**ADJUSTMENT TO CHRONIC PAIN AND
READINESS FOR CHANGE**

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Thesis submitted to the Faculty of Graduate Studies and Research
in partial fulfilment of the requirements
for the degree of Master of Arts

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READINESS FOR CHANGE"**

submitted by **Victor Gallant, B.A.**

in partial fulfilment of the requirements for

the degree of Master of Arts

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ABSTRACT

Assessing the adjustment of individuals with chronic pain is a complex endeavour, requiring the analyses of a broad range of interpersonal, intrapersonal, physical, and psychological characteristics. The objective of this project was to show the validity of using the Transtheoretical Model of Behavioural Change (TTM) as an assessment tool with a heterogeneous population of chronic pain patients. The goals of this project were to identify unique groups of patients, defined in terms of their stage of readiness to make change, and to show that the theoretical grouping scheme, developed using the TTM would provide unique and additional information to already existing pain assessment measures.

Ninety-seven outpatients (aged 18 and over) from a local pain clinic with a diverse number of pain complaints and etiological pain profiles were asked to complete a questionnaire package that included a stages of readiness questionnaire. Using cluster analytic techniques, participants were classified, into three groups, that were defined in terms of the Transtheoretical Model. Subsequent statistical analyses and comparisons demonstrated that these individuals in the different groups differed significantly on measures of psychosocial adjustment, and in the use of maladaptive coping behaviours. The discussion of the findings centred around the utility of the Transtheoretical (readiness for change) Model as a tool for identifying patients ready to (a) adhere to medical treatment and (b) actively engage in behavioural interventions aimed at enhancing psychosocial adjustment to chronic pain. The use of the stages paradigm as a guide for screening pain patients was discussed as an important addition in the development of assessment protocols for chronic pain patients.

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Adjustment To Chronic Pain And Readiness For Change

Careful evaluation of chronic pain patients is critical when determining the form of intervention that will be of benefit to relieve these patients of their suffering (Newman & Seres, 1986). Effective pre-treatment assessment for any new incoming chronic pain patient should identify particular needs and then match those needs with the most appropriate treatment. The questions that need to be addressed are: "What patients, with what set of characteristics (demographic, psychological, somatic), are most likely to benefit from what set of treatment modalities?" (Turk & Holzman, 1986, p. 265).

Chronic Pain and the Chronic Pain Patient

Chronic pain is identified and diagnosed when pain persists for more than six months and results in the need for long-term treatment (Merskey & Bogduk, 1994). Apart from this temporal distinction, chronic pain is also recognised as a multidimensional, multifaceted problem (Engelbart & Vrancken, 1984; Merskey & Bogduk, 1994; Novy, Nelson, Francis, & Turk, 1995).

Defined as a "malefic force" (Zarkowska & Philips, 1986 p. 355), chronic pain has the potential for imposing emotional, physical, and economic stress on the sufferer (Engelbart & Vrancker, 1984; Zarkowska & Philips, 1986). Working from widely divergent theoretical models, neurophysiologists, cognitive psychologists, behavioural psychologists, and social psychologists have provided uniquely differing views as to the definition and understanding of chronic pain (Blackman, 1982; Haddox, 1990; Melzack, 1987; Newman & Seres, 1986; Novy, Nelson, Francis, & Turk, 1995). Chronic pain is a

sensory phenomenon, with unique neurophysiology, perceptual, and higher order central nervous system processes (Melzack, 1987). It is also a dysphoric subjective state, and as well, a social role that will have an impact on family, vocational, and societal responsibilities and status (Keefe, Dunsmore, & Burnett, 1992; LaCross & Soumekh, 1996).

Chronic pain patients will initially present with an acute problem. Over time, multiple investigations and multiple medical treatments may result in a constellation of psychosocial and behavioural difficulties (Miller & Kraus, 1990). The outcome has been shown to be influenced by such variables as the cause and duration of the pain, and on individual variables such as coping ability, personality, and past experiences (Crisson & Keefe, 1988; Jensen & Karoly, 1992; Miller & Kraus, 1990; Philips, 1987; Turner & Clancy, 1986; Zarkowska & Philips, 1986).

In the initial stages of a chronic pain problem, a diagnosis is applied and a prediction is made as to when the patient will be able to return to normal functioning. In approximately 10 to 20% (Nachemson, 1982) of patients who enter the medical system for an acute problem, and in some cases upwards of 40% (Philips & Grant, 1991), symptoms do not resolve. This may result in diagnoses being added and the estimated date of functional recovery being delayed. Following missed diagnoses the patient recycles back through medical management (Baszanger, 1987; Clifford, 1993) to undergo further exploratory, investigations, with possible changes in medications, and diagnoses.

Illness behaviour and passivity can be reinforced (Clifford, 1993) along with hopelessness and helplessness (Hendler, 1982), catastrophising (Geisser, Robinson, & Keefe, 1994) and depression, when ongoing pain perception follows continued treatment. Increased uncertainty, anxiety, and confusion in the social environment of the patient follow as the perception of pain continues (Clifford, 1993; Hendler, 1982). Prolonged, unsuccessful medical management can also unleash previously controlled psychological conflicts and interject the threat of loss of socio-economic order in the person's life. As pointed out by Hendler (1982) "...chronic pain patients ... undergo an arduous odyssey that carries them throughout the full range of human emotion" (p. 7). These emotional reactions can play directly into the exacerbation of pain perception. What can result is a decreased physical activity level, leading to a bodily deconditioning, aggravating the organic structures of the pain problem (Bajwa & Borsook, 1996; Blackman, 1982; Clifford, 1993).

Classification of Pain Patients

Since Sternbach (1974) argued that pain patients did not represent a homogeneous group, (Guck, Meilman, Skultety, & Polini, 1988) the emphasis in assessment of chronic pain patients has been to identify clinically meaningful subgroups (Iezzi, Adams, Stokes, Pilon, 1992; Jamison, Rock, & Parris, 1988; Jamison, Rudy, Penzien, & Mosley, 1994; Keefe, Bradley, & Crisson, 1990; Klapow, et al., 1995; Klapow et al., 1993;). Keefe, Bradley, and Crisson (1990) reported 4 distinct subgroups of low back pain patients who differed in the frequency with which they used motor pain behaviours such as rigid, guarded behaviour, sighing behaviour or rubbing behaviour. Reesor and Craig (1988) identified a subgroup of back pain patients as "incongruent pain patients" whose pain behaviour did not match their

symptoms and who evidenced poorer prognosis in their adjustment to back pain. Brown and Nicassio (1987) classified pain patients based on the nature of coping strategies used by the patients - active coping versus passive coping (Brown & Nicassio, 1987; Snow-Turek, Norris, Tan, 1996). The Symptom Checklist - 90 (SCL-90) has also been used to derive subgroups of patients (Jamison, Rock, & Parris, 1988; Williams, Urban, Keefe, & Shutty, 1995). Some of the more frequently used methods of classification for chronic pain patients are described below.

Chronic Pain Syndrome. Because of the apparent insidious nature of chronic pain, it has been suggested that chronic pain be best thought of as a disease with its own constellation of symptoms and disorders (Haddox, 1990; Hendler, 1982). "Chronic Pain Syndrome" (Merskey & Bogduk, 1994; Follick, Aberger, Ahern, & McCarthy, 1984) has been used as a diagnostic label referring to a particular clinical presentation involving a persistent pattern of pain, elevated pain sensation, increased affective distress, and decreased functional ability. As well, the pain may have arisen from organic causes, presently compounded by psychological and social problems in behavioural change (Merskey & Bogduk, 1994; Baszanger, 1987). Besides the overt behaviours like doctor shopping, narcotic abuse, alcohol and recreational drug use to alleviate pain, concomitant disturbance of mood and affect may also be present. Once identified, the goal is to break these behaviour patterns and replace them with a more adaptive coping strategies (LaCross & Soumekh, 1996).

All individuals with a chronic pain condition must learn to adapt to and live with their pain recognising that pain is going to have some influence on their lifestyle. Some

individuals, however, become more disabled by their pain than other individuals who present with a similar pain condition. Klapow and colleagues (1993) made this distinction in a population of chronic pain sufferers. Three subgroups of chronic pain patients were identified. “Chronic pain syndrome” patients had a high level of pain, depression and impairment. “Positive Adaptation to Pain” patients had high levels of pain with low levels of depression and impairment. “Good Pain Control” patients had low levels of pain, depression and impairment.

The importance of these results was to emphasise that not all patients who complain of chronic pain present with a chronic pain syndrome. Presenting with similar pain problems, individuals did show differential patterns of behavioural and emotional responses to that pain (Klapow et al., 1993; Zarkowska & Phillips, 1986). Although it is important to recognise these differences between patients based on their cognitive and behavioural responses, it is just as important to get an understanding of why these differential patterns evolved. It is also important to understand the factors that have a significant role in their development.

The use of Chronic Pain Syndrome is becoming less favourable as a diagnostic label. The Task Force on Taxonomy of the International Association for the Study of Pain (Merskey & Bogduk, 1994) felt that the category “Chronic Pain Syndrome” was often used in a pejorative manner. They also felt that the label evaded the requirement for accurate physical and psychiatric diagnosis. Where both physical and psychological disorders occur together, it is preferable to make both physical and psychological diagnoses and to indicate the contribution of each diagnosis to the patient’s pain. On the

surface, chronic pain is a unitary, subjective phenomenon, but one that is multidimensional in nature (Merskey & Bogduk, 1994).

MMPI. Perhaps the most widely used measure to assess chronic pain patients and to establish subgroups of patients has been the Minnesota Multiphasic Personality Inventory (MMPI) (Armentrout, Moore, Parker, Hewett & Feltz, 1982; Guck, Meilman, Skultety, & Polini, 1988; Keefe, Bradley & Crisson, 1990). Sternbach (1974) described four types of patients based on frequently found MMPI profiles. Although a four cluster solution was used by Costello, Hulsey, Schoenfeld, and Ramamurthy (1987) in support of Sternbach, (1974) a follow-up report calls into question the methods used to derive the profiles (Robinson, Swimmer, & Rallof, 1989). Gender differences have also been reported on these subscales of the MMPI. Three subgroups have been identified for men and four subgroups for women (Guck, Meilman, Skultety, & Polini, 1988; Kinder & Curtiss, 1990; Strassberg, Tiley, Bristone, & Oei, 1992). Age differences across the scales of the MMPI were also reported (Fow, Sittig, Dorris, Breisinger, & Anthony, 1994).

Most studies of the MMPI with pain patients do report the existence of unique subgroups of patients (Costello, Hulsey, Schoenfeld, & Ramamurthy, 1987; Hienrichs, 1987; Guck, Meilman, Skultety, & Polini, 1988). However, few studies report long-term outcome differences among the MMPI subgroups. One such study by Guck, Meilman, Skultety, and Polini (1988) found there to be no long-term follow-up differential effects among MMPI subgroups of chronic pain patients. It was hypothesised that the failure to find substantial long-term outcome differences may be a result of the multidisciplinary

nature of the treatment programs. Different patients may benefit from different components of a particular program (Guck, Meilman, Skultety, & Polini, 1988).

Another difficulty with the MMPI, as reported by Cripe, Maxwell and Hill (1995) is that any given item of the MMPI may be endorsed for a variety of reasons. They report that any resulting elevation for any scale for any two individuals can be the same but for very different reasons. For patients with a chronic pain problem, it is difficult to ascertain whether the scale elevations, or even item elevations, are the result of the problem itself or some unrelated reason (Cripe, Maxwell, & Hill, 1995). Elevations on the MMPI may reflect current physical pain and disability in pain patients, rather than psychological or emotional problems that independently affect outcome (Ornduff, Brennan, & Barrett, 1988; Wade, Dougherty, Hart, & Cook, 1992). For example, the MMPI Hysteria scale was found to consist of two types of items: (a) body related items that deal with body malfunctions and distressing physical experiences and (b) items pertaining to placating interpersonal attitudes, including anger and denial. Ornduff, Brennan, and Barrett (1988) found that hysteria scores are disproportionately elevated in pain patients because of the tendency for these patients to endorse more of the bodily items.

MPI. The West Haven Multidimensional Pain Inventory (MPI) (Kerns, Turk, & Rudy, 1985) has become one of the most respected and reliable means for patient classification (Mikail, DuBreuil, & D'Eon, 1993; Turk & Rudy, 1990; Turk & Rudy, 1988). Turk and Rudy (1990) applied the classification system for chronic pain patients based on the empirical integration of physical, psychosocial and behavioural data. They labelled this classification system as the Multiaxial Assessment of Pain (MAP).

By comparing the MPI profiles of several quite distinct chronic pain groups - 200 patients with chronic back pain, 200 with temporomandibular disorder and 100 chronic headache patients - a taxonomy based on psychosocial and behavioural data appears to generalise across groups of chronic pain patients. Certain modal patterns of psychosocial and behavioural assessment data appear to recur in chronic pain patients. These represent homogeneous subgroups of chronic pain patients independent of medical diagnosis (Turk and Rudy 1990;). Individuals with different pain diagnoses, who are classified within the same MAP subgroup may be more similar to each other than patients with the same medical-dental diagnosis but who are classified within a different MAP subgroup. The work of Turk and Rudy (1990), and Kabat-Zinn and Chapman-Waldrop (1988) point out that it is not the specific pain diagnosis that is important, but more the complex biopsychosocial make-up of the individuals that will determine the success of these individuals in adapting to their medical condition.

Assessment

Recognising the many medical, physical, social, psychological, and economic factors that have been shown to influence the chronic pain experience, adequate assessment of a patient's adjustment to chronic pain is one of the ongoing challenges in pain management (McGuire, 1992; Novy, Nelson, Francis, & Turk, 1995; Williams, 1988). Kleinke (1994) identified concepts relevant to the understanding for how patients with chronic pain cope with pain: cognitive strategies, self-efficacy, helplessness, catastrophising, and cognitive distortions. However, what makes assessment so difficult, is that chronic pain is so inherently private and only known by the individual (Baszanger, 1987). The key is to turn

the patient's personal, subjective experience into an operational category that will lead to better understanding of the needs of that patient.

Of 17 assessment instruments tested, Mikail, DuBreuil and D'Eon (1993) identified four psychometric measures that appeared to capture chronic pain patients' level of emotional adjustment, functional ability and perceptions of pain, without extensive overlap. These included the Beck Depression Inventory (BDI), the Multidimensional Pain Inventory (MPI), the Coping Strategies Questionnaire (CSQ), and the McGill Pain Questionnaire (MPQ). Five factors were identified in this study: "General Affective Distress", "Coping", "Support", "Pain Description" and "Functional Capacity." The BDI and the MPI affective distress subscale accounted for 78% of the variance in the 'General Affective Distress' factor. The MPI Support, Punishment, Distancing and Solicitous subscales accounted for 94% of the variance in the 'Support' factor. The MPQ accounted for 97% of the variance in the 'Pain Description' factor, and the MPI General Activity and Interference subscales accounted for 78% of the variance the 'Functional Capacity' factor. In a follow-up confirmatory factor analysis, De Gagne, Mikail, and D'Eon (1995) identified the MPQ, the MPI and the BDI as representative of the multidimensionality of the pain experience with minimal overlap among these measures.

It is important to identify all, or as many of the factors that promote adaptive functioning in the face of chronic pain (Jensen, Turner, Romano, & Karoly, 1991). Identifying factors that distinguish individuals who are functioning well from those who are not, will lead to a better understanding of the reasons for the wide variation in adaptation to pain. This will ultimately lead to more effective treatments (Jensen, Turner, Romano, & Lawler, 1994). Multiple dimensions of the individual's life including the personal, physical, cognitive, social

support, family life, and behavioural dimensions should be considered when assessing adjustment in a chronic pain patient. But, as pointed out by Flor, Behle, and Birbaumer (1993), and Novy, Nelson, Francis, and Turk (1995) these many factors are interrelated and as yet any explanation for the multiple interrelations has not been completely tested, and therefore not completely understood.

Recognising the Importance of Change

Chronic pain results in changes to an individual's life. These can include physical impairment and disability (Banks & Kerns, 1996), vocational changes (Goldberg & Maciewicz, 1994), changes in social activities, change in sexual function (Banks & Kerns, 1996) or changes in family responsibilities (Banks & Kerns, 1996; Lacroix & Barbaree, 1990). These changes may contribute to the degree of psychological distress in many patients (France, Krishnan, Houpt, & Maltibie, 1988). Learning to accept these changes is the challenge faced by individuals suffering with a chronic pain condition. Successful adaptation to chronic pain requires the patient to deal with the changes caused by their pain. Then the patient must learn new skills, cognitions, and behaviours that will help them manage their life with chronic pain (France, Krishnan, Houpt, & Maltibie, 1988).

Innovative programs, like the Stress Reduction and Relaxation Program (Kabat-Zinn & Chapman-Waldrop, 1988) have been developed to teach chronic pain patients new cognitive and behavioural coping strategies. The goal of these treatment programs is to reduce suffering and help individuals maintain a functionally effective lifestyle (Brown, Nicassio, & Wallston, 1989). Programs have been developed to assist patients to enhance their self-efficacy (Anderson, Dowds, Pelletz, Edwards, & Peetes-Asdourian, 1995),

modify their coping strategies (Brown & Nicassio, 1987; Snow-Turek, Norris, & Tan, 1996), change behaviour patterns (Philips, 1987), and change their attitudes and beliefs as they relate to chronic pain (Harkapaa, Jarvikoski, Mellin, Hurri, & Luoma, 1991; Jensen, Turner, & Romano 1994; Kuile, Spinhoven, Linssen, & van Houwelingen, 1995; Newman & Seres, 1986; Spinhoven & Linssen, 1991). Although reasons for the beneficial effects of these treatments remains unclear, it is interesting to stress the important role of change in all of these programs.

Changes to behavioural response. Fordyce (1976) made an important contribution toward the understanding of both the development and the maintenance of chronic pain. Recognising that chronic pain occurs within a social context, assessments should place more emphasis on the role of operant learning factors in the maintenance of pain behaviours.

For the acute pain patient, pain behaviours may include verbal complaints, non-language sounds, body posturing, and displays of functional limitations. These behaviours are likely to serve important adaptive functions for the acute patient. They are also likely to be directly related to actual tissue damage. However, these behaviours may lose their adaptive function over time and be reinforced by the environment through operant conditioning (Kerns, Southwick, Giller, Haythornthwaite, Jacob, & Rosenberg, 1991; Keefe, Bradley & Crisson, 1990; Novy, Nelson, Francis, & Turk, 1995). These reinforcement contingencies may include direct positive reinforcement such as attention from a solicitous spouse. Negative reinforcement, such as the avoidance of unwelcomed responsibilities like making major financial decisions or working can also influence the

continuance of pain behaviour. Avoidance or termination of certain actions like household chores or child care can reinforce pain behaviours. Finally, non-reinforcement of well behaviours can also reinforce pain behaviours as in the case where a spouse may encourage invalidism and discourage independence (Philips, 1987; Turk & Flor, 1987).

The family and its extended social network have been viewed as important learning environments. They may operate to maintain and exacerbate pain, suffering, and disability (Feinauer & Steele, 1992; Kerns, Southwick, Giller, Haythornthwaite, Jacob, & Rosenberg, 1991; Nicassio & Radojevic, 1993; Paulsen, & Altmaier, 1995). Romano et al. (1991) found a greater tendency for the spouses of chronic pain patients to respond to their partners' pain behaviour with greater solicitous behaviour than spouses of non-pain patients. This resulted in the pain patients being more likely to respond with increased pain behaviour (Romano et al., 1991). Lousberg, Schmidt, and Groenman (1992) reported that in a sample of 42 chronic back pain patients, those patients with a more solicitous spouse complained of more pain and walked for shorter periods of time. In the family setting, family members may perform household tasks for the patient to terminate the pain expression, thereby potentially perpetuating a maladaptive pain cycle (Nicassio & Radojevic, 1993).

Operant conditioning programs aim to identify maladaptive pain behaviours and remove the gains associated with those behaviours, while also identifying adaptive behaviours and rewarding those. These conditioning programs, that change behavioural responding, have been shown to increase a patient's level of physical activity and reduce dependence on medication (Diamond & Conian, 1991). Behavioural therapists also

advocate involving spouse and family members in treatment. Teaching these individuals to prompt and reinforce adaptive behaviours and change attention away from pain behaviour is a major goal of behavioural programs (Keefe, Dunsmore, & Burnett, 1992). However as pointed out by Turk and Flor (1987) several difficulties do arise with conditioning programs and need to be worked out. These include identifying the behaviours that are to be modified, determining how to identify operantly conditioned behaviours, determining what percentage of patients have operantly defined behaviours, and how the treatment effects are to be maintained and generalised (Turk and Flor, 1987).

Changes to cognitions and coping styles. How pain behaviours relate to the adjustment in chronic pain patients is still unclear (Jensen, Turner, & Romano, 1994). Findings in cognitive-behavioural interventions with pain patients have shown that improvements in function are not completely explained by specific behavioural changes (Jensen, Turner, & Romano, 1994; Keefe, Crisson, Urban & Williams, 1990; Kuile, Spinhoven, Linssen, & van Houwelingen, 1995). The important change may not be in what the patient does about their pain condition, but more in how the patient chooses to think about their pain (Jensen, Turner, & Romano, 1994; Turk & Rudy, 1992). One's cognitive schema must change to accommodate the idea that some health problems are chronic (Gamsa, 1994).

Cognitions and beliefs about pain play a crucial role in adjustment to chronic pain (DeGood & Kiernan, 1996; Flor, Behle, & Birbaumer, 1993; Jensen, Turner Romano & Lawler, 1994; Jensen, Turner, & Romano, 1994) by influencing both the initiation of coping efforts and ones overall sense of well-being (Jensen & Karoly, 1992). In a

heterogeneous chronic pain population, patients reported greater physical dysfunction who also presented with a greater belief that emotions have an impact on the pain experienced and who believed themselves to be more disabled (Jensen, Turner, Romano, & Lawler, 1994). Similarly patients expressing the belief that exercise may be harmful were more physically impaired. Belief in the appropriateness of medication for chronic pain management was associated with the number of self-reported emergency room visits (Jensen, Turner, Romano, & Lawler, 1994). Patients seeking treatment for chronic pain who believed that their pain was someone's fault, as opposed to those patients who saw no one at fault, reported significantly more concurrent distress, significantly less expected benefit from treatment, and significantly more incidents of being made worse by past treatments (DeGood & Kiernan, 1996).

Interventions designed to bolster a generalised sense of competence and to change helplessness appraisals and passive coping strategies in response to pain have been shown to improve the psychological and functional well-being of the individual facing chronic pain (Smith & Wallston, 1992). Changes in pain-related beliefs and cognitive coping strategies were found to be associated with improvement in depressive symptoms and physical functioning. Decreased endorsement of helplessness responses was also associated with decreased number of pain-related physician visits (Jensen, Turner, & Romano, 1994).

Changes in emotional response. Depression appears to be strongly associated with success or regression in the treatment of chronic pain. Studies suggest that between 50 and 65% of chronic pain patients are significantly depressed (Averill, Novy, Nelson, & Berry,

1996; Banks & Kerns, 1996; Turk & Holzman, 1986). Distress appears to affect perceptions of pain (Keefe & Williams, 1989) and studies seem to indicate that depression among chronic pain patients may be a function of negative and distorted thinking (Banks & Kerns, 1996). However, chronic pain was shown to be accompanied by a variety of other disturbing emotions including aggression (Berkowitz, 1993), anxiety, frustration, anger, or fear (Kerns, Rosenberg, & Jacob, 1994). Wade, Price, Hamer, Schwartz, and Hart (1990) found that anger, frustration, and anxiety in addition to depression, were significant contributors to the overall emotional unpleasantness produced by chronic pain.

Williams and Richardson (1993) stated that the assessment of mood disorder was an important task in understanding pain patients. However, the difficulty with assessing emotional status in chronic pain patients is interpreting the causal direction of these emotions. It is difficult to determine if the pain produces or exacerbates the emotional response (Banks & Kerns, 1996; Berkowitz, 1992; Gamsa, 1994).

Chronic pain is not synonymous with disability and depression (France, 1987). There may be numerous biological, emotional, behavioural, or cognitive events that may account for a concurrent relation between chronic pain and depression (France, 1987). Looking at a population of rheumatoid arthritis patients, Brown, Nicassio, and Wallston (1989) found there to be no direct relation between pain and depression over a 6 month interval. Appraisals of helplessness in patients with rheumatoid arthritis were associated with increased pain, depression, functional disability, and the tendency to exhibit greater passive and less active coping in the population (Nicassio & Radojevic, 1993). Over time, the experience of persistent pain may lead the patient to believe that there is nothing that can be done about the

pain, leading to dysphoric mood and decreased motivation to actively cope with pain. This cognitive-affective profile is also symptomatic of depression (Banks & Kerns, 1996).

Depression levels also appear to be strongly associated with the coping strategies used by the patients (Brown, Nicassio, and Wallston, 1989; Turk & Rudy, 1990).

Subjects who rated their ability to decrease pain as relatively high reported more active coping strategies (e.g., staying busy, or active) along with lower levels of depression.

Thus, changing from a passive coping strategy, such as catastrophising, to one that is more adaptive, like coping self-statement, appears to result in a related decrease in the depressive state of chronic pain patients (Brown, Nicassio, and Wallston, 1989; Keefe, Crisson, Urban & Williams, 1990).

Readiness to make change. Many factors contribute to the success of chronic pain patients making a lifestyle change. These include the patients' attitudes toward particular programs, family reinforcement of illness behaviours, availability of vocational opportunities, and personality dynamics (Jensen, Turner, & Romano, 1994). Another factor considered to be very important when trying to implement a change in a pain patient's life-style is timing. Prochaska, DiClemente, and Norcross (1992) mentioned that presenting a treatment program before a patient is ready will result in failure. Understanding just how ready individuals are to make major or even minor changes in their life is considered an important complement in establishing treatment programs.

Patients ready to make changes in their lifestyle are most appropriate for chronic pain programs (LaCross & Soumekh, 1996). In a behavioural management program, those patients ready to adhere to the treatment regimen evidenced the greatest

improvement in pain reduction (Basler & Rehfisch, 1990). To predict outcome in pain management programs, a measure of motivation may be a useful adjunct to the broad array of measures already in use (Goldberg & Maciewicz, 1994).

Stages of Change

Stemming from work attempting to identify converging themes in psychotherapy, Prochaska developed a model of change based on a comparative analysis of 18 therapies (Prochaska, 1979). Designed as an integrative and comprehensive account of therapeutic change (Prochaska, 1994), the Transtheoretical Model of Behaviour Change assumes that the content of a treatment will vary considerably from client to client depending on the client's particular history, present environment, and personality (Prochaska & DiClemente, 1982; Wilcox, Prochaska, Velicer, & DiClemente, 1985).

The initial work with the TTM was with smokers, specifically comparing self-quitters from those who used community based services. Considering retrospective interviews given 6 to 12 months after cessation of a behaviour problem, studies suggested a variety of cognitive and behavioural techniques used by self-quitters to achieve and maintain cessation (DiClemente & Prochaska, 1982). These individuals recognised that change unfolds in a series of stages (Prochaska, Norcross, & DiClemente, 1994). Prochaska identified six stages of change that these individuals progressed through as they changed their unwanted behaviours. These stages are: Precontemplation, Contemplation, Preparation, Action, Maintenance, and Relapse.

For a smoking cessation group, a clear relationship was noted between the stages of change and treatment success. Twenty-two percent of all precontemplators, 43% of

contemplators and 76% in the action or preparation for action were not smoking following treatment (Prochaska, DiClemente, & Norcross, 1992). Stages of change were better predictors of positive outcome than age, socio-economic status, problem severity, goals and expectation, self-efficacy and social support (Prochaska, DiClemente, & Norcross, 1992).

The Transtheoretical model of discrete stages has been validated in studies of psychotherapy clients (McConaughy, DiClemente, Prochaska & Velicer, 1989), and worksite health promotion projects (Marcus, Rakowski, & Rossi, 1992). Other studies with the TTM addressed smoking cessation, weight control, adolescent delinquent behaviour, sunscreen use, quitting cocaine, high-fat diets, safer sex practices, condom use, mammography screening, exercise, and physicians' preventive practices with smokers (Courneya, 1995; DiClemente et al., 1991; Owen, Wakefield, Roberts, and Esterman, 1992; Pallonen, Fava, Salonen, and Prochaska, 1992; Prochaska et al, 1994; Wilcox, Prochaska, Velicer, & DiClemente, 1985). These data extended the validation of the TTM, thus supporting a generalised model of behavioural change.

What follows is a brief description of each stage, including some of the tasks that the individual must carry out in an effort to advance to the next stage.

Precontemplation. In the Precontemplation stage, individuals have no intention of changing their behaviour and typically deny that they have a problem. Precontemplators usually show up for treatment because of pressures from others. However, they resist change. Denial is characteristic of Precontemplators. There is a tendency for precontemplators to place responsibility for their problems on factors which they see as

being outside of their control. These include genetic makeup, family, society or destiny (Prochaska, Norcross, & DiClemente, 1994).

Contemplation. In the contemplation stage, people acknowledge that they have a problem and begin to think seriously about solving it. They struggle to understand their problem, to see its causes and to wonder about possible solutions. However, many people will remain stuck in the contemplation stage. These chronic contemplators remain stuck primarily as a result of substituting thinking for action. In making the transition from contemplation stage to the preparation stage individuals begin to focus on solutions to their problem behaviour. Thinking becomes more focused on the future than on the past (Prochaska, Norcross, & DiClemente, 1994).

Preparation. Moving into activity and planning for action characterises the third stage, the preparation stage. These individuals may have a great deal of ambivalence about change as this movement leads them into unknown territory that can be intimidating. Eventually, they will make better use of their time by planning carefully, developing a firm, detailed scheme for action and making sure that they have learned adaptive behavioural skills (Prochaska, Norcross, & DiClemente, 1994).

Action. The fourth stage is the one in which individuals overtly modify their behaviour and their surroundings. The person engages in particular actions intended to bring about change (Miller & Rollnick, 1989). The action stage requires the greatest commitment of time and energy. Because relapse is more the rule than the exception, the process of changing behaviour does not end with the action stage. Maintenance of the behaviour is the next challenge. The problem with the action stage, is that change and

action are often equated. Little attention is focused on the efforts of preparing to take action, or on the efforts to maintain the change that follow the action (Prochaska, Norcross, & DiClemente, 1994). Making change does not guarantee that the change will be maintained. Efforts to make change may be followed by minor or major steps backwards (Miller & Rollnick, 1989).

Maintenance. The fifth stage, maintenance, requires a strong commitment. Maintenance is a long, ongoing process and may in fact be the final stage to which individuals advance. During maintenance, the challenge is to sustain the change accomplished by previous action, and to prevent relapse. The work at maintaining the new behaviour may require ongoing work that may last for the rest of the individual's life. Patience and persistence are what characterise the maintenance stage (Prochaska, Norcross, & DiClemente, 1994).

It is important to keep in mind that linear progression through the stages has been shown to be relatively rare. People who initiate change begin by proceeding from contemplation to preparation to action to maintenance. Most, however relapse at some point, returning to an earlier stage before renewing their efforts to try again (Prochaska, Norcross, & DiClemente, 1994).

Comprehensive Model Building

In developing a comprehensive model of behaviour change, Prochaska and colleagues (1994) felt that they needed to have a model that generalised across a broad range of problems in a large population. A recent study (Prochaska et al., 1994) examined the relationships between the stages of change across 12 behaviours. Although there was

considerable variety within the set of behaviours studied (Prochaska et al., 1994) there were also commonalities among the problems. All of the behaviours had important health or mental health consequences. Also, the behaviours required long-term attention rather than one-time performance and all of the behaviours were relevant to a large number of people. These commonalities can also be used to identify chronic pain patients. Apart from chronic pain affecting a large number of people, chronic pain can also have serious mental health consequences, and the very nature of the pain being chronic implies that it requires long-term attention.

Studies using the Transtheoretical Model have explored changes in the addictive patterns of behaviour associated with such substances as cigarette smoking, alcohol use, and drug use (Prochaska, Norcross, & DiClemente, 1994). Pain is a complex clinical entity that has prominent behavioural manifestation and negative psychological and social consequences (Savage, 1993). Similar to an addictive process, chronic pain may be disabling, even in the absence of clear physical impairment. The individuals involved often have difficulty finding compassionate, effective medical care. Successful treatment requires an active role on the part of the patient. In most cases, adaptive change is only possible with effort on the part of the patient and the care provider (Savage, 1993). The research by Prochaska, DiClemente, and Norcross (1994) led them to conclude that patients, along with their physicians, need to be active agents of change.

One important goal of assessment is to aid in selecting interventions most suited for the patient (McGuire, 1992). As an assessment tool the TTM classification provides both proscriptive and prescriptive information as to treatments of choice. For example,

action oriented therapies may be quite effective with individuals who are in the preparation stage or the action stage. Individuals in the precontemplation or contemplation stage may need more information and a more educational component to their treatment (Prochaska, DiClemente & Norcross, 1992).

The Transtheoretical Model (TTM) has significant potential in helping understand how patients with different motivational needs respond to therapy. Related research supports this assertion. Newman and Seres (1986) related the importance of an interdisciplinary approach to treatment of chronic pain. Patients were assessed using diagnostic assessment procedures that used medical, surgical, and psychological specialists. An important criteria for inclusion into the treatment program was the patient's willingness to work on their problem from a self-help perspective. Thirty-three percent of the patients assessed were eliminated from the program because they appeared to be unmotivated to work. Had the Transtheoretical Model been utilised in the assessment procedure, these individuals would likely have been found to be in the precontemplation or contemplation stage. There was either no willingness to change how they were managing their pain, or there was a willingness but the patient was not quite ready to make the change. Knowing this, an educational package could have been developed for these people explaining more about adjustment to pain. By increasing their awareness of the problems involved there may have been a concordant increase in their motivation to make a lifestyle change. Instead of eliminating individuals from treatment programs because of their unwillingness to take part, a program could be designed to

match their particular needs as established from their classification within the stages of change model.

At the six month follow-up, one-quarter to one-third of these patients had continued to show progress in their pain management skills (Newman & Seres, 1986). The TTM model would have identified these individuals as being in maintenance. However one quarter of the individuals reassessed had declined fairly rapidly to their preadmission level of function, despite a measurable and significant improvement during their treatment program. According to the TTM, (Prochaska, Norcross, & DiClemente, 1994), linear progression, although possible, is a relatively rare phenomenon. People who initiate change begin by proceeding from contemplation, to preparation to action to maintenance. Most, however, relapse at some point returning to the contemplation, or sometimes even to the precontemplation stage, before renewing their efforts. The work and effort involved on the part of the patient and the complex nature of chronic pain are ingredients working against the individual that may encourage a relapse to a previous stage.

Purpose and Hypotheses

As the review of assessment procedures of chronic pain patients indicates, there are several studies that have endeavoured to identify subgroups of pain patients. These constructs are useful insofar as they enhance the understanding of the complexity of the individual. However there is the risk. Health care professionals who identify a pain patient as “dysfunctional” or as “interpersonally distressed” may unintentionally create problems by failing to recognise that these labels are time specific and may change over time. These

labels may be presented as enduring personality constructs. The methods that one uses to label a problem may crystallise a problem and thus make it more chronic (O'Hanlon & Weiner-Davis, 1989). Assessing pain patients within a context of change, may avoid labelling problems and promote positive, adaptive behavioural change.

Change is an important, dynamic component of adjustment in chronic pain patients. Given the dynamic complexity of change formulated by the research of Prochaska and his colleagues (Marcus, Rakowski, & Rossi, 1992), investigating the stages of change paradigm with a chronic pain population would advance the assessment procedure already established. This study examined the potential for extending a theory of behavioural change based on dynamic cognitive and social learning constructs, to a population of chronic pain patients. An assessment of chronic pain patient was carried out to establish whether subgroups of patients who differ in their readiness to make change could be identified. From the literature reviewed the following hypotheses were tested.

Hypothesis 1. Participants with decreased levels of readiness for change will demonstrate poorer adjustment to their chronic pain condition and perceive a more negative impact of pain on their life. Specifically, participants with decreased readiness for change will report greater pain severity, affective distress, and perceived interference of pain in daily activities (as assessed by the MPI). Further, participants with decreased readiness for change will report lower levels of perceived control over pain and general activity, as assessed by the MPI.

Hypothesis 2. Participants with decreased levels of readiness for change will demonstrate less adaptive psychosocial adjustment to their chronic pain condition.

Specifically, participants with decreased readiness for change will report higher levels of depressed mood (as assessed on the BDI) and lower levels of social intimacy (as assessed on the MSIS).

Hypothesis 3. Participants with decreased levels of readiness for change will demonstrate greater substance use in their self-management of pain symptoms. Specifically, participants with decreased levels of readiness for change will report greater use of alcohol, narcotics, medication and cigarettes.

Hypothesis 4. The stages of readiness for change will be shown to report information that is independent from the classification provided for by the Multidimensional Pain Inventory (MPI). Specifically, classification into one of the stages of readiness for change will be unrelated to the classification given by the MPI. Moreover, the stages of change will account for variance in self-reported adjustment to chronic pain left unexplained by the major MPI subscales.

Methods

Participants

Over a period of nine months, patients from a local pain clinic were approached and asked to complete a questionnaire package. To be accepted into the study participants must have presented with the following criteria: a pain condition for more than six months, an ability to read English, a pain condition that was not the result of a malignancy, and no pre-morbid psychiatric history. Any patient failing to meet these criteria were flagged by the physicians and were not assessed. Upon the physician's request, 6 patients who, for complicated health reasons or because of known psychiatric and social problems were not assessed. Ten individuals were approached who had difficulty comprehending English and chose not to complete the package. Two patients at the clinic refused outright to complete the questionnaire package.

One-hundred and sixteen questionnaire packages were distributed. One hundred-one of these packages were returned. Four were too incomplete to be of any use in the analysis. After the collection period, the final number of completed packages was 97.

Table 1 gives a breakdown of the demographic nature of the sample. Seventy percent of the sample was female. The average age of the sample was 47 years, with a range between 24 years and 85 years. Over 74% of the sample had a high school education of better. Sixty-nine percent of the sample were married or living in a common-law relationship. Forty-five percent of the sample were not employed, 42 % were receiving a disability pension and 15.5% were receiving a security pension.

Table 1

Demographic Characteristics of Sample

Total Sample		97
Females		68
Age		$M = 47$ ($SD = 13.69$)
Education	Grade 8 or less	3
	Some H/S	22
	H/S Graduate	22
	Some College	22
	Degree/Diploma	22
	Post-Graduate	6
Relationship Status	Single	11
	Married	67
	Divorced	10
	Separated	3
	Widowed	6
Employed	No	43
	Yes	33
	Retired	21
Disability Pension	No	41
	Yes	41
Security Pension		15

Table 2 gives a summary of the medical status of the participants including the location of their pain and the number of pain sites identified. Table 3 provides information on the medication and narcotic usage among the sample.

Table 2

Medical Status of Participants

<u>Pain Site</u>	<u>Percentage Reporting</u>
Head	28.9%
Neck	41.2%
Shoulder	45.4%
Chest	17.5%
Stomach	19.6%
Back	68.0%
Legs	60.8%
Pelvic	25.8%
Pubic	9.3%

<u>Reported Number of Pain Sites</u>	<u>Percentage Reporting</u>
1	28.9%
2	22.7%
3	12.4%
4	7.2%
5	12.4%
6	8.2%
7 or more	8.3%

Table 3

Medication usage

<u>Number of pain medications</u>	<u>Percentage Of Sample</u>
None	9.3%
1	30.9%
2	27.8%
3	18.6%
4	10.3%
5	2.1%

<u>Narcotics</u>	<u>Percentage of Sample</u>
NO	51.5%
YES	48.5%

The average pain duration for the sample was 119 months with a standard deviation of 115.60 months. The minimum duration was 10 months and the maximum was 636 months. Over 50% of the sample reported pain in no more than two areas of their body. The most commonly mentioned pain area was the back and the legs. The number of medications that individuals used on a regular basis to manage their pain ranged from no medications at all to five or more different types of medication. Forty-eight percent of the participants were using narcotic analgesics as a means to manage their pain.

Measures

Demographic information. Participants were instructed to provide personal data and medical information. This information included the date of birth, medications, relationship status, education level, employment status, and whether the participant was receiving a pension. Appendix A provides a copy of this background information sheet.

Stages of Change. The International Pain Foundation (IPF) has identified several areas of an individual's life that can be impacted by chronic pain (International Pain Foundation, 1991). These areas fall into one of three categories: (1) physical health (2) psychological health and (3) social well-being. Within these areas the IPF proposes guidelines that individuals with chronic pain should follow as a means of living adaptively with their chronic pain. In the present study, participants were presented with a series of guidelines for managing chronic pain, corresponding to the IPF guidelines (International Pain Foundation, 1991). Table 4 presents the list of guidelines.

Table 4

Guidelines Recommended By the International Pain Foundation for Managing Chronic Pain

Area of Concern	Guidelines
Caring For Your Physical Health	-keeping your use of prescribed medications under control -avoiding the use of nonprescribed drugs to manage pain -eliminating tobacco and alcohol, and reducing caffeine -eating and sleeping regularly -eating a balanced diet -exercising regularly
Caring For Your Psychological Health (Thought and Feelings)	-keeping a positive attitude about your life and staying hopeful about managing pain -reducing stress and having a regular hobby or pleasurable activity -having a special way to relax, without relying on alcohol, drugs, or sleep -keeping a positive attitude towards yourself and your personal goals
Caring For Your Social Well-Being	-participating in social activities with others -doing necessary activities for daily living (e.g. shopping) -working regularly at a job, or volunteer activity, or personal project -sharing personal thoughts and feelings with someone -sharing sexual feelings with a special friend or loved one

Participants were asked how ready they felt they were to follow the IPF guidelines.

They were given six choices ranging from "I am not ready to plan any changes" to "I

have been following the guidelines regularly for 5 years or more". See Appendix B for a copy of this measure. Based on the participant's response, a score from 1 to 6 was given for each algorithm. The diagnostic algorithm for classifying patients according to the TTM is provided in Table 5.

Table 5

Example Items and Scores for the Stages Of Change Questionnaire

Stage	Score	Item
Precontemplation	1	I do not follow the guidelines and I am not ready to plan any changes in how I manage this aspect of my pain.
Contemplation	2	I do not follow the guideline regularly, but within 6 months I will be ready to do so.
Preaction	3	I do not follow the guideline regularly but within the next 30 days I will be ready to do so.
Action	4	I have been following the guidelines regularly for less than 6 months.
Maintenance	5	I have been following the guidelines regularly for more than 6 months.
Termination	6	I have been following the guidelines regularly for 5 years or more.

Lifestyle Behaviours. Sixteen items, which reflected day-to-day activities were presented to the patients. These questions were related to the participants' endeavours to

manage their pain. The present study was interested in only medication consumption, smoking behaviour, and alcohol consumption. These behaviours are recognised as passive coping strategies for dealing with chronic pain (Jamison, Stetson, & Parris, 1991; Schofferman, 1993). Individuals were asked, over the past month, how often they engaged in the above-noted activities. They were requested to indicate their response on a five point Likert type scale going from 0 (never), 1 (rarely), 2 (sometimes), 3 (frequently), and 4 (extremely often). Higher scores reflected a greater frequency of having engaged in the activities. See Appendix C for a copy of this section of the questionnaire package.

West Haven-Yale Multidimensional Pain Inventory. The MPI is theoretically linked to the cognitive-behavioural perspective of pain with importance placed on the patient's perceptions of self-control and problem solving abilities. Specifically, it evaluates the individual's perceptions and appraisals of their present activity level and their perception of the responses of a significant other (Kerns, Turk, & Rudy, 1985). See Appendix D for the complete instrument.

The WHYMPI (Kerns, Turk, & Rudy, 1985) was designed to provide a brief but comprehensive assessment of the subjective experience of pain. The measure consists of three sections. The first section consists of five sub-scales which focus on the evaluation of perceived pain intensity and the impact of pain on various aspects of the patient's life. The second section consists of three subscales designed to evaluate the patient's perception of the responses of a significant other to their communications of pain. The third section evaluates the frequency of the patient's performance of common day-to-day activities.

The reliability estimates for all the scales ranged from 0.70 to 0.90 with the stability coefficients in the 0.62 to 0.90 range, indicating that a large proportion of the reliable variance in these scales was stable over time (Kerns, Turk, & Rudy, 1985). The intercorrelations among the scales of the MPI, range from 0.00 to 0.51, and indicate that each scale contains unique, reliable discriminant distinctiveness (Kerns, Turk, & Rudy, 1985). The MPI has proven to be adequate at measuring the various dimensions across heterogeneous chronic pain populations (Turk & Rudy, 1990). It was found to contribute to the Coping, Support and Functional Ability dimensions of pain better than other measures (Mikail, DuBreuil, & D'Eon, 1993).

Along with measuring the cognitive, behavioural, and affective dimensions of pain, the MPI also classifies patients as Dysfunctional, Interpersonally Distressed or as an Adaptive Coper. Individuals classified as Dysfunctional show a higher than average level of pain severity, life interference and affective distress. Interpersonally Distressed individuals perceive little support from others in their environment. Lastly, Adaptive Copers have significantly lower levels of pain severity, less interference with activities, lower affective distress and greater perceptions of life control (Turk & Rudy, 1990; Turk & Rudy, 1988). Validation for the uniqueness of each group has been shown (Etscheidt, Steger, & Braverman, 1995; Turk & Rudy, 1988). Pain duration, age, and gender did not differentiate between the groups (Turk & Rudy, 1988). Group differences were shown not to be accounted for solely by the degree or type of physical pathology (Turk & Rudy, 1990; Turk & Rudy, 1988). Pain profiles of patients have been reliably replicated across several studies and across different populations (Jamison,

Rudy, Penzien & Mosley, 1994; Turk & Rudy, 1990; Turk, Rudy, Zaki, & Curtain, 1989; Turk & Rudy, 1988).

The Beck Depression Inventory (BDI: Beck et al., 1961). The Beck Depression Inventory (BDI) is one of the most widely used (Novy, Nelson, Berry & Averill, 1995; Williams & Richardson, 1993), reliable and valid (Beck & Beamesderfer, 1974; Beck, Ward Mendelson, Mock, & Erbaugh, 1961) measures of depressive symptomatology. The BDI has also demonstrated its usefulness with chronic pain patients (Newton-John, Spence, & Schotte 1995; Turner & Romano, 1984).

The BDI is a 21-item, self-report inventory, with each item consisting of four statements rank-ordered from 0-3 in terms of increasing severity for a particular depressive symptom. Participants identify those statements that describe the way they have been feeling over the past week. The total score ranges from 0 to 63. Higher scores indicate greater depressive symptomatology. See Appendix E for the complete instrument.

There is evidence of an internal consistency of .86. There is also evidence of reliability with test-retest correlations ranging from .48 to .86 for varying time intervals. Strong support for the construct validity of this measure has been reported by Beck, Steer, and Garbin (1988), and Turner and Romano (1984).

There is no arbitrary score that can be used for all purposes as a cut-off point. The specific cut-off point depends upon the characteristics of the patients in the sample and on the purposes for which the inventory is being used (Beck & Beamesderfer, 1974). As a screening device to detect depression among pain patients a BDI score of 15 was considered to be the optimal cut-off score for screening clinically depressed mood (Bishop, Edgley, Fisher, &

Sullivan, 1993) in back pain patients. However, Williams and Richardson (1993) found that a mean score of 18.1, for a heterogeneous population of pain patients, fell in the mild depression range, with 71.7% of patients scoring at or above the threshold of 13 recommended by Turner and Romano (1984).

The BDI has several advantages including the availability of comparative data, the capacity to assess suicidal potential and a clearer clinical interpretation (Mikail, DuBreuil, & D'Eon, 1993). Also, the BDI requires minimal time to administer and score, and can be easily incorporated into medical evaluation (Bishop, Edgley, Fisher, & Sullivan, 1993).

Miller Social Intimacy Scale (MSIS; Miller & Lefcourt, 1982). The MSIS is a valid and reliable measure designed to assess intimacy in the context of interpersonal relationships (Miller & Lefcourt, 1982; Miller & Lefcourt, 1983). Findings suggest that the MSIS can be a more precise measure of intimacy than a direct assessment of marital status (Miller & Lefcourt, 1983). Subjects who scored high on the intimacy scale, described their closest relationship as being characterised by high levels of trust and intimacy (Miller & Lefcourt, 1983). Subjects who scored low on the MSIS described themselves as lonely (Miller & Lefcourt, 1983). Subjects who lack an intimate relationship and who experience stress will be more prone to psychological disturbance than will similarly stressed subjects who do have an intimate relationship (Kerns, Southwick, Giller, Haythornthwaite, Jacob, & Rosenberg, 1991; Miller & Lefcourt, 1983).

The MSIS is comprised of 17 questions designed to assess the maximum level of intimacy currently experienced in the context of friendship or marriage. Of the 17 items, 6 pertain to frequency (i.e. "How often do you show him/her affection?") and 11 pertain to

intensity ratings (i.e. "How much do you feel like being encouraging and supportive to him/her when he/she is unhappy?"). Subjects are instructed to frame their responses around their closest relationship. Items are scored on a 10 point Likert type scale, with a total possible score of 170. The sum of their ratings yield a measure of the maximum level of intimacy being experienced at present. See Appendix F for a copy of this questionnaire.

Test-retest reliability of .96 over a period of 2 months has been reported and suggests stability in this measure. Cronbach alpha levels of between .86 and .91 provided evidence for a strong internal consistency. (Miller & Lefcourt, 1982; Miller & Lefcourt, 1983).

Procedure

The data collection was started following approval from the director of the pain clinic and the ethics board of the Ottawa General Hospital, and after having advised, explained, and co-ordinated the research activities with the physicians, nursing staff, and clerical staff of the clinic. Patients were approached as they waited for their appointment at a local pain clinic. After an explanation of the project, (the script that was used in the recruitment of participants is provided below in Appendix G) participants were asked if they would be willing to complete the questionnaire. Those agreeing to participate were invited to read the information sheet that was provided (see Appendix H and Appendix I). Because the facility at which this study was conducted was bilingual, the ethics review board of the facility requested both an English and a French version of the information sheet.

After having read the information sheet, participants were asked to view the questionnaire package, the format of the questionnaire and the style of their responses. Any questions the participants had were answered. Finally, subjects agreeing to participate were asked to sign a consent form, stating their willingness to take part in the protocol. See Appendix J for a copy of the consent form.

Upon returning a completed questionnaire, each participant received a debriefing letter explaining more fully the intent of the project and thanking them for their participation. Also, the debriefing letter included suggestions made by the International Pain Foundation on exercises and activities pain patients could do to make living with their chronic pain easier. See Appendix K for a copy of the debriefing letter.

Results

The analyses examined the utility of the Transtheoretical Model of Behavioural Change (TTM) with a heterogeneous population of chronic pain patients. Using cluster analysis, participants were placed into groups defined in terms of the TTM. Analyses showing differences on psychosocial variables and behavioural patterns between the groups were performed. Finally, the profiles, generated by the Stages of Change Questionnaire, were examined to determine whether it provided a unique contribution to already existing pain measurements.

Clustering Participants

Participants responded to a series of guidelines established by the IPF for managing chronic pain. These guidelines were set out in three separate algorithms reflecting the three life-style areas known to be affected by pain: (a) physical health, (b) psychological health, and (c) social well-being. To investigate trends in the data, and in an attempt to classify participants into groups defined by the Transtheoretical Model, a hierarchical, cluster analysis was performed.

Cluster analysis assigns individuals into groups so that the individuals within a group resemble each other on the variables more than they resemble individuals in other groups. Dependent variables were the participants' scores on the three algorithms. The READY-PHY variable was the score from the algorithm which indicated how ready the participants felt they were to make change in how they care for their physical health. The READY-PSY variable was the score from the second algorithm which indicated how ready participants felt they were to make changes in how they care for their psychological

health. Finally, the READY-SOCIAL variable was from the third algorithm and indicated how ready participants felt they were to make changes in how they care for their social well-being.

There are a number of agglomerative hierarchical clustering procedures (Norusis, 1988). Ward's method was chosen as it is a most effective clustering method (Lorr, 1983) and it has been used repeatedly within the health psychology arena (Patterson, Haines & Popkin, 1994; Shapiro, Rodrigue, Boggs, and Robinson 1994). Ward's method, otherwise known as the minimum variance method (Lorr, 1983), is based on the premise that the most accurate information is available when each entity constitutes a group. As the number of clusters is systematically reduced, the grouping of increasingly dissimilar entities yields less precise information. The goal is to form a group such that the sum of squared within-group deviations about the group mean of each profile variable is minimised for all profile variables at the same time (Lorr, 1983). Means for all variables are calculated. The squared Euclidean distance to the cluster means is calculated. These distances are summed for all of the cases. The clusters that merge are those that result in the smallest increase in overall sum of the squared within-cluster differences (Norusis, 1988).

In determining the number of clusters to maintain, the stopping rule reported by Robinson, Geisser, Dieter and Swerdlow (1991) and used by Shapiro, Rodrigue, Boggs, and Robinson (1994) was used. Robinson, along with his colleagues (1991) provided a guideline in which the largest number of clusters present were considered until no group

contained less than 10% of the sample. Table 6 presents the means and standard deviation for 3, 4 and 5 cluster solution across the readiness variables.

Table 6

Means and Standard Deviations For 3, 4, and 5 Cluster Solutions Across Readiness

Variables

	Cluster 1		Cluster 2		Cluster 3		Cluster 4		Cluster 5	
	M	SD	M	SD	M	SD	M	SD	M	SD
Cluster										
Solution 1	<u>N = 22</u>		<u>N = 24</u>		<u>N = 51</u>					
Ready-phy	5.09	.92	2.42	1.06	5.49	.67				
Ready-psy	3.64	1.53	3.25	1.29	5.35	.66				
Ready Social	3.27	1.61	2.92	1.32	5.39	.79				
Cluster										
Solution 2	<u>N = 9</u>		<u>N = 13</u>		<u>N = 24</u>		<u>N = 51</u>			
Ready-phy	5.11	.60	5.08	1.12	2.42	1.06	5.49	.67		
Ready-psy	5.22	.67	2.54	.78	3.25	1.29	5.35	.66		
Ready Social	1.89	.78	4.23	1.30	2.92	1.32	5.39	.79		
Cluster										
Solution 3	<u>N = 9</u>		<u>N = 13</u>		<u>N = 19</u>		<u>N = 51</u>		<u>N = 5</u>	
Ready-phy	5.11	.60	5.08	1.12	2.68	1.00	5.49	.67	1.40	.55
Ready-psy	5.22	.67	2.54	.78	2.84	1.07	5.35	.66	4.80	.84
Ready Social	1.89	.78	4.23	1.30	2.42	.90	5.39	.79	4.80	.84

Three readiness for change (R-CH) clusters were most appropriate for the present sample. Twenty-three percent of the sample were in R-CH cluster 1, 24% of the sample was in R-CH cluster 2, and 53% of the sample were in R-CH cluster 3. Comparisons of clusters on the dependent variables, READY-PHY, READY-PSY, and READY-SOCIAL are presented in Table 7 and represented graphically in Figure 1.

Table 7

Comparison of R-CH Clusters formed with Ward's Method Across Readiness for Change Stages

Dependent	Cluster 1		Cluster 2		Cluster 3		Sample	
Measures	<u>N</u> = 22		<u>N</u> = 24		<u>N</u> = 51		<u>N</u> = 97	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
READY-PHY	5.09	.92	2.42	1.06	5.49	.67	4.64	1.54
READY-PSY	3.64	1.53	3.25	1.29	5.35	.66	4.44	1.44
READY-								
SOCIAL	3.27	1.61	2.92	1.32	5.39	.70	4.30	1.61

Figure 1. Means for clusters across readiness variables using Ward's clustering method.

Interpretation of clusters 2 and 3 were fairly straightforward. R-CH cluster 2 appeared to represent individuals who were not actively engaged in making change. In terms of the TTM, this group represented a preaction group. R-CH cluster 3, appeared to be maintaining change across all dimensions and was defined as a maintenance group. Interpretation of R-CH cluster 1 was more complex. R-CH cluster 1 represented a mixed group of individuals who were actively involved in pursuing change in how they manage the medical/physical aspects of their pain but were as yet not engaged in pursuing change in their psychological health or in the social aspect of their health.

Cross Replication of Clusters

As a way of validating the above cluster solution, Lorr (1983) recommended that, a second clustering method be used with the same data set. Agreement between or among classification methods increases the confidence that an underlying data structure is being revealed (Patterson, Haines & Popkin, 1994). The second method chosen was the average linkage within groups method. The average linkage within groups combines clusters so that the average distance between all cases in the resulting cluster is as small as possible (Norusis, 1988). The average linkage method and Ward's method were used to maintain the homogeneity within the clusters. (Shapiro, Rodrigue, Boggs, and Robinson, 1994). See Appendix L for the results of this analysis.

Ward's clustering technique and the average linkage technique were compared for concordance. Over 80% of the participants were similarly classified in both methods. To examine the classification agreement between the two methods and to ensure that the agreement was not due purely to chance, the kappa statistic was used. The kappa statistic

is a measure of agreement that corrects for chance agreement and is used as a measure of interrater reliability for the cases of quantitative ratings (Fleiss, 1981). Values of kappa greater than .75 are taken to represent excellent agreement beyond chance, values below .40 represent poor agreement beyond chance, and values between .40 and .75 represent fair to good agreement beyond chance. The kappa statistic was .67 indicating good agreement between the methods beyond what would be expected by chance. Table 8 shows the number of subjects classified into the clusters using the two techniques. The numbers on the diagonal represent those individuals classified by both clustering techniques as belonging within the same cluster.

Table 8

Number of Individuals Classified Into Each R-CH Cluster As Per Clustering Technique

Average Linkage Clustering				
	R-CH	R-CH	R-CH	Row Total
	Cluster 1	Cluster 2	Cluster 3	
Ward's Clustering				
R-CH Cluster 1	14	2	6	22
R-CH Cluster 2	2	17	5	24
R-CH Cluster 3	4	0	47	51
Column Total	20	19	58	97

Preliminary Analyses

Prior to the analyses, BDI scores, MSIS scores, and the scores on the five subscales of the MPI (Severity, Distress, Control, General Activity, and Interference) were examined through SPSS^x programs for the accuracy of data entry, missing values, and fit between their distributions and the assumptions of multivariate analysis.

Twenty-one percent of the participants had not completed Part 2 of the MPI, an index of social functioning that assesses patients' reports of the frequency and range of behavioural responses of a significant other. Due to the number of participants without this information, it was decided to use the results of the Miller Social Intimacy Scale to index social well-being. The MSIS asks individuals to 'think of someone special in their life including a close friend'. This is different from section 2 of the MPI which states that researchers are interested 'in knowing how your spouse (or significant other) responds to you when he or she knows that you are in pain'. The MSIS addressed the impact of all close relationships, including platonic friendships which can also have an important impact on social well-being (Miller & Lefcourt, 1982). It is the quality of the relationship and the perceived closeness of the relationship that is important, not the nature of the relationship (Feinauer & Steele, 1992; Miller, & Lefcourt, 1982).

Ten participants were missing scores on the MSIS, which represented 10.3% of the total sample. Mean scores on this variable for each cluster were calculated and substituted for those participants who were missing scores (Tabachnick & Fidell, 1989). The calculated mean value for R-CH cluster 1 was substituted for two participants in this cluster. The calculated value for R-CH cluster 2 was substituted in for two participants in

R-CH cluster 2. Six participants from R-CH cluster 3 had the calculated mean value for R-CH cluster 3 substituted for their missing scores. A similar procedure was used to replace scores for two other participants in R-CH cluster 3 who were missing BDI scores (Tabachnick & Fidell, 1989).

The scores on all the psychometric measures for the combined sample are presented in Appendix L. The scores for the present sample were compared with the scores from normative samples.

Group Comparison Across Sociodemographic and Medical Variables

An examination of the relationship between the clusters, the sociodemographic variables, and the medical variables was performed. Potential differences between the R-CH clusters on the dependent variables of age, pain duration, and number of pain sites were examined with ANOVAs. Univariate F-tests established that across the groups, there were no differences in the age, pain duration, or number of reported pain sites. See Table 9 for a report of these analyses.

Table 9

Comparison Between The R-CH Clusters on Age, Pain Duration, and Number of Pain Sites Reported

	R-CH Cluster 1		R-CH Cluster 2		R-CH Cluster 3		F	sig
	(n = 22)		(n = 24)		(n = 51)		(df)	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		
Age (yrs)	46.8	16.5	43.4	14.1	48.8	12.0	1.31	
							(2,94)	ns
Pain Duration (mos)	120.3	131.3	123.8	131.4	115.6	101.9	1.30	
							(2,94)	ns
Number of Pain Sites	3.0	1.9	3.3	2.6	3.2	2.1	.17	
							(2,94)	ns

Chi-square analyses were carried out to determine any possible relationship between the R-CH clusters, and the variables of gender, relationship status, and education level attained. Because of low expected frequency (< 5) for the marital status variable, a decision was made to collapse across this variable (Shavelson, 1988) and define relationship status as married/not married. Individuals defined as married included those in common-law relationships. Individuals in the latter group included those who identified themselves as single, divorced, separated, or widowed.

As reported in Table 10, Table 11, and Table 12 the distribution of participants across the clusters was independent of gender, education status, and relationship status. There were no significant relationships between these variables and the stages of change.

Table 10

Obtained Frequencies For χ^2 Test of Independence For Gender Across The R-CH Clusters

	R-CH Cluster 1	R-CH Cluster 2	R-CH Cluster 3	Row Total	χ^2
Gender					
Male					
Count	9	5	15	29	
Row Percent	31.0%	17.2%	51.7%	29.9%	
Column Percent	40.9%	20.8%	29.4%		
Female					
Count	13	19	36	68	
Row Percent	19.1%	27.9%	52.9%	70.1%	
Column Percent	59.1%	79.2%	70.6%		
Column	22	24	51	97	2.22
Total	22.7%	24.7%	52.6%	100%	ns

Table 11

Obtained Frequencies For χ^2 Test of Independence For Relationship Status Across The R-CH Clusters

	R-CH Cluster 1	R-CH Cluster 2	R-CH Cluster 3	Row Total	χ^2
Relationship Status					
Married					
Count	17	12	38	67	
Row Percent	25.4%	17.9%	56.7%	69.1%	
Column Percent	77.3%	50.0%	74.5%		
Not-Married					
Count	5	12	13	30	
Row Percent	16.7%	40.0%	43.3%	30.9%	
Column Percent	22.7%	50.0%	25.5%		
Column	22	24	51	97	5.48
Total	22.7%	24.7%	52.6%	100%	ns

Table 12

Obtained Frequencies For χ^2 Test of Independence For Education Level Attained Across

The R-CH Clusters

	R-CH Cluster 1	R-CH Cluster 2	R-CH Cluster 3	Row Total	χ^2
Education Level					
Some High-School					
Count	4	7	14	25	
Row Percent	16.0%	28.0%	27.5%	25.8%	
Column Percent	18.2%	29.2%	27.5%		
High-School					
Count	4	4	14	22	
Row Percent	18.2%	18.2%	63.6%	22.7%	
Column Percent	18.2%	16.7%	27.5%		
College and above					
Count	14	13	23	50	
Row Percent	28.0%	26.0%	46.0%	51.5%	
Column Percent	63.6%	54.2%	45.1%		
Column	22	24	51	97	2.81
Total	22.7%	24.7%	52.6%	100%	ns

Because there was no direct measure of income level, analyses on variables related to employment status and supplementary income subsidy were carried out to establish if there was any relationship between socio-economic status and the R-CH cluster status. The distribution of participants across the cluster was independent of employment status. These results are reported in Table 13.

Table 13

Obtained Frequencies For χ^2 Test of Independence For Employment Status Across The R-CH Clusters

	R-CH Cluster 1	R-CH Cluster 2	R-CH Cluster 3	Row Total	χ^2
Employment Status					
Working					
Count	11	8	14	33	
Row Percent	33.3%	24.2%	42.4%	34.0%	
Column Percent	50%	33.3%	27.5%		
Not Working					
Count	11	16	37	64	
Row Percent	17.2%	25.0%	57.8%	66.0%	
Column Percent	50%	66.7%	72.5%		
Column	22	24	51	97	4.08
Total	22.7%	24.7%	52.6%	100%	ns

There was no relationship between the clusters and whether the participants did or did not receive an income supplement in the way of a disability cheque or a pension.

These results are reported in Table 14.

Table 14

Obtained Frequencies For χ^2 Test of Independence For Income Resources Across The R-CH Clusters

	R-CH Cluster 1	R-CH Cluster 2	R-CH Cluster 3	Row Total	χ^2
Receiving Pension or Disability					
No					
Count	10	13	18	41	
Row Percent	24.4%	31.7%	43.9%	42.3%	
Column Percent	45.5%	54.2%	35.3%		
Yes					
Count	12	11	33	56	
Row Percent	21.4%	19.6%	58.9%	57.7%	
Column Percent	54.5%	45.8%	64.7%		
Column	22	24	51	97	2.5
Total	22.7%	24.7%	52.6%	100%	ns

Forty-one participants had no other source of income but from work. Of these individuals, 31.7% did not work. For individuals not receiving a supplement, no significant relationship was found across the cluster between individuals who were and were not employed. These results are reported in Table 15.

Table 15

Obtained Frequencies For χ^2 Test of Independence For Employment Status For Individuals Without Subsidy* Across The R-CH Clusters

	R-CH Cluster 1	R-CH Cluster 2	R-CH Cluster 3	Row Total	χ^2
Employment Status					
Employed					
Count	7	7	14	28	
Row Percent	25.0%	25.0%	50.0%	68.3%	
Column Percent	70.0%	53.8%	77.8%		
Unemployed					
Count	3	6	4	13	
Row Percent	23.1%	46.2%	30.8%	31.7%	
Column Percent	30.0%	46.2%	22.2%		
Column	10	13	18	41	2.01
Total	24.4%	31.7%	43.9%	100%	ns

*Note: Those participants who do not receive any form of subsidy.

Hypothesis 1. Participants with decreased levels of readiness for change will demonstrate poorer adjustment to their chronic pain condition and perceive a more negative impact of pain on their life.

The first hypothesis addressed differences between the readiness for change (R-CH) clusters, on five of the MPI subscales. The subscales assessed the perceived pain intensity and impact that chronic pain had on aspects of the participant's life. These subscales, include PAIN SEVERITY, INTERFERENCE, LIFE-CONTROL, DISTRESS and GENERAL ACTIVITY.

An omnibus F-test using a multivariate analysis of variance (MANOVA) was performed using the R-CH clusters as the independent variable. With the use of Wilk's criterion, no significant differences between the groups on any of the MPI subscales were observed ($F(10, 180) = .92$). Table 16 reports these findings.

Table 16

Means and Standard Deviations Across R-CH Clusters For MPI Sub-Scales

	R-CH Cluster 1		R-CH Cluster 2		R-CH Cluster 3	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
MPI-Severity	4.61	.81	4.60	1.09	4.91	.99
MPI-Interference	4.26	1.34	4.69	.89	4.64	1.17
MPI-Control	2.58	.94	2.77	1.17	2.86	1.46
MPI-Distress	3.94	1.00	3.90	.89	3.86	1.24
MPI-General Activity	2.13	1.02	2.15	1.05	2.24	.88

Scores on the readiness for change algorithms did not appear to relate with perceptions of pain severity, interference, perceived life control, levels of affective distress, and the general activity scale. This is contrary to what was proposed in hypothesis 1.

Hypothesis 2 Participants with decreased levels of readiness for change will demonstrate less adaptive psychosocial adjustment to their chronic pain condition.

The second hypothesis assessed psychosocial adjustment as measured by the BDI and the MSIS for the R-CH clusters. With Wilk's criterion, the combined DVs (BDI and MSIS) were significantly affected by cluster status, $F(4,186) = 5.81, p < .001$. Table 17 provides the means and standard deviation for each of the measures across the clusters.

Table 17

Means and Standard Deviation For The Psychosocial Variables Across The R-CH Clusters

	R-CH Cluster 1		R-CH Cluster 2		R-CH Cluster 3	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
BDI	*19.23 ^{ab}	9.55	23.67 ^a	11.01	16.69 ^b	10.07
MSIS	120.54 ^a	29.19	121.71 ^a	31.44	143.26 ^b	26.39

Note: * Different superscripts indicate statistically significant difference at $p < .05$.

Post-hoc comparisons using a one-way ANOVA, with Scheffe's procedure revealed that individuals in R-CH cluster 2 had significantly higher depression scores ($p <$

.05) than individuals in R-CH cluster 3. Participants in R-CH clusters 1 and 2 scored significantly lower than participants in R-CH cluster 3 on the Miller Social Intimacy Scale. These were the only significant differences between the R-CH clusters.

The Beck Depression Inventory is made up of two types of questions (Beck & Steer, 1987): (1) items focused on bodily or somatic concerns (SBDI), such as a concern for sleep, fatigue, appetite, and general physical health, and (2) items concerned with thoughts and feeling or more general cognitions (CBDI), such as a feeling sad, discouraged, feeling like a failure guilty, and crying. In the present sample, R-CH cluster 3 differed significantly from R-CH cluster 2 on the CBDI subscale ($F = 4.01 (2,94), p < .05$), but not on the SBDI subscale. Table 18 gives a breakdown, across the R-CH clusters, of the scores on the subscales of the BDI.

Table 18

Breakdown Across The R-CH Clusters On The SBDI And The CBDI Subscales of the Beck Depression Inventory.

Subscale	R-CH Cluster 1		R-CH Cluster 2		R-CH Cluster 3	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
CBDI	10.64 ^{ab}	7.45	13.00 ^a	7.55	8.20 ^b	6.48
SBDI	8.59 ^a	3.22	10.67 ^a	4.22	8.50 ^a	4.29

Note: * Different superscripts indicate statistically significant difference at $p < .05$.

Hypothesis 3. Participants with decreased levels of readiness for change will demonstrate greater substance use in their self-management of pain symptoms.

Considering the participants' responses to questions asking if they engaged in certain behaviours as a way of managing their pain, specific group comparisons were made on alcohol consumption and cigarettes use. Lower scores on these behavioural measures indicate less likelihood of engaging in these behaviours. Along with these behaviours, medication use and narcotic use were also compared across the clusters. A multivariate F -test indicated group differences in tobacco use and alcohol use ($F = 2.24 (4, 186) p < .01$). Post-hoc comparison with Scheffé's procedure identified individuals in cluster 2 as using significantly more alcohol and drugs than individuals in cluster 3. Also cluster 2 evidenced significantly more nicotine use than cluster 3. Table 19 reports these findings.

Table 19

Differences Between R-CH Clusters On Maladaptive Substance-Use Behaviours

Behaviour	R-CH Cluster 1		R-CH Cluster 2		R-CH Cluster 3	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Alcohol and Drug						
Use	.63 ^{ab}	1.09	.92 ^a	1.14	.28 ^b	.80
Cigarette Use	1.09 ^{ab}	1.66	2.13 ^a	1.79	1.06 ^b	1.55

Note: * Different superscripts indicate statistically significant difference at $p < .05$.

Although the clusters did not differ in the overall number of medications they used ($F (2, 94) = 2.68, ns$), a chi-square analysis revealed a significant relationship between the use of narcotic analgesics and the clusters ($\chi^2 (2, N = 97) = 6.63, p < .05$). Forty-six percent of the participants who were in R-CH cluster 1 used analgesics, whereas 71% of

the individuals in R-CH cluster 2 used analgesics. For R-CH cluster 3, only 39% of these individuals used analgesics. Table 20 reports the observed frequencies of analgesic use across the clusters.

Table 20

Observed Frequencies of Narcotic Analgesic Use Across The R-CH Clusters

	R-CH Cluster 1	R-CH Cluster 2	R-CH Cluster 3	Row Total	χ^2
Narcotic Use					
NO					
Count	12	7	31	50	
Row Percent	24.0%	14.0%	62.0%	51.5%	
Column Percent	54.5%	29.2%			
YES					
Count	10	17	20	47	
Row Percent	21.3%	36.2%	42.6%	48.5%	
Column Percent	45.5%	70.8%	39.2%		
Column	22	24	51	97	6.63
Total	22.7%	24.7%	52.6%	100%	$p < .05$

Hypothesis 4. The grouping scheme presented by the Pain Management Survey will report information that is different from the classification provided for by the

Multidimensional Pain Inventory (MPI). Knowing the stages of change will add additional information to assessment measures of chronic pain patients already established.

The MPI classification for the present sample has been reported below in Table 21. Of the sample for which there was sufficient information to complete the profiles - 66 out of the 97 questionnaire packages - the majority were classified as Dysfunctional. The latter three classifications, namely Hybrid, Anomalous and Unanalyzable, likely resulted for one of three reasons: (1) the participant's MPI scale score represented more than one of the prototypic profiles (Rudy, 1987); (2) the participant's scale scores were likely significantly different from all three prototypic group profiles (Rudy, 1987); or (3) the participant failed to complete fully the questionnaire package (Rudy, 1987). This third reason resulted primarily from individuals indicating that they were presently not married or in a close relationship.

Table 21

MPI Classifications For Participants

Classification	Percentage of Sample
Dysfunctional	32.0%
Interpersonally Distressed	20.6%
Adaptive Coper	15.5%
Hybrid	6.2%
Anomalous	5.2%
Unanalyzable	20.6%

Chi-square analysis, with MPI classification scheme as one variable and the R-CH Clusters as the other variable, indicated that the R-CH clusters did not differ in the MPI profile classification. That is, the MPI classification is independent of cluster membership of the participants (χ^2 (N=66) = 1.18, ns). Only the three first, primary MPI profile classification were utilised in this analysis, as these are considered to provide the greatest clinical information. Table 22 provides the values of the obtained frequencies for the MPI dimensions across the clusters.

Table 22

Obtained Frequencies For The MPI Profiles Across The R-CH Clusters

	R-CH Cluster 1	R-CH Cluster 2	R-CH Cluster 3	Row Total	χ^2
MPI Classification					
Dysfunctional					
Count	6	6	19	31	
Row Percent	19.4%	19.4%	61.3%	47.0%	
Column Percent	37.5%	50.0%	50.0%		
Interpersonally Distressed					
Count	7	3	10	20	
Row Percent	35.0%	15.0%	50.0%	30.3%	
Column Percent	43.8%	25.0%	26.3%		
Adaptive Coper					
Count	3	3	9	15	
Row Percent	20.0%	20.0%	60.0%	22.7%	
Column Percent	18.8%	25.0%	23.7%		
Column	16	12	38	66	1.82
Total	24.2%	18.2%	57.6%	100%	ns

To what extent does the information provided by the stages of change algorithms add to what is assessed by the MPI? The purpose of the fourth hypothesis was to show

that the R-CH algorithms add additional and unique information to the information obtained from already existing assessments of psychological adjustment to chronic pain. The present analysis was concerned with determining whether additional variance was accounted for in the data set by the R-CH variables.

Because of the exploratory nature of this study, Principle Component Analysis with Varimax rotation was used to answer the fourth hypothesis. Eight variables were entered into the analysis. For these variables we had a complete set of data for all 97 participants. These variables included the MSIS, the BDI total score, the summation score from the algorithms ($\Sigma \text{R-CH} = \text{READY-PHY} + \text{READY-PSY} + \text{READY-SOCIAL}$) and five subscales of the MPI (Severity, Interference, Control, General Activity, Distress).

Two components were extracted. The scree plot and the eigenvalues supported this extraction. The loadings for the rotated variables on each factor are presented in Table 23. A cut off of .3 was used (Tabachnick & Fidell, 1989).

Table 23

Matrix of Factor Loadings

<u>Variable</u>	<u>Factor 1</u>	<u>Factor 2</u>
MPI-Distress	.83	
MPI-Interference	.78	
MPI-Control	-.74	
BDI	.73	-.41
MPI-Pain Severity	.66	
MPI-General Activity	-.55	.37
MSIS		.81
$\Sigma R-CH$		.66

Note: Factor loadings under .3 are not reported; $n = 97$

Component 1, appeared to represent High Distress, Low Functioning Component. This component was comprised of the physical variables of the pain and the variable of control. The highest variable to load onto this component was Distress as measured by the MPI. Component 2 was characterised by high factor loadings for the readiness variable, and the MSIS. Also loading onto the second component was the BDI score, which loaded negatively and the General Activity which loaded positively. This component appeared to represent a readiness for engaging in adaptive psycho-social activities. Table 24 lists the communalities, and the percentage of the variance accounted for by each factor.

Table 24

Communalities, Eigenvalues and Percentage of Variance accounted for By Each Factor

Factor	Communality	Eigenvalue	Percentage of Variance	Cumulative
			Accounted	Variance
1	.69	3.20	40.0	39.8
2	.68	1.68	20.9	59.9

From Table 23 and Table 24, the Σ R-CH score loads on an independent factor from that information provided for by the MPI subscales. This component accounted for an additional 21 percent additional variance in the sample, and together, these eight variables accounted for 60.9 percent of total variance in self-reported adjustment to chronic pain.

Discussion

In a world where the only certainty is change, learning to respond effectively to changing life events is clearly associated with healthy and satisfying lives (Gross, 1994, p. 87).

Ninety-seven chronic pain patients from an outpatient pain clinic, presenting with a diverse number of pain complaints and etiological pain profiles, were asked to complete a questionnaire package. Included in this package were three algorithms, developed from prior research (McConaughy, DiClemente, Prochaska, & Velicer, 1989; McConaughy, Prochaska, & Velicer, 1983) to assess how ready individuals felt they were to make lifestyle changes and to follow recommended International Pain Foundation (IPF) guidelines for managing chronic pain. Cluster analysis placed participants into one of three readiness for change (R-CH) categories defined in terms of the Transtheoretical Model of Behavioural Change (TTM), (Prochaska, 1979).

Fifty-three percent of the participants indicated that they had been following the IPF guidelines for six months or more. This group was identified as a maintenance group (R-CH-MAINTENANCE). Twenty-five percent of the participants indicated that they had not been following the guidelines and were not ready to actively make changes necessary to comply with those guidelines in how they manage their pain. This suggested a pre-action level of motivational readiness for using adaptive pain management strategies (R-CH-PREACTION). The third group, comprising 23 percent of the participants indicated that they were actively engaged in following guidelines concerned with managing their physical health. However they were in a pre-action stage as far as following the guidelines for managing their psychological health and social well-being. This group was more

complex and represented a hybrid cluster (R-CH-HYBRID). The disproportionate representation of one stage may be a limitation, but the focus of the present study was on comparing individuals in different stages and not on providing an accurate estimate of the population prevalence.

The results indicate that depression, social intimacy, and passive coping behaviours have a direct relationship with the stages of readiness for change within a pain population. The more maladaptive profile appeared to be R-CH-PREACTION. This group evidenced greater affective distress and decreased social support scores than the more adaptive maintenance group, R-CH-MAINTENANCE. Compared with R-CH-MAINTENANCE, the R-CH-PREACTION group also reported significantly greater use of tobacco, alcohol, and narcotic analgesics.

Participants in R-CH-HYBRID group appeared to be actively engaged in pursuing change in how they managed the physical aspect of pain. However they were not pursuing change within the psychological or social dimensions. R-CH-HYBRID failed to differ from R-CH-PREACTION on the psychometric measures. Nevertheless R-CH-HYBRID and R-CH-PREACTION groups demonstrated different patterns in how each was distinguished from the R-CH-MAINTENANCE group. Finally, similar to R-CH-PREACTION group, the R-CH-HYBRID group indicated a significantly lower levels of social intimacy than R-CH-MAINTENANCE group, indicating a greater dissatisfaction with their relationship.

Individuals in R-CH-MAINTENANCE indicated that they were maintaining change in how they were managing their life with chronic pain, and had been doing so for

more than six months. This group appeared to be adapting more positively, showing the least amount of affective distress and the greatest degree of social intimacy. This group also tended to smoke less, rely less on alcohol to regulate pain, and use fewer narcotic analgesics than the R-CH-PREACTION group.

Hypothesis 1

The first hypothesis was not supported. Participants with decreased readiness for change did not report greater pain severity, affective distress, and perceived interference of pain in daily activities (as assessed by the MPI). Further, participants with decreased readiness for change did not report lower levels of perceived control over pain or lower levels of general activity, as assessed by the MPI.

As reported by Deardorff, Rubin and Scott (1991), the physical dimensions of pain seem to play a small role for patients who experience chronic pain. With persistent pain, the nociceptive response becomes less important in influencing suffering and pain, while the other domains become more predominant. All the patients recruited into this study perceived the impact of pain on their life similarly. This is likely attributable to the fact that the pain patients in the three R-CH clusters share similar essential characteristics, such as chronic pain for an average of ten years and a compromised quality of life.

Patients who attend pain clinics often present with symptoms of chronic disability. Pain programmes result in a significant improvement in physical work activity and reductions in analgesic consumption and analgesic demand. There is little agreement, however, about the efficacy of programmes in reducing pain intensity (Guthrie, 1996). This implies that the actual physical experience of the pain may not change and remain the

same for most patients. How individuals assimilate the pain experience into their daily experience and accordingly alter their lifestyle concerning chronic pain, results in different levels of overall adjustment for individual patients. A successful adaptation to chronic pain requires the patient to deal with the many changes caused by the illness and to develop or modify pre-existing coping skills (France, Krishnan, Houpt, & Maltbie, 1988). Variation in readiness to make these changes will likely depend on social circumstances, timing, opportunity, location, change goal, the degree of social pressure or support for the goal, alterations in environmental circumstances, developmental crises, and physical or emotional pain. (Gross, 1994).

Hypothesis 2.

Participants with decreased levels of readiness for change demonstrated less adaptive psychosocial adjustment to their chronic pain condition. Specifically, participants with decreased readiness for change reported higher levels of depressed mood (as assessed on the BDI) and lower levels of social intimacy (as assessed on the MSIS).

Depression. Chronic pain is often accompanied by depression (Averill, Novy, Nelson, & Berry, 1996). From the present sample, it appears that the degree to which chronic pain patients are ready to make change is also related to their level of depression. As pointed out by Folkman and Lazarus, (1985) the essence of coping and adaptation is change. Emotions experienced by patients with chronic pain are characterised by flux. Individuals in the preaction group indicated a significantly greater level of affective distress, as measured by the BDI, than did the maintenance group. This was specifically verified for cognitive-affective symptoms of depression. Among the pre-action cluster

there may be a greater sense of helplessness, characterised by a decreased willingness to assume an active role in their treatment. This may result in creating an overall sense of loss of control over their life having a negative impact on overall well-being and life satisfaction.

The physical nature of pain alone is not a sufficient condition for the development of depression (Kerns & Haythornwaite, 1988). Individuals from all clusters had a tendency to report problems in the areas of work, sleep, fatigue, health concerns, and irritability as assessed by the somatic subscale of the BDI. However, where the clusters differed were on those items that measured feelings and cognitions such as feeling sadness, feelings of being a failure and feelings of being disappointed. Those individuals having elevated scores on the cognitive-affective items, indicating a greater degree of distress, were not actively engaged in following the IPF guidelines for coping with chronic pain. They also indicated that they were not planning to in the near future. This finding supports Williams and Richardson (1993) by showing that chronic pain patients differ not so much in their somatic- physical nature of the pain but in their cognitive-affective response to their pain.

The findings of this study reinforce the clinical importance of discriminating between cognitive-affective symptoms and somatic complaints in the chronic pain population. Assessment instruments that utilise somatic symptoms, such as poor sleep, poor appetite, lethargy and poor concentration, which can all be affected by physical illness, do not necessarily indicate the presence of depression in medically ill patients (Silverstone, Lemay, Elliot, Hsu, & Starko, 1996). Therefore, concerning medical

problems, the somatic complaints measured by the BDI must be carefully weighed before concluding that a medical patient is indeed depressed.

Social Intimacy. The relationship between the social intimacy scale and the level of readiness for change may indicate the social consequences of adaptive adjustment to chronic pain. Change does not occur in isolation, but affects all individuals within the patient's sphere of influence. The act of coping adaptively with a stressor, like chronic pain may give rise to an enhanced quality of life and psychosocial functioning by mobilising interpersonal resources. As pain patients alter their coping behaviours, there may be a shift in the perception of the pain patient by significant others (Antonovsky, 1988).

The hybrid R-CH cluster and the preaction R-CH cluster both had significantly lower scores on the Social Intimacy Scale than individuals who claimed they had been following the guidelines for six months or more. Disruptions in relationships, the nature of which remains unclear at this point, appear to resolve themselves as patients progress to maintenance.

Changing how they self-manage their chronic pain may be a time of great disruption for chronic pain patients. Learning and adapting to new management skills, and relinquishing older, less adaptive patterns of behaviour, may have a major impact on the lives of the people in the immediate environment of a chronic pain sufferer. In some cases, the supporting network of individuals may be reluctant to change patterns that for them, have become established. Spouses of patients with chronic pain symptoms often unwittingly collude with the patients' abnormal illness behaviour or reinforce maladaptive

ways of coping with illness (Guthrie, 1996). For chronic pain patients, behavioural change may result in a disruption in personal relationships.

Change involves invoking the unfamiliar, which may tend to increase distress. Life patterns that have become routine are disrupted in ways that the individuals are not fully prepared to alter. Continuity within a relationship may be lost and cannot be acknowledged without distress in the relationship (Gross, 1994).

Within the maintenance group there was a noticeable increase in the level of reported intimacy. The difficulties of active change, within the social environment appear to have become more resolved. As patients learn to integrate recommendations on pain management into their lifestyle, positive environmental contingencies of their change help to reinforce the adaptive coping strategies.

An important predictor of healthy psychological and physiological functioning is social support. Closeness with others including closeness with spouse, with friends, and with family, have predicted healthy psychological and physical functioning (Feinauer & Steele, 1992; Miller & Lefcourt 1982). Individuals who lack intimacy in their relationships will be more prone to psychological disturbance (Miller & Lefcourt 1982; Feinauer & Steele, 1992).

Hypothesis 3.

Participants with decreased levels of readiness for change demonstrated greater substance use in their self-management of pain symptoms. Specifically, participants with decreased levels of readiness for change reported greater use of alcohol, narcotics, and cigarettes.

Maladaptive behaviour patterns like smoking or alcohol use, may reflect a lack of awareness of more adaptive coping skills. Individuals with a decreased level of readiness to change health behaviour may envision fewer alternative strategies for coping with a stressful situation. Patients who report more reliance upon medical professionals are likely to have internalised fewer cognitive and potentially adaptive coping strategies (Buckelew, Shutty, Hewett, Landon, Morrow, & Frank, 1990). These relationships may also reflect a general, overall poorer health lifestyle pattern (Patterson, Haines, & Popkin, 1994)

The use of opioids in the treatment of non-malignant pain is conventionally thought to interfere with a self-management approach to rehabilitation. The present findings found that individuals who were in the earlier stages of change, who were more depressed and had poorer intimacy scores reported greater use of narcotic analgesics. Schofferman (1993) found that patients improved in their ability to deal with their pain and evidenced an improvement in their psychological and social functioning as their intake of narcotic analgesics was lowered.

Patients who rely on narcotics to alleviate their pain, may become increasingly distressed when these medications do not work effectively. Although not measured, perhaps these patients become helpless as their pursuit of a purely medically based pain relief proves ineffective. Dependence on passive methods of pain relief (e.g. taking medications) and a reliance on medical doctors to provide a cure may impede the ability of the patient to recognise that their actions are an important ingredient to maintaining a healthy life with chronic pain.

When pain persists after aggressive medical management, it is essential for patients to move on to a co-ordinated restoration program. The goal of this management transition approach is increased function, not pain relief. Continuing to expect significant short-term pain relief may be counter-productive. Clifford (1993) identifies prerequisites for transition: the patient and health care professionals are prepared to leave behind the concepts of diagnosis and cure, and the patient is prepared to increase function despite ongoing pain perception. Upon recognising the importance of other approaches to dealing with pain, and making positive changes in lifestyle that include increased exercise, decreased bed-rest, decreased narcotic use, and increased social contacts, there is usually an improvement in the overall well-being of the patient, even though chronic pain is still a part of their life.

Hypothesis 4.

The stages of readiness for change contributes information that is independent from the classification provided for by the Multidimensional Pain Inventory (MPI). Specifically stage classification was shown to be unrelated to the classification given by the MPI. Moreover, the stages of change accounted for additional variance in self-reported adjustment to chronic pain.

Researchers attempting to assess people's adjustment to chronic pain have been attentive to personality trait variables as well as status variables like age and health. Also, researchers have devoted a great deal of energy to the study of social relations (Reich & Zautra, 1995). But adapting to chronic pain is a dynamic process, involving the assimilation of new ways of living (Antonovsky, 1988; Blackman, 1982). Adapting to a

lifestyle with chronic pain may require changing daily activities to accommodate to a life with pain. Work roles, family obligations, and leisure activities (Samuelsson, Ahlmen, & Sullivan, 1993) are a few important areas that may require change.

As Folkman and Lazarus (1985) point out, to be concerned with change is to be concerned with a process as opposed to structure. By structure they refer to stable factors such as personality traits or static features of an environment. The TTM appears to offer a novel approach to pain management assessment strategies insofar as it evaluates readiness to make change, and the motivation of pain patients to initiate new adaptive techniques to pain management. As pointed out by Samuelsson, Ahlmen, and Sullivan (1993), adaptation to new knowledge, to new ways of living, and to changed circumstances, takes place at a pace that is determined according to the individuals own capacity.

Difficulties

It is important to emphasise that the present study is correlational by design. As a result, there can be no inferences about causality. It is only possible to show relationships between the stages of change variables and the psychosocial and behavioural variables. Any implication of causality is only speculative and awaits further exploration in the form of repeated measures or longitudinal designs.

The ninety-seven participants in the present investigation responded differently to the stages of change questionnaire. There were three separate algorithms corresponding to three lifestyle areas known to be affected by pain. The participants were presented with a series of guidelines that would make living with chronic pain easier. After reading all of

the guidelines, participants were asked to make a global response on each algorithm as to how ready they felt they were to make the changes proposed by the guidelines. Three groups were identified and defined in terms of the TTM, which offers partial validation for this model with chronic pain patients.

It is possible that the lack of a Precontemplation group may be the result of having assessed a clinical population. Precontemplators, theoretically, would not be utilise the pain clinic. This could be considered engaging in a change activity, and would therefore make anyone in the clinic would score no lower than the Preparation on the algorithm. In the future it will be important to assess a non-clinical chronic pain population. However, it must be emphasised that the assessment provided by the Stages of Change Questionnaire is about how patients *self-manage* their pain, which is more than just following their physicians' orders. The questionnaire is also assessing the acquisition of new health promoting lifestyle behaviours. The questionnaire was based on a series of guidelines provided by the International Pain Foundation, and these guidelines are known to be effective for patients who self-manage their own pain.

Refinements to the questionnaire, explicitly asking participants to rate their readiness for change along each of the specified IPF guidelines as opposed to a global response to all the guidelines may provide a more detailed change profile for the participants, thus strengthening the validity of this model. Further developments of the questionnaire are warranted to elucidate more clearly the stage profiles for the participants. In the present study, only three groups were identified. Because of a relatively small sample, the initial stages, namely precontemplation, contemplation, and

preaction were grouped together to form a preaction group. With further refinements of the questionnaire, more of the distinct stages will become apparent, validating further the importance of this model with a pain population.

A cross-sectional, one-time only assessment provided the basis of the present analyses. Such an approach may be difficult to draw firm conclusions concerning change. To investigate change, assessments at a delayed time interval may have provided better evidence for the validity of the model. Prochaska, DiClemente, and Norcross (1992) identify change as a progression through a series of discrete scales. With a repeated measures design, there may have been a more clear indication that patients with chronic pain show a similar progression through the stages. However, the findings of the present study do indicate that individuals with chronic pain differ in terms of their readiness to change how they self-manage their pain. These differences in levels of readiness were related to levels of psychosocial distress. These results will hopefully encourage research to further the understanding of change as it occurs within a chronic pain population.

A problem in using empirical methods to develop classification concepts, is that the results from any analysis describe similarities and differences among individuals within the particular sample. Ideally, we would like to use empirical clustering techniques to define a typology of general significance. To support the present findings, a confirmatory analysis of the groups, using a different population needs to be conducted to show that the clustering structure is able to be recaptured. To avoid potential Type II error, it is necessary to use more than one cluster technique when analysing data and to replicate the

findings across samples. Therefore, replication of this study is essential before these clusters are considered reliable (Shapiro, Rodrique, Boggs, & Robinson, 1994).

Although the stages of change paradigm is centred on knowing at what stage of change individuals are in, there are three other dimensions of this model that need to be explored. The present investigation is part of an ongoing endeavour to explore these other dimensions, namely the Process of Change, the relationship between Self-Efficacy and the stages, and the Decisional Balance. Understanding change and its component parts will greatly influence how the pain patient is perceived within the health-care environment and perhaps shed light on the mechanisms of change that are currently being sought. The present analysis provides evidence for the validity of this model, and shows the importance for the use of the stages of change in assessing chronic pain patients for treatment.

Summary

Individuals who suffer with a chronic pain condition must be encouraged to take responsibility for their rehabilitation (Clifford, 1993) and change how they self-manage their condition. This initial work with the TTM model with a population of chronic pain patients has attempted to show that a failure to adapt to the changes that pain brings to their life is related to a poorer level of psychosocial functioning.

Research has attempted to identify adaptive and maladaptive responses to chronic pain and on that basis establish evidence-based guidelines and programs to promote adaptive change (Anderson, Dowds, Pelletz, Edwards, & Peetes-Asdourian, 1995; Kabat-Zinn & Waldrop, 1988; Philips, 1987; Snow-Turek, Norris, & Tan, 1996). However, not

all methods work as effectively with all individuals. Programs designed to change such things as cognitive-behavioural patterns, emotional responding, and environmental contingencies, fail to consider measuring how ready individuals are to make the necessary change.

There is a shift in the approach taken in managing and facilitating lifestyle changes in chronic pain patients. Despite advances in the understanding of pain and the increasing number of treatment options, health care professionals who work with chronic pain patients often become frustrated at the lack of progression in their attempts to alleviate pain patients of their suffering (Rowbotham, 1993). Patients may begin to feel as though they are being labelled as analgerers or hypochondriacs. A conceptual shift in thinking about pain must be made if this clinical misinterpretation is to be avoided (Sullivan, Turner, & Romano, 1991). This shift is presently underway.

Researchers are becoming more interested not only in knowing what interventions work but also how they work. Recognising that pain patients represent a heterogeneous sample, health care providers are looking for the mechanism that fosters change (Mikail, Henderson, & Tasca, 1994; Miller, 1993). The hope is to eventually balance the current practice of assessment with a tool that recognises the importance of understanding change within a chronic pain population.

Understanding change and helping individuals to make positive changes in how they manage their life with pain are important elements in assisting pain patients to function more adaptively and benefit more from existing treatment modalities. Parallel research, using the TTM with chronic pain patients supports the trend in pain research

towards a deeper understanding of change (Kerns, Rosenberg, Jamison, Caudill, Haythornthwaite, & Snow, 1996). As well, a recent publication (Jensen, 1996) proposes a program based on motivational interviewing techniques established by Miller and Rollnick (1989) in the context of the stages of change paradigm.

Chronic physical illness is a long-term stressor. The psychological reaction to any physical disorder is a transitional process moving the patient from the initial shock and denial to a gradual assimilation of the information and the adjustment to the new physical state (Antonovsky, 1988; Clifford, 1993). A key to implementing change is to determine where along this transitional process the individual is, and then to determine if the patient is ready to make necessary changes. The TTM provides a method for operationally defining this process by recognising change as a progression through a series of discrete stages. Depending on the stage, individuals requesting treatment will approach their problem differently and present with different needs. In the present study, individuals were found to respond differently to a staging questionnaire defined in terms of the TTM. Further research with the TTM will determine that different therapeutic techniques will be more or less beneficial depending on the particular stage with which individuals enter into treatment.

For chronic pain problems, a cure is not always evident. Adaptive maintenance through lifestyle change such as maintaining a healthier diet, maintaining regular sleep patterns, increasing social interactions, and increasing exercise levels, is important. However, the problem with any lifestyle change is that the rewards are not always immediately apparent. For example, exercise involves a degree of effort and possible

discomfort to attain long-term gains (Barlow, Macey, & Struthers, 1993). This effort may deter individuals who are not prepared to accept the discomforts associated with such a change. These individuals may prefer to avoid making any of the necessary changes and stay with their current level of functioning although that level may be less adaptive.

Knowing how ready individuals are to engage in lifestyle change will enable those professionals who treat pain patients to continue to develop more effective means of rehabilitating these patients. Findings suggest that there needs to be more time spent working to develop new interventions for patients who are not ready to make adaptive lifestyle change (Anderson et al. 1995). Individuals in the earlier stages of change will need help to understand the importance of making adaptive change. It is only after the patient has accepted the need to make change that adoption of new adaptive patterns of management will be most beneficial. Understanding the dynamics of change will make health care professionals who work with individuals more effective at assisting their clients to lead more productive and satisfying lives.

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Appendix A

Demographic and Medical Information

PLEASE COMPLETE ALL QUESTIONS BELOW:

Today's Date: Day ___ Month ___ Year ___

LAST Name: _____ FIRST Name: _____

DATE OF BIRTH: Day _____ Month _____ Year _____

ADDRESS: _____

_____

_____ Postal Code: _____

TELEPHONE #: (Home) _____ (Work) _____

In case of an EMERGENCY, who should we contact?

Name: _____

Telephone # (Home) _____ (Work) _____

Relationship to you: _____

What MEDICATIONS are you taking now for your pain?

Name _____ What is it for: _____

Name _____ What is it for: _____

Name _____ What is it for: _____

Name _____ What is it for: _____

Name _____ What is it for: _____

What is your RELATIONSHIP status?

Circle one: Single/Married or Living Together Divorced/Separated/Widowed

What level of EDUCATION have you completed?

- Check one:
- ☐ Grade 8 or less
  - ☐ Some High School
  - ☐ High School Certificate
  - ☐ Some Community College or University
  - ☐ Community College or University Degree
  - ☐ Post-Graduate Degree (Complete or in progress)

What is your present EMPLOYMENT? _____

You have been in this position since (month/year) _____ / _____

OR

You have been receiving a pension or disability payment since (month/year) _____ / _____

Appendix B

Stages of Change Questionnaire

The International Pain Foundation recommends that it is important to manage chronic pain by doing the following lifestyle activities:

Caring For Your Physical Health

- keeping your use of prescribed medications under control
- avoiding the use of nonprescribed drugs to manage pain
- eliminating tobacco and alcohol, and reducing caffeine
- eating and sleeping regularly
- eating a balanced diet
- exercising regularly

Place an "X" beside the statement that best describes *how ready you feel* to follow this guideline in your day-to-day life.

- ( ) I do NOT follow the guidelines for caring for my PHYSICAL HEALTH, and I am NOT ready to plan any changes in how I am managing this aspect of my pain
- ( ) I do NOT follow the guidelines for caring for my PHYSICAL HEALTH regularly, but within 6 months I will be ready to do so.
- ( ) I do NOT follow the guidelines for caring for my PHYSICAL HEALTH regularly but within the next 30 days I will be ready to do so.
- ( ) I have been following the guidelines for caring for my PHYSICAL HEALTH regularly, for less than 6 months.
- ( ) I have been following the guidelines for caring for my PHYSICAL HEALTH regularly, for more than 6 months.
- ( ) I have been following the guidelines for caring for my PHYSICAL HEALTH regularly, for 5 years or more

The International Pain Foundation recommends that it is important to manage chronic pain by doing the following lifestyle activities:

Caring For Your Psychological Health (Thought and Feelings)

- keeping a positive attitude about your life and staying hopeful about managing pain
- reducing stress and having a regular hobby or pleasurable activity
- having a special way to relax, without relying on alcohol, drugs, or sleep
- keeping a positive attitude towards yourself and your personal goals

Place an "X" beside the statement that best describes *how ready you feel* to follow this guideline in your day-to-day life.

- ( ) I do NOT follow the guidelines for caring for my PSYCHOLOGICAL HEALTH and I am NOT ready to plan any changes in how I am managing this aspect of my pain
- ( ) I do NOT follow the guidelines for caring for my PSYCHOLOGICAL HEALTH regularly, but within 6 months I will be ready to do so.
- ( ) I do NOT follow the guidelines for caring for my PSYCHOLOGICAL HEALTH regularly but within the next 30 days I will be ready to do so.
- ( ) I have been following the guidelines for caring for my PSYCHOLOGICAL HEALTH regularly, for less than 6 months.
- ( ) I have been following the guidelines for caring for my PSYCHOLOGICAL HEALTH regularly, for more than 6 months.
- ( ) I have been following the guidelines for caring for my PSYCHOLOGICAL HEALTH regularly, for 5 years or more

The International Pain Foundation recommends that it is important to manage chronic pain by doing the following lifestyle activities:

Caring For Your Social Well-Being

- participating in social activities with others
- doing necessary activities for daily living (e.g. shopping)
- working regularly at a job, or volunteer activity, or personal project
- sharing personal thoughts and feelings with someone
- sharing sexual feelings with a special friend or loved one

Place an "X" beside the statement that best describes *how ready you feel* to follow this guideline in your day-to-day life.

- ( ) I do NOT follow the guidelines for caring for my SOCIAL WELL-BEING and I am NOT ready to plan any changes in how I am managing this aspect of my pain
- ( ) I do NOT follow the guidelines for caring for my SOCIAL WELL-BEING regularly,
but within 6 months I will be ready to do so.
- ( ) I do NOT follow the guidelines for caring for my SOCIAL WELL-BEING regularly but
within the next 30 days I will be ready to do so.
- ( ) I have been following the guidelines for caring for my SOCIAL WELL-BEING regularly,
for less than 6 months.
- ( ) I have been following the guidelines for caring for my SOCIAL WELL-BEING regularly,
for more than 6 months.
- ( ) I have been following the guidelines for caring for my SOCIAL WELL-BEING regularly,
for 5 years or more

Appendix C

Lifestyle Management Behaviours

Chronic pain can bring about many changes in a person's day-to-day life. Take a moment to think of your day-to-day activities over the past month, and answer the questions below.

OVER THE PAST MONTH...

NEVER	RARELY	SOMETIMES	FREQUENTLY	EXTREMELY OFTEN
(0)	(1)	(2)	(3)	(4)
1. I have been able to relax and unwind by doing a special activity or relaxation exercise (i.e. something other than sleeping, drinking alcohol, or smoking cigarettes).			(0) (1) (2) (3) (4)	
2. I have been following the instructions of my physician for taking prescribed medication. OR: My physician has not prescribed medication for my pain ( )			(0) (1) (2) (3) (4)	
3. I have taken alcohol or drugs NOT prescribed by my physician to manage my pain.			(0) (1) (2) (3) (4)	
4. I have been eating a balanced diet (lean meats, fruits & vegetables, whole grain breads and cereals, and milk products).			(0) (1) (2) (3) (4)	
5. I have taken alcohol.			(0) (1) (2) (3) (4)	
6. I have smoked cigarettes.			(0) (1) (2) (3) (4)	
7. I have been able to sleep on a regular schedule.			(0) (1) (2) (3) (4)	
8. I have been able to control negative thoughts and feelings related to my pain.			(0) (1) (2) (3) (4)	
9. I have been able to control the stress in my life.			(0) (1) (2) (3) (4)	

10. I was able to go through a day by accepting chronic pain as part of my life. (0) (1) (2) (3) (4)
11. I have been physically active, even though I have pain. (e.g. going for a walk, doing a stretching exercise). (0) (1) (2) (3) (4)
12. I have been able to work effectively at my job, or a volunteer position, or on some personal project. (0) (1) (2) (3) (4)
13. I have shared important thoughts and feelings with a friend or someone special about how I am managing chronic pain in my life. (0) (1) (2) (3) (4)
14. I have felt that it was possible to share sexual feelings with a special friend or loved one.
OR: I do not have a special friend or loved on
( ) (0) (1) (2) (3) (4)
15. I got together with friends or family members to have fun or relax, even when I had pain. (0) (1) (2) (3) (4)
16. I have been able to do the activities that are part of daily living (e.g. shopping, housework). (0) (1) (2) (3) (4)

Appendix D

MPI

Age (in years): _____

Sex (check one): _____ Male _____ Female

When did your pain first start? Month: _____ Year: _____

Where is your pain mainly located?

- ☐ Head, face & mouth
☐ Neck region
☐ Upper shoulder and arms
☐ Chest area
☐ Stomach/abdomen area
☐ Lower back
☐ Pelvic area
☐ Pubic area, genitals, anus

SECTION A

Instructions. An important part of our evaluation includes an examination of pain from your perspective, because you know your pain better than anyone else. The following questions are designed to help us learn more about your pain and how it affects your life. Besides each question is a scale to mark your answer. Read each question carefully and then circle a number on the scale beside that question to indicate how that specific question applies to you. Please answer all 28 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 you pain began, how much has your pain changed your ability to work? (_____ check here if you have retired for reasons other than your pain.)	0	1	2	3	4	5	6
	No change					Extremely changed	

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 Extremely changed
5. How supportive or helpful is your spouse (significant other) to you in relation to your pain? (____ Check here if you are not currently married or in a relationship.) 0 1 2 3 4 5 6
Not at all supportive Extremely supportive
6. Rate you overall mood during the past week. 0 1 2 3 4 5 6
Extremely low Extremely high
7. How much has you pain interfered with you ability to get enough sleep? 0 1 2 3 4 5 6
No interference Extreme interference
8. On average, how sever has you pain been during the last week? 0 1 2 3 4 5 6
Not at all sever Extremely sever
9. How able are you to predict when you 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
11. How much do you limit your activities in order to keep you 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? (____ Check here if you are not currently married or in a relationship.) 0 1 2 3 4 5 6
Not at all worried Extremely worried

14. During the <u>past week</u> 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 Change a lot
16. How much suffering do you experience because of you 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 (_____ Check here if you are not married or in a relationship.)	0	1	2	3	4	5	6	Not at all attentive Extremely attentive
21. During the <u>past week</u> , how much do you feel that you've been able to deal with you problems?	0	1	2	3	4	5	6	Not at all Very much
22. How much control do you feel that you have over you pain?	0	1	2	3	4	5	6	No control at all A great deal of control
23. How much has your pain changed you ability to do household chores?	0	1	2	3	4	5	6	No change Extreme change

24. During the <u>past week</u> , how successful were you in coping with stressful situation in your life?	0	1	2	3	4	5	6
	Not at all successful				Extremely successful		
25. How much has your pain interfered with you ability to plan activities?	0	1	2	3	4	5	6
	No change				Extreme change		
26. During the <u>past week</u> , 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 or interfered with your friendships with people other than you family?	0	1	2	3	4	5	6
	No change				Extreme change		
28. During the <u>past week</u> , How tense or anxious have you been?	0	1	2	3	4	5	6
	Not at all tense or anxious				Extremely tense or anxious		

SECTION B

Instructions. In this section, we are interested in knowing how your spouse (or significant other) responds to you when he or she knows that you are in pain. On the scale listed beside each question, circle a number to indicate how often you spouse (or significant other) responds to you in that particular way when you are in pain. Please answer all 14 questions.

(_____ Check here if you are not currently married or in a relationship. Please go on to Section C.)

1. Ignore me.	0	1	2	3	4	5	6
	Never				Very often		
2. Asks me what he/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.	0	1	2	3	4	5	6
	Never				Very often		

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. Get 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 C

Instructions. Listed below are 19 daily activities. Please indicate how often you do each of these by circling a number on the scale listed beside each activity. Please complete all 19 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 Never	2	3	4	5 6 Very often	
5. Go grocery shopping.	0 1 Never	2	3	4	5 6 Very often	
6. Work in the garden. (____ Check here if you do not have a garden.)	0 1 Never	2	3	4	5 6 Very often	
7. Go to a movie.	0 1 Never	2	3	4	5 6 Very often	
8. Visit friends.	0 1 Never	2	3	4	5 6 Very often	
9. Help with the house cleaning.	0 1 Never	2	3	4	5 6 Very often	
10. Work on the car. (____ Check here if you do not have a car.)	0 1 Never	2	3	4	5 6 Very often	
11. Take a ride in a car or bus.	0 1 Never	2	3	4	5 6 Very often	
12. Visit relatives (____ Check here if you do not have relatives within 100 miles	0 1 Never	2	3	4	5 6 Very often	
13. Prepare a meal.	0 1 Never	2	3	4	5 6 Very often	
14. Wash the car. (____ Check here if you do not have a car.)	0 1 Never	2	3	4	5 6 Very often	
15. Take a trip.	0 1 Never	2	3	4	5 6 Very often	
16. Go to a park or beach.	0 1 Never	2	3	4	5 6 Very often	
17. Do the laundry.	0 1 Never	2	3	4	5 6 Very often	

18. Work on a needed house hold repair.	0	1	2	3	4	5	6
	Never						Very often
19. Engage in sexual activities	0	1	2	3	4	5	6
	Never						Very often

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DISKETTE(S), SLIDES, MICROFICHE, ETC...).

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Appendix E

Beck Depression Inventory

Pg. 115-116

Have been removed.

Appendix F

MSIS

For each question below, think of someone special in your life (e.g. spouse, partner, close friend). Answer each question in relation to that special person. For each question circle the number that best describes how you feel.

	Very Rarely	Some of the Time					Almost Always			
1. When you have leisure time how often do you choose to spend it with him/her alone?	1	2	3	4	5	6	7	8	9	10
2. How often do you keep very personal information to yourself and do not share it with him/her?	1	2	3	4	5	6	7	8	9	10
3. How often do you show him/her affection?	1	2	3	4	5	6	7	8	9	10
4. How often do you confide very personal information to him/her?	1	2	3	4	5	6	7	8	9	10
5. How often are you able to understand his/her feelings?	1	2	3	4	5	6	7	8	9	10
6. How often do you feel close to him/her?	1	2	3	4	5	6	7	8	9	10
	Not Much	A Little					A Great Deal			
7. How much do you like to spend time alone with him/her?	1	2	3	4	5	6	7	8	9	10
8. How much do you feel like being encouraging and supportive to him/her when he/she is unhappy?	1	2	3	4	5	6	7	8	9	10
9. How close do you feel to him/her most of the time?	1	2	3	4	5	6	7	8	9	10
10. How important is it to you to listen to his/her very personal disclosures?	1	2	3	4	5	6	7	8	9	10
11. How satisfying is your relationship with him/her?	1	2	3	4	5	6	7	8	9	10
12. How affectionate do you feel towards him/her?	1	2	3	4	5	6	7	8	9	10
13. How important is it to you that he/she understands your feelings?	1	2	3	4	5	6	7	8	9	10
14. How much damage is caused by a typical disagreement in your relationship?	1	2	3	4	5	6	7	8	9	10

15. How important is it to you that he/she be encouraging
and supportive to you when you are unhappy? 1 2 3 4 5 6 7 8 9 10
16. How important is it to you that he/she show you affection? 1 2 3 4 5 6 7 8 9 10
17. How important is your relationship with him/her in your
life? 1 2 3 4 5 6 7 8 9 10

Appendix G

Participant Recruitment Script

Script

Hello _____,

My name is _____ and I am presently involved in a research project looking at how individuals like yourself, with a chronic pain condition manage with their pain on a day to day basis. This project is to be the basis of my Master Degree in psychology at Carleton, however the Pain Management Unit is quite interested in the project as they are looking for ways that they may enhance the programs that they offer here at the clinic. Every individual who comes into the clinic has certain needs and concerns and together, we are attempting to determine if there maybe more efficient ways of meeting those needs.

As an initial part of this process, I am approaching every individual patient who comes into the clinic and asking them to complete a questionnaire package. This package will take approximately one hour to complete. We appreciate the participation of everyone and also because you are the individuals who are utilising this facility your input is most important to yourself as a future patient as well as all the other patients who will be using this facility.

Do you have any questions?

This is the package. Because it is a research project, all participants are requested to sign a consent form. This is done for a variety of reason, the most important of which is the issue of confidentiality; you may be asking yourself where does all this information

go. All completed questionnaires will come directly to me and the only people who will have access to the package will be myself, and my advisor on the project, Dr. Robert Nolan. Other reasons to have you sign the consent form include ensuring that you understand that your role in the project is to complete a questionnaire package, once, and to ensure that you have ample opportunity to ask any question that you may have in regards to the project.

The next part of the package is a brief information sheet which explains to you the nature of the project and restates what I have already stated, in a written form. It is in both English and French. You can read through this now. You will note that there are phone numbers at the bottom. Should you agree to participate and if you have any questions about the project do not hesitate to call these numbers, one being the number to my advisor, Dr. R. Nolan, and the other being my number. As well should you have any questions as to the ethical nature of this study there is a number here which you may call and have your questions addressed.

The next part is concerned with some basic information on your self: your relationship status, your level of education, past medical experiences, pain medications etc.

The rest of the questionnaire fairly straight forward. Throughout the document there will be a small set of instructions. Read those before proceeding. The questions to which you will be responding will be quite similar to this first one here. There will be a statement and you will circle the number following the key, which is most suited to you. Items to which you will respond are on both sides of the page. This package should take you approximately one hour to complete.

Do you have any questions?

I will leave the package with you, and you can return it to me when you have finished.

I thank you very much for your willingness to participate.

Appendix H

Information Sheet

Psychological Adjustment to Chronic Pain

Information Sheet

The Department of Psychology along with the Pain Management Unit of the Ottawa General Hospital are currently interested in assessing how individuals, like yourself, are adjusting to their pain. One of the major problems for chronic pain patients is to find a treatment program that meets their needs. The main goal of the study is to improve upon an already successful pain management program with the hopes of being able to more effectively match future chronic pain patients with treatment services.

As an individual who chooses to participate in the study, you will first be required to complete a consent form indicating that you are aware of the nature of the study. You will then be asked to complete a series of questionnaires that will take 60 minutes to complete. You will be asked to complete these questionnaires before you leave from the clinic today. There will be no risk involved in completing the questionnaire package and you can withdraw your participation at any time. Refusal to complete the questionnaires will in no way affect the quality of the treatment that you receive at the clinic.

The informed consent will be kept separately from the package of questionnaires that you will receive. There will be no personally identifying marks that will go on the questionnaire package and only the research team will have access to these questionnaires.

Again, the goal of this study is to improve upon an already successful program here at the Pain Management Unit of the Ottawa General Hospital. The information that you provide will help in the development of new assessment tools that will enable the clinic and its staff to match their skills more effectively with the needs of the future patients. If you request, an interim report of the findings can be mailed to you at the end of the summer.

For any questions you may have please contact: Dr. Rob Nolan, supervisor (737-8628) or Victor Gallant, research assistant (737-8927). For any questions regarding the ethical nature of this study please call Dr. Bill Jones, Chairperson of the Carleton University Ethics Committee at 788-2600 ext. 2648, or Lise Paquet, Carleton University, 788-2600 ext. 2692.

Thank you for your time and participation.

Victor Gallant, (MA in progress)

Research Assistant

Department of Psychology

Dr. Rob Nolan, (Psychologist)

Co-ordinator, Health Psychology

Department of Psychology

Appendix I

Information Sheet (French Version)

Adaptation psychologique à la douleur chronique

Feuillet d'information

Le Département de Psychologie en collaboration avec la Clinique Anti-douleur de l'Hôpital Générale d'Ottawa est actuellement intéressé à déterminer l'adaptation à la douleur qu'ont les gens comme vous-mêmes. Un des problèmes majeurs des patients ayant une douleur chronique est de trouver un programme de traitement qui correspond exactement au besoin. Le but de notre étude est d'améliorer un programme, qui se voit déjà adéquat, pour augmenter son efficacité à mieux répondre aux besoins des futurs patients.

Si vous choisissez à participer à cette étude, vous serez demandé à remplir un formulaire de consentement indiquant que vous connaissez le but de l'étude. Par après, vous serez demandé de compléter une série de questionnaires et cela prendra environ 60 minutes. Vous serez toujours sans obligation et vous pouvez vous retirer de cette étude en tout temps. Vous serez demandé à remplir ces questionnaires avant de partir de la clinique aujourd'hui. Votre refus de compléter ces questionnaires n'affectera aucunement le traitement que vous recevez déjà à la clinique.

Le formulaire de consentement sera séparé du lot de questionnaires que vous complétez.
Le lot de questionnaires n'aura aucun renseignement personnel à votre sujet et seulement les chercheurs auront accès à vos questionnaires.

Le but, encore, de cette étude est d'améliorer le programme déjà adéquat qui est en place à la Clinique Anti-douleur de l'Hôpital Générale d'Ottawa. L'information que vous divulgerez aidera au développement de nouveaux outils d'évaluation qui seront utilisés par les employés de la clinique pour répondre avec plus d'efficacité aux besoins de futurs patients.

Ce protocole a été approuvé par le Conseil d'éthique en recherches de l'Hôpital général d'Ottawa, dont le mandat est d'examiner tous les aspects éthiques de tous les projets de recherches sur les humains. Si vous le désirez, vous pouvez communiquer avec le président du conseil - le docteur G.D. Goss au 737-6792.

Pour plus ample renseignement, veuillez diriger vos questions à Victor Gallant, assistant-chercheur au 613 737 8927, ou au Dr. Rob Nolan, conseiller, au 613 737 8628.

Merci de votre temps et de votre participation.

Victor Gallant

Dr. Rob Nolan, psychologue

Appendix J
Consent Form

Psychological Adjustment to Chronic Pain
and Readiness For Change

Investigators: Dr. R. P. Nolan, V. Gallant,

I agree to participate in this study with the understanding that information will be collected and used for research purposes only and will be treated as confidential. I have been informed about the purpose of this study and realise that I am under no obligation to participate and may withdraw at any time. Refusal to participate or withdrawing from the study will in no way affect my present and/or future treatment.

Signature _____

Date _____

Appendix K

Debriefing Sheet

HÔPITAL GÉNÉRAL D'OTTAWA OTTAWA GENERAL HOSPITAL

INFORMATION SHEET

Thank you for completing this questionnaire package. The purpose of this assessment has been to look at lifestyle changes that often help patients to adjust to chronic pain, and how ready people feel they are in being able to make these changes.

Here is some information from the International Pain Foundation that we believe will help you as you look for ways to manage your chronic pain. Should you have any questions about this project, or the ethical nature of this questionnaire package, please do not hesitate to call Dr. Rob Nolan, Department of Psychology OGH, at 737-8628, or Victor Gallant, Psychology Research Assistant, at 737-8927. If you wish, you may also talk to the Chairperson of the Research Ethics Board for the Ottawa General Hospital, at 737-6792, or Dr. Bill Jones, Chairperson of the Carleton University Ethics Committee, at 782-2600 ext. 2648.

SOME WAYS TO BETTER
LIVE WITH YOUR PAIN

ACCEPT YOUR PAIN

Accepting how you feel — not denying it or overreacting to it — is the first step in living with your pain.

ADJUST YOUR GOALS

Be honest about your current abilities. Focus on the present — not on what you "used to do." Set goals that are challenging but possible to achieve.

LEARN THE DIFFERENCE BETWEEN "MAYBE" AND "MUST"

An action that causes you some pain (think, drink, exercise) should be done only if it is necessary. Consider the pain you may feel when you do it. But don't let it stop you from doing it if it is necessary.

KEEP A JOURNAL

A journal record can help you see patterns in how you feel. It can help you see when you are doing well and when you are not. It can help you see when you are doing better than you thought you were.

DON'T "HANG ON" TO YOUR PAIN OR THE ATTENTION IT BRINGS

Don't let your pain be an excuse for not trying new activities or experiences. Success is not more pain, but more pleasure in what you do.

Examine your attitudes and actions — they can make a big difference in how you feel and what you're able to do.

REDUCE YOUR STRESS

Plan ahead, spend less time on things that stress you out. Take time to relax, too.

LEARN AND USE A RELAXATION TECHNIQUE

Stress makes it harder to deal with pain. Relaxing can help you deal with it better.

There are many different techniques. Some are:

- guided imagery
- progressive relaxation
- meditation
- rhythmic breathing

Consult your doctor or a physiotherapist for more information.

TALK WITH PEOPLE

Having someone to talk to can help you deal with your pain.

Join a support group or share your feelings with friends. Let your doctor know about your pain.

Symptoms — like stress — can be managed by learning to relax and taking time to rest.

CUT DOWN ON STIMULANTS

Stimulants may make your pain worse. Limit your intake of caffeine, alcohol, and nicotine.

Discuss your pain with your doctor. They can help you manage your pain.

MORE TIPS FOR MANAGING YOUR PAIN

STAY HEALTHY

Do everything you can to build and maintain a healthy body -- you'll feel better because of it. For example:

EAT AND SLEEP ON A REGULAR SCHEDULE

Be as regular as possible with meals and rest. You'll feel better, and it will be easier to stay involved with other people, jobs, activities, etc.

GET PLENTY OF APPROPRIATE EXERCISE

You'll have more energy and stop feeling physically drained. Your physical health can show you ways to stay fit -- and fight chronic pain.

EAT A BALANCED DIET

Eat a variety of foods that provide lots of vitamins and minerals. Eat whole grain products, fruits, vegetables, lean meats, low-fat dairy products, etc.

STOP SMOKING AND LIMIT DRINKING

Smoking is extremely hazardous to your health. Drink alcoholic beverages moderately if you choose to drink at all.

STAY ACTIVE

Positive actions can do a lot to combat chronic pain. For example:

MOVE FROM PASSIVE TO ACTIVE

Concentrate on things you can do, rather than things you can't. It's your life -- make the most of the chances you have.

CHOOSE ACTIVITIES AND HOBBIES THAT INTEREST YOU

Try new activities you think you'll like. Give yourself a chance to enjoy them, even if they're hard at first!

VOLUNTEER TO HELP OTHERS

Give your time through community, religious, or other organizations. It's a way to share your talents, meet others -- and to feel good about yourself.

FOCUS ON OTHERS, NOT ON YOUR PAIN

Turning your attention to other people often means less attention to your own pain. Reaching out is a way to find help and support from others, too.

LEARN TO PACE YOURSELF

Don't do too much at once. Take breaks and stop before your pain increases.

Appendix L

Confirmation of Cluster Structure

The clusters resulting from average linkage method resembled those of the Ward's minimum variance. Comparing the results give in Table 25 with those obtained from Ward's method, presented in Table 8, and comparing Figure 1 with Figure 2, the cluster structure obtained with Ward's method seems to have been captured using a second clustering procedure. This was done as a partial validation for the cluster solution obtained for use in the following analysis. It appears that patients with chronic pain did respond differently to the algorithms.

Table 25

Confirmation of Cluster Structure Using Average Linkage Within Method Across
Readiness Variables.

Dependent	R-CH Cluster 1		R-CH Cluster 2		R-CH Cluster 3		Sample	
Measures	(N = 20)		(N = 19)		(N = 58)		(N = 97)	
	M	SD	M	SD	M	SD	M	SD
READY-PHY	5.00	.79	2.58	.90	5.19	1.32	4.64	1.54
READY-PSY	4.10	1.07	2.68	1.00	5.14	1.12	4.44	1.44
READY-								
SOCIAL	2.70	.98	2.68	1.34	5.38	.72	4.30	1.61

Figure 2. Means for clusters across readiness variables using average linkage within groups clustering method.

Table 26 shows the subjects for whom there were disagreements between the two clustering techniques. For example, subject number 2, in the first row, was placed into cluster 1 using the Ward's method, and into cluster 2 using the average linkage within group method. The table only list those subjects for whom there were disagreements. There were 19 disagreements in total suggesting that a portion of the population was not easily classified

Table 26

Subjects for Whom Clustering Techniques Resulted in Different Cluster Placement

Cluster 1		Cluster 2		Cluster 3	
*WAV	WARD	WAV	WARD	WAV	WARD
	**2	2			
			13	13	
	27			27	
29					29
38					38
41					41
	45			45	
	46			46	
	52	52			
53					53
54			54		
			58	58	
	62			62	
			77	77	
	80			80	
			81	81	
87			87		
	90			90	
			92	92	

Note: *Clustering technique: WAV = WAVERAGE Average linkage within groups;

**Entries into the table represent subject ID number.

Appendix M

Scores for Sample on Psychometric MeasuresBackground Characteristics of the Participants

Table 27 provides a breakdown of the scores on the measures used in the present study.

Table 27

Scores on the Psychometric Measures For The Entire Sample

<u>Measure</u>	<u>Mean</u>	<u>St. Dev.</u>
BDI TOTAL SCORE	18.99	10.49
CBDI	9.94	7.19
SBDI	9.05	4.12
MSIS	132.67	26.31

Beck Depression Inventory. The mean on the Beck Depression Index mean score with all participants pooled together was 18.99 ($SD = 10.49$). The scores ranged from a low of 3.00 to a high of 53.00. In comparison with other investigations of pain patients which also used the BDI as an index, the present results were comparable. In a sample of 315 patients, the mean and the standard deviation for the BDI was 15.74 (8.28) (Mikail, DuBreuil, & D'Eon, 1993). With a second sample of 306 chronic pain patients, 55% reporting low back pain, 16% reporting head, face, or mouth and 7% reporting cervical pain the mean score on the BDI was 19.38 with a standard deviation of 10.24 (De Gagne, Mikail, & D'Eon, 1995). Finally, in a report using a heterogeneous sample of two

hundred and seven chronic pain sufferers the mean BDI score was 18.1 ($SD=8.89$) with a range of 0 to 47. This falls in the mild depression range with 71.7% of patients scoring at or above the threshold (William, & Richardson, 1993).

Miller Social Intimacy Scale. Score on the Miller Social Intimacy Scale (MSIS) for the group as a whole was 132.64 ($SD = 26.41$), with a minimum score of 35.0 and a maximum of 170. This represents two standard deviations below the scores obtained for a married sample, and about a third of a standard deviation below that found for an unmarried student population. In comparison, a sample of married distressed couples who completed the MSIS prior to treatment, had a mean score of 126.3 ($SD = 22.3$). From this, the participants in this sample appeared to be doing better than distressed married couples, but worse than a sample of healthy married couples. Their responses were most similar to a group of unmarried individuals, who rated a relationship they had with a close friend.

The majority of our sample was married. In the present sample the mean score for married men was 135.09 ($SD = 18.92$) and for married females the mean score was 138.87 ($SD = 27.23$). There was no difference between the married men and the married women. In comparison, the reliability and validity study (Miller & Lefcourt, 1982) the mean for married males was 152.5 ($SD = 10.9$) and for married females it was 156.2 ($SD = 7.3$). As measured by the MSIS, pain patients appear to experience a decreased level of intimacy with their partners.

The sample means for just the married individuals in the present sample were comparable with the means for a sample of married couples who were seeking counsel

for marital problems (Miller & Lefcourt, 1982). As would be expected, chronic pain does have an influence on the degree of closeness experienced not only in marital dyads but also with close friends, as the scores for individuals who are not in a close relationship are lower than their counterparts who are. In comparing the MSIS scores between individuals who were married from those who were single, there was a significant difference with married individuals showing a higher level of satisfaction with their relationship ($t(96) = 8.533, p < .01$).

Table 28 presents the mean and standard deviation across gender for the MSIS. Scores are broken down across relationship status for the chronic pain population in this study. They were compared with a healthy sample of married and unmarried male and female individuals.

Table 28

MSIS Scores Across Gender and Relationship Status

	<u>MSIS</u> (Present Sample) Mean (St.Dev)	<u>MSIS</u> (Miller's Sample) Mean (St.Dev)
Male	132.59	
Single	126 (23.32) n = 8	134.9 (21.9) n = 86
Married	135.09 (18.92) n = 21	152.5 (10.9) n = 17
Female	132.66 (28.78)	
Single	119.68 (28.17) n = 13	139.3 (16.8) n = 130
Married	138.87 (27.23) n = 42	156.2 (7.3) n = 17

Multidimensional Pain Inventory. For the group as a whole, raw scores with the standard deviations are presented in Table 29 for the five subscales of the MPI used in the analyses. Along with these numbers, are the norms as obtained from a heterogeneous sample of 300 pain patients. As can be seen, the present sample compared with the normative sample.

Table 29

Sub-Scale Scores on MPI Comparing The Present Sample With A Normative Sample

	<u>Present Sample</u>	<u>Normative Sample</u>
<u>Sub-Scale</u>	<u>(n = 97)</u>	<u>(n = 300)</u>
	<u>Mean (St.Dev)</u>	<u>Mean (St. Dev)</u>
Severity	4.77 (0.98)	4.51 (1.04)
Interference	4.56 (1.15)	4.61 (1.16)
Life Control	2.78 (1.28)	3.19 (1.62)
Distress	3.89 (1.10)	3.78 (1.28)
General Activity	2.19 (0.95)	2.05 (0.99)