezing
- ☐ Sweating

6.

To what extent do you agree with each of the following statements? ***(Circle one response for each)***	**Strongly Disagree**				**Strongly Agree**
a) The Health Care Provider's instruction for taking a prescription pain medicine is just a guideline, I can actually take it any time I am having pain.	1	2	3	4	5
b) If my friend is in pain, it is OK to give him/her some of my prescription pain medicine if I no longer need it for myself.	1	2	3	4	5

7.

To what extent do you <u>agree</u> with the following statements? ***(Circle one response for each)***	**Strongly Disagree**				**Strongly Agree**
a) People who take prescription pain medications, as directed by their Health Care Providers, are in danger of becoming **dependent** on them.	1	2	3	4	5
b) People who take prescription pain medications, as directed by their Health Care Providers, are in danger of becoming **addicted** to them.	1	2	3	4	5

8. Please define *narcotic dependence* in your own words.

_____

_____

9. According to the Food and Drug Administration, what is the best way to dispose of narcotic pain medications when you no longer need them? *(Check one)*

- ☐ Throw in the trash
- ☐ Rinse down the sink
- ☐ Flush down the toilet
- ☐ Call the police

10. List three ways you can relieve your pain besides using medications (e.g. yoga)

a. _____

b. _____

c. _____

Part II. Discharge Teaching

1.

How much time did your nurse(s) spend with you on each of the following issues? ***(Circle one response for each)***	**MINUTES spent discussing issue**					
a) Explaining **proper rest** for recovery at home	1	2	3	4	5	6+
b) Explaining **pain medications** to be used at home.	1	2	3	4	5	6+
c) Explaining **who to contact** during recovery at home.	1	2	3	4	5	6+

2.

Did you receive the following paperwork at the hospital? ***(Check ✓)***	**YES**	**NO**
a) I received paperwork about my **insurance coverage.**	☐	☐
b) I received paperwork about my **pain medications.**	☐	☐
c) I received paperwork about my **physical therapy.**	☐	☐

3. Who provided you with information about pain medications you will be taking when you are discharged from the hospital? ***(Check all that apply)***

- ☐ Nurse
- ☐ Pharmacist
- ☐ Physician
- ☐ Other _____

4.

Did the person(s) who provided your discharge teaching: ***(Check ✓)***	**YES**	**NO**
a) Tell you how to dispose of your unused prescription pain medications once you no longer need them?	☐	☐
b) Answer all your questions about your prescription pain medications?	☐	☐
c) Give you a number to call if you think of any questions when you get home?	☐	☐

5. ***This question refers to the prescription pain medications you will be taking when you go home.***

Of the topics listed below, are there any for which you would have liked to have received more information than you did? ***(Check all that apply)***

- ☐ Dosage
- ☐ When to take the medication
- ☐ How to take it (e.g. with food, with plenty of water)
- ☐ Side effects
- ☐ Lifestyle changes (e.g. do not drive or use heavy machinery)
- ☐ Other _____

6.

How worried are you about taking your pain medication on your own at home? ***(Circle one response for each)***	**Not Worried at all**				**Very Worried**
a) Dosage	1	2	3	4	5
b) When to take the medication(s)	1	2	3	4	5
c) How to take the medication(s)	1	2	3	4	5
d) Side effects	1	2	3	4	5
e) Lifestyle changes	1	2	3	4	5
f) Other _____	1	2	3	4	5

7. Did a friend, caregiver, family member listen to your medication teaching with you? *(Check ✓)*

- ☐ Yes
- ☐ No

8. Did you receive information about taking narcotic medication before coming to the hospital? *(Check ✓)*

- ☐ Yes
- ☐ No

Part III. Surgical Information

1. Surgery Information:

Surgical Procedure _____

Surgery Date: __ __ / __ __ / 2017

Surgeon _____

2. The information you have provided in the first phase of this study has been extremely valuable and very much appreciated. Would you be interested in participating in the second phase of this study, as described in your Informed Consent information?

☐ Yes
☐ No

If yes, please provide your contact information so that we will be able to make arrangements for the interview at the end of the study.

Name: _____

Telephone Number: _____

Can messages be left at this telephone number: Yes ☐ No ☐

Email: _____

City, State: _____

Thanks again for completing this survey!

Appendix C1 – Phase 1 Constructs

Phase 1 Constructs

(Compare with Transition Diagram)

Admission/Discharge Surveys – common questions

Survey question numbers next to construct supported

1) **Pain scale use** (AS 2.1, DS 1.1)
   Participants expected to be taught how to measure their pain using a 10-point Likert scale—0 (*none*) to 10 (*extreme*)—prior to self-medication; knew how to use the scale to determine which medication and dosage (if range is given) to administer.

2) Pain medication (AS2.2, DS 1.2)
   Participants expected to either know the trade and generic names of the pain medications they were prescribed after discharge with the dosage, frequency, and how it should be taken, or they were expected to be able to independently find the information on the medication container or in their discharge information.

3) Opioid side effects (AS 2.5, DS 1.5)
   Participants given the option to choose the most common side effects from a list of medication side effects.

4) Medication precautions
   a) Opioid (AS 2.6-2.9; DS 1.6-1.9)
      - not sharing medications with those for whom they are not prescribed
      - checking with the physician before taking opioids with OTC (over-the-counter) medications
      - knowing how to dispose of unused opioids in their city/town
      - being able to distinguish between opiate tolerance, dependence, and addiction
      - taking medications exactly as directed

   b) Tylenol (AS 2.3, DS1.3; AS2.4, DS 1.4)
      - knowing the FDA maximum daily dose of Tylenol
      - knowing which opioid compounds contain Tylenol

5) Alternate treatments for pain (AS 2.10, DS 1.10)
   Participants were expected to be able to list at least three non-pharmaceutical means of relieving their pain

Appendix C2 – Phase 2 Constructs

Phase 2 Constructs

(Compare with Transitions Diagram)

Change & Difference

1) Assessment of pain (medication record)
   a) Pain scale
   b) Pain quality scale
   c) Pain location
   d) Spasm scale

2) Determination of medications (medication record and/or journal)
   a) Able to choose which medication is necessary to treat their pain, e.g. Tylenol vs. Opioid
   b) Able to choose an alternative method of pain control, if appropriate
   c) Knowledge of the available pain medication and how they work

3) Monitoring reactions (medication record, QOL scales, journal)
   a) Pain symptoms
   b) Pain relief
   c) Medication side effects
   c) Toxic symptoms
   d) Withdrawal symptoms

4) Defining activity limitations (medication record, journal, interview)
   a) No driving while taking opioids
   b) Using assistive devices if lightheaded to avoid falling
   c) Utilizing Lifeline (or similar product) if living alone in case of a fall or other emergency
   d) Utilizing Hopelink or similar support if patient needs to get somewhere and does not have a ride

5) Building on knowledge & experience (journal and interviews)
   a) Knowing what has worked in the past and using that knowledge as a guide in the present; this evolves over the course of recovery
   b) Acknowledging their journey from hospital admission to the present and the gains they have made

Appendix D – Journal Pages

Day 1 – September 19, 2017
"What Kind of Day I Had"

_____

_____

_____

_____

_____

_____

_____

_____

Quality of Life
Circle the number that describes how you feel
(1 = poor; 10 = terrific)

Role Limitation

1 2 3 4 5 6 7 8 9 10

Physical Limitation

1 2 3 4 5 6 7 8 9 10

Social Limitation

1 2 3 4 5 6 7 8 9 10

Sleep/Energy

1 2 3 4 5 6 7 8 9 10

Day 2 – September 20, 2017
"What Kind of Day I Had"

_____

_____

_____

_____

_____

_____

_____

_____

Quality of Life
Circle the number that describes how you feel
(1 = poor; 10 = terrific)

Role Limitation

1 2 3 4 5 6 7 8 9 10

Physical Limitation

1 2 3 4 5 6 7 8 9 10

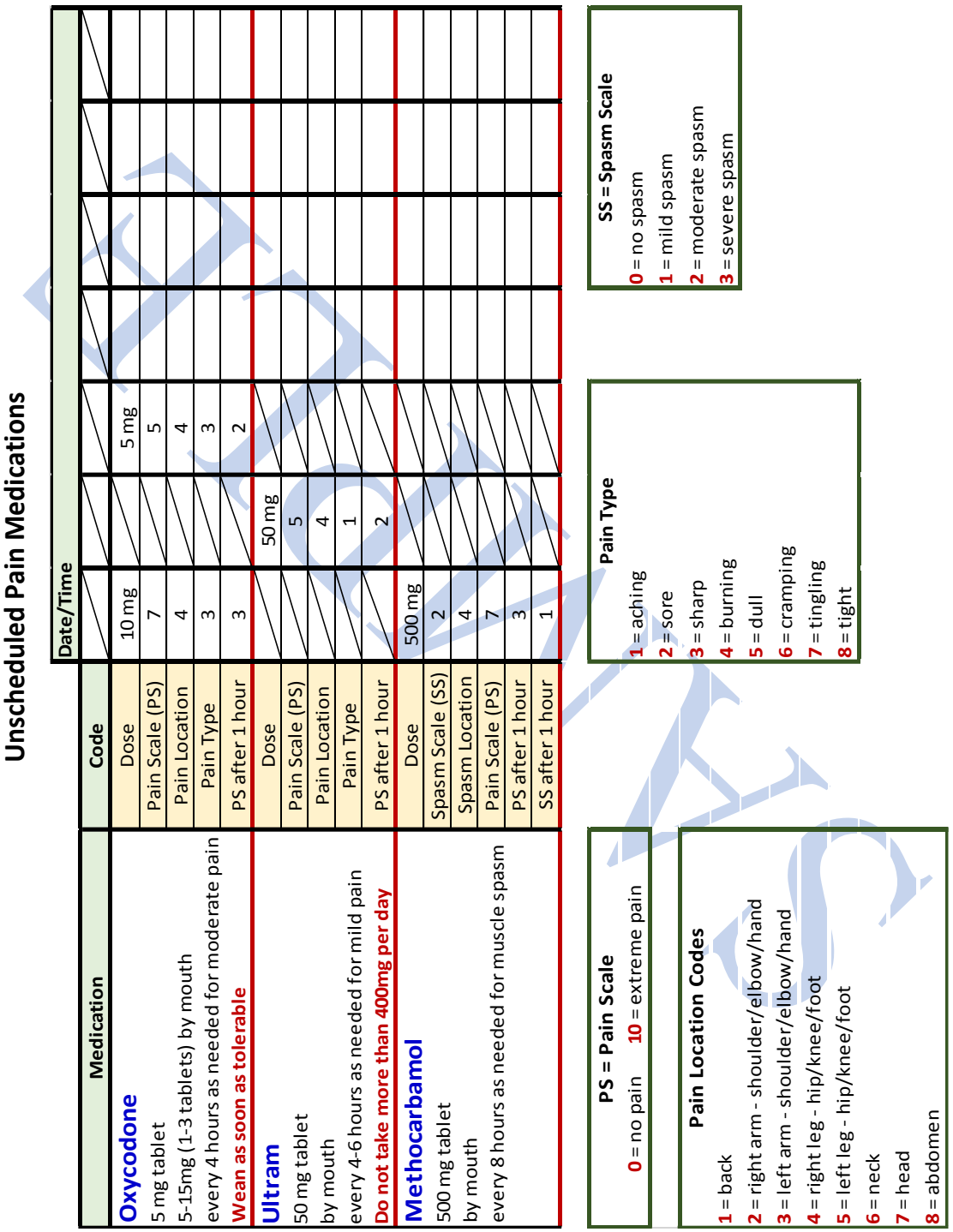
Social Limitation

1 2 3 4 5 6 7 8 9 10

Sleep/Energy

1 2 3 4 5 6 7 8 9 10

Appendix E1 – Unscheduled Medication Record



Unscheduled Pain Medications

Medication	Code	Date/Time						
Oxycodone	Dose	10 mg		5 mg				
5 mg tablet	Pain Scale (PS)	7		5				
5-15mg (1-3 tablets) by mouth	Pain Location	4		4				
every 4 hours as needed for moderate pain	Pain Type	3		3				
Wean as soon as tolerable	PS after 1 hour	3		2				
Ultram	Dose		50 mg					
50 mg tablet	Pain Scale (PS)		5					
by mouth	Pain Location		4					
every 4-6 hours as needed for mild pain	Pain Type		1					
Do not take more than 400mg per day	PS after 1 hour		2					
Methocarbamol	Dose	500 mg						
500 mg tablet	Spasm Scale (SS)	2						
by mouth	Spasm Location	4						
every 8 hours as needed for muscle spasm	Pain Scale (PS)	7						
	PS after 1 hour	3						
	SS after 1 hour	1						

PS = Pain Scale
0 = no pain **10** = extreme pain

Pain Location Codes
1 = back
2 = right arm - shoulder/elbow/hand
3 = left arm - shoulder/elbow/hand
4 = right leg - hip/knee/foot
5 = left leg - hip/knee/foot
6 = neck
7 = head
8 = abdomen

Pain Type
1 = aching
2 = sore
3 = sharp
4 = burning
5 = dull
6 = cramping
7 = tingling
8 = tight

SS = Spasm Scale
0 = no spasm
1 = mild spasm
2 = moderate spasm
3 = severe spasm

Appendix E2 – Scheduled Medication Record

Scheduled Medication Record

Medication	Code	Date						
		03/16/17	03/16/17	03/16/17	03/17/17			
Acetaminophen	Time	8A	2P	7:30P	2A			
500mg oral tablet	Pain Scale (PS)	5	4	4	2			
Take 1000mg (2 tablets)	Pain Location	2	2	2	2			
every 6 hours	Pain Type	1	1	2	2			
	PS after 1 hour	2	0	0	Sleeping			
Ibuprofen	Time	6A	12P	6P	12A			
200mg	Pain Scale (PS)	8	6	6	7			
by mouth	Pain Location	2	2	2	2			
every 6 hours	Pain Type	1	2	1	1			
	PS after 1 hour	4	3	4	2			
Methocarbamol	Time	8A	4:30P		12A			
500mg	Spasm Scale (SS)	3	3		4			
by mouth	Spasm Location	2	2		2			
every 12 hours	Pain Scale (PS)	5	4		7			
	PS after 1 hour	2	0		2			
	SS after 1 hour	0	0		0			

PS = Pain Scale

0 = no pain **10** = extreme pain

Pain Location Codes

1 = back
2 = right arm - shoulder/elbow/hand
3 = left arm - shoulder/elbow/hand
4 = right leg - hip/knee/foot
5 = left leg - hip/knee/foot
6 = neck
7 = head
8 = abdomen

Pain Type

1 = aching
2 = sore
3 = sharp
4 = burning
5 = dull
6 = cramping
7 = tingling
8 = tight

SS = Spasm Scale

0 = no spasm
1 = mild spasm
2 = moderate spasm
3 = severe spasm

Appendix F – Interview Questions

Interview Questions

1) Tell me what it was like medicating yourself for pain after you left the hospital?

2) What experiences during this time really stand out for you?

3) On the whole, do you feel that you managed your pain well after coming home from the hospital?

4) What was the hardest part of medicating yourself for pain? Easiest part?

5) Did you feel that you had enough information to successfully medicate yourself for pain when you left the hospital? If not, what information do you feel you needed but did not receive?

6) Identify for me some of the other things you did to relieve your pain besides pain medication.

7) Tell me the kind of support you experienced during your recovery from surgery, especially in relation to your pain management?

8) Do you feel that your relationship with other family members has changed? If that is the case, in which ways have they changed?

9) Do you feel you have progressed in your ability to perform the activities of daily life (ADLs)? Are you back to your normal routine?

10) How close are you to being back to your normal social life, e.g. church, playing bridge, going to restaurants, parties, etc

Appendix G – Informed Consent Script

Greeting and Introduction of the Study

"Hello Mr/Ms _____. My name is Deborah Vickers. I am a PhD student at the University of Washington, School of Nursing. I am doing a research study on pain management after surgery. The study is in two parts. Phase 1 involves taking a short 15-minute survey before your pre-surgery visit and taking a similar survey again before discharge. When the Discharge Survey is completed, you will receive a gift card worth $10."

"Phase 2 occurs after you go home. It involves keeping track of the pain medications that you take on a simple check-off sheet and completing a quality of life scale at the end of the day which should take about five minutes to complete. The study will conclude with an interview with me in your home or at a place chosen by you. At this time you will receive an additional gift card worth $50."

"You may participate in Phase 1 of the study without also participating in Phase 2 or you may choose to participate in both Phases 1 and 2. Whether or not you participate will not influence the quality of care you receive while you are hospitalized. If you begin the research, you are under no obligation to complete the study. You may withdraw at any time and for any reason with no questions asked or any pressure to continue participation. However, for Phase 1, both surveys must be completed to receive financial compensation and for Phase 2, the final interview must be completed to receive financial compensation. Do you have any questions about the study as I have explained it to you? Would you like to participate in this study?"

No – "I do appreciate your taking the time to listen to my explanation. It is important for you to know that your care and benefits will in no way be affected by your decision to not participate in this study. I trust that your surgery will go well and that you will make a speedy recovery."

Yes – "Thank you for your willingness to participate in the Postoperative Pain Management Study. In order to determine if this study would be a good fit for you, I need to ask you a few questions. Are you able to read, write, and communicate in English (*pause, response*)? Do you have trouble making decisions or remembering important information (*pause, response*)? Do you have chronic pain other than the one being treated by surgery (*pause, response*)? Have you ever used alcohol and recreational drugs on a regular basis?

Patient Meets Criteria - "The study seems to be a good fit for you. Your surgeon has determined that you will be staying overnight in the hospital. If, for any reason, this situation should change and you are discharged the same day as your surgery, we will have to withdraw you from this research, you will not need to do the Discharge Survey, and there will be no financial compensation. Should this happen, we will keep your Admission Survey until the completion of the study which would be December 31, 2017. Withdrawing from this study, for whatever reason will in no way affect the quality of care you will receive while you are a patient

at the University of Washington Medical Center. Are you still interested in participating? Do you have any questions about the study?

Patient does not meet the criteria – "It does not seem that this study is a good fit for you. It is important for you to know that your care and benefits will, in no way, be affected because you are not participating in this study. I do appreciate your taking the time to listen to my explanation and to answer my questions. I trust that your surgery will go well and that you will make a speedy recovery."

Informed Consent

Thank you for choosing to participate in the Postoperative Pain Management Study. Just as you have to sign a consent form for your surgery, we ask that you also read and sign an Informed Consent to participate in this study. Again, signing this form does not obligate you in any way to complete either Phase 1 or Phase 2 of the research study. It only signifies that the research has been explained to you, your questions have been answered, and that you would like to participate for as long as it feels right for you to do so. I will give you a few minutes to read this form. Feel free to ask me any questions about phrases or words you might not understand as you read it. (They will read the Informed Consent). Do you have any questions about the consent form? Will you please explain to me, in your own words, what the study is about? Will you also explain to me your obligation for completing this study? Are you still interested in participating? OK, please sign here where it says "Participant name printed and participant signature". I will sign the form when you are through. Then, I will give you the Admission Survey and you will be half-way through Phase 1.

Admission Survey

Here is a copy of the Admission Survey. Please print instead of write. You may ask me questions if you see something you do not understand. (Proceed with survey).

Thank-you for Your Participation

Thank you very much for your participation in this research. After you have received your discharge instructions from your nurse on the day of discharge, I will return with a similar Discharge Survey. At that time, you may make a decision to volunteer for Phase 2 of the study. After the survey is completed, you will receive your gift card for $10. Do you have any questions for me before I leave? You have my name and telephone number if you think of any questions that cannot wait until you see me again. I will see you soon and wish you the best for a speedy recovery after surgery. Good-Bye.

In the event someone reveals information that would disqualify them from the study

In light of this information, I do believe that this study would not be a good fit for you. It is important that you channel your energy into healing from your surgery and working with your physician to manage your [substance abuse]. I wish you the best of luck in your recovery.

Appendix H – Informed Consent

UNIVERSITY OF WASHINGTON
CONSENT FORM

Postoperative Pain Management Study

Researcher: Deborah Vickers, RN, MA, PhD(c)
PhD Student, School of Nursing
dvickers@uw.edu*; 206-696-0461

Faculty Sponsor: Elaine Walsh, PhD, RN, PMHCNS-BC
Associate Professor, Psychosocial & Community Health
emwalsh@uw.edu *; 206-543-4568

*Please remember that we cannot guarantee confidentiality of information sent by e-mail.

Researchers' statement

We are asking you to be in a research study. The purpose of this consent form is to give you the information you will need to help you decide whether to be in the study or not. Please read the form carefully. You may ask questions about the purpose of the research, what we would ask you to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When we have answered all your questions, you can decide if you want to be in the study. This process is called "informed consent." We will give you a copy of this form for your records.

PURPOSE OF THE STUDY

The purpose of this study is to determine what patients think about pain medications. We will use this information to improve nursing education. We also want to understand the experience patients have when they go home and have to manage their own pain after surgery.

STUDY PROCEDURES

The study will occur in two parts. You will have the opportunity to sign up for Phase 1 only or for Phases 1 and 2.

Phase 1 will consist of two short surveys. The first will be taken today. It will consist of questions which should take between 5-10 minutes to answer. The second survey will occur after discharge teaching is completed but prior to discharge from the hospital. This survey is very similar to the first survey and should take 10-15 minutes to answer. The last question on this survey will give you the opportunity to volunteer to participate in Phase 2 of this research study.

If you are, for any reason, unable to take the survey at the time of discharge, you will be withdrawn from the study and will be ineligible for the financial compensation mentioned below. Reasons might include your desire to discontinue the study or the surgeon's decision to perform surgery as a day procedure, rather than an overnight stay (a condition of the study).

Phase 2 will follow your experience of self-medication for pain after you return home. There are four factors to this part of the research: 1) **medication record** – you will record your pain medications each time you take them and rate your pain on a check-off form (3 minutes), 2) **daily journal** in which you will write one or two sentences that best describe your day and check-off quality of life on a 1-10 scale for that particular day (5 minutes), 3) **interview** – this will occur two weeks after you have been off all your narcotic pain medications or at the end of 8 weeks if you are still taking narcotic pain medications (30-45 minutes); at the completion of the interview, you will receive a $50 gift card, 4) **confirmation of transcription** – this will consist of your reading a written copy of your previous interview (transcription) to confirm that the printed words were the words that you communicated in the previous interview and that the meanings attached to them were the meanings that you meant to communicate. . . The total time involved for Phase 1 is 15-25 minutes and only occurs while you are in the clinic and the hospital.

The total time for Phase 2 depends on how often and for how long you will be taking the pain medications after discharge from the hospital. For example, if you take pain medications four times a day, you will spend 17 minutes per day on the study records – three minutes for each medication administration and five minutes for the journal. The interview process will take 30-45 minutes. It may take place in your home or at another private location convenient for you. The transcription of your interview will be sent via email as a PDF file or, if you choose, it can be sent via postal mail. This will occur within a week of your interview and you may contact the researcher via text, email, or postal mail to confirm the transcription. Your confirmation must be in writing. The estimated time for reading and responding is approximately 20-30 minutes.

The surveys will ask questions related to your knowledge about your pain medications, some personal questions such as year of birth, race/ethnicity, and languages spoken, and questions related to your surgery such as type of surgery, date, and surgeon. The questions will be no more personal than these examples. The interview will include questions about your experience medicating yourself for pain. The researcher will ask you about different aspects of controlling and managing post-operative pain. She will also ask you to describe what you think might have made the experience even better for you.

The most sensitive questions that you may be asked will be similar to the following examples:

Most sensitive question: Do you believe that your postoperative pain was well-managed during your recovery?

Associated sub-questions: What do you think helped you to manage your pain? What do you think made it harder for you to manage you pain?

You are not required to answer any question that you do not want to answer, whether it is part of the surveys, medication record, daily journal, or interview. You are also able to withdraw from the study at any time and for any reason.

It will be necessary for the researcher to see your medical record to determine if you will be able to participate in the study and to monitor your date of discharge. No copies of any information

will be made and no one from this study will see your medical record except for the researcher. The interview will be audio-recorded and the researcher will make a transcription of the interview – that is, she will type it out word for word to provide a printed copy. The recordings will be destroyed six years after the completion of the study (no later than December 31, 2023).

RISKS, STRESS, OR DISCOMFORT

Potential discomforts included in this study are the frequent recording of pain medications in Phase 2 of the research plan. If this becomes too much for you, you might have someone do the recording for you or you may decide to discontinue the study. Despite our best efforts to ensure privacy, there is always the chance that this privacy could be breached. It is unlikely, but possible. Although you may begin this study with the Admission Survey, if your surgeon decides to do a day procedure instead of surgery that will cause you to stay overnight, you will be withdrawn from the study and your survey will not be included in the research, though it will be held until the close of the study, no later than December 31, 2023.

BENEFITS OF THE STUDY

There are no direct benefits to you for participating in this study. This study will benefit nursing education by providing evidence of what patients need to know about their pain medications when they leave the hospital. If patients do not have adequate knowledge of their pain medications, this study will help nurses to understand what changes need to be made in the process of discharge teaching so all patients will have the opportunity to benefit from a positive pain management experience when they return home.

CONFIDENTIALITY OF RESEARCH INFORMATION

Your medical record will be examined prior to your entrance into the study for the purposes of determining if you would be a candidate for the Postoperative Pain Management Study. The information examined will include the type of surgery you will be having, the dates of your pre-surgery clinic visit, your medical history, and discharge information while you are in the hospital

The information you give the researcher will be kept private and stored in a locked file cabinet, if it is printed information, or on a password-protected computer, if it is electronic in nature. You will be given a code when you finish the first survey and your information will only be known by that code thereafter. Only the researcher will have access to the code sheet and names so no one will be able to connect your records for the study to your name. The code sheet will be destroyed six years after the conclusion of the study (no later than December 31, 2023) though the coded records may be kept indefinitely for use in designing future research studies.

OTHER INFORMATION

For those who complete Phase 1 of the study (Admission and Discharge Surveys), you will receive a $10 gift card at the completion of the second survey in appreciation for your time and

effort. For those who complete Phase 2 of the study, you will receive a $50 gift card at the completion of the interview.

You may refuse to participate and you are free to withdraw from this study at any time without penalty or loss of benefits to which you are otherwise entitled. However, you will not receive financial compensation unless both surveys are completed for Phase 1 and the interview is completed for Phase 2 of the study.

Printed name of study staff obtaining consent Signature Date

Participant's statement

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions later about the research, or if I have been harmed by participating in this study, I can contact one of the researchers listed on the first page of this consent form. If I have questions about my rights as a research subject, I can call the Human Subjects Division at (206) 543-0098. I give permission to the researchers to use my medical records as described in this consent form. I will receive a copy of this consent form.

Printed name of participant Signature of participant Date

Copies to: Researcher
Participant

Appendix I – Survey Scoring

Survey Scoring

(Total Perfect Score 24)

2.3 **Tylenol recommended max daily dose** (multiple choice w/ 1 correct response)
1.3 1 = 4
0 = any other response

2.4 **Medications containing Tylenol** (multiple choice w/ 3 correct responses)
1.4 1 point for each correct response
0 = none

2.5 **Common side effects of opioids** (multiple choice w/ 6 correct responses)
1.5 1 point for each correct response
0 = none

2.6a **Instructions are just guidelines** (Likert scale w/ 1 correct response)
1.6a 1 = 1
0 = any other response

2.6b **May meds give to friend** (Likert scale w/ 1 correct response)
1.6b 1 = 1
0 = any other response

2.7a **In danger of becoming dependent** (Likert scale w/ 1 correct response)
1.7a 1 = 5
0 = any other response

2.7b **In danger of becoming addicted** (Likert scale w/ 1 correct response)
1.7b 1 = 5
0 = any other response

2.8 **Definition of dependence** (fill-in w/ 7 possible responses)
1.8 1 point for each correct answer
0 = none

2.9 **Disposal of opioid medication** (multiple choice w/ 1 correct response)
1.9 1 = 3
0 = any other response

2.10 **Alternate forms of pain relief** (fill-in w/ 3 responses required)
1.10 1 point for each response (up to three)
0 = none

Appendix J – Definition of Opioid Dependence

National Institute on Drug Abuse (NIDA)

https://www.drugabuse.gov/publications/teaching-packets/neurobiology-drug-addiction/section-iii-action-heroin-morphine/8-definition-dependence

https://teens.drugabuse.gov/blog/post/tolerance-dependence-addiction-whats-difference

https://www.ncbi.nlm.nih.gov/pubmed/21412369

1. An adaptive state
2. Develops from repeated drug administration
3. Results in physical and mental symptoms of withdrawal upon cessation of drug use
4. Withdrawal can range from mild to life-threatening
5. Withdrawal symptoms can only occur once a person has developed tolerance
6. Person needs the drug to function normally
7. Hyperalgesia – can be a symptom of and is thought to be r/t tolerance (NIH above)

Appendix K – Alternative Forms of Pain Management

The Postoperative Pain Management Study
Participants' Contributions

1. Massage
2. Yoga
3. Hot tub
4. Acupuncture
5. Walking
6. Heat/Cold Therapy
7. Deep Breathing
8. Stretching
9. Exercising
10. Rest/Sleep
11. Nutrition Therapy
12. Repositioning
13. Meditation/Visualization/Prayer
14. Distraction
15. Effleurage
16. Aromatherapy
17. Chiropractor
18. PT
19. Warm bath
20. Don't touch painful area
21. Herbal Medicine
22. TENS Unit
23. Reduce Stress
24. Kung Fu
25. Tai Chi
26. Slow down routine activities
27. Music/Art Therapy
28. Reiki
29. Epsom Salts Bath
30. Positive Attitude
31. Ask for help
32. Talking through it

Appendix L – Codes and Themes

Pain Themes

1. **Commute from hospital to home**
   - Pain/Discomfort
   - Fatigue

2. **Activity**
   - Limitations
   - Increases
   - Fatigue
   - Overdoing It

3. **Pain & Medications**
   - Experiencing and Managing the Medication Side Effects
   - Experiencing and Managing the Physical Effects of Pain

4. **Daily Routine Management and Support**
   - Reorganization of post-hospital days
   - Physical/Emotional Support of Family/Helpers

Surgical Recovery Themes

5. **Physical Effects**
   - Dealing with Post-Surgical Issues
   - Dietary/Nutritional Changes

6. **Social Effects**
   - Desire for Social Interactions
   - Ability to participate in social activities

7. **Emotional Effects**
   - Reactions – Emotional (minus pain)
   - Milestones
   - Enjoyment During Recovery
   - Loss of Control of Environment
   - Movement toward Independence

Appendix M – Participant Diagnosis Sheet

PPMS Participant Diagnosis Sheet

Female, Dx: Incisional hernia - incision hernia repair

Female, Dx: Indeterminate colitis – total colectomy w/ end ileostomy

Male, Dx: Prostate ca – retro-urethral fistula repair and bladder neck reconstruction

Female, Dx: Crohn's colitis – colectomy w/ coloproctostomy and loop ileostomy

Male, Dx: Crohn's disease – ileocecectomy w/ primary repair of sigmoid colon

Male, Dx: Crohn's disease – ileocecectomy and proctectomy w/ end colostomy

Female, Dx: Ulcerative colitis – completion proctectomy and small bowel resection

Female, Dx: Ventral hernia – ventral hernia repair

Male, Dx: Recurrent prostate ca – partial small bowel resection

Male, Dx: Multiple ventral and incisional hernias – ventral/incisional hernia repairs

Male, Dx: Perforated diverticulitis – Ventral hernia repair/end colostomy takedown

Female, Dx: Crohn's disease – small bowel resection

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