AN EVALUATION OF THE PREDICTIVE VALIDITY OF THE PAIN MEDICATION QUESTIONNAIRE WITH A HETEROGENEOUS GROUP OF CHRONIC PAIN PATIENTS

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To my family and friends,
who have provided me with love and support
throughout the years

AN EVALUATION OF THE PREDICTIVE VALIDITY OF THE PAIN MEDICATION QUESTIONNAIRE WITH A HETEROGENEOUS GROUP OF CHRONIC PAIN PATIENTS

by

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AN EVALUATION OF THE PREDICTIVE VALIDITY OF THE PAIN MEDICATION QUESTIONNAIRE WITH A HETEROGENEOUS GROUP OF CHRONIC PAIN PATIENTS

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The Pain Medication Questionnaire (PMQ) was initially developed by Adams and colleagues (2004) as a 26-item self-report assessment to screen for opioid medication misuse. The PMQ has demonstrated good reliability and validity, and was predictive of early termination from treatment and identified patients who demonstrated maximal benefit from interdisciplinary treatment (Holmes et al., 2006). This current study explored whether or not the initial PMQ score would accurately predict the development of aberrant opioid medication use behaviors relative to specific behavioral indices (i.e., request for early refills, use of a medication agreement) and a physician rating of medication misuse behaviors.

Patients fell into two groups according to their initial score on the PMQ based on the median score of 25. Patients with higher PMQ (H-PMQ) scores reported greater levels of perceived disability and decreased physical and mental functioning. Total scores from the PMQ were moderately correlated with initial measures of physical and psychosocial functioning, and observed problematic medication use behaviors observed by physicians during evaluation. However, higher PMQ scores did not significantly predict the use of a medication agreement or requests for early refills. Five patients were identified from the H-PMQ group that demonstrated problematic opioid medication use that fell outside of the realm of early refill requests. These included utilizing leftover pain medications, taking narcotic medication prescribed to a family member, prescription forgery, and referral for detoxification. Although these patients varied on demographic variables, they each had a PMQ total score greater than 30. Indicating that although a PMQ total score ≥ 25 is indicative of problematic use, a score ≥ 30 suggests that a patient should be closely monitored when prescribed and opioid medication. Overall, this study demonstrated that a patient's self-report is significantly correlated with problematic behaviors observed by physicians. Therefore, when utilized in a busy clinic setting, the PMQ will aide in the identification of specific problematic behaviors and beliefs at the outset of treatment that may hinder successful treatment of a patient's pain condition.

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95% CI – 95 % Confidence Intervals

ANOVA – Analysis of Variance

ASAM – American Society of Addiction Medicine

CAGE – *C*ut down, *A*nnoyed, *G*uilty, *E*ye-opener

DPQ – Dallas Pain Questionnaire

DSM-IV – Diagnostic and Statistical Manual of Mental Disorders -4th Edition

DSM-IV-TR - Diagnostic and Statistical Manual of Mental Disorders -4th Ed-Text Revision

EtOh – Alcohol

H-PMQ – High Scoring PMQ Group (PMQ Total Score ≥ 25)

HR-PMQ – Higher Scoring PMQ Group (PMQ Total Score ≥ 30)

Hx – History

IASP – International Association for the Study of Pain

Idis-tx – Interdisciplinary Treatment Group

IPTA – Intractable Pain Treatment Act

JCAHO – Joint Commission on Accreditation of Health Care Organizations

L-PMQ – Low Scoring PMQ Group (PMQ Total Score < 25)

LR-PMQ — Lower Scoring PMQ Group (PMQ Total Score < 30)

M – Mean

MCS – Mental Component Scale SF-36

Med-tx – Medical Treatment Group

N – Sample Total Size

n – Subgroup Total Size

NSAIDS – Non-steroidal Anti-Inflammatory Drugs

OR – Odds Ratio

OSW – Oswestry Disability Index

Other-tx – Other Treatment Group

Pain Center – The Eugene McDermott Center for Pain Management at The University of Texas Southwestern Medical Center at Dallas

PC – PMQ Completer

PCS – Physical Component Scale of the SF-36

PDUQ – Prescription Drug Use Questionnaire

PMQ – Pain Medication Questionnaire

PNC – PMQ Non-Completer

PRA – Physician Risk Assessment

SD – Standard Deviation

SF-36 – Short Form of the Health Status Questionnaire 2.0

SOAPP – Screener and Opioid Assessment for Patients with Pain

VAS – Visual Analogue Scale

CHAPTER ONE
Introduction

Pain, due to its subjective nature, is often difficult to treat. In the past, a commonly held view of pain is that it was something to be endured (Brookoff, 2000a). However, the Joint Commission on Accreditation of Health-Care Organizations has recognized pain as the fifth vital sign and, as such, it is to be documented as to duration, intensity, and location during each visit (as cited in Gatchel, 2001). The treatment of chronic pain is varied and includes the use of non-steroidal anti-inflammatory drugs (NSAIDs), opioid medications, education awareness of his or her condition, psychotherapy, behavioral medicine, acupuncture, physical therapy or various other treatments. The use of opioid medications to control malignant pain or cancer pain is widely accepted. However, the use of opioid medications to treat chronic nonmalignant pain remains controversial (Bannwarth, 1999; Portenoy, 1996). Much of the controversy surrounding the use of opioid medications to treat chronic nonmalignant pain is due to the known abuse liability of opioid medication and the related state regulations. Many physicians and patients have fear surrounding the use of opioid medication as a treatment option for pain. Unfortunately, this has led to the under-treatment of legitimate pain in some patients (Savage, 1996).

Addiction, like pain, is chronic and relapsing (Savage, 1993). Research pertaining to opioid addiction and misuse has been obfuscated by the lack of clear definition of related terms such as dependence and tolerance. Physical dependence is included in the definition of addiction; however, due to the nature of opioid medication physical dependence develops after a short time of using opioids. The American Society for Addiction Medicine (ASAM)

criteria specify that physical dependence is expected, as well as tolerance, and define addiction related to opioids by a persistent pattern of opioid use that involves loss of control over the use, preoccupation with obtaining opioids despite adequate analgesia, and the continued experience of adverse consequences associated with the use of opioids (as cited in Compton, Darakjian, & Miotto, 1998).

Physicians are currently faced with the challenge of assessing and treating pain adequately while maintaining vigilance against addiction to medications. In order to facilitate this process, it is necessary to have measures that will allow a physician to identify patients who may be good candidates for opioid therapies, and those who might potentially misuse prescribed opioid medication (Gatchel, 2001). The Pain Medication Questionnaire (PMQ; Adams et al., 2004) was developed as a 26-item, self-report screening instrument to assist physicians in identifying patients who may develop problematic opioid medication use. This instrument has been proven to be psychometrically sound (Adams et al., 2004). A follow-up study indicated that the PMQ is a sound predictor of treatment completion and overall benefit from participation in an interdisciplinary treatment setting. Patients with higher overall PMQ scores were less likely than their lower scoring counterparts to complete treatment; however, those who did derived a significantly greater benefit from interdisciplinary treatment. The current study aimed to establish the predictive validity of the PMQ in terms of predicting aberrant opioid use among patients experiencing pain.

CHAPTER TWO
Review of the Literature

Chronic pain constitutes a major health concern each year, as it is the primary reason people seek medical help from physicians (Weaver & Schnoll, 2002). It is estimated that one-third of the U.S. population will experience chronic pain at some point in their life (Brookoff, 2000a). Affecting upwards of 50 million people, chronic pain is the most common cause of long-term disability (Brookoff, 2000a). As a result, chronic pain costs society billions of dollars each year in health care utilization, lost work hours and disability (Gatchel, 2001). Pain, as defined by the International Association for the Study of Pain (IASP), is "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage" (IASP, 2005). In general, pain serves as a warning, indicating the threat of or actual tissue damage in the body (Schnoll & Weaver, 2003). Persistent stimulation of the pain pathway leads to physiological changes in the neural pathway resulting in hypersensitivity to stimuli.

Pain that persists for greater than three months is defined as chronic pain (Bannwarth, 1999). A case of chronic pain can be mystifying because the underlying pathology causing the pain is sometimes poorly defined or unidentifiable, which can be frustrating to patients and physicians, as it indicates an essential body system is under stress. Overall, chronic pain is a destructive illness that manifests in physical and psychological symptoms (e.g., psychomotor impairment, depression), as well as behavioral consequences for the individual (Brookoff, 2000a).

Theories of Pain

Throughout history, there have been many models of pain proposed. Descartes first described pain as sensory signals originating from the stimulus that travel up the spinal pathway and into a pain center in the brain (Melzack, 1993). Descartes proposed that psychological manifestation of pain directly correlated to physical injury. The biomedical model of pain follows this closely as it postulates that pain reports are a direct result of physical pathology. This model does not account for pain in the absence of pathology (Turk, 1999).

In 1959, George Engel proposed the idea of psychogenic pain and the pain-prone patient (Mikail, Henderson, & Tasca, 1994). Engel theorized that pain stemmed from memories formed during childhood. Various stressors introduced later in life could reactivate these memories, causing pain that was greater than underlying pathology or in the absence of any identifiable pathology. In addition, Engel proposed that certain personality factors could influence a patient's perception of pain. An individual's "psychic signature" reflects the personal meaning attached to suffering. In contrast, the "peripheral" signature of pain is that which is in concordance with the proposal of the physician (Grezesiak, Ury, & Dworkin, 1996).

Melzack and Wall (1965) proposed the *Gate Control Theory of Pain.* Specifically, this model proposes that pain is the product of afferent stimuli, efferent modulation, environmental influence, emotional reactions, and cognitions associated with the pain (Bradley, 1996). Melzack and Wall (1965) postulated that there is a mechanism in the

nervous system that activates selective brain processes that control sensory input. Furthermore, the activities of the central nervous system that correspond to attention, emotion and memories of prior experience can also modulate sensory input and regulate the perception of pain. Research has shown that depression, anxiety, psychological trauma and physical conditioning affect pain perception (Savage, 1999). Related to the gate control theory of pain is the biopsychosocial model of pain that proposes that psychosocial and physical factors must be assessed, as well as a physical history, in order to determine the most efficacious treatment available (Gatchel, 2001). Further, Turk (1999) noted that it is important to remember that each patient who enters treatment comes with a host of different attitudes, beliefs, expectations and coping resources that will affect treatment and outcomes.

Treatment of Pain

Recent history, suggests that the predominating view of pain has been that it is a part of life that should just be endured (Brookoff, 2000b). Pain, in general, is often difficult to treat due to its subjective nature. Currently, there are no commonly agreed upon concrete objective measures to quantify a patient's pain. The only viable way to assess pain is through patient communications and observable pain behaviors, such as the verbalization of pain, abstention from certain painful activities, or changes in physical functioning that correspond with reported pain (Turk, 1999).

However, the Joint Commission on Accreditation of Health Care Organizations (JCAHO) now requires physicians to assess pain as the "fifth" vital sign. Patients are asked to rate their pain on a scale from one to ten, with one being the absence of pain and ten being

absolutely intolerable pain. In addition, upon initial assessment, physicians are to document the patient's description of the pain, location, duration, intensity, contributing factors to pain aggravation, strategies utilized to minimize pain, current treatment and effectiveness, as well as the patient's goal for pain management. The American Pain Foundation has created the "Pain Patient's Bill of Rights" to inform patients of the new guidelines for physicians to document regarding pain (as cited in Gatchel, 2001)

Treatment of chronic pain varies. Patients and physicians can utilize non-steroidal anti-inflammatory drugs (NSAIDs), opioid medications, education awareness of his or her condition, psychotherapy, behavioral medicine, acupuncture, physical therapy or various other treatments. The use of opioid medications to control malignant pain or cancer pain is widely accepted. However, the use of opioid medications to treat chronic nonmalignant pain remains controversial (Bannwarth, 1999; Portenoy, Foley, & Inturrisi, 1990). Currently, 90% of all opioids prescribed by physicians are for chronic non-cancer pain. The goal of utilizing opioid medications is to minimize pain experienced by patients and reduce suffering. Fins (1997) defined suffering as the meaning attached to the physical pain. Fins (1997)also postulated that Americans tend to live with suffering out of a fear of discovering the underlying cause of pain.

While acceptance for the use of opioid medications in the treatment of chronic nonmalignant pain is growing, their use has been controversial in the past. This is due to the known addictive qualities of opioids (Bannwarth, 1999). Estimates of addiction to opioid medications in the chronic pain population range between 3% and 16%, though the exact prevalence of opioid addiction among chronic pain patients is hard to establish due to the

variability in patient samples and differing definitions of addiction (Miotto, Compton, Ling, & Conolly, 1996). Research has found rates for addictive disorders in the general population to be between 3% and 26% (Savage, 2002). In patients with chronic pain, rates of alcoholism and other addictive diseases are similar to those of the general population. A history of substance abuse appears to be a contributing factor to the development of addiction to opioid medication (Nedeljkovic, Wasan, & Jamison, 2002).

Legislation and Regulation of Opioid Medication

Although opioids have been used to treat a variety of ailments throughout history, the addictive nature of opium has led to governmental regulations to monitor the use of opioid medication. Opium, an extract of the poppy plant, has been used to treat pain for thousands of years. Morphine, the gold standard of treating pain, was widely used during the 1800s to treat pain, anxiety, respiratory problems, and other ailments of the human condition (Dews & Mekhail, 2004). However, there is a known history of abuse for opioids as well. In 1914, the Harrison Act was passed in an attempt to control the commercial preparation and distribution of opium (Dews & Mekhail, 2004). Physicians were allowed to prescribe opioid medications to treat medical conditions, but not addiction. In 1970, Congress passed the Controlled Substance Act, which classifies substances based on their addictive potential (Gilson & Joranson, 2002). Opioids were included due to their abuse liability. There are six schedules of drugs: Schedule I includes drugs with a high abuse potential with no medical use, such as heroin and marijuana; Schedule II drugs include opium, morphine, and cocaine; Schedule III includes codeine; Schedule IV drugs include diazepam; Schedule V are drugs with small

amounts of codeine; and Schedule VI are drugs with low abuse potential (Dews & Mekhail, 2004). Abuse potential of a drug is measured by the extent to which the drug results in physical and/or psychological dependence (Clark & Sees, 1993). Federal law does not prohibit a physician from prescribing controlled substances in Schedules II-IV for legitimate causes, but requires a special license to prescribe controlled substances to patients in order to therapeutically maintain an addictive disorder (Dews & Mekhail, 2004). Federal policies regarding opioid medications are intended to control the abuse and diversion of these medicines while still allowing physicians to prescribe the drugs as they deem necessary (Gilson & Joranson, 2002).

State regulations, on the other hand, play a major role in controlling the practices of physicians, pharmacists, and nurses through controlled-substances laws and medical practice guidelines. These state regulations can further impede physicians prescribing opioids to a greater extent than federal regulations. To address the need for adequate pain treatment, some states have enacted Intractable Pain Treatment Acts (IPTA), which allow for legal recognition of using opioid medication legitimately to treat intractable pain and protect physicians from discipline for utilizing opioid medications for this purpose (Gilson & Joranson, 2002). Intractable pain is defined as pain that cannot be removed or treated through generally accepted medical practices that offer relief or cure, or if no cause of pain can be found after reasonable efforts (Clark & Sees, 1993). Ironically, IPTAs sometimes block physicians from providing adequate pain relief with opioids. In Texas and California, physicians are not protected by IPTAs under several circumstances, including prescribing opioid medication for nontherapeutic use; failing to keep complete accurate records of opioid

related practices; writing false prescriptions; or prescribing controlled substances in a manner inconsistent with the safety and welfare of the general public (Clark & Sees, 1993).

Consequences of Regulation

Due to the known abuse liability of opioid medication and the related state regulations, many physicians and patients have fear surrounding the use of opioid medication as a treatment option for pain. Unfortunately, this has led to the under-treatment of legitimate pain in some patients (Savage, 1996). In fact, patient-initiated litigation for causing addiction in patients has compounded the fears physicians have for prescribing opioid medication (Gatchel, 2001). *Opiophobia* is the term that has been applied to the practice of under-prescription of opioid medication due to the fear of inducing addiction in patients (Collett, 1998). Although evidence that iatrogenic addiction to prescribed opioids is low, some physicians still remain reluctant to prescribe opioid medication for chronic nonmalignant pain (Weinstein et al., 2000).

Studies have shown that the use of opioid medication to treat chronic nonmalignant pain is efficacious (Antoin & Beasley, 2004; Brookoff, 2000b; Zenz, Strumpf, & Tryba, 1992). When adequate pain relief is provided, patients often show an increase in functioning because pain no longer restrains or stops activities. When pain relief is provided to a patient, it also helps to relieve suffering related to sadness about the loss of opportunities and guilt for holding others back due to their pain (Brookoff, 2000b). However, some studies suggest that opioid medication should be utilized as a last resort to treat patients in pain due to the addictive qualities of opioids (Antoin & Beasley, 2004; Brookoff, 2000b). In addition, the

risks and benefits of opioid use must be discussed to ensure that patients make informed decisions about this course of treatment.

Potential risks of opioid use in the management of chronic pain are impairment in functioning due to the effects of the opioids, physical dependence on the opioid, and certain hormone and immunological effects of opioids (Brookoff, 2000b). Excessive medication intake can impair a patient's social and/or vocational functioning, as well as cognitive functioning. There may also be a decrease in activities and increased depression. If a patient is dependent on opioid medication, it may become hard to distinguish between pain and the physical need for the drug when withdrawal starts to occur (Turner, Calsyn, Fordyce, & Ready, 1982). Additionally, Turner et al. (1982) found that patients who use narcotic and sedative medications spent more time resting as compared to patients who did not use either narcotics or sedatives.

Use of opioid medication is often accompanied by social, medical, and legal stigmata (Fishman & Teichera, 2003). Labeling a patient as having problematic medication use patterns as an "addict" can create psychological consequences for the patient, as well as legal ramifications for a physician. The label of addict may alienate a person from sources of support and increase isolation, which may potentially, exacerbate the pain problem (Brookoff, 2000b). In Turner et al.'s (1982) study, it was found that chronic pain patients had a tendency to under-report use of opioid medication as compared to observed use of opioid medication. The explanation proposed for this finding, was that a patient might want to appear to fall within a socially acceptable realm of medication use.

Treatment Guidelines

In order to establish therapeutic use of opioid medications, the physician is required to educate the patient about opioid medications and their proper use. Antoin and Beasley (2004) suggest that following a thorough evaluation, appropriate goals should be set for treatment. If opioid therapy is a treatment option, the physician should educate the patient on the risks associated with opioid use and set forth specific instructions and expectations before an opioid is prescribed. The use of a medication agreement is an example of how a physician can communicate these instructions to a patient. Medication agreements allow a physician and patient to outline proper use of opioids. The primary goal is to use patient responsibility as a prerequisite to being prescribed opioid medications (Weaver & Schnoll, 2002). Currently, no standard medication agreement exists. Schnoll and Weaver (2003) outlined that medication agreements should clearly state the rules and expectations associated with treatment. In addition, it is useful to outline policies for providing prescriptions for opioid medication, early refills, and the consequences of violating the medication agreement. Fishman and Teichera (2003) add that medication agreements establish informed consent and could possibly offer physicians some protection in instances of medication abuse. Another important detail that might be included in a medication agreement is that only one physician may prescribe the opioids, and only one pharmacy may fill the prescriptions, in order to avoid duplicate prescriptions or multiple sources of opioid medication for the patient (Dews & Mekhail, 2004).

Despite the benefits of medication agreements, there are some complications that accompany the use of medication agreements. Some patients feel stigmatized by the need for

an agreement outlining medication use and consequences of behaviors of misuse. Medication agreements may also lull the physician into a false sense of security that the patient has been informed of medication use, side effects, and possible results and therefore may not need to be as closely monitored in medication use, as is necessary in all treatment regimens. There might also be legal ramifications for the physician if the patient feels the physician is not holding up his or her part of the agreement (Fishman & Kreis, 2002). The efficacy of medication agreements remains unproven.

Definition of Terms

Pain and addiction parallel one another in terms of the nature of the problem and complexity of issues involved. Both are chronic and relapsing, and it is often difficult to find compassionate and effective medical care (Savage, 1993). Research pertaining to opioid addiction and misuse has been obfuscated by the lack of clear definition of related terms such as dependence and tolerance. Physicians still often confuse the terms of physical dependence, tolerance and psychological dependence (Weinstein et al., 2000). Traditionally, physical dependence on the drug of use was considered a major component of substance addiction. *Dependence* is diagnosed by the presence of withdrawal symptoms (Savage, 2002). However, due to the nature of opioid medication, physical dependence results from even short-term use of opioids(Savage, 1999). At the other end of the spectrum is therapeutic dependence. For a patient who has been in pain, there may be a preoccupation with maintaining a stock of the opioid, stemming from the fear of running out of medication and

returning to a state of pain (Robinson et al., 2001). The absence of pain is a powerful reinforcer in and of itself (Turk, 1999).

Tolerance is defined as repeated exposure to a drug resulting in a decrease in effects or an increase in the needed amount of the drug in order to maintain its initial effects (Collett, 1998). Tolerance can result from ineffective amounts of medication or from the acute progression of the underlying disease process. Tolerance is an expected change when taking opioid medication due to neuroadaptation (Sees & Clark, 1993). Tolerance is caused by pharmacokinetic processes (innate metabolic properties of a drug) or pharmacodynamic processes whereby changes at the receptor level cause differing response to medications or changes in the second messenger mediated system to produce analgesic effect (Schnoll & Weaver, 2003).

Psychological dependence is defined as the taking of a drug for psychic effects often to produce euphoria. This is the term most associated with the vague term addiction (Zenz, Strumpf, & Tryba, 1992). Furthermore, psychological dependence implies that affective and cognitive factors are involved in addiction, but this view is not widely supported by the scientific literature (Savage, 2002).

Addiction has been proven to have a neurobiologic basis (Leshner, 1997; Nestler & Aghajanian, 1997). In general, *addiction* is defined as "a primary neurobiologic disorder characterized by impaired control, compulsive use, craving, and continued use despite harm. The compulsive use of the drug results in physical, psychologic, and social harm to the user" (Nedeljkovic, Wasan, & Jamison, 2002, p. S40). The hallmark of addiction is the presence of compulsion for the drug.

The Diagnostic and Statistical Manual of Mental Disorders – 4th Edition – Text Revision (DSM-IV-TR) (American Psychiatric Association, 2000) outlines a definition of substance abuse from the medical model perspective. The DSM-IV-TR(American Psychiatric Association, 2000) distinguishes substance dependence and substance abuse. *Substance abuse* is defined as a maladaptive pattern of substance use over a 12-month time period that induces significant impairment or distress in the patient. It manifests as an inability to fulfill major role obligations, recurrent substance use in physically hazardous situations, recurrent substance-related legal problems, and continued substance use despite recurrent interpersonal problems related to use. That definition is expanded in the definition of *substance dependence*: additional criteria are the presence of tolerance, withdrawal, increased amount of drug needed as well as spending a great deal of time on activities related to obtaining, using, or recovering from the effects of the substance. The complete DSM-IV-TR criteria for substance abuse and dependence are presented in Tables 1 and 2.

The criteria set forth by the DSM-IV-TR are useful in identifying problematic substance use. However, as stated before, even when taken as prescribed, most patients develop tolerance to opioid medication and show signs of withdrawal with abrupt cessation of the opioid (Savage, 1999; Sees & Clark, 1993). To address this problem specifically, the American Society of Addiction Medicine (ASAM, 2001) clearly defined addiction, physical dependence, and tolerance as related to opioid use. ASAM criteria specify that physical dependence is expected, as well as tolerance, and define addiction related to opioids by a persistent pattern of opioid use that involves loss of control over the use, preoccupation with obtaining opioids despite adequate analgesia, and the continued experience of adverse

consequences associated with the use of opioids (Compton, Darakjian, & Miotto, 1998). The complete ASAM criteria for definitions related to the use of opioid treatment for pain are presented in Table 3.

In considering these definitions, it is important to be aware of a condition known as *pseudo-addiction*. There is the chance that pain in a patient might be under-treated. In some instances this can cause patients to exhibit drug-seeking behaviors, anger, isolation, increased demand for medication, running out of medication early and increasing dosage on own (Sees & Clark, 1993). These behaviors are similar to those of a patient with an addiction. It is necessary to acknowledge that the patient's pain is real and to ensure adequate pain relief in order to relieve a patient's need to secure medications.

Behavioral Signs and Predictive Factors

Addictive disorders are diagnosed on the basis of observable behavioral signs. Several studies have identified specific criteria for appropriate use of opioid medications and what constitutes certain behavioral red flags for possible opioid misuse in chronic pain populations. Antoin and Beasley (2004) included a list of abnormal behaviors or warning signs of abuse that include, but are not limited to: lost/stolen prescriptions; unauthorized dose escalation; multiple prescribers; visits without appointments; and concurrent illicit drug use. Dews and Mekhail (2004) added that crushing sustained release preparations is a sign of possible opioid abuse. Forging prescriptions, injecting oral formulations and stealing or borrowing drugs from others are also problematic drug behaviors (Nedeljkovic, Wasan, & Jamison, 2002). A history of addiction or abuse alerts the physician to closely monitor for

potential relapse but does not indicate that a patient should not receive opioids for pain (Schnoll & Weaver, 2003). Heredity has been shown to play a role in the development of drug abuse. The presence of a biological parent who abused substances or a parent with antisocial personality tendencies increases the likelihood for substance abuse. Lower socioeconomic status is also related to increase of drug abuse, as well as some mood factors such as depression, anxiety and limited coping ability. Though numerous studies have identified biopsychosocial risk factors for opioid misuse, sufficient empirical support is lacking for a specific combination of biopsychosocial factors that cause opioid misuse in patients (Robinson et al., 2001).

Assessment of Misuse

Currently, physicians are faced with the challenge of assessing and treating pain adequately while maintaining vigilance against addiction to medications. In order to facilitate this process, it is necessary to have measures that will allow a physician to identify patients who may be good candidates for opioid therapies, and those who might potentially misuse prescribed opioid medication (Gatchel, 2001). Assessment of risk factors for opioid misuse is needed to the same extent a physician would screen for risk factors for other disorders (Nedeljkovic, Wasan, & Jamison, 2002).

Several studies enumerate behavioral signs of abuse and addiction (Compton, Darakjian, & Miotto, 1998; Michna et al., 2004; Miotto, Compton, Ling, & Conolly, 1996). Many past instruments have focused on alcohol abuse or abuse of illicit drugs. Examples of these are the CAGE (*C*ut down, *A*nnoyed, *G*uilty, *E*ye-opener; Ewing, 1984; Mayfield,

McLeod, & Hall, 1974), Michigan Abuse Screening Test (Selzer, 1971), Drug Abuse Screen Test (Skinner & Allen, 1982) and the Addiction Severity Index (McLellan, Luborsky, Woody, & O'Brien, 1980). A history of substance abuse can be an indicating factor for future misuse of opioid medication (Nedeljkovic, Wasan, & Jamison, 2002). The CAGE (Ewing, 1984) is the most widely used instrument to assess for this. The Structured Clinical Interview for the Diagnostic and Statistical Manual –IV (First, Spitzer, Gibbon, & Williams, 1994) is a semi-structured interview that assigns lifetime diagnoses according to the DSM-IV (American Psychiatric Association, 1994). The nature of the interview allows for tailoring to assess various areas more in depth (Nedeljkovic, Wasan, & Jamison, 2002).

In order to meet the need for a short assessment tool, Chabal, Erjavec, Jacobson, Mariano and Chaney (1997) developed a checklist that when utilized by physicians, will assess for aberrant drug use in patients. The checklist contains five items. If a patient meets three or more criteria, they are considered to be misusing their opioid medication. The criteria are as follows (Chabal, Erjavec, Jacobson, Mariano, & Chaney, 1997, p. 151):

1. The patient displays an overwhelming focus on opiate issues during pain clinic visits that occupy a significant proportion of the pain clinic visit and impedes progress with other issues regarding the patient's pain. This behavior must persist beyond the third clinic treatment session.
2. The patient has a pattern of early refills (3 or more) or escalating drug use in the absence of an acute change in his or her medical condition.
3. The patient generates multiple calls or visits to the administrative office to request more opiates, early refills, or problems associated with the opiate prescription. A

patient may qualify with less visits if he or she creates a disturbance with the office staff.

4. There is a pattern of prescription related problems for a variety of reasons that my include lost medications, spilled medications, or stolen medications.
5. The patient has supplemental sources of opiates obtained from multiple providers, emergency rooms, or illegal sources.

A second tool , the Prescription Drug Use Questionnaire (PDUQ), is specific to assessing possible medication misuse was developed by Compton and colleagues (1998). The PDUQ is a 42-item questionnaire, administered by a trained professional during a 20-minute semi-structured interview to assess for addiction and problematic substance use in patients with chronic pain (Michna et al., 2004). The PDUQ, administered in a clinical setting, evaluates several different aspects related to medication misuse, including but not limited to: history of substance abuse, opioid use patterns, and family history of substance abuse. In a study conducted by Compton and colleagues (1998), the PDUQ was used to screen patients who were referred to a clinic based on past observed problematic or drug-seeking behaviors. The answers to the PDUQ significantly discriminated between patients who had problematic and nonproblematic medication behaviors. The PDUQ was able to identify patients with addictive disease and found three factors that were most predictive of the presence of addictive disease and these factors accurately classified 92 % of their study participants. These factors were: (1) whether or not the patient believes he or she was addicted; (2) unauthorized increases in analgesic dose/frequency; and (3) route of administration that the patient preferred (Compton, Darakjian, & Miotto, 1998).

In today's world of managed care, it is imperative that a physician utilizes appointment time wisely. To address the issue of limited time in the clinical setting, Adams and colleagues (2004) developed a brief, self-report measure of problematic drug-related behaviors -- the Pain Medication Questionnaire (PMQ). The PMQ consists of 26 self-report items. Patients answer items using a five point Likert scale (0 = "Disagree" to 4 = "Agree"). The items were developed based on a review of the literature pertaining to opioid misuse and its measurement and also upon inputs from pain management experts who had worked with many opioid misusers in clinical settings. Items do not specifically refer to "opioids" in order to reduce defensiveness and to suggest that a broad range of medication-related behaviors are being assessed. Wording of the items is neutral, largely in order to encourage more candid responses from patients. Internal consistency of the PMQ using Cronbach's alpha was found to be 0.73; within an acceptable range (Adams et al., 2004).

Butler and colleagues (2004) also developed a brief self-report assessment tool for physicians. The Screener and Opioid Assessment for Patients with Pain (SOAPP) is a 24-item self-report tool, using a five-point Likert scale (0 = "Never" to 4 = "Very Often"). This questionnaire was designed to reflect the consensus of experts in the field regarding specific patient characteristics and behaviors that could lead to problematic opioid use. Butler et al., (2004) found that a score of seven or higher accurately identified 90% of patients who were high-risk for opioid medication abuse. Due to the highly specific nature of the SOAPP for assessing patients in the chronic pain population, Butler et al., believed it may have been a better indicator of future problematic behavior than other measures used (i.e., CAGE). Although assessment tools for opioid medication misuse do exist, currently there are no

widely used brief instruments (Michna et al., 2004; Robinson et al., 2001). Newly developed tools allow physicians with relatively little training in assessing drug abuse the ability to screen for problematic behaviors (Butler, Budman, Fernandez, & Jamison, 2004).

Scope of the Present Investigation

The presence of addiction-related definitions within state laws and regulations that use physical dependence as a feature of diagnosing addiction, lead to the possibility that users of opioid medications may be incorrectly labeled an addict (Gilson & Joranson, 2002). The development of the PMQ provides a means to accurately assess risk for opioid medication misuse. The PMQ was designed to identify patients, based upon self-report, who demonstrated behaviors associated with current or potential problematic pain medication use (Adams et al., 2004). Preliminary findings indicated that the PMQ was psychometrically sound. Additionally, the PMQ total score is useful in predicting treatment completion and benefit from interdisciplinary treatment (Holmes et al., 2006). However, the ability of the PMQ to accurately predict aberrant medication use has yet to be established. Thus, the aim of the present study was to assess the predictive validity of the PMQ in relation to behavioral indices (early refill requests, use of medication agreements, and treatment compliance), as well as the physician's assessment of potential misuse for opioid medication. The PMQ does not attempt to unilaterally determine whether or not a patient will become addicted to his or her opioid medication. Instead, it is a useful instrument in order to assess the potential for opioid misuse. If identified early, it is possible that a patient and physician could consider alternative treatment modalities, or could utilize closer monitoring if opioid medications are

used to control pain. The self-report measure will assist in a busy clinic situation where each individual may be unable to be thoroughly screened utilizing physician report measures such as the PDUQ developed by Compton and colleagues (1998). A secondary goal of the study was to replicate previous findings of Adams and colleagues (2004) which indicated that patients at the highest risk for opioid misuse demonstrated greater levels of pain intensity, physical impairment, and psychosocial distress, relative to their lower risk counterparts.

In the context of the above goals, the following hypotheses for this study were proposed:

1. It was expected that patients at higher risk for opioid misuse would demonstrate greater levels of pain intensity, physical impairment and psychosocial distress, relative to their lower risk counterparts.
2. The predictive validity of the PMQ was expected to be supported, with at least moderate correlation coefficients (e.g., +/- .25-.35) between the PMQ score and the PRA score (physician report of behaviors), requests for early refills, and use of medication agreements.
3. Patients with high PMQ scores were expected to have higher scores on the PRA, increased requests for early refills, and utilize a medication agreement.

CHAPTER THREE
Methodology

Participants

Participants were a convenience sample of 388 consecutive patients who were newly evaluated for treatment at The Eugene McDermott Center for Pain Management at The University of Texas Southwestern Medical Center at Dallas (Pain Center) during the time period from January 2005 through February of 2006. Patients were included in the sample if, during the initial evaluation phase, they completed the PMQ such that a total score could be derived. Patients were excluded from the study if greater than four questions were left blank as a score could not be extrapolated. The final sample was comprised of 249 patients who met eligibility requirements. Patients were included in the study if, upon initial assessment, they had completed the PMQ such that a total score could be derived. If patients answered ≥ 23 questions then a total score could be extrapolated. For these participants the total score was divided by the total number of items included in that score and multiplied by 26 (the total number of PMQ items). A subgroup of the 249 patients (n = 57, 22.7%) had scores that were extrapolated. These patients were not statistically different on the demographic variables of gender, race, disability payment status, pending litigation, status of condition, and marital status than the 192 patients who completed the PMQ. Additionally, the patients whose scores were extrapolated were not significantly different than the patients that fully completed the PMQ for age or duration of pain. A total of 139 patients did not complete the

PMQ upon initial evaluation at the Pain Center that would allow for a total score to be calculated.

Through a series of independent samples *t*-tests and Pearson Chi-Square analyses, the PMQ completers (PC) and PMQ non-completers (PNC) were compared on the categorical variables of gender, marital status, and race, litigation status, disability payment status, and status of condition as well as on physical/functional measures of pain intensity (VAS), the Dallas Pain Questionnaire (DPQ), and the Short Form Health Survey (SF-36) physical functioning component (PCS) and mental health component (MCS) scales. As outlined in Table 4, there were no significant differences between the PC and PNC groups on any of the demographic or self-report physical/functional variables. Therefore, patients who did not complete the PMQ were not significantly different from the core sample group and it was unnecessary to include the PNC group in subsequent analyses.

Of the 249 patients who met inclusion criteria, a total of 92 patients participated in the Pain Center's interdisciplinary treatment program (Idis-tx; n = 92), which included medical, behavioral, psychiatric, and physical therapy components. The sample also included additional patients who received only medical treatment (Med-tx; n = 102) at the Pain Center or a select combination of the various components of the interdisciplinary program (Other-tx; n = 55). Patients were excluded from the interdisciplinary treatment program if the physician felt the program was inappropriate for their condition, or if there were medical or psychiatric issues that would limit their participation in the program. If excluded, the physician may have chosen to follow the patient on a medical treatment basis only, or select a combination of treatments that would provide maximal benefit to the patient, such as medical-behavioral

treatment or medical-physical therapy treatment. A Pearson's Chi-Square analysis, χ^2 (2) = .34, p = .84, indicated that the patients in the three pain treatment groups (Idis-tx, Med-tx, Other-tx) were evenly distributed between the H-PMQ and L-PMQ groups. For the three treatment groups, Pearson Chi-Square analyses were performed on the demographic variables of gender and race. A significant difference was found on the variable of race, χ^2 (8) = 15.86, p = .04. Patients in the Other-tx group were more likely to be Caucasian (96.2%) compared to the Idis-tx group (73.6%) and the Med-tx group (87.0%). Patients in the Idis-tx group were more likely to be African-American (17.6%), than the Med-tx group (7.6%) or the Other-tx group (1.9%). One-way ANOVAs were performed on measures of age, pain duration, and other relevant measures of physical functioning and opioid medication usage. There were no significant differences between groups except in age, F (2,246) = 3.49, p = .03. Follow-up Tukey HSD tests indicated that patients in the Idis-tx group were significantly younger than patients in the Med-tx group. Patients were collapsed across treatment groups into one sample for subsequent statistical analyses. These results are summarized in Tables 5 and 6.

Procedure

General Data Collection. Patients at the Pain Center were referred from outside treating physicians. Prior to the initial medical evaluation the patient received a packet of paperwork that they were asked to complete and bring to the first appointment. The packet included a consent form for medical treatment, directions to the Center, the Oswestry Disability Index (OSW; Fairbank, Couper, Davies, & O'Brien, 1980), the Dallas Pain

Questionnaire (DPQ; Lawlis, Cuencas, Selby, & McCoy, 1989) and a patient questionnaire to collect demographic information, medical background, medication usage, current pain levels and functional capacities. The PMQ (Adams et al., 2004) was also included in this packet. Not all patients completed the entire packet of questionnaires, or every question on a questionnaire leading to varied amounts of data included in the final analyses.

A physician completed the initial evaluation, made a diagnosis of the pain problem, and established the medical plan for treatment. The treatment plan included pain medication(s) and/or procedural management. In addition, the physician recommended psychiatric, behavioral and/or physical therapy evaluations, if the patient was deemed a good candidate for one or more of these services.

When the patient scheduled a behavioral medicine evaluation, he or she received a packet of related forms to fill out and return the day of the appointment. The packet included an explanation of the behavioral medicine program, a consent form for behavioral assessment and treatment, and other self-report psychological inventories (some of which were completed at the Pain Center under the administration of a Pain Center psychologist. Two Pain Center psychologists conducted the assessments and semi-structured interviews. Based on the results of the interview, testing, and the patient's needs, the psychologists developed individualized treatment plans which consisted of recommendations for behavioral interventions which included: individual cognitive-behavioral medicine therapy sessions (generally 8-10 sessions); psychoeducational pain management group; family therapy; and psychiatric medication consultation if deemed appropriate. A psychologist conducted the individual cognitive-behavioral medicine therapy sessions, utilizing relaxation training,

cognitive restructuring and biofeedback. The psychoeducational group sessions consisted of education on the biopsychosocial method of pain management, addressing the psychosocial issues related to pain, as well as teaching patients pain management coping strategies.

Physical therapy sessions consisted of individualized exercise programs and manual therapy. In addition, patients in the interdisciplinary program were discussed among Pain Center providers at regular staffing intervals (pre-, mid-, and post-treatment) in order to integrate information across the disciplines, clarify treatment objectives and to discuss any issues that occurred during the course of treatment.

Information from the initial medical evaluation and behavioral medicine packets was compiled and served as the patient's baseline level of functioning and was referred to as "pre-treatment data." After completion of one-half of planned behavioral medicine visits, patients were administered another packet of paperwork, by their psychologist, which consisted of a subset of instruments initially collected in order to assess the progress of the patient throughout the sessions. At the end of the behavioral medicine visits, the patients were given a packet of questionnaires and a subset of instruments that were completed at the final evaluation. This served as the patient's "post-treatment" data. Medication-only treatment patients were given this packet six months after pre-treatment data was collected. In team staffing, the patient's readiness for discharge was evaluated and any follow-up recommendations were identified. After each treatment interval (pre-, mid-, post-), treating physicians completed a Physician Risk Assessment (PRA) of behavioral observations regarding each patient's opioid usage and risk factors of opioid misuse. Physicians completed a PRA for the medication only patients at 6-months post initial evaluation, if the

patient was still being followed for treatment at the Pain Center. Due to the busy Pain Center setting, the amounts of data were variable across measures and for specific demographic data outside of a specific set of core demographic variables at pre-treatment. Patients who participated in the interdisciplinary program completed measures and were more closely monitored for completeness of their data, thereby ensuring a more complete data set for these patients. The amounts of data were also variable between self-report functioning measures as some patients did not complete every questionnaire, or only partially completed various measures. Specific historical data (e.g., history of drug abuse, history of alcohol abuse) are gathered during the behavioral medicine evaluation and were not available for all patients treated at the Pain Center.

Instruments and Outcome Measures

Pain Medication Questionnaire (*PMQ;* Adams et al., 2004). The PMQ is a 26-item self-report measure to assess for risk of aberrant behaviors related to opioid medication misuse in patients with a variety of pain syndromes. The items were constructed based on literature addressing opioid medication misuse and input from relevant clinical personnel. Patients respond to the questions using a Likert scale, ranging from "Disagree" to "Agree." A higher overall score is reflective of the presence of behaviors indicative of greater potential risk of opioid misuse (Adams et al., 2004).

Physician Risk Assessment Form (*PRA;* Adams et al., 2004). The PRA is a 6-item physician-rated instrument to capture the physician's assessment of patient risk for opioid misuse. The physician rates behaviors on a Likert scale ranging from "No apparent misuse"

to “Obvious misuse.” The physician also reports the type and dosage of opioid the patient was utilizing at the time of assessment. A physician completed a PRA for each patient whether or not the he or she is prescribed an opioid (Adams et al., 2004).

Behavioral Indices. Behavioral indices were obtained via patient chart review, and included: the presence of a patient medication agreement and any requests for early refills. The medication agreement defined terms of use of narcotic medication (action for lost prescriptions or early refill requests) and the responsibilities of the physician and the patient. The agreements were also used to inform patients of the risks associated with opioid medications.

Beck Depression Inventory (*BDI;* Beck, Steer, & Garbin, 1988). The Beck Depression Inventory is a 21-item self-report instrument designed to assess depressive symptomatology. It assesses behavioral signs of depression that manifest in three different domains: somatic, performance difficulty, and negative attitudes (Novy, Nelson, Berry, & Averill, 1995). Research using the BDI has established good psychometric properties, including internal consistency reliability coefficients exceeding .73 in nonpsychiatric samples. Correlations of .73 and above with the Hamilton Rating Scale for Depression suggest adequate validity (Beck, Steer, & Garbin, 1988). In this study, the BDI was administered to patients that participated in the Idis-tx program or those who completed a behavioral medicine evaluation.

CAGE (Ewing, 1984; Mayfield, McLeod, & Hall, 1974). The CAGE is comprised of four questions from a clinical interview assessment. It assesses the behaviors and experiences related to substance abuse. The name is an acronym of the four areas assessed

(Cut down, Annoyed, Guilty, and Eye Opener.) The CAGE has demonstrated good sensitivity and specificity in accurately differentiating between known abusers and non-abusers of alcohol (Beresford, Blow, Hill, Singer, & Lucey, 1990). In the present study, the CAGE was administered as a self-report instrument as part of the pre-treatment paperwork.

The Dallas Pain Questionnaire (*DPQ;* Lawlis, Cuencas, Selby, & McCoy, 1989). Developed by Lawlis and colleagues (1989), the DPQ is a 15-item self-report questionnaire that addresses the domains of pain and disability. Patients respond by indicating on a 10-cm line their level of pain associated with each domain. Scores indicate perceived levels of disability with higher scores indicating an increased level of disability.

Medical Outcomes Short Form-36 Health-Status Survey (*SF-36*; Ware, Snow, Kosinski, & Gandek, 1993). The SF-36 is a 36-item questionnaire that assesses health-related quality of life. The two standardized summary scales produced by this instrument correspond to the patients' overall sense of physical and mental well-being. It has been shown to be sensitive to change, which allows it to detect between treatment responders and nonresponders (Wittink, Turk, Carr, Sukiennik, & Rogers, 2004). It consists of eight scales and two standardized summary scales. The Mental Component Scale (MCS) and the Physical Component Scale (PCS), the two standardized summary scales, were utilized in this study (Adams et al., 2004).

Oswestry Pain Disability Questionnaire (*OSW*; Fairbank, Couper, Davies, & O'Brien, 1980). The OSW is a self-report measure comprised of 10 questions that assess limitations of various activities of daily living secondary to pain. Each item is scored on a 5-point scale.

The OSW can be used to predict work disability (Wittink, Turk, Carr, Sukiennik, & Rogers, 2004).

Visual Analogue Scale (*VAS*; Anagnostis, Mayer, Gatchel, & Proctor, 2003). This VAS was used to rate the patient's degree of pain on a scale from 0 (no pain) to 10 (worst possible pain). The VAS is a 10-cm horizontal line hashed at two-point intervals. The patient marked on the line to represent his or her current level of pain. The VAS has demonstrated good psychometric properties (Gatchel, Mayer, Capra, Diamond, & Barnett, 1986).

Confidential Pain Questionnaire (CPQ). The CPQ is a self-report form collected at pre-treatment. It is Pain Center-specific and elicited information about demographics, employment status, highest education completed, status of worker's compensation or pain related litigation, health care utilization, and medication use.

Design and Statistical Analyses

The first stage of statistical analyses involved identifying and dividing patients into two groups according to a median split: "high and low" PMQ scores. The distribution of the PMQ scores in this study were comparable to those of previous studies (Adams et al., 2004; Holmes et al., 2006). Patients who completed the PMQ were divided into two groups by a median score split determined by the total score on the PMQ. All participants falling below a PMQ total score of 25 comprised the "Low" PMQ scoring group (L-PMQ). Participants who had a PMQ total score of 25 or greater comprised the "High" PMQ scoring group (H-PMQ). Scores from these groups were compared using t-tests and chi-square analyses. Previous

studies (Adams et al., 2004; Holmes et al., 2006) have utilized a three group split by the lower-, middle-, and upper-thirds of the PMQ total scores. These studies have shown that the moderate scoring PMQ groups did not provide much differentiation to the overall results. Therefore, in order to increase the ease of utility of this instrument by other professionals, this study sought to examine the differences between two groups of patients.

During the second phase of analyses, Pearson Chi-square analyses were performed on the demographic data of the two PMQ scoring groups. Independent samples *t*-tests were performed to assess the functioning of patients (physical, functional, psychological) at pre-treatment. Pearson's correlation coefficients were derived between the total PMQ score and pre-treatment perceived physical/function and psychological functioning. Additionally, Pearson's correlation coefficients were derived between the PMQ total score and the physician assessment of potential opioid medication misuse (PRA).

Predictive Validity. In addition, chi-square analyses were used to determine a patient's status (successful or not) at the end of treatment in relation to his or her PMQ score. Successful program completion included patients who completed the program early due to good results or completed all behavioral medicine and physical therapy sessions and the treatment team agreed had progressed throughout treatment. Unsuccessful treatment completion included patients who were discharged early due to noncompliance with one or more of the relevant disciplines. Independent t-tests were performed to determine the differences between the two PMQ scoring groups at follow-up for functional/physical measures, mental functioning, and relative behavioral indices such as utilization of a medication agreement, and the presence of early refill requests. Lastly, a logistic regression

was conducted in order to determine which factors were most predictive of patients who scored in the H-PMQ group.

CHAPTER FOUR
Results

Demographic Variables: Descriptive Analyses

During the time period of January 2005 through February 2006, there were 388 patients that were newly evaluated at the Pain Center. Approximately 64.9 % of the sample was female and 35.1% was male. The majority of the sample was Caucasian (68.8%). The remaining portions of the sample were comprised of African-American (10.1%), Hispanic (3.9%), Asian (1.8%), and Other races (0.8%). The average age of the sample was 54.55 years (16.71) and ranged from a minimum of 15 years to a maximum of 89 years. Exactly half (50%) of the sample was married. A total of 14.2% of the sample was single, while 13.7% was separated/divorced. The average duration of pain was 74.4 months (101.20). As such, the majority of the sample had a chronic pain condition (71.4%). Subacute pain conditions accounted for 5.7% of the sample, while the remaining 4.4% of the sample had an acute pain condition. The majority of the sample did not have pending litigation related to his or her pain condition (75.8%), and were not receiving disability payments (61.6%). Approximately 42.3% of the sample participated in Medical only treatment, whereas 36.9% of the sample participated in the Interdisciplinary treatment group and the remaining 20.9% of the sample were involved with various treatment programs offered at the Pain Center (medical, behavioral medicine, physical therapy). These results are summarized in Table 7.

Of the 249 patients included in the core study sample, 62.7% were female and 37.3% were male. The mean age was 53.59 years (SD = 15.93) and ranged from a minimum of 15 years to a maximum of 87 years. The majority of the sample was Caucasian (79.1%),

followed by African-American (9.6%), and Hispanic (4.0%). Asian and other races comprised only .8% of the sample total each. Over half of the sample was married (56.6%) or separated/divorced (16.9%). The remaining portions of the sample were single (14.1%) or widowed (9.2%).

A breakdown of the sample into treatment groups revealed that approximately 37% of the sample participated in the interdisciplinary treatment program, while 41% received medical treatment only. A total of 22% of the patients participated in some combination of the medical, behavioral medicine, or physical therapy components of the interdisciplinary program, as was deemed appropriate by their physicians. Upon initial evaluation in the Pain Center, 33.3% of the core sample was currently using opioid medication. At the time of initial evaluation, approximately 24% of the sample was receiving disability payments, and 7% had pending litigation related to their pain condition. The majority of patients had a chronic pain condition (84.3%) with the average length of pain being 77.79 months (just over 7 years), with wide variability (SD = 102.67). These results are summarized in Table 8.

Comparison of PMQ Scoring Groups

Independent samples t-tests were used to compare the L-PMQ (n = 121) and H-PMQ (n = 128) groups on the variables of age and pain duration, while Pearson Chi-Square analyses were used to compare the two groups on the categorical variables of gender, race, marital status, status of condition (acute, subacute, or chronic), disability payment status and litigation status. As summarized in Table 9, no significant differences were found on the variables of gender, race, status of condition and litigation status. However, significant

differences were found for marital status, χ^2 (3) = 8.25, p = .04, and disability payment status, χ^2 (1) = 7.22, p < .01. Patients in the H-PMQ (22.6%) groups were more likely to be separated/divorced than the L-PMQ group (11.2%). Patients receiving disability payments were 2.3 times more likely to be in the H-PMQ group (32.8%) than the L-PMQ group (17.5%), χ^2 (1) = 4.88, p < .01, *OR* = 2.29, 95%CI: 1.24-4.32.

Descriptive Analyses of the PMQ and PRA

Prior to initial evaluation, patients completed a packet of paperwork that included the PMQ. Upon completion of the initial evaluation, the physicians completed the Physician Risk Assessment for Opioid Misuse. Basic descriptive data were derived for each of the instruments – the PMQ and the PRA.

PMQ Descriptive Analysis: Total Score. The sample of 249 patients yielded a mean PMQ score of 25.78 (SD = 10.57) as outlined in Table 10. The median score was 25.0, while the modal score was 20.0. The range was 72.74 points, with a low score of 2.26 and high score of 75 (out of a maximum score of 104 points). Skewness was found to be .7, and kurtosis was 1.54. A histogram (Appendix A, Figure 1) illustrates the distribution of PMQ scores. Groups were determined by a median split. Patients with scores of < 25 fell into the L-PMQ group (n = 121), and patients with scores ≥ 25.00 were in the H-PMQ group (n = 128), resulting in two groups of roughly the same size. Individual items of the PMQ are summarized the Table 11.

PRA Descriptive Analysis. The Physician Risk Assessment (PRA) for opioid misuse was completed upon intake for a subgroup (n = 160) of the total sample. Descriptive data are presented in Table 12. The mean PRA score was 4.13 (SD = 4.95), out of a possible 24 points, while the median PRA score was 3. The modal total score was 0 which comprised 24.9% of all of the scores. Both the skewness (1.36) and kurtosis (1.57) of the distribution represent a significant deviation form the normal curve. A histogram (Figure 2) shows the distribution of PRA scores to fall in an asymmetrical curve that is flat and skewed to the higher end of the range. Individual items of the PRA are described in Table 13.

Physical/Functional Measures and Mental Functioning at Pre-Treatment

Independent samples *t*-tests were performed to detect meaningful differences between the PMQ groups upon initial evaluation for treatment. Non-parametric tests were used on the variables of pain intensity (VAS) and subjective levels of physical functioning (PCS) as the two PMQ scoring groups had significantly different variances. No significant differences were found between groups on the measure of pain intensity (VAS) and levels of depression (BDI). However, significant differences were found on several of the physical/functional measures. Patients in the H-PMQ group reported that they were physically functioning more poorly than patients in the L-PMQ group as measured by the PCS, $U = 1116$, $p = .04$, $r = -.20$. Patients in the H-PMQ groups also reported significantly greater levels of subjective disability in both their professional and personal lives as measured by the Dallas Pain Questionnaire (DPQ), $t\ (226) = 8.126$, $p = .03$, and the Oswestry Disability Index (OSW), $t\ (232) = -3.47$, $p < .01$, respectively. Significant differences were found between

groups on the measure of the Mental Component Scale (MCS), t (106) = 2.79, $p < .01$ (see Table 13). The L-PMQ group reported having significantly more psychological resources to deal with their pain. These results are also supported by moderate correlations between each measure and the PMQ total score outlined in Table 15. All measures were significantly correlated with the total PMQ score at the $p < .01$ level, with the exception of the VAS. Both the MCS and PCS components were negatively correlated with the PMQ total score.

Risk Factors at Pre-Treatment

Pearson Chi Square analyses were performed on the categorical variables to see if there were any significant differences between groups based on whether or not patients acknowledged a history of substance abuse, answered one or more of the CAGE questions, had a history of drug or alcohol abuse, or had a history of opioid detoxification. Additionally, patients were compared on whether or not they currently smoked cigarettes, whether or not they were referred based on misuse, were prescribed an opioid medication or utilized a medication agreement while at the Pain Center. Independent samples t-tests were then performed using patients' endorsement (an answer of 'yes') or denial (an answer of 'no') on the same variables (history of substance, drug, or alcohol abuse; CAGE, etc.) to explore the average differences between the PMQ total scores between those groups.

Acknowledgement of Substance Abuse History (ASAH). The results of the Pearson chi-square analyses were not significant between the PMQ scoring groups, χ^2 (1) = .54, p = .50 (see Table 16). Additionally, there was no significant difference between the PMQ total

score when comparing those who denied a history of substance abuse versus those who reported a history of substance abuse, t (216) = -1.83, p = .07.

CAGE Questionnaire. When comparing the two PMQ scoring groups, no significant differences were found between the groups and the endorsement of one of the four CAGE items, χ^2 (1) = 2.09, p = .15. However, when grouped according to whether or not one or more CAGE item was endorsed, patients who endorsed one or more of the CAGE questions had a significantly higher PMQ total score than patient who did not endorse any of these questions, t (144) = -2.41, p = .02. These results are summarized in Table 17.

History of Drug Abuse, Alcohol Abuse, and Referral for Opioid Detoxification. Comparisons using Pearson's Chi-Square analyses revealed no significant differences between PMQ scoring groups for the variables of history of drug abuse, χ^2 (1) = .06, p = .80 or history of opioid detoxification, χ^2 (1) = .96, p = .33. Additional analyses using t-tests indicated that there were no significant differences in the PMQ total scores between patients with a history of drug abuse or opioid detoxification. These results are summarized in Tables 18 and 19.

Analyses of history of alcohol abuse revealed no significant differences between PMQ scoring groups, χ^2 (1) = .79, p = .07. An independent samples t-test revealed no significant differences between the PMQ total scores between patients who acknowledged a history of alcohol abuse and those who did not (see Table 20).

Smoking Status and Opioid Status. Patients who smoke cigarettes did not have a significantly higher average PMQ total score upon initial evaluation compared to patients who do not smoke cigarettes, t (210) = -1.70, p = .09. No significant differences were found

between the PMQ scoring groups based on smoking status, χ^2 (1) = 1.16, p = .28 (see Table 21).

Upon initial evaluation, patients may have been prescribed an opioid medication. There was a significant difference between PMQ scoring groups based on whether or not they were taking opioid medications, χ^2 (2) = 7.52, p = .02. Patients in the H-PMQ scoring group were twice as likely to be taking an opioid medication upon initial evaluation as patients in the L-PMQ group, χ2 (2) = 7.52, p = .02, *OR* = 2.05, 95%CI: 1.06-3.96. Patients who were taking opioid medication, had a significantly higher average PMQ total score than patients not taking opioid medication, t (148) = -2.57, p = .01. Additionally, patients taking an opioid medication were rated by physicians (PRA) to have significantly more aberrant medication usage behaviors than patients not on an opioid medication, t (141) = -3.76, p < .01. These results are outlined in Table 22.

Referral for Misuse. Patients were referred to the Pain Center by outside treating physicians. In some cases patients were referred specifically for opioid misuse. There was a significant difference between PMQ scoring groups and referral for misuse. Patients in the H-PMQ group were 6.4 times more likely to be referred for misuse than patients in the L-PMQ group, χ^2 (1) = 7.14, p < .01, *OR* = 6.40, 95%CI: 1.39-29.49. These results are outlined in Table 23.

Prediction of PMQ group from Pre-Treatment Data

A binary logistic regression model (Table 24) was also developed to examine the best combination of predictors for classifying patients into PMQ scoring groups (H-PMQ and L-

PMQ). Variables included in the initial regression equation were determined by theory and statistical differences that emerged from baseline analyses. Variables were entered into an Enter procedure to determine which variables could best predict membership in the H-PMQ group. As recommended by Hosmer and Lemeshow, an alpha level of .15 was utilized for inclusion, and variables were excluded if they did not contribute at the .10 level. This procedure resulted in a 13-factor solution that predicted PMQ scoring group membership with 85.7% accuracy, and with 91.7% sensitivity and 80.0% specificity. These 13 predictor variables were disability payment status, MCS, DPQ, PMQ Items 1, 3, 6, 23, PRA Items 1, 2, 6, PRA total score, referred misuse, status of the condition.

Physician Risk Assessment (PRA) for Opioid Misuse at Pre-Treatment

The physicians at the Pain Center completed the PRA, which was an independent assessment of a patient's medication usage behaviors. A series of nonparametric Mann-Whitney Tests were performed to compare PRA scores (for both the total instrument and each individual item) between the L-PMQ and H-PMQ scoring groups, as the data were not normally distributed. As presented in Table 25, results for each analysis were significant at the $p < .05$ level. The means of the PMQ groups were found to be significantly different on PRA for each of the individual items in addition to being significantly different on the PRA total score. Patients in the H-PMQ were rated significantly higher by the physicians on each item of the PRA and the PRA total score.

These findings were supported by a series of Pearson's correlation coefficients, calculated between PMQ total score and PRA individual items and total score at pretreatment (see Table 26), which were all significant at the $p < .01$ level.

Behavioral Indices at Follow-up

Medication agreements are often utilized to clearly outline the risks associated with opioid medications in addition to Pain Center policy regarding early refills. The H-PMQ and L-PMQ scoring groups did not differ significantly on the utilization of a medication agreement, $\chi^2 (1) = 1.34$, $p = .25$. Additionally, patients who utilized a medication agreement did not differ significantly on their average PMQ total score from patients who did not have a medication agreement at the Pain Center, $t (154) = -1.16$, $p = .25$. These results are summarized in Table 27.

A key behavioral indicator of medication misuse is whether or not a patient requested an early refill for his or her opioid medication. A Pearson Chi Square analysis was performed to determine if the patients in the H-PMQ scoring group requested more early refills than the L-PMQ group. The results of this analysis were not significant, $\chi^2 (1) = .01$, $p = .91$, indicating that the PMQ scoring groups were similar in the amount of early refill requests that were made over the period of the study. An independent samples *t*-test was conducted to determine if the patients who requested an early refill had a higher average PMQ total score than those who did not request an early refill of their opioid medication. There was no significant difference for the average PMQ total score between patients who requested an

early refill and those who did not, t (247) = -.52, p = .63. These results are summarized in Table 28.

Physical/Functional Measures and Mental Functioning at Follow-up

Upon discharge from the interdisciplinary program or an equivalent six months post-initial evaluation for the medical only treatment group, the physicians completed another PRA. An independent samples *t*-test was conducted at follow-up on various measures of physical and psychological functioning, and physician ratings of problematic opioid misuse behaviors between the two PMQ scoring groups. There were no significant differences between groups on any of these measures, as summarized in Table 29.

Paired samples *t*-tests were conducted for patients with initial and follow-up scores on the physical/functional measures and the PRA. The results of these analyses were not significant, with the exception of the pain rating. At follow-up, patients reported significantly less pain intensity than at pre-treatment, t (25) = 4.72, $p < .01$ (see Table 29). A previous study (Holmes et al., 2006) indicated that patients in the H-PMQ scoring group were more likely to be unsuccessfully discharged from interdisciplinary treatment or drop out of treatment (see Table 30). The H-PMQ group was compared to the L-PMQ scoring group on the variable of early termination from treatment using a Pearson Chi-Square Analysis. Medical only treatment patients and "Other" treatment patients were excluded from this analysis to preclude confounding with discharge status as these data are not collected on these patients. There were no significant differences between the PMQ scoring groups for early termination, $\chi 2$ (1) = .55, p = .46. These results are summarized in Table 31.

Anecdotal Cases

Portenoy (1996) compiled a list of "aberrant drug-related behaviors". Among the "probably more predictive" behaviors were: 1) forging prescriptions; 2) stealing or borrowing drugs from others; 3) frequently losing prescriptions; and 4) resisting changes to pain treatment, despite adverse side effects. Throughout the course of chart review, it was observed that several patients demonstrated problematic medication use behaviors that were not coded in data collection. These behaviors included increasing medication dosage without prior authorization, utilization of pain medications leftover from other doctors, taking narcotic medication of other family members and prescription forgery.

Case #1

This patient was a 30 year-old, Hispanic, male who was separated/divorced at the time of initial evaluation. He had insurance, and was a smoker. Upon initial evaluation to the Pain Center, he reported that his pain was severely disabling on both the DPQ and the OSW. He scored a 57 on his PMQ out of a possible 104 points. On the PRA, he was observed to demonstrate a moderate amount of problematic medication usage behaviors, as he was rated as 12 out of 24. He was prescribed hydrocodone, and upon chart review there was no medication agreement present in his chart. He demonstrated a pattern of early refill requests with the hydrocodone; requesting three early refills before his medication was changed to a non-opioid medication. He had one early refill request for his non-opioid medication at which time he was reminded that he demonstrated a pattern of early refills on his previous

medication. In his chart, it was documented that he delivered a forged prescription for Lortab to his pharmacy, which was caught before it was filled. This patient was initially referred to the Pain Center for interdisciplinary treatment; however he was never evaluated by a behavioral medicine psychologist. He was discharged from the program early due to noncompliance with all relevant disciplines (medical, behavioral medicine, and physical therapy).

Case #2

This patient was a 41 year-old Caucasian, married female. She had insurance at the time of initial evaluation and was not receiving disability payments, nor did she have pending litigation related to her pain. She had a chronic pain condition (duration > 7 months). She was a smoker and denied a history of substance abuse. She rated her level of pain intensity as 7 out of 10 (worst pain ever). She reported that her pain was severely disabling on both the DPQ and the OSW. Her PMQ total score was a 45 out of a possible 104. She was not evaluated using the PRA upon initial evaluation. This patient was being followed for medical treatment only within the Pain Center. Upon review of her chart, it was noted that, although she did not request any early refills, she had called in to state that she was still in pain and that her current medications were not helping her relieve the pain. It was also noted that she "took daughter's Vicodin." She also informed the nurse that she had been on Vicodin for five years and it worked well.

Case #3

This patient was a 58 year-old Caucasian, married female. She had insurance and was a non-smoker upon initial evaluation. She was not receiving disability payments nor did she have pending litigation related to her pain condition. She had an acute pain condition upon evaluation (duration <1 month). She rated her pain intensity as 8 out of 10 (worst possible pain). She reported that her pain was severely disabling on the DPQ and that the pain was crippling her daily activities according to the OSW. Her total score on the PMQ was 31 out of a possible 104, and her physician rated her problematic opioid use behaviors as 12 (of 24). She was referred on the basis of opioid misuse, and had no medication agreement in her chart. She was not prescribed opioids at the Pain Center. The patient called the nurse and stated that she was not sure if she was taking the correct medication. Upon follow-up, the patient indicated that she had been taking leftover hydrocodone from another physician and needed "steroids and narcotics" for her pain and was returning to her primary care physician. The patient was reminded that she should not take leftover medication from another doctor and was reminded about Pain Center policy regarding the proper use of medication. At that time the patient also stated that she did not and would not sign a medication agreement as she would not be bound by an agreement. She received only medical treatment at the Pain Center and was referred back to her primary care physician.

Case #4

This patient was a 47 year-old, Caucasian, single female. She had insurance, and was a smoker upon initial evaluation. She was not receiving disability payments nor did she have

pending litigation related to her pain. She had a chronic pain condition upon evaluation (duration 72 months). She did not complete the VAS; however, she reported that her pain was severely disabling her as rated by the DPQ, however her pain was moderately disabling according to her OSW score. Her PMQ total score was 39.5 out of a possible 104 total points. She was rated 12 out of a possible 24 on the PRA. She was referred on the basis of prior opioid misuse. She demonstrated a pattern of phone calls to the Pain Center regarding her medications. More specifically, she called in to request an early refill before "leaving town;" at which time she was reminded to refill her prescriptions at her appointments. She scheduled an appointment specifically for medication review and refill, after which she called in to state that she had been "given the incorrect quantity of hydrocodone" and wanted the "correct" quantity called into the pharmacy. She was told that she was to take maximum of eight tablets per day; therefore the correct quantity had been given to her. She verbalized the desire to have maximum of nine tablets per day. This increase was not authorized. In response the patient stated "ok, I'll do something then." She was reminded that she needed to maintain her medication agreement. Although initially evaluated for participation in the interdisciplinary program, she remained on medication management only due to missing numerous interdisciplinary appointments.

Case #5

This patient was a 59 year-old Caucasian, male who was separated/divorced. He had insurance and did not smoke upon initial evaluation. He was separated at the time of initial evaluation, but through the course of treatment his divorce was finalized. He was not receiving disability payments nor did he have any pending litigation related to his pain

condition. He had a chronic pain condition upon evaluation (pain duration 26 months). He did not complete the VAS; and he reported that his pain was moderately disabling on the DPQ and OSW. His PMQ total score was a 32.5 out of a possible 104 points and he was rated at 12.5 out of a possible 24 on the PRA. In September of 2005 he requested an early refill for Norco which was denied. It was discussed at staffing that he be referred for opioid detoxification at the end of treatment as he was continuing to demonstrate problematic medication use behavior, however no such recommendation was made at the completion of treatment as the requests for early refills had subsided. However, he later went through 150 hydrocodone in 10 days and stated that he "lost count." At this time, he was referred for opioid detoxification. The patient acknowledged a problem with his narcotic use and planned on calling that day to schedule the detoxification. The patient was aware that he would not be able to continue his medical treatment at the Pain Center without written documentation that he finished a detoxification program.

PMQ Groups Divided at a PMQ Total Score ≥ 30

In light of the anecdotal cases sharing the common characteristic of a PMQ total score greater than 30, the patients were regrouped according to PMQ total score ≥ 30 as the higher-PMQ scoring group (HR-PMQ, n = 85), and patients with a score less than 30 falling into the lower-PMQ scoring group (LR-PMQ, n = 164). There were no significant differences between groups for the demographic variables of age and pain duration. HR-PMQ patients demonstrated significantly higher amounts of subjective disability than patients in the LR-PMQ total group on both the DPQ, t (227) = -2.43, p = .02, and the OSW, t (233) = -2.47, p =

.01. Patients in the HR-PMQ group also reported significantly lower subjective levels of psychological functioning (MCS) compared to their lower-scoring counterparts, t (106) = 3.36, p = < .011. Patients in these two PMQ scoring groups also reported subjective levels of physical functioning (PCS) that were not significantly different, U = 1293.00, p = .98, r = -.37. Patients also demonstrated levels of pain intensity (VAS) that were not significantly different between the LR-PMQ group and the HR-PMQ group, t (214) = -.94, p = .35.

Patients in the HR-PMQ group were rated, by physicians (PRA), as demonstrating significantly more problematic medication use behaviors as observed during the course of the initial evaluation. Patients in the HR-PMQ group were 4.7 times more likely to be referred for previous opioid misuse than the patients in the LR-PMQ group, $\chi^2(1) = 8.22$, $p < .01$, OR = 4.72, 95%CI: 1.51 – 14.71 (see Table 32).

A binary logistic regression model (Table 33) was also developed to examine the best combination of predictors for classifying patients into PMQ scoring groups (HR-PMQ and LR-PMQ). Variables included in the initial regression equation were determined by theory and statistical differences that emerged from baseline analyses. Variables were entered into an Enter procedure to determine which variables could best predict membership in the H-PMQ group. As recommended by Hosmer and Lemeshow, an alpha level of .15 was utilized for inclusion, and variables were excluded if they did not contribute at the .10 level. This procedure resulted in a 12-factor solution that predicted PMQ scoring group membership with 85.7% accuracy, and with 94.3% sensitivity and 64.3% specificity. These 12 predictor variables were whether or not the patient was receiving disability payments, MCS, DPQ,

PMQ Items (1, 3, 6, 23), PRA Items (1, 2, 6), PRA total score, and whether or not the patient was referred based on previous opioid misuse.

CHAPTER FIVE
Discussion

The initial study by Adams and colleagues (2004) indicated that the PMQ demonstrated adequate reliability and validity and had strong potential as a self-report screening measure of risk for opioid misuse. A second study (Holmes et al., 2006) demonstrated that patients in the H-PMQ scoring group were more likely to have a known substance abuse problem and were more likely to drop out of treatment. Additionally, they had diminished biopsychosocial functioning compared to the L-PMQ scoring group. Patients who completed the interdisciplinary treatment program displayed a significant decrease in PMQ scores over time, relative to patients who were unsuccessfully discharged or dropped out of the program. The purpose of this present study was to examine the ability of the initial PMQ score to accurately predict future opioid medication misuse behaviors in patients who reported a high amount of problematic behaviors related to opioid medication use.

Demographic Variables

The core sample of pain patients in this study included 249 patients. The average patient was a married, Caucasian female, approximately 54 years in age with a chronic pain condition (pain duration > 6 months) with an average length of pain of just over seven years. With regard to PMQ scoring groups (low and high), patients demonstrated no differences on the variables of gender, race, status of condition (acute, subacute, or chronic), and litigation status. As such, the sample appears to represent a heterogeneous sample of chronic pain patients in the various groups.

Despite this, patients in the H-PMQ were 2.3 times more likely than the L-PMQ group to be receiving disability payments. This is indicative of the fact that patients with higher levels of disability are at risk for developing opioid misuse (Portenoy, 1996). Patients in the H-PMQ group were also more likely to be separated or divorced than the L-PMQ scoring group. It is possible that separated or divorced patients may fall into the H-PMQ group due to lack of social support compared to the patients who are married.

Patients evaluated at the Pain Center were often referred for interdisciplinary treatment combining medical, behavioral medicine, and physical therapy. Patients were excluded from the interdisciplinary treatment program if their treating physician deemed the program inappropriate for their pain condition, or if some other condition (medical or psychiatric) would preclude significant benefit from interdisciplinary treatment. Treatment groups were compared to determine if there was a certain "patient type" that received a specific treatment modality. Overall, low-, and high-scoring PMQ patients were evenly distributed across treatment modalities with no significant differences on demographic variables except age, indicating that treatments are tailored to individuals with no pre-determined idea of what treatment should be utilized for certain patients. The patients from the medical-only treatment group were, on average, older than patients in the interdisciplinary treatment group. One possible explanation of this could be the belief that patients who are older may not fully benefit from an interdisciplinary treatment program.

An initial sample of 388 patients, were newly evaluated at the Pain Center between January 1, 2005 and February 28, 2006. However, a subset of this sample (N=139) did not complete the PMQ such that a total score could be derived. The patients who did not

complete the PMQ were not significantly different on any demographic variables, or on physical/functional measures and measures of psychological functioning, than the group of patients who did complete the PMQ. There are numerous explanations that could account for this. First, when a patient arrived at the Pain Center he or she may have been overwhelmed by the amount of paperwork to fill out at the initial evaluation. Additionally, if the packet of information was not sent to them prior to the first appointment, the patient may not have had the time before the appointment to complete the entire packet of paperwork. In a busy clinic setting, it is difficult to ensure that all patients have fully completed their paperwork prior to an appointment, or arrange for the patient to stay after their appointment to complete the paperwork. Also, many patients discussed with Pain Center psychologists that they left items unanswered if they were not taking any medications for pain.

PMQ and PRA

The Pain Medication Questionnaire yielded a mean score of 25.78 (SD = 10.57), with a similar median score of 25.0, and a modal score of 20.0. The measure of skewness (0.7) was within an acceptable range; however, the curve was not a close approximation of the normal curve with regard to kurtosis (1.54). Measures of skewness and kurtosis falling between -1.0 and +1.0 are generally considered to be appropriate indicators of a normal distribution (Muthen & Kaplan, 1985). The increased kurtosis of the PMQ distribution could be due to outlying scores which in turn flatten the normal curve somewhat. These descriptive findings are consistent with the initial study of the PMQ (N=184), where the mean score was 24.60 (SD = 10.16), and the median was 24.25 (Adams et al., 2004). The follow-up study of

the PMQ also yielded similar results (N=271), where the mean score was 25.49 (SD = 10.16), and the median score was 25.00 (Holmes et al., 2006). However, as the PMQ has been shown to be normally distributed in past studies (Adams et al., 2004), the PMQ scores were divided into two groups according to a median split. This resulted in two groups of roughly the same size.

The PRA was initially completed by the treating physician after the initial evaluation. The average score on the PRA was 4.13 (SD = 4.05) out of a possible 24 points. The median score was 3, while the modal score was 0.00, comprising approximately 25% of the scores. This is indicative of the fact that one-quarter of the patients did not demonstrate problematic opioid usage behaviors as observed by the physicians on the PRA. One explanation may be that due to increased time constraints on physicians, as a result of significant patient loads, the physicians may not have had time to complete a thorough review of a patient's medical record while completing the PRA.

As the PRA total scores were significantly different between PMQ scoring groups, and the PRA item and total scores were moderately correlated with the PMQ total score, we can conclude that the PMQ assesses the same behaviors that physicians observe during the course of their evaluation. As such, the PMQ is a reliable and valid indicator of problematic medication use behaviors and can be utilized by other care providers in order to develop an individualized treatment plan that will provide maximum benefit to the patient. However, the PMQ should not be a sole indicator of whether or not opioid medication should be utilized for the treatment of the pain condition (Adams et al., 2004).

Physical/Functional Measures and Mental Functioning

One aim of this study was to replicate the initial study (Adams et al., 2004) of the PMQ. Pre-treatment analyses revealed several significant differences between PMQ scoring groups on measures of subjective physical functioning. Patients in the H-PMQ group reported higher levels of subjective disability (DPQ, OSW) than the L-PMQ group and there was an overall decrease in subjective physical functioning (PCS), which is consistent with the study by Holmes and colleagues (2006). On a measure of psychological functioning (MCS) it was found that the H-PMQ group had more impairment than the L-PMQ group which is also consistent with the second study of the PMQ (Holmes et al., 2006). There were no significant differences between PMQ scoring groups on measures of pain intensity (VAS) or levels of depression (BDI), which is inconsistent with previous studies (Adams et al., 2004; Holmes et al., 2006). Scores on the pre-treatment measures were all significantly correlated with the PMQ total score with the exception of the pain rating (VAS). As such, higher scores on the measures of disability and levels of depression were correlated with higher PMQ total scores, indicating that patients who are experiencing higher levels of disability may rely more on pain medication in order to regain functioning. The MCS and PCS scales were significantly negatively correlated with higher PMQ total scores, as patients who reported decreased physical and mental functioning scored higher, on average, on the PMQ.

Risk Factors

Several risk factors were identified prior to data collection that could be used to indicate whether or not a patient would demonstrate aberrant opioid medication use. Savage (2002) reported that rates of alcoholism and other addictive diseases in patients with chronic pain are similar to rates for the general population ranging from 3-26%. A history of substance abuse appears to be a contributing factor for the development of addiction to opioid medication (Nedeljkovic, Wasan, & Jamison, 2002). In the packet of information gathered from patients at the initial evaluation, patients were asked a series of questions including substance abuse history and were asked to respond to the CAGE questionnaire (Ewing, 1984).

A total of 217 patients answered the history of substance abuse question. Of those patients, 15 acknowledged a history of substance abuse. The total PMQ score did not significantly differ between patients who disclosed a history of substance abuse and those who did not. Additionally, patients within each of the PMQ scoring groups did not differ significantly for a history of substance abuse. Patients who had a history of drug abuse, alcohol abuse, or referral for opioid detoxification, or were smoking upon initial evaluation also did not differ significantly on the total PMQ score, nor were the PMQ scoring groups significantly different on these variables.

Endorsement of one or more CAGE questions, has been shown to be a sensitive indicator of past substance misuse (Sullivan & Fleming, 1997). Although, in the present study there were no significant differences between the two PMQ scoring groups on the endorsement of a CAGE question, patients who endorsed one or more of these items had a

significantly higher average PMQ total score than those who did not endorse one of these questions. This is suggestive that past behaviors related to substance use patterns are important when considering the best treatment plan for patients with chronic pain.

After being evaluated at the Pain Center, patients may have been prescribed an opioid medication for pain control. Results indicated that patients who were taking opioid medications upon initial evaluation were more likely to fall into the H-PMQ group. In comparison to patients not taking opioid medication, patients prescribed opioids had a significantly greater average PMQ total score. Likewise, patients taking opioid medication had a significantly higher average PRA total score.

As patients were referred to the Pain Center by other physicians, there is a chance that these patients have demonstrated problematic medication use behaviors from past clinics. Results indicate that patients in the H-PMQ group were 6.4 times more likely than patients in the L-PMQ group to be referred for previous medication misuse. This trend indicates that patients who have been previously misusing pain medication will report these behaviors on the PMQ. Thus, physicians who utilize the PMQ can focus on specific past medication utilization behaviors that have been and will likely be problematic for the patient. Thus, the PMQ can serve as a basis to facilitate communication between patient and physician.

Physician Risk Assessment

Physicians at the Pain Center rated the behavior of patients during the initial evaluation, independent of knowing the PMQ total score. The two PMQ scoring groups differed significantly on the physicians' rating of opioid misuse, with patients in the H-PMQ

group displaying more problematic medication misuse behaviors than patients in the L-PMQ group. Correlations of moderate strength (.29-.36) between the PRA individual items and the PMQ total score were observed. The PRA total score was also significantly correlated with the PMQ total score with a Pearson Correlation coefficient $r = .35$. These results indicate that the PMQ measures the same behaviors that are observed by the physician upon evaluation, therefore the utilization of the PMQ in a busy clinic setting, may assist the physician to form a treatment plan that will be of greatest benefit to the patient.

Behavioral Indices of Medication Misuse

If patients demonstrate problematic medication usage behaviors prior to initiation of medical treatment, physicians may want to utilize a medication agreement to outline clinic policy regarding opioid medications. The medication agreement is a way to protect both the patient and the physician (Fishman & Kreis, 2002). The Pain Center has a strict policy that there will be no early refills on opioid medication. Analyses revealed that medication agreements were evenly distributed between PMQ scoring groups. Additionally, patients who had a medication agreement had an average PMQ total score that was not significantly different from patients without a medication agreement. These results are indicative of possible increased use of medication agreements with all patients on opioid medication, to ensure that they were properly informed about the risks associated with taking opioid medication. It may also suggest that physicians try to ensure that patients know the policy regarding "lost" prescriptions or early refill requests. Of anecdotal interest, upon review of the charts, it was observed that many of the medication agreements were signed by the

patient and a nurse, without the doctor's signature, or it was signed by the nurse and the doctor, and not the patient. In order to effectively utilize the medication agreement, it is imperative that it be explained to the patient verbally and signed by all parties, and a copy provided to the patient, in order to increase adherence to the agreement.

Another, more definitive, indication of opioid medication misuse is whether or not patients request early refills of opioid medication. Of the 249 patients in the present study, a total of 17 patients requested early refills. There were no significant differences between PMQ scoring groups and the presence of early refill requests. Additionally, patients who requested an early refill on opioid medications did not have a significantly different average PMQ total score than patients who did not request early refills. These results are supportive of a strict Pain Center policy that physicians will not authorize early refills of opioid medication. These results may also be explained by a patient not returning for follow-up evaluation at the Pain Center, which may prevent patients from requesting early refills. Additionally, during the course of the study, there was a transition to an electronic medical record system. During this transition, some comments or requests for early refills of medicine may not have been clearly input into this system; therefore this data may not have been collected from a consistent and reliable source of data.

Behavioral indices of problematic behavior were only collected for early refill requests and the utilization of medication agreements. Some patterns of requests for early refills could be an indication of pseudo-addiction in which a patient's pain is under-treated, and they demonstrate addiction behaviors with their medication in order to achieve maximal pain relief. When a patient is requesting early refills it is imperative to determine if the

patient's pain is adequately treated, or if the patient has developed aberrant medication use behaviors.

Other anecdotal evidence, obtained via chart review, supports the notion that patients demonstrate other problematic medication usage behaviors such as incidences of "lost" or "stolen" prescriptions, or being "out of town" for numerous appointments in a row, but needing refills to ensure that their medication supply is stable. Each of these behaviors may or may not be indicative of opioid medication misuse, however, when a pattern develops, it is suggestive of misuse. In a clinic setting where staff turnaround is an issue, it is necessary to establish guidelines for early refill requests and, if a medication agreement is signed, refer back to the guidelines to ensure adherence to the established plan.

Group Differences at Post-Treatment or Follow-Up

Independent samples *t*-tests were performed for patients in the two PMQ scoring on measures of physical/functional performance and mental performance upon completion of the interdisciplinary program, or 6 months after the initial evaluation for medical treatment only. These analyses revealed no significant differences on the DPQ, OSW, MCS, PCS, VAS, or the PRA. Paired samples *t*-tests were performed on patients with both pretreatment and discharge data. These results indicated that following treatment at the Pain Center, patients demonstrated a significant decrease in their levels of pain intensity. These results suggest that after treatment at the Pain Center, patients have been able to more effectively control their pain.

However, the power of these analyses are questionable as the follow-up data analyzed consisted of between 12 and 26 people depending on the measure analyzed, due to patients being at different stages of treatment which precluded analysis of follow-up data. A priori power analyses (Faul & Erdfelder, 1992) indicated that for a power of .8 and a moderate effect size of .50, a total number of 100 patients would be needed for *t*-tests upon follow-up analyses. Factors such as treatment non-completion may have affected the total number of patients that reach follow-up evaluation. Additionally, as an anecdotal aside, less than 25 % of the patients initially evaluated for medical only treatment were still being followed at the Pain Center six-months after initial evaluation. Some of these patients may have been a referral for a second opinion which would preclude follow-up treatment at the Pain Center. It is also possible that some patients were "medication seeking" and were not prescribed an opioid, therefore they left the Pain Center and never returned. Additionally, since the Pain Center functions as an interdisciplinary treatment setting, patients who were not suited to the interdisciplinary program may have returned to the referring physician if there were no procedures or treatments available at the Pain Center that would benefit the patient.

Anecdotal Cases

Of particular interest in this study were five patients who demonstrated medication misuse behaviors that were unique to them at the Pain Center, but are representative of variations of possible behavioral indices to notify physicians of medication misuse. These patients varied on demographic variables. Of the five patients, three were female and two were male. The patients ranged in age from 30 to 59. Additionally, two patients were

married, two were separated/divorced and one was single. All but one of the patients was Caucasian. The patients had one key factor in common, a PMQ total score greater than 30. These behaviors included taking opioid medication not prescribed to them, taking leftover medication or demanding specific medications, and forging a prescription.

Therefore, a PMQ total score greater than 25 is indicative of behaviors that could be problematic during the course of treatment and should be addressed with the patient. However, it is recommended that a PMQ total score greater than or equal to 30 be considered a warning of possible medication misuse behaviors outside the realm of early refill requests.

PMQ Total Score ≥ 30

As a result of the anecdotal cases, the patients were regrouped with patients with a PMQ total score ≥ 30 falling into the HR-PMQ group. When compared to patients with a PMQ total score < 30 (LR-PMQ), the HR-PMQ patients demonstrated decreased mental functioning (MCS) and increased levels of subjective disability. However, the HR-PMQ group did not differ significantly from the LR-PMQ group on a measure of physical functioning (PCS). Patients in the HR-PMQ group were 4.2 times more likely than the LR-PMQ patients to be referred to the Pain Center based on past opioid medication misuse. A logistic regression equation was able to predict with 85.6% accuracy PMQ scoring group membership using a cut-off score of 30. However, a previous logistic regression was able to predict PMQ scoring group membership with the same accuracy using a cut-off score of 25.

Conclusions

The present study represented the third stage in a formal attempt to develop a psychometrically sound, self-report screening measure to evaluate the risk of opioid medication misuse among patients with chronic pain. As such, it replicated previous findings that patients in the H-PMQ group reported greater levels of subjective disability and reported lower levels of physical and psychological functioning.

The PMQ total score was significantly correlated with physicians' ratings of problematic medication use behaviors. As such, it is predictive of observable behaviors that will likely develop throughout the course of treatment. Medical care providers, other than physicians, can integrate the PMQ score into a beneficial treatment plan that will assist the patient in optimizing his or her pain relief. This study demonstrated that patients referred for misuse were more likely to fall in the H-PMQ group. Patients are willing to self-report these behaviors, which will allow care providers to communicate with patients to clarify guidelines and establish treatment goals to manage their pain.

To ease the utility of the instrument, patients were divided into two groups using a cut-off score of 25. Scores falling at or above 25 were representative of patients who reported significantly greater levels of subjective disability and lower physical and psychological functioning. Thus, a PMQ total score greater than or equal to 25 reflects the presence of certain medication usage behaviors that are indicative of future problematic use. The treatment team would benefit from reviewing the PMQ and integrating the data obtained from the measure into the treatment plan.

Although a PMQ total score greater than or equal to 25 was able to distinguish between patients who had a higher risk for problematic opioid misuse and those who did not, a select group of patients within the H-PMQ group who scored greater than or equal to 30 demonstrated problematic medication misuse behaviors that fell outside the scope of this study. These behaviors included forging prescriptions, demanding specific medications, and using narcotic medication prescribed to family members. As such, a PMQ total score greater than or equal to 30 appears to be an indicator of medication misuse that is observed by the treatment team. Patients who score greater than or equal to 30 will benefit from a treatment plan that addresses the problematic medication usage behaviors that are reported on the PMQ. This score can also alert the treatment team to more closely monitor the medication use of the patient. Although, in this study, the PMQ total score did not significantly predict the presence of early refill requests, there was evidence that a PMQ total score greater than 30 was indicative of other problematic behaviors associated with opioid medication use.

In conclusion, the PMQ is a psychometrically sound measure that can assist care providers in establishing a plan of care that will provide the patient with the greatest benefit which may include opioid medication. Patients with higher PMQ total scores may require closer monitoring and education regarding opioid medication. Additionally, these patients may benefit from participation in an interdisciplinary treatment program in order to increase coping resources, thereby increasing physical functioning.

Limitations and Directions for Future Research

Although the overall goal of the study, to accurately predict aberrant medication use behaviors based on the PMQ total score, was not significantly supported, there were instances where patients within the H-PMQ group demonstrated problematic patterns of opioid medication misuse that were not within the scope of behavioral indices collected for analysis. In the future, it would be beneficial to develop more standardized behavioral indices, specific to opioid medication, which could be collected by direct care providers on a regular basis that would assist in identifying patients with problematic opioid medication usage, before it escalates to a substance abuse problem.

The majority of the patients included in the sample were never evaluated using follow-up measures. As such, the follow-up comparisons in this study were inconclusive due to the small number of patients for whom follow-up data was able to be obtained. Only a small percentage of patients initially evaluated for medical only treatment returned for follow-up care at the Pain Center. Due to the nature of the referral system and the competitive nature of medical care, it would be helpful to monitor whether or not patients return to the Pain Center for follow-up care. If a patient had decided not to return, it would be beneficial to track the reasons patients do not return to the clinic, assuming they would be willing to share such information. Patients participating in the interdisciplinary program, while included in the initial sample, may have been in progress with their treatment and had not reached discharge at the time when data collection ceased for this study. Additionally, some of these patients may not have finished the program due to non-compliance with one or all of the relevant treatment disciplines. It would also be beneficial to track the type of

medical doctor (pain, primary care, oncology, etc.) that referred the patient to the Pain Center. As such, patients referred to the Pain Center by another pain doctor may be indicative of problematic medication use behaviors.

Although the majority of patients who were newly evaluated for treatment at the Pain Center completed the PMQ, approximately one-third of these patients did not complete the Pain Medication Questionnaire (PMQ). Future studies involving the PMQ may involve an item analysis in order to determine which questions are most predictive of opioid medication misuse in order to shorten the length of the PMQ, thereby possibly increasing completion of the measure.

Summary

This study replicated previous studies (Adams et al., 2004; Holmes et al., 2006) to develop a psychometrically sound instrument that will accurately identify patients who may develop problematic opioid misuse to assist in a busy clinic setting. Patients who fell into the H-PMQ group were more likely than the L-PMQ group to have increased levels of subjective disability and were functioning lower on a self-report measure of psychological health. The PMQ was significantly moderately correlated at pre-treatment with the physicians' ratings of problematic opioid misuse behavior. Thus, it appears to be an accurate, self-report, indicator of current and future problematic medication utilization behaviors. As a result, health care providers can utilize the score on the PMQ to determine the propensity of a patient to develop future problematic behaviors.

APPENDIX A
Figures

Figure 1. Distribution of the PMQ Scores at Pre-Treatment

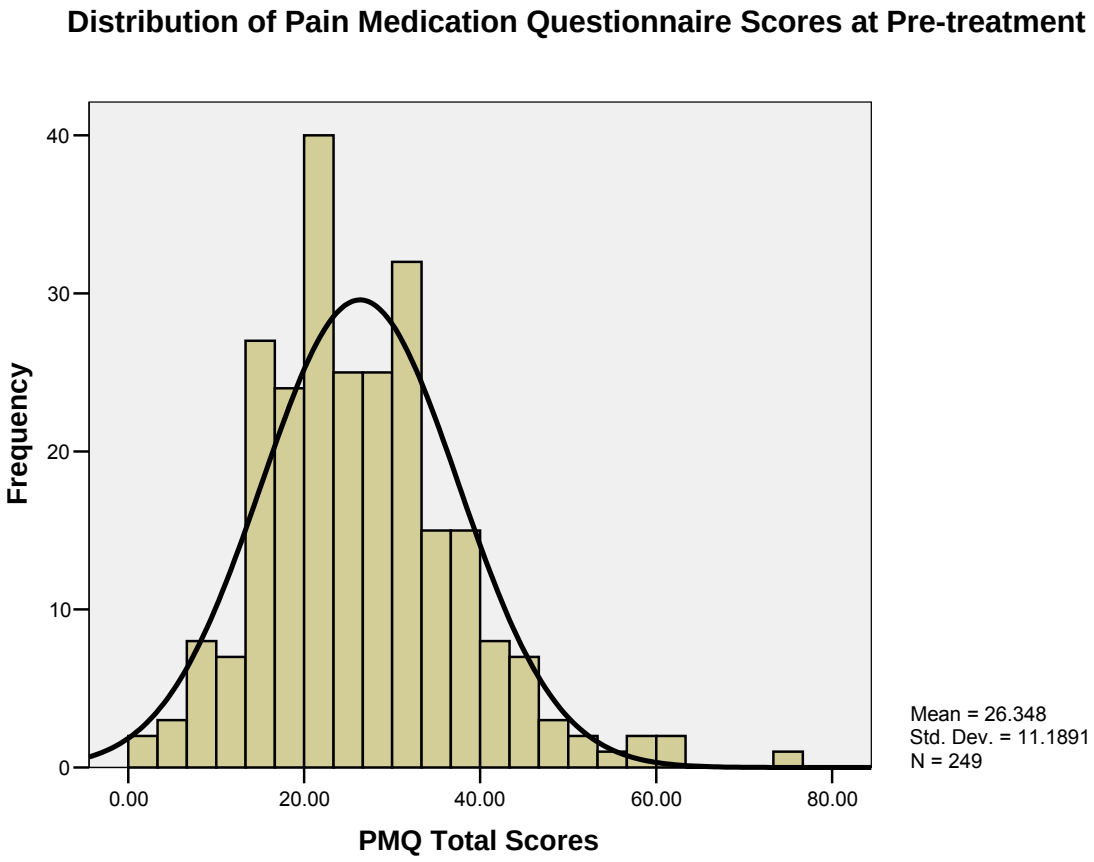
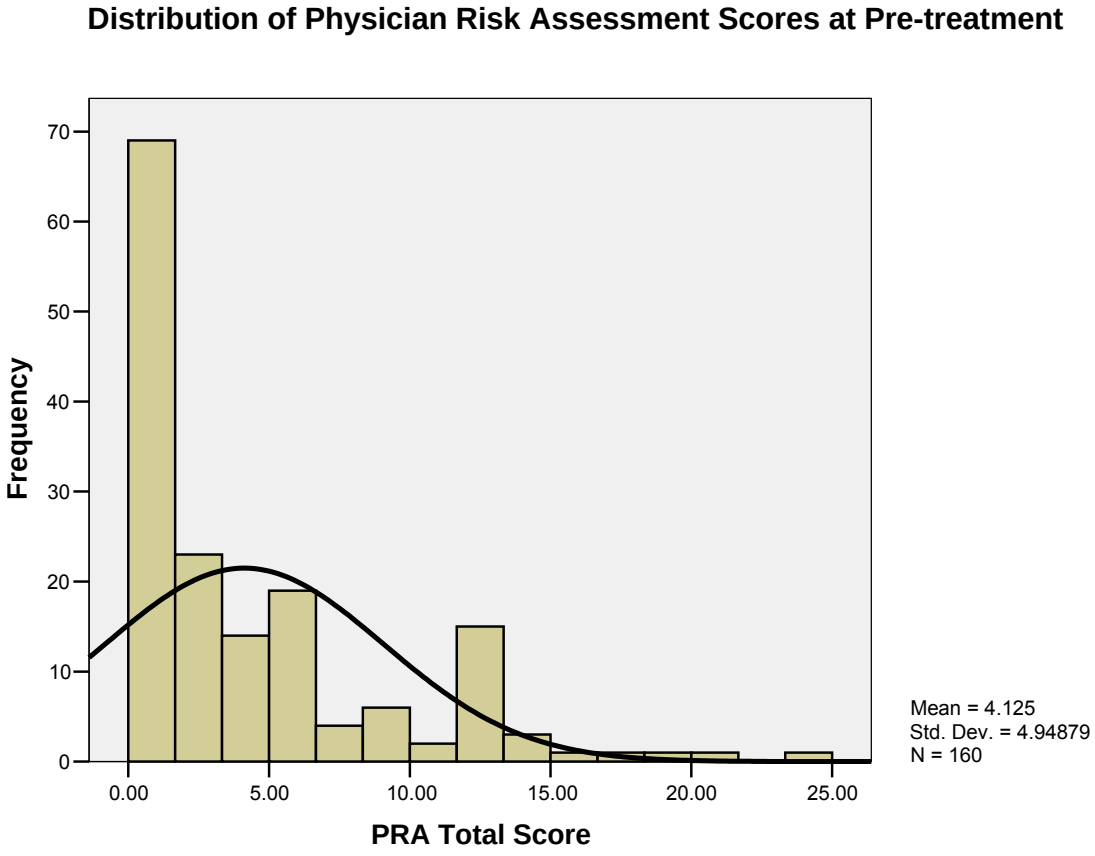


Figure 2. Distribution of the PRA Scores and Pre-Treatment



APPENDIX B
Tables

Table 1

DSM-IV-TR Diagnostic Criteria for Substance Abuse (American Psychiatric Association, 2000, pp. 114-115)

A. A maladaptive pattern of substance use leading to clinically significant impairment or distress, as manifested by one (or more) of the following, occurring within a 12-month period:

(1) recurrent substance use resulting in a failure to fulfill major role obligations at work, school, or home
(2) recurrent substance use in situations in which it is physically hazardous
(3) recurrent substance-related legal problems
(4) continued substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance

B. The symptoms have never met the criteria for Substance Dependence for this class of substance

Table 2

DSM-IV-TR Diagnostic Criteria for Substance Dependence (American Psychiatric Association, 2000, pp. 110-111)

A maladaptive pattern of substance use, leading to clinically significant impairment or distress, as manifested by three (or more) of the following, occurring at any time in the same 12-month period:

(1) tolerance, as defined by either of the following:
    (a) a need for markedly increased amounts of the substance to achieve intoxication or desired effect
    (b) markedly diminished effect with continued use of the same amount of the substance
(2) withdrawal, as manifested by either of the following:
    (a) the characteristic withdrawal syndrome for the substance (refer to Criteria A and B of the criteria sets for Withdrawal from the specific substances)
    (b) the same (or closely related) substance is taken to relieve or avoid withdrawal symptoms
(3) the substance is often taken in larger amounts or over a longer period than was intended
(4) there is a persistent desire or unsuccessful effort to cut down or control substance use
(5) a great deal of time is spent in activities necessary to obtain the substance, use the substance, or recover from its effects
(6) important social, occupational, or recreational activities are given up or reduced because of substance use
(7) the substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance (e.g., current cocaine use despite recognition of cocaine-induced depression or continued drinking despite recognition that an ulcer was made worse by alcohol consumption

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Table 3

Definitions Related to the Use of Opioids for the Treatment of Pain (ASAM, 2001)

The American Academy of Pain Medicine, the American Pain Society, and the American Society of Addiction Medicine recognize the following definitions and recommend their use.

I. Addiction

Addiction is a primary, chronic, neurobiologic disease, with genetic, psychosocial, and environmental factors influencing it development and manifestations. It is characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.

II. Physical Dependence

Physical Dependence is a state of adaptation that is manifested by a drug class specific withdrawal syndrome that can be produced by abrupt cessation, rapid dose reduction, decreasing blood level of the drug, and/or administration of an antagonist.

III. Tolerance

Tolerance is a state of adaptation in which exposure to a drug induces changes that result in a diminution of one or more of the drug's effects over time.

Table 4. Statistical Comparison of PMQ Completers (PC) and PMQ Non-Completers (PNC)

Variables	PC (n = 249)	PNC (n = 139)	Statistic
Gender [n (%)]			$\chi^2(1) = 1.61$, $p = .20$, .75 (.48 – 1.17)‡
Female	156 (62.7)	96 (69.1)	
Male	93 (37.3)	43 (30.9	
Race [n (%)]			$\chi^2(4) = 8.98$, $p = .06$‡
Caucasian	197 (83.8)	70 (72.9)	
African-American	24 (10.2)	15 (15.6)	
Hispanic	10 (4.3)	5 (5.2)	
Asian	2 (0.9)	5 (5.2)	
Other	2 (0.9)	1 (1.0)	
Missing§	14	43	
Marital Status [n (%)]			$\chi^2(4) = 5.93$, $p = .20$ ‡
Married	141 (58.5)	53 (55.8)	
Sep/Divorced	42 (17.4)	11 (11.6)	
Single	35 (14.5)	20 (21.1)	
Widowed	23 (9.5)	10 (10.5)	
Living W/Sig other	0 (0.0)	1 (1.1)	
Missing§	8	44	
Condition Status [n (%)]			$\chi^2(2) = 1.76$, $p = .42$‡
Acute	12 (5.1)	5 (6.3)	
Subacute	14 (5.9)	8 (10.0)	
Chronic	210 (89.0)	67 (83.8)	
Missing§	12	60	
Disability Pmts [n (%)]			$\chi^2(1) = .01$, $p = .93$, .98 (.55 – 1.72)‡
Yes	60 (35.4)	22 (25.9)	
No	176 (74.6)	63 (74.1)	
Missing§	13	54	
Age (years) [n (M, SD)]	249 (53.59,15.93)	139 (56.27,17.96)	$t(386) = 1.52$, $p = .13$
Pain Duration (mos) [n (M, SD)]	231 (77.79, 102.67)	79 (64.62, 96.74)	$t(308) = -1.0$, $p = .32$

‡ OR not calculated due to more than two subdivisions of the variable
‡ χ^2 (df) = χ^2 statistic, p value, Odds Ratio (95% Confidence Intervals)
§Data were not included in statistical analyses or frequencies

Table 4 (cont). Statistical Comparison of PMQ Completers (PC) and PMQ Non-Completers (PNC)

Variables	PC (n = 249)	PNC (n = 139)	Statistic
Pending Litigation [n (%)]			$\chi^2(1) = 2.78$, $p = .10$,
Yes	18 (7.7)	2 (2.5)	3.31 (.75 – 1.72) ǂ
No	215 (92.3)	79 (97.5)	
Missing[§]	16	58	

‡ OR not calculated due to more than two subdivisions of the variable
ǂ χ^2 (df) = χ^2 statistic, p value, Odds Ratio (95% Confidence Intervals)
[§]Data were not included in statistical analyses or frequencies

Table 5. Statistical Comparison: Demographics of Treatment Groups

Variable	Idis-tx (n = 92)	Med-tx (n = 102)	Other-tx (n = 55)	Statistic
Gender [n (%)]				$\chi^2(2) = 2.16$, $p = .34$‡
Female	63 (68.5)	61 (59.8)	32 (52.7)	
Male	29 (31.5)	41 (40.2)	23 (41.8)	
Race [n (%)]				$\chi^2(8) = 15.86$, $p = .04$*‡
Caucasian	67 (73.6)	80 (87.0)	50 (96.2)	
African-American	16 (17.6)	7 (7.6)	1 (1.9)	
Hispanic	5 (5.5)	4 (4.3)	1 (1.9)	
Asian	1 (1.1)	1 (1.1)	0 (0.0)	
Other	2 (2.2)	0 (0.0)	0 (0.0)	
Missing§	1	10	3	
Marital Status [n (%)]				$\chi^2(6) = 8.17$, $p = .23$‡
Married	49 (53.3)	58 (60.4)	34 (64.2)	
Sep/Divorced	24 (26.1)	12 (12.5)	6 (11.3)	
Single	12 (13.0)	15 (15.6)	8 (15.1)	
Widowed	7 (7.6)	11 (11.5)	5 (9.4)	
Missing§	0	8	2	
Age (years) [n, M (SD)]	92, 50.62 (14.00)	102, 56.57 (16.18)	55, 53.02 (17.68)	$F(2,246) = 3.49$, $p = .03$*
Pain Duration (mos) [n, M (SD)]	84, 85.45 (99.38)	96, 75.04 (109.29)	51, 70.37 (96.09)	$F(2,246) = .49$, $p = .67$

§Data were not included in statistical analyses or frequencies
‡ OR not calculated due to more than two groups
*Significant $p<.05$

Table 6. Statistical Comparison: Pre-Treatment Measures of Treatment Groups

Measure	Idis-tx n (M, SD)	Med-tx n (M, SD)	Other-tx n (M, SD)	Statistic
VAS[T]	77, 7.64 (1.79)	88, 8.97 (10.78)	53, 8.85 (12.48)	$\chi^2(2) = 5.84$, $p = .05$[‡]
DPQ[T]	84, 88.13 (31.68)	94, 85.83 (29.42)	51, 83.73 (22.06)	$F(2,226) = .38$, $p = .68$
PMQ[T]	92, 26.41 (9.83)	102, 25.78 (11.91)	55, 24.74 (9.15)	$F(2.246) = .43$, $p = .65$
PRA[T]	64, 5.28 (5.28)	59, 3.68 (4.83)	37, 3.00 (4.95)	$\chi^2(2) = 8.29$, $p = .02$*[‡]

[T] n, M (SD)
[‡] OR not calculated due to more than two groups
*Significant p<.05

Table 7. Demographic Variables for Total Sample (N = 388)

Variables	Total Sample (N = 388)
Gender [n (%)]	
Female	252 (64.9)
Male	136 (35.1)
Race [n (%)]	
Caucasian	267 (68.8)
African-American	39 (10.1)
Hispanic	15 (3.9)
Asian	7 (1.8)
Other	3 (0.8)
Missing	57 (14.7)
Marital Status [n (%)]	
Married	194 (50.0)
Separated/Divorced	53 (13.7)
Single	55 (14.2)
Widowed	33 (8.5)
Living w/Sig other	1 (0.3)
Missing	52 (13.4)
Status of Condition [n (%)]	
Acute	17 (4.4)
Subacute	22 (5.7)
Chronic	277 (71.4)
Missing	72 (18.6)
Disability Payments [n (%)]	
Yes	82 (21.1)
No	239 (61.6)
Missing	67 (17.3)
Age (years) [n (M, SD, range)]	388 (54.55, 16.71, 15 - 89)
Pain Duration (mos) [n (M, SD)]	310 (74.44, 101.20)

(cont.)

Table 7 (cont). Demographic Variables for Total Sample

Variables	Total Sample (N = 388)
Pending Litigation [n (%)]	
Yes	20 (5.2)
No	294 (75.8)
Missing	74 (19.1)
Opioid Status [n (%)]	
Yes	112 (28.9)
No	114 (29.4)
Missing	162 (41.8)
Treatment Group [n (%)]	
Idis-tx	143 (36.9)
Med-tx	164 (42.3)
Other-tx	81 (20.9)

Table 8. Demographic Variables for the Core Sample (n = 249)

Variables	Core Sample (n = 249)
Gender [n (%)]	
Female	156 (62.7)
Male	93 (37.3)
Race [n (%)]	
Caucasian	197 (79.1)
African-American	24 (9.6)
Hispanic	10 (4.0)
Asian	2 (0.8)
Other	2 (0.8)
Missing	14 (5.6)
Marital Status [n (%)]	
Married	141 (56.6)
Separated/Divorced	42 (16.9)
Single	35 (14.1)
Widowed	23 (9.2)
Missing	8 (3.2)
Status of Condition [n (%)]	
Acute	13 (5.2)
Subacute	14 (5.6)
Chronic	210 (84.3)
Missing	12 (4.8)
Disability Payments [n (%)]	
Yes	60 (24.1)
No	176 (70.7)
Missing	13 (5.2)
Age (years) [n (M, SD, range)]	249 (53.59, 15.93, 15 - 87)
Pain Duration (mos) [n (M, SD)]	231 (77.79, 102.67)

(cont.)

Table 8 (cont). Demographic Variables for the Core Sample (n = 249)

Variables	Core Sample (n = 249)
Pending Litigation [n (%)]	
Yes	18 (7.2)
No	215 (86.3)
Missing	16 (6.4)
Opioid Status [n (%)]	
Yes	83 (33.3)
No	67 (26.9)
Missing	99 (39.8)
Treatment Group [n (%)]	
Idis-tx	92 (36.9)
Med-tx	102 (41.0)
Other-tx	55 (22.1)

Table 9. Demographic Variables for the H-PMQ and L-PMQ Scoring Groups

Variables	H-PMQ Group (n = 128)	L-PMQ Group (n = 121)	Statistic
Gender [n (%)]			$\chi^2(1) = .33$, $p = .57$, .86 (.51 – 1.44)‡
Female	78 (60.9)	78 (64.5)	
Male	50 (39.1)	43 (35.8)	
Race [n (%)]			$\chi^2(4) = 9.07$, $p = .06$‡
Caucasian	92 (77.3)	104 (90.4)	
African-American	18 (15.1)	6 (5.2)	
Hispanic	6 (5.0)	4 (3.5)	
Asian	1 (0.8)	1 (0.9)	
Other	2 (1.7)	0 (0.0)	
Missing§	0	6	
Marital Status [n (%)]			$\chi^2(3) = 8.25$, $p = .04$*‡
Married	68 (54.8)	73 (62.9)	
Separated/Divorced	28 (22.6)	13 (11.2)	
Single	20 (16.1)	15 (12.9)	
Widowed	8 (6.8)	15 (12.9)	
Missing§	4	5	
Status of Condition [n (%)]			$\chi^2(2) = 2.00$, $p = .37$‡
Acute	9 (3.5)	4 (7.4)	
Subacute	8 (5.2)	6 (6.6)	
Chronic	105 (91.3)	105 (86.1)	
Missing§	6	6	
Disability Payments [n (%)]			$\chi^2(1) = 7.22$, $p < .01$**, 2.30 (1.24 – 4.23)‡
Yes	40 (32.8)	20 (17.5)	
No	82 (67.2)	94 (82.5)	
Missing§	4	7	
Age (years) [n (M, SD, range)]	121 (51.74, 14.81, 15-87)	128 (55.54, 16.84)	$t(247) = 1.89$, $p = .06$

‡ χ^2 (df) = χ^2 statistic, p value, Odds Ratio (95% Confidence Intervals)
§Data were not included in statistical analyses or frequencies
*Significant at p<.05, **Significant at p<.01 (cont.)

Table 9 (cont). Demographic Variables for the H-PMQ and L-PMQ Scoring Groups

Variables	H-PMQ Group (n = 128)	L-PMQ Group (n = 121)	Statistic
Pain Duration (mos)[n (M, SD)]	118 (83.93, 99.24)	113 (71.38, 105.91)	$t(229) = -.93$, $p = .35$
Pending Litigation [n (%)]			$\chi^2(1) = .04$, $p = .84$, 1.11 (.42 – 2.91)[ǂ]
Yes	10 (8.1)	8 (7.3)	
No	114 (91.9)	101 (92.7)	
Missing[§]	14	12	
Treatment Group [n (%)]			$\chi^2(2) = .34$, $p = .84$[‡]
Idis-tx	49 (38.3)	42 (35.0)	
Med-tx	52 (40.6)	50 (41.7)	
Other-tx	27 (21.1)	28 (23.3)	

[‡] OR not calculated due to more than two subdivisions of the variable
[ǂ] χ^2 (df) = χ^2 statistic, p value, Odds Ratio (95% Confidence Intervals)
[§]Data were not included in statistical analyses or frequencies

Table 10. PMQ Descriptive Data for the Total Sample (n = 249)

n	249
Mean	25.78
Median	25.00
Mode	20.00
SD	10.57
Range	73.74
Minimum	2.26
Maximum	75.00
Skewness (SE)	.71 (.15)
Kurtosis (SE)	1.55 (.31)
Percentiles	
25.0	18.72
33.3	20.00
50.0	25.00
66.7	30.00
75	32.00

Table 11. PMQ Item Descriptives

Item	M	SD
1. I believe I am receiving enough medication to relieve my pain.	2.52[b]	1.29
2. My doctor spends enough time talking to me about my pain medication during appointments.	1.68[b]	1.44
3. I believe I would feel better with a higher dosage of pain medication.	2.20	1.36
4. In the past, I have had some difficulty getting the medication that I need from my doctors.	1.57	1.48
5. I wouldn't mind quitting my current pain medication and trying a new one, if my doctor recommends it.	1.02[b]	1.17
6. I have clear preferences about the type of pain medication I need.	1.97	1.24
7. Family members seem to think that I may be too dependent on my pain medication.	.82	1.15
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.	1.02[b]	1.24
9. At times, I take pain medication when I feel anxious and sad, or when I need help sleeping.	.86	1.09
10. At times, I drink alcohol to help control my pain.	.25	.56
11. My pain medication makes it hard for me to think clearly sometimes.	.91	1.11
12. I find it necessary to go to the emergency room to get treatment for my pain.	.50	.76
13. My pain medication makes me nauseated and constipated sometimes.	1.23	1.25

[a]Represents mean score for individual item, on a scale of 0-4 points, with higher score representing higher level of agreement with item, except where noted with b.
[b]Higher score represents higher level of disagreement with item.
(cont.)

Table 11 (cont). PMQ Item Descriptives

Item	M	SD
14. At times, I need to borrow pain medication from friends or family to get relief.	.25	.61
15. I get pain medication from more than one doctor in order to have enough medication for my pain.	.18	.43
16. At times, I think I may be too dependent on my pain medication.	.62	.97
17. To help me out, family members have obtained pain medications for me from their own doctors.	.13	.37
18. At times, I need to take pain medication more often than it is prescribed in order to relieve my pain.	1.17	1.16
19. I save any unused pain medication I have in case I need it later.	1.34	1.40
20. I find it helpful to call my doctor or clinic to talk about how my pain medication is working.	1.04	1.20
21. At times, I run out of pain medication early and have to call my doctor for refills.	.71	1.01
22. I find it useful to take additional medications such as sedatives to help my pain medication work better.	.60	.94
23. How many painful conditions, injured body parts or illnesses do you have?	1.63	1.40
24. How any times in the past year have you asked your doctor to increase your prescribed dosage of pain medication in order to get relief?	.85	1.12
25. How many times in the past year have you run out of pain medication early and had to request an early refill?	.62	1.01
26. How many times in the past year have you accidentally misplaced your prescription for pain medication and had to ask for another?	.19	.44

[a]Represents mean score for individual item, on a scale of 0-4 points, with higher score representing higher level of agreement with item, except where noted with b.
[b]Higher score represents higher level of disagreement with item.

Table 12. Physician Risk Assessment (PRA) for Opioid Misuse: Descriptive Data for Total Sample (n = 160)

n	160
Mean	4.16
Median	3.00
Mode	0.00
SD	4.95
Range	24.00
Minimum	0.00
Maximum	24.00
Skewness (SE)	1.34 (.19)
Kurtosis (SE)	1.53 (.38)
Percentiles	
25	0.00
33.3	0.00
50	3.00
66.7	5.00
75	6.0

Table 13. PRA Item Descriptives

Item	M	SD
1. Does this patient's history suggest misuse of medication or another substance?	.76	.97
2. Does this patient appear to have a history of compliance with treatment?	.76	.95
3. Does this patient appear to be exaggerating his/her level of pain, relative to his/her diagnosis?	.71	.89
4. Does this patient show excessive concern with getting or increasing medication?	.65	.88
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?	.56	.78
6. What is your current overall estimation of this patient's risk for opioid misuse?	.79	.96

Table 14. Comparison of Mean Scores on Physical/Functional and Psychological Measures between PMQ Scoring Groups

Measure	H-PMQ Group n (M, SD)	L-PMQ Group n (M, SD)	Statistic
PCS	55 (25.79, 6.48)	52 (29.07, 8.30)	$t(106) = 2.30$, $p = .02$*
MCS	55 (37.42, 12.02)	53 (44.34, 13.92)	$t(106) = 2.79$, $p < .01$**
VAS	107 (9.51, 12.98)	110 (7.44, 1.77)	$U = 5087.50$, $p = .10$, $r = -.20$
DPQ	114 (90.46, 29.09)	114 (82.11, 28.03)	$t(226) = -2.21$, $p = .03$*
OSW	114 (25.12, 11.01)	114 (20.64, 8.49)	$t(232) = -3.47$, $p < .01$**
BDI	49 (17.51, 11.39)	44 (13.55, 8.72)	$t(91) = -1.87$, $p = .07$

*p<.05, two-tailed
**p<.01, two-tailed

Table 15. Correlation Between PMQ Total Score and Measures of Physical/Functional and Psychological Measures

Measure	n	Pearson's r (with PMQ Total Score)	*p*
PCS	108	-.26	<.01**
MCS	108	-.32	<.01**
VAS	218	.11	.10
DPQ	229	.24	<.01**
OSW	235	.24	<.01**
BDI	93	.21	.04*

*p<.05, two-tailed
**p<.01, two-tailed

Table 16. Comparison of Risk Factors: Acknowledgment of Substance Abuse History (ASAH)

Risk Factor	Acknowledgement by PMQ Group H-PMQ (n = 112)	L-PMQ (n = 106)	Statistic
ASAH-Yes	9 (8.0) †	6 (5.7) †	$\chi^2(1) = .48$, $p = .49$, 1.46
ASAH-No	103 (92.0) †	100 (94.3) †	(.50 – 4.24) ǂ
	PMQ Score by Total Sample (n = 218)		
ASAH-Yes	15 (30.51, 14.58) ᵀ		$t(216) = -1.83$, $p = .07$
ASAH-No	203 (25.30, 10.31) ᵀ		

ǂ χ^2 (df) = χ^2 statistic, *p* value, Odds Ratio (95% Confidence Intervals)
†n (%)
ᵀn (M, SD)

Table 17. Comparison of Risk Factors: Answer of "Yes" to more than 1 CAGE question

Risk Factor	Endorsement by PMQ Group H-PMQ (n = 78)	 L-PMQ (n = 70)	Statistic
CAGE = 0	62 (81.6) †	63 (90.0) †	$\chi^2(1) = 2.19$, $p = .15$, 2.03
CAGE ≥ 1	14 (18.1) †	7 (10.1) †	(.77 – 5.38) ǂ
	PMQ Score by Total Sample (n = 146)		
CAGE = 0	125 (25.67, 10.40) ᵀ		$t(144) = -2.41$*, $p = .02$
CAGE ≥ 1	21 (31.98, 14.16) ᵀ		

ǂ χ^2 (df) = χ^2 statistic, *p* value, Odds Ratio (95% Confidence Intervals)
†n (%)
ᵀn (M, SD)
*Significant p<.05, two-tailed

Table 18. Comparison of Risk Factors: History of Drug Abuse

Risk Factor	Acknowledgement by PMQ Group H-PMQ (n = 35)	L-PMQ (n = 35)	Statistic
Hx Drug Abuse-Yes	7 (20.0) †	6 (17.1) †	$\chi^2(1) = .09$, $p = .76$,
Hx Drug Abuse-No	28 (80.0) †	29 (82.9) †	1.21 (.36 – 4.04)‡
	PMQ Score by Total Sample (n = 70)		
Hx Drug Abuse-Yes	13 (24.80, 9.44) ᵀ		$t(68) = -.72$, $p = .48$
Hx Drug Abuse-No	57 (24.87, 9.09) ᵀ		

‡ χ^2 (df) = χ^2 statistic, *p* value, Odds Ratio (95% Confidence Intervals)
†n (%)
ᵀn (M, SD)

Table 19. Comparison of Risk Factors: History of Opioid Detoxification

Risk Factor	Acknowledgment by PMQ Group H-PMQ (n = 35)	L-PMQ (n = 34)	Statistic
Hx Opioid Detox-Yes	1 (2.9)	0 (0.0)	$\chi^2(1) = .99, p = .32$⌐
Hx Opioid Detox-No	34 (97.1)	34 (100.0)	
	PMQ Score by Total Sample (n = 69)		
Hx Opioid Detox-Yes	1 (42.00, 0.0)⊤		$t(67) = -1.83, p = .07$
Hx Opioid Detox-No	68 (24.87, 9.26)⊤		

⌐Odds Ratio not calculated due to no cases in one of the groups
†n (%)
⊤n (M, SD)

Table 20. Comparison of Risk Factors: History of Alcohol (EtOH) Abuse

Risk Factor	Acknowledgement by PMQ Group H-PMQ (n = 35)	 L-PMQ (n = 34)	Statistic
Hx EtOH Abuse-Yes	5 (14.3) †	4 (11.8) †	$\chi^2(1) = .09$, $p = .76$,
Hx EtOH Abuse-No	30 (85.7) †	30 (88.2) †	1.25 (.31 – 5.11)ǂ
	PMQ Score by Total Sample (n = 69)		
Hx EtOH Abuse-Yes	9 (27.35, 11.66) ᵀ		$t(67) = -.73$, $p = .47$
Hx EtOH Abuse-No	60 (24.90, 9.10) ᵀ		

ǂ χ^2 (df) = χ^2 statistic, *p* value, Odds Ratio (95% Confidence Intervals)
†n (%)
ᵀn (M, SD)

Table 21. Comparison of Risk Factors: Smoking Status

Risk Factor	Acknowledgement by PMQ Group H-PMQ (n = 111)	 L-PMQ (n = 101)	Statistic
Smoker-Yes	34 (30.6) †	24 (23.8) †	$\chi^2(1) = 1.26$, $p = .26$, 1.42
Smoker-No	77 (69.4) †	77 (76.2) †	(.79 – 2.61)‡
	PMQ Score by Total Sample (n = 212)		
Smoker-Yes	58 (28.00, 10.29) ᵀ		$t(210) = -1.70$, $p = .09$
Smoker-No	154 (25.21, 10.79) ᵀ		

‡ χ^2 (df) = χ^2 statistic, *p* value, Odds Ratio (95% Confidence Intervals)
†n (%)
ᵀn (M, SD)

Table 22. Statistical Analysis of Opioid Status

Risk Factor	PMQ Group H-PMQ (n = 128)	PMQ Group L-PMQ (n = 121)	Statistic
Taking Opioids	53 (41.4) †	30 (24.8) †	$\chi^2(2) = 7.78$, $p = .02$*‡
Not Taking Opioids	31 (24.2) †	36 (39.8) †	
Unknown	44 (34.4) †	55 (45.5) †	
PMQ Score by Total Sample (n = 150)			
Taking Opioids	83 (28.15, 9.82) ᵀ		$t(148) = -2.57$, $p = .01$**
Not Taking Opioids	67 (24.05, 9.55) ᵀ		
PRA Score by Total Sample (n = 143)			
Taking Opioids	77 (5.66, 5.13) ᵀ		$t(141) = -3.76$, $p < .01$**
Not Taking Opioids	66 (2.51, 4.55) ᵀ		

‡ OR not calculated due to more than two subdivisions of the variable
†n (%)
ᵀn (M, SD)
*Significant p<.05, two-tailed
**Significant p≤ .01, two-tailed

Table 23. Comparison of Risk Factors: Referred for Opioid Misuse

Risk Factor	PMQ Group H-PMQ (n = 79)	PMQ Group L-PMQ (n = 67)	Statistic
Opioid Misuse-Yes	13 (16.5) †	2 (3.0) †	$\chi^2(1) = 7.14^{**}, p < .01$, 6.40
Opioid Misuse-No	66 (83.5) †	65 (97.0) †	(1.39 – 29.49) ∓
	PMQ Score by Total Sample (n = 146)		
Opioid Misuse-Yes	15 (31.33, 6.47) ᵀ		$t(144) = -2.23^{*}, p = .03$
Opioid Misuse-No	131 (25.31, 10.23) ᵀ		

∓ χ^2 (df) = χ^2 statistic, *p* value, Odds Ratio (95% Confidence Intervals)
†n (%)
ᵀn (M, SD)
*Significant p<.05, two-tailed
**Significant p≤ .01, two-tailed

Table 24. Logistic Regression for L-PMQ group and H-PMQ group

MODEL: Disability Payment Status (Y/N), MCS, DPQ, PMQ Items (1, 3, 6, 23), PRA Items (1, 2, 6), PRA Total, Referred for Misuse (n = 49)

		Predicted PMQ Scoring Group		
		L-PMQ	H-PMQ	% Correct
Observed PMQ Scoring Group	L-PMQ	22	2	91.7
	H-PMQ	5	20	80.0
		Overall Correct Classification Rate:		**85.7%**

Model χ^2	*df*	*p*
30.16	12	< .01

Summary of Logistic Regression Analysis of PMQ Scoring Group:

Variables	B	SE	Wald Statistic	p	Odds Ratio (OR)	95% Confidence Interval
Disability Pmts-No	-1.17	1.87	.39	.53	.31	.01 – 12.09
MCS	-.02	.04	.17	.68	.98	.90 – 1.07
DPQ	-.01	.02	.20	.65	.99	.95 – 1.04
PMQ Item 1	.11	.40	.08	.78	1.12	.51 – 2.47
PMQ Item 3	.06	.41	.02	.89	1.06	.47 – 2.38
PMQ Item 6	-.21	.44	.22	.64	.81	.34 – 1.94
PMQ Item 23	1.03	.49	4.47	.04	2.80	1.08 – 7.27
PRA Item 1	-.71	.97	.53	.46	.49	.07 – 3.30
PRA Item 2	-2.24	1.30	2.99	.08	.10	.01 – 1.35
PRA Item 6	-5.16	2.52	4.19	.04	.01	.00 - .81
PRA Total Score	1.96	.83	5.58	.02	7.11	1.40 – 36.19
Referral Misuse-No	1.87	2.25	.68	.41	6.40	.08 – 521.82

Table 25. Comparisons of Physician Risk Assessment for Opioid Misuse (PRA) Scores, between L-PMQ and H-PMQ Scoring Groups

PRA Item #	H-PMQ (n = 87)	L-PMQ (n = 73)	Statistic
1	.94 (1.02)[T]	.54 (.87)[T]	$t(158) = -2.65$, $p < .01$**
2	.99 (.99)[T]	.49 (.78)[T]	$t(158) = -3.39$, $p < .01$**
3	.92 (.99)[T]	.45 (.68)[T]	$t(158) = -3.34$, $p < .01$**
4	.87 (1.01)[T]	.38 (.62)[T]	$t(158) = -3.58$, $p < .01$**
5	.75 (.88)[T]	.34 (.56)[T]	$t(158) = -3.39$, $p < .01$**
6	.96 (1.05)[T]	.59 (.81)[T]	$t(158) = -3.34$, $p = .02$*
Total Score	5.43 (5.52)[T]	2.65 (3.65)[T]	$t(158) = -3.68$, $p < .01$**

[T] M (SD)
*Significant, $p < .05$, two-tailed
** Significant, $p < .01$, two-tailed

Table 26. Correlation between PMQ Total Score and PRA Individual Items and Total Score (n = 160)

PRA Item #	Pearson's r (with PMQ Total Score)	*p*
1	.29	<.01*
2	.31	<.01*
3	.32	<.01*
4	.36	<.01*
5	.31	<.01*
6	.26	<.01*
PRA Total	.35	<.01*

*Significant p<.01, two-tailed

Table 27. Behavioral Index: Use of Medication Agreement

Variable	PMQ Group H-PMQ (n = 84)	PMQ Group L-PMQ (n = 72)	Statistic
Med Agmt-Yes	38 (45.2) †	26 (36.1) †	$\chi^2(1) = 1.34$, $p = .25$, 1.46 (.77 – 2.79) ǂ
Med Agmt-No	46 (54.8) †	46 (63.9) †	
	PMQ Score by Total Sample (n = 156)		
Med Agmt-Yes	64 (27.04, 9.47) ᵀ		$t(154) = -1.16$, $p = .25$
Med Agmt-No	92 (25.14, 10.35) ᵀ		

ǂ χ^2 (df) = χ^2 statistic, *p* value, Odds Ratio (95% Confidence Intervals)
†n (%)
ᵀn (M, SD)

Table 28. Comparison of Behavioral Index: Early Refill Request

Variable	PMQ Group H-PMQ (n = 128)	L-PMQ (n = 121)	Statistic
Early Refill-Yes	9 (7.0) †	8 (6.6) †	$\chi^2(1) = .02$, $p = .90$, 1.07
Early Refill-No	119 (93.0) †	113 (93.4) †	(.40 – 2.87) ǂ
	PMQ Score by Total Sample (n = 249)		
Early Refill-Yes	17 (27.08, 13.09) ᵀ		$t(247) = -.52$, $p = .60$
Early Refill-No	232 (25.69, 10.39) ᵀ		

ǂ χ^2 (df) = χ^2 statistic, *p* value, Odds Ratio (95% Confidence Intervals)
†n (%)
ᵀn (M, SD)

Table 29. Comparison of Mean Scores on Subjective Physical/Functional and Psychological Measures between H-PMQ and L-PMQ Scoring Groups at Post-Treatment

Measure	H-PMQ	L-PMQ	Statistic
PCS	12 (29.18, 8.62)[T]	12 (33.79, 13.58) [T]	$t(22) = .99$, $p = .33$
MCS	12 (45.06, 10.65) [T]	12 (44.67, 10.66) [T]	$t(22) = .37$, $p = .72$
VAS	12 (4.42, 1.78) [T]	14 (4.71, 2.84) [T]	$t(24) = .310$, $p = .76$
DPQ	12 (73.50, 25.57) [T]	12 (61.42, 29.66) [T]	$t(22) = -1.07$, $p = .30$
OSW	12 (19.75, 8.37) [T]	12 (16.75, 9.03) [T]	$t(22) = -.84$, $p = .41$
PRA	16 (3.66, 4.76) [T]	10 (2.60, 3.86) [T]	$t(24) = -.59$, $p = .56$

[T]n (M, SD)

Table 30. Paired Samples t-tests at Follow-up: Comparison of Mean Scores on Physical/Functional and Psychological Measures between H=PMQ and L-PMQ Scoring Groups

Measure	Pre-tx	Post-tx	Statistic
PCS	16 (27.59, 9.01) [T]	16 (30.73, 12.33) [T]	$t(15) = -1.81$, $p = .09$
MCS	16 (42.19, 8.15) [T]	16 (46.48, 10.64) [T]	$t(15) = -1.83$, $p = .09$
VAS	26 (7.23, 2.41) [T]	26 (4.58, 2.37) [T]	$t(25) = 4.72$*, $p < .01$
DPQ	21 (82.19, 26.72) [T]	21 (66.95, 29.12) [T]	$t(20) = 1.67$, $p = .11$
OSW	24 (21.96, 6.08) [T]	24 (18.25, 8.65) [T]	$t(23) = 1.99$, $p = .06$
PRA	20 (3.60, 4.04) [T]	20 (3.38, 4.42) [T]	$t(19) = .23$, $p = .82$

[T] n (M, SD)
*Significant p<.01, two-tailed

Table 31. Early Termination Discharge Status by PMQ Scoring Groups.

Early Termination	L-PMQ (n = 43)	H-PMQ (n = 49)	Statistic
Yes	7 (16.3) †	11 (22.4) †	$\chi^2(1) = .55$, $p = .46$, 1.49 (.52 – 4.26)‡
No	36 (86.7) †	38 (77.6) †	

† n (%)
‡ χ^2 (df) = χ^2 statistic, *p* value, Odds Ratio (95% Confidence Intervals)

Table 32. Statistical Comparison between PMQ Total Score < 30 (LR-PMQ) and PMQ Total Score ≥ 30 (HR-PMQ)

Variable	LR-PMQ (n = 164)	HR-PMQ (n = 85)	Statistic
Age (years) [n (M,SD)]	164 (54.04, 16.50)	85 (52.71, 14.81)	$t(247) = .63$, $p = .53$
Pain Duration (mos) [n (M,SD)]	154 (76.12, 99.66)	77 (81.14, 109.04)	$t(229) = -.35$, $p = .73$
PCS [n (M,SD)]	72 (27.69, 8.26)	36 (26.81, 6.04)	$U = 1293.00$, $p = .98$
MCS [n (M,SD)]	72 (43.77, 13.38)	36 (34.99, 11.48)	$t(106) = 3.36$, $p < .01$**
VAS [n (M,SD)]	146 (7.52, 1.77)	70 (7.77, 2.00)	$t(214) = -.94$, $p = .35$
DPQ [n (M,SD)]	153 (82.99. 28.99)	76 (92.68, 27.38)	$t(227) = -2.43$, $p = .02$*
OSW [n (M,SD)]	155 (21.83, 10.82)	80 (25.23, 8.51)	$t(233) = -2.47$, $p = .01$**
PRA Item #1			$U = 1933.00$, $p < .01$**
PRA Item #2			$U = 1720.00$, $p < .01$**
PRA Item #3			$U = 1892.50$, $p < .01$**
PRA Item #4			$U = 1887.00$, $p < .01$**
PRA Item #5			$U = 1974.50$, $p < .01$**
PRA Item #6			$U = 2086.00$, $p < .01$**
PRA Total Score			$U = 1759.50$, $p < .01$**
Ref Misuse-Yes	5 (5.2)†	92 (94.8)†	$\chi^2(1) = 8.22$, $p < .01$**
Ref Misuse-No	39 (79.6)†	10 (20.4)†	4.72 (1.51 – 14.74)‡

*Significant p ≤ .05, two-tailed
**Significant p ≤ .01, two-tailed
†n (%)
‡ χ^2 (df) = χ^2 statistic, *p* value, Odds Ratio (95% Confidence Intervals)

Table 33. Logistic Regression for LR-PMQ group and HR-PMQ group

MODEL: Disability Payment Status (Y/N), MCS, DPQ, PMQ Items (1, 3, 6, 23), PRA Items (1, 2, 6), PRA Total, Referred for Misuse (n=49)

		Predicted PMQ Scoring Group		
		LR-PMQ	HR-PMQ	% Correct
Observed PMQ Scoring Group	LR-PMQ	33	4	94.3
	HR-PMQ	5	9	64.3
		Overall Correct Classification Rate:		**85.7%**

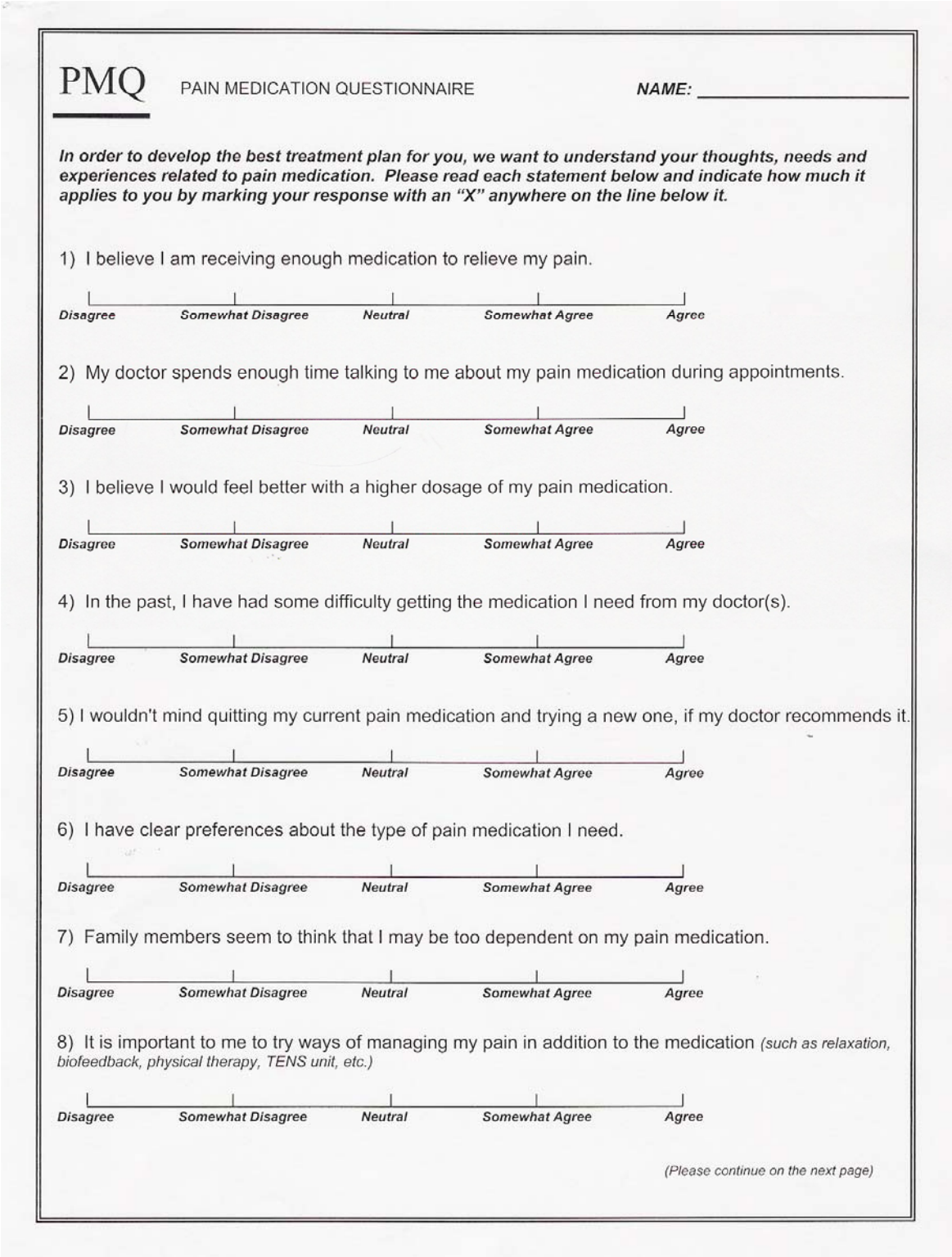
Model χ^2	*df*	*p*
31.30	12	< .01

Summary of Logistic Regression Analysis of PMQ Scoring Group:

Variables	B	SE	Wald Statistic	p	Odds Ratio (OR)	95% Confidence Interval
Disability Pmts-No	3.72	1.97	3.58	.06	41.13	.87 – 1934.48
MCS	-.17	.10	3.03	.08	.84	.70 – 1.02
DPQ	-.01	.03	.29	.59	.99	.94 – 1.04
PMQ Item 1	.79	.56	2.03	.15	2.21	.74 – 6.54
PMQ Item 3	.21	.52	.16	.69	1.23	.44 – 3.43
PMQ Item 6	.38	.55	.47	.49	1.46	.50 – 4.23
PMQ Item 23	1.18	.59	4.03	.05	3.24	1.03 – 10.21
PRA Item 1	-2.21	1.97	1.25	.26	.11	.00 – 5.23
PRA Item 2	-1.24	1.40	.79	.37	.29	.02 – 4.45
PRA Item 6	-4.10	2.71	2.29	.13	.02	.00 – 3.34
PRA Total Score	1.59	.88	3.32	.07	4.92	.87 – 27.34
Referral Misuse-No	-.92	1.99	.21	.64	.40	.01 – 19.80

APPENDIX C
Pain Medication Questionnaire

(Adams et al., 2004)



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

Date: _____ Name: _____
MR #: _____

INTAKE/BASELINE

PHYSICIAN RISK 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 (complete for all new evals, even if no opioid use)

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*

Does this patient (will this patient) have a medication agreement here?	**Yes**	**No**
Does it appear this patient was referred partly on the basis of opioid misuse?	**Yes**	**No**

Date: _____ Name: _____
MR #: _____

MIDPOINT

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**

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**

Date: _____ Name: _____
MR #: _____

MED-ONLY Follow-up Evaluation

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?

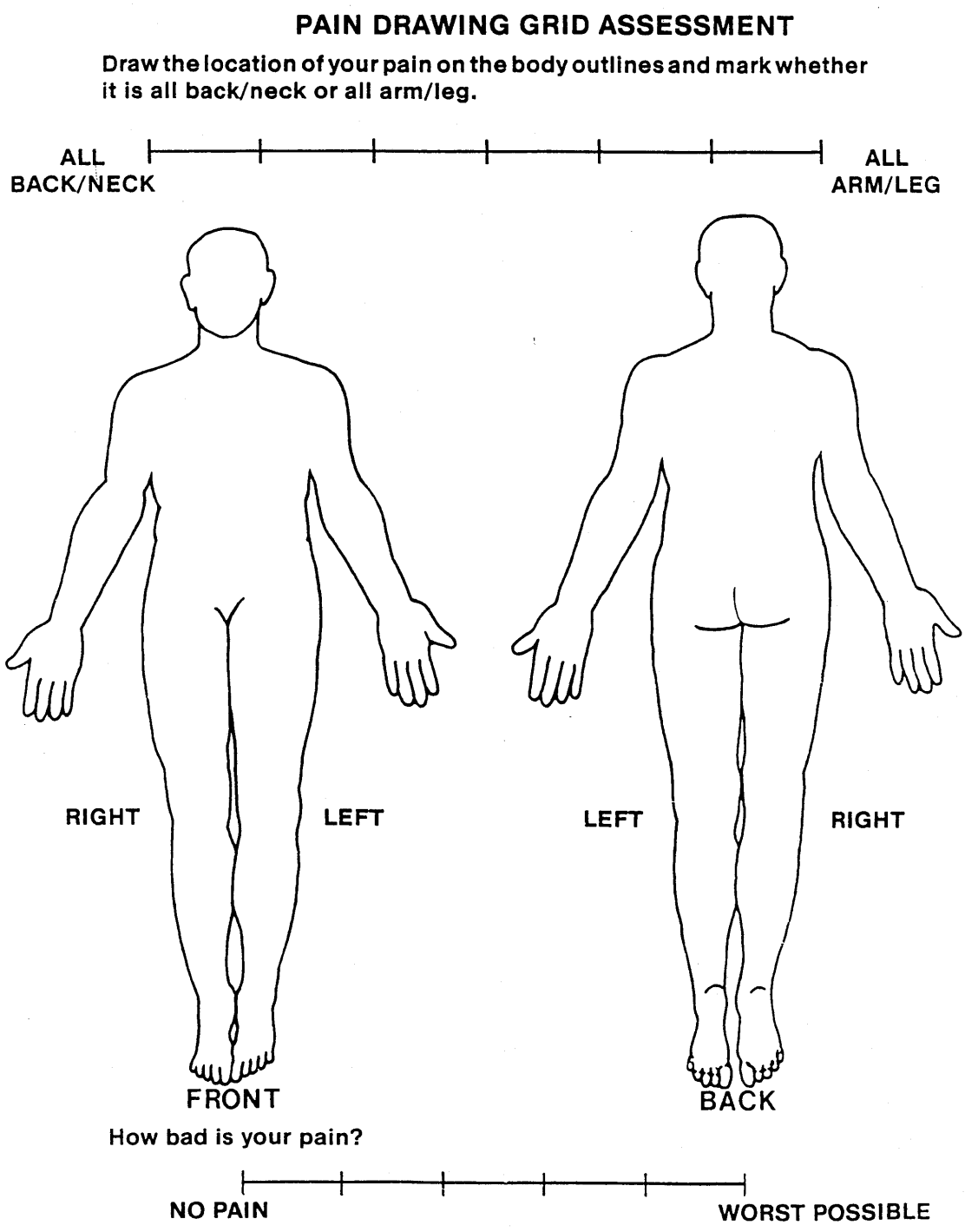
Not at all — *Somewhat* — *Obviously*

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**

(Anagnostis, Mayer, Gatchel, & Proctor, 2003)



Dallas Pain Questionnaire (Million, Haavik-Nilsen, Jayson, & Baker, 1981)

NAME: _____ **DATE:** _____

PLEASE MAKE AN "X" ALONG THE LINE TO SHOW HOW FAR FROM NORMAL TOWARD THE WORST POSSIBLE SITUATION YOUR PAIN PROBLEM HAS TAKEN YOU.

1. **How bad is your pain?**

no pain — worst possible

2. **How bad is the pain at night?**

no pain — worst possible

3. **Does the pain interfere with your lifestyle?**

no problem — total change in lifestyle

4. **How good are pain killers for your pain?**

complete relief — no relief

5. **How stiff is your back?**

no stiffness — worst possible stiffness

6. **Does your pain interfere with walking?**

no problem — cannot walk

7. **Do you hurt when walking?**

no pain — worst possible pain

8. **Does your pain keep you from standing still?**

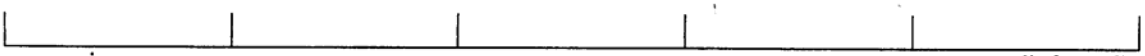
can stand still as long as I want — cannot stand still at all

9. **Does your pain keep you from twisting?**

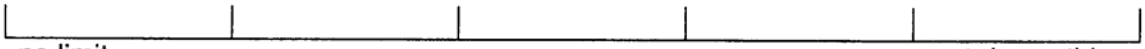
10. **Does your pain allow you to sit in an upright position?**

11. **Does your pain allow you to sit in a soft arm chair?**

12. **Do you have back pain when lying in bed?**



13. **How much does pain limit your normal lifestyle?**



14. **Does pain interfere with your work?**

15. **How much have you had to change your work because of back pain?**

(Fairbank, Couper, Davies, & O'Brien, 1980)

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

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: Tel: _____ Relationship: _____

Additional contact # 2: Tel: _____ Relationship: _____

Additional contact #3: Tel: _____ Relationship: _____

Date of birth: _____ Age: _____ Right- or Left-handed? (Circle one)

Gender: Male Female **Race:** Caucasian African-American Hispanic Asian Other

How did the pain start? (Circle as many as apply):

suddenly	bending
gradually	pulling
lifting	at work
twisting	motor vehicle accident
fall	direct blow to spine
sports injury	other: _____
unknown	

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

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

Are you receiving disability payments? Yes No

Which best describes your pain? (Circle as many as apply):

sharp	dull
burning	splitting
throbbing	crushing
shooting	stabbing
aching	sore
cramping	tingling

What brings on the pain or makes it worse? (Circle as many as apply):

sitting	lifting
standing	pulling
walking	bending forwards
running	bending backwards
twisting	during exercise
no apparent reason	using arms
after exercise	coughing
sneezing	other: _____

Patient Name: _____

What eases or eliminates the pain? (Circle as many as apply):

lying down	exercise
sitting	pain pills
standing	aspirin, Tylenol, Advil
walking	muscle relaxants
arthritis medicine	nothing
physical therapy	other: _____

Is it getting *better*, *worse* **or** *staying about the same*? (Circle one) **Is it** *constant* **or does it** *vary*? (Circle one)

Does your pain awaken you at night? YES NO (Circle one) **If yes, can you get back to sleep? YES NO** (Circle one)

How many hours do you sleep on an average night? _____ Do you take medicine to sleep? YES NO (Circle one)

Do you have trouble controlling your bladder or bowels? _____

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):

_____ _____

_____ _____

CURENT PAIN MEDICATIONS AND DOSE (Bring prescription bottles with you if you are uncertain):

_____ _____ _____

_____ _____ _____

Patient Name: _____

Have you had any tests for your current conditions? (Circle as many as apply):

x-rays	MRI (magnetic resonance imaging)
bone scan	nerve conduction test
CAT scan	EMG (electromyography)
myelogram	

ALLERGIES TO MEDICATIONS?: _____

CURRENT OTHER (NON-PAIN) MEDICATIONS AND DOSE (Bring prescription bottles with you if you are uncertain):

_____ _____ _____

_____ _____ _____

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):

_____ _____

_____ _____

Are there any diseases that run in your family? _____

Review of current symptoms (Circle any of the following if they apply to you):

unusual tiredness	unusual bleeding	heavy cough	trouble sleeping
fevers	easy bruising	chest pain	
chills	lumps or bumps	trouble breathing	
unusual sweating	swollen glands	depression	
loss of appetite	change in bowels habits	change in vision	
unexplained weight loss	blood in the urine or stool	seizures	
rashes	impotence	tingling (pins & needles)	

Patient Name: _____

SOCIAL HISTORY

What is your current occupation? _____ **Part-time or Full Time?** (Circle one)

(Please check one): **New employer since onset of pain?** _____ **Same employer since onset of pain?** _____

Have you participated in vocational training/retraining since the onset of your pain? YES NO (Circle one)

If you do not work, do you participate in other income producing activities? (i.e., rental properties, crafts, etc.)

YES NO (Circle one) If yes, please describe: _____

If you are not working, is it due to your initial onset of pain/ injury or a new pain/ injury? YES NO (Circle one)

Annual Household Income: _____

Marital Status: Single _____ Married _____ Widowed _____

Divorced/Separated _____ Living with Significant Other _____

Number of children: _____

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

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

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

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

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

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

Do you exercise? YES NO (Circle one) How often? _____

Females: Last menstrual period _____

Could you be pregnant? Yes ___ No _____ Birth Control Method _____

_____ _____

Patient Signature Date Attending Physician Signature Date

_____

Fellow Physician Signature Date

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VITAE

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