

Psychosocial Interventions for Chronic Pain: A Snapshot Review

**A Snapshot Review by the Australian Centre for
Posttraumatic Mental Health for the Institute for Safety,
Compensation, and Recovery Research**

Dr Damon Mitchell

Associate Professor Meaghan O'Donnell

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Executive Summary

Introduction and Background

ISCRR's research plan for 2010-11 includes an investigation of what interventions are effective in reducing the burden of mental health conditions for clients of TAC. The TAC and WorkSafe joint Health Services Group (HSG) has commissioned a review of the research evidence to explore the development and treatment of chronic pain in patients who have experience motor vehicle accidents or work place injury. Key questions to be addressed within the literature review include:

1. What psychosocial factors contribute to the vulnerability to chronic pain?
2. What is the relationship between mental health and chronic pain?
3. What are the current best practice psychosocial interventions for chronic pain?
4. Can we prevent the development of chronic pain?

Method

The literature was sourced using standard scientific databases, notably Medline, Web of Science and PsychInfo. The following key words were entered when conducting the search: chronic pain, pain, bio-psychosocial model, psychosocial interventions, treatment, early interventions, comorbidity, workplace accidents, motor vehicle accidents, mental health, CBT, ACT, mindfulness. Articles relating to each question were then selected for inclusion in the review based on expert opinion. Priority was given to high quality studies including systematic reviews and Randomised Control Trials.

Note:

This Snapshot Review was produced using Evidence Check methodology in response to specific questions from TAC and WorkSafe joint Health Services Group (HSG). This review does not aim to be a comprehensive review of all literature relating to the topic area. The literature in this review was current at the time of production (but not necessarily at the time of publication).

Findings

- Chronic pain is a frequently occurring problem with significant psychological, social, and economic costs. The bio-psychosocial model is currently used to define the collective range of factors that can contribute to chronic pain problems.
- High rates of psychiatric comorbidity are noted in people who present with chronic pain problems. In particular, anxiety disorders, depression, substance misuse, and insomnia are frequently diagnosed in people with chronic pain. Rates are noted to be 2 to 7 time greater than in the general population. It is important that these conditions are routinely screened for within clinical settings and factored into treatment. Research indicates that these comorbid problems respond to interventions such as cognitive behavioural therapy (CBT).

- Clinicians need to be aware of key psychosocial risk factors that contribute to chronic pain problems. Important risk factors include: fear and avoidance, catastrophizing (thought process whereby the magnitude and probability of a negative outcome is exaggerated), behaviours such as guarding and excessive bed-rest, negative cognitions and beliefs, low self-efficacy, low readiness to change, helplessness, a lack of acceptance, and environmental factors such as heavy workload and conflict.
- Interventions for both acute and chronic pain should initially include education about the bio-psychosocial model of pain, reassurance regarding prognosis, encouragement to remain active, and information about appropriate exercises.
- Cognitive behavioural therapies are the key psychosocial interventions for chronic pain. Aspects of CBT that are particularly useful for chronic pain include graded exposure, graded activity, and cognitive therapy. Pleasant event scheduling, problem solving, relaxation techniques, hypnosis, and distraction are additional methods that can be integrated in to CBT programs. Third generation CBT interventions including Acceptance and Commitment Therapy (ACT), mindfulness, and motivational interviewing are also being used to treat chronic pain problems. Overall, there is a general level of research supporting the use of these techniques in terms of reducing anxiety, depression, and disability. To a lesser extent there are reductions in levels of chronic pain. Overall, these therapies enable people to more effectively cope with chronic pain and lead a functional life.
- Social and occupational factors also play an important role in the development of chronic pain. Clinicians need to be aware of social factors that might reinforce and maintain chronic pain problems. There is also a need to assess work-related factors such as stress, workload, and relationships with colleagues. Return-to-work programs are a viable option to overcome barriers in the workplace that maintain chronic pain disability.
- Clinical consensus guidelines recommend multidisciplinary interventions that involve multiple providers. Such approaches are an integration of cognitive behavioural therapies, functional restoration, back-schools, and physiotherapy. However, there has been little research that has systematically examined the benefits of multidisciplinary interventions.
- Early intervention studies typically demonstrate reductions in chronic pain and disability. However, the effectiveness of early interventions is likely to depend on the appropriate matching of treatment to risk factor. Such programs have also been shown to be cost-effective when weighed against costs associated with disability.

Literature Review

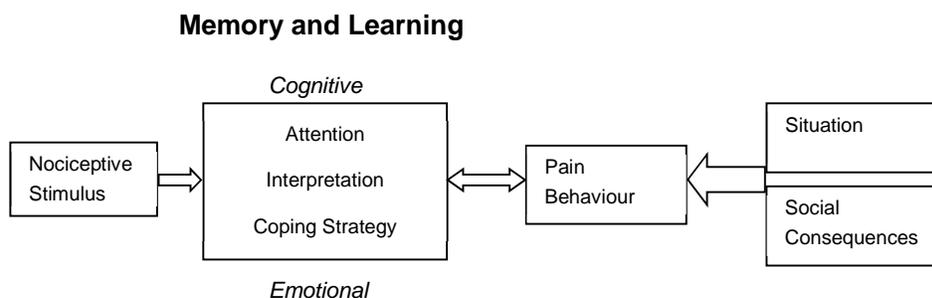
Introduction and Bio-Psychosocial Model

Chronic pain is a serious debilitating problem with significant psychological, social, and economic costs¹. Chronic pain is estimated to affect approximately 1 out of 6 Australian workers². However, rates of chronic pain have been reported to range from 11 to 44% depending on the type of injury, gender, and age³. Chronic pain is associated with high levels of unemployment, disability, benefit receipt, and psychological distress, poorer health, and greater interference with daily activities. Based on days of leave due to chronic pain and lost productivity it is estimated that chronic pain costs the Australian economy \$5.1 billion per annum⁴. These findings reinforce the need for an improved understanding of psychosocial variables and treatments for chronic pain.

The literature defines pain as an unpleasant sensory and emotional experience arising from actual or potential tissue damage or injury⁵. Thus pain may present following a more or less apparent injury or accident. Work-related injury and motor vehicle accidents are two of the most common causes of chronic pain problems⁶. Following injury acute pain frequently presents but typically subsides during recovery in the ensuing weeks and months. However, for a percentage of people the pain persists for an extended period of time and becomes chronic. A number of definitions exist for chronic pain, although it can typically be considered as pain that persists for 3 to 6 months, or above and beyond what would be the normal expected time for recovery^{7,8}. The bio-psychosocial model is a useful model to explain the multiple factors that lead to chronic pain presentations⁹. This model encompasses a complex and reciprocal set of interactions between biological, psychological, and social factors that contribute to the development and persistence of chronic pain (see figure 1). This model underpins a number of psychosocial treatments for chronic pain which will be shortly reviewed.

What Factors Contribute to the Vulnerability to Chronic Pain?

Attention, interpretation, and coping strategies play a central role in how people cope with the experience of pain (see figure 1). Furthermore, these factors influence pain-related behaviour such as taking leave. How people in the environment react towards pain-related behaviours can also influence future pain-behaviours and coping methods (for example reinforcing sickness behaviours).



Boundaries: Culture, Family

Figure 1. Basic representation of the bio-psychosocial model of chronic pain (adapted from Linton, 2011)

Overall, a key goal is to identify early risk factors and prevent the onset of chronic pain issues. A range of psychosocial risk factors for chronic pain have been cited in the literature¹⁰⁻¹³. These may occur or exist before (pre-), during (peri-), or after (post-) an injury. Figure 2 provides a more detailed picture of vulnerability factors that can lead to chronic pain problems¹⁴. Pre-injury factors can include pre-existing physical, psychological, or pain problems, past alcohol dependence, and socio-demographic factors such as unemployment and older age. Peri-injury factors might include the severity of injury and pain, degree of tissue and nerve damage, location of injury, and number of injury sites. A range of post-injury factors have also been cited including levels of distress, anxiety, hypochondriasis, depression, duration of problem, lack of clarity regarding pain problem, use of passive coping strategies (e.g. rest, use of hot-packs), higher compensation, restriction of movement, beliefs and expectations regarding recovery/re-injury, and effectiveness of prior treatments. Furthermore, a number of social/environmental factors including dependency, reinforcement of sickness behaviour, lack of social support, and work factors can maintain chronic pain problems. In addition, it has been demonstrated that expectations of recovery have a strong influence on rates of recovery, pain intensity, and pain-related limitations¹⁵.

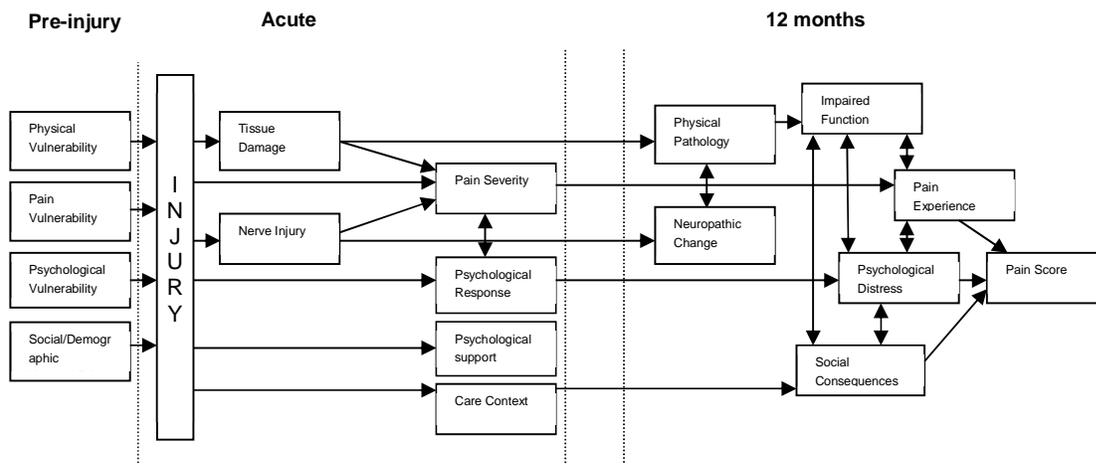


Figure 2. Biopsychosocial Model of Chronic Pain Development (Holmes et al., 2010)¹⁴

What is the Relationship between Chronic Pain and Mental Health?

Chronic pain frequently results in emotional distress such as anxiety, lowered mood¹⁶ and significant psychiatric conditions³. In fact rates of comorbid psychiatric conditions are noted to be 2 to 7 times greater than those observed in the general population. Of clinical relevance approximately 50%-100% of people presenting with chronic pain are likely to meet criteria for a psychiatric condition¹⁷. Further research is still required to better understand the causal relationship between chronic pain and psychiatric disorder.

In terms of anxiety, the presence of chronic pain increases the likelihood of having post-traumatic stress disorder (PTSD), panic disorder, generalized anxiety disorder, and social anxiety by up to three times¹⁸. For example, Jenewein and colleagues⁶ found that 44% of people who were involved in a work or motor vehicle accident experienced chronic pain at 36 months. Furthermore, these individuals had greater levels of PTSD, anxiety, depression, and disability. These differences emerged between 6 and 12 months following

injury. PTSD is one anxiety disorder that is strongly linked to chronic pain^{6,19}. Studies that have investigated this relationship suggest that PTSD and pain may drive each other²⁰. A number of mechanisms are thought to contribute to this comorbidity such as avoidance, anxiety sensitivity, anxiety and pain perception, reduced activity levels, pain acting as a reminder of the trauma, and reduced capacity to apply cognitive coping mechanisms²¹. Furthermore, PTSD and chronic pain are understood to involve shared biological pathways such as the hypothalamic pituitary axis¹⁹.

Another mental health problem that occurs alongside chronic pain is depression²². Rates of depression in people with chronic pain generally range from 30-50%¹⁷, with some rates noted between 80 and 100%. Research indicates that there is a trend for chronic pain to result in depression and also for pre-existing depression to increase vulnerability to developing chronic pain problems following injury^{11,23}. A number of mechanisms may lead to the co-occurrence of these disorders including shared biological pathways, loss of function, and impaired coping. Another possibility is that the presence of chronic unremitting pain results in learned helplessness/hopelessness which is a key feature of depression²⁴. There is also discussion that depression can go unrecognized in the presence of a chronic pain problem and that the co-occurrence of these two problems is associated with worse clinical outcomes¹⁷. These observations highlight the importance of explicitly assessing for the presence of comorbid psychiatric conditions such as depression.

Chronic pain is also comorbid with substance use disorders²⁵ with studies reporting rates of up to 48%. At present there is only limited and conflicting evidence regarding the direction of causality between these problems. Clearly though chronic pain places an individual at increased risk for substance use. For example, substances may be used to provide pain relief (self-medicate) especially in patients with a history of addiction²⁶. In addition, medications that have potential for addiction are often prescribed and made available for people with chronic pain. Critically, addiction needs to be assessed for (past, present, and family history) alongside careful monitoring of prescription.

Insomnia also frequently occurs alongside chronic pain with rates noted to be as high as 50 to 70%²⁷. Sleep deprivation is likely to result from chronic pain but may also exacerbate the pain experience and reduce levels of functioning. Effective treatment of insomnia may in some ways improve functioning and ability to cope with pain.

Assessment

People who present with chronic pain require a thorough assessment of pain-related factors such as type, intensity, frequency, duration, location, level of disability, and nature of injury. In addition, psychosocial risk factors should be assessed for. A range of psychometric tools are available to assist this process^{28,29}. Furthermore, based on the high rates of comorbidity it is important that patients are screened for anxiety disorders (including PTSD), depression, sleep impairment disorders, and substance use disorders. If an individual screens positive for a psychiatric disorder, then a more detailed psychiatric assessment should entail. The treatment plan should then include addressing this psychiatric comorbidity.

What are the Current Best Practice Psychosocial Interventions for Chronic Pain?

A number of psychological models and interventions have been developed to assist people to manage and reduce levels of chronic pain, and its resulting disability¹⁶. These interventions are also useful for treating comorbid psychiatric disorders. Current psychosocial interventions include education, cognitive-behavioural therapy (CBT - which broadly includes graded exposure, behavioural activation, graded activity, relaxation, distraction, and cognitive therapy), mindfulness and acceptance and commitment therapies (ACT), and motivational interviewing (MI). Each intervention is hypothesized to moderate chronic pain problems by targeting relevant mechanisms (as noted in Table 1) such as cognition, coping style, behaviour, and the environment³⁰. The following section outlines current psychosocial interventions for chronic pain.

Table 1: List of Interventions and mode of actions

	Intervention	Model and Risk Factors	Mode of Action/outcome
Education	Education	Knowledge: Lack of information about biopsychosocial factors, negative expectations for recovery	Increase knowledge Shift expectancies Guide self-management
CBT Interventions	Graded exposure	Fear-Avoidance: Fear, anxiety, catastrophizing, avoidance of movement/activity	Extinction of fear response through exposure Modification of unhelpful beliefs
	Graded activity	Decreased activity, fear of re-injury, overuse, guarding, learned helplessness	Increased reinforcement for activity Decreased attention/reinforcement of pain related behaviours
	Cognitive Therapy	Cognitions: Fear beliefs, negative beliefs about injury and recovery.	Modified beliefs regarding pain, injury, and recovery, Improved coping skills.
	Distraction Mindfulness Refocusing Relaxation	Attention: Over-focus and hyper-vigilance towards pain/somatic experience, tension	Divert attention from pain Dissociation from experience of pain
Third Wave Cognitive Behavioural Approaches	Acceptance and Commitment Therapy Mindfulness	Acceptance: Decreased acceptance, resistance towards actual pain experience	Acceptance of chronic pain Shift in attention/refocus Increased commitment and action towards values
	Motivational Interviewing	Self Efficacy and Readiness to Change: Negative beliefs about ability to cope and reduced readiness to change	Increased motivation to change unhealthy behaviours and engage in healthy behaviours
Environmental Interventions	Return to work programs	Environment: Conflict, work demands, heavy duties	Improve relationships with others Change and modify work environment

Education and Advice

Education about the bio-psychosocial model of pain, reassurance regarding prognosis, and expectations for recovery are an important treatment component for chronic back pain³¹. Such interventions are routinely incorporated into the treatment paradigms noted below. Advice to stay active and avoid excessive bed-rest is also included if there are no contraindications. Education shapes knowledge and beliefs regarding effective coping strategies and recovery and can reduce levels of catastrophizing and pain-related fear³². A recent Cochrane review of 24 educational interventions concluded that 2.5 hours of education for people with sub-acute low back pain resulted in better short and long-term outcomes in terms of pain reduction and return to work³³. However, people with chronic pain problems are likely to require further education and advice alongside more intensive treatment approaches^{33,34}. Back-schools also incorporate an educational component including information regarding anatomy of the back, biomechanics, posture, and ergonomics in addition to skills such as back exercises. A systematic Cochrane review of 19 studies concluded that there is moderate evidence that back schools are effective at

reducing chronic pain and improving functioning³⁵. At present a number of CBT and multidisciplinary approaches incorporate psycho-education as part of treatment.

Cognitive Behavioural Therapy Approaches

A prominent model that underpins the cognitive-behavioural approach to understanding and treating chronic pain is the ‘fear-avoidance’ model^{36,37}. This model posits that a number of cognitive and behavioural factors contribute towards and maintain chronic pain and disability (see figure 3). The presence of pain demands resources such as attention and cognitive processing³⁸. With the onset of an injury and acute pain there are normal attempts to protect the wound and facilitate recovery. Thus increased levels of anxiety and fear arise in relation to movements that may lead to further damage or injury³⁹. A range of protective or harm-avoidant behaviours such as guarding are also activated. Problems arise when this system becomes over-activated leading to excessive worry, fear, and avoidance. Ongoing avoidance is then reasoned to lead to increased symptoms of depression, muscle atrophy, disability, and increased chronic pain. Evidence currently shows that fear avoidance profiles are associated with increased sick leave and health care usage⁴⁰ and greater disability⁴¹.



Figure 3. Fear-avoidance model of chronic pain³⁶

A range of beliefs and appraisals are also understood to be important in the maintenance and shaping of chronic pain⁴². Importantly, it is the interpretation of the pain experience that is likely to shape emotional experience, behaviour, types of coping strategies used, and disability. Relevant beliefs and appraisals include catastrophizing about re-injury or the triggering of pain, beliefs about the nature of pain and ability to control pain, beliefs about ability to cope (self-efficacy), and expectations about recovery¹⁶. Such beliefs and expectations have been shown to be important in moderating the pain response, disability, and work loss and hence are an important factor to target⁴²⁻⁴⁴.

Cognitive Behavioural Therapy

CBT includes a range of interventions that aim to address these problems. These include psycho-education, relaxation skills training³⁰, attention refocusing and distraction³⁸, cognitive restructuring, pleasant events scheduling, and problem skills training depending on the presenting issues of the patient. CBT approaches are designed to change behaviours and beliefs that increase chronic pain and disability. A number of literature reviews and studies have explored and found support for the effectiveness of CBT in treating chronic pain presentations, reducing pain, disability, pain-related behaviours, and psychological distress⁴⁵⁻⁴⁸. In a recent Cochrane review of 40 randomized and controlled studies implementing behavioural and CBT the authors concluded that CBT only has small to moderate effects in terms of assisting patients to reduce anxiety and depression, levels

of disability, and chronic pain⁴⁹. Overall, there is support for the use of CBT interventions for chronic pain. However, results and effect sizes are likely to vary depending on sample, treatment specifics, and variables assessed⁴⁶. Similar to all treatment approaches further research is required to determine the active treatment components of CBT and patient characteristics that influence responsiveness. Importantly, CBT is also an effective treatment for the psychiatric conditions that may be comorbid with chronic pain including depression, anxiety and PTSD.

Graded Exposure and Graded Activity

Graded exposure is a behavioural intervention that is designed to assist people re-engage in feared and avoided actions they believe may result in pain or re-injury. In this procedure patients are asked to rate how much they fear a sequence of activities and movements. Patients are then provided with education and assistance to gradually engage in these activities and overcome their fear and anxiety. With engagement in feared activities expectations and beliefs of pain and re-injury also typically modify. A number of studies have explored the effects of graded exposure on chronic pain presentations^{32,50-55}. A recent systematic review outlined the effects of graded exposure on chronic pain, disability, perceived effect, and work outcome in 15 studies⁵⁶. These authors concluded that there is some evidence supporting the use of graded exposure in reducing disability associated with chronic pain. Another review indicated that studies using exposure based interventions resulted in decreased fear of movement/injury, fear avoidance beliefs, levels of avoidance, and to some extent levels of chronic pain⁴⁸. Despite the emerging dataset, such studies have been limited in terms of small sample sizes and quality including lack of randomized control groups.

Another specific approach is graded activity which is aimed at increasing healthy and functional behaviours over time by using positive reinforcement⁵⁴. A recent study demonstrated that both graded exposure and graded activity in conjunction with physical therapy were effective at reducing the intensity of pain and level of disability⁵⁰. Furthermore, a range of studies and systematic reviews reinforce that graded activity is effective at reducing disability and pain related complaints^{56,57}.

Third Wave Cognitive Behavioural Approaches

Mindfulness and Acceptance and Commitment Approaches (ACT)

The concept of acceptance is becoming more recognized in the management of chronic pain⁵⁸. Lower levels of acceptance are theorized to be associated with higher levels of avoidance, cognitive narrowing and inflexibility, and increased attempts to control and struggle with the pain experience⁵⁹. This over-focus and attempt to control the symptoms and emotional experience associated with chronic pain ultimately lead to a reduction in activity. In one sense it is the struggle with pain that becomes the problem. Evidence is accumulating showing that acceptance can result in decreased levels of pain, reduced anxiety and avoidant behaviours, lower rates of depression, and decreased disability⁵⁸.

Recently attention has been given to mindfulness, and acceptance and commitment therapy (ACT)⁵⁹. Conceptually these approaches are concerned with how people use ineffective psychological strategies to control, suppress, and avoid their pain. Whereas CBT directly challenges unhelpful thought processes and behaviours, ACT and mindfulness assist clients to change their psychological stance towards their thoughts, emotions, and pain. Mindfulness is a strategy concerned with shifting awareness, being

focused on the present moment, and maintaining a non-judgmental stance towards the actual experience of pain. In comparison, ACT is a structured therapy that utilises a mindfulness approach, in addition to teaching clients to increase their willingness to experience certain levels of discomfort, defuse unhelpful cognitions regarding pain, and re-engage in valued activities⁶⁰.

Recently, Veehof and colleagues⁶¹ conducted a systematic review and meta-analysis of 22 mindfulness and acceptance based interventions for chronic pain. Overall, ACT and mindfulness based interventions produced small to moderate effect sizes in terms of reducing pain, depression, and anxiety and increasing physical well-being and quality of life. The authors concluded that ACT and mindfulness interventions had similar effects to other CBT interventions and that these types of interventions may be a useful alternative or adjunct to current therapies. Chiesa & Serretti⁶² conducted another systematic review on 10 mindfulness interventions (9 of which were included in the Veehof study). The main findings were that these interventions produced small non-specific effects in terms of reducing chronic pain and symptoms of depression. When compared to active control groups (support and education) no additional significant effects were noted. In summary, there is a need for further studies into the specific effects of mindfulness and ACT studies for chronic pain. An important caveat of these types of interventions is that pain reduction is not a major goal of therapy. Rather, increased acceptance, reduced control strategies, decreased interference due to chronic pain (ie; less disability), and greater engagement in valued activities are the primary goals of ACT and mindfulness therapies.

Motivational Approaches

The purpose of motivational approaches is to emphasize the importance of change and to increase patient's belief in their ability, readiness, and motivation to engage in and maintain adaptive self-management behaviours and coping strategies (e.g. exercise) despite potential barriers. Such approaches were initially developed to assist people with substance use problems to change behaviour but have since been adapted for a range of problems. At present there is only preliminary evidence supporting the use of motivational approaches in the treatment of chronic pain⁶³. Clearly, further studies are required to explore the role of motivational approaches in people with chronic pain. Regardless, motivational approaches are very useful in engaging the patient in therapies.

Environmental Interventions

Chronic pain and associated behaviours occur and are moderated within the context of complex social situations. Behavioural and Social-Learning models propose that there are powerful rewarding and punishing contingencies which shape attitudes, beliefs, and behaviour¹⁰. A number of interventions involve shifting environmental factors that might maintain and reinforce chronic pain. Clinicians frequently teach and reinforce coping strategies and influence beliefs about chronic pain and expectations for recovery. Clinicians also need to be careful not to accidentally reinforce or pay too much attention to pain-related behaviours and displays. Therapy can also lead to modifications in terms of the level and quality of social support from others.

A number of occupational factors are also understood to influence the progression of chronic pain. In particular, Linton⁶⁴ reviewed 21 prospective studies that explored occupational risk factors for the development of chronic pain. Consistently, the authors found that job dissatisfaction and stress, boring and repetitive tasks, relationships with

work colleagues and supervisors, stress and work demands, and perceptions regarding ability to work were associated with chronic back pain problems. To a lesser extent work pace, level of control in the work environment, emotional effort, and the belief that work is dangerous were associated with outcome.

Return-to-work programs can be effective at reducing disability and are frequently integrated into multidisciplinary interventions⁶⁵. Specifically these interventions are aimed at assessing and identifying any barriers related to the work environment and then adjusting these for the person with chronic pain⁶⁶. Findings from this study demonstrated that people with chronic pain were able to shift from a focus on trying to eliminate pain to restoring work capacity. One systematic Cochrane review concluded that there is low evidence that workplace interventions reduce chronic pain and moderate evidence that such interventions reduce sick leave days in the short term but not in the medium and long term⁶⁷. Overall, there is still a need for further research into the effectiveness of return to work programs.

Multidisciplinary Interventions and Combined Therapies

Chronic pain is a complex problem that often requires intervention from multiple disciplines including occupational therapists, physiotherapists, physicians, nurses, and psychologists. Evidence has emerged that multidisciplinary approaches or functional restoration programs are effective at aiding return to work, improving function, and reducing pain⁶⁸⁻⁷³. For example, pain reduction can range from 20%-40% following multidisciplinary interventions⁷⁴. Such interventions include education, CBT, physiotherapy, exercise, and workplace-based interventions. However, such studies have been limited in terms of their quality and definition of treatment protocols. Where possible it is recommended that interventions be coordinated amongst health care providers using multidiscipline approaches. However, there is still a need to standardize and develop guidelines for the most effective multidisciplinary management of chronic pain.

Early Interventions: Can we prevent the Development of Chronic Pain?

An overall goal is to be able to detect early warning signs and prevent the onset of chronic pain problems. A systematic review indicated that there is emerging evidence for the effectiveness of early interventions for reducing the likelihood of developing chronic pain problems¹⁰. This review is consistent with recent studies demonstrating the benefit of early interventions such as CBT for back pain^{75,76} and education for whiplash-associated disorders⁷⁷. Furthermore, Gatchel et al.,⁷⁸ found that an early intervention program resulted in fewer costs in the long-term and increased return to work. Importantly, the current evidence indicates that early interventions that target relevant psychosocial risk factors have the greatest positive effects. In contrast, interventions tend to be less effective when delivered in an omnibus fashion to patients who do not present with specific risk factors. Despite the emerging findings, further research still needs to be conducted around mechanisms of change, timing and level of intervention, and environmental context.

Summary and Future Directions

Chronic pain is a frequent and complex consequence of injury that results in considerable disability and cost. Furthermore chronic pain is often comorbid with a range of psychiatric disorders such as PTSD, depression, anxiety, sleep problems, and substance use disorders. At present the bio-psychosocial model offers a comprehensive way to understand factors associated with the development and maintenance of chronic pain and comorbid psychological problems. Research is currently enhancing our knowledge about a number of risk factors (pre-, peri-, and post-injury) which are linked to chronic pain development. These can include pre-existing psychological problems, age, severity of injury and pain, beliefs regarding re-injury/treatment, fear and avoidance, depression, social consequences, and work-related stressors. Effective intervention is likely to depend on accurate identification and assessment of these risk factors. At present a range of psychosocial treatments exist for the management of chronic pain such as CBT, graded exposure/activity, ACT and mindfulness, motivational interviewing, workplace interventions, and multidisciplinary interventions. Overall, there is an emerging evidence base supporting the use of these interventions. In addition, early interventions show promise in terms of reducing and preventing chronic pain problems. However, there is still a need for further research to refine detection of risk factors and determine appropriate matching of intervention to pain presentation.

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