MULTIDIMENSIONAL PAIN INVENTORY: REVISED PROFILE CLASSIFICATIONS BASED ON CLINICAL OBSERVATIONS IN A PAIN SETTING

APPROVED BY SUPERVISORY COMMITTEE

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To all of my family and friends
who continuously support me in every endeavor.

MULTIDIMENSIONAL PAIN INVENTORY: REVISED PROFILE CLASSIFICATION BASED ON CLINICAL OBSERVATIONS IN A PAIN SETTING

by

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THESIS

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The purpose of this study was to build a new profile classification system for the Multidimensional Pain Inventory (MPI). According to some clinical researchers, the current profiles of the MPI do not fully portray how chronic pain patients evaluate and manage their pain because of the great variability in each

subgroup. This study tried to revise the current profile classifications based on clinical observations, which may then lead to facilitate improved patient assessment, professional communication, and treatment planning. Participants, who completed pre- and post- treatment MPI measures, were randomly selected from the interdisciplinary program at the Eugene McDermott Center for Pain Management at UT Southwestern Medical Center at Dallas. Two hundred and eighty patients were then assigned to three different groups depending upon the re-coded scores from their pre-treatment MPI. Patients were grouped according to their MPI subscale scores. In order to determine if the hypotheses were supported or not, paired t-test were completed on six different psychosocial and functional outcome measures. Analyses were also conducted to check for differences among the nine different groups. As postulated, a number of significant relationships were identified. Paired t-test analyses demonstrated the significance of the relationship between certain MPI subscales. When Pain Severity (PS) and Interference (I) were below average (as determined by recoded T scores), patients had a good prognosis. When Life Control (LC) equaled Affective Distress (AD), participants were seen to have a good prognosis as well. Associations between the other MPI subscales were also assessed, but data did not support those hypotheses. The majority of the outcomes did not meet expectation, because of several limitations with the study design.

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LIST OF ABBREVIATIONS

AC	Adaptative Coper
AD	Affective Distress
ANCOVA	Analysis of Covariance
BDI	Beck Depression Inventory-II
DPQ	Dallas Pain Questionnaire
D	Distracting Responses
DYS	Dysfunctional Coper
HRQoL	Health Related Quality of Life
ID	Interpersonally Distressed Coper
I	Interference
LC	Life Control
MCS	Mental Component Scale
MPI	Multidimensional Pain Inventory
OSW	Oswestry
PCS	Physical Component Scale
PS	Pain Severity
P	Punishing Responses
SF-36	Medical Outcomes Survey 36 Item Short form Health Survey
So	Solicitous Responses

LIST OF ABBREVIATIONS CONTINUED

S	Support
VAS	Pain Drawing Analog
WHYMPI	West Haven Yale Multidimensional Pain Inventory

CHAPTER ONE

INTRODUCTION

Chronic pain has an overwhelming effect on the quality of life of a person. Pain can cause obstacles in eating, mobility, sleeping, and overall ability to function in all aspects of life. Chronic pain can also lead to emotional and mental problems like anxiety, depression, fatigue, frustration, and lowered self-esteem. It has been accepted that pain is a biopsychosocial phenomenon and that the factors form a dynamic interaction. The healthcare world must find a way to provide for the increasing frequency and the devastating effects of pain, which are becoming a major concern. With more than half of all Americans experiencing recurrent or chronic pain in the past year, an efficient treatment must be found.

The Multidimensional Pain Inventory (MPI) was constructed specifically for use with chronic pain patients. It has been found to be an instrument that has been used to identify subgroups of patients and their coping styles. The MPI is professed to capture the multidimensionality of chronic pain across a number of psychosocial and behavioral variables. The MPI empirically derived three main subgroups of chronic pain patients, and these profiles were labeled as adaptive (AC), dysfunctional (DYS), and interpersonally distressed (ID) coping styles. These profiles allowed healthcare providers to tailor a treatment plan based upon the individual and his/her own personal problems. However, several studies

found that MPI profile clarifications are needed for chronic pain patients because the current three profiles do not fully characterize how patients evaluate and manage their pain. The purpose of this study was to revise the current profile classifications based upon clinical observations within a chronic pain setting, which may facilitate improved patient assessment, professional communication, and treatment planning within the chronic pain setting.

CHAPTER TWO

LITERATURE REVIEW

According to the American Chronic Pain Association, over 50 million people are living with some type of pain (2005). As Gatchel and Turk (1996) noted, pain is arguably one of the most universal forms of stress. The treatment of chronic pain costs more than $70 billion in annual health care costs (Gatchel, 2001). Yet, treatment for chronic pain continues to challenge health care providers and, if treated ineffectively, the emotional components of pain escalate progressively until the emotional symptoms eclipse all aspects of the patient's life.

Back pain is a phenomenon that most individuals experience at some point in their lives. It is the leading cause of disability in individuals under the age of 45, and it is the third leading cause of disability in those older than age 45, making it a major health care problem in the United States (Akuthota, 2001). This pain not only effects the individual who suffers from the pain, but it also effects his or her significant others as well, leaving only a small percentage of the population untouched by this devastating problem (Gatchel, Adams, Polatin, & Kishino, 1999). The pursuit to understand and control pain has been a significant human goal since the beginnings of time.

Theories of Pain

As people develop a greater understanding of pain, it is important to form new models for pain. Since the beginning of time, pain was first seen as a punishment from the Gods. The ancient Greek physician, Hippocrates, hypothesized one of the earliest theories of personality when he stated that four bodily fluids or "humors" were responsible for specific personality types and various physical or mental illnesses (Meldrum, 2003). Melzack and Wall (1965) introduced the Gate Control Theory, which had the greatest influence on the subsequent acceptance of the fact that there was a close interaction between psychological and physiological processes and pain. This theory assumed that there were a number of structures within the central nervous system that significantly contributed to pain. Melzack and Wall (1965) hypothesized that a gate, located in the dorsal horn of the spinal cord, regulated the passage of transmission (T) cells. The passage of T cells depends upon the relative firing of inhibitory and excitatory fibers. If the number of excitatory fibers exceeds the number of inhibitory fibers, the gate opens allowing for the activation of T cells, which allows for pain to be felt. Conversely, if the number of inhibitory fibers exceeds that of the excitatory fibers, the gate remains closed, blocking the T-cells, and in turn blocking the pain impulse.

Yet a new theory was needed to explain the complexity of interactions involved in the pain process. This need allowed for the development of the

biopsychosoical model of pain. The biopsychosocial model recognizes the variety of ways that pain effects patient's lives. Today, this model conceptualizes pain by examining the interplay between the biological, physiological, cognitive, behavioral, and social aspects of pain (Gatchel, 1999). Instead of focusing solely on an underlying somatic cause, the individual's unique situations must be addressed as well. Because chronic symptoms extend over time, they must be viewed as a longitudinal, ongoing process. During the acute phase of an illness, the biological factors may take precedence, but over time, as the symptoms become chronic, the psychological and social factors begin to play important roles in the response to treatment, temperament, and interaction with significant others. Therefore, it is crucial that all models of pain treatment utilize this heuristic approach (Turk & Monarch, 2002). This model has effected many interdisciplinary treatment programs designed to help patients deal with all aspects of their pain.

Pain

The International Association for the study of Pain (1984) defines pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage. It is also subjective from person to person. In the body, signals travel through a network of peripheral nerves that run throughout the body to the central nervous system, the brain, and spinal cord. There they gather in the dorsal horn, a site in the spinal cord that acts as a "clearinghouse" for pain

messages. The signals are transmitted into the brain's thalamus, which sorts them and passes them on to the cerebral cortex, where the pain is actually "felt" (Arnst, 1999).

Everyone at some point will experience acute pain episodes; however, the vast majority do not progress to chronic pain, nor does their pain disable them. The primary difference between acute and chronic pain is that acute pain serves as a biological signal. The acute signal points to the underlying cause, and directs the physician to the origin of the pain, which generally leads to a well-defined treatment plan with a predictable outcome. The key to acute pain is that the location, pattern, and description of the pain usually lead the physician to the underlying cause (Gatchel & Epker, 1999). Chronic pain lacks biological purpose and alerts the physician only that something is wrong somewhere in the patient's life. The problem or pain can have origins in any aspect of the patient's life or body. We do not really know what causes most types of chronic pain. What we do know is that it is usually not a helpful communication tool that our bodies use. That is, it is usually not a "warning system" that alerts us to the possibility of further damage. Unfortunately, because this "warning system" is the main purpose of acute pain, people often misinterpret chronic pain as indicating that further damage is occurring. Chronic pain, in fact, appears to serve no useful purpose at all.

While many people are able to carry on their usual activities despite chronic pain, and/or modify their lifestyle to accommodate for it, others might be severely disabled and/or distressed by their pain. There are often differences in the site of the pain, its severity, the actual sensations (e.g. sharp, tingling, numbing) and how often it is experienced. Interestingly, the same type of injury in any two people can result in very different experiences of pain.

In addition to the varying experience of physical pain among people, the ways in which they cope with their chronic pain condition also range widely. Another component of pain, which changes from person to person, is the effect that the pain has on one's life. The overall experience of chronic pain is a very individual experience (Lazarus and Folkman, 1984).

The majority of acute pain patients will recover from their pain experience; however, a small percentage will go on to develop chronic pain. Chronic pain is definitely a problem if it is prolonged, and extremely distressing the longer it persists, and particularly if it interferes significantly with a person's life. It can lead to a number of problems including job loss, financial difficulties, relationship difficulties, a decrease in usual activity, depression, anxiety, and insomnia.

Gatchel (1996) proposed a three-stage model to account for the progression from acute to chronic pain. The first stage, the acute phase, is characterized by the patient's natural, emotional responses to his/her perceived

pain. Initial fear, anxiety, and worry are common, coupled with the removal, if possible, of the pain provoking stimuli. Often, these troubling feelings subside as the pain subsides; however, if the pain persists beyond the duration of the typical healing process, the patient progresses to the next stage. In Stage 2, the sub-acute phase, patient's psychological and behavioral reactions resulting from their condition begin to intensify. In this stage, feelings of anger, distress, somatization, and learned helplessness become more apparent. Gatchel (1996) suggests that patient's premorbid psychological functioning, personality characteristics, current socioeconomic status, and environmental conditions all influence their response to the pain. Finally, Stage 3, the chronic phase, occurs when the patient begins to adopt the "sick role." This allows the patient to avoid social obligations and responsibilities, which in turn reinforces the patient's dependent behavior. If patients have persistent pain and continue to use maladaptive cognitive and behavioral coping strategies, then the degree of suffering and functional disability associated with the pain may be significantly increased.

Chronic Pain

Many studies have recognized that a high self-report of pain and disability are potentially important in predicting those with an acute episode who later progress to development of chronic back pain, and those who will not respond to treatment (Gatchel, Polatin, & Mayer, 1995). Greater intensity of self-reported

pain was also found to be a predictor of persisting pain 6 months after initial report of back pain (Philips, Grant, & Berkowitz, 1991). These types of studies provide evidence of the importance of the severity of acute pain. Additionally, Feuerstein, Berkowitz, and Peck (1997) found that psychosocial factors appear to be related closely to chronicity development. They completed a large-scale study of musculoskeletal-related disability in United States Army personnel. They not only found that back-related disorders were the most prevalent disability, but they also found a number of risk factors for developing chronic low back pain. They found that interpersonal stressors, role conflict, and repetitive/boring work were all contributing risk factors. In 1997, the National Advisory Committee on Health and Disability developed a summary of psychosocial risk variables: maladaptive attitudes and beliefs about back pain; display of frequent pain behaviors; reinforcement of pain behaviors by family members; lack of social support; compensation issues; heightened emotional reactivity; and job dissatisfaction. These variables can be used as a guide to assessing psychosocial risk factors for long-term pain disability and work loss.

Predictors of Chronic Pain

Chronic pain has enormously harmful repercussions, for both the patient and the economy. For this reason, there has been an expanding endeavor to understand the risk factors that make acute pain patients susceptible to further progression to chronic pain.

Many other variables have successfully predicted the progression of acute to chronic low back pain. Volinn, Van Koevering, and Loeser (1991) found that patients 40 years and older are two times more likely to report chronic pain than patients who are 25 or younger. Family status has also been recognized as a potential factor. For example, one study found that married patients returned to work significantly sooner than single patients with no children. Findings indicate that individuals with no apparent physiological pathology experienced significantly more highly stressful events before pain onset than organically determined chronic pain patients (Lampe et al., 1998).

The development of chronic pain also appears to be related with wage earnings, compensation, and pending litigation (Barnes, Smith, Gatchel, & Mayer, 1989; Kerns, Bayer, & Findley, 1999). Wage earnings have been shown to predict chronicity of low back pain. Patients who earned less than $1,000 a month were twice as likely to develop chronic low back pain than patients who earned more than $1,000 a month (Gatchel, Gardea, 1999; Volinn et al., 1991). Mayer (1999) suggests that financial compensation does not motivate chronic pain patients to rapidly return to work. Research has found that overall, patients receiving financial compensation reported increased levels of pain, depression, disability, poorer prognosis, and decreased productivity (Gatchel & Gardea, 1999).

Interdisciplinary Treatment Centers for Pain

Interdisciplinary treatment providers work together, extensively coordinating treatment plans and individualized goals. Ongoing communication is a vital part of this treatment modality. Interdisciplinary team members usually include a physician, nurse, psychologist, physical therapist, occupational therapist, and a medical-disability case manager (Gatchel & Turk, 1999; Wright & Gatchel, 2002). Gatchel & Turk (1999) outlined four important factors that determined the success of an interdisciplinary pain treatment program, including: 1) an understanding of the philosophy of the treatment program by all staff members; 2) regular meetings to reinforce goals and maximize communication among team members; 3) reinforcement among team members for each other's role and efforts along with communication of respect for specific skills; and 4) systematic monitoring of treatment outcomes in order to assure quality assurance. The goals of this method of treatment focus on maximizing function and minimizing pain, increasing productivity and a return to work, reducing future healthcare utilization, avoiding medication dependence, and helping patients assume responsibility for progress and management (Gatchel & Turk, 1999).

Psychological Disturbance and Chronic Pain

Some research suggests that within a chronic pain population there is a significant comorbidity of psychological disturbances and physical disorders (Dworkin, Von Korff, & LeResche, 1990). Much discussion persists as to which

is the primary cause, the physical illness or the psychological disturbance. Results from one study indicated that those patients who were unable to find an effective solution to their pain problems through common medical procedures developed psychopathology as a result (Dworkin, Von Korff, & LeResche, 1990). Yet another study suggested that a large proportion of chronic pain patients have endured a great amount of psychological problems prior to the experience of pain (Polatin, Kinney, Gatchel, Lillo, & Mayer, 1993). Researchers continue this debate of whether the pain condition came before the psychological problems; however, most researchers agree as to the importance of coping strategies in the development and maintenance of chronic pain (Fordyce, Roberts, & Sternbach, 1985; Lazarus & Folkman, 1984; Turk & Flor, 1987).

Coping Strategies

Lazarus and Folkman (1984) defined coping as "ongoing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 346). Kerns and Turk (1985) noted that pain assessment should consist of a number of points, including the individual's coping strategies. It has been found that active coping strategies (i.e., staying busy, ignoring pain, distraction) are usually associated with less pain, whereas passive coping strategies (i.e., restricting activities due to pain, engaging in wishful thinking, depending on others to relieve pain) are associated with more severe pain (Brown & Nicassio, 1987). Manne and Zautra

(1992) found that patients who rely on passive, avoidant, or emotion-focused mechanisms for coping usually report lower self-esteem, poorer adjustment, and greater negative effect as opposed to patients who utilize active, problem-solving techniques.

Multidimensional Pain Inventory, (MPI)

The belief that pain patients vary with regard to their coping styles, or characteristic way of dealing with pain, leads to the hypothesis that accurate assessment of coping strategies is pertinent in designing appropriate treatment programs for chronic back pain patients. Because Kerns, Turk, and Rudy (1985) were dissatisfied with the limited number of coping styles measures available, they developed the West Haven-Yale Multidimensional Pain Inventory (WHYMPI). The WHYMPI, also known more commonly as the Multidimensional Pain Inventory (MPI), was constructed specifically for use with chronic pain patients. It is a brief, sixty-one item, self-report measure designed to assess the impact of pain on the individual's life, the patient's perceived responses of others to the patient's pain, and the frequency of patient participation in common daily activities (Kerns et al., 1985). The MPI is an instrument that has been used to classify subgroups of patients, and is professed to capture the multidimensionality of chronic pain across a number of psychosocial and behavioral variables (Kerns et al., 1985).

In a study by Turk and Rudy (1988) on the MPI, three subgroups of chronic pain patients were derived empirically and these groups were labeled as adaptive (AC), dysfunctional (DYS), and interpersonally distressed (ID) copers. The DYS patients were characterized by high pain severity, marked interference with everyday life due to pain, high affective distress, low perception of life control, and a low activity level. The AC patients reported lower pain severity, lower interference, lower levels of affective distress, a higher activity level, and a higher degree of life control than the other two subgroups. The ID patients were mainly distinguished by lower reported levels of social support, lower scores on solicitous and distracting responses from significant others, and higher scores on punishing responses compared to the DYS and AC patients (Rudy, Turk, Zaki, & Curtin, 1989). The MPI assesses common daily activities and establishes a baseline activity rate upon which treatment progression/regression may be measured.

The MPI classification algorithm uses a goodness of fit decision rule to determine whether an individual's set of MPI standardized scale scores is similar to that of a prototypical profile in order to be assigned to one of the three copying style subgroups: AC, ID, or DYS. The MPI program uses 9 of the 13 scales to generate a classification of each patient into one of three copying styles (i.e. DYS, ID, AC) or into one of the three non-prototypic profiles (Hybrid, Anomalous, or Unanalyzable). Designation as Hybrid indicates that a patient's profile represents

aspects of two of the classifications. An Anomalous classification indicates that the patient's profile contained inconsistencies such that statistically confident classification was not possible. Unanalyzable classification indicates that more than 2 of the 9 scales used in the calculation are missing data. Test results that do not fall clearly into one of the profiles or that contain missing scale values are considered invalid for meaningful clinical interpretation. The MPI needs more meaningful patient clusters so that it can predict treatment outcomes more effectively.

Research has also found that the MPI is predictive of long-term pain (Epker & Gatchel, 2000). The MPI clusters have also demonstrated the ability to predict treatment completion and establish who will benefit from treatment (Rudy, Turk, Kubinski, & Zaki, 1995). Despite this, some studies have found that for a sizable number of chronic pain patients, MPI classifications may not be stable, trait-like characterizations (Broderick et al., 2004). Broderick, Junghaenel, and Turk (2004) examined the adaptational classification stability of the MPI in two samples of fibromyalgia patients. Retest at post-treatment resulted in one-third of patients being assigned to a different classification. Twenty patients had four repeated MPI assessments over a 10-month period; 85% of them changed classification at least once. Turk and Okifuji (1998) noted that the assessment of MPI profiles would lead to important "tailoring" of needs or treatment strategies to account for the different personality characteristics of patients. Another study

found that specific coping strategies and greater flexibility in coping were associated with greater perception of control (Haythornthwaite, 1998). A study by Zaza (2000) examined the generalizability of non-malignant pain patients with profiles based on the MPI to patients with cancer related pain. In this study, data were collected from 112 cancer patients. In total, only 107 out of the 112 completed the MPI. Of the 96% of patients classified, only 60% were classified by the three main profiles. This and other various studies show that one setback of the MPI is the fact that it is unable to classify all patients into the three profiles. Other studies have also reported that anywhere from 3-30% of patients are unclassifiable (Okifuji, 1999). In a recent study to evaluate whether the MPI is effective for predicting response to interdisciplinary treatment in a heterogeneous group of patients with chronic pain, it was found that the MPI subgroup classification did not significantly predict the degree of positive treatment outcomes (Davis, Reeves, Graff-Radford, Hastie, & Naliboff, 2003).

Many studies have found that the MPI provides a way to identify patients with high levels of disability perceptions, affective distress, or those prone to pain magnifications (Townsend et al., 2005). It is also evident that serial administrations of the MPI can track changes in measured variables during the course of treatment and assess outcomes. However, other studies have found that the MPI profiles clarifications are needed for chronic back pain patients because the three profiles present do not fully characterize how patients evaluate and

manage their pain. One reason for this could be the great variability within each profile; better cutoff scores would allow for a marked difference.

Several other investigators have also questioned the MPI subgrouping algorithm, as well as the MPI scales upon which it is based (Robinson, 1997). Robinson et al (1997) showed that the MPI could be easily manipulated, yielding questionable results. Deisinger (2001) and Riley (1999) were unable to duplicate the MPI factor structure.

A recent study by McCracken (2005) investigated the relations between solicitous, punishing, and distracting responses from significant others in the patient's life. Results showed both solicitous and punishing responses from significant others were negatively associated with acceptance of pain. This suggests that social influences can play a role in patient's engagement in activity with pain present and their willingness to have pain without trying to avoid or control it.

Although the MPI has been effectively used with specific types of chronic pain syndromes, no study has been performed to evaluate whether more distinct profiles will allow for better assessment and provide for more accurate prediction of treatment outcomes. The current investigation is designed to do so.

Goals and Hypotheses of the Present Study

The purpose of this study was to develop better patient profiles described on the MPI. According to the MPI, a patient with a T-score of 40 in pain-severity is given the same profile of a person with a T-score of 60. A greater need for specific profiles is needed in order to better differentiate between chronic pain patients in various areas such as observed physical functioning, self-reported pain, depressive moods, quality of interpersonal relationships, and perceived functional limitations. The current study was conducted with the intent to explore new, more specific patient profiles that would help determine that patient's treatment outcomes. Some clinicians and researchers feel that the current profiles do not fully characterize how patients evaluate and manage their pain (A.W. Stowell & M. Deschner, personal communication, January, 2005). The purpose of this study was to revise the current profile classifications based on clinical observations within a chronic pain setting, which may facilitate improved patient assessment, professional communication, and treatment planning within the chronic pain setting.

Clinical evaluation and research with chronic pain patients will be used to investigate the relationships between the internal sub-scales to generate new profiles for patients. It was hypothesized that overall, profiles that distinguish patients on the internal subscales will allow for improvement in other patient

areas. It is also hypothesized that with clearer profile classifications, better predictions and treatment recommendations can be made.

Clinical Observations

Based upon the clinical expertise of two psychologists at The Eugene McDermott Center for Pain Management at UT Southwestern Medical Center, the following hypotheses were made. They have observed the following when dealing with their patients based upon their combined more than 25 years of experience in the field (A.W. Stowell & M. Deschner, personal communication, January, 2005). Consequently, we have made the following hypotheses.

Hypotheses

Based on the literature review and experts, the following a priori hypotheses were proposed for the MPI analysis:

1) Patients with below average *Pain Severity* (PS) scores and with above average *Interference* (I) scores will have a poor prognosis (PS$\downarrow$ and I$\uparrow \Rightarrow$ poor prognosis);
2) Patients with above average *Pain Severity (PS)* scores and below *Interference* (I) scores will have a good prognosis (PS$\uparrow$ and I$\downarrow \Rightarrow$ good prognosis);
3) Patients with average or below average *Pain Severity* (PS) and *Interference* (I) will have a good prognosis (PS$\underline{\downarrow}$ and I$\underline{\downarrow} \Rightarrow$ good prognosis);

4) Patients with an above average *Pain Severity* (PS) and *Interference* (I) levels will have a poor prognosis (PS↑ and I↑ ⇒ poor prognosis);
5) Patients with above average or average *Life Control* (LC) with *Affective Distress* (AD) at below average will have a poor (LC↑ and AD↓ ⇒ poor prognosis);
6) Patients with *Life Control* (LC) equaling or falling within the same range as their *Affective Distress* (AD) will have a good prognosis (LC=AD ⇒ good prognosis);
7) Patients with average or above average *Support* (S) and *Distracting Responses* (DR), with below average *Punishing Responses* (P) and *Solicitous Responses* (So) levels, will have a good prognosis (S↑ and D↑ and P↓ and So↓⇒good prognosis);
8) Patients with average or above average *Support* (S), *Solicitous Responses* (So), and *Punishing Responses* (P) levels, with below average *Distracting Responses* (DR) levels, will have a poor prognosis (S↑ and So↑ and P↑ and D↓⇒poor prognosis); and,
9) Patients who show above average *Pain Severity* (PS), *Interference* (I), and *Affective Distress* (AD) levels, with below average *Life Control* (LC), will have a poor prognosis (PS↑ and I↑ and AD↑ and ↓LC ⇒ poor prognosis).

* All scores/levels described refer to specified MPI sub-scale T-scores.
* Good Prognosis is defined by the patient getting better from pre-treatment to post-treatment as determined by the outcome measures cutoff scores.
* Poor Prognosis is defined by the patient staying the same or getting worse from pre-treatment to post-treatment as determined by the outcome measures cutoff scores.

CHAPTER THREE

METHOD

Subjects

Chronic pain participants (N=280) were initially evaluated at The Eugene McDermott Center for Pain Management at the University of Texas Southwestern Medical Center at Dallas for the comprehensive interdisciplinary program. The inclusion criteria for participation in this study included the following: (1) the patient was English speaking; (2) the patient had a fully completed pre-treatment MPI and post-treatment MPI; (3) the patient had persistent pain that limited his or her work and other activities of daily living.

Instruments and Outcome Measures

The West-Haven-Yale Multidimensional Pain Inventory (MPI; Kerns et al., 1985). The MPI is a 61 item, self-report measure that adopts a cognitive-behavioral perspective to examine how participants evaluate and manage their pain. The measure yields three coping styles: Adaptive (AC), Interpersonally Distressed (ID), and Dysfunctional (DYS); and consists of eight subscales that evaluate the patient's perception of pain. The MPI was based on a normative sample of chronic pain patients and has good internal consistency reliability with kappa coefficients of .70 to .90, depending on the scale (Kerns et al., 1985).

Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI is a 21-item self-report inventory designed to assess the

presence and intensity of depressive symptomatology. The items are multiple-choice and are scored from 0 to 3, with a potential range of scores from 0 to 63. Research using the BDI has established good reliability and internal consistency (Beck, Steer, & Garbin, 1988) and the psychometric properties include internal consistency reliability coefficients exceeding .73 in non-psychiatric samples. The total score is the sum of all responses, with scores interpreted as: 0-13 indicates "minimal depression"; 14-19 indicates "mild depression"; 20-28 indicates "moderate depression"; and 29-63 indicates "severe depression."

Visual Analogue Scale (VAS) (VAS; Alaranta, Soukka, & Harju, 1990). This instrument is a visual analogue scale used to rate the patient's degree of pain on a scale from 0 (no pain) to 10 (worst possible pain). Many studies support the use of the VAS with chronic pain patients. Also, the VAS has demonstrated good psychometric properties (Alaranta et al., 1994; Gatchel, Mayer, Capra, Diamond, & Barnett, 1986; Rissanen, Alaranta, Sainio, & Harkonen, 1994).

The Dallas Pain Questionnaire (DPQ; Million, Haavik-Nilsen, Jayson, & Baker, 1981). The DPQ is an analog scale comprised of 15 self-report items assessing perceived pain and disability. Subjects indicate their response to each item by marking a point on a 10-cm line, representing a range of possible answers from 0 to 10. The total score is the sum of all responses, with scores interpreted as: 0-39 indicates "mildly disabling" pain; 40-84 indicates "moderately disabling pain"; and 85 and above indicates "severely disabling pain." The DPQ has

particular utility when the self-report of pain surpasses what would be expected given physical findings. If this occurs, it is suggested that there is a psychosocial component to the patient's disability (Capra, Mayer, & Gatchel, 1985).

Medical Outcomes Survey 36-Item Short Form Health Survey (SF-36; Ware, Snow, Kosinski, & Gandek, 1993). The SF-36 is a 36-item questionnaire that assesses health-related quality of life (HRQoL), both physical and mental, from the point of view of the health care recipient. It is widely used for routine monitoring and assessment of health-care treatment outcomes. It has eight different scales, as well as two standardized summary scales, the Mental Component Scale (MCS) and the Physical Component Scale (PCS). Both the MCS and the PCS correspond, respectively, to patient's overall sense of mental and physical well-being. The availability of population-based normative data from various medical populations (such as a spinal population) makes the SF-36 useful for comparative purposes as well. The SF-36 has been found to have high test-retest reliability coefficients, and examination of internal consistency has found Cronbach's alphas exceeding .70, and usually above .80 (Ware et al., 1993).

Oswestry Disability Questionnaire (OSW; Fairbanks, Couper, Davies, & O'Brien, 1980). The Oswestry is a self-rating scale comprised of 10 questions that assess limitations of various activities of daily living secondary to pain and gives an evaluation of the degree of functional impairment. The items are scored on a 0-5 point scale, with a potential range of scores from 0 to 50. The Oswestry

has demonstrated adequate reliability, with test-retest reliability found to be .99 with 24 hours between administrations, and it has adequate validity (Kaplan, Wurtele, & Gillis, 1996; Leclaire, Blier, Fortin, & Proulx, 1997).

Procedure

Each new patient seen at the Center undergoes a comprehensive pre-treatment evaluation with a physician, physical therapist, behavioral medicine psychologist and, when needed, a psychiatrist or other health care specialist. The interdisciplinary team then develops a specific individualized treatment program, focusing on functional restoration, for each patient. This comprehensive outpatient program consists of the following components, with the number of sessions in each component dependent upon the needs of the particular patient (as determined by each discipline within the interdisciplinary team): medical and medication management (such as with pain-reducing prescriptive drugs and injection procedures), as well as management of any psychotropic medication needs by a psychiatrist; physical therapy (6-12 sessions involving general conditioning, range-of-motion, and strengthening exercises); group counseling (10 sessions involving education about pain issues such as coping, pacing, and stress, as well as group social support); and individual behavioral medicine therapy sessions (10-16 sessions involving multimodal cognitive-behavioral methods of pain management, such as relaxation/biofeedback, stress management, and constructive coping skills training).

As patients arrive for their scheduled appointments at the clinic, they are asked to complete an initial evaluation packet for both their initial medical appointment and behavioral medicine evaluation. The medical packet contains the Dallas Pain Questionnaire, Oswestry Disability Questionnaire, Pain Medicine Questionnaire, Treatment helpfulness Questionnaire, Coping Strategies Questionnaire, Beck Depression Inventory, and Confidential Pain Questionnaire. The behavioral medicine packet includes a Behavioral Medicine Evaluation Description, Informed Consent for Psychological Evaluation, Psychological release of information, Stress & Lifestyle Change Survey, Multidimensional Pain Inventory (MPI), Beck Depression Inventory (BDI-II), Millon Behavioral Medicine Diagnostic (MBMD), and Minnesota Multiphasic Personality Inventory-2 (MMPI-2).

Statistical Analyses

The patient's pretreatment MPI subgroups were determined on the basis of the classification schema, scoring algorithm, and normative data presented by Turk and Rudy. These investigators performed multivariate discriminate analyses on a heterogeneous sample of responses of patients with chronic pain on the MPI scales, and resulted in the identification of the three distinct coping profiles (AC, DYS, & ID), as well as three non-prototypic profiles: the hybrid profile, anomalous profile, and unanalyzable profile. After obtaining the patient's pretreatment MPI profile, all the subscale T-scores were recoded and categorized

into three levels (below average, average, and above average) based upon T scores and SD from the mean. Scores were interpreted as: 0- 45.98 indicates "below average"; 45.99- 53.99 indicates "average"; and 54.00-99.99 indicates "above average" (Figure 1). Nine groups were made from the original 280 people, based upon whether or not the patient met the criteria for a specific hypothesis. These groups were not mutually exclusive, so one patient could potentially be in two different groups. Paired sample t tests were conducted to evaluate whether the hypotheses (groups 1-9) were supported based upon the pre- to post- outcome measures or dependent variables (BDI, DPQ, VAS, OSW, MCS, and PCS). Each outcome measure was evaluated to check whether or not the hypotheses made were supported. An analysis of covariance (ANCOVA) was then performed to assess the impact of the outcome measure on the MPI subscale T-score. The dependent variable in this case was the post- outcome measure score. The specific group was held constant, while the pre- outcome measure score was the covariate. These statistics were run for each outcome measure. Finally, the nine groups were regrouped into two large groups based upon the hypothesized prognosis of each group. All groups hypothesized to have a "good prognosis" were put into one group, while those hypothesized to have a "poor prognosis" were put into another group. These groups were labeled *Good* and *Poor* and then analyzed using an ANOVA to determine if differences existed at pre-treatment.

CHAPTER FOUR

RESULTS

Demographic Data

Demographic information about the entire study sample is presented in Table 1. First, the total sample of 280 patients was analyzed for proportional breakdown on the categorical variables of race, gender, marital status, disability payment status (receiving disability payments or not receiving disability payments), litigation status (involved in pending litigation or not involved in pending litigation), and early termination status. Additionally, overall mean and standard deviations were obtained for continuous variables of age and pain duration. The same demographic variables were used to determine information on the 9 groups that were derived from the original sample of 280. Groups 1 through 9 are not mutually exclusive so they could not be analyzed to look for group differences among the groups.

Total Sample

Of the 280 patients in the study sample, 70.4% (n=197) were female and 29.6% (n=83) were male. The mean age was 53.62 years ranging from a minimum of 17 years to a maximum of 86 years. The largest racial group was Caucasian by far, at 83.6%, while African Americans represented the next largest group, at 10.4%. Hispanic and other races comprised 5.7%. Sixty-three percent of the participants were married, 14.6% single, 11.1% divorced/separated, and

6.1% widowed. It was found that 18.2% of the sample was receiving disability income, and approximately 13.2% had pending litigation related to their pain condition at the time of initial assessment. The mean length of pain for this sample was found to be 89 months (7.4 years) with a wide variability (Table 1).

The outcome results of this study will be in the following eleven chapters with each group representing one chapter. Groups 1-9 will be presented in each of the following chapters beginning with demographic information and then followed by the analysis completed for each group. All of the data utilized in the results of this section were obtained through a number of measures, including the Beck Depression Inventory (BDI), Dallas Pain Questionnaire (DPQ), Pain Drawing Analog (VAS), Oswestry (OSW), and from the Health Status Questionnaire or SF-36 the Mental Component Scale (MCS) and Physical Component Scale (PCS). A statistical significance level of .05 was utilized for all of the following analyses.

CHAPTER 5

RESULTS:

GROUP 1 (PS↓ AND I↑ ⇒ POOR PROGNOSIS)

Demographic Characteristics

Group 1 (n=10) consisted of 70% (n=7) female and 30% (n=3) male participants. The mean age was 57.3 years ranging from a minimum of 32 years to a maximum of 78 years. The largest and only racial group was Caucasian, at 100%. Sixty percent of the participants were married, 20.0% divorced/separated, 10% single, and 10% widowed. It was found that 10% of the sample was receiving disability income, and approximately 20% had pending litigation related to their pain condition at the time of initial assessment. The mean length of pain for this sample was found to be 138 months (11.5 years) with a wide variability (Table 2).

Physical Variables

Dallas Pain Questionnaire. On the self-report DPQ a significant improvement was noted for Group 1 from pre-treatment to post-treatment showing significantly lower (less pain and disability) DPQ scores, $t(8)=3.30$, $p=.013$ (Table 3). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the DPQ. Significant differences were

found between the groups, with intake scores as covariates, at post-treatment, F (1, 245) = 71.94, p=.000 (Table 4).

Oswestry. On the self-report OSW to assess limitations of various activities a significant improvement was noted for Group 1 from pre-treatment to post-treatment showing significantly lower (less disability) OSW scores, t (8)=3.10, p=.017 (Table 3). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the OSW. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 245)= 96.71, p=.000 (Table 4).

Pain Drawing Analog. On the self-report VAS representative of their pain, a trend towards improvement was noted for Group 1 from pre-treatment to post-treatment showing significantly lower (less pain) VAS scores, t (9)=2.21, p=.058 (Table 3). Furthermore, analysis of covariance (ANCOVA), used to parcel out any variance at intake for both groups, was then employed and statistically significant differences were found (Table 4).

SF-36-Physical Component Scale. On the self-report PCS to assess the patient's overall sense of physical well-being a significant improvement was noted for Group 1 from pre-treatment to post-treatment showing significantly higher (greater physical well-being) PCS scores, t (9)=-2.56, p=.033 (Table 3).

Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the PCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 239) = 120.54, p=.000 (Table 4).

Mood & Personality Measures.

Beck Depression Inventory. On the self-report BDI to assess the patient's depression levels a significant improvement was noted for Group 1 from pre-treatment to post-treatment showing significantly lower (less depressed) BDI scores, t (10)=3.88, p=.004 (Table 3). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the BDI. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 269) = 153.15, p=.000 (Table 4).

SF-36-MCS. On the self-report MCS to assess the patient's overall sense of mental well-being a trend for improvement was noted for Group 1 from pre-treatment to post-treatment showing higher (greater well-being) MCS scores, t (9)=-2.22, p=.057 (Table 3). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected

for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the PCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, $F(1, 239) = 120.54$, $p=.000$ (Table 4).

CHAPTER SIX

RESULTS:

GROUP 2 (PS↑ AND I↓ ⇒ GOOD PROGNOSIS)

Demographic Characteristics

Group 2 (n=20) consisted of 80% (n=16) female and 20% (n=4) male participants. The mean age was 57 years ranging from a minimum of 20 years to a maximum of 86 years. The largest racial group was Caucasian by far, at 90%, while African Americans represented the next largest group, at 10%. Seventy percent of the participants were married, 20% single, 5% divorced/separated, and 5% living with a significant other. It was found that 20% of the sample was receiving disability income, and approximately 5% had pending litigation related to their pain condition at the time of initial assessment. The mean length of pain for this sample was found to be 113 months (9.4 years) with a wide variability (Table 5).

Physical Variables

Dallas Pain Questionnaire. On the self-report DPQ, no statistical significance was noted for Group 2 from pre-treatment to post-treatment scores (Table 6). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the DPQ. Significant differences were found

between the groups, with intake scores as covariates, at post-treatment, F (1, 245) = 71.13, p=.000 (Table 7).

Oswestry. On the self-report OSW to assess limitations of various activities a significant improvement was noted for Group 2 from pre-treatment to post-treatment showing significantly lower (less disabled) OSW scores, t (18)=2.22, p=.040 (Table 6). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the OSW. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 245)=95.03, p=.000 (Table 7).

Pain Drawing Analog. On the self-report VAS representative of their pain, a significant improvement was noted for Group 2 from pre-treatment to post-treatment showing significantly lower (less pain) VAS scores, t (19)=4.16, p=.001 (Table 6). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the VAS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 256)= 12.25, p=.001 (Table 7).

SF-36-Physical Component Scale. On the self-report PCS to assess the patient's overall sense of physical well-being no significant improvement was noted for Group 2 from pre-treatment to post-treatment scores (Table 6). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the PCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, $F (1, 239) = 112.84$, $p=.000$ (Table 7).

Mood & Personality Measures.

Beck Depression Inventory. On the self-report BDI to assess the patient's depression levels a significant improvement was noted for Group 2 from pre-treatment to post-treatment showing significantly lower (less depressed) BDI scores, $t (19)=2.62$, $p=.018$ (Table 6). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the BDI. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, $F (1, 269) = 154.81$, $p=.000$ (Table 7).

SF-36-MCS. On the self-report MCS to assess the patient's overall sense of mental well-being no significant improvement was noted for Group 2 from pre-

treatment to post-treatment (Table 6). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the MCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, $F(1, 239) = 63.56$, $p=.000$ (Table 7).

CHAPTER SEVEN

RESULTS:

GROUP 3 (PS↓ AND I↓ ⇒ GOOD PROGNOSIS)

Group 3 (n=187) consisted of 69% female (n=129) and 31% male participants (n=58). The mean age was 54 years ranging from a minimum of 19 years to a maximum of 83 years. The largest racial group was Caucasian by far, at 83.4%, while African Americans represented the next largest group, at 11.2%. Hispanic and other races comprised 5.3%. Sixty-six percent of the participants were married, 15% single, 11% divorced/separated, and 6.1% widowed. It was found that 14.4% of the sample was receiving disability income, and approximately 5% had pending litigation related to their pain condition at the time of initial assessment. The mean length of pain for this sample was found to be 86 months (7.1 years) with a wide variability (Table 8).

Physical Variables

Dallas Pain Questionnaire. On the self-report DPQ a significant improvement was noted for Group 3 from pre-treatment to post-treatment showing significantly lower (less pain and disability) DPQ scores, $t(165)=11.47$, $p=.000$ (Table 9). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the DPQ. Significant differences were

found between the groups, with intake scores as covariates, at post-treatment, F (1, 245) = 39.23, p=.000 (Table 10).

Oswestry. On the self-report OSW to assess limitations of various activities a significant improvement was noted for Group 3 from pre-treatment to post-treatment showing significantly lower (less disability) OSW scores, t (164)=7.67, p=.000 (Table 9). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the OSW. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 245) = 55.67, p=.000 (Table 10).

Pain Drawing Analog. On the self-report VAS representative of their pain, a significant improvement was noted for Group 3 from pre- to post-treatment showing significantly lower (less pain) VAS scores, t (170)=17.15, p=.000 (Table 9). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the VAS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 256) = 7.12, p=.008 (Table 10).

SF-36-Physical Component Scale. On the self-report PCS to assess the patient's overall sense of physical well-being a significant improvement was noted for Group 3 from pre-treatment to post-treatment showing significantly higher (greater physical well-being) PCS scores, t (161)=-7.23, p=.000 (Table 9). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the PCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 239) = 80.36, p=.000 (Table 10).

Mood & Personality Measures.

Beck Depression Inventory. On the self-report BDI to assess the patient's depression levels a significant improvement was noted for Group 3 from pre-treatment to post-treatment showing significantly lower (less depressed) BDI scores, t (184)=7.77, p=.000 (Table 9). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the BDI. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 269) = 121.55, p=.000 (Table 10).

SF-36-MCS. On the self-report MCS to assess the patient's overall sense of mental well-being a trend for improvement was noted for Group 3 from pre-treatment to post-treatment showing higher (greater well-being) MCS scores, t (161)=-6.27, p=.000 (Table 9). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the MCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 239) = 58.16, p=.000 (Table 10).

CHAPTER EIGHT

RESULTS:

GROUP 4 (PS↑ AND I↑ ⇒ POOR PROGNOSIS)

Demographic Characteristics

Group 4 (n=31) consisted of 64.5% female (n=20) and 35.5% male (n=11) participants. The mean age was 49.4 years ranging from a minimum of 17 years to a maximum of 85 years. The largest racial group was Caucasian by far, at 80.6%, while Hispanic represented the next largest group, at 12.9%. African Americans comprised 6.5%. Fifty-five percent of the participants were married, 19.4% single, 22.6% divorced/separated, and 3.2% widowed. It was found that 35.5% of the sample was receiving disability income, and approximately 29% had pending litigation related to their pain condition at the time of initial assessment. The mean length of pain for this sample was found to be 73 months (6 years) with a wide variability (Table 11).

Physical Variables

Dallas Pain Questionnaire. On the self-report DPQ a significant improvement was noted for Group 4 from pre-treatment to post-treatment showing significantly lower (less pain and disability) DPQ scores, $t(28)=4.86$, $p=.000$ (Table 12). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to

determine differences between groups for the DPQ. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 245)=52.12, p=.000 (Table 13).

Oswestry. On the self-report OSW to assess limitations of various activities a significant improvement was noted for Group 4 from pre-treatment to post-treatment showing significantly lower (less disability) OSW scores, t (28)=5.65, p=.000 (Table 12). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the OSW. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 245)=72.21, p=.000 (Table 13).

Pain Drawing Analog. On the self-report VAS representative of their pain, a significant improvement was noted for Group 4 from pre- to post-treatment showing significantly lower (less pain) VAS scores, t (30)=5.85, p=.000 (Table 12). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the VAS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F(1, 256)=10.37, p=.001 (Table 13).

SF-36-Physical Component Scale. On the self-report PCS to assess the patient's overall sense of physical well-being a significant improvement was noted for Group 4 from pre-treatment to post-treatment showing significantly higher (greater physical well-being) PCS scores, t (28)=-3.09, p=.005 (Table 12). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the PCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 239)=110.79, p=.000 (Table 13).

Mood & Personality Measures.

Beck Depression Inventory. On the self-report BDI to assess the patient's depression levels a significant improvement was noted for Group 4 from pre-treatment to post-treatment showing significantly lower (less depressed) BDI scores, t (28)=3.56, p=.001 (Table 12). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the BDI. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 269)=43.34, p=.000 (Table 13).

SF-36-MCS. On the self-report MCS to assess the patient's overall sense of mental well-being a trend for improvement was noted for Group 4 from pre-treatment to post-treatment showing higher (greater well-being) MCS scores, $t(28)=-6.75$, $p=.000$ (Table 12). Furthermore, analysis of covariance (ANCOVA), used to parcel out any variance at intake for both groups, was then employed and statistically significant differences were found (Table 13).

CHAPTER NINE

RESULTS:

GROUP 5 (LC↑ AND AD↓ ⇒ POOR PROGNOSIS)

Demographic Characteristics

Group 5 (n=134) consisted of 68.7% female (n=92) and 31.3% male (n=42) participants. The mean age was 57.23 years ranging from a minimum of 28 years to a maximum of 86 years. The largest racial group was Caucasian by far, at 86.6%, while African Americans represented the next largest group, at 9.0%. Hispanics and other races comprised 4.5%. Sixty-three percent of the participants were married, 13.4% single, 11.2% divorced/separated, and 9.1% widowed. It was found that 13.4% of the sample was receiving disability income, and approximately 9.7% had pending litigation related to their pain condition at the time of initial assessment. The mean length of pain for this sample was found to be 107.82 months (8.9 years) with a wide variability (Table 14).

Physical Variables

Dallas Pain Questionnaire. On the self-report DPQ a significant improvement was noted for Group 5 from pre-treatment to post-treatment showing significantly lower (less pain and disability) DPQ scores, t (117)=9.94, p=.000 (Table 15). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to

determine differences between groups for the DPQ. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 245)=66.95, p=.000 (Table 16).

Oswestry. On the self-report OSW to assess limitations of various activities a significant improvement was noted for Group 5 from pre-treatment to post-treatment showing significantly lower (less disability) OSW scores, t (119)=7.32, p=.000 (Table 15). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the OSW. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 245)=90.12, p=.000 (Table 16).

Pain Drawing Analog. On the self-report VAS representative of their pain, a significant improvement was noted for Group 5s from pre- to post-treatment showing significantly lower (less pain) VAS scores, t (124)=13.91, p=.000 (Table 15). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the VAS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 245)=66.95, p=.000 (Table 16).

SF-36-Physical Component Scale. On the self-report PCS to assess the patient's overall sense of physical well-being a significant improvement was noted for Group 5 from pre-treatment to post-treatment showing significantly higher (greater physical well-being) PCS scores, t (117)=-5.06, p=.000 (Table 15). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the PCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 239)=116.12, p=.000 (Table 16).

Mood & Personality Measures.

Beck Depression Inventory. On the self-report BDI to assess the patient's depression levels a significant improvement was noted for Group 5 from pre-treatment to post-treatment showing significantly lower (less depressed) BDI scores, t (132)=5.07, p=.000 (Table 15). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the BDI. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 269)=17.45, p=.000 (Table 16).

SF-36-MCS. On the self-report MCS to assess the patient's overall sense of mental well-being a trend for improvement was noted for Group 5 from pre-treatment to post-treatment showing higher (greater well-being) MCS scores, $t(117)=-4.25$, $p=.000$ (Table 15). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the MCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, $F(1, 239)=38.15$, $p=.000$ (Table 16).

CHAPTER TEN

RESULTS:

GROUP 6 (LC=AD ⇒ GOOD PROGNOSIS)

Demographic Characteristics

Group 6 (n=67) consisted of 68.7% female (n=46) and 31.3% male (n=21) participants. The mean age was 52.90 years ranging from a minimum of 22 years to a maximum of 83 years. The largest racial group was Caucasian by far, at 80.6%, while African Americans represented the next largest group, at 12.1%. Hispanic and other races comprised 6%. Sixty-three percent of the participants were married, 17.9% single, 10.4% divorced/separated, and 3.0% widowed. It was found that 20.9% of the sample was receiving disability income, and approximately 16% had pending litigation related to their pain condition at the time of initial assessment. The mean length of pain for this sample was found to be 85.9 months (7.15 years) with a wide variability (Table 17).

Physical Variables

Dallas Pain Questionnaire. On the self-report DPQ a significant improvement was noted for Group 6 from pre-treatment to post-treatment showing significantly lower (less pain and disability) DPQ scores, $t(61)=4.69$, $p=.000$ (Table 18). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the

group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the DPQ. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 245)=72.34, p=.000 (Table 19).

Oswestry. On the self-report OSW to assess limitations of various activities a significant improvement was noted for Group 6 from pre-treatment to post-treatment showing significantly lower (less disability) OSW scores, t (58)=4.40, p=.000 (Table 18). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the OSW. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 245)=97.02, p=.000 (Table 19).

Pain Drawing Analog. On the self-report VAS representative of their pain, a significant improvement was noted for Group 6s from pre- to post-treatment showing significantly lower (less pain) VAS scores, t (62)=8.37, p=.000 (Table 18). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the VAS. Significant differences were found

between the groups, with intake scores as covariates, at post-treatment, F (1, 256)=11.46, p=.001 (Table 19).

SF-36-Physical Component Scale. On the self-report PCS to assess the patient's overall sense of physical well-being a significant improvement was noted for Group 6 from pre-treatment to post-treatment showing significantly higher (greater physical well-being) PCS scores, t (55)=-3.16, p=.003 (Table 18). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the PCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 239)=119.47, p=.000 (Table 19).

Mood & Personality Measures.

Beck Depression Inventory. On the self-report BDI to assess the patient's depression levels a significant improvement was noted for Group 6 from pre-treatment to post-treatment showing significantly lower (less depressed) BDI scores, t (63)=4.39, p=.000 (Table 18). Analysis of covariance (ANCOVA), used to parcel out any variance at intake for both groups, was then employed and statistically significant differences were found (Table 19).

SF-36-MCS. On the self-report MCS to assess the patient's overall sense of mental well-being a trend for improvement was noted for Group 6 from pre-

treatment to post-treatment showing higher (greater well-being) MCS scores, t(55)=-5.80, p=.000 (Table 18). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the MCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 239)=59.98, p=.000 (Table 19).

CHAPTER ELEVEN

RESULTS:

GROUP 7 (S↑ AND D↑ AND P↓ AND SO↓⇒GOOD PROGNOSIS)

Demographic Characteristics

Group 7 (n=10) consisted of 50% female (n=5) and 50% male (n=5) participants. The mean age was 49.8 years ranging from a minimum of 30 years to a maximum of 70 years. The largest racial group was Caucasian by far, at 80%, while African Americans represented the next largest group, at 10%. Other races comprised 10%. Sixty percent of the participants were married, 20% single, and 20% divorced/separated. It was found that 20% of the sample was receiving disability income, and approximately 10% had pending litigation related to their pain condition at the time of initial assessment. The mean length of pain for this sample was found to be 56.3 months (4.69 years) with a wide variability (Table 20).

Physical Variables

Dallas Pain Questionnaire. On the self-report DPQ a significant improvement was noted for Group 7 from pre-treatment to post-treatment showing significantly lower (less pain and disability) DPQ scores, $t(10)=3.09$, $p=.013$ (Table 21). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to

determine differences between groups for the DPQ. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 234)=66.32, p=.000 (Table 22).

Oswestry. On the self-report OSW to assess the patient's limitations for various activities no significant improvement was noted for Group 7 from pre-treatment to post-treatment scores (Table 21). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the OSW. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 232)=90.24, p=.000 (Table 22).

Pain Drawing Analog. On the self-report VAS representative of their pain, a significant improvement was noted for Group 7 from pre- to post-treatment showing significantly lower (less pain) VAS scores, t (10)=2.95, p=.016 (Table 21). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the VAS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 244)=12.39, p=.001 (Table 22).

SF-36-Physical Component Scale. On the self-report PCS to assess the patient's overall sense of physical well-being a significant improvement was noted for Group 7 from pre-treatment to post-treatment showing significantly lower (greater physical well-being) PCS scores, t (8)=-3.75, p=.007 (Table 21). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the PCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 226)=114.21, p=.000 (Table 22).

Mood & Personality Measures.

Beck Depression Inventory. On the self-report BDI to assess the patient's depression levels no significant improvement was noted for Group 7 from pre-treatment to post-treatment (Table 21). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the BDI. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 255)=136.32, p=.000 (Table 22).

SF-36-MCS. On the self-report MCS to assess the patient's overall sense of mental well-being no significant improvement was noted for Group 7 from pre-

to post-treatment (Table 21). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the MCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, $F(1, 226)=55.45$, $p=.000$ (Table 22).

CHAPTER TWELVE

RESULTS:

GROUP 8 (S↑ AND SO↑ AND P↑ AND D↓⇒POOR PROGNOSIS)

Demographic Characteristics

Group 8 (n=14) consisted of 64.3% female (n=9) and 35.7% male (n=5) participants. The mean age was 58.14 years ranging from a minimum of 36 years to a maximum of 78 years. The largest racial group was Caucasian by far, at 92.9%, while African American represented the next largest group, at 7.1%. Ninety-three percent of the participants were married, and 7% were single. It was found that 14.3% of participants from Group 8 were receiving disability income, and no one had pending litigation related to their pain condition at the time of initial assessment. The mean length of pain for this sample was found to be 71 months (5.9 years) with a wide variability (Table 23).

Physical Variables

Dallas Pain Questionnaire. On the self-report DPQ a significant improvement was noted for Group 8 from pre-treatment to post-treatment showing significantly lower (less pain and disability) DPQ scores, $t(13)=3.32$, $p=.006$ (Table 24). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the DPQ. Significant differences were

found between the groups, with intake scores as covariates, at post-treatment, F (1, 233)=67.36, p=.000 (Table 25).

Oswestry. On the self-report OSW to assess limitations of various activities a significant improvement was noted for Group 8 from pre-treatment to post-treatment showing significantly lower (less disability) OSW scores, t (14)=2.79, p=.015 (Table 24). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the OSW. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 231)=89.56, p=.000 (Table 25).

Pain Drawing Analog. On the self-report VAS representative of their pain, a significant improvement was noted for Group 8 from pre- to post-treatment showing significantly lower (less pain) VAS scores, t (13)=5.13, p=.000 (Table 24). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the VAS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 243)=12.47, p=.000 (Table 25).

SF-36-Physical Component Scale. On the self-report PCS to assess the patient's overall sense of physical well-being a significant improvement was noted for Group 8 from pre-treatment to post-treatment showing significantly higher (greater physical well-being) PCS scores, t (14)=-.375, p=.002 (Table 24). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the PCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 225)=114.4, p=.000 (Table 25).

Mood & Personality Measures.

Beck Depression Inventory. On the self-report BDI to assess the patient's depression levels a significant improvement was noted for Group 8 from pre-treatment to post-treatment showing significantly lower (less depressed) BDI scores, t (14)=2.45, p=.029 (Table 24). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the PCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 254)=133.19, p=.000 (Table 25).

SF-36-MCS. On the self-report MCS to assess the patient's overall sense of mental well-being a trend for improvement was noted for Group 8 from pre-treatment to post-treatment showing higher (greater well-being) MCS scores, $t(14)=-2.61$, $p=.022$ (Table 24). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the MCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, $F(1, 225)=53.98$, $p=.000$ (Table 25).

CHAPTER THIRTEEN

RESULTS:

GROUP 9 (PS↑ AND I↑ AND AD↑ AND ↓LC ⇒ POOR PROGNOSIS)

Demographic Characteristics

Group 9 (n=9) consisted of 66.7% female (n=6) and 33.3% male (n=3) participants. The mean age was 46 years ranging from a minimum of 36 years to a maximum of 57 years. The largest and only racial group was Caucasian, at 100%. Sixty-six percent of the participants were married, while 22.6% were divorced/separated. It was found that 67.7% of the sample was receiving disability income, and approximately 22.2% had pending litigation related to their pain condition at the time of initial assessment. The mean length of pain for this sample was found to be 90 months (7.5 years) with a wide variability (Table 26).

Physical Variables

Dallas Pain Questionnaire. On the self-report DPQ a significant improvement was noted for Group 9 from pre-treatment to post-treatment showing significantly lower (less pain and disability) DPQ scores, $t(9)=2.92$, $p=.019$ (Table 27). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the DPQ. Significant differences were

found between the groups, with intake scores as covariates, at post-treatment, F (1, 245)=60.27, p=.000 (Table 28).

Oswestry. On the self-report OSW to assess limitations of various activities a significant improvement was noted for Group 9 from pre-treatment to post-treatment showing significantly lower (less disability) OSW scores, t (8)=5.38, p=.001 (Table 27). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the OSW. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 245)=89.02, p=.000 (Table 28).

Pain Drawing Analog. On the self-report VAS representative of their pain, a significant improvement was noted for Group 9 from pre- to post-treatment showing significantly lower (less pain) VAS scores, t (9)=3.04, p=.016 (Table 27). Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the VAS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, F (1, 255)=12.34, p=.001 (Table 28).

SF-36-Physical Component Scale. On the self-report PCS to assess the patient's overall sense of physical well-being no significant improvement was noted for Group 9 from pre-treatment to post-treatment scores. Furthermore, to assess differences at the two time intervals (pre- to post-), not stemming from any variance between those selected for the group and those not selected at intake, one-way ANCOVA was conducted to determine differences between groups for the PCS. Significant differences were found between the groups, with intake scores as covariates, at post-treatment, $F(1, 239)=114.16$, $p=.000$ (Table 28).

Mood & Personality Measures.

Beck Depression Inventory. On the self-report BDI to assess the patient's depression levels a significant improvement was noted for Group 9 from pre-treatment to post-treatment showing significantly lower (less depressed) BDI scores, $t(7)=4.03$, $p=.007$ (Table 27). Analysis of covariance (ANCOVA), used to parcel out any variance at intake for both groups, was then employed and statistically significant differences were found (Table 28).

SF-36-MCS. On the self-report MCS to assess the patient's overall sense of mental well-being a trend for improvement was noted for Group 9 from pre-treatment to post-treatment showing higher (greater well-being) MCS scores, $t(9)=-4.97$, $p=.001$ (Table 27). Analysis of covariance (ANCOVA), used to parcel out any variance at intake for both groups, was then employed and statistically significant differences were found (Table 28).

CHAPTER 14

RESULTS:

GOOD GROUP VERSUS POOR GROUP

Demographics

Groups 1, 4, 5, 8, and 9 were blended together to form one large group called the "Poor" group (n=201). Groups 2, 3, 6, and 7 were also blended together to form one large group called the "Good" group (n=280). No demographic analysis could be completed on these two groups because groups are not mutually exclusive. Group divisions were made based upon hypothesized prognosis outlook (Table 29 & 30).

Physical Variables

Dallas Pain Questionnaire. On the self-report DPQ for the Poor group a significant improvement was noted for Group 9 from pre-treatment to post-treatment showing significantly lower (less pain and disability) DPQ scores, t (109)=5.19, p=.000 (Table 29). The Good group on the other hand, also showed a significant improvement, t(161)=8.78, p=.000 (Table 30).

Oswestry. On the self-report OSW to assess limitations of various activities a significant improvement was noted for both groups from pre-treatment to post-treatment scores. The Poor group showing significantly lower (less disability) OSW scores, t (106)=13.15, p=.000 (Table 29), and the Good group showing OSW scores, t(146)=8.98, p=.000 (Table 30).

Pain Drawing Analog. On the self-report VAS representative of their pain, a significant improvement was noted for Group 9 from pre- to post-treatment scores showing significantly lower (less pain) VAS scores for the Poor Group, t (106)=13.15, p=.000 (Table 29). The Good group also showed a significant improvement from pre- to post-treatment, t(151)=13.71, p=.000 (Table 30).

SF-36-Physical Component Scale. On the self-report PCS to assess the patient's overall sense of physical well-being a significant improvement was noted for both the Poor and Good groups from pre-treatment to post-treatment scores. Poor group showed scores of t(100)=-7.11, p=.000 (Table 29) and the Good group showed scores of t(140)=-6.80, p=.000 (Table 30).

Mood & Personality Measures.

Beck Depression Inventory. On the self-report BDI to assess the patient's depression levels a significant improvement was noted for both groups from pre-treatment to post-treatment showing significantly lower (less depressed) BDI scores for the poor group, t (109)=5.19, p=.000 (Table 29). The good group showed BDI scores of t (161)=8.78, p=.000 (Table 30).

SF-36-MCS. On the self-report MCS to assess the patient's overall sense of mental well-being a trend for improvement was noted for Group 9 from pre-treatment to post-treatment showing higher (greater well-being) MCS scores for

the Poor group, t(100)=-6.14, p=.00 (Table 29). The Good group showed significantly improved scores t(140)=-6.80, p=.000 (Table 30).

CHAPTER FIFTEEN

DISCUSSION

Previous literature has demonstrated that chronic pain is both widespread and immensely expensive, regardless of how it is treated (Gatchel, 2001; Gatchel & Turk, 1996). Since its increasing prevalence, issues concerning how best to treat people facing this debilitating problem have become extremely important when searching for possible treatment options. The current study sought to determine a better way to analyze a patient's prognosis. Currently, the Multidimensional Pain Inventory profiles are used to classify subgroups of patients, and are professed to capture the multidimensionality of chronic pain across a number of psychosocial and behavioral variables. Although the profiles are clinically useful, some concerns have been raised regarding their ability to predict outcomes as seen by the literature review. The relationships between specific MPI subscales were evaluated by using different types of functional and psychosocial outcome measures, which have been widely accepted. As will be discussed, the majority of the hypotheses proposed in this study were not supported by findings of this study.

For most of the groups, there were significant improvements after completion of the interdisciplinary program. When looking at the outcome measures for each group, a trend of improvement was seen in most groups.

Groups 3 and 6

Two of the nine hypotheses were found to be supported by data from this study. When evaluating paired t-tests for Group 3 (PS↓ and I↓ ⇒ good prognosis) and Group 6 (LC=AD⇒ good prognosis) the means from pre-treatment to post-treatment for all outcome measures (BDI, DPQ, VAS, OSW, MCS, & PCS) were found to be significant in the hypothesized direction. Participants from Group 3 (n=187) and Group 6 (n=67) were found to decrease the amount of depression in their lives, increase functioning, and decrease pain.

When running an ANCOVA on Group 3 (PS↓ and I↓⇒good prognosis), all measures were found to be significant in the right direction, while holding pre-treatment scores constant. This indicates that the outcome measures correlate with the specified MPI subscale. In this case, when a participant's pain severity and their interference levels are below average, the patient is indicating he/she is not suffering immensely from pain, and his/her pain is not interfering with the other aspects of his/her life. In general he/she has some pain, but is able to continue with what he/she needs to be doing.

When evaluating the ANCOVAs for Group 6 (LC=AD⇒ good prognosis), the DPQ, OSW VAS, MCS, and PCS were all found be significant. However, when holding the pre-treatment outcome measure score for the BDI constant, it was found that the slopes of homogeneity assumption were significant. As a result, an ANCOVA could not be evaluated.

Participants in Group 6 reported mild depression at the beginning of treatment. At post-treatment, they reported only minimal depression decreasing an average of four points. They reported an overall sense of greater mental well being reporting mild/moderately impaired to low average impairment. Participants also reported a greater physical well being from pre- to post-treatment. Patients also reported minimal disability at the end of treatment. In general, patients reported a decrease in pain on both the Pain Drawing Analog and the Dallas Pain Questionnaire. One possible reason for this outcome could be that these are people who have the ability to exhibit some control over their pain and their lives. They seem to be able to cope with problems that arise and with stressful situations. As a result of this they do may not be feeling overwhelmed with pain, stress, or tension. This is a group of people who are able to control both aspects of their lives with the resources that they have.

Groups 1, 2, 4, 5, 7, 8, and 9 were not supported by statistical analyses. One possible explanation for the results was that there was not enough power to gain any type of significant information. Had there been larger numbers in each group a trend could possibly have been established. In each case, the opposite effect was seen. For example, it was hypothesized that Group 1 would have a poor prognosis; however, statistical analyses showed that in actuality, participants with the above criteria would have an overall good prognosis. There were many possible explanations for these results. One reason could be the interdisciplinary

program itself. Programs like the one at Eugene McDermott Center for Pain Management extensively coordinate treatment plans and individualize goals for each patient. This type of specialized treatment could be one reason why most of the groups were seen to have improvement in both psychosocial and functional areas of their lives.

When evaluating the means of the outcome measures for all groups hypothesized with a good prognosis versus those groups hypothesized to have a poor prognosis, it was found that the hypothesized Poor group actually had better pre-treatment scores than the Good group. The opposite effect was seen when looking at these two groups. The Poor group reported less depression, pain, and overall mental and physical functioning than the Good group. When looking at post-treatment scores, the same effect was seen as well. Those in the Poor group had lower scores on all outcome measures when compared to the hypothesized Good group.

One advantage of this study compared to other studies was the fact that all MPI profiles were used even those that did not fall into one of the three main coping styles. Each MPI profile was then recoded to figure out what type of prognosis each case demonstrated. In the majority of the history of the MPI literature, it has been seen that those participants classified in an "other" profile are normally disregarded. This study gives one possible method to classify these

patients, instead of seeing the profile and attaining no information. Clinicians can look at subscale scores and make better hypotheses about treatment outcomes.

Overall, the MPI subscales seem to hold together as a group and correlate with one another; however, when looking at smaller groups of subscales, they do not correlate as highly when predicting a pain patient's perceived prognosis. Moreover, this experiment was unable to tell if demographic differences were found among the nine different hypothesized groups because the groups were not mutually exclusive. The number of participants per group was very small, and may have showed significance if the number of patients in each group was larger.

At the beginning of this study, it was hypothesized that those patients, defined as having a "poor prognosis," were those that had an "above average" interference (I) subscale score. The interference subscale on the MPI is used to assess a chronic pain patient's perception of how pain interferes with life, including interference with family and marital functioning, work, social-recreational activities, and satisfaction with present level of functioning in each of these areas. Looking at the literature in general, normally Adaptive Copers reported low levels of pain severity, low pain interference and low affective distress. Therefore, these individuals described and reported a better quality of life than those individuals who were unable to adapt and live with their pain. Another point that must also be considered is the fact that these participants entered a rigorous process to help them through the pain process. The Eugene

McDermott Pain Center for Pain Management has a comprehensive program, which increases the participant's functioning, decrease depression levels, and increase positive coping strategies to understand and deal with pain. The process in general may help all types of patients such as those in debilitating pain, as well as, those who are initially resistant to treatment.

Limitations and Directions for Future Research

The current study has several limitations that should be acknowledged. The small sample size that was observed in a number of subscale relationship conditions was a limitation that decreased the statistical power, as well as the ability to generalize results across comparable groups.

Another possible limitation of the current study was the distribution of MPI subscale scores into three distinct categories (below average, average, and above average). This division was somewhat arbitrary and may have affected subgroup sample size, as well as the mean and SDs. Although this procedure was performed with caution, future research may choose an alternate method of categorizing subscale T-scores. Another possible option would be choosing to divide scores into eight categories based upon the normal curve and using each standard deviation as its own group. This, however, would require a very large sample size.

In summary, participants who exhibited below average pain and below average perceptions of pain interference were likely to have a good prognosis.

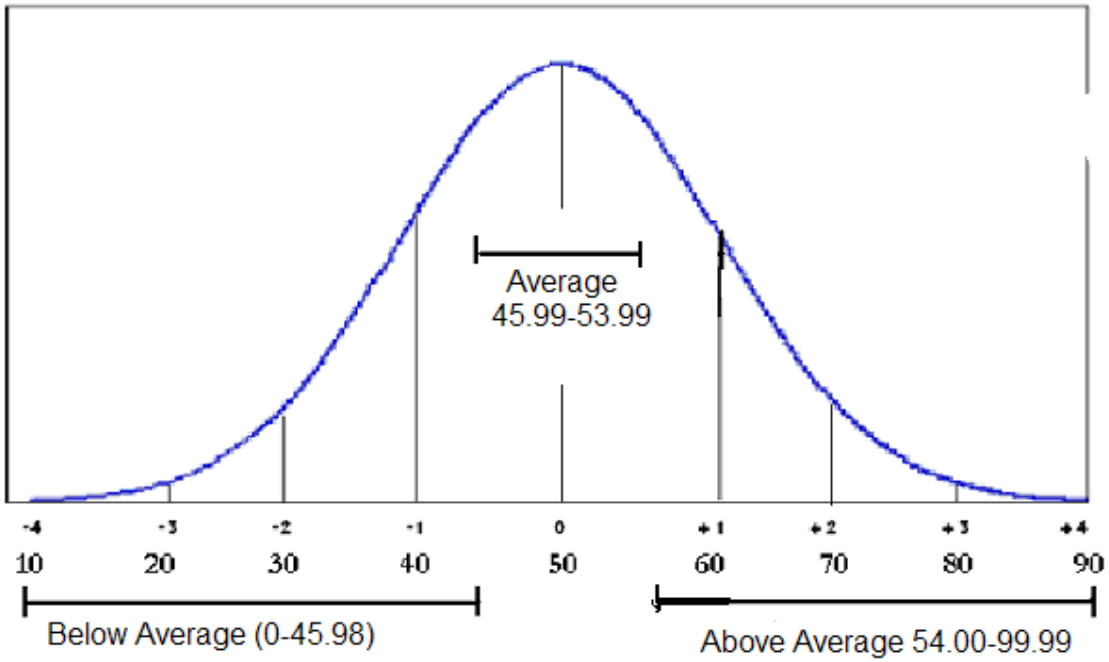
These were people who were able to conduct different aspects of their life, including family and marital relations as well as work and social activities, with a good level of functioning, even with some pain in their lives. This study also illustrated a good prognosis for those patients whose perceived control over their pain and life equaled their mood and tension. These were people that did not allow pain to control their lives. They have established some amount of control over different aspects of their life, and their feelings and emotions are congruent with their amount of control.

Future research, in conjunction with the above findings, may enable researchers to determine with greater certainty which patients would have a better prognosis when looking at the MPI subscales. Further research into the MPI subscales may allow a decrease in the amount of participants classified in one of the "other" profiles, allowing for greater efficacy.

APPENDIX A

FIGURES

Figure 1, Graph demonstrating three different groups.



APPENDIX B:

TABLES

Table 1

Demographic Characteristics for Total Group.

Variables	Total Group (N=280)
Gender (%)	
Male	29.6%
Female	70.4%
Race (%)	
Caucasian	83.6%
Latino	3.9%
African American	10.4%
Other	1.8%
Marital Status (%)	
Single	14.6%
Married/ Living Together as Married	66.1%
Divorced or Separated	11.1%
Widowed	6.1%
Age (Mean)	53.62
Disability Payments (%)	
No	78.6%
Yes	18.2%
Pending Litigation (%)	
No	82.1%
Yes	13.2%
Time (in months) since the first onset of pain (Mean)	89.54

Table 2

Demographic Characteristics for Group 1 (PS↓ and I↑ ⇒ poor prognosis)

Variables	Total Group (n=10)
Gender (%)	
Male	30%*
Female	70%*
Race (%)	
Caucasian	100%*
Latino	
African American	
Other	
Marital Status (%)	
Single	10%*
Married/ Living Together as Married	60%*
Divorced or Separated	20%*
Widowed	10%*
Age (Mean)	51.8
Disability Payments (%)	
No	80%*
Yes	10%*
Pending Litigation (%)	
No	70%*
Yes	20%*
Time (in months) since the first onset of pain (Mean)	137.78

* Percentages are based on individual group size

Table 3

Independent Paired t-test for Group 1 (PS↓ and I↑ ⇒ poor prognosis)

Outcome Measures	Mean(SD)	t (df)=t	p
BDI-pre-	17.3(8.14)	t (9)=3.88	.004*
BDI-post-	11.9(7.84)		
DPQ-pre-	105.1(15.7)	t (7)=3.30	.013*
DPQ-post-	69.0(34.6)		
Oswestry-pre-	23.4(4.5)	t (7)=3.11	.017*
Oswestry-post-	15.25(6.8)		
PDA-pre-	6.56(2.6)	t (8)=2.21	.058
PDA-post-	3.67(2.1)		
SF-36 MCS-pre-	45.2(8.1)	t (8)=-2.22	.057
SF-36 MCS-post-	52.0(11.1)		
SF-36 PCS-pre-	24.1(6.3)	t (8)=-2.56	.033*
SF-36 PCS-post-	33.1(11.4)		

*$p \leq .05$, two-tailed.

Table 4

GROUP 1 (PS↓ and I↑ ⇒ poor prognosis) ANCOVA (Using the Post-outcome measure as the Dependent Variable with the Pre-treatment outcome score as the Covariate)

Outcome Measures	Post- Mean (SD)	F	df	p	partialη^2
BDI					
Met Hypothesis 1	11.90(7.84)	53.15	269	.000*	.363
Did not meet hypo	9.84(8.32)				
DPQ					
Met Hypothesis 1	69.00(34.58)	71.94	245	.000*	.227
Did not meet hypo	67.66(29.86)				
Oswestry					
Met Hypothesis 1	15.25(6.82)	96.71	245	.000*	.283
Did not meet hypo	16.54(7.86)				
VAS					
Met Hypothesis 1	3.67(2.12)**				
Did not meet hypo	4.53(2.12)				
SF-36 MCS					
Met Hypothesis 1	52.0(11.12)	62.96	239	.000*	.209
Did not meet hypo	49.47(11.55)				
SF-36 PCS					
Met Hypothesis 1	33.11(11.38)	120.54	239	.000*	.335
Did not meet hypo	32.91(10.14)				

*$p \leq .05$, two-tailed.

** Significant Slopes-of-homogenity

Table 5

Demographic Characteristics for Group 2 PS ↑ and I ↓ ⇒ good prognosis

Variables	Total Group (n=20)
Gender (%)	
Male	20%*
Female	80%*
Race (%)	
Caucasian	90%*
Latino	
African American	10%*
Other	
Marital Status (%)	
Single	20%*
Married/ Living Together as Married	75%*
Divorced or Separated	5%*
Widowed	
Age (Mean)	57.25
Disability Payments (%)	
No	75%*
Yes	20%*
Pending Litigation (%)	
No	90%*
Yes	10%*
Time (in months) since the first onset of pain (Mean)	112.56

* Percentages are based on individual group size

Table 6

Independent Paired t-test for Group 2 (PS↑ and I↓ ⇒ good prognosis)

Outcome Measures	Mean(SD)	t (df)=t	p
BDI-pre-	13.9(9.5)	t (18)=2.62	.018*
BDI-post-	10.7(6.9)		
DPQ-pre-	95.8(15)	t (17)=1.65	.117
DPQ-post-	87.3(21.0)		
Oswestry-pre-	23.44(4.81)	t (17)=2.23	.040*
Oswestry-post-	19.89(7.34)		
PDA-pre-	7.89(1.48)	t (18)=4.17	.001*
PDA-post-	6.26(2.10)		
SF-36 MCS-pre-	45.93(12.35)	t (14)=-1.21	.246
SF-36 MCS-post-	49.93(11.70)		
SF-36 PCS-pre-	24.13(6.11)	t (14)=.537	.599
SF-36 PCS-post-	23.40(5.17)		

*$p \leq .05$, two-tailed.

Table 7

GROUP 2 (PS↑ and I↓ ⇒ good prognosis) ANCOVA (Using the Post-outcome measure as the Dependent Variable with the Pre-treatment outcome score as the Covariate)

Outcome Measures	Post- Mean (SD)	F	df	p	partialη^2
BDI					
Met Hypothesis 2	10.74(6.88)	154.81	269	.000*	.365
Did not meet hypo	9.85(8.40)				
DPQ					
Met Hypothesis 2	87.33(21.0)	71.13	245	.000*	.225
Did not meet hypo	66.17(30.03)				
Oswestry					
Met Hypothesis 2	19.89(7.34)	95.03	245	.000*	.279
Did not meet hypo	16.23(7.81)				
VAS					
Met Hypothesis 2	6.26(2.10)	12.24	256	.001*	.046
Did not meet hypo	4.36(2.14)				
SF-36 MCS					
Met Hypothesis 2	49.93(11.70)	63.55	239	.000*	.210
Did not meet hypo	49.53(11.54)				
SF-36 PCS					
Met Hypothesis 2	23.40(5.16)	112.84	239	.000*	.321
Did not meet hypo	33.55(10.10)				

*$p \leq .05$, two-tailed.

Table 8
Demographic Characteristics for Group 3 PS ↓ and I ↓ ⇒ good prognosis

Variables	Total Group (n=187)
Gender (%)	
Male	31%*
Female	69%*
Race (%)	
Caucasian	83.4%*
Latino	3.7%*
African American	11.2%*
Other	1.6%*
Marital Status (%)	
Single	14.4%*
Married/ Living Together as Married	66.3%*
Divorced or Separated	10.2%*
Widowed	7.0%*
Age (Mean)	54.08
Disability Payments (%)	
No	82.9%*
Yes	14.4%*
Pending Litigation (%)	
No	90%*
Yes	5%*
Time (in months) since the first onset of pain (Mean)	85.91

* Percentages are based on individual group size

Table 9

Independent Paired t-test for Group 3 (PS↓ and I↓ ⇒ good prognosis)

Outcome Measures	Mean(SD)	t (df)=t	p*
BDI-pre-	12.42(7.94)	t (183)=7.77	.000*
BDI-post-	8.23(6.99)		
DPQ-pre-	84.05(23.49)	t (164)=11.48	.000*
DPQ-post-	59.64(27.79)		
Oswestry-pre-	19.07(7.99)	t (163)=7.69	.000*
Oswestry-post-	14.35(7.19)		
PDA-pre-	7.17(1.82)	t (169)=17.19	.000*
PDA-post-	4.01(1.99)		
SF-36 MCS-pre-	44.41(11.91)	t (160)=-6.28	.000*
SF-36 MCS-post-	50.66 (11.03)		
SF-36 PCS-pre-	30.65(8.58)	t (160)=-7.23	.000*
SF-36 PCS-post-	35.60(9.93)		

*$p \leq .05$, two-tailed.

Table 10

GROUP 3 (PS↓ and I↓ ⇒ good prognosis) ANCOVA (Using the Post-outcome measure as the Dependent Variable with the Pre-treatment outcome score as the Covariate)

Outcome Measures	Post- Mean (SD)	F	df	p	partialη^2
BDI					
Met Hypothesis 3	8.23(6.98)	121.55	259	.000*	.311
Did not meet hypo	13.44(9.66)				
DPQ					
Met Hypothesis 3	59.64(27.79)	39.22	245	.000*	.138
Did not meet hypo	83.72(27.67)				
Oswestry					
Met Hypothesis 3	14.35(7.19)	55.67	245	.000*	.185
Did not meet hypo	20.68(7.33)				
VAS					
Met Hypothesis 3	4.01(1.99)	7.12	245	.008*	.027
Did not meet hypo	5.45(2.24)				
SF-36 MCS					
Met Hypothesis 3	50.65(11.03)	58.16	239	.000*	.196
Did not meet hypo	47.38(12.24)				
SF-36 PCS					
Met Hypothesis 3	35.60(9.92)	80.36	239	.000*	.252
Did not meet hypo	27.59(8.41)				

*$p \leq .05$, two-tailed.

Table 11

Demographic Characteristics for Group 4 PS ↑ and I ↑ ⇒ poor prognosis

Variables	Total Group (n=31)
Gender (%)	
Male	35.5%*
Female	64.5%*
Race (%)	
Caucasian	80.6%*
Latino	12.9%*
African American	6.5% *
Other	
Marital Status (%)	
Single	19.4%*
Married/ Living Together as Married	54.8%*
Divorced or Separated	22.6%*
Widowed	3.2%*
Age (Mean)	49.48
Disability Payments (%)	
No	64.5%*
Yes	35.5%*
Pending Litigation (%)	
No	67.7%*
Yes	29.0%*
Time (in months) since the first onset of pain (Mean)	85.91

* Percentages are based on individual group size

Table 12

Independent Paired t-test for Group 4 (PS↑ and I↑ ⇒ poor prognosis)

Outcome Measures	Mean(SD)	t (df)=t	p
BDI-pre-	21.96(11.44)	t (27)=3.56	.001*
BDI-post-	13.79(10.93)		
DPQ-pre-	114.96(15.74)	t (27)=4.86	.000*
DPQ-post-	91.43(28.80)		
Oswestry-pre-	30.75(4.96)	t (27)=5.65	.000*
Oswestry-post-	22.64(7.37)		
PDA-pre-	8.37(1.45)	t (29)=5.86	.000*
PDA-post-	5.57(2.08)		
SF-36 MCS-pre-	34.21(13.28)	t (27)=-6.75	.000*
SF-36 MCS-post-	45.86(12.89)		
SF-36 PCS-pre-	23.28(4.84)	t (27)=-3.09	.005*
SF-36 PCS-post-	28.68(8.23)		

*$p \leq .05$, two-tailed.

Table 13

GROUP 4 (PS↑ and I↑ ⇒ poor prognosis) ANCOVA (Using the Post-outcome measure as the Dependent Variable with the Pre-treatment outcome score as the Covariate)

Outcome Measures	Post- Mean (SD)	F	df	p	partialη^2
BDI					
Met Hypothesis 4	13.79(10.92)	143.34	269	.000*	.348
Did not meet hypo	9.47(7.85)				
DPQ					
Met Hypothesis 4	91.43(28.80)	52.12	245	.000*	.175
Did not meet hypo	64.68(28.77)				
Oswestry					
Met Hypothesis 4	22.64(7.37)	72.21	245	.000*	.228
Did not meet hypo	15.71(7.54)				
VAS					
Met Hypothesis 4	5.57(2.07)	10.37	245	.001*	.039
Did not meet hypo	4.36(2.16)				
SF-36 MCS					
Met Hypothesis 4	45.85(12.89)**				
Did not meet hypo	50.04(11.27)				
SF-36 PCS					
Met Hypothesis 4	28.67(8.22)**				
Did not meet hypo	33.47(10.27)				

*$p \leq .05$, two-tailed.

** Significant Slopes-of-homogenity

Table 14

Demographic Characteristics for Group 5 LC↑ and AD↓ ⇒ poor prognosis

Variables	Total Group (n=134)
Gender (%)	
Male	31.3%*
Female	68.7%*
Race (%)	
Caucasian	86.6%*
Latino	4.5%*
African American	9.0%*
Other	
Marital Status (%)	
Single	13.4%*
Married/ Living Together as Married	63.1%*
Divorced or Separated	11.2%*
Widowed	9.1%
Age (Mean)	57.23
Disability Payments (%)	
No	82.8%*
Yes	13.4%*
Pending Litigation (%)	
No	86.6%*
Yes	9.7%*
Time (in months) since the first onset of pain (Mean)	107.82

*Percentages are based on individual group size

Table 15

Independent Paired t-test for Group 5 (LC↑ and AD↓ ⇒ poor prognosis)

Outcome Measures	Mean(SD)	t (df)=t	p
BDI-pre-	10.13(6.77)	t (132)=5.07	.000*
BDI-post-	7.41 (6.39)		
DPQ-pre-	87.42(25.44)	t (117)=9.94	.000*
DPQ-post-	63.43(27.36)		
Oswestry-pre-	20.52(8.55)	t (119)=9.94	.000*
Oswestry-post-	15.18(7.51)		
PDA-pre-	7.13(1.91)	t (124)=13.91	.000*
PDA-post-	4.10(1.91)		
SF-36 MCS-pre-	48.42(10.96)	t (117)=-4.82	.000*
SF-36 MCS-post-	53.42(9.72)		
SF-36 PCS-pre-	29.11(9.22)	t (117)=-5.60	.000*
SF-36 PCS-post-	33.94(10.84)		

*$p \leq .05$, two-tailed.

Table 16

GROUP 5 (LC↑ and AD↓ ⇒ poor prognosis) ANCOVA (Using the Post-outcome measure as the Dependent Variable with the Pre-treatment outcome score as the Covariate)

Outcome Measures	Post- Mean (SD)	F	df	p	partialη^2
BDI					
Met Hypothesis 5	7.41(6.39)	117.44	269	.000*	.304
Did not meet hypo	12.28(9.17)				
DPQ					
Met Hypothesis 5	63.43(27.36)	66.94	245	.000*	.215
Did not meet hypo	71.52(31.71)				
Oswestry					
Met Hypothesis 5	15.18(7.51)	90.12	245	.000*	.269
Did not meet hypo	17.71(7.94)				
VAS					
Met Hypothesis 5	3.89(1.82)	12.39	245	.001*	.046
Did not meet hypo	4.70(2.26)				
SF-36 MCS					
Met Hypothesis 5	53.24(9.72)	38.47	239	.000*	.152
Did not meet hypo	46.12(12.04)				
SF-36 PCS					
Met Hypothesis 5	36.23(9.69)	112.39	239	.000*	.320
Did not meet hypo	31.83(10.10)				

*$p \leq .05$, two-tailed.

Table 17

Demographic Characteristics for Group 6 LC=AD ⇒ good prognosis

Variables	Total Group (n=67)
Gender (%)	
Male	31.3%*
Female	68.7%*
Race (%)	
Caucasian	80.6%*
Latino	3.0%*
African American	12.1%*
Other	3.0%*
Marital Status (%)	
Single	17.9%*
Married/ Living Together as Married	62.7%*
Divorced or Separated	10.4%*
Widowed	3.0%*
Age (Mean)	52.90
Disability Payments (%)	
No	76.1%*
Yes	20.9%*
Pending Litigation (%)	
No	77.6%*
Yes	16.4%*
Time (in months) since the first onset of pain (Mean)	85.03

*Percentages are based on individual group size

Table 18

Independent Paired t-test for Group 6 (LC=AD ⇒ good prognosis)

Outcome Measures	Mean(SD)	t (df)=t	p
BDI-pre-	14.79(6.75)	t (63)=4.39	.000*
BDI-post-	11.29(8.46)		
DPQ-pre-	92.07(22.60)	t (61)=4.69	.000*
DPQ-post-	74.79(30.58)		
Oswestry-pre-	21.84(7.49)	t (58)=4.10	.000*
Oswestry-post-	17.74(8.39)		
PDA-pre-	7.78(1.66)	t (62)=2.79	.000*
PDA-post-	5.10(2.23)		
SF-36 MCS-pre-	38.98(10.20)	t(55)=-5.80	.000*
SF-36 MCS-post-	47.02(11.01)		
SF-36 PCS-pre-	28.16(8.63)	t (55)=-3.16	.003*
SF-36 PCS-post-	31.36(9.52)		

*$p \leq .05$, two-tailed.

Table 19

GROUP 6 (LC=AD ⇒ good prognosis) ANCOVA (Using the Post-outcome measure as the Dependent Variable with the Pre-treatment outcome score as the Covariate)

Outcome Measures	Post- Mean (SD)	F	df	p	partialη^2
BDI					
Met Hypothesis 6	11.29(8.46)**				
Did not meet hypo	9.50(8.23)				
DPQ					
Met Hypothesis 6	74.79(30.58)	72.34	245	.000*	.228
Did not meet hypo	65.39(29.45)				
Oswestry					
Met Hypothesis 6	17.74(8.38)	97.02	245	.000*	.284
Did not meet hypo	16.21(7.63)				
VAS					
Met Hypothesis 6	5.10(2.23)	11.46	256	.001*	.043
Did not meet hypo	4.31(2.14)				
SF-36 MCS					
Met Hypothesis 6	47.01(11.01)	59.97	239	.000*	.201
Did not meet hypo	50.31(11.59)				
SF-36 PCS					
Met Hypothesis 6	47.02(11.01)	59.97	239	.000*	.201
Did not meet hypo	50.31(11.59)				

*$p \leq .05$, two-tailed.

** Significant Slopes-of-homogenity

Table 20

Demographic Characteristics for Group 7 S↑ and D↑ and P↓ and So↓ ⇒ good prognosis

Variables	Total Group (n=10)
Gender (%)	
Male	50.0%*
Female	50.0%*
Race (%)	
Caucasian	80.0%*
Latino	
African American	10.0%*
Other	10.0%*
Marital Status (%)	
Single	20.0%*
Married/ Living Together as Married	60.0%*
Divorced or Separated	20.0%*
Widowed	
Age (Mean)	49.80
Disability Payments (%)	
No	80.0%*
Yes	20.0%*
Pending Litigation (%)	
No	90.0%*
Yes	10.0%*
Time (in months) since the first onset of pain (Mean)	56.30

* Percentages are based on individual group size

Table 21

Independent Paired t-test for Group 7 (S↑ and D↑ and P↓ and So↓⇒good prognosis)

Outcome Measures	Mean(SD)	t (df)=t	p
BDI-pre-	12.44(7.73)	t (9)=.029	.978
BDI-post-	12.33(10.67)		
DPQ-pre-	88.40(18.90)	t (10)=3.09	.013*
DPQ-post-	58.10(26.13)		
Oswestry-pre-	19.20 (4.85)	t (10)=1.53	.357
Oswestry-post-	16.00(9.88)		
PDA-pre-	6.60(1.35)	t (10)=2.95	.016*
PDA-post-	4.80(2.57)		
SF-36 MCS-pre-	47.88(15.00)	t (8)=.157	.880
SF-36 MCS-post-	46.62(16.36)		
SF-36 PCS-pre-	29.00(10.38)	t (11)=-4.09	.002*
SF-36 PCS-post-	36.63(11.29)		

*$p \leq .05$, two-tailed.

Table 22

GROUP 7 (S↑ and D↑ and P↓ and So↓⇒good prognosis) ANCOVA (Using the Post-outcome measure as the Dependent Variable with the Pre-treatment outcome score as the Covariate)

Outcome Measures	Post- Mean (SD)	F	df	p	partialη^2
BDI					
Met Hypothesis 7	11.25(9.67)	102.47	269	.000*	.328
Did not meet hypo	10.20(8.49)				
DPQ					
Met Hypothesis 7	59.31(23.22)**				
Did not meet hypo	70.43(30.04)				
Oswestry					
Met Hypothesis 7	14.27(9.92)	65.36	245	.000*	.254
Did not meet hypo	17.48(7.71)				
VAS					
Met Hypothesis 7	4.23(2.32)	8.97	256	.003*	.043
Did not meet hypo	4.64(2.23)				
SF-36 MCS					
Met Hypothesis 7	47.08(14.82)	41.67	239	.000*	.180
Did not meet hypo	48.91(11.43)				
SF-36 PCS					
Met Hypothesis 7	38.58(9.91)	87.29	239	.000*	.315
Did not meet hypo	31.79(9.83)				

*$p \leq .05$, two-tailed.

** Significant Slopes-of-homogenity

Table 23

Demographic Characteristics for Group 8 S↑ and So↑ and P↑ and D↓ ⇒ poor prognosis

Variables	Total Group (n=14)
Gender (%)	
Male	35.7%*
Female	64.3%*
Race (%)	
Caucasian	92.9%*
Latino	
African American	7.1%*
Other	
Marital Status (%)	
Single	7.1%*
Married/ Living Together as Married	92.8%*
Divorced or Separated	
Widowed	
Age (Mean)	58.14
Disability Payments (%)	
No	85.7%*
Yes	14.3%*
Pending Litigation (%)	
No	100.0%*
Yes	
Time (in months) since the first onset of pain (Mean)	71.00

* Percentages are based on individual group size

Table 24

Independent Paired t-test for Group 8 (S↑ and So↑ and P↑ and D↓⇒poor prognosis)

Outcome Measures	Mean(SD)	t (df)=t	p
BDI-pre-	15.43(9.53)	t (14)=2.45	.029*
BDI-post-	9.79(9.72)		
DPQ-pre-	94.69(22.83)	t (13)=3.32	.006*
DPQ-post-	66.92(37.26)		
Oswestry-pre-	22.57(7.71)	t (14)=2.79	.015*
Oswestry-post-	17.36(7.61)		
PDA-pre-	8.08(1.80)	t (13)=5.13	.000*
PDA-post-	4.23(2.16)		
SF-36 MCS-pre-	39.14(13.26)	t (14)=-8.86	.022*
SF-36 MCS-post-	48.00(12.92)		
SF-36 PCS-pre-	26.21(5.49)	t (14)=-7.00	.002*
SF-36 PCS-post-	33.21(8.41)		

*$p \leq .05$, two-tailed.

Table 25

GROUP 8 (S↑ and So↑ and P↑ and D↓⇒poor prognosis) ANCOVA (Using the Post-outcome measure as the Dependent Variable with the Pre-treatment outcome score as the Covariate)

Outcome Measures	Post- Mean (SD)	F	df	p	partialη^2
BDI					
Met Hypothesis 8	9.42(9.79)	51.47	259	.000*	.254
Did not meet hypo	10.24(8.37)				
DPQ					
Met Hypothesis 8	63.33(36.49)	22.35	245	.000*	.135
Did not meet hypo	69.07(29.18)				
Oswestry					
Met Hypothesis 8	16.58(7.98)	33.63	245	.000*	.194
Did not meet hypo	17.16(8.04)				
VAS					
Met Hypothesis 8	4.17(2.25)	3.78	256	.053	.025
Did not meet hypo	4.67(2.19)				
SF-36 MCS					
Met Hypothesis 8	49.25(11.90)	21.43	239	.000*	.135
Did not meet hypo	49.32(11.78)				
SF-36 PCS					
Met Hypothesis 8	34.66(7.99)	66.31	239	.000*	.326
Did not meet hypo	32.69(10.23)				

*$p \leq .05$, two-tailed.

Table 26

Demographic Characteristics for Group 9 PS↑ and I↑ and AD↑ and LC↓ ⇒ poor prognosis

Variables	Total Group (n=9)
Gender (%)	
Male	33.3%*
Female	66.7%*
Race (%)	
Caucasian	100%*
Latino	
African American	
Other	
Marital Status (%)	
Single	
Married/ Living Together as Married	66.7%*
Divorced or Separated	33.3%*
Widowed	
Age (Mean)	46.33
Disability Payments (%)	
No	33.3%*
Yes	67.7%*
Pending Litigation (%)	
No	77.8%*
Yes	22.2%*
Time (in months) since the first onset of pain (Mean)	90.22

* Percentages are based on individual group size

Table 27

Independent Paired t-test for Group 9 (PS↑ and I↑ and AD↑ and ↓LC ⇒ poor prognosis)

Outcome Measures	Mean(SD)	t (df)=t	p
BDI-pre-	35.57(8.16)	t (6)=4.03	.007*
BDI-post-	14.29(10.74)		
DPQ-pre-	120.78(14.50)	t (8)=2.92	.019*
DPQ-post-	103.67(21.68)		
Oswestry-pre-	31.50(4.59)	t (7)=5.38	.001*
Oswestry-post-	22.88(4.54)		
PDA-pre-	8.56(1.88)	t (8)=3.04	.016*
PDA-post-	5.56(1.66)		
SF-36 MCS-pre-	26.44(7.26)	t (8)=- 4.97	.001*
SF-36 MCS-post-	43.44(14.24)		
SF-36 PCS-pre-	22.88(3.01)	t (8)=-1.56	.156
SF-36 PCS-post-	26.00(7.68)		

*$p \leq .05$, two-tailed.

Table 28

GROUP 9 (PS↑ and I↑ and AD↑ and ↓LC ⇒ poor prognosis) ANCOVA (Using the Post-outcome measure as the Dependent Variable with the Pre-treatment outcome score as the Covariate)

Outcome Measures	Post- Mean (SD)	F	df	p	partialη^2
BDI					
Met Hypothesis 9	14.29(10.74)**				
Did not meet hypo	9.80(8.22)				
DPQ					
Met Hypothesis 9	103.67(21.68)	60.27	256	.000*	.197
Did not meet hypo	66.35(29.39)				
Oswestry					
Met Hypothesis 9	22.88(4.55)	89.02	245	.000*	.267
Did not meet hypo	16.28(7.83)				
VAS					
Met Hypothesis 9	5.56(167)	12.34	256	.001*	.046
Did not meet hypo	4.46(2.19)				
SF-36 MCS					
Met Hypothesis 9	43.44(14.24)**				
Did not meet hypo	49.79(11.38)				
SF-36 PCS					
Met Hypothesis 9	26.0(7.68)	114.16	1	.000*	.323
Did not meet hypo	33.19(10.2)				

*$p \leq .05$, two-tailed.

** Significant Slopes-of-homogenity

Table 29

Analysis of Variance for "Poor Group"- (Groups 1, 4, 5, 8, and 9)

Outcome Measures	Mean(SD)	t (df)=t	p
BDI-pre-	12.45(10.0)	t (109)=5.19	.000*
BDI-post-	8.55(8.41)		
DPQ-pre-	96.14(26.98)	t (106)=13.15	.000*
DPQ-post-	103.67(21.68)		
Oswestry-pre-	22.64(8.45)	t (99)=9.39	.000*
Oswestry-post-	15.99(8.11)		
PDA-pre-	7.55(1.87)	t (106)=13.15	.000*
PDA-post-	4.31(2.09)		
SF-36 MCS-pre-	45.51(13.35)	t (100)=-6.14	.000*
SF-36 MCS-post-	51.62 (11.15)		
SF-36 PCS-pre-	27.62(8.32)	t (100)=-7.11	.000*
SF-36 PCS-post-	33.66(9.79)		

*$p \leq .05$, two-tailed.

Table 30

Analysis of Variance for "Good Groups"- (2,3,6, and7)

Outcome Measures	Mean(SD)	t (df)=t	p
BDI-pre-	16.28(8.54)	t (161)=8.78	.000*
BDI-post-	10.84(8.12)		
DPQ-pre-	88.36(21.78)	t (146)=8.98	.000*
DPQ-post-	67.47(28.48)		
Oswestry-pre-	21.32(8.23)	t (147)=6.63	.000*
Oswestry-post-	16.84(7.63)		
PDA-pre-	7.41(1.81)	t (151)=13.71	.000*
PDA-post-	4.64(2.25)		
SF-36 MCS-pre-	40.15(10.92)	t (140)=-6.80	.000*
SF-36 MCS-post-	48.09 (11.60)		
SF-36 PCS-pre-	28.74(8.39)	t (140)=-4.99	.000*
SF-36 PCS-post-	32.39(10.42)		

*$p \leq .05$, two-tailed.

APPENDIX C:

MATERIALS

Name_____
Date_____

MULTIDIMENSIONAL PAIN INVENTORY

Instructions: An important part of our evaluation includes examination of pain from **your** perspective. You know your pain better than anyone, so the information you give is very helpful in planning a treatment program for you.

Please read each question carefully and then do your best to answer each one. **Do not skip any questions.** If there is a question that you think does not apply to you, please **circle the number** of that question. After you have completed the questionnaire, check your responses to make sure that you have answered each question. Please use the last page to add any additional information or comments that you think would be of help to us in better understanding your pain problem.

A. Some of the questions in this questionnaire refer to your "significant other." A significant other is a person with whom you feel closest. This includes anyone that you relate to on a regular or frequent basis. It is very important that you identify someone as your "significant other." Please indicate below who your significant other is (circle one):

- Spouse
- Partner/Companion
- Housemate/Roommate
- Friend
- Neighbor
- Parent/Child
- Other (please describe):_____

B. Do you currently live with this person? YES NO

When you answer the questions on the following pages about your "significant other," always respond in reference to the specific person you just indicated.

SECTION 1

This part asks questions to help us learn more about your pain and how it affects your life. Under each question is a scale to mark your answer. Read each answer carefully and then **circle a number** on the scale under that question to indicate how that specific question applies to you. An example may help you to better understand how you should answer these questions.

EXAMPLE:

How nervous are you when you ride in a car when the traffic is heavy?

0 1 2 3 4
5 6
Not at all
Extremely
Nervous
Nervous

If you are <u>not at all</u> nervous when riding in a car in heavy traffic, you would want to **circle** the number 0. If you are <u>very nervous</u> when riding in a car in heavy traffic, you would then **circle** the number 6. Lower numbers would be used for less nervousness, and higher numbers for more nervousness.

Please continue on the next page.

Please answer the following questions:

1. Rate the level of your pain at the **<u>present moment</u>.**

0 1 2 3 4
5 6
No Pain
Very Intense Pain

2. In general, how much does your pain interfere with your day-to-day activities?

0 1 2 3 4
5 6
No Interference
Extreme Interference

3. Since the time your pain began, how much has your pain changed your ability to work?
(_____ Check here if you are not working for reasons other than your pain.)

0 1 2 3 4
5 6
No Change
Extreme Change

4. How much has your pain changed the amount of satisfaction or enjoyment you get from taking part in social and recreational activities?

0 1 2 3 4
5 6
No Change
Extreme Change

5. How supportive or helpful is your significant other (this refers to the person you indicated above) to you in relation to your pain?

0 1 2 3 4 5 6

Not at all Supportive — Extremely Supportive

6. Rate your overall mood during the **past week**.

0 1 2 3 4 5 6

Extremely Low — Extremely High

7. How much has your pain interfered with your ability to get enough sleep?

0 1 2 3 4 5 6

No Interference — Extreme Interference

8. On average, how severe has your pain been during the **last week**?

0 1 2 3 4 5 6

Not at all Severe — Extremely Severe

9. How able are you to predict when your pain will start, get better, or get worse?

0 1 2 3 4 5 6

Not at all able to predict — Very able to predict

10. How much has your pain changed your ability to take part in recreational and other social activities?

0 1 2 3 4 5 6

No Change — Extreme Change

Please continue on the next page.

11. How much do you limit your activities in order to keep your pain from getting worse?

0 1 2 3 4 5 6

Not at all Very Much

12. How much has your pain changed the amount of satisfaction or enjoyment you get from family related activities?

0 1 2 3 4 5 6

No Change Extreme Change

13. How worried is your spouse (significant other) about you because of your pain?

0 1 2 3 4 5 6

Not at all Worried Extremely Worried

14. During the **past week**, how much control do you feel you have had over your life?

0 1 2 3 4 5 6

No Control Extreme Control

15. On an average day, how much does your pain vary (increase or decrease)?

0 1 2 3 4 5 6

Remains the same Changes a lot

16. How much suffering do you experience because of your pain?

0 1 2 3 4 5 6

No Suffering Extreme Suffering

17. How often are you able to do something that helps to reduce your pain?

0 1 2 3 4 5 6

Never Very Often

18. How much has your pain changed your relationship with your spouse, family, or significant other?

0 1 2 3 4
5 6
No Change
Extreme Change

19. How much has your pain changed the amount of satisfaction or enjoyment you get from work?

(_____ Check here if you are not presently working.)

0 1 2 3 4
5 6
No Change
Extreme Change

20. How attentive is your spouse (significant other) to you because of your pain?

0 1 2 3 4
5 6
Not at all Attentive
Extremely Attentive

21. During the **past week**, how well do you feel you have been able to deal with your problems?

0 1 2 3 4
5 6
Not at all
Extremely Well

Please continue on the next page.

22. How much control do you feel you have over your pain?

0 1 2 3 4
5 6
No control at all
A great deal of control

23. How much has your pain changed your ability to do household chores?

0 1 2 3 4
5 6
No Change
Extreme Change

24. During the **past week**, how successful were you in coping with stressful situations in your life?

0 1 2 3 4
5 6

Not at all Successful
Extremely Successful

25. How much has your pain interfered with your ability to plan activities?

0 1 2 3 4
5 6

No Change
Extreme Change

26. During the **past week**, how irritable have you been?

0 1 2 3 4
5 6

Not at all Irritable
Extremely Irritable

27. How much has your pain changed your friendships with people other than your family?

0 1 2 3 4
5 6

No Change
Extreme Change

28. During the **past week**, how tense or anxious have you been?

0 1 2 3 4
5 6

Not at all tense or anxious
Extremely tense & anxious

SECTION 2

In this section, we are interested in knowing how your spouse (or significant other) responds to you when he or she knows you are in pain. On the scale listed below each question, **circle a number** to indicate how often your spouse (or significant other) responds to you in that particular way when you are in pain.

1. Ignores me.

0 1 2 3 4
5 6

Never
Very Often

2. Asks me what he or she can do to help.

0	1	2	3	4
5	6			
Never				
	Very Often			

3. Reads to me.

0	1	2	3	4
5	6			
Never				
	Very Often			

4. Gets irritated with me.

0	1	2	3	4
5	6			
Never				
	Very Often			

Please continue on the next page.

5. Takes over my jobs or duties.

0	1	2	3	4
5	6			
Never				
	Very Often			

6. Talks to me about something else to take my mind off the pain.

0	1	2	3	4
5	6			
Never				
	Very Often			

7. Gets frustrated with me.

0	1	2	3	4
5	6			
Never				
	Very Often			

8. Tries to get me to rest.

0	1	2	3	4
5	6			
Never				
	Very Often			

9. Tries to involve me in some activity.

0 1 2 3 4
5 6
Never Very Often

10. Gets angry with me.
0 1 2 3 4
5 6
Never Very Often

11. Gets me pain medication.
0 1 2 3 4
5 6
Never Very Often

12. Encourages me to work on a hobby.
0 1 2 3 4
5 6
Never Very Often

13. Gets me something to eat or drink.
0 1 2 3 4
5 6
Never Very Often

14. Turns on the T.V. to take my mind off my pain.
0 1 2 3 4
5 6
Never Very Often

SECTION 3

Listed below are 18 daily activities. Please indicate how often you do each of these by circling a number on the scale listed below each activity. Please complete all 18 questions.

1. Wash dishes.
0 1 2 3 4
5 6

Never
Very Often

2. Mow the lawn. (_____ Check here if you do not have a lawn to mow.)
0 1 2 3 4
5 6
Never
Very Often

3. Go out to eat.
0 1 2 3 4
5 6
Never
Very Often

4. Play cards or other games.
0 1 2 3 4
5 6
Never
Very Often

5. Go grocery shopping.
0 1 2 3 4
5 6
Never
Very Often

6. Work in the garden. (_____ Check here if you do not have a garden.)
0 1 2 3 4
5 6
Never
Very Often

7. Go to a movie.
0 1 2 3 4
5 6
Never
Very Often

8. Visit friends.
0 1 2 3 4
5 6
Never
Very Often

9. Help with the house cleaning.

0 1 2 3 4 5 6

Never Very Often

10. Work on the car. (_____ Check here if you do not have a car.)

0 1 2 3 4 5 6

Never Very Often

11. Take a ride in a car or bus.

0 1 2 3 4 5 6

Never Very Often

Please continue on the next page.

12. Visit relatives. (_____ Check here if you do not have relatives within 100 miles.)

0 1 2 3 4 5 6

Never Very Often

13. Prepare a meal.

0 1 2 3 4 5 6

Never Very Often

14. Wash the car. (_____ Check here if you do not have a car.)

0 1 2 3 4 5 6

Never Very Often

15. Take a trip.

0 1 2 3 4 5 6

Never
Very Often

16. Go to a park or beach.
0 1 2 3 4
5 6
Never
Very Often

17. Do the laundry.
0 1 2 3 4
5 6
Never
Very Often

18. Work on a needed household repair.
0 1 2 3 4
5 6
Never
Very Often

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VITAE

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