ADDITIONAL VALIDATION OF THE PAIN MEDICATION QUESTIONNAIRE IN A SAMPLE OF PATIENTS WITH CHRONIC PAIN

APPROVED BY SUPERVISORY COMMITTEE

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DEDICATION

I would like to thank the members of my committee for their encouragement and guidance throughout the past few years. Dr. Robert Gatchel, thank you for providing me with the support and background to be able to build on your previous research. Dr. Cheryl Silver, thank you for your statistical guidance and encouragement through not only this project but both years of the graduate program. Mr. Jason Zafereo, thank you for your involvement in this project and allowing me a helpful perspective on pain management. Thank you, Mr. Rob Haggard, for your assistance throughout every step of this process, answering every question, and being a wonderful mentor.

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ADDITIONAL VALIDATION OF THE PAIN MEDICATION QUESTIONNAIRE IN A SAMPLE OF PATIENTS WITH CHRONIC PAIN

By

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The present study represents an initial stage in the formal attempt to aid in developing a psychometrically sound, self-report screen tool used for assessing potential pain medication misuse risk. This study follows previous studies of Adams and colleagues (2004) and Holmes and colleagues (2006). The Pain Medication Questionnaire (PMQ), initially a 26-item instrument, was studied as a 23-item questionnaire designed to measure risk for opioid misuse. This revised PMQ showed good reliability and validity. This study also examined the ability of the revised PMQ to predict pain medication misuse in a heterogeneous sample of chronic pain patients. The PMQ was administered to 1,540 patients at a pain center that provided interdisciplinary pain management, including medication, psychological, and physical therapy disciplines. The risk of a patient's pain medication misuse, as predicted by the PMQ, was found to significantly decrease following interdisciplinary intervention. Cut-off scores were

created from the distributed PMQ scores by assessing a frequency scatter plot and determined that those participants with scores below a 21 on the PMQ made up the lowest (L-PMQ) group, scores including and between 21 to 30 on the PMQ made up the middle (M-PMQ) group, and scores above 30 made up the highest (H-PMQ) group. A comparison using the H-PMQ and L-PMQ groups revealed that those participants in the H-PMQ group, after completing an interdisciplinary treatment program, had significantly decreased PMQ scores at post-treatment. In addition, the H-PMQ group was significantly associated with greater levels of non-compliance or drop out from treatment, early pain medication refill requests, and endorsement of having a history of alcohol abuse or history of rehab for alcohol or drugs. Finally, the present study also examined the relationship of total PMQ score with measures of physical impairment and perceived pain. Findings suggest that higher scores on the PMQ are minimally associated with higher levels of impairment of physical functioning and perceived pain.

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CHAPTER ONE
Introduction

ADDITIONAL VALIDATION OF THE PAIN MEDICATION QUESTIONNAIRE IN A SAMPLE OF PATIENTS WITH CHRONIC PAIN

Scope of the Problem

Chronic pain is a problem for both individuals and society, with the costs of chronic pain alone being a major health-care issue in the United States, exceeding $125 billion each year (Gatchel, 2001). Pain is not only considered a problem for those directly suffering, but also impacts the nation as a whole by loss of productivity in the work force and payment of disability benefits through social security. In addition, pain costs billions of dollars each year due to medical expenses and lost wages, both for untreated and undertreated pain (Katz et al., 2007). As an example, approximately 70% of the population in the United States will at some point during their lifetime suffer from back pain (Gatchel, 2001). Chronic non-cancer pain (CNCP) significantly affects approximately 10 to 20% of the overall population at any point in time (Sullivan, Edlund, Steffick, & Unutzer, 2005). In addition, roughly 300,000 to 400,000 spine surgeries for back pain are done every year with success rates of only 50 to 60% (Gatchel, 2001). Because pain comes at such a tremendous price for the United States, it is imperative for the health care system to address costs, treatment, and issues associated with chronic pain.

The Joint Commission on Accreditation of Health-Care Organizations recognized pain as the *fifth vital sign*, to be assessed and documented during each physician visit

along with pulse, temperature, blood pressure, and respiration (Dowling, Gatchel, Adams, Stowell, & Bernstein, 2007). As an important step in the assessment and treatment of pain, Gatchel (2001) focused attention on the significance of recognizing that pain is a distinctive experience for each individual. Pain is considered to be subjective and may be viewed as an emotional and neurological response to a stimulus (Hawkins, Smeeks, & Hamel, 2008). This subjectivity can make it more complicated for physicians to correctly assess and treat individual patients. Savage (1996) discussed that a difficult decision faced by physicians dealing with chronic pain patients is their ability to interpret the subjective reports of pain and objective functioning levels described by the patient. It is especially difficult during follow-up appointments to determine whether the decrease in pain is attributable to opioid medication or other types of pain treatment. Because of the complexity of pain, it is important to address all individual factors when attempting to create a comprehensive diagnostic and treatment plan. Pain is now often viewed as a complex interaction between social, biological, and psychological factors, thus creating a biopsychosocial perspective of pain (Gatchel, 2001).

There are many pathways to determining the most beneficial treatment plan for a chronic pain patient because each individual can have unique responses to the plan. For physicians, this can be a difficult choice, but as Gatchel (2001) discussed, each plan should be designed using the influence of the biopsychosocial perspective to ensure a more effective treatment to maximize recovery. Treating physicians must learn to maintain and oversee the treatment plan with medication agreements, setting goals, and monitoring drug intake regularly to help maximize the effectiveness of the treatment (Molea & Augustyniak, 2005). Villars et al. (2007) found that most side effects

associated with opioid prescriptions are found in patients on around-the-clock dosage and patients on around-the-clock dosage along with additional dosages as needed. Therefore, physicians must be cautious when developing the type of prescription each patient will be given because certain opioid schedules may increase risks of side effects. Also, physicians need to be actively involved to ensure maximum compliance with the recommended treatment to avoid increased risk of addiction (Wasan et al., 2007). Because of the lack of research concerning the risk of opioid addiction with chronic pain patients, physicians have increasing doubts and fears about prescribing to chronic nonmalignant pain patients. Unfortunately, this has led to many legitimate chronic pain patients being either undertreated or untreated altogether. It is important for physicians to gain extensive knowledge about each individual patient to determine a sufficient treatment plan (Dowling, et al. 2007). Because opioid medication is considered controversial when treating chronic non-malignant pain, it is important to provide measures to more adequately evaluate and treat chronic pain and to determine the risk of potential opioid misuse to allow physicians to estimate whether an individual will be more likely to become involved in opioid misuse. One such valid and reliable measurement for potential opioid misuse is the Pain Medication Questionnaire, and it can positively contribute to the decisions made by physicians concerning opioid medications (Adams et al., 2004).

CHAPTER TWO
Literature Review

CHRONIC PAIN AND OPIOID USE

In the past, pain management professionals have relied on an overly simplistic, dichotomous categorization to label pain as either a physical or mental experience with no overlap. The primary assumption was that the amount of pain being experienced was in direct correlation with an amount of observable physical damage (Turk, 1996). However, pain has been demonstrated to be a more complex experience and, thus, many criticisms have been identified against this dichotomous theory's assumptions of pain. The dichotomous theory failed to identify pain when the physiological cause of the pain was unknown or could not be determined. In addition, the theory failed to connect psychological and social factors into the equation of pain.

The Medical Model

Another model that attempted to define the experience of pain was the medical model (Weinstein et al., 2000). The medical model assumed that diagnoses are made from a complaint. It is the physician's job, therefore, to "fix" the complaints by using specific interventions and thus curing the patients of their symptoms. A main belief represented in the medical model was first introduced in the 17th century by Descartes with the theory that people's reports of pain were a direct result from a specific site of disordered biology (Turk & Gatchel, 2002). Moreover, the medical model assumed that secondary features associated with the pain, such as sleep disturbances or depression, will dissipate or

weaken once the site of pain is healed; therefore, the secondary features are not necessarily attended to in treatment and are seen only in the background of the "real" problem of the site of pain. Further, the medical model did not take into account all the aspects that have been shown to be related to chronic pain, including psychological or social factors. Therefore, the limitations of this particular model to determine all causes of pain, or attend to the influences of psychosocial aspects, have restricted the medical model in clarifying the concept of pain.

The Gate Control Theory of Pain

An attempt to merge physiological and psychological factors to explain pain was first seen in the Gate Control Theory of Pain in the 1960's (Melzack & Casey, 1968). Melzack and Casey (1968) stated that a subjective experience of pain is associated with three systems pertaining to nociceptive stimulation: cognitive-evaluative, motivational-affective, and sensory-discriminative. The Gate Control Theory was unlike previous theories, because of the assertion that the experience of pain can be accounted for by thoughts, feelings, and behaviors. In very basic terms, this theory proposed the presence of a structure in the dorsal horn of the spinal cord that serves a gate-like function, increasing or decreasing the flow and transmission of nerve impulses from the peripheral fibers to the central nervous system. Thus, sensory input can be "modified and reviewed" by the gate before it evokes pain. The facts behind the Gate Control Theory are the following:

> the variable relationship between injury and pain, the location of pain and tissue damage is sometimes different, the nature of the pain and sometimes the location

> can change over time, pain can persist long after tissue healing, pain is a multi-dimensional experience, and non-noxious stimuli can sometimes produce pain. (p. 165)

Melzack and Casey (1968) described a process in which the central nervous system is continuously interacting with other systems to determine the experience of pain. The nervous system interacts with the behavioral, cognitive, affective, and sensory systems to form and shape the pain experience. For instance, a person may choose to behave in ways to modify the sensory input and therefore alter the pain. In addition, a person's cognitive decisions such as decreasing attention to the site of pain or modifying past experiences can alter the overall pain experience. The Gate Control Theory is useful, in that it contributes to the development of more beneficial and comprehensive treatments that focus on factors beyond physiology to explain pain (Turk & Gatchel, 2002).

Biopsychosocial Model of Pain

According to the Biopsychosocial Model of Pain, pain is more comprehensively understood when explained using psychological, physiological, and social factors. This model accounts for aspects of pain including social support, reinforcement, and psychological pathologies that can result from a chronic condition. Turk and Gatchel (2002) discussed the importance of the distinction between a disease and illness in the context of chronic pain. Disease is a biologically based event that is involved in the disruption of physiological structures and functions. An illness refers to how the patient and his or her social network live with, respond, and perceive the patient's symptoms and

linked disabilities. The biopsychosocial model emphasizes aspects associated with both the disease and the illness of a patient. Therefore, the model encompasses a multitude of factors that contribute to the subjective experience of pain. Turk and Gatchel (2002) described the interactions between factors with the statement: "Biological factors may initiate, maintain, and modulate physical perturbations, whereas psychological variables influence appraisals and perception of internal physiological signs, and social factors shape patients' behavioral responses to the perceptions of their physical perturbations" (p. 7). In general, the physical, psychological, and social factors are constantly evolving and tend to shift throughout the progression of the illness or disability. For instance, during the onset and initial phases of a chronic condition, biological factors may be predominant in the experience of pain but, over time, social and psychological factors tend to take on the majority of influence over the symptoms. The social and psychological factors can be detrimental in the maintenance and success of an intervention. For example, having an overwhelming fear of reinjury, or fearing a loss of autonomy, or fear of failure can lead to reduced motivation on the part of the patient to carry out an intervention or to comply with treatment. In regard to treating patients using an opioid prescription, treating physicians must be aware that treatment should go beyond that of altering physical factors, such as the reduction of pain, and also include social and psychological factors that have been associated with pain. A biopsychosocial model can assist in treating patients in a more comprehensive manner and help determine the risks and benefits associated with prescribing opioids to chronic pain patients.

Kinney, Gatchel, Polatin, Fogarty and Mayer (1993) assessed both chronic and acute low back pain patients using a Structured Clinical Interview for the DSM-III-R

(SCID) to evaluate psychopathology. Not including somatoform pain disorder diagnoses, the chronic low back pain (CLBP) subjects showed significantly higher rates of both current Axis I and Axis II disorders, with rates of 68% and 60%, respectively. Acute low back pain (ALBP) subjects also revealed higher rates than the general population, with 23% meeting criteria for an Axis I diagnosis and 21% meeting criteria for an Axis II disorder. In CLBP subjects, 46% had a current diagnosis of major depression, 25% had an anxiety disorder, and 33% had Paranoid Personality Disorder. The most common diagnoses with the ALBP group were substance abuse (38%), anxiety disorders (21%), and major depression (26%). In the CLBP group, there were significantly higher rates of life-time psychopathology, suggesting the possibility that patients with past psychological problems may be more vulnerable to end up in a chronic pain state and disability. Although there is no causal relationship found in the study between psychopathology and chronic pain, there seems to be a significant correlation between the two, and therefore assessing and treating psychopathology should be a top priority in a treatment plan for all chronic pain patients (Kinney et al., 1993).

Biopsychosocial Treatment

Flor, Fydrich and Turk (1992) evaluated the effect of multidisciplinary treatments for chronic nonmalignant back pain by conducting a meta-analysis of 65 studies. In comparison to patients on a waiting list, receiving a controlled treatment, no treatment, or a unimodal treatment (including only medical care or physical therapy), patients receiving a multidisciplinary treatment for chronic pain reported more success in pain relief and functioning. Also, the treated patients had a much higher likelihood of

returning to work than those untreated (68% vs. 32% respectively). In addition, those treated actually had less frequent interactions with health care providers, resulting in decreased utilization of time and resources used for the patients and their families. The decrease in health care interactions can be a direct result of the multidisciplinary treatment's success in that most treatment effects are maintained over an extended period of time in comparison to no treatment or unimodal treatments (Flor et al., 1992). In addition, 43% of participants that received a multidisciplinary treatment returned to work after treatment, resulting in billions of dollars saved by third-party payers. Significant progress was also made in the use of medication, activity levels, and frequency of pain behaviors. Sixty-five percent of those treated made improvements compared to only 35% improved in a group treated without multidisciplinary care. Patients treated with multidisciplinary care functioned better than 75% of the untreated or unimodal-treated sample. Multidisciplinary pain treatment is a highly efficacious treatment for chronic pain and can be more successful than no treatment or unimodal treatment.

Opioid Medication as Pain Treatment

Opium, an extract from poppy, has been used for thousands of years to reduce pain, including civilizations as far back in history as the Egyptians and Sumerians (Robinson et al., 2001). It has remained a consistent option for pain patients as a source to reduce pain; however, the medical community has struggled with the concerns regarding opioid use for decades (Savage, 1996). In the United States, the use of opium-derived medication rose dramatically in the 1800's, especially in the populations of middle class

white women and Civil War veterans. Opium then saw another boost in the early 1900's within the lower socio-economic status populations, creating a negative stigma that was associated with poverty. In the 1960's, opium was turned into a popular street drug called heroin. It became associated with higher crime rates, poverty, and unfavorable social behaviors. Despite the lack of evidence associating long-term opioid with irreversible physical change, the view that increasing opioid availability to the public is bad for society remains a strong obstacle to prescribing opioids for pain treatment (McQuay, 1999).

Legislation

The Pure Food and Drug Act of 1906 and the Harrison Narcotics Act of 1914 and were two of the first legal movements to monitor opioid use in and out of the medical community (Robinson et al., 2001). The Harrison Narcotics Act was formed to monitor the trafficking of opioids and called for sound records to be kept at all transfer points (Savage, 1996). This includes keeping track at the location where medically dispensing of opioids takes place. In addition to the tracking of opioids, in 1919 the United States Supreme Court decided with two cases, Webb et al. v. the United States and the United States v. Doremus, that the principle of addiction is outside the realm of the medical community; therefore, physicians cannot prescribe opioids to maintain a form of addiction. The United States government took action to formally criminalize those involved with opioids during the Reagan administration. The government announced a war against drugs and the pressure on the medical community became immense. Physicians were now required by law to accurately assess for opioid addiction. In part,

this upset the medical community by raising concerns about opioid use, and ultimately, the prescribing of opioids has remained conservative to date. For example, physicians must be able to show a legitimate medical purpose for prescribing opioids, and pharmacists distributing the opioids must monitor the process and changes that take place concerning opioid prescriptions (Clark & Sees, 1993). A few State governments have taken action to protect physicians with the use of Intractable Pain Acts. Texas and California have formed laws to shield physicians who prescribe pain medication to patients with intractable pain. The laws define intractable pain as a state in which the cause of the pain is uncontrollable or cannot be treated, and the generally accepted course of medical practice cannot provide relief or a cure for the cause of the pain even after reasonable efforts. Situations in which the laws do not protect treating physicians include nontherapeutic use of substances that are controlled, failure to complete sound records of the prescribing and dispensing of controlled substances, writing false prescriptions for controlled substances, and prescribing or providing controlled substances in a way that is not consistent with public welfare or health. The physician is still responsible for determining if a patient had opioid addiction either by initial screening or watching for aberrant drug behaviors during the treatment phase. Despite the adverse impact and negative stigma that some legislation and public policy has created, opioid medication remains a successful treatment option to decreasing pain (Portenoy & Foley, 1986).

Pharmacology of Opioids

Opioid analgesics interact with opioid receptors in the central nervous system in order to provide pain relief (Bannwarth, 1999). Opioids can have effects that will inhibit the

immune system by activating the hypothalamic-pituitary-adrenal system. Similar to a stress response, Glucocorticoids and noradrenalin are released in response to opioids and act on lymphocytes, thereby decreasing the ability of the immune system by reducing the body's inflammatory responses (Flores, Dretchen & Bayer, 1996). Dependent on the type of opioid and the receptors involved, the immunosuppressive capacity can vary. The receptors involved with pain relief are the subtypes μ, δ, κ (Bannwarth, 1999). The ways in which the opioids react with the receptors determine their category. Opioid medications can be considered pure agonists, partial agonists, or mixed agonist-antagonists. Pure agonists are usually prescribed for moderate pain levels, but have limitations in that too high of a dosage can lead to detrimental effects. Examples of pure agonists include codeine, tramadol, and dihydrocodeine. Partial and mixed opioids are classified due to their ceiling effect in regards to level of analgesia and, therefore, are used for low to moderate pain.

Opioids can also be categorized as weak or strong depending upon the type of pain experienced by the patient. Weak opioids, such as codeine and tramadol, are used in relieving moderate pain, whereas strong opioids (such as morphine) are used in relieving severe pain. Another alternative to treating moderate pain can be prescribing a low dosage of a strong opioid. For example, oxycodone, a strong opioid, can be combined at a low dosage with aspirin to provide an analgesic effect. Despite the categorizations and expected side effects associated with both weak and strong opioids, individual responses may vary because of the underlying mechanisms associated with the metabolism of the opioid (Bannwarth, 1999). For instance, some patients may metabolize morphine in such

an abnormal way that a case of paradoxical pain, or pain worsened by the use of opioids, may become present (Mercadante et al., 2003).

Opioid exposure can lead to neural alterations within the brain, including changes in the limbic system, striatum, hypothalamus, and midbrain (Nestler & Aghajanian, 1997). When patients are frequently exposed to opioids, the neural pathways may begin to alter, therefore changing the way in which the neural circuits and neurons work. In addition, frequent exposure to opioids can alter a person's dopaminergic and serotonergic cells, resulting in both somatic and motivational characteristic changes as well as the restructuring of the synaptic connections. Frequent exposure provides the complex behaviors that have become associated with drug dependence, tolerance, and withdrawal. It is important for both the treating physician and patient to be aware of the expected side effects associated with opioids, but also to be aware of possible abnormal side effects that may inhibit pain relief.

Opioid Responsiveness

Each individual experiences pain in a different way because of differing biological components underlying differences in opioid responsiveness, or the extent to which pain is relieved using opioid prescriptions (Portenoy, Foley & Inturrisi, 1990). Portenoy et al. (1990) looked at neuropathic pain and its relationship to opioid responsiveness. The authors believed that opioid responsiveness can be defined by the level of analgesia achieved with an increase in dosage; opioid responsiveness is on a continuum; a diverse group of patient characteristics and pain-related factors determine opioid responsiveness; and neuropathic mechanisms can reduce opioid responsiveness. Factors that contribute to

the level of opioid responsiveness include predisposition to side effects, history of opioid exposure and/or psychological dependence, psychological distress, and genetic factors. Due to the complexity of factors contributing to the opioid responsiveness of an individual, it is unnecessary to withhold opioid prescriptions due to the presence of one or more factors that may be associated with low opioid responsiveness or high potential of abuse. Portenoy et al. (1990) argued that many factors underlie the possible success of opioid treatment and, therefore, should be considered when forming a treatment plan.

Risk vs. Benefits of Opioid Use

Chronic pain patients have been using opioids as a method to reduce pain for decades. This is especially true for those patients for whom surgery or other methods were not beneficial (Holmes et al., 2006). Opioid use has been found to be an effective treatment for chronic non-malignant pain patients and can often be used for long periods of time without extreme side effects (Portenoy & Foley, 1986). The use of opioids has risen dramatically due to a belief that they will inevitably lead to pain relief, increased marketing from the pharmaceutical industry, and opioids' success in alleviating acute and cancer pain (Nedeljkovic, Wasan & Jamison, 2002). Gatchel (2001) stated that opioid analgesia is still the most widely used medication for many chronic and acute pain syndromes, making it clear that opioid prescription use will most likely continue to be a top prescribed treatment for pain patients. In addition, the American Pain Society and the American Academy of Pain Medicine stated that concerns regarding opioid use were overstated and "the use of opioids for the relief of chronic pain is a legitimate medical practice" (1997).

Arkinstall et al. (1995) conducted a randomized, double-blind, controlled study using the analgesic codeine to further research possible benefits associated with opioid use. Participants treated with codeine had significantly lower scores on several categorical pain intensity measurements, including the Pain Disability Index (PDI) and the Visual Analog Scale (VAS) compared to those participants given a placebo treatment. The PDI measures the extent to which pain interferes with daily functioning including social activities and self-care. The VAS assesses pain intensity on a visual analog scale consisting of 'no pain' on the left and 'excruciating pain' on the right side of the scale. In addition, Slawsby, Nedeljkovic, Srdjan and Katz (1998) assessed mood and pain in a randomized, controlled study. Participants who received an opioid analgesic (a set-dose of oxycodone or sustained-release morphine sulfate along with titrated-dose oxycodone) showed significantly lower levels of pain and less emotional distress than those in the control group who received only naproxen. In addition, Slawsby et al. (1998) reported that participants who reported less pain severity and better mood had varied their medications from day to day, suggesting that taking opioids on an as-needed basis may be beneficial. Zenz et al. (1992) used both the Karnofsky Performance Status Scale to measure a patient's functioning and the VAS to determine the effect of opioid analgesics on chronic nonmalignant pain severity. A considerable number of patients had significant or partial pain relief from opioid therapy as well as higher ratings of performance in correlation with less pain severity. Zenz et al. (1992) reported no resulting addictions to opioids in this study, as well as minimal physical side effects.

Nedeljkovic et al. (2002) pointed out that, with the increase in prescribing opioid medication for chronic pain patients, a controversy in the health care system has arisen,

and posed the question "do the benefits of taking opioid medication outweigh the risks associated with opioid therapy?" The use of opioid medication to treat nonmalignant chronic pain remains controversial because of the adverse effects of possible addiction and opioid misuse (Dowling et al., 2007). Wasan et al. (2007) stated that the abuse of prescription opioids has increased approximately 70% from the year 1997 to 2002. This dramatic increase has created numerous questions regarding the use of opioid therapy in pain patients. In addition, Holmes et al. (2006) discussed that physicians have become more reluctant to use opioids for nonmalignant chronic pain due to uncertainty about long-term effectiveness and concerns about addiction. Legality plays a major role in the reluctance of physicians because they must show a legitimate medical purpose for prescribing opioid medication, as well as screen for abuse potential (Adams et al., 2004). Bijur et al. (2008) stated that there is no gold standard for the amount prescribed that will provide adequate pain relief for all pain patients, leaving it up to the physician to determine. In addition, the majority of chronic pain patients have been found to use a larger dosage of long-acting opioids than recommended by the manufacturer, thus adding more confusion to the issue of prescribing opioids. (Gallagher, Welz-Bosna & Gammaitoni, 2007).

There are many side effects associated with opioid use, including the neurologic side effect of hyperalgesia, or paradoxical pain (Harris, 2008). Hyperalgesia is the presence of increasing pain despite opioid increase, as well as increase in pain sensitivity. It is believed that hyperalgesia is associated with opioid tolerance. In addition, opioids have been associated with numerous gastrointestinal effects such as nausea, vomiting, and constipation. Also, high levels of methadone are associated with high risk of cardiac

dysrhythmia, decreased renal function, and sexual dysfunction (Harris, 2008). If excessive opioids are prescribed, then a patient may experience respiratory distress (McQuay, 1999). In addition, it is believed that opioids may contribute to an interference of functioning, difficulty concentrating, light-headedness, lack of energy, muscle rigidity, and poor coordination, leading to an increase in possible disabilities and worsening of pain (Robinson et al., 2001; Villars et al., 2007; Harris, 2008). Kalso et al. (2004) stated that 80% of patients using opioids experienced adverse events such as constipation, nausea, somnolence, and drowsiness. Overall, prescription opioid medication remains controversial due to the lack of viable research and increased association with opioid abuse and severe side effects.

Treating physicians have numerous options when creating a prescription schedule for their chronic pain patients. Villars et al. (2007) compared chronic pain patients who received opioids only as needed, around-the-clock, or a combination of both, by evaluating side effects associated with each schedule. Those participants receiving around-the-clock or the combination prescription experienced significantly higher levels of constipation, drowsiness, and poor coordination than patients receiving opioids on an as needed basis. Although there may be correlations between types of opioid prescriptions and certain side effects, it is important for the physicians to be aware that many factors contribute to an individual's response to different analgesic medications and schedules. Physicians can decide, based on previous abuse risk factors, physical health, and level of pain, which prescription schedule, if any, will provide the greatest benefit to the patient. In addition, opioid rotation has become an option for patients whose pain is increasing while presently on an opioid prescription or for patients

experiencing unbearable side effects (Freye, Anderson-Hillemacher, Ritzdorf & Levy, 2007). Opioid rotation is simply switching to another type of opioid prescription instead of increasing the dosage of the present opioid prescribed. Switching to another opioid can clear the accumulated metabolites from the original opioid and allow another opioid to increase pain relief (Harris, 2008). Freye et al. (2007) found that patients who switched to another opioid had an increase in pain relief, a reduction of side effects, and an overall potential to improve their quality of life. Also, a physician can help decide the route in which the patient will receive opioids (McQuay, 1999). Different administration routes determine different onset times and duration of pain relief. An intravenous route has an onset time of approximately 2 minutes, whereas intramuscular injections take around 20 minutes to begin pain relief. Normal-release oral formulations take approximately one hour, and sustained-release formulations (those used for a longer duration of effect) take two to four hours to work. Although the previous studies provide positive evidence for the variety of opioid prescriptions, routes, and schedules, another layer of nuance is added to an already complex decision made by physicians when determining whether to prescribe opioid medication.

Other risks associated with opioid prescriptions include the relationship between chronic pain and overall substance abuse, and the magnification of comorbid psychiatric disorders alongside opioid prescriptions (Strain, 2002). Numerous studies have found that approximately 15 to 20% of the chronic pain population has a current diagnosis of alcohol or substance abuse or dependence. In comparison to the general population, several studies do show a higher rate of substance abuse disorders in chronic pain patients (Fishbain, Goldberg, Meagher, Steele & Rosomoff, 1986; Polatin, Kinney, Gatchel, Lillo

& Mayer, 1993; Hoffman, Olofsson, Salen & Wickstrom, 1986). These studies have shown that chronic pain patients exhibit higher rates of Mood Disorders such as major depression, with rates ranging from 4% to 45%. In addition, chronic pain patients have demonstrated a high prevalence of Personality Disorders (PDs) in numerous studies, ranging from 40 to 60% prevalence. Because the presence of a psychiatric disorder may contribute to the outcome of a treatment plan, it is vital to assess for such comorbidity in order to determine the most effective treatment plan. Strain (2002) stated that it is most beneficial to treat the independent psychiatric disorders of the patient while determining possible etiologic roles of substance use in their presenting symptoms.

Alternative Analgesic Medications

In addition to opioid analgesics, physicians can choose two types of other medications considered nonopioid analgesic medications. These two broad categories are known as nonsteroidal anti-inflammatory drugs (NSAIDs) and "adjuvant analgesics" (Portenoy, 2000). NSAIDs include acetylsalicylic acid, dipyrone, and other drugs that are not available in the United States. The goal of these drugs is to inhibit the peripheral and central cyclooxygenase, of which there are two forms: COX-1, which is necessary for the healthy functioning of the stomach, platelets, and kidneys; and COX-2, an enzyme involved in inflammation. NSAIDs are considered nonspecific analgesics which can be used for a multitude of pain syndromes. In addition, NSAIDs have not been shown to produce any symptoms of physical dependence or tolerance; however, they do have a ceiling dose due to the serious side effects that may result from higher doses. Each individual has a different minimum effective dose and ceiling dose which cannot be

accurately determined prior to the intake of an NSAID. However, physicians can help screen out or be more aware of patients who may be more at risk. Patients at risk include the elderly, those that have previously suffered from NSAID toxicity, and those on anticoagulants. COX-2 inhibitors have shown clinical potential; however, they are expensive medications that may be less readily available for specific populations. In addition, nonselective COX drugs have improved in regards to gastroprotective therapy and may serve just as well as COX-2 inhibitors. More research needs to be conducted to help physicians determine the potential costs and benefits associated with different NSAIDS (Portenoy, 2000).

Another category of a nonopioid analgesic is the "adjuvant analgesics" (Portenoy, 2000). These medications can be grouped into four separate subcategories according to their use: Multipurpose, Neuropathic, Musculoskeletal, and Cancer. Multipurpose analgesics are antidepressants, corticosteroids, and α2 –adrenergic agonists. Antidepressants, especially tricyclics, have shown great potential in relieving many types of chronic pain. α2 –adrenergic agonists have shown potential in being used for patients with neuropathic, cancer, low back, and headache pain. Analgesics for neuropathic pain include such drugs as local anesthetics, GABA agonists, and anticonvulsants. Most of these drugs are recommended to be used only with neuropathic pain, or opioid-insensitive pain that does not respond to progressively increasing doses of opioid medications (McQuay, 1999). Common causes of neuropathic pain can include nerve compression or destruction. Other medications that can be used to help with neuropathic pain include antidepressants, local anesthetics, and spinal infusions of local anesthetics with opioid mixtures. Drugs including muscle relaxants and some benzodiazepines can also

potentially help relieve musculoskeletal pain (Portenoy, 2000). There has been a major increase in prescriptions of these drugs over the past two decades in treating chronic pain due to their successful management of pain. With the achievements of the alternative analgesic medications in chronic pain patients, physicians now have an abundance of choices to make, but they need to carefully consider the costs and benefits associated with the medications for each individual patient.

Opioid Misuse Defined

One central controversy of prescribing opioid medication lies within the confusion over the definition of opioid misuse, and the criteria that must be met in order for a situation to be labeled opioid misuse. In one such attempt, the federal government defined an addict as: "anyone who consistently used a narcotic drug so as to put the public, health, morals, welfare, or safety at a risk from danger" (Clark & Sees, 1993). In addition, the government views an addict as someone whose use of a narcotic drug leads to a loss of self control. This definition has been criticized because of the lack of focus on psychosocial issues associated with abuse and dependence. To help alleviate some of the definition problems, the American Academy of Pain Medicine, the American Pain Society, and the American Society of Addiction Medicine created a consensus definition for opioid addiction: a chronic, primary neurobiologic disease, associated with genetic, environmental, and psychosocial factors influencing its development and manifestations (Wasan et al., 2007). The groups' definition includes behaviors such as impaired control over use, craving, compulsive use, and continued use despite adverse effects. In addition,

aberrant drug-related behaviors were defined as behaviors that imply the presence of substance abuse or addiction. Portenoy (1996) discussed certain aberrant drug-related behaviors that are most predictive of possible opioid misuse: forging prescriptions, frequently misplacing prescriptions, stealing drugs from others, and resisting pain treatment alterations despite undesirable effects. Other behaviors discussed as possible predictors include aggressively seeking out more drugs and escalating dosage regardless of prescribed amount. The addiction to opioid prescriptions is comparable to that of other drugs, such as cocaine, because it can be chronic and relapsing (Savage, 1993). Zenz, Strumpf and Tryba (1992) described an addiction as a psychological dependence characterized by a compulsion to take a drug in order to experience its effects. The researchers' data did not support the belief that addiction is frequent with opioid medications. In addition, there is confusion because of the manner in which the word *addiction* is used today. Addiction is often mistakenly used to depict physical dependence, and thus contributes to the confusion within the medical community and society.

Pseudoaddiction

Another factor that contributes to the confusion over opioid misuse is the notion of pseudoaddiction, or the presence of drug seeking behaviors with the recurrence of pain (Zenz et al., 1992). Weissman and Haddox (1989) described three phases that patients and the health care teams go through in order to develop a pseudoaddiction: inadequate dosage of opioid medication to remove the primary pain; behavioral changes of the patient in order to convince others of their need to receive an increase in dosage; and a

predicament of mistrust among the patient and the health care team. Phase 1 is characterized by the inadequacy of the medication or the duration of pain relief to be potent enough to provide sufficient pain relief. This may then cause the patient to begin seeking and craving for pain relief (Zenz et al.,1992). Phase 2 is marked by an increase in drug-seeking behaviors and attempts to convince the health care team that the pain is more severe so that a higher dosage of medication can be available (Weismman & Haddox, 1989). Drug-seeking behaviors can include grimacing, holding body parts that are in pain, and vocalizations of pain such as crying or moaning. If the patient regresses into an immature relationship with the health care staff, then suspicion may occur. Phase 3 occurs when the relationship between the health care team and the patient becomes distant. The health care team might then respond to the immature drug-seeking behaviors of the patient by avoiding or ignoring the patient's requests. The patient may then exhibit drug-seeking behaviors and characteristics of an addicted patient or simply display other bizarre behaviors. In summary, this vicious cycle can lead to isolation and anger on both the part of the health care team and the patient. Despite the fact that pseudoaddiction has been proven to be a result of an undermedication of pain, it remains largely unnoticed in the medical setting.

Physical Dependence

In addition to the possible risk of addiction or pseudoaddiction to an opioid prescription, patients suffering from opioid abuse can experience withdrawal if taken off the prescription drug. Symptoms can also be produced by an abrupt cessation of medication dosage, an administration of an antagonist, or decreasing the level of the drug in the

blood (Savage, Covington & Heit, 2001). Physical dependence can be defined as the presence of withdrawal symptoms after a significant dose reduction (Zenz, Strumpf & Tryba, 1992). Withdrawal symptoms are the physiological alterations that occur in response to pharmacological properties of the opioid medication (Portenoy & Foley, 1986). The body's opioid receptors change and adapt when exposed to opioid medications, and therefore, are involved in the withdrawal symptoms experienced after a significant reduction in the medication. Opioid withdrawal symptoms are similar to those seen in illegal drugs and include sweating, anxiety, irritability, and restlessness (Katz et al., 2007). Physical dependence might occur after repeated exposure to opioid medications, but is not considered to be a clinical problem and, therefore, does not necessarily interfere with the success of the treatment (Portenoy & Foley, 1986; Collett, 1998).

Tolerance

Just as numerous substances are related to the development of tolerance, so too are opioid medications. Opioid tolerance can be defined as either an increased dosage required to create the same pain relief, or a decrease in pain relief with a stable amount of opioid use. The phenomenon of the "honeymoon effect", or the increase in tolerance, has been found in many patients with opioid addiction (Kalso, Edwards, Moore & McQuay, 2004). A need for a higher dosage of opioid medications to maintain its effect can be caused by other factors beyond tolerance, however, and physicians need to be aware of the underlying cause in order to better treat the patient (Zenz, Strumffp & Tryba, 1992). For example, addiction, or the worsening of the pain, can both be reasons for needing a

dosage increase other than tolerance. Tolerance can be dependent on the opioid chosen for treatment and the average time it takes for a patient to become desensitized to the effects. For instance, Zenz et al. (1992) discussed that side effects, such as nausea and fatigue, usually subside within two to three weeks following the onset of taking some opioid treatments. The researchers also stated that tolerance needs to be checked but does not usually interfere with the opioid therapy of patients since numerous patients have been successful while continuing on a stable opioid therapy. In addition, cross-tolerance, or the development of tolerance to other opioids beyond the initial opioid prescribed, has not been seen in humans. Therefore, patients can successfully be switched to alternative opioid medications if one opioid creates an intolerable amount of side effects (Collett, 1998). Both tolerance and withdrawal are adverse effects of opioid misuse and raise more controversy about the risks associated with opioid prescriptions.

Physicians' Reluctance to Prescribe Opioids

Due to the increase in addiction rates associated with prescribed opioids, physicians have become more cautious about using opioids for treatment of chronic pain (Lin, Alfandre & Moore, 2007). It is difficult for treating physicians to adequately assess potential misuse due to the variability in physicians' experience, assessment methods, knowledge, and personal prejudices (Hawkins, Smeeks & Harnel, 2008; Turk, 1996). Lin et al. (2007) studied 187 physicians to assess their beliefs and concerns about opioid prescriptions for chronic pain patients. Each physician was given a 26-item survey to evaluate the physician's knowledge of opioid use, concerns, and frequency of prescribing opioids. Fifty-eight percent of the physicians surveyed admitted that they were hesitant to

prescribe opioids because of side effect concerns. The issue of illegal aversion led 37% of physicians to admit their reluctance to prescribing opioids, and the fear of causing addiction caused 31% of physicians to be reluctant to prescribe. Furthermore, one in every four physicians admitted to having inadequate knowledge about prescribing the correct dose of opioid medication.

The factors of lack of knowledge, reluctance to prescribe, and fear of legal consequences have been found to contribute to the notion of *opiophobia*, or fear of prescribing opioids (Weinstein et al., 2000). Opiophobia can lead to the undertreatment or untreatment of chronic pain patients. Weinstein et al. (2000) found that, after surveying 386 physicians, approximately 30% of physicians reported restricting the prescription of opioids to those patients with severe intractable pain only, and 10% would only prescribe opioids to those patients who had a life expectancy of less than a year. Also, smaller community physicians revealed higher prejudices against opioid prescriptions and had less knowledge about opioids. The belief that opioids may cause cognitive impairments added to the hindrances facing physicians concerning opioid prescriptions (Ersek, Cheerier, Overman & Irving, 2004). In addition, there is a belief that cognitive side effects can magnify disabilities in elderly persons, thus increasing the risks of injury and potential life-threatening situations associated with opioids. These statistics, unfortunately, revealed the presence of current barriers to adequate pain treatment. Moreover, physicians revealed more negative attitudes towards chronic pain patients. Weinstein et al. (2000) argued that the idea of the medical model can contribute to this negative attitude because chronic pain does not fit with the model. Pain, due to its subjective nature and a general lack of understanding of its origin and treatment, can

cause physicians to become disturbed and believe they cannot adequately diagnose, intervene, and relieve the pain. Due to these factors, physicians must consider other models to treat chronic pain beyond the medical model.

The treatment of pain is often inadequate for pain patients, including those with pseudoaddiction. Three factors can contribute to the inadequacy of pain treatment: 1) physicians' insufficient education about the treatment and diagnosis of pain; 2) disproportionate fear of tolerance and dependence; 3) and the underutilization of present pain management methods. With a more solid definition of misuse, more appropriate and timely use of opioids for pain relief, and awareness of predictive behaviors, physicians can become more confident in their treatment plan for chronic pain patients.

Opioid Use for Chronic Pain and Biopsychosocial Factors

Because opioid abuse is complex in nature, it is important to view it within a biopsychosocial perspective to enable treatment providers to better diagnose and screen for opioid misuse and addiction. Holmes et al. (2006) stated that opioid abuse involves depressive symptoms, anxiety, and maladaptive coping skills. Patients with increased evidence of potential opioid misuse also exhibited poorer life functioning, higher levels of psychosocial distress, and were less likely to complete an interdisciplinary pain treatment program. Other psychological factors associated with opioid misuse include a history of a mood disorder, a substance abuse history, and psychosocial stressors (Wasan et al., 2007). Research has predicted that prescription opioid abuse is similar to other

forms of substance abuse in regard to overall poor psychological well being (Edlund, Sullivan, Steffick, Harris & Wells, 2007).

Adams et al. (2004) showed that patients displaying more aberrant drug-related behaviors also had diminished social support and were more likely than other patients to be unemployed. The authors discussed the fact that these patients most likely lacked motivation to return to work or lacked the coping skills required to handle stress on the job. In addition, patients with higher levels of aberrant drug-related behaviors were more likely to express feeling socially alienated and to have an increased level of psychosocial stress. Wasan et al. (2007) suggested that some patients may attempt to cope with mood problems by turning to prescription pain medication, further implicating the role of biopsychosocial factors and coping skills associated with opioid prescription misuse.

Strain (2002) stated that opioid dependence is correlated with numerous psychiatric disorders. Side-effects such as changes in mood, sleep, appetite, perceptual experiences, and beliefs may results from taking opioids, and need to be assessed to determine if they are truly side effects or symptoms of a comorbid psychiatric disorder. Lifetime prevalence rates of psychiatric disorders are greater than 40% within the opioid-abusing population (Abbott, Weller, & Walker, 1994; King, Brooner, Kidorf, Stoller & Stitzer, 2000; Strain, Brooner & Bigelow, 1991). Major depression is the most common comorbid psychiatric disorder found with opioid abuse, with lifetime prevalence rates ranging from 4% to 54% (Rounsaville, Weissman, Kleber & Wilber, 1982; Chen et al., 1999). Anxiety disorders are also frequently found in opioid abusers, with phobia being the most common anxiety disorder diagnosed, ranging from 8% to 39% (Brooner, King, Kidorf, Schmidt & Bigelow, 1997; Krausz, Verthein & Degkwitz, 1999). Strain (2002)

demonstrated that personality disorders occur at very high rates in opioid-abusing populations. Antisocial personality disorder has been found in approximately one-third of opioid-dependent patients (Abbott, Weller & Walker, 1994; Strain et al., 1991; King et al., 2000). Although Strain (2002) revealed sufficient data showing a relationship between opioid abuse and specific psychiatric disorders, there remains a lack of evidence comparing psychiatric disorders with the chronic pain population using opioids. Therefore, more research will be required to determine what effect the factor of chronic pain has on opioid misuse and psychiatric disorders.

Opioids and Reinforcement

Sullivan (2008) argues that all human beings are designed with innate behavioral responses to pain, or pain behaviors. These behaviors can include facial displays and anticipatory postural compensation. In a social context, such behaviors can lead to solicitous communication between the individual and an observer, where the observer shows a great deal of concern for the individual and can possibly limit the individual's recovery by creating an environment for secondary gain. In this case, the individual in pain might receive more attention, and be allowed to cease certain activities which may seem harmful to the observer, in turn representing a secondary gain. This type of communication can serve to prolong periods of pain, recovery, and possible mood problems associated with the pain.

In addition to the issue of primary and secondary gain with opioid prescriptions, there is a notion of reinforcement of pain. Savage (1996) repeated that a person may begin to feel euphoric and have a higher sense of well-being while using opioids. These

feelings can serve as primary reinforcers and justify the person's extended use of opioids. Secondary reinforcers require that the patient attempts to avoid withdrawal symptoms by remaining on the prescribed opioid medication. In addition, allowing chronic pain patients to experience pain in between dosages gives the patient an opportunity to form a relationship between opioids and their ability to decrease suffering, leading to a higher risk of developing addiction (Wesson, Ling & Smith, 1993). It is important to screen for psychological issues when determining if an opioid prescription is the best treatment for a patient, as pathological issues may become magnified if an opioid addiction occurs. Gatchel (2001) suggested a "stepwise approach" when assessing patients. This means that the physican needs to use many assessment tools to create an adequate picture of the client and obtain more accurate information regarding potential opioid misuse. Screening instruments can include questionnaires, patient and family histories, psychological screeners, and behavioral observations. Combining these instruments can give a more accurate biopsychosocial view of the patient and to improve treatment strategies.

Assessment of Potential Opioid Misuse

The inability of physicians to confidently determine whether or not a certain patient will likely become addicted if prescribed opioids is a difficult problem in the health care system. Katz et al. (2007) discussed the challenge within science and regulatory communities to find a balance in prescribing opioid medication to chronic pain patients and resisting an increase in opioid addiction rates. Nedeljkovic et al. (2002) discussed many factors that contribute to an onset of addiction, including pain and both

environmental and biological vulnerabilities. It is the interaction of these three things that make it difficult for physicians to assess whether some types of patients are more at risk than others. Another concern is that addiction to pain medication may not be as overt as substance abuse, meaning that the signs of abuse may not be clear, and therefore, many patients may go unnoticed. In general, Dunbar and Katz (1996) found that pain patients in general displayed higher levels of somatization, obsessive-compulsive tendencies, interpersonal distress, and depression. Pain patients overall may be displaying higher levels of psychological stress despite their risk for potential medication use. Despite these issues, physicians and researchers need to focus on multiple factors to decrease the risk of opioid misuse for current patients, and concentrate on the best available treatment for each client. This involves being able to adequately screen for those patients who are at a higher risk for future opioid misuse. Researchers have yet to develop a screening instrument that will successfully predict each patient who will most likely develop an addiction, but many researchers have come up with screening instruments that can offer significant help.

Stepwise Approach

Gatchel (2001) proposed using a sequence of assessments to better understand both the present and potential biopsychosocial factors involved with each patient. He argued against relying on just one assessment or instrument in order to assess potential risk for opioid misuse, since many factors contribute to present and future aberrant drug-related behaviors. Initially, biological factors can be assessed using medical interventions, assessment, and history. Determining the history of pain, opioid use, and maintenance

are important pieces of information that need to be assessed prior to prescribing. A physical examination and diagnosis may be used to assess the patient. Next, the treating physician or rehabilitation team may administer a form of intervention to decrease pain, such as surgery, biofeedback training, or counseling. The intervention will then be evaluated as to its outcome. If a specific type of intervention is deemed risky for a patient because of confounding variables, then alternative interventions may need to be used, or a possible delay in an intervention can be considered. The stepwise approach model for assessing the potential for opioid misuse with chronic pain patients can be a useful contribution toward a standardized assessment tool for physicians.

DSM-IV-TR

The initial assessment used to determine substance abuse and related opioid misuse is the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (4th ed. TR, 2000). The DSM-IV-TR identifies substance abuse as a maladaptive pattern of substance use that leads to considerable suffering or impairment. Substance abuse will cause problems in one or more of the following areas within a 12 month period: failure to fulfill obligations associated with major roles at school, home, or work due to recurrent substance use; recurrent use that results in the person being placed in physically hazardous environments; substance-related legal problems; and, continued use despite persistent interpersonal or social problems that are caused or exacerbated by the effects of the substance being used. Substance dependence, as defined by the DSM-IV-TR, can consist of: tolerance; withdrawal; the intake of a larger dosage over a longer period than initially planned; persistent failed attempts to control

use of a substance; substantial amount of time spent on using, obtaining, and recovering from drug use; important social, recreational, and occupational roles being given up due to the use of the substance; and the continued use despite the knowledge of having a psychological or physical problem that is correlated with the use of the substance. The DSV-IV TR discusses behaviors such as escalating drug use, depression, and drug-seeking behaviors. However, even the DSM-IV-TR lacks certain reliability when assessing known persons with opioid misuse. Therefore, it may not be helpful in assessing or even diagnosing opioid prescription misuse or abuse (Nedeljkovic et al., 2002).

The CAGE

The CAGE questionnaire, developed by Ewing (1984), is another initial assessment tool for opioid addiction, but was designed primarily to assess for alcohol abuse and dependence. It has four questions concerning alcohol consumption behaviors: 1. Have you ever felt you should cut down on your drinking? 2. Have people annoyed you by criticizing your drinking? 3. Have you ever felt bad or guilty about your drinking? 4. Have you ever had a drink in the morning to get rid of a hangover? Each question is meant to be answered with a yes or a no. A positive answer on two or more of the questions has been shown to result in a four-to-seven times greater likelihood of alcohol problems than with no more than one positive answer (Aartgeerts, Buntinx & Kester, 2004). The CAGE has risen in popularity for alcohol abuse assessment, but is still questioned concerning the ability of the questionnaire to screen for abuse and dependence without supportive data from other intake assessments.

Prescription Drug Use Questionnaire

Another example of an addiction screener is the Prescription Drug Use Questionnaire (PDUQ), a 42- item questionnaire used to assess addiction in chronic pain patients (Compton, Darakjian & Miotto, 1998). Unlike the CAGE and the DSM-IV, the PDUQ is tailored towards the chronic pain population. It contains questions regarding the specific pain condition, social and family factors, family history of substance abuse and pain, patient history of substance abuse, psychiatric history, and opioid use. Compton et al. (1998) found that those patients who revealed current substance abuse were more likely to save unused medications, supplement analgesics with alcohol or psychoactive drugs, and to use analgesics to reduce symptoms unrelated to pain. In addition, if patients showed a past history of an addictive disease, they were more likely to be diagnosed with a substance abuse disorder than those who did not. The strongest indicators of addiction, revealed from the PDUQ, were the patient believing he or she is addicted, having a preferred route of administration, and increasing the dosage or frequency of an analgesic. Despite the promising ability of the questionnaire, it is still intended to be used with many other assessments when evaluating for potential opioid misuse.

Screener and Opioid Assessment for Patients with Pain (SOAPP)

The Screener and Opioid Assessment for Patients with Pain (SOAPP) is a self-screener for chronic pain patients to help determine the presence of opioid-medication problems (Butler, Budman, Fernandez & Jamison, 2004). The goal was to create another questionnaire that could help to screen for potential problematic drug-related behaviors among the chronic pain population. Butler et al. (2004) designed the SOAPP for the

purpose of enabling physicians without adequate training in addiction issues to better assess patients. The questions on the screener address several items, including substance abuse history, relationship with doctor, antisocial behaviors, personal care, need for medication, medicated-related behaviors, psychiatric history, and psychosocial problems. Of the 24 questions on the SOAPP, 14 items have been shown to predict subsequent aberrant drug-related behaviors. Despite these promising findings, Butler et al. (2004) revealed a danger in missing high-risk patients because, in general, it is easier to misclassify a low-risk patient than to identify a high-risk patient. Although the SOAPP can help determine potential aberrant behaviors, using it with other questionnaires and assessments would likely be the most beneficial means of administration.

Pain Mediation Questionnaire

Another pain medication misuse screener is the Pain Medication Questionnaire (PMQ), developed by Adams et al. (2004) to assess behaviors in patients that have been shown to be significantly related to medication misuse. One of the goals of the PMQ is to more adequately assess and treat chronic pain. The PMQ is also designed to determine levels of potential pain medication misuse to allow a physician to better evaluate whether a certain individual will be more likely to suffer from opioid misuse (Dowling et al., 2007). Holmes et al. (2006) discussed that future research is needed to improve the PMQ by showing that some items may perform too weak and therefore do not significantly contribute to the validity of the PMQ. By re-validating the PMQ and creating solid scores to reveal more distinct levels of aberrant behavior and risk involved with pain medication misuse, the PMQ can be a valuable instrument in the chronic pain field that

can be more efficient and valuable to pain management professionals working with chronic pain patients.

Rationale for the Current Study

The present study was designed to expand and build on previous research with the PMQ and its ability to assess risk for pain medication misuse. As mentioned previously, Holmes et al. (2006) emphasized that the 26-item PMQ could be reduced due to specific items not contributing significantly to the overall score. Therefore, this study sought to create a PMQ with fewer items that could possibly become a supplemental assessment for pain medication misuse that physicians and other health care providers could use with more time-efficiency. Adams et al. (2004) suggested dividing the PMQ scores into three distinct categories. Cut-off points were identified for the lowest, middle, and highest groups of PMQ scores. Based on a frequency scatter plot, the following proposed groups were created: subjects who scored below 21 on the PMQ were labeled the "Low" PMQ scoring group (L-PMQ), subjects scoring between or equal to 21 to 30 on the PMQ were labeled the "Middle" PMQ scoring group (M-PMQ); and those subjects scoring higher than a 30 on the PMQ were labeled the "High" PMQ group (H-PMQ). Similar groups were compared during the Adams et al. (2004) study, and were also used in the present study. By comparing the scoring groups, the current study attempted to build on previous research to reveal the PMQ's ability to reveal participants at higher risk for medication misuse. This will enable health care providers to choose other or secondary options for pain management. The present study was completed for the purpose of attempting to create an efficient and effective measure of risk for pain medication misuse.

Scope of Current Investigation

The following hypotheses for the current study were proposed:

1. It was expected that some questions would be identified that have significantly low correlations with the total PMQ score.

2. It was expected that a measure of test-retest reliability would be higher using the revised PMQ than that found by Adams et al. (2004), which was a Pearson's correlation coefficient of .85, with the original PMQ.

3. It was expected that an estimation of internal consistency measured by a Cronbach's alpha would be higher using the revised PMQ than the .73 coefficient estimated by Adams et al. (2004) with the original PMQ.

4.a. It was expected that the PMQ scores would have a higher Pearson's correlation coefficient with the Million Visual Analogue Scale than .36 found by Adams et al. (2004).

b. It was expected that the revised PMQ scores would have a higher Pearson's correlation coefficient with the Oswestry Pain Disability Questionnaire than the .23 found by Adams et al. (2004).

c. It was expected that the revised PMQ scores would have a higher Pearson's correlation coefficient with the Visual Pain Analogue than the .25 found by Adams et al. (2004).

5. It was expected that significant differences would be found between groups (H-PMQ and L-PMQ) on the Physician's Risk Assessment Form.

6. It was expected that scores in the H-PMQ group would be predictive of those patients likely to: a) have a known history of opioid detox; b) make early refill requests for medication related to pain; and c) be discharged or drop out from treatment due to non-compliance

7. It was expected that PMQ scores would be significantly lower at post-treatment in comparison to pre-treatment following interdisciplinary pain treatment.

CHAPTER THREE

METHODS

Subjects

Overall, a sample of 4,182 consecutive patients, evaluated for treatment at The Eugene McDermott Center for Pain Management (The Center), at the University of Texas Southwestern Medical Center at Dallas was used. The participants were evaluated between October, 1998 and February, 2008. All patients who completed the PMQ, so that a total score could be calculated, were included in the sample. This study produced a sample that included 1,813 patients who all took part in an interdisciplinary treatment program (including physical therapy, psychiatric, medical, and psychological components). Patients were only included in this study's sample if the treating physician deemed the program appropriate for their condition.

Procedure

The participants received a packet of paperwork in the mail before their first visit to The Center. The packet included a consent form for medical treatment and questionnaires that were used to collect information concerning the patient's medication usage, pain level, medical history, and functional capacities. The PMQ was included to be completed with this packet. A treating physician conducted the initial medical assessment and established a pain medication and pain management plan. If the treating physician

deemed that an interdisciplinary treatment program would be beneficial to the patient, then the patient was referred to The Center for psychosocial and physical therapy evaluations. When the patient scheduled an assessment, he/she received a packet of paperwork, including consent for psychological assessment and treatment, an explanation of the behavioral medicine program, and several psychological questionnaires. Semi-structured interviews and tests were administered by a staff psychologist. Individualized treatment plans and psychosocial diagnoses were made, including designated numbers of group behavioral medicine sessions, individual sessions, and psychiatric medication consultation if needed. Sessions were conducted by a clinical psychologist, and included cognitive restructuring, relaxation training, biofeedback training, and other cognitive-behavioral interventions. The 10-session psychoeducational group educated patients on the biopsychosocial approach to pain management and taught coping strategies. In addition to the 10 sessions, participants on average received 5-10 physical therapy sessions, 1-2 sessions for medication monitoring, and 2-4 sessions with a physician. All professional staff met weekly in order to discuss each patient, to clarify goals for the individualized treatment plans, and to integrate information.

Results from the initial assessments comprised the "pre-treatment" data that functioned as a baseline for assessing changes during the course of treatment. When one-half of each patient's behavioral medicine sessions were completed, the treating psychologist administered a packet of paperwork, which included a subset of the instruments given during "pre-treatment." Results from this second assessment functioned as the "mid-point" treatment data, and were used to evaluate the patient's improvement and direct further treatment. When patients completed all behavioral

medicine sessions, they received a pack of questionnaire that comprised the "post-treatment" evaluation. Patients found to be ineligible up to this point for "post-treatment" evaluation were discharged. Reasons for being discharged included non-compliance with treatment, geographical relocation, intervening medical or psychiatric issues that limited the effectiveness of treatment, or insufficient insurance coverage. Patients that dropped out due to noncompliance with treatment include 276 patients, 42 patients dropped out due to geographical issues, 37 patients dropped out due to an intervening medical or psychiatric condition, and 49 patients dropped out due to insurance issues. All patients who were discharged received appropriate referrals to other health-care providers.

Instruments and Outcome Measures

Million Visual Analogue Scale (MVAS)

The MVAS is an analog scale consisting of 15 self-report items related to pain (Million, Haavik-Nilson, Jayson & Baker, 1981). Each answer is made by the participant picking a point along a 10 point Likert scale representing a range of potential answers from 0 to 10. Endpoints of the line can represent "No Pain At all" and "Severe Pain". Scores are derived by the summation of each of the scores from the 15 items. The MVAS is helpful in assessing reported pain that exceeds expectations based on physical, objective measures, and may indicate an involvement of psychosocial factors (Capra, Mayer & Gatchel, 1985).

Oswestry Pain Disability Questionnaire (OSW)

This questionnaire is designed to assess level of functional impairment as a result of pain in activities of daily living using a self-rating scale (Fairbank, Couper, Davies & O'Brien, 1980). There are 10 questions, each rated from 0 to 5, with higher scores representing increased levels of degree impairment. Questions concern personal care, sitting, walking, standing, lifting, traveling, sleeping, social activities, degree of improvement, and pain intensity. A total score is derived from the summation of each individual item with a maximum score of 50. Degree of disability is then categorized by the following ranges: 0-10 represents minimal disability; 11-20 is considered moderate disability; 20-30 means severe disability; 30-40 represent a "crippled" state; and 40-50 refers to "bed-bound or exaggeration of symptoms". The OSW has been found to have strong validity, strong internal consistency, and a high degree of test-retest reliability (Fairbank, Couper, Davies & O'Brien, 1980).

Patient Information Form

The patient information form is the clinic-specific data sheet that elicits information including the patient's date and detail of injury, demographics, education completed, employment status, personal injury litigation involvement or worker's compensation, medication, chronic health problems, and health care utilization.

Pain Medication Questionnaire (PMQ)

The participants in this study completed the PMQ, a 26-item screening instrument, with a 5 point Likert scale, used to assess for the risk of medication misuse among chronic pain patients. If a few items were missing on the PMQ, the researcher then extrapolated a score based on an average of the total PMQ so that the PMQ could be included in the analyses. In the initial assessment of the PMQ, Adams et al. (2004) used 184 chronic pain patients to determine that the PMQ is a reliable instrument, with r=.84 in a test-retest interval, an internal consistency yielding a Cronbach's alpha of .73, and adequate construct and content validity. Additionally, Adams et al. (2004) took a sample of patients (n = 19) that completed two PMQ's at two points, approximately one hour apart, during their psychological evaluation, yielding a Pearson's correlation coefficient of .85. The test-retest reliability coefficient of .85 was determined to be adequate. Three groups were derived from the data, and were from the lowest one-third of the scores (L-PMQ), the middle-third of the scores (M-PMQ), or the highest one-third of the scores (H-PMQ). High PMQ scores were correlated with an increase in potential of medication misuse, higher incidence of aberrant drug-related behaviors, and higher levels of psychosocial distress. Adams et al. (2004) found statistically significant differences between the two subgroups in the variable opioid use potential, thereby enabling physicians and other health care professionals to assess whether or not a specific patient would be a higher risk for potential abuse according to their scores. Additionally, using a sample of patients (n = 142) that completed the PMQ at both pre- and post-treatment points, an analysis of reliability yielded a Pearson's correlation coefficient of .46, suggesting a possibility that PMQ scores changed over time due to effects of a comprehensive treatment.

Physician Risk Assessment Form (PRA)

The PRA was developed as an adjunct instrument by Adams (2002) as a way to evaluate a physician's assessment of patients' risks for opioid misuse. To help to validate the PMQ originally, the PRA required the physician to rate the patient on a set of factors related to potential risk for medication misuse. The physician's ratings were based on behavioral observations during an initial medical assessment. The PRA has six items, all on a 5-point Likert scale ranging from a score of 0 to 4, which reflect increasing level of risk, with a maximum score of 24.

Visual Pain Analogue Scale (VAS)

The Visual Pain Analogue Scale (VAS) is designed to rate a patient's pain from 0 to 10. The patient is asked to place an "X" on the line to signify his or her current level of pain. The scale is made up on a 10-cm line hashed at two-point intervals. The use of the VAS for chronic pain was supported by many studies that have also demonstrated good psychometric properties of the VAS (Gatchel et al., 1986; Rissanen, Alaranta, Sainio & Harkonen, 1994).

Design and Statistical Analyses

At the time of this study, a total of 4,182 participants of a consecutive sample had met inclusion criteria during the screening process to participate in treatment at The Center. 1,813 participants completed the PMQ at the pre-treatment, or the intake phase, and were selected for this study. In terms of statistical analyses, chi-square procedures were

conducted for gender and ethnicity, and ANOVA procedures were used for age to evaluate their potential influence on outcome. Pearson's correlation coefficients were interpreted according to Cohen's (1969) effect sizes for *r*. Cohen stated that the values of *r* for small, medium, and large effects, are .1, .3, and .5, respectively. Due to missing data for various measures and subjects, the sample sizes that were analyzed differed and are reflected in the different degrees of freedom in each analysis.

In the context of the previously reviewed hypotheses, the following analyses were used:

1. To identify questions that do not significantly contribute to the total score of the PMQ, Pearson's correlation coefficients were used for an item-analysis.

2. Test-retest reliability of the PMQ was determined by using Pearson's correlation coefficients.

3. Internal consistency of the PMQ was estimated by using a Cronbach's alpha.

4.a. A Pearson's correlation coefficient was run to examine the relationship of the PMQ to the Million Visual Analogue Scale.

b. A Pearson's correlation coefficient was run to examine the relationship of the PMQ to the Oswestry Pain Disability Questionnaire.

c. A Pearson's correlation coefficient was run to examine the relationship of the PMQ to the Visual Pain Analogue questionnaire.

5. An independent t-test was used to determine significant differences between the H-PMQ and L-PMQ groups on the Physician's Risk Assessment Form.

6. Chi square analyses were conducted to determine significant differences between the H-PMQ and L-PMQ groups on: a) having a known history of opioid detox; b) early refill requests for medication related to pain; and c) treatment non-completion

7. To determine that PMQ scores are significantly lowered after interdisciplinary treatment, a repeated measure t-test was used to compare scores at pre-treatment and post-treatment.

CHAPTER FOUR

Results:

Demographic Variables: Descriptive Analyses

The total sample of 1,813 patients was analyzed for proportional breakdowns on the categorical variables of: gender and race. Additionally, standard deviations and overall means were obtained for the continuous variable of age. The three PMQ scoring groups (L-PMQ, M-PMQ and H-PMQ) were then analyzed according to the same demographic variables. Statistical analyses were performed to compare these two groups.

Of the sample, 64.7% of the participants were female, with the remaining 35.3% male. The mean age of the participants was 51.89 years (S.D. = 19.1), with a range of age from 14 to 98. The majority of the participants were Caucasian (79.4%) with the next largest group being African-Americans (12.4%). Asian, Hispanic, and other races made up 8.2% of the total. Moreover, 20.6% of the total sample was considered Non-Caucasian. These demographic data are presented in Table 1. In addition, pain conditions were analyzed. Of the sample, 4.3% of the participants had a diagnosis of Musculoskeletal Pain, 15.2% had a diagnosis of Neuropathic Pain, 45.8% had a diagnosis of Visceral Pain, 13.1% had a diagnosis of Vascular Pain, and 21.6% had more than one of the previous diagnoses.

Comparison of PMQ Scoring Groups on Demographic Variables

Pearson Chi-Square analyses were used to compare the L-PMQ, M-PMQ, and H-PMQ groups on the categorical variables of race and gender, while a one-way analysis of variance (ANOVA) was used to compare the three groups on the variable of age. No significant differences were found among the groups on the variables of gender and race. However, significant differences were found only for the variable of age, $F(2, 1537) = 5.41$, $p < .01$. The L-PMQ group had a mean age of 52.55 (SD = 23.60), and the M-PMQ group had a mean age of 51.11 (SD = 14.67). The H-PMQ group had a mean age of 47.88 (SD = 19.62). A post hoc analysis was run to determine where the differences were among the three scoring groups. It revealed a difference between the L-PMQ and H-PMQ scoring groups at $p < .01$. Results of these analyses are presented in Table 2.

PMQ Descriptive Analysis: Individual Items

The means and standard deviations were derived for each of the PMQ's 26 items. With a possible range of 0 to 5 points, individual item means ranged from a low of 0.07 (SD = 0.29) to a high of 2.42 (SD = 1.38). Higher scores typically reveal higher levels of concurrence with the given item or frequency of the described behavior; however, higher scores on some items (#'s 1, 2, 5, and 8), reflect higher levels of disagreement with the item. Therefore, these items are reverse-scored. The items with the five highest means are listed below:

Item #1: I believe I am receiving enough medication to relieve my pain. (M = 2.42, SD = 1.38; *reverse-score*)

Item #2: My doctor spends enough time talking to me about my pain medication during appointments. (M = 1.55, SD = 1.4; *reverse-score*)

Item #3: I believe I would feel better with a higher dosage of pain medication. (M = 2.11, SD = 1.32)

Item #6: I have clear preferences about the type of pain medication I need. (M = 1.97, SD = 1.30)

Item #23: How many painful conditions (injured body parts or illnesses) do you have? (M = 1.73, SD = 1.40)

Conversely, numerous items had very low means, suggesting very low occurrence of, or admittance to, such behaviors. The items with the five lowest means are:

Item #10: At times, I drink alcohol to help control my pain. (M = 0.19, SD = 0.50)

Item #14: At times, I need to borrow pain medication from friends or family to get relief. (M = 0.19, SD = 0.52)

Item #15: I get pain medication from more than one doctor in order to have enough medication for my pain. (M = 0.15, SD = 0.47)

Item #17: In order to help me out, family members have obtained pain medications for me from their own doctors. (M = 0.07, SD = 0.29)

Item #26: How many times in the past year have you accidentally misplaced your prescription for pain medication and had to ask for another? (M = 0.13, SD = 0.37)

PMQ Descriptive Analysis: Total Score

As summarized in Figure 1, the selected sample (n = 1,540) yielded a mean PMQ score of 21.67 (SD = 9.62) on a revised PMQ with only 23 questions. The median score was 21.00, while the modal score was 24.00. The range was 70.84 points, with a low score of .16 and a high score of 71 (out of a maximum score of 104 points). The distribution of PMQ scores is shown in Figure 1. Skewness was found to be .75, and kurtosis was 1.15, which represents a reasonably close approximation to the normal curve. Measures of kurtosis and skewness falling between -1 and +1 are generally accepted to indicate a normal distribution (Muthen & Kaplan, 1985).

Results of Hypothesis Testing

Reliability Analyses

Reliability analyses were conducted to evaluate the accuracy and stability of the PMQ and its individual items. An analysis of internal consistency reliability was conducted for the sample (*n* = 1,450) after PMQ data were collected. Pedhazur and Schmelkin (1991) proposed that the measure of internal consistency is the measure of choice for assessing reliability by evaluating the extent to which responses on any item of an instrument serve as good indicators of responses on other items. This approach assumes that each item on an instrument is intended to assess the same construct. Cronbach's alpha, the most commonly used assessment of internal consistency, was conducted to assess the PMQ's

reliability, yielding a coefficient of .72. Although alpha coefficients of .80-.90 are typically desired, Nunnally (1978) proposed that coefficients of greater than .70 are considered adequate in the early stages of research on a new instrument.

Item analyses were conducted on the 26 items in the PMQ. All 26 items were examined with an item-total correlation, which reveals the strength of the relationship between the total score and each item, minus the individual item's contribution. Correlation coefficients were dispersed between a low of .04 (item #5) and a high of .58 (item #18). The five items with the strongest item-total correlation coefficients were:

Item #4:	In the past, I have had some difficulty getting the medication I need from my doctors. (r = .46)
Item #18:	At times, I need to take pain medication more often than it is prescribed in order to relieve my pain. (r = .58)
Item #21:	At times, I run out of pain medication early and have to call my doctor for refills. (r = .56)
Item #24:	How many times in the past year have you asked your doctor to increase your prescribed dosage of pain medication in order to get relief? (r = .49)
Item #25:	How many times in the past year have you run out of pain medication early and had to request an early refill? (r = .56)

The findings reveal that these five items vary most consistently with the total score in comparison to the other items in the PMQ. In other words, patients who showed higher scores on these individual items tended to have higher PMQ scores. Conversely, patients who scored lower on the five items tended to have lower PMQ scores.

On the other hand, the five items that had the weakest item-total correlation coefficients are listed below:

Item #5:	I would not mind quitting my current pain medication and trying a new one, if my doctor recommends it. (r = .04; *reverse-score item*)
Item #8:	It is important to me to try ways of managing my pain in addition to the medication (such as relaxation, biofeedback, physical therapy, TENS unit, etc.) (r = .19; *reverse-score item*)
Item #10:	At times, I drink alcohol to help control my pain. (r = .13)
Item #17:	To help me out, family members have obtained pain medications for me from their own doctors. (r = .20)
Item #23:	How many painful conditions (injured body parts or illnesses) do you have? (r = .09)

These findings suggest that patients' responses on these five items were not related consistently with their total PMQ scores.

Hypothesis 1 was supported. Correlation analyses revealed questions that do not significantly contribute to the PMQ. Therefore, the three items with the lowest correlation coefficients were taken out of the PMQ. When the 3 items (#'s 5, 10 & 23) were removed, test-retest reliability was re-calculated using a sample of patients (n = 18) with the revised PMQ and it yielded a coefficient of .77, compared with Adams' r = .85, representing an adequate test-retest reliability. In addition, the re-calculation of Cronbach's alpha yielded a coefficient of .703, suggesting that the PMQ's internal consistency continued to be adequate if those items were eliminated. Although the alpha coefficient was lower than that obtained by Adams et al. (α = 0.73), it still is considered sufficient. Moreover, an adjunct Fisher's z transformation revealed that there were not statistically significant differences at the .05 level between the test-retest coefficient in

this study in comparison to the coefficient in Adams' et al. (2004) study. Thus, Hypotheses 2 and 3 were not supported.

PMQ Scores Relative to Indices of Perceived Pain

Medication misuse is considered an addiction associated with environmental, biological, and psychosocial factors. Adams et al. (2004) found that pain medication misuse is significantly correlated with greater levels of distress and physical pain. Based on this research, the current study hypothesized that the revised PMQ would significantly correlate with measures of perceived pain.

PMQ Scores Relative to the MVAS, OSW, and VAS

Table 3 shows the analyses described in this section. Using a sample of patients who completed all measures (n = 1,209), and the revised PMQ with 23 items, a Pearson's correlation coefficient was derived to assess the relationship of the PMQ with the Million Visual Analogue Scale (MVAS). A correlation coefficient of .24 was obtained, suggesting a small correlation between the two measures, which was significant at p <.01. A Pearson's correlation coefficient of .22 was obtained for a sample of patients (n = 1,205) that completed both the PMQ and the Oswestry Pain Disability Questionnaire (OSW), and was significant at p <.01, suggesting a small correlation of the PMQ to a measure of perceived physical impairment and distress. Lastly, a sample of patients (n = 1,454) completed both the PMQ and the Visual Pain Analogue Scale (VAS), and yielded

a Pearson's correlation coefficient of .08, representing a small correlation between the two measures that was significant at $p < .01$. Thus, hypothesis 4 was not supported.

Although the three correlation coefficients are not as high as hypothesized, the analyses still revealed a small correlation of the revised PMQ to the MVA and OSW, measures of perceived pain, and suggest that the revised PMQ may be minimally related to indicating levels of pain.

PMQ Scores Relative to Indices of Opioid Misuse

Hypothesis 5 and 6 addressed opioid misuse. Hypothesis 5 involved the PRA and Hypothesis 6 discussed substance use history, early prescription refill requests, and treatment non-completion. Both hypotheses will be discussed in the next few pages.

Given that the PRA scores were not normally distributed, a Mann-Whitney test was run and determined no significant difference between the distributions in the High and Low scoring groups ($U = 104$, $n_1 = 38$, $n_2 = 6$, p = .69, two-tailed), and did not support Hypothesis 5, that there would be a significant difference between the two groups. Patients in the L-PMQ group ($M = 2.2$, $SD = 3.94$), on average, were given higher scores on the PRA than patients in the H-PMQ group ($M = 1.92$, $SD = 2.29$). These findings contradict those found by Adams et al. (2004) which showed patients in the H-PMQ, on average, scored higher on the PRA than those in the lower scoring groups.

The variable of history of opioid detox was used to assess differences between the two PMQ scoring groups. Initially, an independent samples t-test was run on a sample of patients ($n = 588$), but did not reveal significant differences on the PMQ

between those patients who endorsed a history of opioid detox compared with those who did not endorse, t (586) = -1.35, p = .18. The group of patients who did endorse an opioid detox history had a mean PMQ score of 25.50 (SD = 9.32), compared with those patients who did not endorse, who had a mean PMQ score of 22.30 (SD = 9.91). However, a Chi-Square analysis did reveal significant differences between the L-PMQ and H-PMQ scoring groups in regards to the distribution of those patients who endorsed having an opioid detox history, $\chi 2$ (1) = 2.74, $p < .05$, one-tailed.

This study hypothesized that scores on the PMQ could help to predict whether or not patients requested early refills for medication. In this analysis, early refill request was defined by a participant's answer to a clinician's question regarding whether or not the participant had requested early refill requests in the past year. The participant then answered with a "yes" or "no". An independent samples t-test was run to assess the relationship of PMQ scores to early refill requests using a sample of patients (n = 159), and revealed significant differences between the groups, t (157) = -2.72, $p < .01$. The group of patients who asked for early refills had a mean PMQ score of 26.94 (SD = 9.39), and the group who did not ask for refills had a mean PMQ score of 22.16 (SD = 8.09).

In addition, a Chi-Square analysis was used to compare the proportions of early refill requests between the L-PMQ and H-PMQ groups. Results revealed a significant relationship between PMQ scoring group and early refill requests, $\chi 2$ (1) = 7.85, $p < .01$. Moreover, only 8.33% of the L-PMQ group made early refill requests, whereas 30.77% of the H-PMQ requested early refills.

The current study hypothesized that scores on the PMQ could help to predict whether or not patients were discharged or dropped out of treatment due to non-

compliance. Patients were deemed inappropriate for treatment if they revealed consistent non-compliance and were thus terminated from treatment. Patients also dropped out for a variety of reasons, including travel issues, insurance issues, and intervening medical conditions. To assess the relationship between PMQ scores and drop-out/termination status, patients were categorized into two groups: 1) "Drop-out/Terminated" or 2) "Active patients/Not a drop-out". An independent samples t-test was run to compare initial PMQ scores for the two groups using a sample of 1,479 patients. The means for the two groups were significantly different, t (1477) = -2.97, $p < .01$. The mean PMQ score for the "Drop-out/Terminated" group was 23.38 (SD = 9.78), and the mean PMQ score for the "Active patients/Not a drop-out" group was 21.35 (SD = 9.60).

Again, a Chi-Square analysis was also run to assess the distribution drop-out/termination or active status between the two PMQ scoring groups, and was significant, $\chi 2$ (1) = 7.99, $p < .01$. More specifically, 13.24% of the L-PMQ group dropped out or terminated treatment compared to 20.75% of the H-PMQ. Based on the previous analyses, hypothesis 6 was not fully supported. The above analyses are shown in Table 4.

Change in PMQ Scores with Treatment Completion

The current study hypothesized that PMQ scores would be decreased after completion of an interdisciplinary treatment program. Using a sample of (n = 122) patients who completed the PMQ at both pre-treatment and post-treatment, a paired samples t-test

revealed a significant decrease in mean PMQ score from pre-treatment to post-treatment, t (121) = 6.97, $p < .01$; therefore, hypothesis 7 was supported. The pre-treatment mean PMQ score was 20.75 (SD = 9.47), compared with the post-treatment mean PMQ score of 15.42 (SD = 7.87).

CHAPTER FIVE
Results:

SUPPLEMENTAL ANALYSES

PMQ Scores Relative to the MVAS, OSW, and VAS

Adjunct analyses in the study used Fisher's z transformations to compare differences between Pearson correlation coefficients in the current study to those coefficients found in Adams' et al. (2004) study. In the case of all three correlations comparing the relationship of the PMQ to the MVAS, OSW, and VAS, the current study's findings did not differ significantly from those findings in Adams et al. (2004). The z values of the differences between the two correlations on each measure were not significant at the .05 level.

Substance Use History

Adjunct analyses in the study used four variables to assess differences between the H-PMQ group and L-PMQ groups: history of drug abuse; history of alcohol abuse; history of substance abuse; and history of rehabilitation for drugs and alcohol. Each variable was assessed individually in order to determine which variables had a significant relationship to PMQ scores.

An independent samples t-test using a sample of 590 patients yielded significant differences on mean PMQ scores between the patients with a drug abuse history and those without, t (588) = -2.29, $p < .05$. Those patients who endorsed having a drug abuse history had a mean PMQ score of 24.39 (*SD* = 10.11), and patients who did not endorse a drug abuse history had a mean PMQ score of 21.95 (*SD* = 9.79). Therefore, on average, participants with a drug abuse history were at greater risk for medication misuse associated with higher PMQ scores. A Chi-Square analysis was used to assess the proportion of patients in the L-PMQ and H-PMQ groups who endorsed having a drug abuse history, but it did not show significance, $\chi 2$ (1) = .99, p = .32, indicating that the proportions of participants in the two groups did not differ significantly in regards to drug abuse history. History of alcohol abuse was also assessed by an independent samples t-test to determine if there were significant differences on mean PMQ scores using a sample of 587 patients. The independent samples t-test did not reveal a significant difference on the PMQ mean score with regards to history of alcohol abuse, t (585) = -1.89, p = .059, indicating that the level of risk determined by the PMQ does not differ between those with and without an alcohol abuse history. Patients who endorsed a history of alcohol abuse had a mean PMQ score of 24.18 (*SD* = 9.97), compared to those patients who did not endorse alcohol abuse who had a mean PMQ score of 22.06 (*SD* = 9.88). A Chi-Square analysis revealed significant differences between the L-PMQ and H-PMQ groups concerning the proportion of patients who endorsed a history of alcohol abuse, $\chi 2$ (1) = 6.55, p = .01. Therefore, the number of patients in the H-PMQ group endorsing history of alcohol abuse was significantly higher than the number of patients in the L-PMQ group

History of substance abuse, determined by endorsement of either alcohol or drug abuse on the Patient Information Form, was assessed to see if endorsement of such a history would be significantly different between the two PMQ groups. An independent samples t-test was used with a sample of patients (n = 896) to assess differences and did not show significance, t (214.41) = -1.34, p = .183), revealing that there was no significant difference in risk for medication misuse as determined by PMQ scores between those who endorsed history of substance abuse and those who did not. However, an adjunct Chi-Square analysis did reveal significant differences between the scoring groups, $\chi 2$ (2) = 23.95, p <.01, indicating that there was significantly more patients that endorsed a history of substance abuse in the H-PMQ group compared with the L-PMQ group.

Endorsing a history of rehab concerning drugs and alcohol was also used to determine possible differences between the two PMQ scoring groups. An independent samples t-test was used with a sample of patients (n = 587), and it revealed significant differences on mean PMQ scores between those patients who did not endorse a history of rehab and those who did endorse, t (585) = -2.21, p < .05. Patients who did endorse a history of rehab had a mean PMQ score of 26.73 (SD = 12.67), compared to the mean PMQ score of 22.19 (SD = 9.74) of patients who did not endorse. A Pearson's Chi-Square analysis revealed significant differences between the L-PMQ and H-PMQ groups in regards to the proportion of patients who endorsed a history of rehab, $\chi 2$ (1) = 9.15, p < .01. The previous analyses revealed a significant difference in the proportions of patients that endorsed a history of rehab in both the H-PMQ and L-PMQ groups, and also showed

that patients with a higher risk of medication misuse were more likely to have endorsed a history of rehab.

Prediction of Participant's Scoring Groups

A sequential logistic regression model was also used to assess the best combination of factors that could predict classification into the L-PMQ or H-PMQ scoring groups. Variables included in the regression equation were: age, history of alcohol abuse, early refill request, and substance abuse history. All variables were chosen based on significant differences between the scoring groups in previous univariate analyses. Early refill request, in this analysis, was defined as endorsing a question regarding number of early refills requests on the PMQ to ensure a maximum number of participants could be used for the regression analysis. The question on the PMQ to determine if a participant had endorsed requesting early refills asked the participant how many times, from 0 to 4, the participant had requested an early refill in the past year. If the participant answered 0, then they were placed in the "No" group, and if the participant had requested early requests 1 to 4 times in the past year then they were placed in the "Yes" group. Endorsement of early refill requests was found to represent an overwhelming predictor in the model, $\chi 2$ (1) = 87.94, $p < .01$. The model predicted classification in either scoring group with 85.5% accuracy, and with 74% sensitivity and 93% specificity. In addition, chi square analyses were run to assess the relationship between request for early refills and two items on the Physician's Rating Assessment (PRA) concerning level of excessive concern regarding receiving additional medication, and the physician's current estimation

of the overall risk for medication misuse for the individual patient. Both chi square analyses yielded significant results, $\chi 2$ (1) = 26.07, $p < .01$ and $\chi 2$ (1) = 23.27, $p < .01$, respectively.

Change in High Risk Participants after Completing an Interdisciplinary Treatment Program

As an adjunct analysis, a paired samples t-test also revealed a significant decrease in mean PMQ score from pre-treatment to post-treatment for only those participants in the H-PMQ scoring group at pre-treatment, t (14) = 6.33, $p < .01$. The mean PMQ score at pre-treatment for those in the H-PMQ scoring group was 39.4 (SD = 6.88), compared with the post-treatment mean PMQ score of 23.5 (SD = 8.02). The analysis revealed that those participants in the H-PMQ group at pre-treatment, on average, fell into the M-PMQ group at post-treatment, suggesting a potential decrease in the risk for opioid misuse with interdisciplinary treatment. These results along with overall PMQ changes addressed earlier are presented in Figure 3. Further, analyses were run to assess demographic variables to evaluate potential differences between the sample of participants who completed the PMQ at both pre-treatment and post-treatment to those who did not complete the PMQ at post-treatment. No significant differences were found between the two groups on the variables of gender, ethnicity, and age.

CHAPTER SIX

Conclusions

DISCUSSION

Re-analysis of the PMQ showed that this instrument revealed adequate validity and reliability, with potential as a self-report assessment for risk of opioid misuse. The present study sought to replicate Adams' 2004 findings, as well as further evaluate the utility of the revised PMQ.

Demographic Variables

In the sample of 1,540 patients, the average subject was a Caucasian female who is roughly 51 years old. Among the variables of race, gender, and age, only age demonstrated significant differences between the Low, Medium, and High PMQ scoring groups. These findings indicated that, across the PMQ groups, race and gender were generally similar.

Analysis of age revealed significant differences between the PMQ groups. The H-PMQ group had a higher proportion of "younger" patients, compared with the L-PMQ group. One possible explanation is that a younger population may be more likely to fall into the H-PMQ group due to higher rates of substance abuse in general.

Reliability Analyses

Using correlation statistics, five items were found to vary more consistently with the overall PMQ score: Items 4, 18, 21, 24, and 25. Correlations ranged from .46 to .58. Conversely, items 5, 8, 10, 17, and 23 had the lowest correlations with overall PMQ scores, ranging from .04 to .20. Based on previous research done by Adams et al. (2004), the three items with the lowest correlations with the PMQ score were taken out of the PMQ. The revised PMQ displayed adequate test-retest reliability, with a coefficient of $r = .77$. The internal consistency was also adequate, with a Cronbach's alpha of .703.

PMQ Scores Relative to Physical/Functional Measures

The current study hypothesized that correlations between patients' revised PMQ scores and measures of perceived physical functioning would be higher than those correlations found by Adams et al. (2004). The results of the analyses comparing revised PMQ scores to three measures of physical and functional factors, including perceived level of physical pain, revealed small relationships between the PMQ scores and the OSW, VAS, and MVAS. These data indicate that patients who score higher on the PMQ, or at higher risk for opioid misuse, on average, score higher on measures of perceived physical pain, although the relationship is not strong. The findings are consistent with those found by Adams et al. (2004), and reveal that the PMQ may contribute as a supplemental assessment for potential opioid misuse. Further, because the study had a larger sample

size than Adams et al. (2004) and a larger amount of power, larger correlation coefficients were expected.

PMQ Scores Relative to Indices of Opioid and Substance Misuse

Adams et al. (2004) found that patients with higher scores on the PMQ, on average, had higher scoring on the PRA suggesting a relationship between the physician's evaluation between potential opioid misuse and PMQ scores. The present study hypothesized that Adams' et al. (2004) results would be consistent with those analyses with the current sample. However, the findings suggested that higher scores on the PMQ were, on average, were more related with lower ratings on the PRA, contradicting the proposed hypothesis. One possible explanation of this contradiction was the difference in sample sizes between the two scoring groups, L-PMQ and H-PMQ, resulting in a power issues between the sample sizes. The findings may therefore not be generalizable to the general population.

One variable that did not reveal significance between the two scoring groups was the endorsement of a history of drug abuse. However, other analyses did reveal significant or moderate differences between the L-PMQ and H-PMQ scoring groups with the following variables: history of alcohol abuse history, history of rehab for drugs and/or alcohol and history of opioid detox. Patients whose scores were higher on the PMQ were more likely to endorse having a history of alcohol abuse, rehab for drugs or alcohol, or opioid detox. These findings support the predictive validity of the PMQ and its potential use to assess for opioid misuse.

The current study hypothesized that patients scoring in the H-PMQ group would request early refills at a higher rate than those in the L-PMQ group. Results from the analyses revealed a significant difference between the two scoring groups. Patients in the high risk group were more likely to request early refills on their pain medication. Further, the regression analysis revealed that early refill requests can help to significantly predict whether or not patients will be placed in the L-PMQ or H-PMQ scoring group, allowing physicians another variable that may be important in attempting to come up with a beneficial treatment plan in regards to potential opioid misuse. Further, the variable of early refill request is significantly correlated with an external rating of a patient's risk for medication misuse as represented with the physician's ratings. In addition, patients scoring higher on the PMQ were more likely to drop-out or be discharged from treatment compared with those patients scoring lower on the PMQ. These findings are consistent with those in Adams et al. (2004) and the findings in Gatchel et al. (1999) that patients who drop out of treatment are more likely to endorse higher levels of physical impairment and pain intensity at pre-treatment.

PMQ Scores from Pre-Treatment to Post-Treatment

The present study hypothesized that PMQ scores would decrease over time from pre-treatment to post-treatment. Analyses revealed that participants' scores decreased from pre-treatment to post-treatment, suggesting that risk for opioid misuse can significantly decrease over time with an interdisciplinary treatment. In addition, those participants in the H-PMQ group had, on average, significantly decreased scores at post-treatment in

comparison to pre-treatment. These results revealed that even with a high risk for pain medication misuse, participants can decrease their risk with interdisciplinary treatment. These analyses parallel those found by Adams et al. (2004) that participation in an interdisciplinary pain management program appears to have a positive effect on patients' risk for opioid misuse and overall coping with their pain. In addition, these findings lend support to interdisciplinary programs and the positive effects they have on improved psychological functioning, health-care utilization, and decreasing pain level. In addition to medical interventions to treat pain conditions, interdisciplinary programs should be considered to help achieve maximum psychosocial and physical functioning.

Summary and Conclusions

The current study represents a formal attempt to reanalyze a psychometrically-sound, self-report screening tool for assessing risk for potential opioid misuse. The findings of the study were significant in fulfilling this goal. The PMQ demonstrated an appropriate coefficient of internal consistency and showed good test-retest reliability. Validity outcomes with the revised PMQ were also significantly supported by multiple other indices of perceived physical pain. Higher PMQ scores were found to be significantly related to a history of alcohol abuse, history of rehabilitation for drugs or alcohol, and history of opioid detox. In addition, H-PMQ scores were found to significantly correlate with a higher rate of refill requests, drop-out, or non-compliance with treatment. Moreover, the significant decrease in PMQ scores from pre-treatment to post-treatment

suggest that interdisciplinary treatment may have a positive effect on a participant's risk of opioid misuse.

Limitations and Directions for Future Research

Although the current study revealed promising results regarding the PMQ and its ability to help physicians to assess potential opioid misuse, there are several limitations. First, the results of the study may not be generalizable to all chronic pain patients seeking treating or a heterogeneous population in general. This could be due to the significant differences in age between the PMQ scoring groups. The results are likely generalizable to Caucasian females around the early 50's with a chronic pain condition. Also, a decrease in generalizability may be due to the subjective nature involved with the Physician's Risk Assessment, the PMQ and other self-report measures used in this study. Not all participants and physicians assess pain in a similar manner. Also, pain may fluctuate during treatment and cause discrepancies in assessments and treatment plans. In the current study there was no control group, therefore decreasing the ability of the results to generalize to the overall population. Additionally, approximately 15% of the total sample did not complete the treatment program, representing a potentially more motivated subgroup that went on to complete the PMQ and the interdisciplinary treatment program. Secondly, the PMQ is meant to be used in conjunction with other measures to assess overall physical and psychosocial functioning along with potential medication misuse. In addition, the definition of addiction to opioids still remains controversial and uncertain. Although the current study attempted to discuss a recommended definition of

addiction, opioid misuse may be defined differently in various treatment programs and must be considered when using the PMQ to assess potential risk.

Third, the correlation coefficients of the revised PMQ to the MVAS, OSW, and VAS revealed relatively low clinical significance. These results could represent a possibility of over interpreting statistical results due to the increased sample size in this study and, thus increased power that could have increased the statistical significant with other measures. Also, the current study attempted to create cutoff points, but future research needs to be done to possibly determine more appropriate cutoff scores. Because of the distribution of the participants in regards to PMQ scores, the L-PMQ group made up a large proportion of about average PMQ scores. Therefore, there may need to be more of a discrepancy on PMQ scores between the groups in future studies. Fourth, in the current study, there may have been important information missing in the data, perhaps causing an increase of Type 1 or Type 2 errors in the analyses. False-positives or false-negatives may have been more likely due to possible missing data. Additionally, contradictions in statistical analyses may be due to differences in sample sizes in the current study. For example, the difference in significance between PRA scores and PMQ scores found in Adam et al. (2004) and those found in this study. Lastly, the results of the current study are meant to be correlational, not causational.

Future research with the revised PMQ might include determining the level of variance that the type of pain condition and amount of disability contribute to the PMQ score compared to the variance of risk for opioid misuse. For example, comparing different pain conditions and the correlated PMQ scores, along with a population without a pain condition to serve as a comparison group, could help determine the amount of

variance that a pain condition contributes to a participant's PMQ score. In addition, a study comparing opioid abusers and non-opioid abusers could help determine the variance in the PMQ regarding substance or opioid abuse. Also, using a heterogeneous population in a future study could ensure the generalizability of the PMQ. Furthermore, assessing the type of opioid used and whether or not PMQ scores fluctuate with this could be helpful in future research. To control for potential Type 1 errors, future studies could help to ensure equal scoring groups along with insignificant differences among demographic variables. In this study, age was significantly different among the groups and could have contributed to potential Type 1 errors by adding significantly to the variance between the groups. Further, ensuring that the data is complete in regards to the variables could aid in controlling for Type 1 and Type 2 errors.

Future research should endeavor to go further in validating the revised PMQ and create cut-off scores that reveal different levels of risk. Furthermore, the PMQ is intended to be used along with other assessments for measuring potential opioid misuse, and should be used accordingly. The PMQ is likely to provide the best results when used in combination with other indices to create a multi-disciplinary approach to assessment. With future research, the revised PMQ can help physicians assess for potential medication misuse, allowing treatment providers to choose alternate routes to pain management. Finally, the PMQ can help physicians to form interventions specifically for each participant according to their level of functioning and misuse potential to create an opportunity for maximum physical and psychosocial functioning and pain relief.

APPENDIX A
Figures

Figure 1

Distribution of PMQ Scores

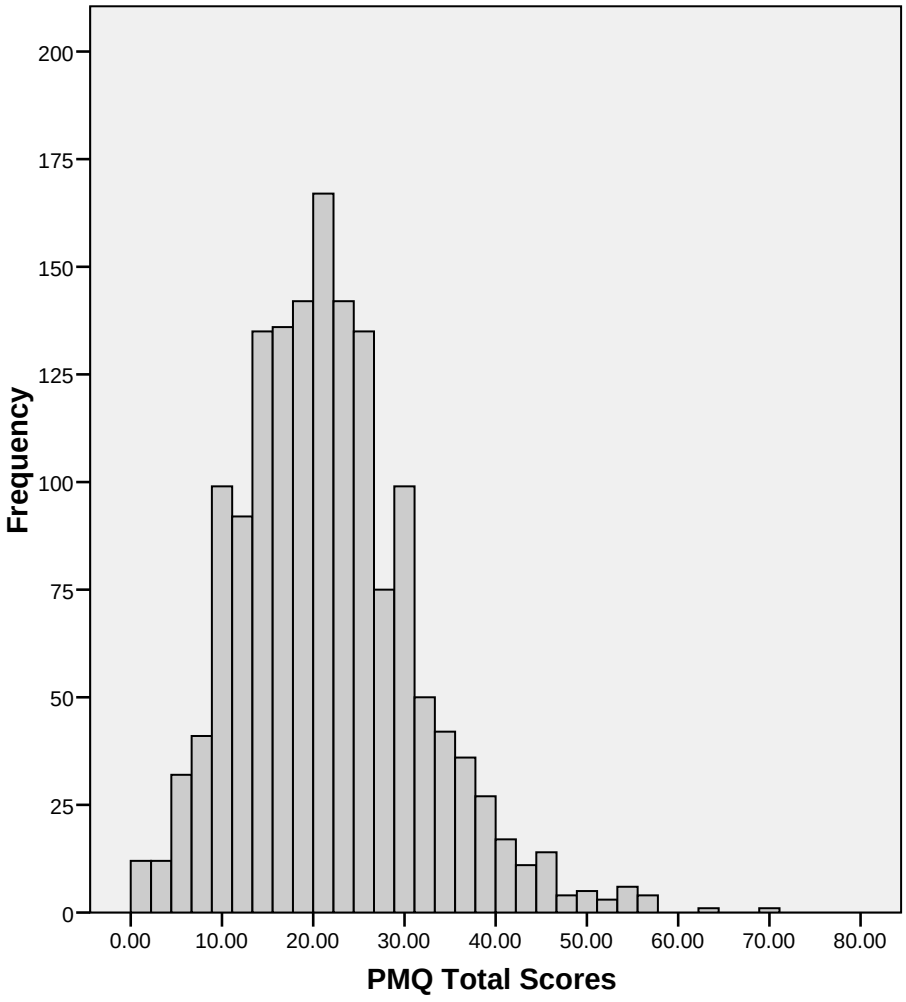


FIGURE 2

Distribution of PRA Scores

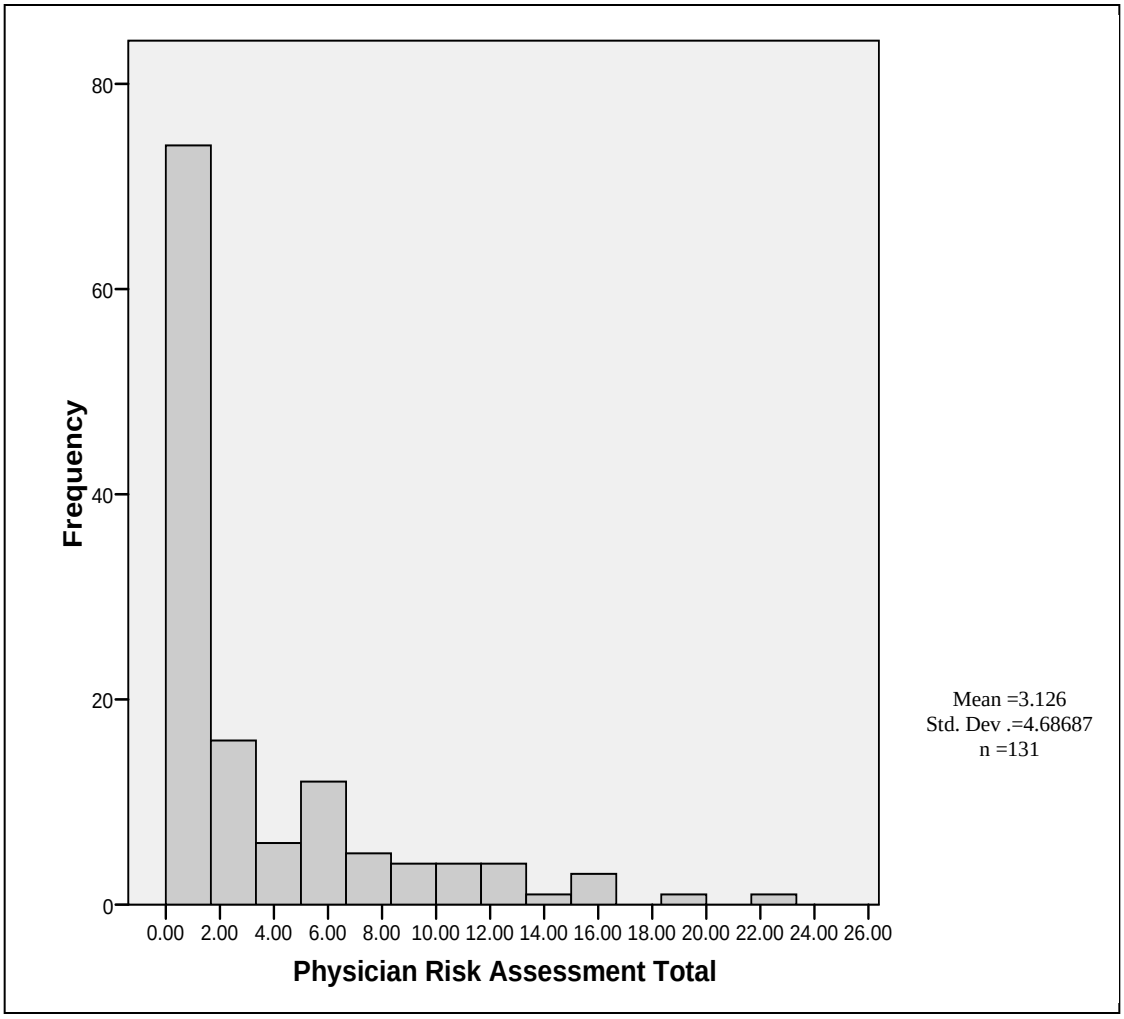
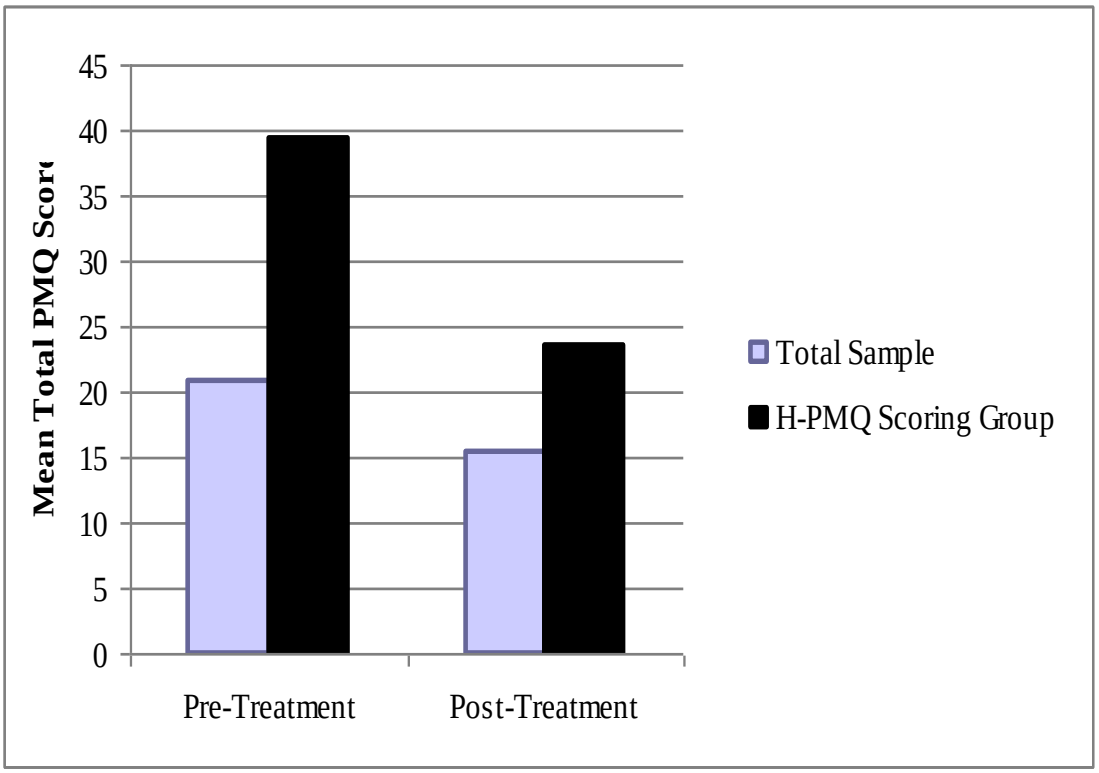


Figure 3

Pre-Treatment to Post-Treatment Change in Total PMQ Score with Total Sample and High Risk Group



APPENDIX B
Tables

Table 1. Demographic Variables for Sample Population

Variables	(*n*=1,813)
Age-Mean	51.89
Range in Years	14-98
Gender (%)	
Male	640 (35.3)
Female	1173 (64.7)
Race (%)	
Caucasian	1382 (79.4)
African American	215 (12.4)
Hispanic	102 (5.9)
Asian	19 (1.1)
Other	22 (1.2)

Table 2. Demographic Variables for PMQ Scoring Groups

Variables	L-PMQ (n=768)	M-PMQ (n=521)	H-PMQ (n=250)	Statistic	Sig.
Age- Mean (SD)	52.55(23.6)	51.11(14.67)	47.88(13.97)	$F(2, 1537)=5.41$	.005
Gender- n(%)				χ^2 (2)=1.62	.446
Male	281(18.3)	191(12.4)	92(6.0)		
Female	487(31.6)	330(21.4)	159(10.3)		
Race- n(%)				χ^2 (10)=10.37	.409
Caucasian	588(39.8)	396(26.8)	182(12.3)		
African American	87(5.9)	64(4.3)	34(2.3)		
Hispanic	40(2.7)	33(2.2)	18(1.2)		
Asian	9(0.6)	8(0.5)	0(0)		
Other	7(0.5)	5(0.3)	5(0.3)		

Table 3. Correlations between PMQ Total Score and Additional Psychological Measures

Measure (n)	Pearson's *r*	*P*
MVAS(1209)	.24**	<.01
OSW(1205)	.22**	<.01
VPA(1454)	.08**	<.01

**p<.01, two-tailed

Table 4. High Risk vs. Low Risk Scoring Groups with Indices of Opioid Misuse

Index- n	High Risk-n (%)	Low Risk-n(%)	χ^2	*df*	*p*
Early Refill Request (98****)			7.85	1	<.01**
Yes	8(30.77)	6(8.33)			
No	18(69.23)	66(91.67)			
Treatment Non-Completion(981****)			7.99	1	<.01**
Yes	50(20.75)	98(13.24)			
No	191(79.25)	642(86.76)			
History of Opioid Detox(588****)			2.74	586	<.95***
Yes	6(1.64)	6(1.64)			
No	99(27.05)	255(69.67%)			

**p*=.01, two-tailed
***p*<.01, two-tailed
****p*<.05, one-tailed
*****Differing sample sizes due to missing data

APPENDIX C
Pain Medication Questionnaire

PMQ PAIN MEDICATION QUESTIONNAIRE

NAME: _____

In order to develop the best treatment plan for you, we want to understand your thoughts, needs and experiences related to pain medication. Please read each statement below and indicate how much it applies to you by marking your response with an "X" anywhere on the line below it.

1) I believe I am receiving enough medication to relieve my pain.

Disagree | *Somewhat Disagree* | *Neutral* | *Somewhat Agree* | *Agree*

2) My doctor spends enough time talking to me about my pain medication during appointments.

Disagree | *Somewhat Disagree* | *Neutral* | *Somewhat Agree* | *Agree*

3) I believe I would feel better with a higher dosage of my pain medication.

Disagree | *Somewhat Disagree* | *Neutral* | *Somewhat Agree* | *Agree*

4) In the past, I have had some difficulty getting the medication I need from my doctor(s).

Disagree | *Somewhat Disagree* | *Neutral* | *Somewhat Agree* | *Agree*

5) I wouldn't mind quitting my current pain medication and trying a new one, if my doctor recommends it.

Disagree | *Somewhat Disagree* | *Neutral* | *Somewhat Agree* | *Agree*

6) I have clear preferences about the type of pain medication I need.

Disagree | *Somewhat Disagree* | *Neutral* | *Somewhat Agree* | *Agree*

7) Family members seem to think that I may be too dependent on my pain medication.

Disagree | *Somewhat Disagree* | *Neutral* | *Somewhat Agree* | *Agree*

8) It is important to me to try ways of managing my pain in addition to the medication *(such as relaxation, biofeedback, physical therapy, TENS unit, etc.)*

Disagree | *Somewhat Disagree* | *Neutral* | *Somewhat Agree* | *Agree*

(Please continue on the next page)

PMQ PAIN MEDICATION QUESTIONNAIRE

9) At times, I take pain medication when I feel anxious and sad, or when I need help sleeping.

Never | Occasionally | Sometimes | Often | Always

10) At times, I drink alcohol to help control my pain.

Never | Occasionally | Sometimes | Often | Always

11) My pain medication makes it hard for me to think clearly sometimes.

Never | Occasionally | Sometimes | Often | Always

12) I find it necessary to go to the emergency room to get treatment for my pain.

Never | Occasionally | Sometimes | Often | Always

13) My pain medication makes me nauseated and constipated sometimes.

Never | Occasionally | Sometimes | Often | Always

14) At times, I need to borrow pain medication from friends or family to get relief.

Never | Occasionally | Sometimes | Often | Always

15) I get pain medication from more than one doctor in order to have enough medication for my pain.

Never | Occasionally | Sometimes | Often | Always

16) At times, I think I may be too dependent on my pain medication.

Never | Occasionally | Sometimes | Often | Always

17) To help me out, family members have obtained pain medications for me from their own doctors.

Never | Occasionally | Sometimes | Often | Always

(Please continue on the next page)

PMQ PAIN MEDICATION QUESTIONNAIRE

18) At times, I need to take pain medication more often than it is prescribed in order to relieve my pain.

Never | Occasionally | Sometimes | Often | Always

19) I save any unused pain medication I have in case I need it later.

Never | Occasionally | Sometimes | Often | Always

20) I find it helpful to call my doctor or clinic to talk about how my pain medication is working.

Never | Occasionally | Sometimes | Often | Always

21) At times, I run out of pain medication early and have to call my doctor for refills.

Never | Occasionally | Sometimes | Often | Always

22) I find it useful to take additional medications *(such as sedatives)* to help my pain medication work better.

Never | Occasionally | Sometimes | Often | Always

23) How many painful conditions *(injured body parts or illnesses)* do you have?

1 painful conditions | 2 painful conditions | 3 painful conditions | 4 painful conditions | 5+ painful conditions

24) How many times in the past year have you asked your doctor to increase your prescribed dosage of pain medication in order to get relief?

Never | 1 time | 2 times | 3 times | 4+ times

25) How many times in the past year have you run out of pain medication early and had to request an early refill?

Never | 1 time | 2 times | 3 times | 4+ times

26) How many times in the past year have you accidentally misplaced your prescription for pain medication and had to ask for another?

Never | 1 time | 2 times | 3 times | 4+ times

(Stop)

APPENDIX D
Materials

OSWESTRY

NAME:_____ **DATE:**_____

How long have you had your pain? _____ **Years** _____ **Months** _____**Weeks**

Please read: This questionnaire has been designed to give the doctor information as to how your pain has affected your ability to manage in everyday life. Please answer every section, and mark in each section only the ***one box*** which applies to you. We realize you may consider that two of the statements in any one section relate to you, but please just *mark the* ***one box*** *which most closely describes your problem.*

Section 1 - Pain Intensity

- ❑ I can tolerate the pain I have without having to use pain killers.
- ❑ The pain is bad, but I manage without taking pain killers.
- ❑ Pain killers give complete relief from pain.
- ❑ Pain killers give moderate relief from pain.
- ❑ Pain killers give very little relief from pain
- ❑ Pain killers have no effect on the pain and I do not use them.

Section 2 - Personal Care (Washing, Dressing, etc)

- ❑ I can look after myself normally without causing extra pain.
- ❑ I can look after myself normally, but it causes extra pain.
- ❑ It is painful to look after myself and I am slow and careful.
- ❑ I need some help, but manage most of my personal care.
- ❑ I need help every day in most aspects of self care.
- ❑ I do not get dressed, wash with difficulty and stay in bed.

Section 3 - Lifting

- ❑ I can lift heavy weights without extra pain.
- ❑ I can lift heavy weights, but it gives extra pain.
- ❑ Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently positioned, e.g., on a table.
- ❑ Pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned.
- ❑ I can lift only very light weights.
- ❑ I cannot lift or carry anything at all.

Section 4 - Walking

- ❑ Pain does not prevent me from walking any distance.
- ❑ Pain prevents me walking more than a mile.
- ❑ Pain prevents me walking more than 1/2 mile.
- ❑ Pain prevents me walking more than 1/4 mile
- ❑ I can only walk using a stick or crutches.
- ❑ I am in bed most of the time and have to crawl to the toilet.

Section 5 - Sitting

- ❑ I can sit in any chair as long as I like.
- ❑ I can only sit in my favorite chair as long as I like.
- ❑ Pain prevents me sitting more than 1 hour.
- ❑ Pain prevents me from sitting more than 1/2 hour.
- ❑ Pain prevents me from sitting more than 10 minutes.
- ❑ Pain prevents me from sitting at all.

Section 6 - Standing

- ❑ I can stand as long as I want without extra pain.
- ❑ I can stand as long as I want, but it gives me extra pain.
- ❑ Pain prevents me from standing for more than 1 hour.
- ❑ Pain prevents me from standing for more than 30 minutes.
- ❑ Pain prevents me from standing for more than 10 minutes.
- ❑ Pain prevents me from standing at all.

Section 7 - Sleeping

- ❑ Pain does not prevent me from sleeping well.
- ❑ I can sleep well only by using tablets.
- ❑ Even when I take tablets, I have less than 6 hours sleep.
- ❑ Even when I take tablets, I have less than 4 hours sleep.
- ❑ Even when I take tablets, I have less than 2 hours sleep.
- ❑ Pain prevents me from sleeping at all.

Section 8 - Sex Life

- ❑ My sex life is normal and causes no extra pain.
- ❑ My sex life is normal, but causes some extra pain.
- ❑ My sex life is nearly normal, but is very painful.
- ❑ My sex life is severely restricted by pain.
- ❑ My sex life is nearly absent because of pain.
- ❑ Pain prevents any sex life at all.

Section 9 - Social Life

- ❑ My social life is normal and gives me no extra pain.
- ❑ My social life is normal, but increases the degree of pain.
- ❑ Pain has no significant effect on my social life apart from limiting my more energetic interests (e.g., dancing).
- ❑ Pain has restricted my social life and I do not go out as often.
- ❑ Pain has restricted my social life to my home.
- ❑ I have no social life because of pain.

Section 10 - Traveling

- ❑ I can travel anywhere without extra pain.
- ❑ I can travel anywhere, but it gives me extra pain.
- ❑ Pain is bad, but I manage journeys over 2 hours.
- ❑ Pain restricts me to journeys of less than 1 hour.
- ❑ Pain restricts me to short necessary journeys under 30 minutes.
- ❑ Pain prevents me from traveling except to the doctor or hospital.

COMMENT:_____

_____

THE UNIVERSITY OF TEXAS
SOUTHWESTERN MEDICAL CENTER
AT DALLAS

The Eugene McDermott Center for Pain Management
5323 Harry Hines Blvd. • Dallas, TX 75390-9189 • 214-645-8450 Fax 214-645-8451
Physical Address: 6263 Harry Hines Boulevard

Confidential Pain Questionnaire

Please take the time to fill out this medical questionnaire at the request of your treating physician. Having all of the background information will facilitate your visit here, enabling the physicians to focus on your principal concerns.

Name: _____ Today's Date: _____

Address: _____ Telephone # _____

E-Mail: _____ Cell Phone #_____

Additional contact #1: Name: _____ Relationship: _____ Tel: _____

Additional contact #2: Name: _____ Relationship: _____ Tel: _____

Additional contact #3: Name: _____ Relationship: _____ Tel: _____

Date of birth: _____ **Age:** _____ **Gender:** Male Female

Race: Caucasian African-American Hispanic Asian Other _____

Time Since First Onset of Pain (Approximate Date): _____

Any pending litigation associated with the pain? (Circle one)
Workers Compensation Personal Injury Other None

Are you receiving disability payments? (Circle one) **YES** **NO**

SOCIAL HISTORY

Marital Status: (Circle one)
Single _____ Married _____ Widowed _____ Divorced/Separated _____ Living with Significant Other _____

Number of children: _____

Do you smoke? (Circle one) **YES** **NO**

If yes, how many packs in a day? _____ How long have you smoked?_____years

If a former smoker, how long ago did you quit? _____

Do you drink alcohol? (Circle one) **YES** **NO** If yes, how much in an average day, week, or month? _____

Do you have a history of alcohol or drug abuse? (Circle one) **YES** **NO**

Have you ever felt the need to cut down on your drinking or drug use? (Circle one) **YES** **NO**

Have people annoyed you by criticizing your drinking or drug use? (Circle one) **YES** **NO**

Have you ever felt bad or guilty about your drinking or drug use? (Circle one) **YES** **NO**

Have you ever needed an eye opener the first thing in the morning to steady your nerves? (Circle one) **YES** **NO**

TURN OVER and COMPLETE BACK

Patient Name: _____

PAST MEDICAL TREATMENTS FOR PAIN (Circle as many as apply and list approximate month and year they were administered. If you are uncertain, please have your physician help you complete this):

Bedrest _____	NSAIDS _____	Ilioinguinal Nerve Block _____
Chiropractic _____	Opiates _____	Facet Joint Injection _____
Acupuncture _____	Physical therapy _____	Trigger point injection _____
Muscle stimulator _____	Muscle relaxants _____	Stellate Ganglion Block _____
Braces _____	Antidepressant drug __	Bier's Block _____
Splints _____	Antianxiety drug _____	Cervical Epidural Steriod Injection _____
Traction _____	Benzodiazipines _____	Somatic Nerve Block _____
TENS _____	Anticonvulsants _____	Lumbar Epidural Steroid Injections _____
Spinal Cord Implant _____	Psychotherapy _____	Other (Specify) _____

Number of healthcare visits during the last six months for your pain condition?: _____

Number of Emergency Room visits during the last six months for your pain condition?: _____

PAST SURGICAL TREATMENT FOR PAIN (Include date):

_____ _____

_____ _____

PAST PAIN DIAGNOSES (Include approximate date):

_____ _____ _____

_____ _____ _____

PAST MEDICAL HISTORY (Circle as many as apply):

high blood pressure	kidney problems
diabetes	arthritis
ulcers	gout
heart problems	stroke
epilepsy	sexual difficulties
thyroid	cancer
bleeding or bruising	other: _____
liver problems (hepatitis)	

PAST SURGICAL PROCEDURES FOR THESE MEDICAL CONDITIONS (Include approximate date):

_____ _____

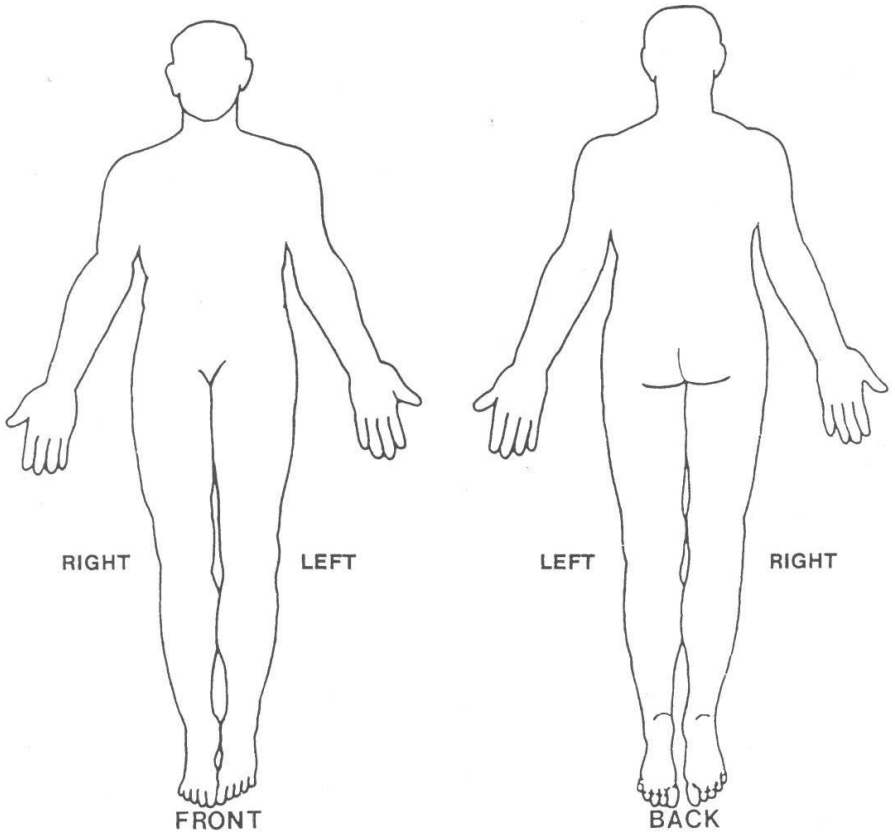
_____ _____

Name: _____ Date: _____

PAIN DRAWING GRID ASSESSMENT

Draw the location of your pain on the body outlines and mark whether it is all back/neck or all arm/leg.

ALL BACK/NECK — ALL ARM/LEG



How bad is your pain?

NO PAIN — WORST POSSIBLE

PAIN DISABILITY QUESTIONNAIRE

NAME:_____

DATE:_____

Sticker

Please read:

This survey asks for your views about how your pain now affects how you function in everyday activities. This information will help you and your doctor know how you feel and how well you are able to do your daily tasks at this time.

Please answer every question by making an "X" along the line to show how much your pain problem has affected you (from having no problems at all to having the most severe problems you can imagine).

BE SURE TO ANSWER ALL QUESTIONS.

1) Does your pain interfere with your normal work inside and outside the home?

Work normally — Unable to work at all

2) Does your pain interfere with personal care (such as washing, dressing, etc.)?

Take care of myself completely — Need help with all my personal care

3) Does your pain interfere with your traveling?

Travel anywhere I like — Only travel to see doctors

4) Does your pain affect your ability to sit or stand?

No problems — Cannot sit/stand at all

5) Does your pain affect your ability to lift overhead, grasp objects, or reach for things?

No problems — Cannot do at all

6) Does your pain affect your ability to lift objects off the floor, bend, stoop, or squat?

No problems — Cannot do at all

7) Does your pain affect your ability to walk or run?

No problems — Cannot walk/run at all

TURN OVER and COMPLETE BACK

8) Has your income declined since your pain began?

No decline — Lost all income

9) Do you have to take pain medication every day to control your pain?

No medication needed — On pain medication throughout the day

10) Does your pain force you to see doctors much more often than before your pain began?

Never see doctors — See doctors weekly

11) Does your pain interfere with your ability to see the people who are important to you as much as you would like?

No problem — Never see them

12) Does your pain interfere with recreational activities and hobbies that are important to you?

No interference — Total interference

13) Do you need the help of your family and friends to complete everyday tasks (including both work outside the home and housework) because of your pain?

Never need help — Need help all the time

14) Do you now feel more depressed, tense, or anxious than before your pain began?

No depression/tension — Severe depression/tension

15) Are there emotional problems caused by your pain that interfere with your family, social, or work activities?

No problems — Severe problems

Anagnostis, C., Gatchel, R.J., Mayer, T.G. (2004). *Spine, 29(20)*, 2290-2302.

Date: _____ Name: _____
MR #: _____

DISCHARGE

PHYSICIAN ASSESSMENT: Patient Opioid Use and Risk for Abuse

Physician: Lou Subramanian Day Vakharia Polatin

Current Opioid Usage

Opioid Analgesics	**Mgs per Day** (e.g. 50mg BID)
fentanyl	_____
methadone	_____
morphine	_____
oxycodone	_____
pentazocine	_____
propoxyphene hydrochloride	_____
hydrocodone/acetaminophen	_____
propoxyphene/acetaminophen	_____
codeine/acetaminophen	_____
hydromorphone	_____
other (_____)	_____

NONE

Risk Factors of Opioid Misuse

1. Does this patient's history suggest misuse of medication or another substance?

|_____|_____|_____|_____|

No apparent misuse *Possible misuse* *Obvious misuse*

2. Does this patient appear to have a history of compliance with treatment?

|_____|_____|_____|_____|

Apparently compliant *Partially Compliant* *Frequently non-compliant*

3. Does this patient appear to be exaggerating his/her level of pain, relative to his/her diagnosis?

|_____|_____|_____|_____|

No apparent exaggeration *Possible exaggeration* *Obvious exaggeration*

4. Does this patient show excessive concern with getting or increasing medication?

|_____|_____|_____|_____|

Shows appropriate concern *Shows some excessive concern* *Shows extreme concern*

5. To what degree do this patient's side effects (e.g., level of sedation, mental confusion) suggest that he/she is taking more than prescribed?

|_____|_____|_____|_____|

Not at all *Somewhat* *Obviously*

6. What is your current overall estimation of this patient's risk for opioid misuse?

|_____|_____|_____|_____|

No apparent risk *Moderate risk* *Substantial risk*

Do you believe this patient has demonstrated problematic usage of his/her pain medication during the course of treatment?	**Yes**	**No**

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