EVALUATION OF BACK EDUCATION PROGRAMME AT THE MEDICAL REHABILITATION UNIT, PALMERSTON NORTH HOSPITAL

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ABSTRACT

Chronic low back pain is a significant health care problem and is frequently one of the most difficult conditions to treat. For the individual, chronic low back pain evolves into a constellation of problems involving psychological and behavioural symptoms as a result of the recurrent pain. Numerous pain clinics have been established providing a multidisciplinary approach to the treatment of chronic pain. A considerable amount of evidence has attested to the efficacy of a comprehensive treatment approach for the management of chronic pain. Despite the support for pain clinics, many outcome studies have been plagued by methodological difficulties. The present study was designed to improve on previous methodological shortcomings and evaluate the efficacy of a multidisciplinary treatment for chronic back pain. The programme, carried out over four mornings per week for three weeks, was conducted in an outpatient clinic of a public hospital. Twenty-four patients consecutively referred to the pain clinic were randomly assigned to treatment and waitlist control conditions. The treatment group was assessed four times and the waitlist control group assessed six times throughout the study. The two groups were compared for differences on a variety of outcome measures on three separate occasions; at pretreatment, immediately after treatment and at follow-up. Outcome measures included self-reported pain intensity, mood, coping skills and physical disability; and objective measures of physical impairments. Multivariate analyses of variance (MANOVA) for outcome measures were carried out. Results suggested significant improvements were achieved after treatment in depression levels and muscle strength. No significant gains were reported in physical functioning such as everyday activities, flexibility, spinal functioning, or pain intensity. When assessed at follow-up six months later, the original gains in mood were maintained but a significant decline in muscle strength was reported. The goals of the programme to improve physical functioning and return to work were not achieved, thus predictions for the efficacy of the chronic back pain programme were not supported. Implications of these findings are discussed together with recommendations for improving outcomes, especially the importance of physical reactivation.

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I wish to dedicate this thesis to Aimee and Adam.

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CHAPTER 1
INTRODUCTION

Pain hurts. It is an almost universal human experience. The normal response to this noxious perception is to seek relief from the pain. Pain, as a physiological mechanism, alerts the body of potential harm thus ensuring the individual does not endure greater tissue damage than necessary.

One of the most frequently reported pain problems is low back pain. Four out of five people suffer from low back pain some time during their lives. It is one of the major health problems for society and leads an individual to seek medical care (Keefe, Gil & Rose, 1986). There is evidence that 80-95% of low back pain sufferers will achieve amelioration of pain and return to normal functioning within days or even weeks (Fordyce, 1988; Hazard et al., 1989). Full recovery, with little or no deleterious effect, is often realised.

For about one percent of low-back pain sufferers this optimistic prognosis does not eventuate (Mayer et al., 1987). Despite the repeated attempts at conservative management and/or surgical procedures, attenuation of pain is not achieved. Nonetheless, in many cases, no discernable cause for the pain can be located. As each successive 'treatment' fails to provide relief from the pain, frustration is apparent and the individual's despair deepens. The treatment of chronic low back pain is one of the most difficult problems for physicians to manage (Deardorff, Rubin & Scott, 1991).

For these individuals, pain evolves from being simply a physiological event to become a multifaceted problem. Long-term chronic benign pain can have a profound impact on the individual's overall functioning; their affect, behaviour and social environment. Experiences of depression, difficulty coping with everyday activities, avoidance of interpersonal relationships with family members, withdrawal from socialising with friends, and often attendant loss of employment due to pain-related disabilities reduce the pain sufferer to dependency and inactivity. Compounding this sense of suffering is the inability of others to comprehend why the patient is not getting better. Derogatory labels such as "whinger", "malingerer", or "bludger", are applied to the pain sufferer,

with the implication that the pain is not 'real'. For some, in desperation, the reason to continue living may be questioned.

Melzack and Wall's (1965) "gate control" model was significant in acknowledging that perception of pain was a multifaceted phenomena, and this was instrumental in inspiring a renewed impetus to the study and development of an effective 'treatment' for this most intractable of problems.

The burgeoning literature on the treatment of chronic benign pain provides empirical evidence of the efficacy of a multidimensional approach to the treatment of chronic non-malignant pain (for example Deardorff et al., 1991; Guck, Skultety, Meilman & Dowd, 1985; Peters, Large & Elkind, 1992). The conclusions from these studies acknowledge that a multifaceted approach, reflecting the complexity of chronic pain problems, is intrinsic to treatment.

This brief overview provides a context for this present study. Conceptual issues concerned with defining pain are discussed in Chapter 2. The historical perspective and the more contemporary views of pain are presented in this chapter. Chapter 3 examines the various psychological theories proposed for the transition of pain from an acute condition to a chronic state. Whilst the literature on multidisciplinary treatment for chronic non-malignant pain is relatively recent, the application of psychological interventions as part of the treatment package has been of increasing interest. The discussion of various treatments for pain is contained in Chapter 4. Chapter 5 reviews the literature of outcome studies on multidisciplinary pain clinics. Although they are the treatment of choice for intractable pain problems, the methodological shortcomings of these studies are discussed and the attempts to surmount these difficulties are presented. Chapter 6, introduces the scope and the research hypotheses of this study, and completes the introduction section.

The methodology adopted in the present study is discussed in Chapter 7, followed by a presentation of the results in Chapter 8. Chapter 9 discusses the results, together with the methodological shortcomings of the study and suggestions for future research. The final chapter, Chapter 10, presents the conclusion to the discussion, with recommendations for the pain programme evaluated for this research.

CHAPTER 2
CONCEPTUAL ISSUES

BODY-MIND DILEMMA

What is pain? The definition of pain is usually dependent on the circumstances and perspective of the observer (Fordyce, 1976; Miller & Kraus, 1990). For the neurophysiologist it is understanding the specific pathways within the nervous system that respond to noxious stimuli. For the experimental psychologist, pain is the measurement of behavioural response to sensory stimulus, whereas the clinical psychologist may be concerned with whether or not a physiologic cause was identified. The physician and dentist are faced with treating patients suffering disagreeable somatic sensation, that can potentially disrupt their way of life and may be life threatening. For the patient, pain is an unpleasant sensation from which relief is sought. The conceptualisation of pain is as diverse as the disciplines working in the area of pain.

Historically, speculation on the nature and etiology of pain focused on the body-mind dilemma. Aristotle viewed pain as an emotional and affective phenomena (Miller & Kraus, 1990; Price, 1988) whilst Stoic philosophers believed pain could be overcome by reasoning and logic (Turk & Rudy, 1986). In contrast, Descartes' dualist philosophy conceptualised the phenomena of pain from a mechanistic approach. The affective-motivational element of pain was largely dismissed and pain was attributed to a physical stimulus impinging on the body.

The mechanistic approach to understanding pain gained dominance during the late 1800s and held sway until recently. Investigations into the anatomy and physiology of the human body lent support for the view of pain as the activity of the sensory system (Tursky, Jamner & Friedman, 1982). Strong advocates for the sensory modality of pain came from influential scientists, such as Darwin, who theorised pain as the intensified stage of any sensation, and Muller (1842, cited Price, 1988) who believed pain was the result of peripheral activity leading to the brain. By the late 1800s, the first systematic studies of pain recognised pain not as an intensification of other senses but as a discrete sensation.

Two major theories of pain transmission and perception within the framework of sensory systems were dominant during this period; the specificity theory of von Frey (1894, cited Melzack & Wall, 1965) and Goldschneider's (1894, cited Melzack and Wall, 1965) pattern theory. Intense controversy existed between these two theories as they were regarded as conflicting and mutually exclusive (Fordyce, 1976; Melzack & Wall, 1965).

Of the two, specificity theory was the most orthodox view. The specificity model hypothesized areas of the skin surface had specific pain receptors which when stimulated resulted in electrical activity. The electrical impulse was transmitted along direct pathways of nerve fibres and tracts leading to specific pain centres in the brain. Pain sensation to the affected part would consequently effect response to the pain. Thus it was widely accepted that pain was a purely sensory event and its intensity was proportional to the severity of the peripheral damage (Turk & Flor, 1984). The underlying assumption of this model was a one-to-one direct communication system with resultant fixed stimulus-response relationship (Sternbach, 1968).

Dissatisfaction with the specificity theory resulted in the development of a new theory; Goldschneider's (1894, cited Melzack & Wall, 1965) "pattern theory". Pattern theory suggests that rather than specific, discrete receptors and transmission for pain, all fibres are similar. Pain is produced by coded spatiotemporal pattern of intense stimulation of these non-specific receptors at the periphery.

Despite the importance of the neurophysiological framework for the investigation of pain in understanding the neural transmission and perception of acute pain, it was not sufficient to account for the clinical phenomena of pain (Fordyce, 1976). Numerous observations of behaviour exhibited by pain patients were not adequately explained by the prevailing theories.

Firstly, many instances of pain reports were accompanied by little or no discernible nociception. Livingston (1943) presented evidence that excruciating pain could be triggered by non-noxious stimuli or could occur spontaneously without any apparent stimulus. Furthermore, other inconsistent manifestations of pain were demonstrated, such as when pain remained long after the removal of the pain stimulus or, in some

instances, zones of increased pain sensitivity spread to unrelated parts of the body where no pathology existed.

Secondly, the amount of distress expressed can differ between individuals. The renowned study by Beecher (1959) highlighted that psychological influences have a profound effect on the perception of and response to pain regardless of the actual tissue damage. In his study, soldiers suffering tissue destruction from combat wounds, during World War II, frequently denied or reported little pain despite their obviously severe injuries. Furthermore, of 215 men admitted to the hospital at Anzio only a third requested pharmacological pain relief. In a comparative study of civilian patients undergoing major surgery and suffering much less trauma, Beecher found 83% of patients sought narcotics for the relief of their pain. In his explanations for the differences in behaviour, Beecher postulated that though the wounds were severe, the combatant soldiers perceived the injuries as an opportunity to escape the life-threatening circumstances of battle. This appeared to indicate situational and motivational factors mediated pain stimulus and pain response.

Thirdly, despite advances in the understanding of the nervous system and the development of numerous drugs, surgical and somatic interventions to alleviate pain and suffering, amelioration of pain is often not achieved (Turk & Rudy, 1986). Implicit to both the pattern and specificity theories is the expectation that interruption of the pain pathways will alleviate the pain, but for patients with chronic pain this frequently does not occur despite the best intentions of the medical profession. A series of everchanging physicians, growing medical records, disability, depression and over-utilisation of the health care system are common experiences for patients suffering intractable pain.

The inconsistencies between pain reporting and pain behaviour underscored the inadequacy of the stimulus-response model, and this paradigm was insufficient for professionals working with chronic pain patients.

RECENT DEVELOPMENTS IN THE STUDY AND TREATMENT OF PAIN

Two significant developments in the 1960s inspired a renewed interest in the mechanism of pain and led to a resurgence in scientific endeavour to the understanding and treatment of pain, especially chronic pain.

The first development was Melzack and Wall's (1965) alternative to the traditional specificity theory of pain. Their "gate control" model which contains elements of both the specificity and pattern theories, was a new approach to the mechanism of pain transmission. It conceptualised a neurophysiological basis for the role of psychological factors in pain. Melzack and Wall (1965) proposed that impulses from the peripheral pain fibres can be increased or decreased by neural mechanisms in the dorsal horns of the spinal chord that project to the brain. These neuromechanisms in the substantia gelantinosa act like a gate within the dorsal horn, mediating sensory impulses to the spinal chord by balancing the activity of small diameter (A delta + C fibres) and large diameter (A-beta) fibres. The large fibre inputs tend to close the gate and prevent synaptic transmission to centrally projecting T (transmission) cells, whereas the small fibre inputs generally open the gate and facilitate T-cell activity once a critical level is exceeded. Small fibre activity is believed to be responsible for prolonging pain experience and causing its spread to other parts of the body. The gate control mechanism is also strongly influenced by descending central control mechanisms from the brain.

More than any other models of pain, the gate-control system emphasises the complex phenomena of pain perception and pain responses; of the interrelationship between sensory-discriminative, motivational-affective and cognitive-evaluative elements. Thus, whilst the somatic input is similar to other sensory processes, pain perception and pain responses are heavily influenced by cognitive, affective and behavioural components. The central control mechanism may be the route through which psychological factors can alter the perception and response to pain (Turk, Meichenbaum & Genest, 1983).

The second development was the increasing recognition of behavioural, emotional and cognitive influences on the course of an illness. This recognition led to the convergence of medical and psychological models and its evolution into new disciplines of health psychology and behavioural medicine (Turk & Flor, 1984). The etiology and course of a disease was no longer considered simply a function of external pathogenic agents and the body, but the complementary interaction between the individual, cognitive and affective factors, and the environment. The integration of medicine and psychology had important implications for the treatment of organic illness.

The "gate-control" model and cooperation of specialists from various disciplines resulted not only in new directions in the control and treatment of pain but in a multidimensional conception of pain. This is reflected in the contemporary definition of pain as:

> "*...an unpleasant sensory and emotional experience associated with actual or potential tissue damage.*" (International Association for the Study of Pain (ISAP), 1979, p. S217).

Thus, it is acknowledged pain is a subjective experience which might occur in the absence of tissue damage. The totality of the pain experience, involving nociception and pain response, interacting within a context of previous experience, prior learning, and emotional and cognitive processes, is incorporated into this definition (Feuerstein, Papciak & Hoon, 1987).

BIOLOGICAL FUNCTION OF PAIN

It is alleged pain has two biological functions. Firstly, pain serves as a warning device (Price, 1988) and secondly, it assists the recovery process by motivating the individual to rest after injury (Price, 1988; Wall, 1979).

Pain as a warning device

Experimental studies using heat-induced injury and heat-induced pain provided strong evidence for the function of pain as a warning of potential injury (Price, 1988). Temperatures sufficient to produce pain threshold and reflexive withdrawal from the nociceptor stimulus were maintained for an extended period (typically 5-6 hours). These studies demonstrated pain expression and nociceptive responses occurred long before tissue damage took place. Furthermore, everyday experience lends support to the view of pain as a warning device. The immediate response to intense heat is to withdraw the affected part of the body rapidly and sharp pain is reported. Hence, pain alerts the individual to withdraw or escape from the noxious stimuli prior to the level where significant tissue damage will occur, preventing serious injury (Price, 1988).

Pain as a motivational state

Wall (1979), on the other hand, argued that the relationship between pain sensations and the evoking stimuli is rather weak. He proposed that in some instances pain perception occurred far too late to prevent harm, such as in sudden injury or where damage was very slow. Instead, Wall suggested pain acts as a motivational state, similar to thirst and hunger, which alerts the individual to the existence of the bodily state and to initiate necessary action for recovery and recuperation. The expression of anxiety and distress from pain served to elicit help from others, obtain quiet relief, and other optimal conditions fundamental for recovery.

CLASSIFICATION OF PAIN

Classification of pain is along arbitrary dimensions of time and course of the pain. Broad categories are 'acute' or 'chronic' pain.

Acute pain

Acute pain is of recent onset, has significant intensity with some underlying pathological process, and is of short duration. It is a sensory phenomena directly linked to the extent of tissue damage or organ pathology (Turk & Rudy, 1987). It is the area most studied by neurophysiologists and consequently our understanding of the physiology of pain typically refers to acute pain.

Chronic pain

On the other hand, pain that does not diminish over time after an expected course of recovery is referred to as chronic pain. Chronic pain is present most of the time with varying intensity and commonly requires long-term treatment. Chronic pain is classified as either chronic malignant pain or chronic benign pain.

Chronic malignant pain

Patients with chronic malignant pain have underlying peripheral malignancies (such as cancer or arthritis), and a source of continued nociceptive input which is amenable to pharmacological treatment (Crue, 1988). These patients are not typically considered chronic pain patients as their pain is associated with a life-threatening disease (Sternbach, 1974).

Chronic benign pain

Chronic benign or non-malignant pain, however, is not life-threatening, has become centralised, and is disruptive to the individual's entire functioning. The symptoms associated with chronic benign pain have been described as:

(a) Pain that has been present for at least six months, usually for several years. Pain reports are persistent and continue long after nociception would be expected to have ceased.

(b) The underlying cause has been identified or treated and disability appears excessive given the physical findings.

(c) Narcotics, medical intervention, and surgical procedures have not been able to relieve the source of pain.

(d) Pain itself has become the disease.

COURSE OF CHRONICITY

Sternbach (1974) first described the changes in the psychological and behavioural functioning of the individual experiencing chronic pain. A sequence of events frequently evolve for the patient as the pain progress from an acute to chronic phase and the debilitating experience of chronic pain continues. Hendler (1982) believes the responses and behavioural adjustments to chronicity are normal responses to intractable pain. He describes the typical four stages of response to pain:

At the first stage, premorbid assessment would indicate the patient as well-adjusted in all spheres of his/her life. No dysfunction is apparent either in the social, psychological, sexual, or financial dimensions prior to injury.

In the second stage when acute pain occurs through injury or illness, medical care for the injury may be sought. Conservative treatment, such as analgesics, may be administered. There is a realistic expectation of recovery after a short period of convalescence and no psychological disturbance is observed.

However, in the third stage, after 2-6 months have elapsed since the injury, psychological distress becomes evident. Greater anxiety and fear about the severity of the pain and denial of the prospect of chronicity are expressed, together with the retention of hope that relief from pain is possible. Concomitant behavioural changes, such as increased irritability, insomnia, social withdrawal, and increased use of analgesics and sedatives can be observed.

In the fourth and final stage, pain is arbitrarily defined as chronic, after it has been experienced continually for 6 months. The previously well-adjusted individual begins to suffer from depression alternating with feelings of anger, and urgent attempts to find pain relief are observed. Multiple visits to various physicians and clinics are common. Each new treatment brings a resurgence of hope, followed by disappointments and increasing resentment and bitterness towards the treating physician. Overuse of medication is frequent, with resultant addiction to narcotics. A strong belief that the pain can be removed and normal living can be resumed remains unabated.

Depression is commonly associated with chronic pain (Fordyce, 1976; Sternbach, 1974). Turk et al. (1983) found depressive symptoms in the chronic pain population ranged from 30%-100%. The occurrence of depression is higher than that found in the general and psychiatric populations (Romano & Turner, 1985). The reasons for the coexistence of chronic pain and depression are not clear. Various etiological processes may be implicated, such as endogenous depression where pain serves to mask clinical depressive symptoms (Sternbach, 1974) or depression may be associated with reaction to the stress of chronic illness and pain.

In addition to the depressive state, feelings of loss of self-esteem and reports of hopelessness and helplessness are frequently reported. Pain becomes the central focus that dominates the individual's life. Marital strife is commonly experienced accompanied by reduction in sexual activity. There is an increased loss of interest in customary social and family activities as a result of the pain. Vocational activity is reduced or ceases due to frequent absences from work for pain-related problems, further increasing isolation and withdrawal. Very often chronic pain patients become reliant and dependent on family members. Their anger at this dependency may be expressed by overt hostility. Thus, chronic pain affects others beyond the patient,

placing strains on family members and supportive social systems (Fordyce, 1976; Miller & Kraus, 1990).

It is apparent that the effects of prolonged disability associated with chronic pain are psychological, social, economic and familial. The cost of this condition is incalculable to the individual in terms of social and emotional impairment and, to society, in terms of multiple medical interventions and lost productivity in the home and the workplace.

These chronic pain sufferers make up the vast pool of patients with chronic benign pain. The majority of patients seen in pain management clinics have chronic non-malignant pain and, it is the existence of these patients that led to the development of multidisciplinary pain clinics. Chronic benign pain, especially chronic low back pain (CLBP), is emphasised in this present study because, not only is it the most numerous and costly pain problem for the individual and society, it is also the most recurrent problem treated in pain clinics. Over 75% of patients presenting at pain clinics have CLBP problems (Aronoff, Crue & Seres, 1988; Fordyce, 1988).

PATHOPHYSIOLOGY OF CHRONIC LOW BACK PAIN

Chronic low back pain (CLBP) develops from a number of organic etiologies. The underlying pathogenesis of low back problems is often degeneration of, inflammation in, traumatic injury of, or muscular problems in the vertebral and muscular regions of the lower back (Feuerstein et al., 1987; Flor & Turk, 1984).

Despite the multiple sources of organic impairment, they are not considered sufficient explanation for many cases of chronic back pain (Flor & Turk, 1984). The diagnosis of back pain from the medical perspective alone is difficult and of uncertain accuracy (Feuerstein et al., 1987). Complicating factors for diagnosis include the relative inaccessibility of the spine for examination and the low correlation of pathological changes in the spine with symptoms of low back pain. Nachemson (1983) estimated only 20%-30% of patients with low back pain have "objective" signs of disease, and that for the majority of his patients, the true cause of low back pain is unknown.

In New Zealand, eighty percent of the general population will suffer lower back pain at some point in their lives (Accident Compensation Corporation [ACC], 1991a; James, Large, Bushnell & Wells, 1991). This figure is comparable with overseas trends for

CLBP (Flor & Turk, 1984). Most sufferers will experience more than one occurrence of pain that disrupts their lives (James et al., 1991). Lifting is the most frequent cause for back problems, with accidents occurring mainly in the home and industrial workplace (ACC, 1991b). Back pain significantly impairs functioning for at least 1-2 days each year for the majority of sufferers, but fewer than 20% will seek professional help for their problem (Fordyce, 1988).

In 1991, in New Zealand, the Accident Compensation Corporation (ACC) paid out a total amount of $240 million for all back injuries, with the number of back claims having increased at a rate of 5% per annum for the past five years (ACC, 1991b). The age group most likely to suffer back injuries is between 20 and 40 years, thus debilitation occurs during the most productive period of an individual's life. Besides the direct cost of medical treatment for the back injuries, the socioeconomic cost from loss of work time and lost productivity is incalculable. In the United States absence from work as a result of CLBP cost an estimated $11 billion in lost wages per year (Frymoyer et al., 1983, cited Feuerstein et al., 1987).

Acute pain is much more prevalent than chronic pain and the majority of pain sufferers will recover. However, 3.9% will be permanently disabled by CLBP (Flor & Turk, 1984). The consequences of chronicity impact not only on the physical functioning, but also the entire life of the pain sufferer. Despite the magnitude of the problem and the abundance of literature written about CLBP, little is known about the causes and, hence, effective treatment for the problem (Turk & Flor, 1984).

CHAPTER 3
PSYCHOLOGICAL THEORIES FOR CHRONIC PAIN

Psychological explanations for chronic pain have tended to reflect the dominant psychological doctrine of their time. During the early 1950s and 1960s psychological theories were based on a typically psychodynamic formulation. Trait theories were prominent in the 1970s in their endeavour to define the personality characteristics of 'psychogenic' pain patients. The importance of behavioural theories during the 1970s was associated with the rise of behaviourism and the more recent outgrowth of behaviourism, cognitive-behaviourism, is reflected in the prevailing eclectic conception of chronic pain.

PSYCHODYNAMIC THEORY

The classical psychodynamic orientation dates back to the Freudian view of pain as a conversion neurosis (Merskey & Spear, 1967; Turk & Flor, 1984). Chronic pain was considered the result of unresolved intrapsychic conflicts (Violon, 1982). According to the Freudian perspective guilt, conflict and resentment were often present where pain was a prominent symptom. Consequently chronic pain was regarded as an hysterical conversion of an unpleasant affect. The various psychological profiles contributed to the different characteristics of chronic pain (Violon, 1982).

Engel (1959) suggested the importance of childhood experiences in the development of chronic pain and labelled them 'pain-prone' patients. 'Pain-prone' individuals were characterised by physical and emotional abuse in their formative years. Furthermore, Engel suggested these individuals suffered from excessive guilt, with a history of defeat and intolerance of success, unfulfilled aggressive drive, and a need to suffer. Pain became a way of feeling and behaving early in life. Consequently 'pain-prone' individuals were predisposed to the development of chronic pain in adulthood. They demonstrated self-punitive behaviours, including unnecessary surgery. Some studies have supported Engel's theory of the importance of early childhood experiences in the development of chronic pain (Mendelson, 1990; Violon, 1982).

The psychodynamic models, however, have been criticised for their introspective approach and inability to explain why particular psychological features are expressed in pain and not some other psychological or physical disorders (Turk & Flor, 1984). Chronic pain is relatively rare whilst guilt, conflict, hostility, anxiety and depression are not specific to pain but are present in many individuals without pain. In addition, these explanations are based on case studies with little empirical support.

TRAIT THEORY

A variety of trait attributes were considered to be associated with the development of chronic pain symptoms (Feuerstein et al., 1987; Weisenberg, 1977). Trait theorists believe personality constructs are underlying characteristics that are fairly consistent. Not only are traits manifested as intrapersonal dispositions but are determinants of behaviour (Allport, 1966), and can be measured using psychometric instruments.

The basis for trait studies in chronic pain patients was, either to describe the premorbid personality of chronic pain patients or, to compare the trait dimensions of those patients who have and those who did not have an identifiable organic pathology (Tapp, 1989). The underlying assumption was that patients with no demonstrable nociception possessed personality and emotional difficulties (Fordyce, 1976; Sternbach, 1978).

The most widely used instrument was the Minnesota Multiphasic Personality Inventory (MMPI) (Tapp, 1989). Review of patients' profiles on the MMPI by Sternbach (1968) showed 'psychogenic' pain patients had more hypochondriasis, showed evidence of hysterical personality characteristics, and had a history of conversion symptoms compared to patients who had demonstrable organic pain.

Another psychometric measure, the Eysenck Personality Inventory, showed chronic pain patients had significantly higher scores on the neuroticism scale compared to those without pain. High neuroticism is characterised by constant preoccupation with things that may go wrong accompanied by strong emotional reaction of anxiety. Furthermore on other psychological tests chronic pain patients displayed low self-concept, were more tense, lacked insight into their feelings, had previous histories of psychosomatic disease, had difficulties with interpersonal and social relationships, and were more depressed when compared with organic pain patients (Feuerstein et al., 1987).

The long-standing criticisms of the trait theory have concentrated on the durability of personality constructs as fixed and unchanging causal entities, and its utility in predicting behaviour (Anastasi, 1988; Mischel, 1968). Trait theories offer little explanation of the mechanism through which psychological factors maintain or exacerbate the organic disorder. Most work in this area have relied on retrospective memory, making it difficult to ascertain whether the psychological traits predispose to pain or whether the experience of pain lead to certain personal characteristics (Feuerstein et al., 1987).

BEHAVIOURAL THEORY

Operant pain

Fordyce (1976) first proposed the operant learning process in the development of chronic pain. Based on the work of early behaviourists, such as Skinner (1953), Fordyce (1976) suggested pain behaviours (such as grimacing, limping, verbalising of distress, inactivity, help seeking) were modified by contingent reinforcement within the environment. Special attention and concern from family members and physicians, compensation payments for illness, and narcotic medication may unwittingly provide positive reinforcement for chronic pain behaviours, as well as extinguishing 'well' type behaviours. In addition, opportunities to avoid or withdraw from anxiety-producing activities (such as employment, every day responsibilities, social and familial obligations) act as negative reinforcers in the learning repertoire of pain behaviours.

Behaviourists, therefore, believe the multiplicity of illness-related behaviours are developed and maintained through learning mechanisms (Feuerstein et al., 1987). The learning mechanism process may be, or become, independent of specific antecedent nociception (Fordyce, 1976).

The operant behavioural model was influential in proposing a treatment modality for altering pain behaviours. By differentiating suffering from pain behaviour, Fordyce (1976) developed a treatment modality, targeting pain behaviours as amenable to change and responsive to intervention. The behavioural perspective has been criticised, however, for ignoring the affective, cognitive and, to some extent, the sensory components of the pain experience (Turk & Rudy, 1986).

COGNITIVE-BEHAVIOURAL THEORIES

The researches by Festinger (1957) and Schacter and Singer (1962) that physiological arousal is susceptible to the mediating influences of cognitive-perceptual interpretation and the social environment, were significant in advancing the study on the role of cognitive structures and processes in determining human behaviour. The knowledge that physiological arousal can be influenced by cognitive-perceptual processes was particularly germane in understanding the etiology of chronic pain. In addition, Melzack and Wall's (1965) gate control model, which incorporated descending control, suggested that cognitive processes were worthy of investigation.

A variety of behavioural-cognitive models have been examined by researchers to elucidate the cognitive structures and processes that mediate the interaction between behaviour, cognition and environmental influences. The contribution of pain patients' attitudes and beliefs regarding their own capabilities to respond to stress, their use of cognitive coping strategies, and the relationship these variables have for adjustment to stress have been investigated (Jensen, Turner, Romano & Karoly, 1991). Pain is often a significant stressor in an individual's life. Turner, Clancy and Vitaliano's (1987) study of chronic low back pain sufferers showed 43% of CLBP patients identified pain as their primary stressor. Of these patients who identified pain as their primary stressor, significant differences were demonstrated in levels of pain, coping strategies and appraisals compared to the pain sufferers who had not judged pain as their principal stressor. The ability to identify cognitive factors and individual differences in functioning to chronic pain may be useful for developing appropriate treatment interventions and predict compliance with treatment and coping efforts (Williams & Keefe, 1991).

Beliefs and coping

Beliefs have been defined by Jensen, Turner, Romano, and Karoly (1991) as an individual's thoughts about the outcome of an event and his/her ability to cope with the event. A person's beliefs has been hypothesised to impact on the individual in two ways. Firstly, beliefs have a direct influence on emotional functioning, and secondly, they indirectly influence coping efforts, both behaviourally and cognitively (Jensen, Turner, Romano & Karoly, 1991).

Two pain-related beliefs that have been investigated are cognitive errors about oneself or one's situation, and self-efficacy beliefs regarding one's ability to perform a specific behaviour (Jensen, Turner, Romano & Karoly, 1991).

Cognitive errors

Cognitive errors (such as misconstruing an event as catastrophic, selective attention to negative aspects of the situation, or blaming oneself for negative events) have been hypothesised to influence the severity and maintenance of psychological distress (Beck, 1967). In particular, depressed persons tend to show faulty information processing about themselves and systematically misinterpret the meaning of events or their experiences and their future in a negative way.

Depression often coexists with chronic pain (Romano & Turner, 1985). Beck's (1967) theory of depression would predict that chronic pain patients who are also depressed are more likely show cognitive distortions than non-depressed chronic pain patients. Lefebvre's (1981) study of chronic low back pain patients, revealed that patients with chronic pain and depression exhibited greater cognitive distortions to pain-related situations than did depressed patients without pain.

Thus, there is evidence that cognitive distortions may mediate the relationship between the severity of pain and long term adjustment to chronic pain (Jensen, Turner, Romano & Karoly, 1991).

Self-efficacy beliefs

Bandura's (1977) social learning model has provided a framework upon which the relationship between self-efficacy beliefs and coping behaviours used by pain patients have been examined. According to this model, self-efficacy expectations and efficacy outcomes are determinants of behaviour. An efficacy expectation is defined as the belief about one's ability to perform a specific behaviour. An outcome expectancy is one's judgement of the consequence of a particular behaviour. Social learning theory suggests an individual's beliefs about his/her efficacy and expected outcome predominantly determines whether a given behaviour will be attempted (Bandura, 1977). Some studies have provided support for the relationship between self-efficacy beliefs and exercise.

The extent of inactivity commonly encountered among chronic pain patients often appears to be inconsistent with physical limitations observed (Dolce, Crocker, Moletteire & Doleys, 1986). Dolce et al. (1986) judged the inconsistency was the consequence of patients experiencing increased pain after engaging in activities and, consequently, their fearful anticipation of painful consequences resulted in avoidance of these activities. In order to decrease these avoidance behaviours and increase efficacy expectations, pain patients were repeatedly exposed to an exercise quota system which assisted them to confront and eventually succeed on previously avoided tasks. The results of this study demonstrated that an exercise quota system was successful in reversing patterns of inactivity and increasing self-efficacy ratings, whilst also reducing concerns about the consequences of the activity. The significant association between self-efficacy ratings and actual exercise levels rendered support for the self-efficacy theory.

Kores, Murphy, Rosenthal, Elias and North (1990) also examined patients' perceived ability to achieve a range of functional activities during their treatment programme. In this study, higher self-efficacy ratings were found to be positively associated with increased activity on measures of performance.

Studies on pain beliefs suggest they have an impact on pain report, psychological functioning and subsequent pain behaviours. Recent studies have demonstrated that pain beliefs have a relationship with the use of coping strategies (Jensen, Turner & Romano, 1991; Williams & Keefe, 1991). Jensen, Turner, and Romano (1991) found that high scores on self-efficacy to perform specific behaviours were strongly related to various coping efforts (such as exercise, relaxation, behavioural and cognitive distraction, and level of medication use). Williams and Keefe (1991) suggested from their studies that patients' pain beliefs were related to the difference in the use of, and perceived effectiveness of pain coping strategies.

Cognitive coping strategies and adjustment

Many CLBP patients, despite the severity of their pain, are able to continue with normal daily activities and are psychologically well-adjusted despite the unremitting pain. The individual's adjustment to chronic pain and his/her idiosyncratic coping strategies adopted to manage pain have been extensively investigated by researchers.

Studies investigating the efficacy of specific cognitive coping strategies in the alleviation of pain have been prominent in the literature on pain control. The orthodox view has been that distraction or "directing one's attention away" from the noxious physical sensation would facilitate adaption to the pain (Cioffi, 1991; McCaul & Malott, 1984), whereas attending to the somatic sensation would increase distress to those sensations (Spanos, Radtkè-Bodorik, Ferguson & Jones, 1979). Most studies in this area have used laboratory pain.

Experimental studies of cognitive factors mediating pain experience

Laboratory studies typically employ nociception stimulation (e.g. heat, electrical shock or cold pressor pain), with dependent measures of pain experience from threshold levels (when stimulation is first perceived as painful), tolerance (the level when nociception can no longer be endured), self-reports and, infrequently, physiological measures (Tan, 1982; Turk et al., 1983; Weisenberg, 1977).

Cumulative results of these substantial experimental studies showed cognitive strategies have a positive effect in enhancing pain tolerance/threshold or attenuating pain ratings (Fernandez & Turk, 1989; Tan, 1982; Turk et al., 1983). Comparison of the various cognitive coping strategies has established no particular approach as more effective than another, although imagery strategies tended to be more effective than when imagery was not employed (Fernandez & Turk, 1989; Turk et al., 1983).

In one of the few experimental studies that did not provide specific cognitive strategies for pain tolerance, Spanos et al. (1979) classified subjects into catastrophisers and non-catastrophisers based on the reported coping strategies used. Catastrophisers were those who focused on or exaggerated the unpleasant situation, made negative self-statements, had anxiety arousing thoughts, and imagined aversive outcomes.

The researchers found non-catastrophisers were successful in significantly reducing pain, and the extent of pain reduction reported was a function of the number of strategies employed. The catastrophisers, on the other hand, were not able to report any reduction in pain regardless of the number of strategies employed. By focusing primarily on the unpleasant event, catastrophisers were not able to maintain concentration on their coping strategy. However the absence of catastrophising was

not itself associated with pain tolerance. Non-catastrophisers, who did not utilise a strategy of their own, reported no pain reduction. The investigators concluded cognitive strategies played an important role in moderating the pain experience.

A major drawback to generalising the efficacy of cognitive techniques for pain reduction is that experimentally-induced pain is not comparable to chronic pain. Induced pain is usually well-defined and time-limited, whereas chronic clinical pain is ambiguous, diffuse, and unpredictable. Distraction/attentional strategies that are effective with acute pain may not be effective for chronic pain.

Empirical studies of cognitive factors mediating pain experience

Rosenstiel and Keefe (1983) were the first to examine the coping strategies employed by CLBP patients, and the extent to which these strategies were associated with predicting behavioural and emotional adjustment. Using the Coping Strategies Questionnaire (CSQ), the researchers identified three main coping factors that were related to adjustment to chronic pain problems:

(a) Cognitive coping and suppression - strategies such as reinterpreting pain sensations, coping self-statements and ignoring pain sensation.

(b) Helplessness - frequent use of catastrophising, inactivity, minimal perceived control of pain and minimum perception of self-efficacy in reducing pain.

(c) Diverting attention or praying - focusing on external events.

Unlike the experimental studies, Rosenstiel and Keefe (1983) found the type of coping strategy used by patients was not correlated either with pain duration, disability status, or the number of previous surgeries. However, they found each of the three factors was related to different patterns of adjustment, and was predictive of average pain, levels of distress, and functional capacity.

The results contradicted previous experimental pain findings that "coping" strategies were effective in attenuating pain. On the helplessness factor, increased catastrophising was associated with high levels of emotional distress (anxiety and

depression), but not pain ratings. The tendency to catastrophise, together with a perception of minimal control over the noxious condition, appears to discourage the useful application of coping strategies. Patients who were consistently elevated in their use of the third coping factor, diverting attention and praying, were more functionally impaired and had higher levels of pain. A similar finding was obtained by Keefe, Crisson, Urban and Williams (1990) using the CSQ; coping strategies were not related to pain behaviours but significantly contributed to psychological distress and pain report.

The overall impact of Rosenstiel and Keefe's (1983) study of adjustment and chronic pain was substantial. Firstly, it highlighted the differences in the role of coping strategies between the experimental studies and chronic pain population; secondly, certain strategies that had previously been associated with "coping" were in fact maladaptive for positive adjustment with chronic pain problems; thirdly, the type of strategies applied was predictive of adjustment; and lastly, this study lends support to the Spanos et al. (1979) study that pain is more often controlled by refraining from the use of catastrophising than the use of any other particular cognitive strategy.

In summary, the role of cognitive factors in contributing to pain experience is complex. Despite this, consistent evidence regarding the role of beliefs and coping strategies in the adjustment to chronic pain is beginning to emerge (Jensen, Turner, Romano & Karoly, 1991). Patients who avoid catastrophising about their condition, who do not believe their pain to be severely disabling, and who feel they have some control over their pain are able to improve their functioning.

Although these research findings are correlational only due to the paucity of true experimental designs (Jensen, Turner, Romano & Karoly, 1991), knowledge about the chronic pain patients' characteristic coping repertoires and their idiosyncratic appraisal of pain experience have been particularly relevant for the effective intervention and control of chronic pain and long-term adjustment.

CHAPTER 4
TREATMENT FOR CHRONIC PAIN

SOMATIC INTERVENTIONS

Medical treatment is often the first intervention of choice for musculoskeletal disorders. The vast array of somatic treatments available are predominantly symptom-oriented, aimed at eliminating or reducing pain and suffering, and improving mobility (Bonica, 1990a; Flor & Turk, 1984). The most frequent therapeutic modality used by health professionals is pharmacological therapy. Drugs, such as analgesics, are widely used as they are inexpensive and readily available, and if properly administered, effective in ameliorating pain. Antidepressant drugs are also commonly prescribed for treating the emotional concomitant of chronic pain (Monks, 1990). The prolonged use of drugs (for example opiod analgesics) is contraindicated for chronic pain because of considerable problems from side effects, such as addiction and tolerance (Flor & Turk, 1984; Fordyce, 1976; Keefe, 1982; Sternbach, 1978).

Anaesthesiology has made significant contribution to the treatment of pain with such procedures as local regional anaesthesia and steroid injections (Bonica & Buckley, 1990). Although often effective when pain is acute, these interventions produce only temporary relief, and are not appropriate in some cases for chronic pain.

Like the pharmaceutical approach, surgical interventions have a long history in the alleviation of pain. When conservative treatment modalities fail to reverse functional impairment, surgery is often attempted for the management of chronic pain. Long term relief from non-malignant chronic low back pain through destructive surgical procedures has not been consistently demonstrated. A substantial proportion of patients remain unimproved or made worse because of the increased pain or a neurological deficit (Loeser, 1990).

Electrical stimulation of peripheral nerves is increasingly used for the relief of non-malignant chronic pain. Transcutaneous electric nerve stimulation (TENS) therapy gained prominence since Melzack and Wall (1965) presented their gate control model. The model suggests the system responsible for pain perception may be modulated by

peripheral stimulation. Stimulation of peripheral nerves reduces reaction to pain by activating descending inhibitory mechanisms of the large diameter fibres in the periphery, or by competing, at the spinal level, with ascending noxious input. TENS therapy is easy to use, cheap, and has no serious side effects. This technique is sometimes effective for symptomatic pain-relief (Sternbach, 1978).

Physical therapy plays an important role in restoring functional capacity of many musculoligamentous conditions (Edwards et al., 1992; Sternbach, 1978). Edwards et al's study (1992) showed 55% of chronic low back pain patients were successfully rehabilitated and a substantial reduction in low back pain was achieved after four weeks of intensive physical therapy. Nachemson (1983) proposed that for the 20% of patients who have no demonstrable pathology, encouragement of early gradual biomechanical controlled activity will strengthen and restore spinal mobility, and aid the healing of injured tissues and diminishes pain.

Despite the variety of medical techniques, the prognosis is not promising for non-malignant chronic low back pain. Chronic benign pain is highly refractory to rehabilitation by either conservative management or surgical methods. Patients who are poor candidates for medical and surgical treatment are frequently referred for psychological interventions. Since the introduction of psychological treatment modalities, there have been major advances in the clinical management of chronic benign pain.

PSYCHOLOGICAL INTERVENTIONS

Two major developments have evolved in the field of behavioural medicine in the assessment and treatment of chronic pain (Keefe, Dunsmore & Burnett, 1992). The first is the behavioural approach based on the operant learning principles (Fordyce, 1976; Fordyce, Fowler, & DeLateur, 1968). The pioneering work of Fordyce and his associates (1968) was the impetus for the increased interest in psychological factors in the maintenance and management of chronic pain.

The second approach, cognitive-behavioural, is based on more recent theoretical advances in cognitive and behavioural therapies (Turk et al., 1983).

Behavioural strategies

The application of contingency management strategies in the treatment of chronic pain is based on the assumption that acquisition of pain behaviours is contingent on environmental consequences (Fordyce, 1990, 1978; Fordyce, Roberts & Sternbach, 1985). The behavioural approach considers maladaptive and excessive pain behaviours are reinforced through the process of learning within a social context. This suggests that the acquired pain behaviours can be altered through modification of the environmental contingencies.

The indications for contingency management are symptoms that have no organic findings, organicity, whilst present, is insufficient to account for excessive pain behaviours, and pain problems that have existed for several months and are a long-standing problem. Contraindications for contingency management are acute or malignant chronic pain directly linked to and proportional to physical findings, no excessive deactivation or overguarding behaviour, or no environmental reinforcers that act as motivators for well behaviours (Fordyce, 1990).

Specific behaviours typically targeted for treatment are overmedication, reliance on health care utilization, underuse of, or overguarding against body movements, and excessive pain behaviours (such as verbal and body language) that evoke protective action by others.

Besides attempting to diminish maladaptive behaviours, the goals of treatment are enhancement of alternative behaviours that increase activity level, and modifying the social contingencies of family members (Fordyce, 1990, 1978, 1976; Keefe et al., 1986). The methods used to increase activity level include systematic reinforcing of gradual increases in daily exercise and activity quota with social praise and a chance to rest. Medication reduction is gained by giving patients progressively smaller doses in a "pain cocktail" on a fixed time schedule rather than on a PRN basis.

To maintain the gains made from inpatient treatment and generalisation to the home environment, the patient's spouse is trained in the use of social reinforcers to enhance well-behaviours and to ignore pain behaviours. A thorough analysis of the pain behaviour manifested and the environmental contingencies that influence them are important prior to treatment.

Cognitive-behavioural approach

Cognitive-behavioural therapies developed in the past decade when behavioural scientists became increasingly dissatisfied with the inadequacy of simple learning theories in explaining human behaviour. As the recognition that cognitive, emotional and behavioural factors played a part in the experience of pain, the cognitive structures and cognitive processes which affect behaviour and produce behaviour change became increasingly important. As a consequence, a variety of cognitive-behavioural methods was developed for the treatment of chronic pain (Turner & Romano, 1990; Pearce, 1983).

Subsumed under the rubric of cognitive-behavioural therapies are a diverse range of cognitive and behavioural strategies (Mahoney & Arnkoff, 1978). Their differences lie in the conceptualisation of the cognitive process of change, and the strategies and techniques utilised to produce change. Despite their diversity, the fundamental theory underpinning these approaches is based on Bandura's (1977) theory of 'reciprocal determinism'; that an individual's behaviour and emotion is strongly influenced by their cognitive structure and cognitive processes.

All cognitive-behavioural therapies involve modifying patient's cognitions, feelings, and behaviours. Therapeutic interventions are typically time-limited and involve active participation within a structured therapeutic framework. Reconceptualisation of the belief that the pain is purely somatic is often necessary before intervention can begin. This involves education of the multidimensional nature of pain, and, thus, provides a rationale for the use of cognitive-behavioural techniques. The goal of cognitive-behavioural strategies is the patient, working in a collaborative relationship with the therapist, acquiring skills to gain control over the pain, and, ultimately improving their overall functioning.

Most studies on the treatment of pain can be classified into two major types of cognitive therapy (Turner & Romano, 1990); (a) cognitive restructuring; and (b) coping skills training. Considerable overlap exists between the two.

Cognitive restructuring

Cognitive restructuring is typified by Ellis's (1962, 1973) rational-emotive therapy, Meichenbaum's (1977) self-instructional training, and Beck's (1970) cognitive therapy.

The fundamental assumption of cognitive restructuring is that negative feelings and emotional distress are often caused by maladaptive or negatively distorted thoughts. Such negative beliefs, resulting from cognitive distortions, are related to increased pain, suffering, and functional disability.

Treatment is aimed at increasing the awareness and identification of one's negative, automatic thoughts, the connections between cognition, affect, and behaviour, and examining the extent to which these biased thoughts are rational, adaptive, and justified by evidence. More reality-oriented interpretations can then be substituted for idiosyncratic distorted cognitions.

Acquisition of coping strategies

The second type of intervention, coping skills' acquisition, is often part of psychological pain programmes. Coping skills acquisition aims to develop individual self-efficacy by training patients in a repertoire of skills, in order to mitigate the effect of pain and stress. The most common techniques employed are relaxation, attention-diversion, coping self-statements, and stress inoculation.

Relaxation as a therapeutic technique for reducing tension and anxiety was first developed by Jacobson (1938). Pain often increases muscle tension, further spreading to other muscle groups, and subsequently exacerbating the pain. Relaxation serves to disrupt the pain-muscle tension cycle by decreasing the focus on pain, as well as the emotional concomitant of pain, such as depression and anxiety. Several relaxation techniques have been used in pain control. Some emphasise progressive muscle tension-relaxation; others passive muscle relaxation using mental imagery or music; and others controlled, diaphragmatic breathing exercises. The relative ease in which relaxation is learnt increases patients' sense of control over their pain (Syrjala, 1990).

Attention diversion techniques and positive coping self-statements, which attempt to divert attention away from pain, are aimed at altering the subjective experience of pain. These strategies are more appropriate for acute pain, although the procedures are sometimes adapted to individual chronic pain patients.

Stress inoculation is the most frequent coping skills acquisition used for chronic pain. It is a comprehensive and flexible approach based on Bandura's self-efficacy model for the management of stress-related problems (Meichenbaum, 1985). Successfully applied to problems such as anger (Novaco, 1976), anxiety and post-traumatic disorders (Meichenbaum, 1985), Meichenbaum and Turk (1976) adapted stress inoculation for use with a variety of non-malignant chronic pain problems.

The general underlying principle of stress inoculation is that by exposing an individual to stress stimulus that is strong enough to arouse the defense without being so strong as to be overwhelmed by them, the individual's resistance to the maladaptive effects of stress is enhanced. This approach has three main steps. The first is educating the client about the nature of stress and responses to stress. The second step requires training the client in a variety of flexible coping skills and rehearsing the skills acquired. The final phase involves applying the skills in controlled, graded stress-inducing circumstances that may either be a real life situation, or a situation analogous to the stress situation.

In summary, the single modality therapies discussed above may successfully help individuals to control their pain and function normally, but each method has distinct limitations for the treatment of a complex, multidimensional problem. The conventional medical approach focuses on somatic events, whilst the strict behaviourist ignores the mental processes associated with persistent pain. In turn, the cognitive-behavioural procedures do not attend to the wider social and environmental contingencies that may perpetuate the patient's pain behaviours.

MULTIDISCIPLINARY PAIN CLINICS

Bonica (1990b) reported that as early as 1945 he had realised the need for a multidisciplinary treatment approach to the complex problems of pain. Although medically trained, Bonica first conceptualised and developed a multidisciplinary facility where individuals from different medical disciplines were able to integrate their specialised knowledge and skills to the common goal of developing the most effective assessment and therapeutic strategies for the alleviation of chronic pain (Bonica, 1990b). In addition, the growing awareness of the importance of psychological factors

in the maintenance and management of pain encouraged Fordyce and his associates (1973) to develop the first innovative comprehensive behavioural pain programme that had a psychological emphasis.

Since these early beginnings, and the subsequent integration of the medical and psychological disciplines into an interdisciplinary treatment for chronic pain, important advances in the modern day management of intractable pain problems have been made (Loeser, Seres & Newman, 1990). Many types of pain facilities now exist. Most are either comprehensive pain programmes treating a great variety of chronic pain syndromes, or syndrome-oriented programmes treating a particular pain syndrome (eg headaches, low back pain, cancer pain). Both pain programmes operate either with an inpatient and/or an outpatient facility. Back pain is the most common chronic pain problem seen at pain rehabilitation centres. More than 75% of patients who present at these clinics predominately suffer back problems (Aronoff et al., 1988; Fordyce, 1988).

The makeup of staff in a multidisciplinary pain clinic varies from centre to centre but frequently comprise of health professionals from medicine; anaesthesiology, rehabilitation medicine and neurologic surgery; physiotherapy; occupational therapy; social work/vocational counselling; nursing; and psychology. Most programmes offer a flexible hybrid of treatments that include medical treatment; psychological treatment (using cognitive-behavioural approach such as coping skills training, assertion training, communication, family therapy), systematic relaxation training, biofeedback, physical therapy (including TENS, massage), occupational therapy, vocational counselling and training, and nerve blocks (Loeser, Seres & Newman, 1990; Aronoff & Wagner, 1988). The common factors of comprehensive pain centres are that they are multidisciplinary, holistic-oriented (medical, psychological and sociological factors), and involve active participation of patients in taking responsibility for the management of their pain, rather than an assumption of a "cure" for pain.

The central goals of treatment in back pain programmes are reconceptualisation of back pain problems through education and provision of information about the nature of chronic back pain, and physical reactivation of unused muscles, often with the intention of return to work and recovery of functional performance. To achieve the

goals of pain management, a variety of techniques are used, such as relaxation, exercise, vocational retraining, cognitive-behavioural strategies, problem solving, communication, and assertion skills (Benjamin, 1989).

CHAPTER 5
REVIEW OF OUTCOME STUDIES OF MULTIDISCIPLINARY CLINICS

EARLY STUDIES AND TREATMENT OUTCOMES

The early published studies of treatment programmes for chronic low back pain were predominantly inpatient multimodal programmes, employing operant behavioural principles. As the multiplicity of chronic pain problems were better understood, so treatment regimes evolved in an endeavour to reflect these changes, resulting in a variety of therapeutic strategies being used, in which behavioural techniques were but a part. These multidisciplinary treatment clinics were eclectic in their treatment approach (using psychological and medical principles), and the most prevalent model used in present day pain treatment centres. These two types of multimodal programmes are discussed below.

Behavioural programmes and outcomes studies

As early as 1968, Fordyce, Fowler and DeLateur reported applying operant behavioural strategies with a patient having problems with constant low back pain. The treatment was carried out in a comprehensive medical rehabilitation department of a teaching hospital and used a single-case design. Significant success was achieved in decreasing the patient's medication intake and increasing her activity level over the course of 8-weeks inpatient and 23-weeks outpatient care. From this notable beginning, Fordyce set up one of the first multidisciplinary programmes for chronic pain using behavioural therapy and behaviour modification techniques (Fordyce, 1976; Keefe et al., 1986).

In a later study, Fordyce et al., (1973) described outcome results for 36 patients, mainly with chronic low back problems. Impressive results were obtained by Fordyce and his associates, with significant reduction in drug intake and improvements in uptime and exercise tolerance, although changes in pain intensity were not as notable. The remarkable success obtained by behavioural techniques with patients who had been refractory to previous rehabilitation efforts demonstrated the effectiveness of psychological methods in the treatment of chronic pain.

Further support for operant conditioning techniques was demonstrated by Sternbach (1974), with patients who had been resistant to traditional treatments. Utilizing the behavioural methods employed by Fordyce et al. (1973), Sternbach (1974) treated patients with an organic basis for their chronic pain, the majority having low back problems. Emotional difficulties concomitant with their pain were reported. The outcome measures examined both behavioural and psychological outcomes of treatment. Not only were significant improvements shown on behavioural measures, but changes in mood were apparent, with decreases demonstrated on the depression, hysteria and hypochondria subscales of the Minnesota Multiphasic Personality Inventory (Sternbach, 1974).

Cairns and Pasino (1977) systematically compared the specific contribution of external contingency management in an attempt to identify the component of operant treatment that contributed to improved levels of performance. Verbal reinforcement was successful in ameliorating pain behaviour and improving physical functioning.

Swanson, Maruta and Swenson (1979) reported outcomes on the largest group of patients. Two hundred patients were treated in a comprehensive inpatient programme, similar to existing programmes. At the termination of treatment, 59% of patients had been successfully treated as shown by improved medication level, increased activity, and reduction in subjective pain ratings. At one year follow-up, the treatment gains had been maintained for treated patients.

Of the investigations into the treatment of chronic pain, only two used a comparison group design in their studies; Roberts and Reinhardt (1980) used a quasi-experiment comparison design with 1 to 8 year follow-up. On behavioural and psychological assessments, 77% of treated patients maintained improvements on all variables at follow-up assessment and were functioning normally, compared to non-treated patients. Sturgis, Schaefer and Sikora (1984) selected patients who were eligible for but had refused treatment as a control group. It was one of the few studies where no significant differences were reported between the treated and untreated groups.

Multidisciplinary programmes and outcome studies

Seres and Newman (1976) reported treatment of 100 patients with chronic low back pain at the Portland Pain Center. Most had sustained their injuries while at work and were claiming compensation at the time of admission. The treatment programme,

which lasted for up to 4 weeks, was considerably shorter than Fordyce et al's (1973) programme. It incorporated a wider range of therapy modalities including biofeedback, relaxation, transcutaneous electrical stimulation, and psychotherapy. Results on outcome measures of physical functioning demonstrated substantial improvements in activity and mobility. At the time of discharge only 5% of patients were taking pain medication compared to 87% at admission. Seventy-five percent of patients consented to close their compensation claim after treatment. In a later study, 18 months after treatment, the investigators reported most patients had continued to improve their physical functioning, although an increase in analgesic medication intake was revealed (Newman, Seres, Yospe & Garlington, 1978).

Gottlieb et al. (1977) treated 72 patients whose disability and incapacitating pain were directly related to their unemployment. The treatment programme incorporated a stronger emphasis on return to work and was unique in teaching patients self-regulation strategies for reducing factors, such as anxiety and depression, that contributed to their pain. Patients were encouraged to actively take more responsibility for their own pain management (Keefe et al., 1986). The programme not only significantly reduced maladaptive pain behaviours but was successful in getting patients back to gainful employment (82%).

In the only exclusively outpatient treatment study of the time, Khatami and Rush (1978) reported five case studies of long-standing chronic pain patients. The treatment package incorporated a cognitive emphasis in the therapeutic regime. Based on Beck's (1970) model of depression, patients were taught to evaluate events or pain-related stresses in more realistic ways and to respond more appropriately. Significant reduction in feelings of depression and hopelessness were demonstrated on the Beck Depression Inventory and the Hopelessness scale, together with improvements on all behavioural measures.

Review of outcome studies

The first comprehensive reviews to appear since Fordyce et al's (1968) pioneering work with behavioural strategies for the management of chronic back pain, were, taken as a whole, unified in their support for the utility of psychological interventions in managing chronic pain problems. Operant conditioning programmes achieved

consistent, substantial improvements with activity and medication variables, and these gains were maintained long-term, although modest changes in subjective pain were reported (Linton, 1982; Turner & Chapman, 1982). The cognitive-behavioural/multidisciplinary approaches, although still evolving, showed potential to alleviate reported pain and positive results were manifested on a variety of other variables (Keefe, 1982; Linton, 1982; Turk & Flor, 1984; Turner & Chapman, 1982).

Notwithstanding the promising evidence for the comprehensive treatment approach to chronic pain, the paucity of research and the methodological shortcomings of these studies precluded conclusive support for the efficacy of psychological interventions as the treatment of choice for chronic pain management (Linton, 1982; Tan, 1982; Turner & Chapman, 1982).

The most fundamental limitation of these investigations was the lack of adequate control groups (Keefe, 1982; Latimer, 1982; Linton, 1982; Tan, 1982). The rather weak single-group pre-/post-test design was used in the majority of studies. Several problems inherent with the use of this design are controlling for variables such as history, maturation, regression, reactivity to measurement, and other factors extraneous to the treatment such as placebo, attention, and demand characteristics (Linton, 1982). Consequently, causal inferences of treatment effect are problematic in the absence of a control condition (Latimer, 1982; Linton, 1982). Of the three studies that had a control condition of any type, Roberts and Reinhart's (1980) and Sturgis et al's (1984) comparison groups were not convincingly comparable. Patients assigned to the comparison conditions, who either had been refused or rejected for treatment, could not be considered equivalent to patients accepted for treatment. Whereas Cairns and Pasino (1977) had employed adequate controls, their study was only concerned with examining specific variables of the operant procedures.

The second methodological weakness was the lack of follow-up data (Keefe et al., 1986; Latimer, 1982; Linton, 1982; Tan, 1982; Turner & Chapman, 1982). Follow-up periods reported in research have ranged from 1 month (Gottlieb et al., 1977) to 8 years (Roberts & Reinhardt, 1980). Most studies did not report any follow-up of patients after discharge (for example Fordyce et al., 1968; Cairns & Pasino, 1977; Khatami & Rush, 1978).

Aronoff, Evans and Enders, (1983) critically examined the follow-up analysis of treatment programmes. Of the twenty studies they evaluated, several methodological problems were identified. First, there was a reliance on mailed questionnaire; second, the number of responses elicited were often meagre; third, there was a dependence on memory for events rather than actual measurements taken at the time; fourth, subjective ratings by staff were used with no objective or corroborative dependent measures of self-reports in assessing outcome; and last, but not least, the inconsistent use of measures at admission and follow-up, making it difficult to adequately compare the difference between patients' functioning at pre-test assessment and their functioning at the follow-up assessment.

Careful follow-up study of treatment effects is essential as pain treated in multidisciplinary clinics is extremely chronic (often having lasted for several years), and some treatment effects are known to be vulnerable to relapse. For example, Cairns and Pasino (1977) found increases in physical activity were only temporary if the reinforcement contingencies were not available in the natural environment. It is therefore important to know not only that treatment works but also that the gains from treatment are maintained over time.

The third methodological shortcoming identified was the narrow range of outcome measures implemented for the assessment of treatment effectiveness, despite the goals of multidisciplinary programmes being changes across multiple variables which were considered part of the chronic pain syndrome. Roy (1984) criticised the tendency of the studies to reduce the dependent measures to increased activity and/or reduction of pain as major outcome measures. Latimer (1982) questioned the integrity and reliability of some psychometric instruments used. In most cases, the outcome measures were idiosyncratic to the programme. In other studies the dependent measures were incongruent with the stated objectives of treatment and the assessment of these goals (Roy, 1984). The criticisms about the heterogeneity and reservations regarding the reliability and validity of outcome measures restricted the support for the efficacy of pain rehabilitation clinics.

Sanders (1979) suggested the ideal assessment of pain be trimodal; involving cognitive-verbal, overt-behaviour and physiological indices, and should include both

subjective and objective data. Roy (1984) believed the evaluation of treatment should include assessment of social and personal functioning, reflecting the broader implications of chronic pain syndromes.

In summary, the early reviews concluded that although the research into the efficacy of comprehensive-oriented interventions for pain management were encouraging, they were preliminary in nature due to the methodological weaknesses of these studies.

CONTEMPORARY RESEARCH AND OUTCOME STUDIES

In response to the insistence on more rigorous controlled studies, researchers improved the methodological designs of earlier investigations of multidisciplinary pain treatment programmes. Most utilised pre-/posttreatment comparative designs that considered the effects of specific components of operant techniques in comparison with other treatment modalities (Altmaier, Lehmann, Russell, Weinstein & Chuan, 1992; Cohen, Heinrich, Naliboff, Collins & Bonebakker, 1983; Sanders, 1983; Turner, 1982;). Others utilised a single group design with continuous measures (for example, Cinciripini and Floreen, 1982).

Nonetheless few studies employed a randomised no-treatment control group. The difficulty of employing such a stringent research design had been contemplated by Keefe (1982) who speculated the reluctance of researchers to assign patients to control conditions where patients would be denied treatment. Turner and Chapman (1982) queried the ethical dilemma confronting researchers in assigning patients to classically defined control study conditions. Fordyce, Roberts and Sternbach (1985) believed informed consent to such research design was ethically unsound, and that patients in the control condition would not complete repeated measures long enough to match full-scale intervention.

To circumvent the predicament of a randomised no-treatment control group, Guck, Skultety, Meilman and Dowd (1985) attempted a no-treatment control with a group of patients who did not have insurance cover. At the 1-5 year follow-up of patients after they had received treatment, 60% of treated patients reported being gainfully employed or in appropriate role activities, not receiving pain-related compensation, and having no further treatment for pain or using pain-related medication. Not one member from the untreated group met these criteria.

Deardorff et al., (1991) also used a no-treatment group similar to Roberts and Reinhardt's (1980) study. Significant increases were reported for the treatment group in physical functioning and return to work, with decreases in self-report pain ratings and interference in activities compared to the no-treatment group. None in the untreated group was employed at 11 months' follow-up.

Mayer et al. (1987) evaluated a treatment programme using as a control group patients who were either denied entry to the programme because of the lack of financial support from insurance assessors or patients who dropped out from the programme. The investigators reported that 87% of the treated patients were actively working at 2 year follow-up compared to 41% of those from the untreated group. Improvements on behavioural and psychological outcome measures were also demonstrated by the treatment group compared to those who had not received treatment. Hazard et al. (1989) also used for a control group subjects who were not treated for an assortment of reasons, such as lack of financial support from insurers, programme dropouts and those who refused treatment. Eighty-six percent of the treated group had returned to work compared with 29% of those had been denied treatment. Cassisi, Sypert, Salamon and Kapel (1989) found programme participants were employed and experiencing less pain than non-participants. The treated patients also made significantly less use of health care resources than non-participants.

By 1986, Linton was able to report the quality of the studies was superior to previous research. Malone and Strube's (1988) quantitative review, using meta-analysis, found mood and activity levels consistently showed greater response to treatment than pain symptoms. Flor, Fydrich and Turk (1992) found impressive evidence for the efficacy of multidisciplinary treatments on a broad range of dependent variables. Treated patients were twice as likely to return to work, decrease their overall pain behaviour and use of medication, and improve in their activity levels compared to a sample that either had not received treatment, were on a waiting-list, or had received a unimodal treatment. Skinner et al's (1990) study reported similar findings for the back programmes in the United Kingdom to those from the United States.

The accumulation of data and the substantially improved research design attested to the effectiveness of comprehensive interventions for pain management on a variety of

outcome measures, despite the continuation of pain reports. Follow-up data, however, continued to be meagre and, when available, were incomplete due to the high attrition rate of patients in the no-treatment group (Malone & Strube, 1988).

The appropriateness of the control groups in these studies also remained doubtful. Misgivings were expressed about the comparability of treated subjects with those refused treatment because of the lack of insurance cover, such as the probable anger and frustration experienced by control subjects who are locked into their disability through financial constraint (Flor et al., 1992). In addition, patients who either drop out of treatment or who refuse treatment differ in motivation from those who complete treatment (Guck et al., 1985). Therefore, the obstacle of obtaining a comparable randomised control group remained a challenge for researchers.

Peters and Large (1990) reported the first study to employ a randomised control group design when they evaluated the multidisciplinary pain management programme at Auckland Hospital. Patients were randomly assigned to either inpatient, outpatient or no-treatment groups. On outcome measures of psychological distress, pain behaviour, pain intensity and health-related disability, the treated groups demonstrated significant improvement at posttreatment when compared with the control no-treatment group. Follow-up assessment of the treated patients 18 months later indicated 82% of the treated patients had increased activity and had gained paid employment. A further reduction in pain intensity and the use of pain medications were also reported (Peters, Large & Elkind, 1992). In comparison, the control group was less likely to be engaged in these activities and a subsequent increase in benefit use was found.

Although impressive positive outcomes were demonstrated by the treated subjects, the researchers reported the ethical dilemma they encountered in denying treatment to control patients. The dropout rate from this group was the largest (58%) of the three groups. Fordyce et al. (1985) suggested a waiting list group was a valid alternative to using a no-treatment control group.

In conclusion, the efficacy of multidisciplinary pain programmes for the treatment of chronic pain is supported by the proliferation of data documented. The methodological problems of these studies emphasise the difficulties involved in implementing clinical

outcome studies. Few report a randomised control group. Many studies did not include long-term follow-up assessment and of those that did, return rates were low and were reliant on questionnaires (Linton, 1986). Furthermore, the treatment programmes vary widely from centre to centre. The duration of treatment reported ranged from one to thirty-one weeks, varying from four to two hundred and sixty-four hours of treatment. Some programmes were carried out in inpatient clinics whilst others were based in outpatient treatment centres. Treatment programmes provided were either individual or group-based programmes (Flor et al., 1992).

Notwithstanding the variation in the treatment programmes available, components of the programme are often diverse. The common feature of all the programmes is physical reactivation of neglected muscles and improvement in functioning. However the strategies used are frequently idiosyncratic to the team providing treatment. Treatment could be cognitively focused, offering treatment such as stress inoculation and cognitive reinterpretation strategies, targeting negative beliefs and expectations about pain and acquiring specific cognitive skills for more appropriate beliefs and coping responses (Benjamin, 1989); behaviourally focused using operant conditioning strategies to reduce inappropriate pain behaviours and increase functional behaviours, reduce drug use and return to work (Benjamin, 1989); or a combination of the two approaches. Treatment programmes also varied in the extent to which other therapeutic strategies are incorporated into the programme such as family and marital therapy, psychotherapy, relaxation training, vocational training, and liaison with other health and social agencies (Benjamin, 1989; Linton, 1982).

Comparisons between treatment programmes are problematic and each programme requires evaluation (Roberts & Reinhardt, 1980). In addition, most pain programmes studied are from overseas and these findings require replication from a New Zealand perspective.

CHAPTER 6
PRESENT STUDY

RATIONALE AND AIM FOR THE STUDY

The general acceptance of comprehensive treatment programmes for the management of chronic pain has led to the rapid proliferation of multidisciplinary pain clinics. Unfortunately, the expansion of pain management centres has not been equalled by an increase in the number and improvement in the quality of studies on the efficacy of these programmes.

The paucity of well-designed studies remains problematic. The ethical dilemma in carrying out classically defined prospective control studies inhibits clinical research. Furthermore, the lack of homogeneity of multimodal approaches, and need for cohesiveness in standardised measures necessitate evaluation of each programme.

The aim of this present study is to:

1 Contribute further to investigations of the efficacy of multidisciplinary pain treatment programmes. The research design of this study will endeavour to surmount some of the methodological shortcomings of earlier studies. This will be achieved by:

   a evaluating a pain management programme at Palmerston North Hospital using a randomised wait-list control group. Examination of studies that have evaluated multidisciplinary pain treatment programmes indicates only Morrison, Chase, Young and Roberts (1988) and Philips (1987) employed a randomised waiting list group as a control. Fordyce et al. (1985) believe the use of a wait-list group as a comparison group is a valid alternative, overcoming the ethical dilemma of utilising a no-treatment control group;

   b comparing the treatment group and wait-list group at pretreatment, posttreatment and follow-up on outcome measures. Morrison et al. (1988) sequentially evaluated the control group once pre-treatment and the

treatment group once post-treatment. Their design presents difficulties in controlling for extraneous variables such as history and maturation of subjects throughout the period of the study (Conrad & Maul, 1981). Philips (1987) evaluated the treatment group before and after treatment and at follow-up, but the wait-list group was evaluated only while awaiting treatment. In improving on the deficiencies of these two research designs, this study will evaluate the treatment and wait-list groups concurrently at pretreatment, posttreatment and follow-up assessments; and

c application of the same psychometric instruments for the two groups at all outcome assessments, use of psychometric measures that have acceptable reliability and validity, and a broad range of dependent variables will be assessed (behavioural and psychological factors), using both subjective and objective measures.

2 Sanders (1980) and Aronoff et al. (1983) have suggested that chronic pain patients tend to distort their level of disability in a negative fashion. Thus, as recommended by Turner and Chapman (1982), corroboration of self-reported pain-related disability from a family member or significant other will be obtained.

3 Obtain patients' evaluation of the back pain programme in order to provide feedback to the back programme personnel.

HYPOTHESES

It is hypothesised that:

1 Patients in the treatment group will demonstrate significant improvement on all outcome measures compared with the wait-list control group at the time that the treatment group has received treatment and the waitlist group has not.

2 The gains from treatment will be maintained at the follow-up assessment for both groups.

CHAPTER 7
METHOD

RESEARCH SETTING

The Chronic Back Pain Education Programme was conducted at the Medical Rehabilitation Unit of a large public city hospital. The Medical Rehabilitation Unit is a comprehensive "physical" rehabilitation unit providing the whole spectrum of rehabilitation for those with disabilities. The services are available to those with severe disabilities and handicaps (such as neurological conditions, amputees, spinal injuries) and those with relatively minor impairment but usually major vocational handicap (such as alcoholism, drug addiction, illiteracy, chronic back pain).

The Unit is staffed by a multidisciplinary team of doctors, occupational therapists, physiotherapists, a social worker, a clinical psychologist, and nursing staff. The workshop is staffed by instructors and placement officers. Inpatient, outpatient and day care services are provided with work assessment and placement services available. Referrals to the Unit are received from the community and from hospital wards.

The Back Pain Education Programme, set up at the Unit several years ago, is one aspect of the Unit's outpatient services. It operates bimonthly, 6 times a year, with 70-90 people completing the programme each year. The underlying goal of the programme is "return to work". Patients who attend the back programme are not charged for the service as most are funded by the Accident Compensation Corporation.

DESCRIPTION OF THE TREATMENT PROGRAMME

The Back Education Programme at the Rehabilitation Unit is an outpatient multimodal treatment programme staffed by a multidisciplinary team. Members of the treatment team in the programme evaluated for this study consisted of a medical doctor, a physiotherapist, an occupational therapist, and a psychologist who specialises in pain research. All the members of the multidisciplinary team were employed at the Medical Rehabilitation Unit, except for the psychologist whose service was contracted from the

Psychology Department of Massey University. Other specialists available for part of the programme included a social worker, a dietician, an Accident Compensation Corporation (ACC) rehabilitation coordinator, and a drug and alcohol counsellor. Family members were encouraged to be involved in the programme.

Criteria for acceptance into the programme

All the patients were assessed by the Unit physician, the physiotherapist, and the psychologist. Those who met the programme criteria were advised of their acceptance to the back education programme and informed when the next available treatment would commence. The criteria were:

(a) Pain was chronic, non-malignant, and not less than 6 months' duration
(b) After the medical examination by the Unit physician, all appropriate standard medical or surgical treatments had been exhausted or deemed not suitable for the management of this problem
(c) The patient voluntarily agreed to participate in the pain education programme
(d) No psychiatric problems identified
(e) Under 50 years of age

An additional criterion for acceptance into the programme was not more than two years out of work, but this policy was occasionally disregarded.

The back education programme consists of a 3-week treatment, which is primarily educational in orientation. Patients attended four mornings a week (Tuesday to Friday) from 9.00 am-12.00 pm. The ideal number of participants was 15, although this varied from 10 to 17 in this study. Patients who lived out of Palmerston North, and whose travelling would have prevented them from attending the programme, were able to live-in during the period of treatment.

Components of the programme

Sections of the back programme consisted of:

Physiotherapy sessions for four days of the week, in group activities. Patients were educated about body mechanics, provided with information about anatomy and

posture, lifting, and basic musculature of the trunk. In addition individual exercises were designed to meet the needs of each patient. All exercises were aimed at increasing flexibility, mobility, endurance and strength. Structured exercises in the gym and in the pool were used to achieve these goals. Base-line measures for the exercises were taken in the early part of the programme for each individual, and rather than focusing on pain reports, patients were encouraged to elevate their tolerance for the exercises, improve their stamina and increase the flexibility of muscles unused from long periods of inactivity.

Occupational therapy was conducted on most days. This involved group and individual therapy. Group sessions comprised of education on correct anatomical posture for seating and lifting, and simplification of home and work environment. Autogenic relaxation technique for self-regulation of the autonomic nervous system was also taught.

Individual sessions were dedicated to goal setting activities (eg beginning some leisure or recreation, undertaking some social activity) and work assessments. Work assessment sessions focused on identifying alternative occupational goals commensurate with available skills, planning, placement for work programmes, training opportunities, or attempting a work trial.

Psychological therapy consisted of four sessions, one and a half hours each, conducted over the three weeks. The programme had a cognitive-behavioural emphasis addressing psychosocial pain-related concerns. Therapeutic interventions included relaxation training using diaphragmatic breathing and meditation techniques, stress and mood management, and improving communication styles.

A medical session was arranged to discuss matters relating to diagnosis, investigations, the effects and proper use of medication and other medical issues. In addition to the above, other components of the education programme were discussion of the role of nutritional and weight factors aimed at improving dietary habits; the effects of alcohol and drug abuse; and a session with an Accident Corporation Compensation (ACC) staff to discuss the availability of compensation payments, changes in the ACC legislation and financial difficulties.

Group meetings were arranged to evaluate the programme and encourage socialisation. Individual case conferences with the patient and the multidisciplinary team were organised at the completion of treatment to provide feedback of progress and assess outcome goals. At the conclusion of the back programme patients could avail themselves of additional services provided by the Rehabilitation Unit outpatient programmes (such as work assessment or work placement programmes).

Collection of data

Research data from the Back Pain Education Programme were collected between April and November 1992. All assessment measures for the two groups (treated and waitlist) were completed at the Rehabilitation Unit by the physiotherapist, occupational therapist and the researcher. The measures of physical functioning were taken by the same physiotherapist throughout the study. Three different occupational therapists were involved in the collection of data for the activities of daily living owing to the retirement of one and overseas travel by another. Except for the researcher, all personnel involved in data collection were associated with the Back Education Programme.

As the subject pool was small, two critical aspects for the study were to contain the drop-out rate to a minimum and ensure subjects completed all the measures. Patients were personally followed-up by the researcher whenever this was deemed necessary.

ETHICAL CONSIDERATIONS

The research project was considered and approved by the Manawatu-Wanganui Area Health Board Ethics Committee. Several ethical issues pertinent to the use of subjects for research purposes are discussed below.

Informed consent

Subjects were informed about the purpose of the study, how the study would be conducted, the use of research data and other relevant information that would affect their consent to participate in the study. This included informing them of the requirements to complete several pretreatment, posttreatment and follow-up assessments, time to complete each assessment session, period of time required for

completion of data collection, and obtaining corroborative information from a family member.

Subject were informed of their option to withdraw from participating in the study should they wish at any stage of the research. No subjects were coerced into participating.

Confidentiality

So that personal data and all information relating to subjects remained confidential all names were removed from the data and information sheets, and were identified only by code number for analysis.

Assignment to a waiting list

A strong ethical and moral obligation not to withhold treatment from chronic pain sufferers remains a major consideration for researchers when evaluating the efficacy of pain management clinics. Accordingly subjects assigned to the waiting list were advised they would receive treatment at the next available programme, as would happen normally when a treatment programme was not available. No subjects were denied treatment. For some subjects assignment to a waiting list might be intolerable. Consequently, subjects were informed, verbally and in writing, that participating in the study did not prevent them from seeking treatment elsewhere, continuing pharmacological therapy, pursuing relief from their physician, or withdrawing from the study. In no way were subjects on the waiting list unnecessarily disadvantaged.

Use and collection of corroborative information

Besides patients' self-reports, corroborative information was obtained from a family member or significant other. Subjects were advised of this requirement and their consent obtained to seek this information from a family member or significant other. All corroborative information was treated in the same confidential manner as patients' information, and was not communicated to the patient.

SUBJECTS

Subjects were 27 chronic low back pain patients consecutively referred to the outpatient pain clinic at Palmerston North Hospital Rehabilitation Unit. Patients

considered suitable for the pain management programme were randomly assigned, by the Rehabilitation Unit staff, to one of two groups: treatment or waitlist/control. All patients reported predominant low back problems with symptoms of leg pain. The etiologies however differed.

Subjects in the treatment group

Of the twelve patients assigned to the treatment group, ten completed all the assessments. Two withdrew from the programme after the first week; one for alcohol-related problems for which he subsequently sought treatment, and the other reinjured his back causing debilitating back pain and was unable to complete the programme. This second patient was later reassigned to the waitlist control group and completed the second treatment programme. His data has been included with that group. The sample consisted of two females and eight males. The average age for the group was 37 years (range 23 to 47).

Subjects in the waitlist group

Of the sixteen patients assigned to the waitlist group, fourteen completed all assessments. One withdrew from the treatment programme as he experienced marital difficulties during the course and was unable to be contacted. The second patient completed the programme but was unavailable for the follow-up assessment as he was overseas for a job application. The sample consisted of six females and eight males. The average age for the group was 36 years (range 21 to 52).

The demographic characteristics of patients in the two groups are displayed in Table 1. As shown in Table 1, married men predominated in the sample. The majority of patients had been unemployed for more than one year, and were receiving either benefit or compensation payments for the pain. Most patients had experienced back and leg pain constantly for the past two years.

RESEARCH DESIGN

A 2 (Treatment) x 3 (Assessment) factorial repeated measures time-series design was used. The two variables were: (a) between-group assessment factor (treated and waiting list control subjects), and (b) within-group factor assessment (pretreatment, posttreatment and follow-up measures). Self-report questionnaires and objective measures were obtained for both groups prior to treatment (pretreatment), and were

Table 1: Demographic characteristics of the treatment and waitlist groups prior to treatment

	TREATMENT	WAITLIST	TOTAL
AGE			
mean	37.0	36.0	
standard deviation	8.6	9.3	
SEX			
male	8	8	16
female	2	6	8
MARITAL STATUS			
married	6	5	11
single	2	5	7
divorced	0	2	2
defacto	2	2	4
OCCUPATIONAL STATUS			
construction	1	4	5
wood processing	2	0	2
retail/trade/business	2	3	5
agriculture/livestock	2	3	5
social services	3	4	7
EMPLOYMENT			
employed	2	3	5
unemployed			
less than 1 year	2	3	5
1 year-2 years	1	5	6
more than 2 years	5	3	8
BENEFIT			
none	1	1	2
Accident Compensation	8	9	17
Unemployment	0	2	2
Sickness	1	1	2
DPB	0	1	1
DURATION OF PAIN			
6-12 months	0	2	2
1 year-18 months	2	2	4
18 months-2 years	1	3	4
more than 2 years	7	7	14
TYPE OF PAIN			
constant	8	11	19
intermittent	2	3	5
SITE OF PAIN			
Back	10	14	24
Leg	8	11	19
MEDICATION			
none	6	8	14
analgesics	4	6	10

repeated subsequent to treatment (posttreatment) and at follow up. The follow-up period was 3 months posttreatment for the waitlist group and 6 months after treatment for the treatment group. Outcome measures were based on data obtained at pretreatment, posttreatment and follow-up

Issue of control

Ideally the effective evaluation of a treatment programme would utilise an experimental control group that received no interventions throughout the study. As ethical considerations prohibit the use of this design for this research, the alternative used in this study, although a weaker design, has ethical and practical utility.

Two forms of control were incorporated in the study to evaluate the influence of programme treatment. The first was the waitlist control group. This group yielded data for comparison with the treated group, effectively acting as a no-treatment group. However when the wait list control group underwent treatment at the subsequent programme it no longer functioned as a control group. Thus there was experimental control for the data obtained from the treatment group up until the waitlist group commenced treatment. This occurred six weeks after the treatment group completed its programme.

The second form of control was the use of a quasi-experimental time-series design which controlled the outcomes for the waitlist group. In the event of changes in the variables occuring post-intervention, the time series data from the extra pre- and post-assessments would be analysed to demonstrate that the changes occured at the time of the intervention and did not reflect the initial assessment, gradual changes occurring anyway or other processes which might invalidate the findings.

The time-series design required collection of quantitative data over a number of time periods preceding and following intervention. In the study the waitlist group were assessed on three occasions prior to treatment and on three occasions following treatment. This design is used almost exclusively by programme evaluators when a definite intervention occurs at a specific time (Posavac & Carey, 1985). Data obtained at different time intervals before treatment provides stable baseline measures from which to evaluate both changes and maintenance of change after treatment. Time-

series designs are thus able to control for the effect of random fluctuations due to maturation and reduce the chance that observed changes are due to non-programme variables. The time-series design used in this study, although it did not exert the same extent of control over research conditions as true experimental designs, is a valid alternative when ethical factors prohibit the use of a highly controlled design (Conrad & Maul, 1981).

PROCEDURE

Patients were assessed by the Rehabilitation Unit personnel as a standard procedure of the Unit. If patients were considered suitable for the back education programme, they were contacted by the Unit Co-ordinator and a booklet sent containing information about the programme together with information about the study protocol and a consent form to complete and return. Copies of these are contained in Appendix A. Patients were advised that should they decline to participate in the study, they would be allocated to a programme at a later time not being investigated for research purposes. No patients refused to participate in the study. When a signed consent form was received, patients were randomly assigned to either the treatment or waitlist group by the Rehabilitation Unit office personnel.

Conditions

Treatment

The treatment group was assessed a total of four times over a period of seven months (see Table 2). At the first assessment (pre-treatment) all the participants in the first back programme were brought into the Rehabilitation Unit a day prior to the commencement of the programme. The purpose and details of the study as displayed on the information sheet (refer Appendix A) were again presented to the subjects and queries dealt with.

Self-report questionnaires were given to each subject to complete (refer Appendix B). Only one patient required assistance in completing the questionnaire as he had some difficulty with reading. All subjects completed the questionnaires within 30 minutes. The Relative's Questionnaire was given to each patient to be completed by a family member or significant other and they were returned during the first week of the treatment programme (refer Appendix C).

Table 2: Procedural format of assessment for the treatment and waitlist groups

MONTH	SCHEDULE OF ASSESSMENTS	
	TREATMENT	WAITLIST
May	1 Pretreatment PAIN PROGRAMME BEGINS	1 Pretreatment
June	2 Post-treatment	2 Pretreatment
July	3 Follow-up	3 Pretreatment PAIN PROGRAMME BEGINS
August	No assessment	4 Post-treatment
September	No assessment	5 Follow-up
October	No assessment	No assessment
November	4 Follow-up	6 Follow-up

After the self-report measures had been completed, the patients were assessed by the Occupational Therapist for activities of daily living (refer Appendix D) and the Physiotherapist for functional ability (refer Appendix E). All assessment measures were completed for this group by early-afternoon prior to the commencement of the programme.

The back education programme commenced the following day and, upon completion three weeks' later, the patients were reassessed. The procedure was conducted in a similar manner to that for the first assessment.

When the third assessment was due to be scheduled, at 6-weeks posttreatment and prior to the commencement of the second treatment programme, subjects were contacted by an appointment letter together with appointment times available. Telephone contact was made if no reply had been received and an appointment made at this time. A confirmation-of-appointment letter followed plus the relevant self-report questionnaires to be completed. Copies of the appointment and confirmation-of-appointment letters are shown in Appendix F.

Subjects were requested to complete the mailed questionnaires 1-2 days prior to their appointment and to return them at the time of their assessment.

The experiences of previous assessments showed mailing out the questionnaires prior to the appointment date reduced the time to complete all measures from one hour to twenty minutes, and lessened the onerous task for those involved in data collection. The scheduling of appointments were made about 1-2 weeks in advance and it was not expected the self-report data would be contaminated by the difference in time of assessment. This arrangement was readily complied with by patients who were amenable to reducing the time required for appointments.

The fourth and final assessment, at six months follow-up, was conducted in the same manner as the third assessment.

Waitlist

The waitlist group was assessed three times while waiting for treatment and three times posttreatment. A total of six assessments were conducted over seven months (refer to Table 2 above).

Due to the constraints of the time-frame for assessments patients were contacted by telephone by the Co-ordinator of the Rehabilitation Unit when the first assessment was scheduled to be completed. All assessments of patients in the waitlist group were completed during the first week of the initial treatment programme.

At the first assessment patients were seen individually and the purpose of the research and study protocol were explained in order to reconfirm each patient's consent to participate in the study. Furthermore the patients were advised of their choice to continue seeing their physician, seek alternative treatment and continue with their medication. No patients refused to volunteer for the study. Patients were then given self-report questionnaires to complete and these were collected by the researcher. No patients required assistance in completing the questionnaires. Individual evaluation by the physiotherapist and occupational therapist were conducted. Collection of measures for each patient took one hour to complete.

The second assessment session was conducted in a similar manner to the first assessment, but due to the tight scheduling of assessments, patients were requested to complete the questionnaires at home and return them in a pre-paid envelope. Those who had not returned their questionnaires within the fortnight were contacted by the researcher.

The third and fourth assessments were conducted in a similar manner as for the treatment group's first and second assessment. Patients in the waitlist group were seen as a group prior to the commencement of the treatment programme and immediately after the programme had been completed for further collection of data.

The fifth (follow-up) session was by mailed questionnaire, six weeks after treatment. The questionnaires were completed and returned in the pre-paid reply envelope. Most patients returned their mailed questionnaires within the fortnight, and those not returned were followed up by the researcher.

At the final assessment, carried out three months after treatment, all patients were contacted by mail with an appointment letter and schedule of appointments available. Patients were individually evaluated by the physiotherapist and occupational therapist, and self-report measures gathered.

TABLE 3: Schedule of data collection for the treatment and waitlist groups

TREATMENT GROUP MEASURES AND TIME OF ADMINISTRATION					
1	2	3			4
Patient's measure BDI, PI, PDI, CSQ, PEI Physiotherapist LP,BP,LS,Flex,MS,SW Occupational ADL Spouse's measure SPDI	Patient's measure BDI, PI, PDI, CSQ, GSQ Physiotherapist LP,BP,LS,Flex,MS,SW Occupational ADL	Patient's measure BDI, PI, PDI, CSQ Physiotherapist LP,BP,LS,Flex,MS,SW Occupational ADL	No assessment	No assessment	Patient's measure BDI, PI, PDI, CSQ, PEI Physiotherapist LP,BP,LS,Flex,MS,SW Occupational ADL Spouse's measure SPDI
WAITLIST GROUP MEASURES AND TIME OF ADMINISTRATION					
1	2	3	4	5	6
Patient's measure BDI, PI, PDI, CSQ, Physiotherapist LP,BP,LS,Flex,MS,SW Occupational ADL Spouse's measure SPDI	Patient's measure BDI, PI, PDI, CSQ, Physiotherapist LP,BP,LS,Flex,MS,SW Occupational ADL	Patient's measure BDI, PI, PDI, CSQ, PEI Physiotherapist LP,BP,LS,Flex,MS,SW Occupational ADL	Patient's measure BDI, PI, PDI, CSQ, GSQ Physiotherapist LP,BP,LS,Flex,MS,SW Occupational ADL	Patient's measure BDI, PI, PDI	Patient's measure BDI, PI, PDI, CSQ, PEI Physiotherapist LP,BP,LS,Flex,MS,SW Occupational ADL Spouse's measure SPDI

Patient's measures - BDI=Beck Depression Inventory, PI=Pain Intensity, PDI=Pain Disability Index, CSQ=Cognitive Coping Strategies Questionnaire PEI=Pain Effect Inventory, GSQ=General Satisfaction Questionnaire

Physiotherapist measures - LP=Leg pain, BP=Back pain, LS=Lumber spine assessment, Flex=Flexibility measure, MS=Muscle strength measured on Oxford Scale, SW=Speed Walk

Occupational therapist measures - ADL=Activities of Daily Living

Spouse's measure - SPDI=Spouse's report on the Pain Disability Index

MEASURES

Nine self-report and three objective measures of physical functioning were used as outcome measures for this study. The schedule of data collection for each group at the different assessments is shown in Table 3. The same measures were used for both the treatment and waitlist groups although their administration varied depending on the time of assessment.

Other information obtained were corroboration of a self-report instrument (Relative's Questionnaire), demographic data and a measure of patient's level of satisfaction with the Back Education Programme. The respective instruments were colour-coded (patient, occupational therapist, physiotherapist and relative) for ease of administration and collation of material.

The decision to use the instruments in this present study were based on both the requirements of a repeated measures design and the need to assess a broad spectrum of treatment outcomes, including objective and subjective data. In view of the number of repeated testings in this study the instruments had to be as brief as possible, easy to administer and score. In addition the instruments had to be useful for a clinical population in an applied setting and have face validity for the client. These factors were crucial in encouraging client compliance and cooperation in completing all the required testings. Statistically, the instruments for a repeated measures design had to be robust and reliable in order to reduce measurement errors (Williams, 1988).

Demographic information

Demographic data were collected for each subject. These included their age, marital status, occupational status, duration of pain and medication intake. Copies of the demographic details obtained are contained in Appendix B, pages 2-3 of the booklet.

Patient's self-reports (blue booklet)

Previous research indicates that key measures for outcome studies are the degree to which pain interferes with daily physical functioning (Forydce, 1976; Roberts & Reinhardt, 1980) and subjective pain intensity (Aronoff et al., 1983; Fordyce, 1976). The instruments and their related constructs are listed below.

All the instruments employed were subjective self-report measures. They are listed in the order in which they appeared in the booklet presented to patients, and can be found in Appendix B, in order.

Construct	Instrument
1 Depression	Beck Depression Inventory (BDI)
2 Level of pain	Pain Intensity analogue scale
3 Pain disability	Pain Disability Index (PDI)
4 Coping	Cognitive Coping Strategies Questionnaire (CSQ)
5 Pain prediction	Pain Evaluation Index (PEI)

A detailed description of the psychometric properties of the patient's self-report questionnaires are reported below.

Beck Depression Inventory (BDI, Appendix B, pages 3-6 of the booklet)

Depression is frequently associated with chronic pain. The BDI is a clinical self-report test designed to measure the severity of depression and is the most widely used measure of depression since its development 25 years ago (Sundberg, 1992). The items were derived from clinical observations of symptoms displayed by clinically depressed psychiatric patients and infrequently by nondepressed psychiatric population (Beck, Ward, Mendelson, Mock & Erbaugh, 1961). The BDI consists of 21 items with a scale of 0-3, ranging from no complaints to severe complaints. The BDI is estimated to take an average person with a reading age level of 13 years 5-10 minutes to complete. Easily administered and scored, the ratings are: 0-9 within normal mood range; 10-18 mild-moderate depression; 19-29 moderate-severe depression; 30 plus extremely severe depression. Cognitive, affective, vegetative and somatic symptoms are assessed by the BDI.

Test-retest reliability for non-psychiatric samples range from 0.60-0.90 and the psychiatric samples range from 0.48-0.82 (Beck, Steer & Garbin, 1988; Conoley, 1992). Internal consistency for the psychiatric sample is 0.86 and 0.81 with non-psychiatric subjects. The concurrent and construct validity show mean correlations between the BDI and clinical ratings of depression in psychiatric samples at 0.72 and normals 0.60. Correlations with the MMPI-Depression, Zung Self-rating Depression Scale, Hopeless Scale and Hamilton Scale are moderate to high. The BDI is able to discriminate psychiatric patients from normals and dysthymic from major depressive disorders (Beck et al., 1988). It is also state-oriented, does not reflect earlier depressive episodes and reflects changes in depressive states over time, providing an objective measure of improvement resulting from treatment (Beck et al., 1961).

Pain Intensity (PI, Appendix B, page 6 of the booklet)

Pain Intensity is a subjective measure for the severity of pain, rated on an 11-point visual analogue scale (VAS). Increasing severity of pain is graded from 0 to 10, where '0' indicates 'no pain' and '10' 'pain as bad as it could be'. It has the advantage of simplicity and is one of the most sensitive scales for measuring pain compared to other methods (Huskisson, 1974). The psychometric properties of various pain intensity measures used with chronic low back pain patients were investigated by Strong, Ashton and Chant (1991). The VAS had a loading of 0.87 on pain intensity factor, and moderate to high correlation with the Box Scale (0.81) and the Numeric Rating Scale (0.81).

Most patients in chronic pain can easily understand the scale and consequently the VAS has a low rate of incorrect responses (Jensen, Karoly & Braver, 1986; Strong et al., 1991).

Pain Disability Index (PDI; Appendix B, pages 6-8 of the booklet)

The PDI is a brief measure of disability and the degree to which pain interferes with functioning in 7 broad categories of life activity; family/home responsibilities, recreation, social activity, occupation, sexual behaviour, self-care and life-support activity (Pollard, 1984). Increasing severity are rated on a scale of 0 to 10, where '0' indicates 'no disability' and '10' 'total disability'. An additional question relating to occupation category was included in the Pain Disability Index. As the level of unemployment is

considerable in the community, it was deemed necessary to consider the extent to which disability would interfere with obtaining employment if this option was available for the patient.

Internal consistency for the entire PDI was 0.86, although test-retest reliability showed significant random variation in the scores over a 2-month period (0.44) (Tait, Chibnall & Krause, 1990). Concurrent validity was demonstrated for high disability scorers and low disability scorers on psychological distress (BDI and Spielberger Trait Anxiety Inventory, $p < 0.001$), pain intensity ($p < 0.001$), and immobility (stop activities, lying down, staying in bed, $p < 0.001$). Construct validity was demonstrated in predicting behavioural indices of pain-related dysfunction ($p < 0.05$) (for example interference with activities, somatic symptoms, pain behaviours, satisfaction with life activities, employment status and education) (Tait et al., 1990).

Cognitive Coping Strategies Questionnaire (CSQ; Appendix B, pages 8-12 of the booklet)

It has been reported the coping strategies utilised by pain patients were associated with the level of distress described by patients (Turner & Clancy, 1986). The CSQ is a self-report measure designed to measure the extent to which coping strategies are utilised and the relationship this has with adjustment to pain (Rosenstiel & Keefe, 1983).

The CSQ lists 48 strategies for coping with pain. The 48 items were derived from experimental and clinical studies, and consist of 6 different cognitive techniques (diverting attention, reinterpreting pain sensations, coping self-statements, ignoring sensations, praying/hoping, and catastrophising), and 2 types of behavioural strategies (increased behavioural activities, and pain behaviours) (Rosenstiel & Keefe, 1983). Each of the 8 subscales contained 6 items in each subscale. Two additional measures of overall effectiveness rated by patients were; ability to control pain and ability to decrease pain. The items were rated on a scale from 0 to 6, with the frequency of strategies used increasing from '0' indicating 'never' to '6' 'always'.

The internal consistency for the items had a correlation range from 0.71 to 0.85, except for 'Increasing pain behaviours' which had a low correlation of 0.28 (Rosenstiel

& Keefe, 1983). Principal component analysis revealed three factors accounted for 68% of the variance in item responses (Rosenstiel & Keefe, 1983). Each of the factors (coping strategies used) was reported to be related to adjustment to a chronic pain problem (Keefe, Crisson, Urban & Williams, 1990). The three factors are:

Factor 1 - Cognitive Coping and Suppression. The subscales for factor 1 are reinterpreting pain sensations, coping self-statements and ignoring pain sensations. A high score on this factor suggest the patient is applying cognitive techniques to overcome pain. Regression analysis demonstrated subjects who scored high on this factor were more impaired functionally than those who scored low on this factor ($R = 0.18$) (Rosenstiel & Keefe, 1983).

Factor 2 - Helplessness. The subscales for the second CSQ factor are catastrophising, increasing behavioural activity, ability to control pain and ability to decrease pain. Individuals scoring high on this scale are prone to engage in catastrophising and report poorer ability to use coping strategies to deal with pain both cognitively and behaviourally, and are relatively inactive (Rosenstiel & Keefe, 1983). Regression analysis demonstrated patients who scored high on this factor are more depressed ($R = 0.38$) and anxious ($R = 0.34$) than low scorers (Rosenstiel & Keefe, 1983).

Factor 3 - Diverting Attention and Praying. The third CSQ factor subscales are diverting attention, and praying and hoping. Individuals scoring high on this factor demonstrated frequent application of these two strategies. Regression analysis demonstrated high scorers on this factor experience more pain ($R = 0.59$) and functional impairment ($R = 0.53$) than low scorers (Rosenstiel and Keefe, 1983).

The total proportion of the three coping factors were significant in predicting a relationship between adjustment on measures of depression (Zung Depression Scale, $R^2 = 0.47$), anxiety (State-Trait Anxiety Inventory, $R^2 = 0.22$), average pain (11-point analogue scale, $R^2 = 0.59$) and functional capacity (Functional Capacity Evaluation Scale, $R^2 = 0.65$) (Rosenstiel and Keefe, 1983).

Pain Effect Scale (PEI; Appendix B, pages 12-18 of the booklet)

The PEI assesses factors affecting response to treatment. This scale was developed by Malcolm Johnson and Keith Petrie for research purposes. It is a self-administered 72-item questionnaire which examined personality factors in pain behaviour and pain response.

Physiotherapist instruments (green booklet)

These instruments are standard measures of the Pain Education Programme and routinely used by the physiotherapists for examining the amount of disablement and in designing an exercise regime for rehabilitative purposes. Consequently the measures are particularly useful for the evaluation of treatment. The first three measures are subjective measures of disability (back and leg pain, and lumbar spine assessment), and the remaining three objective measures of functioning (flexibility, speed walk and muscle strength). The instruments chosen for analysis were those that yielded quantitative data and were pertinent to the study.

The outcome measures are presented in the order as they appeared in the booklet, and are contained in Appendix E.

Purpose	Instruments
1 Back pain	Back pain analogue scale (BP)
2 Leg pain	Leg pain analogue scale (LP)
3 Functioning	Lumber Spine Assessment (LS)
4 Flexibility	Range of Movements - Active and Passive (Flex)
5 Mobility	Timed speed walk for 8.43 metres (SW)
6 Muscle strength	Oxford Scale (MS)

Back pain and leg pain (BP and LP; Appendix E, page 2 of the booklet)

The scales for back pain and leg pain were similar and are discussed jointly. Increasing severity of back pain and leg pain are rated on an 11-point visual analogue scale, where '0' represents 'No pain' and '10' indicates 'Worst possible'. The psychometric properties of the visual analogue scales have been discussed under Patient's Self-reports and need not be reiterated.

Lumber spine assessment (LS; Appendix E, pages 2-3 of the booklet)
This instrument is used by the MacKenzie Institute (International) for the assessment of functioning. It is a subjective report of present functioning in seven categories of spinal activity and posture. The measure has diagnostic utility and is sensitive to change over time. The ratings range from 0 to 6 with increasing disablement, where '0' indicates 'No pain' and '6' 'Worst possible'.

Range of movements - Active and Passive (Flex; Appendix E, page 5)
This is a measure of flexibility of the muscles and joints at the hips and lumber spine, and are assessed for active and passive movements. The active assessment requires the patient to initiate movement at the hips by touching their toes. Ratings on the level of flexibility range from '0' indicating no disability (having full range of movement indicated by touching to the floor), '1' minimal restriction (indicated by an ability to bend to the knees), '2' moderate restriction (only able to touch above the knees), and '3' major restriction (an inability to bend forward at the hips and waist).

The passive movements are movements of the limb performed by the physiotherapist while the patient is prone. The range of muscular flexibility and movements of the hip and leg are rated by the degree of flexion in that limb. The amount of flexion range from 0 to 3 where '0' indicate normal range of movements, '1' indicates minimal restriction with 90 degree angle flexion, '2' moderate restriction with 60 degree angle flexion, and '3' major restriction with only 45 degree angle flexion and very little range of movement.

Speed walk (SW; Appendix E, page 5 of the booklet)
Patients were instructed to walk a premeasured area (8.43 metres) as quickly, but as comfortably, as they could and their time to complete the distance recorded.

Muscle strength (MS; Appendix E, page 6 of the booklet)
The Oxford Scale is an internationally recognised assessment of muscle strength and its endurance. The ratings range from Grade 1 'No movement or contraction' to Grade 5 'Normal functioning' of the muscle. Assessment of muscle functioning involve performance of agonist, antagonist, synergist and fixator muscle action as well as isometric and isotonic movements. Grade 1-2 required movements that had no

resistance to gravity. Grade 3-5 necessitate performance of movement against the resistance of gravity. A rating of 5 indicated the capability to endure normal daily activities.

Occupational Therapist instrument (pink booklet)

The Activities of Daily Living (ADL) is a standard measure used in the Back Education Programme. It is a subjective measure completed with the assistance of the occupational therapist. A copy of the instrument can be found in Appendix D, pages 1-2.

Construct	Instrument
Every day activity	Activities of Daily Living (ADL)

The 18 items in the ADL are derived from activities regarded as standard functioning for normal living. These activities are rated on a scale of 0 to 3, where '0' = 'does not apply','1' = 'yes easily', '2' = 'sometimes difficult', and '3' = 'not at all'.

Spouse's measure (buff booklet)

Previous studies suggested chronic pain patients were not reliable in reporting self-activities and tended to distort their level of disability in a negative direction (Aronoff et al., 1983; Sanders, 1980). Turner and Chapman (1982) recommended obtaining ratings of patient's pain behaviours from others such as family members. In accordance with these views, corroboration of patient's report on the Pain Disability Index (PDI) was obtained from their spouse/partner or a significant other. A copy of the questionnaire is contained in Appendix C. The psychometric properties of the PDI have already been discussed above in Patient's Self-Report.

Patient's satisfaction with Back Education Programme

Feedback from patients on the benefits of the various activities in the pain management programme was gained using the General Satisfaction Questionnaire. The instrument was developed specifically for this programme and was administered immediately after the completion of treatment. The activities were rated on a scale of 0 to 6, where '0' indicated 'no benefit at all', and '6' 'very beneficial'. In addition patients were given the opportunity to record why they believed the activities were or

were not of benefit to them, suggestions for inclusion of areas not covered in the programme, improvements to the programme, how they rated their overall improvement, and any other comments they wished to include. A copy of this instrument is found in Appendix G.

STATISTICAL ANALYSES

The Statistical Package for the Social Sciences, SPSS/PC (SPSS, 1990) was used in analysing the data collected. SPSS/PC is a comprehensive and flexible data analysis system for statistical analysis and reporting. The following analyses were used:

1 Descriptive analysis using *t*-test and chi-square statistics to compare the equivalence of the two groups (treatment and waitlist) on demographic details, symptom presentation, functional impairment and psychological state prior to treatment.

2 Bivariate analysis using Pearson's product-moment correlation coefficients to examine the intercorrelation among the variables on the PDI as reported by patients and their spouse.

3 Reliability analysis using Cronbach's alpha to examine the internal consistency of the General Satisfaction Questionnaire (GSQ) and descriptive statistics to summarise the means and standard deviations of patient's response to each item in the GSQ.

4 Multivariate analyses of variance (MANOVA) for outcome measures were carried out. Each of the outcome measures was statistically examined by repeated measures analysis using the General Linear Models Procedure in SPSS.PC MANOVA. This procedure allows simultaneous analysis of multiple dependent and multiple independent variables (Tabachnick & Fidell, 1989). On some measures the total number of subjects was reduced to 23 as cases with missing data were deleted from analysis; however the SPSS.PC package used allowed for such omissions in analysis.

Two types of multivariate analyses were used for this study. The rationale for this was because the number of subjects in each group was small and significant effects may not be demonstrated. Hence the second analysis was undertaken.

Comparison analysis of treatment and waitlist groups

Data from the treatment group were compared with data from the waitlist group obtained at pretreatment, posttreatment (Assessment 2), and follow-up assessments. The outcome measures were entered into a 2 (Treatment) x 3 (Assessment) repeated measures analysis of variance. This repeated measures analysis examines the changes in each dependent measure by time of assessments (pretreatment, posttreatment, and follow-up) which is a within-subjects effect, comparison of treatment and non-treatment, a between-subjects effect, as well as the effect of interaction of time and treatment group.

The schedule of assessments used in this study for comparing the two groups is shown in Table 4. The between-group design has the advantage of not only evaluating before and after treatment effects but comparison with a no-treatment group enhances inferences of cause-and-effect of treatment-related changes if significant differences are found (Conrad & Maul, 1981). In addition, three planned comparisons were conducted. The first comparison contrasted mean scores taken at pretest to mean scores taken at the second assessment (Assessment 2) to assess the immediate effect of the programme after treatment on the functioning of patients. A second comparison contrasted mean scores at Assessment 2 to mean scores at follow-up to determine whether improvements from the programme were maintained after treatment. The third comparison contrasted mean scores at pretest to mean scores at follow-up assessments.

Single group analysis

The second analysis combined the outcome measures for treatment and waitlist groups at pretreatment, posttreatment and follow-up assessments, thus treating the two groups as a single (within) group design. The analysis for the single group design is displayed in Table 5. Each of the outcome measures

was entered into a 1 (Treatment) x 3 (Assessment) repeated measures in SPSS.PC MANOVA. Examination of results from this second analysis was undertaken if the null hypothesis for the time of assessment was not rejected from the first analysis. Only significant findings are reported.

Although this design is not as powerful in inferring cause-and-effect of treatment effects, a within group design reduces error of confounding variables caused by individual differences (Conrad & Maul, 1981). It is thus able to detect any significant effect that the independent variable has on dependent variables. Further analyses of the time series data would follow if significant effects were found.

As the MANOVA demonstrated few changes between pre- and posttest for the comparison group, the time series data from the additional assessments were not needed to demonstrate that the changes were due to the intervention and therefore were not analysed.

Table 4: Schedule of assessments used for MANOVA repeated measures for the treatment group and waitlist group

REPEATED MEASURES OF ANALYSIS: COMPARISON OF OUTCOME MEASURES FOR THE TREATMENT GROUP AND WAITLIST GROUP AT PRETEST, ASSESSMENT 2 AND FOLLOW-UP ASSESSMENTS (SHADED) (bracketed assessments are schedules of measures taken for the treatment group and waitlist group)						
GROUP	**PRETEST**	**ASSESSMENT 2**				**FOLLOW-UP**
Treatment	1 (Pretest)	2 (Posttest)	3 (Posttest)			4 (Follow-up)
Waitlist	1 (Pretest)	2 (Pretest)	3 (Pretest)	4 (Posttest)	5 (Posttest)	6 (Follow-up)

Table 5: Schedule of assessments used for single group MANOVA at pretreatment, posttreatment and follow-up

REPEATED MEASURES OF ANALYSIS: SINGLE GROUP ANALYSIS (COMBINED TREATMENT AND WAITLIST GROUPS) AT PRETEST, POSTTEST AND FOLLOW-UP (SHADED)						
Treatment	1 **PRETEST**	2 **POSTTEST**	3 (Posttest)			4 **FOLLOW-UP**
Waitlist	1 (Pretest)	2 (Pretest)	3 **PRETEST**	4 **POSTTEST**	5 (Posttest)	6 **FOLLOW-UP**

CHAPTER 8
RESULTS

COMPARISON OF THE TREATMENT AND WAITLIST GROUPS AT PRETREATMENT USING CHI-SQUARE AND *t*-TEST ANALYSES

Demographic characteristics

Demographic characteristics of subjects in the treatment and waitlist groups were compared to assess the equivalence of the two groups before treatment. As shown in Table 6 chi-square analyses revealed no statistically significant differences between the two groups in terms of demographic characteristics, indicating there were no differences between the two groups in demographic status prior to treatment.

Table 6: Chi-square analysis of demographic data of patients in the treatment[a] and wait-list[b] groups

DEMOGRAPHIC DATA	Chi-square analyses		
	df	$\underline{x}^2$	$\underline{p}$ =
Sex	1	0.54	.46
Marital status	3	2.79	.43
Length of unemployment	5	5.18	.39
Occupational status	5	5.63	.34
Benefit status	4	2.46	.65
Length of pain	3	2.40	.49
Pain status	1	0.01	.93
Back pain	6	8.9	.18
Leg pain	6	6.03	.42
Medication	1	0.01	.94

[a] Number of patients in treatment group = 10
[b] Number of patients in the waitlist group = 14

t-test analysis of psychometric measures

Additional analyses were conducted to determine if differences on outcome measures existed between the treatment and waitlist groups prior to treatment. *t*-test analyses were computed for the self-report measures of Pain Disability Index (PDI), Beck Depression Inventory (BDI), and Activities of Daily Living (ADL). These analyses compared the mean scores of the treatment and waitlist groups on each of the measures and examined if there are any significant differences between them. As displayed in Table 7, no significant differences were found for the self-report measures (PDI, BDI and ADL). The mean scores for the outcome measures are also shown in Table 7.

Table 7: *t*-test analyses of the mean scores and standard deviation on the PDI, BDI and ADL for the treatment and waitlist groups at pretreatment

OUTCOME MEASURES	t(22)	TREATMENT number = 10		Waitlist number = 14	
		mean score	standard deviation	mean score	standard deviation
PDI	0.18	51.2	12.8	50.4	12.0
BDI	1.12	15.8	5.8	19.2	8.3
ADL	0.37	1.6	0.4	1.6	0.3

MULTIVARIATE ANALYSIS OF VARIANCE (MANOVA) OF OUTCOME MEASURES

The purpose of the statistical analysis was to simultaneously analyse data obtained from the treatment group at pretreatment, posttreatment and follow-up assessments with assessment data from the waitlist group in order to evaluate treatment effects on a variety of outcome measures. To reiterate, as previously discussed in the Method section, if a significant effect was found three planned comparisons would be conducted. The first comparison contrasted mean scores at pretest to mean scores at Assessment 2 for the treated and waitlist patients. The second planned comparison contrasted mean scores taken at the second assessment to mean scores obtained at follow-up assessment, and the third comparison contrasted mean scores from pretreatment to mean scores at follow-up for both groups.

Furthermore, a second analysis would be conducted if a significant main effect for time of assessment was found. The treatment and waitlist control groups would be combined into a single-group design and a statistical analysis carried out on the pretreatment, postreatment and follow-up assessments.

The outcome measures were self-report measures: Cognitive Coping Strategies Questionnaire (CSQ), Beck Depression Inventory (BDI), Activities of Daily Living (ADL), Pain Disability Index (PDI), back pain (BP), and leg pain (LP), and lumber spine functioning (LS); and functional measures: flexibility (Flex), speed walk (SW), and muscle strength (MS).

Analysis of the pain intensity (PI) 11-point visual analogue scale was not carried out as full data were not available for all three assessments. Correlational analysis with the Pearson Product-Moment Correlation found a significant relationship between back pain and pain intensity ($r(25) = 0.5922$ one tailed, $p < 0.01$), and thus back pain was used in the analysis instead of pain intensity.

Cognitive Coping Strategies Questionnaire (CSQ)

Patients' scores on the CSQ were converted to three factor scores as identified by Rosenstiel & Keefe (1983). The three CSQ factors (a) Cognitive Coping and Suppression, (b) Helplessness, and (c) Diverting Attention were analysed separately.

(a) Cognitive coping and suppression - A significant effect for group was demonstrated ($F(1,21) = 11.98$, $p = 0.002$), as displayed in Table 8. The first planned comparison demonstrated a significant difference between the treatment and waitlist groups ($F(1,21) = 15.46$, $p = 0.001$) at pretreatment to assessment 2. The second planned comparison revealed a significant effect ($F(1,21) = 7.19$, $p = 0.014$) at Assessment 2 to follow-up. The third planned comparison demonstrated a significant difference between the two groups ($F(1,21) = 11.63$, $p = 0.003$) from pretreatment to follow-up assessments. The results indicate the groups remained significantly different in the use of cognitive coping and suppression strategies throughout the assessments, the treatment group used cognitive strategies more frequently than the waitlist group.

There was no significant main effect for time of assessment (F (2,42) = 2.42, ns). The group by assessment interaction approached significance (F (2,42) = 3.12, p = 0.054).

Table 8: Repeated measures analysis of variance: main effect of group for mean scores on the 'Cognitive Coping and Suppression'[a] subscale of the CSQ

F	Pretreatment		Assessment 2		Follow-up	
15.46*	mean	sd	mean	sd	mean	sd
treatment n=10	3.32	0.81	3.09	1.23	2.51	1.22
waitlist n=13	1.94	0.75	1.71	0.85	1.94	0.63

*p = 0.001
[a] Interpretation of CSQ scores:
0 = Never use that strategy; 3 = Sometimes do that; 6 = Always use it

(b) Helplessness - Neither the main effect for time of assessment (F (2,42) = 2.69, ns) nor the main effect for the group (F (1,21) = 3.18, ns) were found to be significant. The group by assessment interaction (F (2,42) = 0.04, ns) was also non-significant. The mean scores and standard deviation for both groups are shown in Table 9.

Table 9: Mean scores and standard deviation on the 'Helplessness'[a] subscale of the CSQ for the treatment and waitlist groups

GROUP	Pretreatment		Assessment 2		Follow-up	
	mean	sd	mean	sd	mean	sd
treatment n=10	2.69	0.96	2.55	0.67	2.30	0.44
waitlist n=13	2.30	0.35	2.14	0.65	1.97	0.72

[a] Interpretation of CSQ scores:
0 = Never use that strategy; 3 = Sometimes do that; 6 = Always use it

(c) Diverting attention and praying - Neither the main effect for time of assessment (F (2,42) = 2.00, ns), the main effect for the group (F (1,21) = 3.52, ns), nor the group by assessment interaction (F (2,42) = 1.17, ns) were found to be significant. The mean scores and standard deviation for the groups are shown in Table 10.

Table 10: Mean scores and standard deviation on the 'Diverting attention and praying'[a] subscale of the CSQ for the treatment and waitlist groups

GROUP	Pretreatment		Assessment 2		Follow-up	
	mean	sd	mean	sd	mean	sd
treatment n=10	1.83	0.86	1.65	0.60	1.37	0.50
waitlist n=13	1.20	0.48	1.30	0.66	1.15	0.65

[a] Interpretation of CSQ scores:
0 = Never use that strategy; 3 = Sometimes do that; 6 = Always use it

Beck Depression Inventory (BDI)

No main effect for group was found (F (1,21) = 0.24, p = 0.7). As shown in Table 11, a main effect for time of assessment was demonstrated (F(2,44) = 5.72, p < 0.01). The first planned comparison demonstrated a significant time effect from pretest to Assessment 2 (F (1,21) = 8.79, p < 0.007) with a decrease in mean BDI ratings for both groups. The second planned comparison demonstrated no significant changes at follow-up (F (1,21) = 0.36, ns). The third planned comparison demonstrated a significant difference for mean scores on the BDI at follow-up (F (1,22) = 8.77, p = 0.007) compared to pretreatment mean scores, indicating patients' depressive symptoms had reduced from their pretreatment levels.

As the main effect for time of assessment was significant, the second MANOVA analysis which combined the treatment and waitlist groups into a single-group analysis was carried out. As shown in Table 12, a significant effect for treatment (F (2,46) = 6.87, p = 0.002) was demonstrated, and this difference was maintained at the follow-up assessment.

Table 11: Repeated measures analysis of variance: main effect for time of assessments for mean scores on the Beck Depression Inventory[a] for the treatment and waitlist groups

F	Pretreatment		Assessment 2		Follow-up	
5.72*	mean	sd	mean	sd	mean	sd
treatment n=10	15.8	5.8	12.08	6.3	14.39	7.2
waitlist n=13	18.6	8.3	15.83	8.3	11.59	3.5

*$p < 0.01$
[a] Interpretation of BDI scores:
0-9 = normal; 10-18 = mild-moderate depression; 19-29 = moderate-severe depression; > 30 = extremely severe depression

Table 12: Single-group repeated measures analysis of variance: main effect for time of assessment for mean scores on the Beck Depression Inventory[a] at pretreatment, posttreatment and follow-up

F	Pretreatment number = 24		Posttreatment number = 24		Follow-up number = 24	
6.87*	mean	sd	mean	sd	mean	sd
	17.79	7.46	13.78	7.88	13.48	6.26

*$p = 0.002$
[a] Interpretation of BDI scores:
0-9 = normal; 10-18 = mild-moderate depression; 19-29 = moderate-severe depression; > 30 = extremely severe depression

In addition to the main effect for time of assessment, Figure 1 shows the significant group by assessment interaction ($F(2,42) = 3.54$, $p < 0.05$). The first planned comparison revealed no significant effect for group by assessment interaction ($F(1,21) = 0.12$, $p < 0.8$) from pretest to Assessment 2. The second planned comparison revealed significant interaction effect on mean BDI scores for both groups at follow-up ($F(1,21) = 4.78$, $p < 0.05$). The treatment group increased their mean BDI ratings at follow-up while the waitlist group continued to show a decrease in their mean BDI scores. No significant interaction effect of group by assessment was demonstrated at the third planned comparison ($F(1,22) = 0.14$, $p < 0.8$), from pretreatment to follow-up assessments.

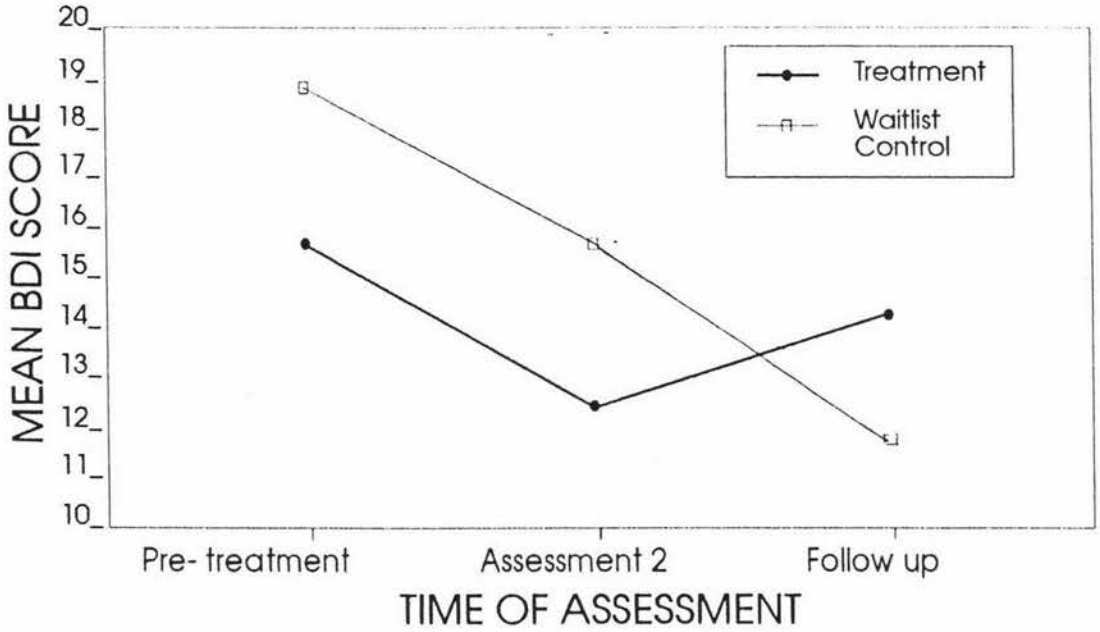

Figure 1: Repeated measures analysis of variance: main interaction effect of group by assessment on mean scores on the Beck Depression Inventory for the treatment and waitlist groups

Activities of Daily Living (ADL)

A main effect for time of assessment revealed significant differences ($F(2,44) = 4.35$, $p = 0.019$), as shown in Table 13. The first planned comparison revealed ADL mean ratings approached significance from pretest to Assessment 2 ($F(1,22) = 3.71$, $p < 0.07$), with ADL mean scores for both groups demonstrating a reduction in impairment of functioning. However ADL mean scores increased for both the treated and waitlist groups at follow-up and these changes were significant ($F(1,22) = 8.40$, $p < 0.01$). The third planned comparison was non-significant for mean ADL scores at pretreatment and follow-up ($F(1,22) = 0.95$, ns), indicating a return to baseline levels for both groups.

Table 13: Repeated measures analysis of variance: main effect of time on mean scores for Activities of Daily Living (ADL)[a] for the treatment and waitlist groups

F	Pretreatment		Assessment 2		Follow-up	
4.35*	mean	sd	mean	sd	mean	sd
treatment n=10	1.63	0.38	1.52	0.37	1.76	0.33
waitlist n=14	1.68	0.26	1.56	0.33	1.68	0.37

*p = 0.019
[a] Interpretation of ADL scores: Can you manage the following activities?
0 = does not apply; 1 = yes, easily; 2 = sometimes difficult; 3 = not at all

The second MANOVA analysis, combining the treatment and waitlist groups into a single-group design, was not significant (F (2,46) = 0.33, ns). The mean scores and standard deviation for the Activities of Daily Living (ADL) are shown in Table 14.

Table 14: Single-group repeated measures analysis of variance: main effect for time of assessment for mean scores on the Activities of Daily Living[a] at pretreatment, posttreatment and follow-up

F	Pretreatment number = 24		Posttreatment number = 24		Follow-up number = 24	
0.723	mean	sd	mean	sd	mean	sd
	1.66	0.31	1.68	0.35	1.71	0.35

[a] Interpretation of ADL scores: Can you manage the following activities?
0 = does not apply; 1 = yes, easily; 2 = sometimes difficult; 3 = not at all

The main effect for group (F (1,22) = 0.00, ns) and the group by assessment interaction (F (2,44) = 0.65, ns) were non-significant.

Pain Disability Index (PDI)

The main effect for time of assessment (F (2,42) = 0.82, ns), the main effect for group (F (1,21) = 0.04, ns), and the group by assessment interaction (F (2,42) = 0.49, ns) were not significant. The mean PDI scores and standard deviation for the groups are shown in Table 15.

Table 15: Mean scores and standard deviation on the PDI[a] for the treatment and waitlist groups

GROUP	Pretreatment		Assessment 2		Follow-up	
	mean	sd	mean	sd	mean	sd
treatment n=10	51.2	13.0	48.3	13.0	49.9	13.4
waitlist n=14	50.2	12.4	49.1	14.6	46.7	17.1

[a] Interpretation of PDI scores (Pollard, 1984):
Low disability = 19 High disability = 55

Back pain (BP)

No significant main effect for group (F (1,22) = 2.65, ns) and the group by assessment interaction (F (2,44) = 0.15, ns) were found. The main effect for time of assessment approached significance (F (2,44) = 3.02, p = 0.059), as shown in Table 16. The first planned comparison showed patients' mean back pain scores decreased from pretest to Assessment 2 (F (1,22) = 9.65, $p < 0.005$). The second planned comparison showed no significant changes from Assessment 2 to follow-up (F (1,22) = 1.37, ns). The third planned comparison revealed no significant effect at follow-up (F (1,22) = 1.93, ns), indicating a return to baseline levels for both groups.

Table 16: Repeated measures analysis of variance: main effect for time of assessment on mean scores for back pain[a] for the treatment and waitlist groups

F	Pretreatment		Assessment 2		Follow-up	
3.02*	mean	sd	mean	sd	mean	sd
treatment n=10	7.70	1.70	6.90	1.52	7.20	1.40
waitlist n=14	7.00	1.80	5.79	1.76	6.43	1.91

*p = 0.059
[a] Interpretation of back pain visual analogue scale:
0 = no pain 10 = worst possible pain

The second MANOVA analysis, which combined the treatment and waitlist groups into a single-group analysis, showed a significant effect for time of assessment ($F(2,46) = 4.92$, $p < 0.012$), as shown in Table 17.

The first planned comparison demonstrated a significant effect ($F(1,23) = 11.10$, $p = 0.003$) at pretreatment to posttreatment, indicating a decrease in back pain after treatment. The second planned comparison revealed marginal significance ($F(1,23) = 3.96$, $p = 0.059$) from posttreatment to follow-up, indicating an increase in pain reports. The third comparison revealed no significant difference ($F(1,23) = 1.33$, ns) for pretreatment to follow-up assessments, indicating a return to baseline scores.

Table 17: Single-group repeated measures analysis of variance: main effect for time of assessment for mean scores on back pain[a] at pretreatment, posttreatment and follow-up

F	Pretreatment number = 24		Posttreatment number = 24		Follow-up number = 24	
4.92*	mean	sd	mean	sd	mean	sd
	7.29	1.76	6.00	1.82	6.75	1.73

*p < 0.012
[a] Interpretation of back pain visual analogue scale:
0 = no pain 10 = worst possible pain

Leg pain (LP)

No significant main effect for time of assessment (F (2,44) = 0.53, ns), for the main effect of group (F (1,22) = 1.30, ns), or for the group by assessment interaction (F (2,44) = 2.09, ns) were found. The mean scores and standard deviation for leg pain are displayed in Table 18.

Table 18: Mean scores and standard deviation for leg pain[a] for the treatment and waitlist groups

GROUP	Pretreatment		Assessment 2		Follow-up	
	mean	sd	mean	sd	mean	sd
treatment n=10	5.00	2.87	5.00	2.79	6.00	3.33
waitlist n=14	5.29	3.54	3.86	2.96	3.43	3.01

[a] Interpretation of leg pain visual analogue scale: 0 = no pain 10 = worst possible pain

Lumber spine functioning (LS)

No significant differences for the main effect of group (F (1,22) = 1.00, ns), for time of assessments (F (2,44) = 0.57, ns), and group by assessment interaction (F (2,44) = 0.69, ns) were demonstrated. Mean scores for the two groups remained constant throughout the three assessment periods, suggesting no treatment-related changes occurred. The mean scores and standard deviation for the groups are shown in Table 19.

Table 19: Mean scores and standard deviation for lumber spine functioning[a] for the treatment and waitlist groups

GROUP	Pretreatment		Assessment 2		Follow-up	
	mean	sd	mean	sd	mean	sd
treatment n=10	3.58	1.25	3.80	0.92	3.48	1.16
waitlist n=14	3.12	0.85	3.32	0.92	3.40	0.92

[a] Interpretation of LS scale: 0 = no pain 6 = worst possible pain

Flexibility (Flex)

No significant main effect for group (F (1,22) = 0.17, ns), for time of assessments (F (2,44) = 2.20, ns), and group by assessment interaction (F (2,44) = 2.20, ns) were found. Mean scores on this functional measure remained consistent throughout the three assessment periods, suggesting no treatment-related changes. The mean scores and standard deviation for the groups are displayed in Table 20.

Table 20: Mean scores and standard deviation for flexibility[a] for the treatment and waitlist groups

GROUP	Pretreatment		Assessment 2		Follow-up	
	mean	sd	mean	sd	mean	sd
treatment n=10	1.67	0.50	1.93	0.75	1.59	0.62
waitlist n=14	1.57	0.52	1.65	0.62	1.69	0.68

[a] Interpretation of flexibility ratings: 0 = nil; 1 = minimal; 2 = moderate; 3 = major

Speed walk (SW)

No significant main effect for group (F (1,22) = 2.77, ns), main effect for time of assessments (F (2,44) = 0.86, ns), and group by assessment interaction (F (2,44) = 0.15, ns) were demonstrated. The mean time in seconds and standard deviation for the speed walk are displayed in Table 21.

Table 21: Mean time in seconds and standard deviation for speed walk for the treatment and waitlist groups

GROUP	Pretreatment		Assessment 2		Follow-up	
	mean	sd	mean	sd	mean	sd
treatment n=10	74.1	18.6	77.6	18.3	73.2	17.1
waitlist n=14	64.3	15.1	66.1	14.7	64.4	14.4

Muscle strength (MS)

High scores on the Oxford Scale correlate with normal muscle functioning. No significant differences for main effect of group (F (1,22) = 2.52, ns) were demonstrated. A significant effect for time of assessment was demonstrated (F (2,44) = 3.38, p = 0.043), as shown on Table 22.

The first planned comparison (F (1,22) = 0.7, ns) and second planned comparison (F (1,22) = 2.76, ns) revealed no significant effects. The third planned comparison revealed a significant effect (F (1,22) = 7.00, p = 0.015) from pretest to follow-up assessments, indicating a decrease in muscle functioning from baseline data.

Table 22: Repeated measures analysis of variance: main effect for time of assessments on mean scores on the Oxford Scale[a] for the treatment and waitlist groups

F	Pretreatment		Assessment 2		Follow-up	
3.38*	mean	sd	mean	sd	mean	sd
treatment n=10	4.13	0.42	4.20	0.61	3.83	0.36
waitlist n=14	3.95	0.39	3.74	0.32	3.81	0.38

*p = 0.043

[a] Interpretation of Oxford Scale score: 0 = nothing; 1 = flicker; 2 = gravity eliminated; 3 = against gravity; 4 = gravity plus resistance; 5 = normal

The second MANOVA analysis of the single-group design showed no significant effect for treatment (F (2,46) = 2.71, p = 0.077), as shown in Table 23.

Table 23: Single-group repeated measures analysis of variance: main effect for time of assessment for mean scores on the Oxford Scale[a] at pretreatment, posttreatment and follow-up

F	Pretreatment number = 24		Posttreatment number = 24		Follow-up number = 24	
2.71	mean	sd	mean	sd	mean	sd
	4.03	0.31	3.89	0.47	3.82	0.37

[a] Interpretation of Oxford Scale score: 0 = nothing; 1 = flicker; 2 = gravity eliminated; 3 = against gravity; 4 = gravity plus resistance; 5 = normal

A significant group by assessment interaction was demonstrated ($F(2,44) = 3.29$, $p < 0.047$), and is shown in Figure 2. The first planned comparison revealed no significant changes for the two groups in muscle functioning from pretest to Assessment 2 ($F(1,22) = 2.62$, ns). The second planned comparison found significant group by assessment effect at follow-up examination ($F(1,22) = 6.01$, $p < 0.025$), indicating the treated group had decreased in muscle strength compared to the waitlist group. The third planned comparison revealed no significant differences between the two groups at pretest and follow-up assessments ($F(1,22) = 0.89$, $p = 0.36$), indicating a return to baseline data.

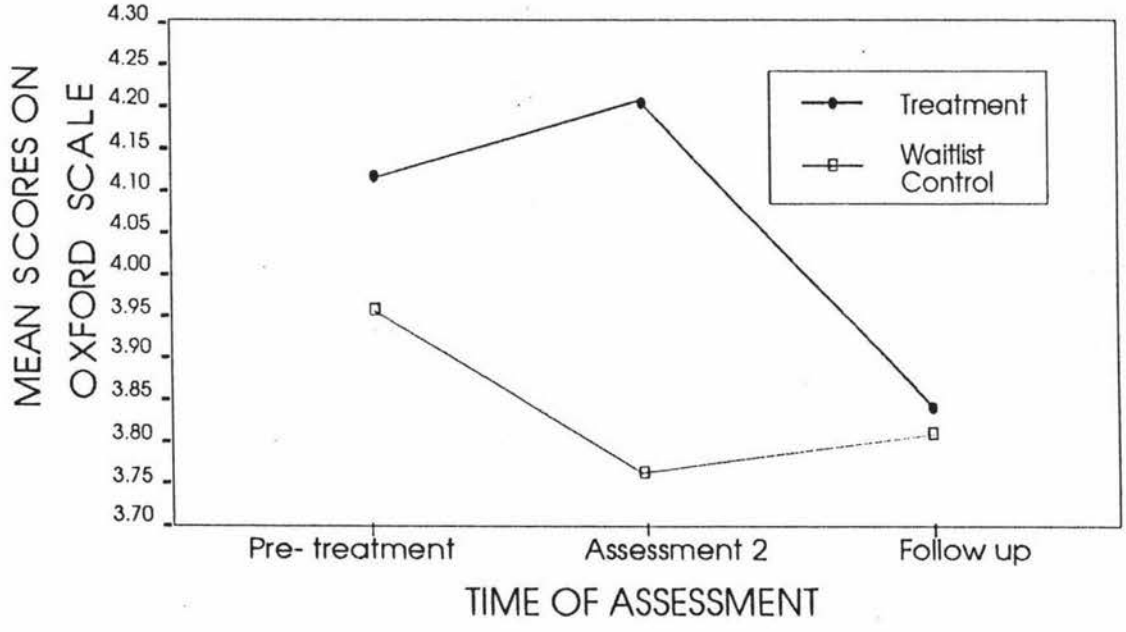

Figure 2: Repeated measures analysis of variance: main interaction effect of group by assessment on mean scores for the Oxford Scale for the treatment and waitlist groups

BIVARIATE ANALYSIS OF PATIENT AND CORROBORATIVE REPORT ON PAIN-RELATED DISABILITY

Relationship of significant other to patient

Twenty-three corroborative reports were obtained as one subject in the waitlist group was unable to nominate a significant other to complete the questionnaire. The most frequent 'Significant Other' nominated was the spouse or a de facto partner (60.9%). Other family members, such as a parent or sibling, were occasionaly selected (30.4%), with friends the least chosen (8.7%) as a 'Significant Other'. Although no patients in the treatment group nominated 'Friend' as a significant other, there appeared to be few differences in the choice of 'Significant Other' between the treatment group and waitlist group. The relationship of 'Significant Other' to the patients is displayed in Table 24.

Table 24: Relationship of 'Significant other' to patients in the treatment and waitlist groups

SIGNIFICANT OTHER	TREATMENT		WAITLIST		TOTAL	
	No.	%	No.	%	No.	%
Partner (spouse/defacto)	7	70	7	53.8	14	60.9
Other family members (such as parent and sibling)	3	30	4	30.8	7	30.4
Other (friend)	0	0	2	15.4	2	8.7
TOTAL	10	100	13	100	23	100

Correlation between self-report and significant other report on the PDI

Correlational relationship between self-reported disability and 'significant other's' report on the Pain Disability Index (PDI) were analysed by Pearson's product-moment correlation coefficient. There was no significant correlation between self-reported ratings and significant other's rating on the total mean PDI scores ($r = 0.4790$, ns). As shown in Table 25, patients' rated their pain-related disability as higher on the PDI scale compared to significant others' rating on the same questionnaire.

Table 25: Pearson's product-moment correlation coefficient of mean scores on the PDI[a] for patients and significant others at pretreatment

	mean score	standard deviation
Patients (n = 24)	50.68	12.06
Significant other (n = 23)	47.65	15.8
r = 0.479, ns		

[a] Interpretation of PDI scores (Pollard, 1984):
Low disability = 19; High disability = 55

As there was no correlation between patients' and significant others' total mean scores on the PDI, each of the seven subcategories within the PDI scale were analysed to examine if any significant correlations existed between the subscales. The mean scores and standard deviation for each of the subcategories are shown in Table 26. All the seven life activities were rated higher by the patients compared with the significant other ratings. This indicated the patients perceived themselves as more disabled in all areas of their everyday functioning.

Table 26: Mean scores and standard deviation for patients and significant others on the seven subcategories of the PDI

LIFE ACTIVITY	PATIENTS		SIGNIFICANT OTHER	
	mean score	standard deviation	mean score	standard deviation
Family	52.32	15.84	50.8	16.80
Recreation	62.96	12.96	59.28	19.68
Social	48.00	20.96	41.04	21.92
Occupation (a)	59.68	16.32	57.84	18.48
Occupation (b)	61.68	17.76	58.40	19.20
Sexual	51.04	21.12	48.88	23.84
Self-care	38.00	16.40	32.72	18.32
Life-support	35.64	17.76	31.68	22.16

[a] Interpretation of PDI scores (Pollard, 1984):
Low disability = 19; High disability = 55

Correlation of the separate mean scores for the seven categories between the patients and significant others were analysed. As shown in Table 27, the only significant correlation found between the subscales was Sexual Behaviour. Patients' mean ratings for Sexual Behaviour was significantly correlated with significant others' mean scores in all the seven categories of the PDI.

Table 27: Pearson's product-moment correlation coefficient of mean scores for the seven categories[a] of life activity on the PDI between patients and significant others

PATIENT RATINGS	SIGNIFICANT OTHER RATINGS							
	FAM	RECR	SOC	OCCU (A)	OCCU (B)	SEX	SELF	LIFE
FAMILY	0.29	0.41	-0.35	0.40	0.39	0.07	0.07	0.35
RECREATION	0.44	0.43	0.11	0.22	0.18	0.41	0.18	0.25
SOCIAL	0.09	0.16	0.61*	0.35	0.25	0.08	0.21	0.27
OCCUPATION (A)	0.32	0.40	0.08	0.32	0.40	0.18	0.08	0.33
OCCUPATION (B)	0.40	0.40	0.04	0.26	0.42	0.24	0.12	0.32
SEXUAL	0.75**	0.83**	0.62*	0.68*	0.66*	0.79**	0.33	0.65*
SELF-CARE	-0.23	-0.15	-0.50	-0.23	-0.29	-0.22	-0.45	-0.20
LIFE-SUPPORT	0.45	0.47	0.23	0.40	0.31	0.44	0.19	0.53

*$p < 0.01$ **$p < 0.001$

[a] FAM = family responsibilities; RECR = recreation; SOC = social activity; OCCU (A) = activities related to occupation; OCCU (B) = return to occupation; SEX = sexual behaviour; SELF = self-care; LIFE = life-support activity

PATIENTS' SATISFACTION WITH THE BACK EDUCATION PROGRAMME

Reliability coefficient of items in the General Satisfaction Questionnaire

To assess the consistency and reliability of the thirteen items in the General Satisfaction questionnaire, Cronbach reliability coefficient alpha were computed for all the activities in the back programme. The coefficient alpha examines inter-item correlations within a scale and is a measure of the extent to which the items are internally reliable. As can be seen in Table 28, the coefficient alpha for each activity were acceptable. The reliability coefficient for the thirteen items was = 0.77 and the standardized item alpha = 0.79.

Mean score and standard deviation for activities in the back programme

To determine the component perceived by patients as the most beneficial in the back programme, the mean ratings and standard deviation were computed for each activity. The data are presented in Table 28.

Activities that were regarded as most beneficial by the patients were the psychological input which presented with the lowest variance from the mean score (mean score = 5.45, standard deviation = 0.88), and work assessment session (mean score = 5.50, standard deviation 2.73). Patients regarded the Accident & Compensation Corporation (mean score = 1.58, standard deviation = 1.47) and the Alcohol and Drug sessions (mean score = 2.04, standard deviation = 2.16) as of the least benefit to them in the back pain programme.

Table 28: Cronbach coefficient alpha, mean scores and standard deviation on the General Satisfaction Questionnaire[a]

ACTIVITIES	coefficient alpha	mean score	standard deviation
Dietician session	0.76	2.54	1.44
Accident Compensation Corporation	0.78	1.58	1.47
Alcohol & Drug counsellor	0.80	2.04	2.16
Psychologist	0.76	5.46	0.88
Work assessment	0.75	5.50	2.73
Recreation sessions	0.77	5.08	2.24
Case coordinator meetings	0.73	4.87	1.87
Physiotherapy education	0.74	4.29	1.57
Physiotherapy exercise/pool	0.75	4.67	1.63
Occupational therapy (OT) education	0.72	4.04	1.68
Occupational therapy (OT) activity	0.72	4.50	1.67
Relaxation by OT and Physio	0.76	4.50	1.10
Medical discussion	0.74	4.79	1.25

[a] Interpretation of GSQ: 0 = no benefit at all; 3 = some benefit; 6 = very beneficial

CHAPTER 9
DISCUSSION

No differences were found at pretreatment for the treatment and waitlist groups on demographic characteristics, emotional adjustment and physical functioning. However group differences were found in the use of cognitive coping strategies. The treatment group used significantly more cognitive coping and suppression strategies compared to the control group, and this difference remained throughout the study. Despite this difference, comparability on the other measures indicate randomisation of the two groups were achieved. It is advised that caution is taken in the interpretation of the results in this study because no adjustments were made for the multiple tests.

OUTCOME MEASURES

It had been predicted, firstly, that patients undergoing treatment for chronic low back pain would demonstrate significant improvements on all outcome measures compared to the waitlist control group. Significant improvements were gained by the treatment group after receiving treatment in Activities of Daily Living (ADL) and depression. Marginal improvements were achieved in back pain, with reports that back pain had decreased after treatment. No significant changes were demonstrated for functional measures, such as lumber spine functioning and everyday activities as measured by the Pain Disability Index (PDI), for leg pain, or for objective measures of flexibility and speed walk. A decrease in the use of coping strategies and an increase in muscle strength were demonstrated by the treated group but these changes were not statistically significant.

Whether the positive changes observed in the treatment group were due to the programme is questionable as significant improvements for depression, back pain, and ADL were also demonstrated by the waitlist control group when they had not received treatment. This outcome had not been anticipated, and does not replicate the research by Philips (1987) who found no changes in the waiting list control group. The unexpected improvements exhibited by the control group and the improvements in the treatment group could possibly be due to factors such as regression to the mean (Whitney & Von Korff, 1992) and/or placebo effects (Pilowsky & Barrow, 1990; Malone & Strube, 1988).

Regression to the mean suggests that a variable that is extreme will tend, by chance, be closer to central tendency when measured on a subsequent occasion. As a consequence a variable that is at its extreme when treatment is sought would, after some interval, be expected to decrease towards its characteristic level whether treatment is given or not (Whitney & Von Korff, 1992). In the present study, the treated and waitlist groups had reported elevated scores for depressive symptomology, back pain and functional impairment prior to treatment. The variability of mood and pain characteristics would indicate that fluctuations would occur over time. Thus on subsequent assessments, improvements for both the treatment and waitlist groups could be interpreted as a regression to the mean rather than cogent support for treatment effects.

An alternative explanation for the improvements displayed is placebo. Placebo phenomena traditionally have had considerable effect on outcome in psychological and medical interventions (Klosko, Barlow, Tassinari, & Cerny, 1990; Pilowsky & Barrow, 1990; Roberts, Kewman, Mercier, & Hovell, 1993). In the study, the waitlist control group received three individual assessments with the back programme team prior to receiving treatment. The attention shown to patients during the assessment regarding their pain status and functioning, carried out during a one-to-one contact, and combined with the expectancy of receiving treatment, may inadvertently had a positive therapeutic or placebo effect for this group.

Pilowsky and Barrow (1990) suggest however that when treatment is added to the 'placebo' greater significant reduction of impairment is seen than with 'placebo' alone. In this study no further improvement in ADL and back pain measures were obtained at subsequent assessments, and a return-to-baseline measure was found at the final assessment. Consequently regression to the mean appears to offer a plausible explanation for the fluctuations demonstrated. This view has some support from the single-group analysis, where the two groups were combined, and no significant changes were demonstrated after treatment.

Further significant alleviation in depressive symptomology, however, was found for the waitlist control group after receiving treatment. Thus according to Pilowsky and Barrow (1990) support for the efficacy of treatment for emotional distress is indicated, over and above regression to the mean or placebo effects.

The second hypothesis predicted that gains from treatment would be maintained in the long term. This was not found for back pain reports and ADL measure. Maintenance of treatment gains was significant for depression as demonstrated by both the single-group and comparison group analyses. The slight improvement in muscle strength for the treatment group was not maintained at the follow-up assessment, and both the treatment and waitlist control groups were significantly worse on this outcome at the final assessment.

In summary, the results of the present study indicate that in general the predictions of the efficacy of outpatient treatment for chronic low back pain were not achieved. There is support, however, for the efficacy of treatment for depression and the gains from treatment were maintained at the follow-up assessment. Treatment efficacy was not supported for pain reports, functional disabilities and cognitive responses either after treatment or in the long term. Muscle functioning significantly declined in the long term.

CORROBORATIVE REPORT ON PAIN-RELATED DISABILITY

In addition to the assessment of treatment efficacy, the second aim of the study was to compare patients' self-reported disability with a significant other report on the same measure prior to treatment. This study supports the use a measure to corroborate patients' self-report of disability as suggested by Sanders (1980) and Aronoff et al. (1983). The present study found patients rated their disability as worse in all areas of their daily activities compared to the ratings obtained from significant others. Apart from self-care and life support activities, the level of disability relating to everyday functioning was consistently elevated (such as responsibility and care of family, occupational, and social and recreational activities), indicating patients were more likely to rate their level of disability in a negative way.

In addition, patients' self rating of their sexual functioning were strongly associated with the significant others' perception of the patients' overall functioning in everyday activities. There were no indications in the literature for this finding. The results suggest that agreement on the level of disability by the patients and significant others was achieved only for sexual functioning, and that patients' sexual behaviours were perceived by the significant others to be correlated with their functioning in other areas of their lives.

SATISFACTION WITH THE BACK PROGRAMME

The final purpose of the study was to obtain patients' evaluation of the programme to assist members of the back programme in the future delivery of treatment. The questionnaire assessed whether patients perceived that they had benefited from the programme, and they were given the opportunity to provide qualitative input in suggesting improvements to the programme. All patients responded to the questionnaire.

Analysis of the ratings for each component of the programme concluded patients rated most activities in the programme as of benefit to them, especially areas that endeavoured to increase their psychological, physical and occupational functioning. Only two components, Accident Compensation Corporation (ACC) and alcohol and drug sessions, received poor ratings with most patients believing they had been of minimal benefit.

When asked to provide further explanations for their ratings, patients considered the ACC and alcohol and drugs sessions had been of little benefit either because the speakers appeared to have insufficient knowledge about their subject area or, as in the case of the alcohol and drugs session, the subject was not relevant to them. In most instances, patients were not taking medication or self-medicating for pain control, thus it appears they did not gain from attending a session focusing on this area.

Patients identified the psychology and physiotherapy sessions as of most benefit to them. The benefits gained were increased knowledge and motivation to do something about back pain-related difficulties, increased ability to cope with the pain, improvement in mobility and in their lifestyle, gaining some focus in their life either from attending the course or setting goals, and improvement in self-confidence.

Patients believed the programme, however, did not help individuals deal with their specific difficulties. Most considered that individual sessions with members of the treatment team were necessary to deal with their particular problems (such as physical exercise, medical and alcohol and drug problems, ACC complaints, and diet). One patient suggested work assessment and retraining for employment should be integral to the programme.

Patients suggested that to overcome some of the difficulties above, the programme ideally would be longer by perhaps one more week, with additional sessions in areas they had rated as beneficial. Another suggestion for improving the programme was reducing the duration of the sessions from one hour to 30 minutes, as some patients found the one hour session rather lengthy due to the uncomfortable seats and because of their back pain. The use of name tags and the availability of the names and addresses of course participants at the initial session were further suggestions for improving the programme. Involvement of the spouse and educating them about their partner's back problems were also seen as desirable.

When patients were asked if they believed they had improved after treatment, the majority of patients believed they had improved both psychologically and physically. Some believed that despite continuing pain they had improved in their ability to deal with the pain. A few did not consider they had improved physically, and had even been made worse, but had improved psychologically. A small number of patients did not believe they had improved in any way at all after the programme.

Overall, the patients were overwhelming in their endorsement of the programme. Some of the advantages of the programme however were not solely attributable to the treatment but resulted from participating in a group. The companionship and support from others who understood and shared similar experiences of chronic pain were frequently cited as valuable to course members.

OVERALL DISCUSSION

The emotional gains from the back programme are consistent with patients' ratings on the depression measure. Malone and Strube (1988) have reported that psychological treatments from multidisciplinary pain treatment programmes have been reliable in treating mood and this is supported by this study. Rosenstiel and Keefe's (1983) study demonstrated high emotional distress experienced by chronic pain patients was often associated with increased use of catastrophising. An important aspect of the cognitive-behavioural approach is educating patients to avoid the use of catastrophising. The decrease in the frequency of catastrophising strategies used by patients over the course of the study, although not statistically significant, concomitant with improvement in mood, is consistent with Rosenstiel and Keefe's (1983) findings.

The lack of data in the present study to indicate physical and functional improvements does not replicate the findings of previous research into the efficacy of multidisciplinary approaches to the management of chronic low back pain. Several factors may have contributed to the lack of positive results in this study, and are discussed below.

The majority of the treatment programmes evaluated for chronic back pain have been inpatient treatment centres (Flor, Fydrich & Turk, 1992). Inpatient treatment programmes are typically longer than for outpatient treatment programmes. Most inpatient programmes vary from a four week treatment package (such as Cassisi et al., 1989) to those lasting up to twelve weeks (Fordyce et al., 1973). Due to the nature of inpatient centres the therapeutic regime is intensive, usually individual-based, and monitors and targets a broader spectrum of pain-related behaviours than outpatient treatment.

In comparison the present study was considerably briefer, operating for four half-days a week over three weeks, and conducted in an outpatient programme. Greater outcome effect on overall functioning has been demonstrated for the inpatient programmes when patients from these programmes have been compared with patients from outpatient programmes, although both groups (inpatient and outpatient) were successfully treated (Peters & Large, 1990).

In addition, patients who seek treatment from an inpatient centre frequently present with considerable functional impairment (Fordyce, 1976). Flor, Fydrich and Turk's (1992) meta-analysis of multidisciplinary pain treatment centres showed patients had average pain duration of seven years, 85% used medication, and there was a high rate of multiple surgeries and levels of unemployment. Among these inpatients greater levels of pain intensity and affective distress were likely to be reported when compared to non-treated control pain patients or patients who received treatment from an outpatient pain centre (Fordyce et al., 1973; Deardorff et al., 1991; Peters & Large, 1990).

Most patients in the present study were not using any form of medication for pain relief (59%), and of those who used medication analgesics were primarily used. In addition, forty-two percent of patients had endured pain less than two years. Thus the positive

outcomes found in previous studies may not have been replicated due to the lower disability patients in the study experienced and because the programme was an outpatient programme.

Also, unlike other research, most of the data for the study were collected and evaluated by an independent researcher. Independent systematic review of pain rehabilitation programmes have not been a high priority for research. The bulk of previously reported outcome data has been generated by the programmes themselves and evaluation assigned to individuals participating in treatment delivery or who are accountable to the programme being evaluated (Cassisi et al., 1989). Therapist and patient variables, such as expectancy of the efficacy of treatment can also account for substantial successful treatment outcome (Roberts, Kewman, Mercier, & Hovell, 1993). The evaluation of outcome studies by researchers who are mindful of the need to justify the funding for these programmes and awareness of the hypotheses being tested may produce unintentional biases in their findings (Cassisi et al., 1989). The lack of an independent evaluator poses a serious problem for the scientific basis of studies of treatment efficacy. Having an independent reviewer not only presents an impartial review of this treatment programme, but reduces the problem of expectancy-effects and inadvertent over-reporting of the size of treatment effect.

The differences between previous research and the present study, however, are not sufficient to account for the inability to reject the null hypothesis for increased functioning of patients. Some outpatient programmes treating patients who are not greatly impaired have reported success in reducing pain intensity, increasing activity and returning patients to paid employment (Peters et al., 1992), improving physical disability, and increasing active use of treatment techniques to control pain (Cohen et al., 1983; Skinner et al., 1990), reducing pain avoidance behaviour, and effecting a major shift in perceived control of pain (Philips, 1987). The failure to achieve the treatment goals of rehabilitation, that is to overcome disability and restore functioning, necessitate examination of the programme studied to understand why these goals were not achieved.

Prior to treatment, patients in the study demonstrated minimal to moderate physical impairment as rated by objective measures of muscle strength and flexibility. In

contrast to the minor physical impairment, patients rated themselves as greatly disabled in carrying out daily functional activities and as having high levels of pain and emotional distress. Despite the improvement in mood after treatment, the discrepancy between physical impairment and functional disability was not affected by treatment.

The inconsistency in reporting between patients' physical disability and their reported pain has already been observed by Fordyce (1988). In addition, Sanders (1980) suggested that chronic pain patients tend to distort their level of disability. This discrepancy was reflected in this study by the patients' higher ratings of their functional disability in all areas of everyday activities than their significant others' ratings.

Physical reactivation to increase activity level has been a major component in the management of chronic back pain. Fordyce et al. (1973) first applied operant conditioning principles using physical therapy in his treatment approach. The application of physical reactivation techniques assists patients to increase the use of neglected muscles often weakened from disuse. Fordyce (1988) believed that chronic pain patients' tendency to guard the body from pain or from use results in excessive duration and magnitude of disability and more suffering than should occur. He further maintained disuse of the musculoskeletal system causes movement to become painful and the pain arising from disuse is often interpreted as indication of lack of healing or increased harm. Fordyce (1988) considered that when pain had become chronic, harm and hurt were not the same, and pain did not serve as a warning signal. He believed chronic pain patients need to confront their pain experience to order to successfully gain mastery and control of pain and increase their activity levels to improve physical functioning. The goal of physical reactivation is not to teach patients to be stoical about their pain but to reduce the excess disability (Fordyce et al., 1985). Thus the target for rehabilitation is the excess disability associated with chronic pain problems rather than pain itself.

Additionally, physical reactivation enhances the person's sense of self-efficacy about their ability to cope with chronic pain through the acquisition of appropriate skills and techniques, and engaging in actual practise. Bandura (1977) maintained that persistence in activities perceived as aversive but which in fact are relatively safe would likely be sustained if self-efficacy was strengthened through mastery. This

proposes that through increasing the patients' sense of competence through successful completion of previously avoided tasks, avoidance behaviours frequently observed with chronic pain patients will be reduced. With gradual increase in physical activity patients learn to confront and reduce unnecessary fears and anxiety associated with pain and exercise, obtain more realistic information about the detrimental effects of inactivity, and decrease avoidance behaviour.

Dolce et al. (1986) used such a graduated increasing exercise quota system where patients were taught to persist in their endeavour despite the pain until their quota was met. The results of the study demonstrated not only reversal of patterns of inactivity but changes in faulty beliefs related to activity avoidance. In addition, self-efficacy expectations increased while worry and concern over the consequences of engaging in exercise were reduced. Morrison et al. (1988) also found an exercise programme that focused on physical reactivation was more enduring for specific behaviour change and resulted in large increases in physical strength and mobility.

In summary, patients with chronic pain problems tend to be more resistant to and not comply well with multidisciplinary pain management interventions (Williams & Keefe, 1991). They tend to exhibit high exercise avoidance and invalid behaviours that are in excess of those necessitated by their observed physical limitations. Their anticipation of pain often limits activity more than the presence of significant physical limitations (Dolce et al., 1986). They do not persist in activities they perceive as aversive which in fact are relatively safe. For these patients complacency and failure to see the value of behaviour change efforts can undermine the physical reactivation goals.

The data from this study indicate that for many patients physical reactivation were not attained. Patients did not improve in their functioning in activities such as their general responsibilites around the home, social activities, occupational activities, and general day-to-day activities. Moreover, no physical improvements were achieved from the treatment.

METHODOLOGICAL ISSUES

Several limitations in the study are evident which argue for caution in making generalisations from the results. The most obvious constraint was the small sample of subjects used in the study. A larger sample size would increase the power of the statistical analysis. Although the homogeneity of the subjects in locus of pain, demographic data, levels of functioning, and the fact that they were a hospital clinic sample suggests they were representative of a typical clinical population of chronic low back pain patients, further research would be required to determine whether the results can be generalised to chronic low back pain population overall.

The follow-up period was relatively brief. If the pain problem has persisted for some time, evidence of improvement may not be observed in the short-term. Major functional recovery was observed in some patients who, subsequent to the final assessment, had sought further psychological assistance for their problems or continued with work placement programmes. The brief follow-up used in this study may not have detected this improvement and a longer follow-up is recommended.

Although the concurrent assessment of both groups is an improvement on Morrison et al's (1988) study, as it controlled for temporal and artefact variables, the limitation of this design is that it did not allow comparison with a control group at follow-up, as the control group had undertaken treatment at this stage. Consideration for future research could circumvent this problem by delaying the treatment for the control group until the follow-up assessment had been completed for the treated group. This would require a delay of at least six months before treatment was offered rather than the two months in this study and may pose a problem for patients having to wait such a lengthy period before treatment is given. Convincing justification would be required for patients to participate in such a study.

A number of limitations were apparent in the measurements used. There was a reliance on self-report of behavioural functioning and no objective data were obtained. Self-report devices tend to rely on the retrospective memory of patients over the past month and therefore can be vulnerable to bias and inaccuracies (Jensen, Turner, Romano, & Karoly, 1991). A daily diary of activities prior to an assessment would

provide less potentially biased measure of functioning. Furthermore, the timing of the various measures was problematic. Patients were often in physical discomfort after they had completed a physiotherapy assessment. If they were then required to complete the self-report assessments, there may have been a negative effect on their ratings on other measures, such as pain intensity and everyday functioning. This order of administration occurred in some instances. It is suggested that in future research the physiotherapy examination be undertaken after all other measures have been completed.

Despite the limitations, this study supports the possibility of using a waitlist control group as an alternative to having a no-treatment control design. No subjects refused to participate in the study and a low drop out rate was achieved. Eleven percent dropped out prior to the post-treatment assessment, and only one patient was unable to be contacted at the follow-up assessment. This compares to Peters and Large (1992) study where only 62% of those who began treatment completed the follow-up assessment. The loss of subjects is a particularly difficult problem to control in clinical research, and the use of a waitlist design served to contain this problem.

The employment of an independent evaluator, inclusion of significant others' reports, and obtaining objective physical measures as well as subjective data of pain-related difficulties are additional features that increased the validity of the results obtained in this study.

FUTURE RESEARCH

A longer follow-up period is recommended for future research. The follow-up period for the study was insufficient to assess whether any long term improvements were achieved or gains derived from treatment were maintained. A reassessment of patients one year after the final assessment would be ideal.

All the patients in the programme were funded by the Accident Compensation Corporation (ACC). These patients may not be representative of the general chronic low back pain population. Further research should include patients receiving funding from other sources, or who are not receiving a benefit or compensation.

CHAPTER 10
CONCLUSIONS AND RECOMMENDATIONS

The findings of this study support the utility of a multidisciplinary approach to the treatment of chronic pain problems. Although the outcome data of the back pain programme at the Rehabilitation Unit were not consistent with the predictions of the study, significant gains in psychological wellbeing and the overwhelming endorsement of the programme by patients suggest there is some foundation for the continuation of the programme.

Based on the findings of previous studies, a three-week programme is of sufficient duration to achieve improvement in functioning (Morrison et al., 1988). However, several recommendations are suggested for improving the outcomes of the programme and these are discussed below.

RECOMMENDATIONS

1 Maintaining the present multidimensional approach of the programme in the treatment of chronic low back pain. However it is recommended that treatment involve an increased emphasis on physical reactivation as a major goal of the programme if improved functioning, physically and in daily activities, are to be achieved.

2 To achieve the goal of physical reactivation, an individualised exercise quota system based on operant conditioning principles is recommended. After an examination of the patient's physical functioning, an exercise quota system is established in conjunction with the patient's disabilities and needs. Gradual increase in exercises are then determined as a daily goal of therapy. The patient is reinforced for meeting this daily quota throughout treatment by means of positive verbal reinforcements and/or the use of a graph charting his/her progress.

3 The exercise regime should provide not only for skill acquisition and strengthening but should also include instruction in the use of these skills in day-to-day activities.

4 In addition to the physical reactivation focus of the programme, the assessment criteria for the programme should include an evaluation of patient's motivation and suitability to fulfil the goals of the programme. The purpose of the programme (whether restoring functional activity or return to work) needs to be emphasised at the initial assessment. Participants should understand that physical reactivation requires exercising unused parts of the body which involves their willingness to work through the pain and that some activities may hurt. The importance of participating in all facets of the programme and accept homework assignments to practise the techniques acquired throughout treatment should be emphasised. Patients need to be informed that improvements in their functioning, mood, and cognition can result if they persist with physical reactivation.

Catchlove and Cohen (1982) found a greater percentage of patients improved where direct instruction for improved functioning or return to work was stressed as part of the treatment programme compared to those not given the instructions.

5 Based on the significant improvements in mood levels as well as the benefits patients gained from the psychological input, it is recommended that the psychological component is increased in the programme. In addition, psychological strategies have been important in assisting patients acquire self-efficacy regarding physical reactivation.

6 Work assessment and retraining opportunities should be provided where necessary. Most patients in the programme had been employed in heavy labouring occupations and were no longer able to continue in this employment. Assistance is required with identifying other occupations available to broaden patients' range of employment opportunities.

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APPENDIX A

MEDICAL REHABILITATION UNIT INFORMATION BOOKLET
ON THE CHRONIC BACK PAIN PROGRAMME

TIMETABLE

INFORMATION SHEET

CONSENT FORM

REHABILITATION UNIT - CHRONIC BACK PAIN PROGRAMME

INTRODUCTION:

You have a back pain problem that has lasted a long time and that is interfering with your life. You will have been examined by doctors before coming to us. After we have assessed you, we will discuss with you whether we think our programme will help you. The following information will give you an idea of what the four week programme will and will not involve. We hope you will read all about this programme, after you've been assessed by the Rehabilitation Unit doctor and before you are assessed by the other team members. You will then have the opportunity to ask more about the programme, before you make a commitment to go onto the programme.

If you are admitted to the Back Pain programme, it means that the Rehab team feel that enough healing has occurred to permit you to attempt more activities. Your programme will be supervised by medical, physiotherapy, occupational therapy and psychology staff.

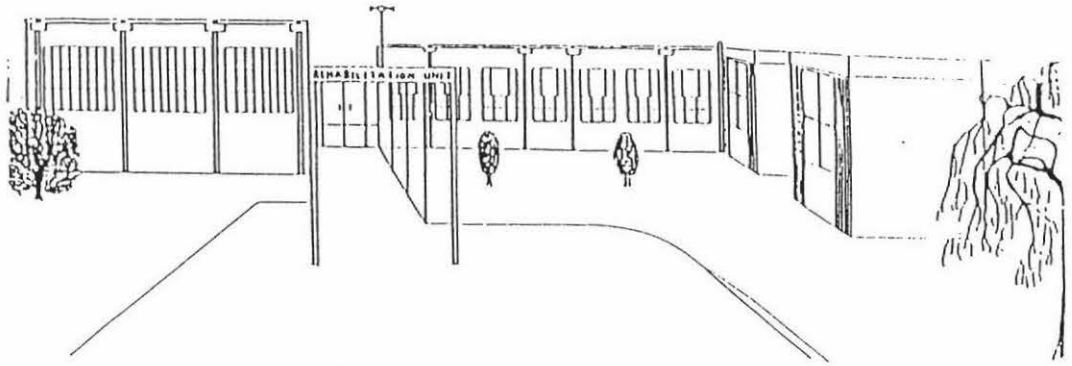
The doctors' primary responsibility is, to oversee the medical aspects of your treatment and to go over with you the medical aspects of your particular problem. The physiotherapists will help you onto a graded exercise programme, teach you more about your back and teach you relaxation skills. The occupational therapists, will help you plan activities, to avoid aggravation of your back pain. The psychologist will teach you skills for managing your pain related problems.

WHAT TO BRING:

Bring casual clothes and comfortable shoes for gym work and walking. Bring togs for swimming. Bring your own supply of medication, if needed.

INPATIENTS:

See attached information sheet.



MEDICAL REHABILITATION UNIT

THE CHRONIC BACK PAIN PROGRAMME

COMPONENTS OF THE PROGRAMME:

You will be participating on a 4-week programme (four mornings per week, Tuesday to Friday), with about 10 to 15 other people. Your programme will involve both group and individual activities. A copy of the full programme is attached. You will be allocated to a staff member, who will act as your Rehab Unit Co-ordinator. Private sessions are available to meet with your co-ordinator.

1. Team Meetings

These sessions will provide you with an opportunity to meet with your treatment team and to learn more about the programme.

2. Physiotherapy

You will go to physiotherapy four days a week. Certain exercises will be selected by your physiotherapist to work on in the gym and pool. These exercises aim to strengthen muscles, increase your stamina and help body parts, long idle or limited by pain, to begin to regain their freedom of movement. Stretching exercises are important to decrease muscle tightness and increase flexibility. You will start with a baseline number of exercises, in which you do whatever number of each exercise you can before pain, weakness or fatigue causes you to want to stop. It will be important that you do not try too many, but also that you do at least a few. Your physiotherapist will gradually increase the number of exercises you do per session, depending on pain.

Each day, you will also practice speed walking. The purpose of this is twofold. If you have trouble walking normally because of your pain, eg. if you limp, this will help you break old walking habits. In addition, brisk walking is an excellent aerobic exercise for most chronic back pain patients and this may get you off to a good start in a regular aerobic exercise programme you can continue at home. It is also important for you to understand how your spine and body works. You will learn the best ways to protect your spine while doing such things as lifting, bending and twisting. Twice a week you will also learn relaxation skills for dealing with pain and stress.

3. Occupational Therapy

You will attend occupational therapy sessions most days. These will include individually tailored activities, to help improve your ability to perform activities that give you problems, or that are difficult because of pain. They will also include group sessions, to look at posture for work, leisure and everyday activities. The use of special equipment will also be covered.

Some of you will need to return to work. Group sessions will discuss this matter. You may wish to go onto the Rehab Unit Work Assessment and Placement programme on completion of this back programme. In the work assessment programme, you will be able to work with a placement officer to look at employment or training options. Work trials can be arranged.

4. Dietitian

A dietitian will give a lecture in the second week, on topics related to nutrition and your health.

5. Psychologist

The main purpose of these group sessions with the psychologist, is to teach a number of skills for managing your pain-related problems. These may include for example, how to improve communication with others, anger management, stress management and generally how to regain some control of your life. You will have plenty of opportunity to practice these skills in the group and other parts of the treatment programme. Sexual difficulties related to your back condition may be discussed with the psychologist.

6. Medical Session

This session is available, to answer questions about medical matters, eg. diagnosis, investigations, medication and other medical treatment.

7. Social Worker

These sessions are available to discuss financial and family related problems. Individual or family appointments with the social worker can be arranged, if necessary.

8. A.C.C.

An A.C.C. Rehabilitation Co-ordinator will discuss various entitlements under A.C.C. and rehabilitation alternatives possible. There will be an opportunity for discussion of difficulties being encountered with A.C.C.

9. Alcohol & Drug Counsellor

Chronic pain sometimes results in the excessive use of alcohol or addictive medication. The problems resulting are discussed and other strategies are suggested.

10. Family Involvement

We encourage your spouse, partner or family member to be present at any of the sessions, so that they can observe your activities and meet with the staff. Individual appointments for family members and staff can be arranged on request.

GENERAL INFORMATION:

You will be encouraged to continue with a home exercise programme, after completing this back programme. Some of you will want to go onto work assessment and placement programme and this can be arranged with your co-ordinator. If there is anything in this programme that you are not sure of, or concerned about, please do not hesitate to contact your Rehab Unit Co-ordinator assigned to you. or your Rehabilitation doctor. Once you've decided to go onto the programme, we would expect a full commitment from you to attend the complete programme, unless there are very important reasons for not attending. If you are unable to attend, we would expect you to let

Books and Videos: available during the programme.

Videos - The Bad Back - Leonard Ring (ACC).
Lifting Techniques - Precious MacKenzie.

Books - Can be loaned from Admin Officer, during the programme, or purchased from Bennetts.

TITLE	AUTHOR	AVAILABLE F
Treat your own back.	Robin McKenzie	Bennetts.
Treat your own neck.	Robin McKenzie	Bennetts.
Your Painful neck & back.	Dr J.W. Fisk	Bennetts.
The back book.	Maggie Lettuin	Bennetts.
Natural pain control.	Dr Vernon Coleman	Bennetts.
Self Massage	Monika Struna	Bennetts.
Control of chronic pain.	Connie Peck	
Drug free pain relief.	Dr George T. Lewis	Bennetts.
The relaxation & stress reduction workbook.	Dr Mathew McKay & Sandra Horn	
Conquering pain.	Dr Sampson Lipson.	

BACK EDUCATION PROGRAMME

WEEK 1

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9.00-9.30	Full assessment by Physiotherapist Occupational Therapist and Clinical Psychologist	TEAM INTRODUCTION (Conference room) Tour of Unit	PSYCHOLOGIST (Conference room)	PHYSIOTHERAPY (Gym)	PSYCHOLOGIST (Conference room)
9.30-10.15		PHYSIOTHERAPY		RECREATION (Gym)	
10.15-10.30	MORNING TEA	MORNING TEA	MORNING TEA	MORNING TEA	MORNING TEA
10.30-11.00	Full assessment continued	OCCUPATIONAL THERAPY Seating (Conference room)	OCCUPATIONAL THERAPY	DIETICIAN	Meeting with CASE COORDINATORS
11.00-11.30		PHYSIOTHERAPY (Conference room)	ACC		11.15am PHYSIOTHERAPY (Gym)
11.30-12.00				OCCUPATIONAL THERAPY (Relaxation lounge)	

BACK EDUCATION PROGRAMME

WEEK 2

TIME	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9.00-9.30	PHYSIOTHERAPY	PSYCHOLOGIST	PHYSIOTHERAPY	WORK ASSESSMENT
9.30-10.15	(Gym)	(Conference room)	(Gym)	(Conference room)
10.15-10.30	MORNING TEA	MORNING TEA	MORNING TEA	MORNING TEA
10.30-11.00	OCCUPATIONAL THERAPY AND PHYSIOTHERAPY	OCCUPATIONAL THERAPY	OCCUPATIONAL THERAPY	MEDICAL DISCUSSION (Conference room)
11.00-11.30	Lifting	PHYSIOTHERAPY (Pool)	PHYSIOTHERAPY (Pool)	RECREATION
11.30-12.00		OCCUPATIONAL THERAPY Relaxation (Lounge)	OCCUPATIONAL THERAPY Relaxation (Lounge)	

BACK EDUCATION PROGRAMME

WEEK 3

<table>
<tr><th>TIME</th><th>TUESDAY</th><th>WEDNESDAY</th><th>THURSDAY</th><th>FRIDAY</th></tr>
<tr><td>9.00-
9.30</td><td rowspan="2">PHYSIOTHERAPY

(Gym)</td><td rowspan="2">PSYCHOLOGIST

(Conference room)</td><td rowspan="2">PHYSIOTHERAPY

Reassessment
(Gym)</td><td>PHYSIOTHERAPY
Video</td></tr>
<tr><td>9.30-
10.15</td><td>EVALUATION
MEETING/TEA</td></tr>
<tr><td>10.15-
10.30</td><td>MORNING TEA</td><td>MORNING TEA</td><td>MORNING TEA</td><td>MORNING TEA</td></tr>
<tr><td>10.30-
11.00</td><td>OCCUPATIONAL
THERAPY
(Lounge)</td><td>OCCUPATIONAL
THERAPY</td><td>OCCUPATIONAL
THERAPY
Reassessment</td><td rowspan="3">MEETING WITH TEAM
- individually

(Conference room)</td></tr>
<tr><td>11:00-
11.30</td><td>PHYSIOTHERAPY
(Pool)</td><td rowspan="2">ALCOHOL & DRUG
COUNSELLOR

(Lounge)</td><td>PHYSIOTHERAPY
(Pool)</td></tr>
<tr><td>11.30-
12.00</td><td>PHYSIOTHERAPY
Relaxation</td><td>PHYSIOTHERAPY
Relaxation</td></tr>
</table>

MANAWATU-WANGANUI
AREA HEALTH BOARD

INFORMATION SHEET
STUDY OF BACK EDUCATION PROGRAMME AT MEDICAL REHABILITATION UNIT, PALMERSTON NORTH HOSPITAL

Secondary Care

Phone (06) 350 8836
Fax (06) 350 8830
Heretaunga Street
Private Bag
Palmerston North
New Zealand

Medical Services
Phone (06) 350 8821
Fax (06) 351 6669
Heretaunga Street
Private Bag
Palmerston North
New Zealand

Surgical Services
Phone (06) 350 8821
Fax (06) 351 6669
Heretaunga Street
Private Bag
Palmerston North
New Zealand

Child Health Services
Phone (06) 350 8821
Fax (06) 351 6669
Heretaunga Street
Private Bag
Palmerston North
New Zealand

Women's Health Services
Phone (06) 350 8821
Fax (06) 351 6669
Heretaunga Street
Private Bag
Palmerston North
New Zealand

Diagnostic and Therapeutic Services
Phone (06) 350 8821
Fax (06) 351 6669
Heretaunga Street
Private Bag
Palmerston North
New Zealand

The purpose of this study is to determine whether the back education programme at Palmerston North Hospital is useful in treating problems of chronic back pain. It is widely accepted that patients experience problems in various areas of their lives due to their back pain.

The back education programme at Palmerston North hospital was set up several years ago to treat chronic back pain. Review of overseas and New Zealand research indicates back treatment programmes, such as the one you will taking, are able to assist chronic back pain sufferers. However the value of the programme at Palmerston North Hospital has not been thoroughly assessed. We hope that information from the study will help us improve the back programme. To be able to judge the usefulness of treatment we need to compare patients in the back programme with those on the waiting list. If you are willing to be in this trial you will be randomly allocated into immediate treatment or a waiting list for the next available treatment. Please note if you are not part of the trial we cannot guarantee that you will receive immediate treatment. Waiting list people can continue seeing their doctor, taking medication, or seek other treatment.

This study is being undertaken by the Medical Rehabilitation Unit in conjunction with the Psychology Dept, Massey University, under the direction of Dr Peter Disler, Director and Consultant Physician to the Unit and Mr Malcolm Johnson, Senior Lecturer, Massey University, with Mrs Mei Wah Williams, MA student, as researcher. The study has been approved by the Manawatu-Wanganui Area Health Board's Ethics Committee.

For those accepted for the back education programme or on the waiting list it involves:

- Answering some questionnaires put to you by our researcher. These questionnaires look at how you manage pain, your disabilities caused by pain, and the effect this has on your home, social and work life.
- An examination of your body movements (assessed by the physiotherapist/ occupational therapist). These are follow up assessments that are part of the treatment programme and are similar to those you would have had whilst in the programme.
- Allowing your wife/husband or another family member answer questions about your disability caused by pain.

The measures will be taken four times over the next 8 months, once every 2 months. They will be taken before you enter the programme, immediately after the programme and twice several months after the programme. It is expected the questionnaires will take no more than 1-1 1/2 hours to complete and the examination of body movements completed within half an hour.

For any further information about this study, please contact Mrs Pauline Coy, Rehabilitation Unit, Palmerston North Hospital on (06) 350-8570, extension 8571.

PATIENT CONSENT FORM

STUDY OF BACK EDUCATION PROGRAMME AT PALMERSTON NORTH HOSPITAL

Principal investigators: Dr Peter Disler, Malcolm Johnson, Mei Wah Williams

Patient' Name: .....

Name of institution: Palmerston North Hospital

Hospital number: .....

I have read the study information sheet, and my questions have been answered to my satisfaction. I understand that:

- I am able to ask further questions at any time during the study.
- I do not have to participate in this study, I am free to withdraw from the study at any time, and I do not have to answer every question on the questionnaire.
- My wish to not participate in this study, or to not answer every question on the questionnaire, will in no way adversely affect my treatment in the back programme.
- My personal information and individual results will be kept confidential to the researchers and myself.

I consent/do not consent for Dr ....., my general practitioner, to be contacted by the researchers and asked to give information about medication use and history related to my back pain.

I consent/do not consent for ..... hospital to be contacted by the researchers and asked to give information on my hospital records concerning my back injury.

I agree that the following person can be contacted by the researchers and asked to also complete a similar questionnaire about my pain disability:

Name: .....

Address: .....

Telephone no:..... Relationship to patient: .....
I agree/do not agree to take part in this study.

Signed: .....(patient) .....(date)

.....(witness) .....(date)

Witness name: ..... (PRINT NAME)

THREE COPIES REQUIRED: 1 retained by patient, 1 retained by researchers, and 1 for the records.

APPENDIX B

SELF-REPORT QUESTIONNAIRES

(1) Demographic data

(2) Beck Depression Inventory

(3) Pain Intensity

(4) Pain Disability Index

(5) Cognitive Coping Strategies Questionnaire

(6) Pain Evaluation Index

MEDICAL REHABILITATION UNIT

PALMERSTON NORTH HOSPITAL

EVALUATION OF BACK EDUCATION PROGRAMME

QUESTIONNAIRES

1992

RESEARCHERS

Dr Peter Disler, Director/Consultant Physician
Medical Rehabilitation Unit
PALMERSTON NORTH HOSPITAL

Mr Malcolm Johnson, Senior Lecturer
Psychology Department
MASSEY UNIVERSITY

Mrs Mei Wah Williams, MA Student
Psychology Department
MASSEY UNIVERSITY

EVALUATION OF BACK EDUCATION PROGRAMME

REHABILITATION UNIT, PALMERSTON NORTH HOSPITAL

QUESTIONNAIRES

NAME:_____

DATE OF BIRTH:_____

SEX: Male ☐ Female ☐

MARITAL STATUS:
Married . . . . . ☐
Never married . . . ☐
Divorced . . . . . ☐
De facto . . . . . ☐

OCCUPATION:_____

Are you presently employed in that occupation ?

Yes ☐ No ☐

If no, how long have you been unemployed?

_____

Are you presently receiving any benefits or payments?

Yes ☐ No ☐

If so, please state what type of benefit
(eg. ACC, Unemployment, Sickness etc.)

_____

PAIN HISTORY: How long have you had your back pain?

less than 6 months ☐
6 months-1 year ☐

Please turn over

1 year to 18 months ☐
18 months to 2 years ☐
more than 2 years ☐ ☐

Is your pain: constant ☐
intermittent ☐ ☐

MEDICATION USE: Are you presently taking any medication?

Yes ☐ No ☐ ☐

If yes, please give the names and amounts of each medicine you take.

_____

_____

Below are a set of multiple choice statements. Circle the letter next to the <u>one</u> statement in each group which <u>best</u> describes the way you have been feeling over the <u>past week</u>, including today. If several statements within a group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

A I do not feel sad.
B I feel sad.
C I am sad all the time and I can't snap out of it.
D I am so sad or unhappy that I can't stand it. ☐

A I am not particularly discouraged about the future.
B I feel discouraged about the future.
C I feel I have nothing to look forward to.
D I feel that the future is hopeless and that things cannot improve. ☐

A I do not feel like a failure.
B I feel I have failed more than the average person.
C As I look back on my life, all I can see is a lot of failures.
D I feel I am a complete failure as a person. ☐

A I get as much satisfaction out of things as I used to.
B I don't enjoy things the way I used to.
C I don't get real satisfaction out of anything anymore.
D I am dissatisfied or bored with everything. ☐

A I don't feel particularly guilty.
B I feel guilty a good part of the time.
C I feel quite guilty most of the time.
D I feel guilty all of the time. ☐

A I don't feel I am being punished.
B I feel I may be punished.
C I expect to be punished.
D I feel I am being punished. ☐

A I don't feel disappointed in myself.
B I am disappointed in myself.
C I am disgusted with myself.
D I hate myself. ☐

A I don't feel I am any worse than anybody else.
B I am critical of myself for my weaknesses or mistakes.
C I blame myself all the time for my faults.
D I blame myself for everything bad that happens. ☐

A I don't have any thoughts of killing myself.
B I have thoughts of killing myself, but I would not carry them out.
C I would like to kill myself.
D I would kill myself if I had the chance. ☐

A I don't cry any more than usual.
B I cry more now than I used to.
C I cry all the time now.
D I used to be able to cry, but now I can't cry even though I want to. ☐

A I am no more irritated now than I ever am.
B I get annoyed or irritated more easily than I used to.
C I feel irritated all the time now.
D I don't get irritated at all by the things that used to irritate me. ☐

A I have not lost interest in other people.
B I am less interested in other people than I used to be.
C I have lost most of my interest in other people.
D I have lost all of my interest in other people. ☐

A I make decisions about as well as I ever could.
B I put off making decisions more than I used to.
C I have greater difficulty in making decisions than before.
D I can't make decisions at all anymore. ☐

A I don't feel I look any worse than I used to.
B I am worried that I am looking old or unattractive.
C I feel that there are permanent changes in my appearance that make me look unattractive.
D I believe that I look ugly. ☐

A I can work about as well as before.
B It takes an extra effort to get started at doing something.
C I have to push myself very hard to do anything.
D I can't do any work at all. ☐

A I can sleep as well as usual.
B I don't sleep as well as I used to.
C I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
D I wake up several hours earlier than I used to and cannot get back to sleep. ☐

A I don't get more tired than usual.
B I get tired more easily than I used to.
C I get tired from doing almost anything.
D I am too tired to do anything. ☐

A My appetite is no worse than usual.
B My appetite is not as good as it used to be.
C My appetite is much worse now.
D I have no appetite at all anymore. ☐

A I haven't lost much weight, if any, lately.
B I have lost more than 2 kilos (5lbs).
C I have lost more than 4 kilos (10lbs).
D I have lost more than 6 kilos (15lbs). ☐

I am purposely trying to lose weight by eating less.

Yes___ No___ ☐

A I am no more worried about my health than usual.
B I am worried about physical problems such as aches and pains; or upset stomach; or constipation.
C I am very worried about physical problems and it is hard to think of much else.
D I am so worried about my physical problems that I cannot think about anything else.

A I have not noticed any recent change in my interest in sex.
B I am less interested in sex than I used to be.
C I am much less interested in sex now.
D I have lost interest in sex completely.

The following questions are about the amount of pain you have recently been experiencing and how much it has disrupted your life.

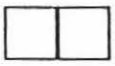
How much pain you have been feeling in the last month. Circle the number which best describes the level of pain you experience.

0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10
no pain — pain as bad as it could be

The rating scales below are designed to measure the degree to which several aspects of your life are presently disrupted by chronic pain. In other words, we would like to know how much your pain is preventing you from doing what you would normally do, or from doing it as well as you normally would. Respond to each category by indicating the overall impact of pain in your life, not just when the pain is at its worst.

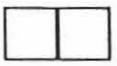
For each of the seven categories of life activity listed, please circle the number on the scale which describes the level of disability you typically experience. A score of 0 means no disability at all, and a score of 10 signifies that all of the activities in which you would normally be involved have been totally disrupted or prevented by your pain.

Family home responsibilities: i.e. activities related to the home or family. e.g. chores and duties performed around the house (yard work) and errands or favours for other family members (driving the children to school).



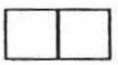
0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10
no disability — total disability

Recreation: e.g. hobbies, sports, and other similar leisure time activities.



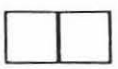
0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10
no disability — total disability

Social activity: i.e. activities which involve participation with friends and acquaintances other than family members, e.g. parties, theatre, concerts, dining out,and other social functions.



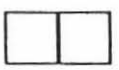
0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10
no disability — total disability

Occupation: (a) Activities that are a part of or directly related to one's job; nonpaying jobs as well (houseperson or volunteer worker).



0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10
no disability — total disability

(b) If work was available now, how disabled do you feel about returning to your occupation, i.e. non-paying jobs (e.g. houseperson or volunteer worker) as well as paid work.



0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10
no disability — total disability

Sexual behaviour: i.e. the frequency and quality of one's sex life.

0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10
no disability — total disability

Self-care: i.e. activities which involves personal maintenance and independent daily living, e.g. taking a shower, driving, getting dressed, etc.

0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10
no disability — total disability

Life-support activity: i.e. basic life-supporting behaviours, e.g. eating, sleeping, and breathing.

0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10
no disability — total disability

Individuals who experience pain have developed a number of ways to cope or deal with their pain. These include saying things to themselves when they experience pain, or engaging in different activities. Below are a list of things that patients have reported doing when they feel pain. For <u>each</u> activity, I want you to indicate how much you engage in that activity when you feel pain, where a 0 indicates you never do that when you are experiencing pain, a 3 indicates you sometimes do that when you are experiencing pain, and a 6 indicates you always do it when you are experiencing pain. Remember you can use any point along the scale.

0 --------- 1 --------- 2 --------- 3 --------- 4 --------- 5 --------- 6
Never do that — Sometimes do that — Always do that

When I feel pain ....

I try to feel distant from the pain, almost as if the pain was in somebody else's body 0 1 2 3 4 5 6

0 ---------- 1 ---------- 2 ---------- 3 ---------- 4 ---------- 5 ---------- 6

Never do that — Sometimes do that — Always do that

When I feel pain ....

I leave the house and do something, such as going to the movies or shopping . . . . . 0 1 2 3 4 5 6 ☐

I try to think of something pleasant . . . . . 0 1 2 3 4 5 6 ☐

I don't think of it as pain but rather as a dull or warm feeling . . . . . 0 1 2 3 4 5 6 ☐

It's terrible and I feel it's never going to get any better . . . . . 0 1 2 3 4 5 6 ☐

I tell myself to be brave and carry on despite the pain . . . . . 0 1 2 3 4 5 6 ☐

I read . . . . . 0 1 2 3 4 5 6 ☐

I tell myself that I can overcome the pain . . . . . 0 1 2 3 4 5 6 ☐

I take my medication . . . . . 0 1 2 3 4 5 6 ☐

I count numbers in my head or run a song through my mind . . . . . 0 1 2 3 4 5 6 ☐

I just think of it as some other sensation, such as numbness . . . . . 0 1 2 3 4 5 6 ☐

It's awful and I feel that it overwhelms me . . . . . 0 1 2 3 4 5 6 ☐

I play mental games with myself to keep my mind off the pain . . . . . 0 1 2 3 4 5 6 ☐

I feel my life isn't worth living . . . . . 0 1 2 3 4 5 6 ☐

I know someday someone will be here to help me and it will go away for a while . . . . . 0 1 2 3 4 5 6 ☐

0 ---------- 1 ---------- 2 ---------- 3 ---------- 4 ---------- 5 ---------- 6

Never do that	Sometimes do that	Always do that

When I feel pain ....

I walk a lot	0 1 2 3 4 5 6	☐
I pray to God it won't last long	0 1 2 3 4 5 6	☐
I try not to think of it as my body, but rather as something separate from me	0 1 2 3 4 5 6	☐
I relax	0 1 2 3 4 5 6	☐
I don't think about the pain	0 1 2 3 4 5 6	☐
I try to think years ahead, what everything will be like after I've got rid of the pain	0 1 2 3 4 5 6	☐
I tell myself it doesn't hurt	0 1 2 3 4 5 6	☐
I tell myself I can't let the pain stand in the way of what I have to do	0 1 2 3 4 5 6	☐
I don't pay any attention to it	0 1 2 3 4 5 6	☐
I have faith in doctors that some day there will be a cure for my pain	0 1 2 3 4 5 6	☐
No matter how bad it gets, I know I can handle it	0 1 2 3 4 5 6	☐
I pretend it's not there	0 1 2 3 4 5 6	☐
I worry all the time about whether it will end	0 1 2 3 4 5 6	☐
I lie down	0 1 2 3 4 5 6	☐
I replay in my mind pleasant experiences in the past	0 1 2 3 4 5 6	☐

0 ---------- 1 ---------- 2 ---------- 3 ---------- 4 ---------- 5 ---------- 6

Never do that	Sometimes do that	Always do that

When I feel pain ....

I think of people I enjoy doing things with	0 1 2 3 4 5 6	☐
I pray for the pain to stop	0 1 2 3 4 5 6	☐
I take a shower or a bath	0 1 2 3 4 5 6	☐
I imagine that the pain is outside of my body	0 1 2 3 4 5 6	☐
I just go on as if nothing happened	0 1 2 3 4 5 6	☐
I see it as a challenge and don't let it bother me	0 1 2 3 4 5 6	☐
Although it hurts, I just keep on going	0 1 2 3 4 5 6	☐
I feel I can't stand it anymore	0 1 2 3 4 5 6	☐
I try to be around other people	0 1 2 3 4 5 6	☐
I ignore it	0 1 2 3 4 5 6	☐
I rely on my faith in God	0 1 2 3 4 5 6	☐
I feel like I can't go on	0 1 2 3 4 5 6	☐
I think of things I enjoy doing	0 1 2 3 4 5 6	☐
I do anything to get my mind off the pain	0 1 2 3 4 5 6	☐
I do something I enjoy, such as watching TV or listening to music	0 1 2 3 4 5 6	☐
I pretend it's not a part of me	0 1 2 3 4 5 6	☐

0 --------- 1 --------- 2 --------- 3 --------- 4 --------- 5 --------- 6

Never do that — Sometimes do that — Always do that

When I feel pain ....

I do something active, like household chores or projects . . . . . 0 1 2 3 4 5 6 ☐

I use a heating pad . . . . . 0 1 2 3 4 5 6 ☐

Based on all the things you do to cope, or deal with your pain, on an average day, how much control do you feel you have over it? Please circle the appropriate number. Remember, you can circle any number along the scale.

0 --------- 1 --------- 2 --------- 3 --------- 4 --------- 5 --------- 6 ☐

No control — Some control — Complete control

Based on all the things you do to cope or deal with you pain, on an average day, how much are you able to decrease it? Please circle the appropriate number. Remember, you can circle any number along the scale.

0 -------- 1 --------- 2 --------- 3 --------- 4 --------- 5 --------- 6 ☐

Can't decrease it at all — Can decrease it somewhat — Can decrease it completely

How <u>true</u> is each of the following statements for you <u>today</u>. Please mark <u>one</u> of the numbers alongside each statement. Do no spend too much time on any statement. There are no right or wrong answers.

1 = always or definitely true
2 = often or mostly true
3 = sometimes or partly true
4 = rarely or a little true
5 = never or not at all true

A life without pain is all that I want . . . . . 1 2 3 4 5 ☐

1 = always or definitely true
2 = often or mostly true
3 = sometimes or partly true
4 = rarely or a little true
5 = never or not at all true

Any sort of paid work is an impossible dream for me right now . . . . . 1 2 3 4 5 ☐

Apart from my pain, I have had to cope with more stress than usual in the past six months . . . . . 1 2 3 4 5 ☐

Being pain free is a reasonable and achievable goal for me . . . . . 1 2 3 4 5 ☐

Doctors find it difficult to fully understand my pain . . . . . 1 2 3 4 5 ☐

I am good at controlling my pain . . . . . 1 2 3 4 5 ☐

I am no use to anyone . . . . . 1 2 3 4 5 ☐

I am worthwhile even though I have this problem . . . . . 1 2 3 4 5 ☐

I believe I will get better . . . . . 1 2 3 4 5 ☐

I believe that changing the way I think and feel about things can help me cope better with my pain . . . . . 1 2 3 4 5 ☐

I can't keep up with my duties around the house . . . . . 1 2 3 4 5 ☐

I could learn to cope with pain much better . . . . . 1 2 3 4 5 ☐

I do not believe now that doctors have the answer for my problem . . . . . 1 2 3 4 5 ☐

I don't believe in myself anymore . . . . . 1 2 3 4 5 ☐

I don't have much energy anymore . . . . . 1 2 3 4 5 ☐

1 = always or definitely true
2 = often or mostly true
3 = sometimes or partly true
4 = rarely or a little true
5 = never or not at all true

I don't trust the ACC . . . . . 1 2 3 4 5 ☐

I expect my recovery to take quite a long time . . . . . 1 2 3 4 5 ☐

I feel depressed and sad much of the time . . . . . 1 2 3 4 5 ☐

I feel overwhelmed by the personal difficulties I face . . . . . 1 2 3 4 5 ☐

I feel relaxed and free from worry . . . . . 1 2 3 4 5 ☐

I feel that even though I may not fully recover, my life will be just as rewarding . . . . . 1 2 3 4 5 ☐

I feel I am worthwhile even though I have this problem . . . . . 1 2 3 4 5 ☐

I find it difficult to unwind and relax . . . . . 1 2 3 4 5 ☐

I found my work rewarding and interesting . . . . . 1 2 3 4 5 ☐

I get angry about the problems others have caused me . . . . . 1 2 3 4 5 ☐

I get easily upset and feel like I can't cope . . . . . 1 2 3 4 5 ☐

I get on well with most people . . . . . 1 2 3 4 5 ☐

I have a low opinion of myself . . . . . 1 2 3 4 5 ☐

I have become more reliant on medication than I want to be . . . . . 1 2 3 4 5 ☐

1 = always or definitely true
2 = often or mostly true
3 = sometimes or partly true
4 = rarely or a little true
5 = never or not at all true

I have had a battle with ACC during the time they have been handling my case ..... 1 2 3 4 5 ☐

I have been unlucky as illness has often interfered with my life and career in the past ..... 1 2 3 4 5 ☐

I have changed jobs more than the average person ..... 1 2 3 4 5 ☐

I have found muscle relaxants often relieve my pain ..... 1 2 3 4 5 ☐

I have had mental health problems in the past ..... 1 2 3 4 5 ☐

I have lots of plans of things I want to do with my life ..... 1 2 3 4 5 ☐

I have never really had many close friends ..... 1 2 3 4 5 ☐

I have started doing number of new things since my pain problem ..... 1 2 3 4 5 ☐

I know how to do some things that reduce my pain ..... 1 2 3 4 5 ☐

I often have felt lonely in my life ..... 1 2 3 4 5 ☐

I readily seek the advice of others about my pain ..... 1 2 3 4 5 ☐

I swing between over doing things and then having to rest up ..... 1 2 3 4 5 ☐

1 = always or definitely true
2 = often or mostly true
3 = sometimes or partly true
4 = rarely or a little true
5 = never or not at all true

I talk about my pain to others more than I should ..... 1 2 3 4 5 ☐

I try any health professional I think may have the answer to my pain ..... 1 2 3 4 5 ☐

I will accept nothing less than a full recovery ..... 1 2 3 4 5 ☐

I will get better ..... 1 2 3 4 5 ☐

I would find it difficult to live without pain killers ..... 1 2 3 4 5 ☐

If doctors knew their business I wouldn't be in this situation ..... 1 2 3 4 5 ☐

Illness often interfered with my work and career in the past ..... 1 2 3 4 5 ☐

Increasing my level of activity always worsens my pain ..... 1 2 3 4 5 ☐

Life does not have much meaning for me ..... 1 2 3 4 5 ☐

My family are helpful in my treatment ..... 1 2 3 4 5 ☐

My life has a clear focus and direction ..... 1 2 3 4 5 ☐

My life has been relatively stable in the past six months ..... 1 2 3 4 5 ☐

My life has been ruined because of the actions of others ..... 1 2 3 4 5 ☐

1 = always or definitely true
2 = often or mostly true
3 = sometimes or partly true
4 = rarely or a little true
5 = never or not at all true

My life will be just as rewarding even though I may not fully recover . . . . . 1 2 3 4 5 ☐

My pain comes and goes with no logical pattern . . . . . 1 2 3 4 5 ☐

My pain often seems to shift from place to place . . . . . 1 2 3 4 5 ☐

My pain problem interferes with my sexual life to a significant degree . . . . . 1 2 3 4 5 ☐

My previous treatment has made my physical condition worse . . . . . 1 2 3 4 5 ☐

My problems could have been sorted out long ago if I had received the right treatment at the time . . . . . 1 2 3 4 5 ☐

One of my family was sick for a long time as I was growing up . . . . . 1 2 3 4 5 ☐

One of my parents also had problems with pain . . . . . 1 2 3 4 5 ☐

Sex is difficult for me . . . . . 1 2 3 4 5 ☐

Sooner or later I feel I will find a doctor who can help me . . . . . 1 2 3 4 5 ☐

The ACC have been helpful with my case . . . . . 1 2 3 4 5 ☐

The people I live with are very caring when I am feeling sore . . . . . 1 2 3 4 5 ☐

The people I live with help me with my chores when I am sore . . . . . 1 2 3 4 5 ☐

1 = always or definitely true
2 = often or mostly true
3 = sometimes or partly true
4 = rarely or a little true
5 = never or not at all true

The treatment I have received has been the best I could have . . . . . 1 2 3 4 5 ☐

There has been a lot of illness in my family background . . . . . 1 2 3 4 5 ☐

There is no pattern to my pain . . . . . 1 2 3 4 5 ☐

When I am under pressure my pain feels a lot worse . . . . . 1 2 3 4 5 ☐

When my pain is bad it is often because I have overdone it . . . . . 1 2 3 4 5 ☐

APPENDIX C

RELATIVE'S QUESTIONNAIRE

MEDICAL REHABILITATION UNIT

PALMERSTON NORTH HOSPITAL

EVALUATION OF BACK EDUCATION PROGRAMME

RELATIVE'S QUESTIONNAIRE

1992

RESEARCHERS

Dr Peter Disler, Director/Consultant Physician
Medical Rehabilitation Unit
PALMERSTON NORTH HOSPITAL

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Psychology Department
MASSEY UNIVERSITY

Mrs Mei Wah Williams, MA Student
Psychology Department
MASSEY UNIVERSITY

BACK PROGRAMME ASSESSMENT
REHABILITATION UNIT, PALMERSTON NORTH HOSPITAL

NAME:_____

ADDRESS:_____

DATE:_____

RELATIONSHIP TO SUBJECT:

Wife/husband/de facto ☐

Mother/father ☐

Other ☐ Specify: _____

The rating scales below are designed to measure the degree of disability to which several aspects of your relative's life are observed to be presently disrupted by chronic pain. In other words, we would like to know how much the pain is preventing him/her from doing what he/she would normally do, or from doing it as well as he/she normally would. Respond to each category by indicating the overall impact of pain in your relative's life, not just when the pain is at its worst.

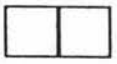
For each of the seven categories of life activity listed, please circle the number on the scale which describes the level of disability you observe your relative typically experiences. A score of 0 means no disability at all, and a score of 10 signifies that all of the activities in which he/she would normally be involved have been totally disrupted or prevented by pain.

Family home responsibilities: i.e. activities related to the home or family. (E.g. chores and duties performed around the house (yard work) and errands or favours for other family members (driving the children to school).

0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10

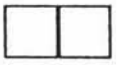
no disability — total disability

Recreation: e.g. hobbies, sports, and other similar leisure time activities.



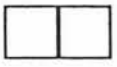
0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10
no disability — total disability

Social activity: i.e. activities which involve participation with friends and acquaintances other than family members, e.g. parties, theatre, concerts, dining out,and other social functions.



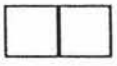
0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10
no disability — total disability

Occupation: (a) Activities that are a part of or directly related to his/her job; nonpaying jobs as well (houseperson or volunteer worker).



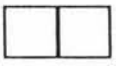
0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10
no disability — total disability

(b) If work was available now, how disabled would he/she be in returning to his/her occupation, i.e. non-paying jobs (e.g. houseperson or volunteer worker) as well as paid work.



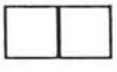
0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10
no disability — total disability

Sexual behaviour: i.e. the frequency and quality of one's sex life.



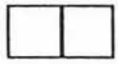
0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10
no disability — total disability

Self-care: i.e. activities which involves personal maintenance and independent daily living, e.g. taking a shower, driving, getting dressed, etc.



0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10
no disability — total disability

Life-support activity: i.e. basic life-supporting behaviours, e.g. eating, sleeping, and breathing.



0 ---- 1 ---- 2 ---- 3 ---- 4 ---- 5 ---- 6 ---- 7 ---- 8 ---- 9 ---- 10

no disability — total disability

APPENDIX D

OCCUPATIONAL THERAPIST ASSESSMENT

BACK PROGRAMME ASSESSMENT

REHABILITATION UNIT, PALMERSTON NORTH HOSPITAL

OCCUPATIONAL THERAPY ASSESSMENT

DATE:_____

NAME:_____

ADDRESS:_____

_____

TELEPHONE NO:_____

DATE OF BIRTH:_____ **AGE:**_____

OCCUPATION:_____

BENEFIT:_____

ACTIVITIES OF DAILY LIVING: Can you manage the following activities?

0	1	2	3
Does not apply to me	Not at all	Sometimes difficult	Yes easily

In/out of bed 0 1 2 3

In/out of shower 0 1 2 3

In/out of bath 0 1 2 3

In/out of chair 0 1 2 3

Doing hair and/or shaving 0 1 2 3

Dressing upper body 0 1 2 3

0	1	2	3
Does not apply to me	Not at all	Sometimes difficult	Yes easily

Shoes and socks	0 1 2 3	☐
Cooking meals	0 1 2 3	☐
Laundry	0 1 2 3	☐
Vacuuming	0 1 2 3	☐
Making beds	0 1 2 3	☐
Grocery/shopping	0 1 2 3	☐
Heavy cleaning	0 1 2 3	☐
Home maintenance	0 1 2 3	☐
Gardening	0 1 2 3	☐
Mowing lawns	0 1 2 3	☐
Stairs	0 1 2 3	☐
Driving	0 1 2 3	☐
Other, specify	0 1 2 3	☐
	0 1 2 3	☐

SLEEPING PATTERNS

Type of bed _____

Quality of sleep _____

Normal number of hours sleep per night _____

Do you experience night pain? _____

How does your back feel on rising? _____

_____

Sleeping position favoured _____

Resting position in which you are most comfortable

_____

_____

SOCIAL

Layout of home - adaptations necessary

_____

_____

Role within social structure. Changes?

_____

Routine

_____

Changes in habits/routine

_____

_____

Interests held

_____

_____

Are you still continuing with these?

_____

Support systems available

_____

_____

WORK

Briefly describe your work activities

_____

_____

List specific lifting and carrying activities you do at work

_____

_____

If not working - do you wish to return to work?

_____

Work assessment - Yes ☐ No ☐

Explanation of what Occupational Therapy can offer.

APPENDIX E

PHYSIOTHERAPY ASSESSMENT

BACK PROGRAMME ASSESSMENT

REHABILITATION UNIT, PALMERSTON NORTH HOSPITAL

PHYSIOTHERAPY ASSESSMENT

DATE:_____

NAME:_____

ADDRESS:_____

_____

TELEPHONE NO:_____

DATE OF BIRTH:_____

OCCUPATION:_____

DOCTOR:_____

POSTURES/STRESSES:_____

_____

HISTORY:

Symptoms now:_____

_____

_____

Present for:_____

At onset:_____

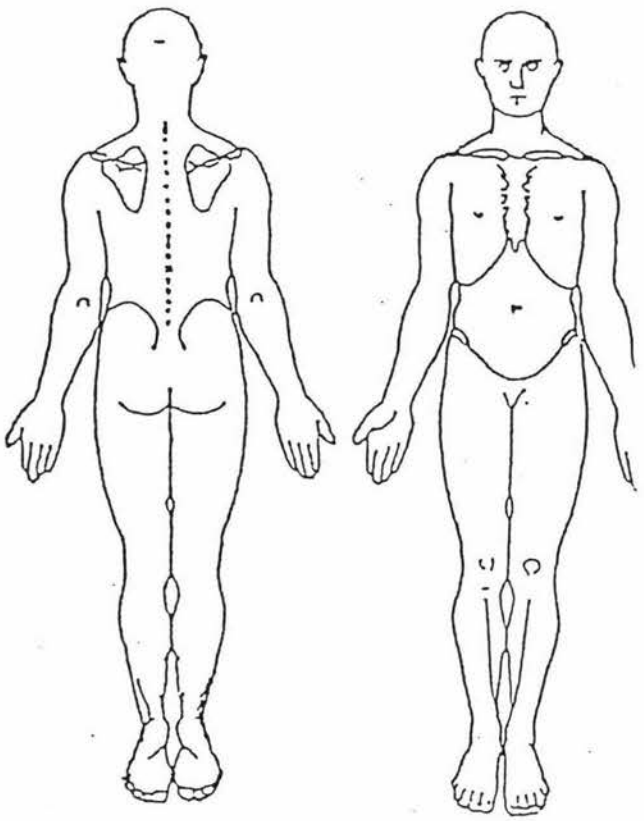
_____

Improving ☐ Unchanging ☐ Worsening ☐

Commenced as a result of:_____

_____

Commenced for no apparent reason: Yes ☐ No ☐



BACK PAIN

0 ---- 1 ----- 2 ---- 3 ----- 4 ---- 5 ----- 6 ---- 7 ----- 8 ---- 9 ----- 10
No Pain — Worst Possible

LEG PAIN

0 ---- 1 ----- 2 ---- 3 ----- 4 ---- 5 ----- 6 ---- 7 ----- 8 ---- 9 ----- 10
No Pain — Worst Possible

SYMPTOMS: Constant ☐ Intermittent ☐

LUMBER SPINE ASSESSMENT

What makes the symptoms worse. On a scale of 0 to 6 where 0 indicates no pain and 6 worst possible pain:

0 --------- 1 --------- 2 ---------- 3 --------- 4 --------- 5 --------- 6
No Pain — Worst Possible

Bending 0 1 2 3 4 5 6

0 --------- 1 --------- 2 ---------- 3 --------- 4 --------- 5 --------- 6
No Pain — Worst Possible

Sitting . . . . . 0 1 2 3 4 5 6 ☐

Rising . . . . . 0 1 2 3 4 5 6 ☐

Standing . . . . . 0 1 2 3 4 5 6 ☐

Walking . . . . . 0 1 2 3 4 5 6 ☐

Lying (supine/(R)/(L)/prone) . . . . . 0 1 2 3 4 5 6 ☐

On the move . . . . . 0 1 2 3 4 5 6 ☐

Is it better in the morning Yes ☐ No ☐ ☐

evening Yes ☐ No ☐ ☐

Other:_____

What makes the symptoms <u>better</u> - on a scale of 0 to 6 where 0 is no pain and 6 worst possible pain:

0 --------- 1 ---------- 2 ---------- 3 ---------- 4 ---------- 5 ---------- 6
No Pain — Worst Possible

Bending . . . . . 0 1 2 3 4 5 6 ☐

Sitting . . . . . 0 1 2 3 4 5 6 ☐

Rising . . . . . 0 1 2 3 4 5 6 ☐

Standing . . . . . 0 1 2 3 4 5 6 ☐

Walking . . . . . 0 1 2 3 4 5 6 ☐

Lying (supine/(R)/(L)/prone) . . . . . 0 1 2 3 4 5 6 ☐

On the move . . . . . 0 1 2 3 4 5 6 ☐

Is it better in the morning Yes ☐ No ☐ ☐

evening Yes ☐ No ☐ ☐

Other:_____

Sleep disturbed: Yes ☐ No ☐ ☐

Normal sleeping postures: prone ☐

supine ☐

sidelying - right ☐

- left ☐ ☐

Bedding surface: firm ☐

soft ☐

sagging ☐

waterbed ☐ ☐

Cough/sneeze/strain +ve/-ve

Bladder:_____

Gait:_____

Previous history:_____

_____

_____

X-Rays:_____

General Health:_____

Meds:_____

Steroids:_____ Weight Loss:_____

Recent history: _____

Accidents:_____

_____

RANGE OF MOVEMENTS - Active

0 ---------- 1 ---------- 2 ---------- 3
Nil Minimal Moderate Major

Flexion . . . . . 0 1 2 3 ☐

Extension . . . . . 0 1 2 3 ☐

Lateral flexion - right . . . . . 0 1 2 3 ☐

- left . . . . . 0 1 2 3 ☐

Rotation - right . . . . . 0 1 2 3 ☐

- left . . . . . 0 1 2 3 ☐

Squat: . . . . . 0 1 2 3 ☐

Distance feet apart:_____

Comments:_____

_____

RANGE OF MOVEMENTS - Passive

0 ---------- 1 ---------- 2 ---------- 3
Nil Minimal Moderate Major

Flexion (angle at hips) . . . . . 0 1 2 3 ☐

Straight leg raise - right . . . . . 0 1 2 3 ☐

Straight leg raise - left . . . . . 0 1 2 3 ☐

Hamstrings (fingertips to feet) . . . . . 0 1 2 3 ☐

Comments:_____

SPEED WALK:

Distance:_____ Time:_____

MUSCLE STRENGTH: 0 - 5 Oxford Scale

0 - nothing
1 - flicker
2 - gravity eliminated
3 - against gravity
4 - gravity plus resistance
5 - normal

Abdominals - obiques . . . . . 0 1 2 3 4 5 ☐

- rectus abdominals . . . . . 0 1 2 3 4 5 ☐

Extensors . . . . . 0 1 2 3 4 5 ☐

PLAN - TICK

REFERRAL TO:_____ B.P. _____ W.A.

NOT SUITABLE (state reasons)_____

_____

APPENDIX F

APPOINTMENT AND CONFIRMATION OF APPOINTMENT LETTERS

Dear

The assessment for the back programme study will be due in . The physiotherapist and the occupational therapist are available to do an assessment of your body movements in the first two weeks of at 3.30pm each day. An appointment schedule is attached with this letter. Would you please ring Helen (at the front desk) on (06) 350-8570 to make an appointment, or return the appointment times with your preferred dates in the pre-paid envelope. If the dates or times are not suitable, please ring Helen so we can make alternative arrangements for you. We look forward to hearing from you.

Yours sincerely

Mei Wah Williams

Study of Back Education Programme at Medical Rehabilitation Unit Palmerston North Hospital

Assessment Appointment Date and Time

November 2nd - 6th

Monday 2nd November 3.30pm

.....

Tuesday 3rd November 3.30pm

.....

Wednesday 4th November 3.30pm

.....

Thursday 5th November 3.30pm

.....

Friday 6th November 3.30pm

.....

November 9th - 13th

Monday 9th November 3.30pm

.....

Tuesday 10th November 3.30pm

.....

Wednesday 11th November 3.30pm

.....

Thursday 12th November 3.30pm

.....

Friday 13th November 3.30pm

.....

The physiotherapist and occupational therapist can only assess two people each day, so please indicate two dates that are suitable for you. If we cannot give you the first choice, then hopefully we can fit you in for the second choice.

Dear

We wish to confirm your appointment at the Medical Rehabilitation Unit, Palmerston North Hospital on at .

I have enclosed two questionnaires for you to complete a day or two before you come in for your appointment. This is so as to save you time in not having to complete them when you are here.

The first questionnaire is the Relative's Questionnaire which is to be completed by the same person who completed the previous one. The other questionnaire is for you to complete.

Please bring them both with you when you come in for your appointment.

If you have any queries, please ring Helen on (06) 350-8570.

Thanking you.

Yours sincerely

Mei Wah Williams

APPENDIX G

GENERAL SATISFACTION QUESTIONNAIRE

BACK PROGRAMME ASSESSMENT

REHABILITATION UNIT, PALMERSTON NORTH HOSPITAL

GENERAL SATISFACTION QUESTIONNAIRE

We would like to know whether the information and activities provided in the back education programme have been of benefit to you. Below is a list of the activities in the programme. Using the scale below, indicate how beneficial you felt that activity was for you. A score of 0 means no benefit at all, a score of 3 indicates it was of some benefit, and a 6 indicates the activity was of great benefit.

0 ---------- 1 ---------- 2 ---------- 3 ---------- 4 ---------- 5 ---------- 6
no benefit at all — some benefit — very beneficial

Dietician sessions ..... 0 1 2 3 4 5 6 ☐

ACC sessions ..... 0 1 2 3 4 5 6 ☐

Alcohol and drug counsellor ..... 0 1 2 3 4 5 6 ☐

Psychologist sessions ..... 0 1 2 3 4 5 6 ☐

Work assessment talk ..... 0 1 2 3 4 5 6 ☐

Recreation sessions ..... 0 1 2 3 4 5 6 ☐

Case coordinator meetings ..... 0 1 2 3 4 5 6 ☐

Physiotherapy education (eg lifting/anatomy, etc) ..... 0 1 2 3 4 5 6 ☐

Physiotherapy exercise/pool programme ..... 0 1 2 3 4 5 6 ☐

Occupational therapy education sessions
(eg lifting/work simplification/seating ..... 0 1 2 3 4 5 6 ☐

Occupational therapy activity sessions
(goal setting) ..... 0 1 2 3 4 5 6 ☐

Relaxation by Occupational Therapist and
Physiotherapist . . . . . 0 1 2 3 4 5 6 ☐

Medical discussion . . . . . 0 1 2 3 4 5 6 ☐

If you did not find the activities benefical, can you explain why not?

_____

_____

If the activities were beneficial, can you explain why?

_____

_____

In the programme are there any areas you felt were not covered and would like more information on?

_____

_____

Have you any suggestions how the sessions may be improved? Eg do you think there could be more or less of any sessions, etc.

_____

_____

Overall, do you feel you have improved/not improved after the treatment programme (eg physically, emotionally)? Yes ☐ No ☐

_____

_____

Any further comments you wish to make about the programme.

_____

_____