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One in five Canadians experience chronic pain - this means over seven million Canadians of all ages experience chronic pain as a result of injury, illness, or dysfunction. Three quarters of these individuals say their pain interferes with their work life. Many are clinically depressed; some to the point of being suicidal.1

Until recently, prescription medications, including opioids, have been central to chronic pain management. However, the practice of prescribing opioids for chronic pain is currently under review in most jurisdictions. Here in Canada, the first recommendation of the 2017 Canadian Guidelines for Opioids for Chronic Non-Cancer Pain is for “the optimization of non-opioid pharmacotherapy and non-pharmacological therapy, rather than opioids.” As an example, there is recent evidence that opioid use does not improve physical functioning in people living with chronic neuropathic pain.2

Interdisciplinary teams are effective in chronic pain management care but can be difficult to access. Wait times for specialized pain clinics may be a year or longer and are primarily limited to large urban centres. The prevalence of chronic pain within the Canadian population highlights the need for more avenues of care within the community.

Early recognition and management may be an effective tool for prevention and mitigation of the development of chronic pain and can be accomplished within the primary care model.

This document provides physiotherapists with profession-specific information and resources for the prevention, recognition, and initial management of chronic pain. While many of the examples address chronic musculoskeletal pain, the principles and approaches described are applicable to management of all patients with chronic pain.

Definitions

Pain is “an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described by the patient in terms of such damage.”3 Williams and Craig proposed an updated definition of pain in 2016: a “distressing experience associated with actual or potential tissue damage with sensory, emotional, cognitive, and social components.”4 The two definitions are used interchangeably.

Chronic or persistent pain is defined as “pain that persists or recurs. Chronic pain may be present in disease processes such as rheumatoid arthritis, a peripheral neuropathy, or after an injury. It may also occur in the absence of injury or illness.”5 While the term chronic pain implies that a period of time must pass to label pain as chronic, it is important to understand that risk factors for persistent pain and disability may be present even in acute illness or injury states.

A biomedical or “pathomechanical” approach is the conventional medical model for pain management in which signs and symptoms are assumed to arise from damage to physical structures or degenerative processes occurring following injury or as part of a disease process. However, recent research indicates that the biomedical model for management of chronic/persistent pain is ineffective and even counterproductive.6,7,8

The purpose of this clinical resource is to provide physiotherapists who may not regularly see patients diagnosed with chronic or persistent pain with fundamental information and resources to guide their recognition, assessment and management of those patients. It is not intended to be comprehensive or exhaustive, and physiotherapists are strongly urged peruse other existing resources (courses, literature, mentors) to further build their skills and competencies in the treatment of persistent pain.
The biopsychosocial model for chronic/persistent pain management proposes that the experience of pain can best be understood as a combination of biology (e.g., tissue damage, physiological processes), psychology (e.g., mood, emotional health, thoughts and beliefs) and social or contextual factors (e.g., culture, environment or resources). Thus, the biopsychosocial model necessitates that physiotherapists incorporate assessments and treatments that reflect the inter-connectedness of biological, psychological and social factors in the person living with pain. This understanding of pain also extends the range of treatment options available. For example, the focus is not only on interventions that address tissues such as muscles and joints, but also treatments that facilitate addressing the psychological and social factors known to impact pain and treatments that assist patients to maximize function and improve their quality of life.

Chronic/persistent pain is a complex, heterogeneous condition. Biological factors interact with psychological factors, and both are further influenced by the patient’s social and cultural environment, contributing to the individual’s experience of pain. Physiotherapists can be equipped to develop an effective plan of care that addresses the inter-connected biological, psychological and social factors.5,10

- Houben et al. (2005) found that physiotherapists using a biomedical approach to low back pain were more likely to regard activities as harmful and to be more restrictive on a patient’s return to physical activity than those using a biopsychosocial approach.6
- Synott et al. (2015) found that physiotherapists were more comfortable with the biomechanical aspects of treatment and either did not address psychosocial factors affecting recovery, or on occasion, stigmatized patients with those signs and symptoms.7
- Finally, a study by Reme et al. (2009) found that previous treatment by a physiotherapist using a biomedical approach was a risk factor for long-term disability in low back pain patients. In that approach, other important factors impacting outcome were less likely to be addressed compared to those using a more holistic biopsychosocial approach.8
The Biopsychosocial Classification of Chronic Pain

As Figure 1 depicts, these factors are inter-connected and typically coexist. Although biological, psychological and social factors of pain are presented separately in this resource to improve understanding of each of the factors; in practice these factors are concurrent. For example, it is unlikely a person with chronic pain will present with only psychological factors influencing their pain. By using a biopsychosocial classification approach to clinical reasoning, clinicians will better understand the breadth of the disorder and facilitate the development of a similarly multifactorial plan of care.

Despite the complexity of pain, there are signs and symptoms that cluster together that typically reflect biological and psychological processes that explain persistent pain and disability. Understanding these processes enables physiotherapists to initiate appropriate treatments, self-management strategies and/or referrals. Implementing an assessment and treatment approach that is sensitive to the patient's social and environmental context will individualize care and help create a strong therapeutic relationship.

This approach can be used for specific diagnoses known to be associated with persistent pain such as rheumatoid arthritis, fibromyalgia, neuropathic pain or complex regional pain syndrome, or in cases where pathology is not well understood such as non-specific low back pain or whiplash associated disorders (WAD). These classifications are not diagnostic tools, but support the clinician's clinical reasoning. Using a classification-based approach for chronic pain may improve clinical outcomes by helping clinicians select appropriate interventions and tailor patient education to provide a reasonable explanation for the variety and complexity of their pain presentation.1,12

Biological Factors in Chronic Pain

There are numerous biological pain mechanisms. However, three principal pain classifications have important implications for the clinical management of pain: nociceptive, peripheral neuropathic, and central sensitization pain. For the purposes of this document, the terminology used will be from the International Association for the Study of Pain.3,5

Nociceptive pain is a response to noxious stimuli (thermal, mechanical or chemical).

Peripheral neuropathic pain is the result of a disease or damage affecting peripheral nerves.
Centrally-mediated pain, which includes central sensitization, results in an increased responsiveness, or hypersensitivity, to ascending nociceptive input in the somatosensory system, while descending anti-nociceptive pathways are inhibited. This may be seen as widespread hypersensitivity to, for example, light, touch, noise, temperature, or mechanical pressure, in patients with musculoskeletal pain. Sensitization may be observed through the patient’s responses to stimuli, such as allodynia or hyperalgesia. Allodynia is a painful response to a stimulus that does not normally evoke pain, such as light touch, or temperatures that are normally within the comfortable range, while hyperalgesia is an augmented or increased response to a stimulus that is normally painful, such as a pinprick.

Central Sensitization in Chronic Pain

Central sensitization (CS) is now recognized as a key factor in the diagnosis and management of chronic pain. CS may be present in a range of conditions such as fibromyalgia, temporomandibular joint (TMJ) syndrome, tennis elbow, chronic fatigue syndrome, persistent neck or low back pain, pelvic floor disorders or osteoarthritis. It may account for pain unexplained by the anatomical features of the injury or disease, persisting beyond recovery of tissue injury, or be the actual underlying pain mechanism through spontaneous discharge of central neurons with no peripheral driver.

While CS is known to be present in many chronic pain disorders, it can also develop in acute and sub-acute phases of injury. For example, patients with recent WAD may exhibit signs of early CS as can those with recent fractures whose level of pain does not recede as anticipated. It is also important that clinicians are aware that in the early phase of an injury, CS is one of a number of factors that can interact to increase the risk of persistent pain and disability. Psychological and social factors also play an important role and must be addressed.

Psychological Factors in Chronic Pain

Psychological distress also affects pain perception and can contribute to the complexity of the individual’s presentation. Awareness of contributing psychological and social factors can help guide both the treatment approach and identification of goals with the patient. There is strong evidence that psychological and social factors influence outcomes. One means of organizing these factors is through use of “flags.”

Flags help physiotherapists identify risks for disability and assess barriers to recovery that should be targeted and integrated within the treatment plan. They are grouped as clinical and psychosocial and may also highlight the need for additional support to facilitate the patient’s return to their normal level of activity.

Flags may be positive (adaptive) or negative (maladaptive). Table 1 includes the existing flags used in health care along with behavioural examples adapted from the Occupational Health and Wellbeing website.

<table>
<thead>
<tr>
<th>Flag</th>
<th>Category</th>
<th>Behavioural Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>Clinical - requires referral for further investigation and/or management</td>
<td>Serious pathology such as inflammatory or neurological conditions, structural musculoskeletal damage or disorders, circulatory problems, suspected infections, tumours or systemic disease</td>
</tr>
<tr>
<td>Orange</td>
<td>Clinical - requires referral for further investigation and/or management</td>
<td>Includes excessively high levels of distress, major personality disorders, post-traumatic stress disorders, drug and alcohol abuse/ addictions or clinical depression</td>
</tr>
<tr>
<td>Yellow</td>
<td>Psychosocial - (in relation to the individual’s attitudes, beliefs, emotions, behaviours, family, judgment and workplace) associated with poor clinical outcomes and transition to persistent pain</td>
<td>• Catastrophizing - thinking the worst, thinking about pain all the time and feeling helpless. This is also related to the belief that pain is always an indication of tissue damage • Over-protective family and/or lack of support • Other health-care providers with strong unhelpful beliefs that influence the patient • Finding painful experiences unbearable, reporting extreme pain disproportionate to the condition • Having unhelpful beliefs about pain and work or activities- for instance, “If I do X,Y,Z my pain will get worse” • Becoming preoccupied with health, over-anxious, distressed and low in mood • Fear of movement and of re-injury • Uncertainty about what the future holds • Changes in behaviour or recurring behaviours • Expecting other people or interventions to solve the problems (being passive in the process) and serial visits to various practitioners for help with no improvement • Disturbed sleep</td>
</tr>
<tr>
<td>Blue</td>
<td>Psychosocial (in relation to employees and their work environment) - can delay recovery or be an obstacle to it</td>
<td>• Concerns about whether they are able to meet the demands of the job • Low job satisfaction • Little or poor support at work • Perception that job is very stressful • Poor communication between employer and employee • An accommodating approach in the workplace to providing altered duties or modified work options to facilitate a return to work</td>
</tr>
<tr>
<td>Black</td>
<td>Psychosocial (outside immediate control of individual) - may need to involve other professionals</td>
<td>• Misunderstandings among those involved • Financial issues and/or claims procedures • Sensationalist media reports • Family and friends with strong unhelpful beliefs influencing the employee • Social isolation and becoming disconnected from the community • Poor or unhelpful company policies, such as those related to insurance benefits, disability leave, accommodations</td>
</tr>
<tr>
<td>Pink</td>
<td>Positive factors that give individuals the potential for a better outcome</td>
<td>• Individual enjoys their job and/or life roles • Has realistic goals for recovery and return to daily roles and activities • Willing to take responsibility for improving health, and believes improvements are possible • Individual has discovered that activity actually helps them feel better • Wants to stay active</td>
</tr>
</tbody>
</table>

Table 1: Clinical and Psychosocial Flags with Examples of Behavioural Indicators
The Importance of Orange flags

Orange flags represent the mental health or psychological equivalent of red flags, and alert the clinician of the need for referral or consultation to provide the patient optimal care. For example, there is an elevated incidence of anxiety disorder in the chronic pain population, the onset of which may have preceded the diagnosis of chronic pain for many. Similarly, the prevalence of personality disorders is higher in the chronic pain population than in the general population. Personality disorders, such as borderline personality disorder, involve patterns of behaviour, mood, social interaction, and impulsiveness, and can cause distress to the person experiencing them, as well as to other people in their lives. The symptoms of personality disorders are varied and depend on the type of disorder the individual is experiencing.

It is important to understand that everyone may experience aspects of personality disorders to varying degrees at some point in their life. However, actual diagnosis of a personality disorder must be done by a mental health professional.

If they are not identified, treatment outcomes may be affected, as unmanaged psychological disorders can be barriers to achieving successful pain management. For example, in the presence of unmanaged psychological disorders, the therapist may have difficulty interpreting the patient’s responses to the planned treatment program.

The presence of an orange flag is not a contraindication to treatment, but highlights the need for consultation and/or collaboration with the appropriate professional. In the assessment section of this resource, readers are introduced to a variety of tools that may help determine the presence or extent of psychological distress.

Clinical Resource:
- The Flag System - Physiopedia

Social Factors in Chronic Pain

Understanding social and environmental factors are key to developing an individualized and patient-centred approach in the assessment and management of pain. These factors can range from socio-economic, place of residence (e.g., rural versus urban), to location of practice (e.g., private versus public). To illustrate the importance of social factors, the role of culture in pain is discussed.

Ethnicity and/or cultural background may be an important factor to consider during assessment and treatment planning. A substantial amount of literature has been written on the effect of ethnicity on perceptions of pain, disability and psychological distress. Ethnicity is defined as the “distinction between groups of people who share a certain social background, distinguishing behaviours, culture, history, beliefs, conventions and traditions as well as physical characteristics.” Many studies show that individuals in some minority groups experience higher levels of pain and psychological distress than those of European descent or some East Asian cultures. While this finding may be attributable to cultural attitudes to pain, (as well as to the study design), it may be also in part due to less than adequate pain treatment received in racial/ethnic minority groups. This in turn may be a result of a lack of cultural sensitivity or awareness on behalf of the provider, language barriers, and socioeconomic status.
The therapeutic relationship (the rapport established between the patient and the treating physiotherapist) is central to effective care for any physiotherapist-patient encounter, in any area of practice. However, since people living with pain are more frequently exposed to stigma and disbelief, establishing a positive therapeutic relationship is particularly important in the assessment and management of individuals with chronic/persistent pain.

**Therapeutic Relationship**

Components of a successful therapeutic relationship include “validating the patient’s experience, individualizing treatment, and clarifying physical problems and solutions.”

Establishing a therapeutic relationship begins at the first encounter and continues throughout treatment. Clinicians have a strong influence on a patient’s understanding of their condition and can affect, not only the present outcome, but potentially any future events. Underlying the therapeutic relationship are the knowledge, experience and attitudes (beliefs) of both the clinician and the patient and the quality and content of their interaction.

Pain is a subjective and personal experience affected by a variety of factors. When an individual consults a health-care professional, they do so within the context of their personal experience and any previous management. These factors can include the following:

- Medical history - any underlying or pre-existing injury or disease
- Sex /gender and ethnicity or cultural background
- Personal experiences - chronic condition(s), physical and psychological trauma
- Previous treatments and their effectiveness
- Pain symptoms - severity, frequency and intensity
- Beliefs about the nature of their pain and their expectations for the probability of finding relief
- Personal strategies for coping or managing pain
- Beliefs about their likelihood of resuming previous lifestyle and/or work
- Level of family support, social network and current employment situation

Each of these components is of variable significance to the individual and is a factor in the development of a plan of care.

However, the clinician also brings their own personal and professional knowledge and beliefs as well as their clinical experience to each clinical encounter.

At a professional level, the clinician brings a conceptual framework on pain and specific tools and skills to manage it based on their professional training.

At a personal level, the clinician’s beliefs about pain, based on their own experiences, may also be a factor in their approach to the patient.

Both perspectives may be factors affecting the therapeutic relationship and indirectly affecting outcomes. It is critical for the clinician to be aware of all factors to deliver effective care to patients experiencing chronic/persistent pain.

**Patient History**

Although injury, illness or post-operative conditions may have triggered the original referral, biomedical assessment alone is not sufficient to address the complexity of pain. Instead, a biopsychosocial approach is required.

The goal of the assessment in management of patients presenting with chronic pain or those at risk for chronic pain is to:

- Rule out any red flags
- Identify the pain mechanism and the factors that may affect treatment outcomes
- Develop a treatment plan specific to that person
### Neuropathic pain

- History of lesion or disease of nervous system, or post-traumatic /post-surgical damage to the nervous system.
- Positive neurological findings (e.g., altered reflexes, sensation, and muscle power in dermatomal/myotomal or cutaneous nerve distribution).
- Related to a medical or systemic cause such as stroke, herpes, diabetes or some form of neurodegenerative disease.
- Pain and sensory dysfunction are neuro-anatomically logical
- Pain is frequently described as burning, shooting or pricking

### Central sensitization

- No history of a lesion, damage or disease to the nervous system.
- Pain severity does not correlate well to diagnostic imaging findings.
- Disproportionate, widespread, non-mechanical, non-anatomical pattern of pain provocation in response to movement/mechanical testing. Positive findings of hyperalgesia and/or allodynia and/or hyperpathia within the distribution of pain.
- Pain is heterogeneous; there is no standard presentation.

### Assessment tools for determining pain mechanisms

- **The Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) pain scale** is an assessment tool that identifies pain of a primarily neuropathic origin.
- **The Pain Detect Questionnaire (PDQ)** is a self-reported pain questionnaire that includes a body map and categorizes responses as unlikely, possible, or likely of neuropathic origin. It can also be used to monitor change over time. PDF copies for non-commercial use are freely available in multiple languages.
- **The Neurophysiology of Pain Questionnaire (NPQ)** identifies pain of a primarily neuropathic origin.
- **Signs (LANSS) pain scale**
- **The Central Sensitization Inventory (CSI)** is a new tool that can be used to identify Central Sensitivity Syndromes such as fibromyalgia, irritable bowel syndrome or chronic fatigue syndrome. It can be applied repeatedly to guide treatment and assess effectiveness of treatments.

### Assessment of Biological Factors in Chronic Pain

The history documents the individual’s medical history, comorbidities, employment and lifestyle, as well as information on their pain history, including:

- Pain characteristics (subjective account)
- Pain beliefs and biases
- Previous treatment and its effectiveness
- Expectations for care
- Sleep patterns
- Medications - dosage and compliance

#### Assessment tools for determining pain mechanisms

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- The Neurophysiology of Pain Questionnaire (NPQ questionnaire) is used to clarify the patient’s understanding of pain. It can also be used as basis for patient education.
- The Central Sensitization Inventory (CSI) is a new tool that can be used to identify Central Sensitivity Syndromes such as fibromyalgia, irritable bowel syndrome or chronic fatigue syndrome. It can be applied repeatedly to guide treatment and assess effectiveness of treatments.

#### Assessment of Psychological Factors in Chronic Pain

Individuals living with chronic pain may experience pain when a seemingly unconnected stimulus such as smell, sight or even certain words triggers a threat cue that exacerbate pain experience. Thus, the language used when discussing pain is important.

It is important to be mindful that repeated, or ongoing, use of terms such as “pain,” or “damage” may also trigger that response in some patients. In addition, the individual’s pain beliefs and biases may also be inadvertently reinforced by ongoing reference to pain in relation to illness or injury throughout care, with resulting poor outcomes. While it is important to validate the patient’s experience of pain, once the assessment is complete, it may be more effective to speak in terms of progress, capacity, etc.

Open-ended questions allow the patient to describe their experience with pain, for example how it affects their life and how their activity affects their pain. The goal is not to “detect” the source/cause/intensity of pain but to gather information about their pain experience, how it is affecting their life, current functioning and coping skills, and to communicate responsiveness to their situation and needs. Open-ended questions begin with how, when or what, as is “How did you ...?”, “When XYZ happened what did you do?” or “What do you think might happen if...”

<table>
<thead>
<tr>
<th>Table 2: Examples of clinical findings that assist differentiation between three common pain types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nociceptive pain</td>
</tr>
<tr>
<td>- History of damage to body tissue in past six to eight weeks</td>
</tr>
<tr>
<td>- Clear, proportionate mechanical/anatomical nature to aggravating/easing factors</td>
</tr>
<tr>
<td>- Pain diminishes according to natural healing phase</td>
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<tr>
<td>- Pain is local, most often with signs such as edema, hematoma, skin coloration etc.</td>
</tr>
<tr>
<td>- Pain is described as sharp, aching, throbbing</td>
</tr>
<tr>
<td>Neuropathic pain</td>
</tr>
<tr>
<td>- History of lesion or disease of nervous system, or post-traumatic /post-surgical damage to the nervous system.</td>
</tr>
<tr>
<td>- Positive neurological findings (e.g., altered reflexes, sensation, and muscle power in dermatomal/myotomal or cutaneous nerve distribution).</td>
</tr>
<tr>
<td>- Related to a medical or systemic cause such as stroke, herpes, diabetes or some form of neurodegenerative disease.</td>
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<tr>
<td>- Pain and sensory dysfunction are neuro-anatomically logical</td>
</tr>
<tr>
<td>- Pain is frequently described as burning, shooting or pricking</td>
</tr>
<tr>
<td>Central sensitization</td>
</tr>
<tr>
<td>- No history of a lesion, damage or disease to the nervous system.</td>
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<tr>
<td>- Pain severity does not correlate well to diagnostic imaging findings.</td>
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<tr>
<td>- Disproportionate, widespread, non-mechanical, non-anatomical pattern of pain provocation in response to movement/mechanical testing. Positive findings of hyperalgesia and/or allodynia and/or hyperpathia within the distribution of pain.</td>
</tr>
<tr>
<td>- Pain is heterogeneous; there is no standard presentation.</td>
</tr>
</tbody>
</table>

### Physical examination

Conduct a thorough physical assessment, including a neurological screen - reflexes, myotomes, dermatomes, and specific testing such as clonus, Babinski.

Physical function is assessed though observation, functional patterns and/or global movements including:

- Range of motion
- Muscle strength
- Sensorimotor
- Neurodynamic testing

Consider peripheral neuropathic pain (PNP) in the presence of a condition or diseases such as disc herniation/stenosis causing radiculopathy or diabetes with hyperalgesia and altered sensation.
Gaining understanding of the individual’s unique experience allows the clinician to learn and understand their beliefs and the factors they will need to incorporate and address in any education that is included in the treatment plan. Framing questions within a structured approach such as “ACT-UP” will ensure the assessment addresses all relevant psychosocial factors and is a useful component of the screen for other medical conditions. In addition, the patient will be reassured that their concerns about pain are recognized, which will build their trust in the clinician.

<table>
<thead>
<tr>
<th>ACT UP</th>
<th>Examples: Probing Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities</td>
<td>How is pain affecting your life? (sleep, appetite, relationships, physical activities?)</td>
</tr>
<tr>
<td>Coping</td>
<td>How do you deal/cope with your pain?</td>
</tr>
<tr>
<td>Think</td>
<td>Do you think your pain will ever get better?</td>
</tr>
<tr>
<td>Upset</td>
<td>Have you been feeling anxious (worried/depressed)?</td>
</tr>
<tr>
<td>People</td>
<td>How do people respond when you have pain?</td>
</tr>
</tbody>
</table>

Many patients have been told or have heard stories that colour their understanding or expectations for recovery. Careful questioning may elicit these beliefs and the clinician can incorporate this information within education and intervention planning. While open-ended questioning is a key part of assessment, when this type of questioning suggests psychological distress, clinicians are strongly encouraged to implement a screening tool, to better determine the extent of the distress.

Note: Any physiotherapist wishing to implement these tools in practice should ensure that they have received appropriate training, or, at a minimum, done their research to know how, when, and why to implement, how to interpret, and how to follow up if necessary. Here is a helpful video to broadly understand pain measurement concepts.

Screening tools specific to Low Back Pain

- STarT Bach tool - a prognostic tool to help clinicians identify modifiable biomedical, psychological and social risk factors for back pain.
- Orebro Musculoskeletal Pain Questionnaire is a screening tool that assesses both physical impairment and psychological factors.

Psychological Screening Tools

- Depression Anxiety Stress Scale (DASS) is a self-report instrument for measuring depression, anxiety and tension/stress.
- Patient Health Questionnaire (mood disorders) - used to screen for, monitor and measure the severity of depression.
- Tampa Kinesiophobia Scale - developed to measure fear of movement.
- Pain Catastrophizing Scale - developed to help quantify an individual’s pain experience.
- Fear Avoidance Beliefs Questionnaire - measures a patient’s fear of pain and avoidance of activity due to fear.

Culturally Competent Care in Chronic Pain

It is impossible to outline all the possible idiosyncratic social and environmental contexts that may be important to consider for each person with pain. However, culture is used here as an example of the relevance of social and environmental factors in pain. While physiotherapists are not expected to understand all the nuances of the cultural diversity of Albertans, acknowledging that pain may have varied meaning across cultures is an important first step. There are no questionnaires that capture the potential relevance of culture and pain. However, by taking time to build trust in the relationship, attempting to understand the beliefs about pain and how it is understood and managed in their culture may enable a more productive treatment interaction.

Culturally competent health care has been defined as “acknowledging and incorporating the importance of culture, assessment of cross-cultural relations, vigilance toward the dynamics that result from cultural differences, expansion of cultural knowledge, and adaptation of services to meet culturally unique needs.”

Below are the components of a culturally informed approach to physiotherapy management of chronic pain:

1. Language – attempt to offer programming in the patient’s native language. Translate materials and have the translation reviewed for readability and sensitivity
2. Persons - collaborate with individuals native to the culture and seek advice on adapting the program in a culturally sensitive way
3. Metaphors - collaborate with individuals native to the culture to develop metaphors to explain important concepts
4. Content – provide culturally specific examples to communicate concepts such as pacing
5. Concepts - use culturally appropriate models (e.g., an Indigenous medicine wheel, traditional Chinese medicine concepts)
6. Goals – linked to culturally informed roles and expectations
7. Context - provide, or consult with, links to community supports

The following questions are broadly applicable to all cultural groups and may be incorporated into the assessment:

- What do you call your pain?
- What do you think has caused it?
- Why do you think it started when it did?
- What problems do you think the pain causes? How does it work?
- How severe is your pain? How long do you think it will last?
- What kind of treatment do you think is necessary? What are the most important results you hope to achieve?
- What are the main problems this pain has caused you?
- What do you fear most about the pain?

Identifying psychological distress, CS or PNP necessitates a modified approach to treating pain that is outlined below.
Not all individuals will require the same level of detail of information or level of care. The clinician takes into consideration the combination of factors affecting the patient, and develops an individualized treatment plan.

**Treatment Planning**

Not all individuals will require the same level of detail of information or level of care. The clinician takes into consideration the combination of factors affecting the patient, and develops an individualized treatment plan. For example, one individual may present with shoulder pain but their assessment reveals multiple yellow flags, related to work environment, family responsibilities, and job security. Another individual may present with fibromyalgia, but there are few flags - they have a supportive work and a stable family and social environment.

Biological factors such as central sensitization, psychological factors such as anxiety, depression and insomnia, in combination with the patient's social and environmental context contribute to the individual's experience of pain. Although physiotherapists may feel reluctant to address psychological, social, and environmental aspects of care, an effective plan of care must include addressing the factors hypothesized to impact the experience. Biological, psychological and social factors coincide and interact. Thus, addressing just one aspect is unlikely to facilitate progress toward the patient's goals related to pain reduction or management and function.

Incorporating the biopsychosocial approach may require a shift in perspective and review of personal beliefs. Along with focused professional development activities such as courses, journal reviews and professional collaboration, clinicians review their personal beliefs and attitudes to understand any influence on their practice. This may be done through self-assessment by completing patient assessment tools such as the Pain Catastrophizing Scale or the Tampa Kinesiophobia Scale. Self-assessment enables the clinician to have greater understanding of their own personal beliefs and to recognize any potential impact this may have on client outcomes in this population.

There are three basic foundational components of physiotherapy treatment and/or management for individuals experiencing chronic/persistent pain. These components address chronic pain that is influenced by biological factors such as CS and primarily psychological yellow flags:

- **Education**
  - Improving function, activity, and overall quality of life
  - Promoting self-management (self-efficacy)

These treatments and management principles are fundamental and are relatively basic competencies. There are additional professional development opportunities available that will broaden and deepen the physiotherapist's treatment repertoire in the management of patients with chronic pain.

**Clinic resources:**

- The Canadian Physiotherapy Association's Pain Sciences Division offers a variety of professional development and networking opportunities with other clinicians, educators and researchers
- The University of Alberta offers a certificate in pain management
- The NeuroOrthopedic Institute offers “evidence-based multimedia resources and courses for the treatment of pain”
- Physiotherapy Alberta - College + Association offers webinars and links to professional development opportunities through the XChange website
- ignitephysio is a website dedicated to providing physiotherapists with clinical resources, and a forum to discuss clinical questions, resources, and a forum to discuss clinical questions

Additional resources are provided at the end of the document

**Education**

Education addresses any assessment findings related to biological factors such as central sensitization, and/or psychosocial factors such as maladaptive thoughts or beliefs. For example, fear-avoidance beliefs (i.e., pain is a sign of tissue damage, activity is dangerous).
Education interventions can be discrete or intensive depending on the extent the assessment reveals that the patient holds maladaptive beliefs about pain. In the case where the assessment does not reveal maladaptive beliefs, education will not be intensive and typically involves reassurance and encouragement to remain active. In contrast, when beliefs are maladaptive (e.g., pain is a sign of tissue damage, fear of movement, pain catastrophizing), Pain Neurophysiology Education (PNE) is an important first step.

PNE for patients with chronic/persistent pain addresses the physiology of pain, in contrast to the biomedical approach (in which education focuses on anatomy and biomechanics). The goal for PNE is to help the patient to:

- Revise their understanding of pain, to recognize and accept that their pain experience is not tied to actual or potential injury/harm
- Increase/improve physical activity and function based on that understanding
- Promote self-management, including setting goals

PNE is an effective tool. Research shows that patients retained the knowledge they gained from a single session of PNE for as long as three months. Recent research showed success in this approach as part of a tailored physiotherapy program in persons with chronic pain who were considered “hard to reach” because of other comorbidities.

PNE can alter a patient’s pain perceptions and health status, and is most effective when it is delivered in a one-to-one format. It should be tailored to the individual, and presented in combination with written materials the patient can review in the non-clinical environment. As part of the educational process, patients are encouraged to discuss the application of PNE principles to daily activity.

PNE is ongoing throughout treatment. Optimally, it is first taught/explained in a manner that encourages questions and ongoing discussion (e.g., based on the patient’s responses to the Neurophysiology of Pain Questionnaire) and reinforced throughout overall treatment in further discussions with the patient, relating all treatment to the goals of PNE.

**Components of PNE**

The level and detail of PNE is geared to the individual, based on assessment findings (e.g., barriers – sleep pattern, medications, literacy, co-morbidities). Additional detail and information can be added as treatment progresses and the level of discussion changes.

The key components of PNE are:

- Learning about pain is therapy - when you understand why you hurt, you hurt less
- Pain is normal, personal and always real - pain is a response to what your brain judges to be threatening
- There are danger sensors, not pain sensors
- Pain and tissue damage can each exist in the absence of the other
- Pain depends on the balance between factors that threaten the body and those that promote safety
- Pain relies on context (e.g., senses, beliefs, etc)
- Our nervous system can adapt to become more, or less, sensitive
- Active treatment strategies promote recovery

Personalize PNE to the individual and their situation – use examples and metaphors that will make sense to the patient and help them integrate the PNE messages.

The following are useful teaching resources for PNE:

- **Painful Yarns, Metaphors and Stories to Help Understand the Biology of Pain** by Lorimer Moseley
- **Everything you need to know about pain in 5 minutes** - GP Access and Hunter Integrated Pain Service, Australia
- **Neurophysiology of Pain Questionnaire**
- **Explain Pain** (Butler & Moseley) e-book

**Clinic resources for PNE**


**Self-Management**

The self-management component addresses assessment findings related to factors (biological and psychosocial) that limit the patient’s confidence in actively managing pain autonomously.

Self-management fosters the individual’s autonomy. Three of the primary principles in chronic disease self management may be applied to individuals living with chronic pain:

- Acknowledgment that one may have to live with the condition
- Positively managing the condition
- Optimizing physical and emotional health to minimize the effects of the condition

The following websites provide useful, accessible information for both patients and health-care professionals on self-management:

- **Better choices, Better Health**
- **Pain BC** Information for health professionals and patients (self-management)
- **Life is Now** provides information and resources for people living with chronic pain, health professionals, and others who work with this population

Pacing and planning programs help teach strategies for being active without triggering pain. A useful guide to pacing and planning can be found at Chronic Pain Australia. An important aspect of self-management is setting realistic, practical goals with the patient that are achievable and that the patient can see as success. Two tools that will assist this process are the Patient Specific Functional Scale and the Canadian Occupational Performance Measure.
Improving Function and Activity

Strategies to improve function and activity address assessment findings for biological factors such as central sensitization and deconditioning, as well as for psychological factors such as maladaptive thoughts or beliefs. For example, fear-avoidance beliefs (i.e., pain is a sign of tissue damage, activity is dangerous).

Individuals experiencing chronic/persistent pain adopt various coping strategies that may or may not be adaptive depending on their personal circumstances, such as avoidance of movement (fear), persistence (no pain no gain), or a combination, in which some activities are seen as potentially painful and avoided, while other activities are completed regardless of pain.

While there are numerous exercise approaches to increase function and activity, graded activity is a simple approach used to gradually acclimatize the patient to activity. It is a useful strategy for patients fearful of movement, but may also be incorporated into management of patients demonstrating central sensitization or peripheral neuropathy.

To use the graded activity process:

1. Select a meaningful activity
2. Measure the tolerance to that activity (time/distance before pain increases 2 points on the 0-10 pain intensity scale) – for example: when starting a walk at 4/10 pain, how long before pain intensity rises to 6/10
3. Negotiate a starting point below the activity tolerance (e.g., 50-75% of tolerance)
4. Each week, gradually increase activity (10-25%)
5. Recommend an activity range to enable some flexibility based on how one feels that day (e.g., on a good day, activity could be at the higher end of the range; when on a bad day, activity would be at the lower end of the range).

In some centres, as an example, patients are instructed to grade their daily activity level as “red, green or yellow light days.” Together with the physiotherapist, the patient has identified a range of exercise or activity that corresponds to each colour. Each day, they choose the level of exercise or activity that corresponds to the colour of the light that day.

Note: Some patients may modify a specific movement or range to maintain or continue a function or activity. This is not the same as fear-avoidance behaviour.

Other exercise approaches such as graded exposure and cognitive functional therapy are options that the reader should consider to add to future professional development activities.

Graded exposure is similar to graded activity, except its focus is the hierarchy of fear and maladaptive beliefs, and treatment progression is based on these levels. Its application in physiotherapy as a strategy to reduce pain-related fear in patients with chronic low back pain.

Cognitive Functional Therapy (CFT) targets the patient’s fears, beliefs and behaviours or activities associated with pain. It incorporates motivational interviewing and graduated strategies to restore normal movement and activity. It is effective in the management of non-specific chronic low back pain.

Relaxation and Mindfulness

Relaxation and mindfulness techniques address assessment findings for biological factors such as central sensitization and de-conditioning, as well as any psychological factors such as maladaptive thoughts or beliefs. For example, fear-avoidance beliefs (i.e., pain is a sign of tissue damage, activity is dangerous).

When prescribing exercises and activity, it is common to focus on increasing activity or strength, however; relaxation can be included as a key part of an activity plan in chronic pain management. Relaxation techniques, such as mindfulness, may be incorporated within the chronic pain program, whether by a physiotherapist with training in techniques or through referral to another health professional.
There is evidence that relaxation can reduce pain in both acute and chronic pain, although the benefit may not be long-term.\textsuperscript{52} Examples of relaxation techniques include progressive muscle relaxation, guided imagery, meditation, yoga and deep or tactical breathing in a restful position.

Mindfulness techniques have been shown to improve psychological measures and physical function.\textsuperscript{53}

**Exercise Prescription**

Appropriate exercise prescription is an important component of optimizing function and mobility in people with chronic pain. For some, earlier steps may be required (e.g., PNE, GMA) before getting to specific exercise prescription, while for others education and exercise can occur concurrently.

When prescribing a formal exercise program, it is important to find a starting point that the patient is comfortable with, not the level that the physiotherapist expects or has determined. The goal for an exercise program is to have consensus on a baseline for building a program and that the patient achieves and sees success. As with any intervention, however, it is important to prescribe exercise in accordance with the findings of the assessment for each particular patient.

While exercise has been shown to have powerful analgesic (pain relieving) effects for most healthy people, a subset of those with chronic pain may in fact show the opposite effect where their pain increases as a result of exercise, a phenomenon termed exercise-induced hyperalgesia. Clinicians should be aware of this phenomenon and plan treatments accordingly, possibly starting with education and graded activity before formal exercise prescription.

If a structured exercise program is not the patient’s preference, consider other activities – e.g., pole walking, dancing, Tai Chi, or Qi Gong – which will have a different connotation to the patient. Culturally competent exercise and activity prescription should consider both individual and family-oriented activities.

**Disturbed Sleep Patterns**

Sleep disturbance is a common symptom in patients with chronic pain, and research shows that sleep and pain may have a bidirectional reciprocal relationship.\textsuperscript{54} If the assessment has identified that the patient is experiencing sleep disturbances, a more detailed sleep assessment is warranted. Available assessment tools include:

- **Pittsburgh Sleep Quality Index**, which measures sleep quality in the clinical population
- **Pain and Sleep Questionnaire (PSQ-3)**, which measures the impact of pain on sleep in chronic nonmalignant pain of various etiologies\textsuperscript{55}

In addition, asking the patient to keep a sleep diary may help to better understand their sleep patterns.

Incorporating the principles of sleep hygiene within treatment, including a discussion of resting positions, can assist the patient in obtaining more restful sleep and may help reduce pain.\textsuperscript{56}

In the event that assessment indicates that the disturbed sleep patterns are significant or the interventions are not effective, the clinician may consult or collaborate with other health-care providers experienced in the area, and/or refer the patient to their physician or a sleep clinic.

**Strategies for Managing Patients who Demonstrate Maladaptive Patterns or Behaviours**

On occasion, there will be a patient whose patterns of behaviour, mood and/or social interactions are barriers to successful treatment outcomes. Once the therapist recognizes these patterns, they may be able to adjust their treatment approach to mitigate their effect. Below are general descriptors of three types of behaviours that are barriers to successful outcomes, along with strategies to consider for a management approach.

**Patient behaviour:** The patient consistently attempts to exert power over perceived authority figures, positions themself as morally correct and/or polarizes helpers as either “villains” or “heroes.”

**Strategies the clinician may consider:**

- First, recognize that your actions have not precipitated the behaviour
- Maintain a frank, confident manner
- Manage expectations - don't give guarantees or other promises
- Outline treatment process and expectations, including discharge criteria
- Avoid language that prompts acceptance or rejection of ideas – e.g., “One possibility is...”
- Help identify triggers for behaviour - recent disappointment, personal loss
- Understand that this patient may see therapeutic relationship as contractual - e.g., giving physiotherapist praise is a strategy, or, they may end it when it no longer has value to them

**Patient behaviour:** The patient is constantly in crisis but is inflexible about solutions, has unrealistic expectations for others, and is very “touchy” or reactive.

**Strategies the clinician may consider:**

- Be clear and specific in all communication - a vague comment or response may trigger anxiety
- Continue to provide clear descriptions of therapeutic goals (e.g., function, quality of life) - their coping strategies may have been overwhelmed by the stress associated with a having a disability
- Acknowledge their challenges - recognize their concerns and expectations
- Clarify the roles and responsibilities for both patient and physiotherapist – maintain boundaries
- Emphasize the patient’s responsibility to do their own work
- Set clear rules for treatment length, targets, attendance
- This client may also have difficulty terminating a therapeutic relationship and perceive discharge as rejection. Consider framing discharge as their positive achievement (i.e., graduation)
- Use “I” language - avoid “you” comments to decrease any defensiveness (e.g., “I think this may have contributed” ... not “You should have realized”)

**Patient behaviour:** The patient consistently complains about their situation, but does nothing to change, frequently changes topic/complaint, avoids issues, convinces others they “deserve” to be helped and/or that they are helpless regardless of what they do.
Clinician resources:

- **The 2017 Canadian Guidelines for Opioids for Chronic Non-Cancer Pain**
- [WHO’s analgesic ladder](https://www.wpro.who.int) was originally developed for cancer care, but over time has been applied to management of chronic pain. (Please note, however, that IASP does not support the WHO document for management of chronic pain)

Strategies for the clinician to consider:

- Avoid treatment positioning in which you are above or looking down at patient – try to be at eye level
- Set good boundaries so you do not overextend yourself. Be collaborative, but not overly sympathetic
- Help them understand responsibility for activity outcome – don’t “rescue”
- Refrain from critical comments – this may provoke strong negative emotions
- Maintain professional boundaries – anticipate statements that challenge your professional abilities or appear to blame physiotherapist/treatment for pain (e.g., “Let’s go back over the past few days. Can you think of anything that may have brought this on?”)
- Recognize that the behaviour may be masking fear/terror the patient is trying to hide

**Manual Therapy and Modalities**

Manual therapy and modalities are interventions that are generally more effective in the management of mechanical/nociceptive pain and are thought to help modulate that component of chronic pain. They can be adjuncts in the management of chronic pain, as outlined within this resource but are not the primary focus of treatment.

**Medications used in Management of Chronic Pain**

Optimal care includes awareness of the medications used in chronic pain management and their potential side effects. Familiarity with these medications can assist the physiotherapist in planning their PNE, treatment progress, and in monitoring outcomes.

Medications are catalysts or complementary to care and affect a patient’s quality of life (QoL). For example, inadequate sleep can affect QoL, and have a negative impact on mental health. Familiarity with the medication(s) prescribed for the patient will enable the physiotherapist to ask the physician about the medication’s potential effect on sleep and whether a change in dosage or medication is warranted.

Clinicians are encouraged to become familiar with the common medications used in chronic pain management, including their generic and branded names, their mechanism of action (in broad terms), usual dosing strategies, and potential side effects. These include common opioids, pregabalin and gabapentin, tricyclics, and selective norepinephrine or serotonin reuptake inhibitors. Constipation, sleep disturbance, shakiness (tremor), dry mouth, lethargy, and even opioid-induced hyperalgesia (a paradoxical increase in pain sensitivity some people will experience while taking opioids) are important side effects of which clinicians should be aware when developing treatment plans.

It is also recommended that clinicians become familiar with the definitions and clinical manifestations of tolerance, physical dependence, psychological dependence (addiction), and pseudo-addiction to help themselves and their patients work through their concerns about use of these drugs and to advocate appropriately on their patient’s behalf.
A pain specialist physician should be involved if the physiotherapist observes:

- Treatment failure after trial of four drugs for neuropathic pain
- An opioid dose greater than 180 mg morphine/day or equivalent
- Inadequate response to non-specialist management

Consult or refer to psychology/mental health professionals if the assessment or treatment reveals that the patient has:

- Moderate to high levels of distress (as measured by one or some of the psychological assessment procedures outlined above)
- Difficulty adjusting to life with pain

Refer the patient to a multidisciplinary pain clinic if there is evidence of:

- Declining functional capacity
- Moderate to high levels of distress

Additional Resources for Chronic Pain Management

- Physiopedia - provides an overview of chronic pain and its management
- Comprehensive Pain Assessment for Clinicians Part 1 and Part 2, video by Dave Walton PhD
- Recovery Strategies, by Greg Lehman - a free workbook for patients and clinicians
- CORE Bach tool - a biopsychosocial approach to assessment of back pain
- CPA Pain Science Division blog - a range of topics covered by clinicians

Consult a pain-specialist physiotherapist (or other qualified health-care provider) if there is little to no improvement in function, despite implementation of interventions described in this manual.
### Complex Regional Pain Syndrome

Complex regional pain syndrome (CRPS) is a sensory, vasomotor and autonomic disorder of an extremity which can result in disability and impacts to quality of life.\(^5^8,5^9,6^0\) The pathophysiology of CRPS can be thought of as three major biological pathways: aberrant inflammatory mechanisms, vasomotor dysfunction and maladaptive neuroplasticity.\(^6^1\) This maladaptive neuroplasticity can lead to altered body perception and appears to be correlated directly with pain.\(^6^2,6^3\)

Presently, the gold standard for diagnosing CRPS is the Budapest Criteria with a sensitivity and specificity of 0.99 and 0.68 respectively.\(^6^4\) These criteria reflect the variability of signs and symptoms both between and within individuals: not all persons with CRPS will present with the same symptom profile, and some persons will have different symptoms across time (the course of the day, and the course of the condition).\(^6^0\) It is also important to note that persons with CRPS can see substantial improvements in their condition, particularly when the condition is identified early.

Medically, the following differential diagnoses should be ruled out:\(^6^5\)
- Infection - particularly osteomyelitis
- Post-traumatic conditions
- Post-operative states
- Neuropathic pain
- Bone diseases
- Rheumatic diseases
- Vascular disorders
- Psychiatric conditions - fictitious syndrome
- Dermatological

### Treatment

For this complex condition, it is critical that the physiotherapist displays and maintains empathy - a clear understanding of the severity of their symptoms but does not enable disability. On the McGill Pain Index, CRPS pain is listed higher than childbirth, amputations, fractures, and phantom limb pain.

Based on the assessment findings, treatments interventions will include:
- Education - pain neurophysiology specific to CRPS (see below)
- Sleep hygiene
- Graded Motor Imagery (GMI). The following videos describe its use in CRPS:
  - David Butler on [Graded Motor Imagery Part 1](#)
  - David Butler on [Graded Motor Imagery Part 2](#)
  - David Butler on [Graded Motor Imagery Part 3](#)
- Sensory Integration and somatosensory re-education
  - The goal of this intervention is to improve the quality of touch or normalize sensation. The approach is similar to those in graded exposure therapy.\(^6^6,6^7\)
- Paced Graded Activity, respecting baseline symptoms.
  - One hour later symptoms should be no worse\(^6^8\)
- Proprioception and balance training
- Functional activities may be introduced before standard or typical exercises, e.g., assuming light tasks around the home (folding light laundry, dusting etc...)

### QOL Restoration

- Address secondary effects of de-conditioning:
  - Aerobic and strengthening exercises may be introduced at abnormally lower levels, based on baseline symptoms. Exercises are increased very gradually using baseline symptoms as guideline.
  - Evaluate the need for modified work (hours and tasks). In some cases, the patient is removed from the work place to obtain symptom control and prevent their condition from spiralling downwards.

### Specific Pain Neurophysiology Education for CRPS

- Pathophysiology of CRPS in patient-friendly language
  - Include fact that currently CRPS is considered a permanent condition that can be self-managed and controlled not cured\(^6^9\)
• Discuss the influence of stress, anxiety, depression and poor sleep on pain
• Explain adaptive coping
• Pacing and Planning
• Provide specific instructions for treatment interventions and teach self monitoring:
  - Attention is not focused on symptoms but on mindful awareness, respecting baselines
• Ensure the patient knows they are heard and understood: they have frequently been called malingerers or misdiagnosed as having psychiatric diagnoses
• Help patient use neutral or positive language, and to reframe negative statements, particularly around body image

Education is an ongoing process and repetition will be necessary.

Specific CRPS flags
• Red Flag: Post arm trauma – constant intense pain greater than 5/10 for two or more days

Other risk factors for the possible development of CRPS
• Use of ACE inhibitors at time of trauma
• Migraine
• Asthma
• Osteoporosis
• Female sex

Recommendations for management of patients whose CRPS does not improve

If the patient fails to progress on validated functional or quality of life outcome measures in four weeks of treatment, they should be transferred to a specialized multidisciplinary pain center with experience in CRPS. Seek input from these centers if transfer is not possible.

CRPS Resources: Clinical Practice Guidelines

- Royal College of Physicians of London 2012

Neuropathic Pain

Neuropathic pain can be the result of a variety of conditions, such as illness, injury, or medication. The following link to “Managing Patients with Neuropathic Pain” from the Best Practice Advisory Council of New Zealand describes its overall management. Physiotherapists can use this information to implement the principles of chronic pain management in this document as appropriate.

HIV Neuropathy

HIV neuropathy is an example of a peripheral neuropathy related to disease. HIV is no longer a terminal illness, and with medication people with HIV are living longer and with a better quality of life. Regardless, peripheral neuropathy is a common complication of HIV infection. It can affect peripheral sensory and motor nerves, thoracic nerves, cranial nerves or autonomic nerves. Using the recommendations in the E-Module for Evidence-based HIV Rehabilitation, physiotherapists can apply the principles of chronic pain management in the care of HIV peripheral neuropathy.

Fibromyalgia (FM)

FM is a syndrome of diffuse body pain with associations of fatigue, sleep disturbance, cognitive changes, mood disturbance, and other variable somatic symptoms.

The 2013 Canadian Guidelines for the Diagnosis and Management of Fibromyalgia include a role for physiotherapists consistent with the principles of chronic pain management in this document: education, self-management strategies, and graduated exercise programs. For example, it reports evidence that aerobic exercise and strength training can reduce pain in the short term. However, when an aerobic exercise program was combined with CBT, the beneficial effects were seen up to one year later.
## Appendix

### Differeniating Key Pain Patterns

Adapted from Smart et al. 2011

- **Pain localized to area injury/dysfunction** (with/without somatic referral)
  - No
    - History of nerve injury, pathology, or mechanical compromise
      - No
        - Pain disproportionate to the nature and extent of injury or pathology
          - **Yes**
            - Disproportionate, non-mechanical, unpredictable pattern of pain provocation in response to multiple non-specific aggravating/easing factors
              - **Yes**
                - Strong association with maladaptive psychosocial factors (negative emotions, poor self-efficacy, maladaptive beliefs and pain behaviors, altered family/work/social life, medical conflict)
                  - **Yes**
                    - Diffuse/non-anatomic areas of pain/tenderness on palpation
                      - **Yes**
                        - Central Sensitization
                          - Sensitivity 91.8%
                          - Specificity 97.7%
                          - Positive Predictive Value 91.8%
                          - Negative Predictive value 97.7%
                        - **No**
                          - Peripheral Neuropathic
                            - Sensitivity 96.3%
                            - Specificity 96.0%
                            - Positive Predictive Value 96.3%
                            - Negative Predictive Value 96.0%

- **Yes**
  - Usually intermittent & sharp with movement/mechanical provocation; may be more constant dull ache or throb at rest
    - **Yes**
      - Clear, proportionate mechanical/autonomic nature to aggravating and easing factor
        - **Yes**
          - Pain described as burning, shooting, electric shock like, or sharp
            - **No**
              - Pain in association with other dysesthesias
                - **Yes**
                  - Night pain/disturbed sleep
                    - **No**
                      - Pain relieving postures/movement patterns
                        - **No**
                          - Nociceptive Pain
                            - Sensitivity 90.9%
                            - Specificity 91.0%
                            - Positive Predictive value 92.7%
                            - Negative Predictive value 88.9%

- **No**
  - Usual pain referral in dermatomal or cutaneous distribution
    - **Yes**
      - Pain/symptom provocation with mechanical movement tests (active/passage, neurodynamic, e.g. SLR, tests that move/load or compress neural tissue)
        - **Yes**
          - Peripheral Neuropathic
            - Sensitivity 96.3%
            - Specificity 96.0%
            - Positive Predictive Value 96.3%
            - Negative Predictive Value 96.0%
          - **No**
            - Pain described as burning, shooting, electric shock like, or sharp
              - **No**
                - Pain in association with other dysesthesias
                  - **Yes**
                    - Night pain/disturbed sleep
                      - **No**
                        - Pain relieving postures/movement patterns
                          - **No**
                            - Nociceptive Pain
                              - Sensitivity 90.9%
                              - Specificity 91.0%
                              - Positive Predictive value 92.7%
                              - Negative Predictive value 88.9%

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**Legend**

- **Black**: presence of symptoms
- **Blue**: absence of symptoms

* Patients with pain localized to the area of injury/dysfunction with or without some somatic referral were 60 times more likely to be classified with a dominance of nociceptive pain, versus non-nociceptive pain, controlling for other variables.

** Patients with “pain referral in dermatomal or cutaneous distribution” were over 24 times more likely to be classified with a dominance of Peripheral neuropathic pain, controlling for other variables.

*** Patients with a “disproportionate, non-mechanical, unpredictable pattern of pain provocation in response to multiple non-specific aggravating/easing factors” were over 30 times more likely to be classified as central sensitization pain

1. With thanks to A. Chisholm and S. Miller 2017
Figure 2: Clinical Reasoning – differential diagnosis Central Sensitization (CS) in LBP

![Algorithm for the differential diagnosis of predominant nociceptive versus central sensitization low back pain (modified from [27]).]

Algorithm NeP excerpted from page 1601 of:
Open access https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4949003/

Figure 3: Clinical Reasoning – differential diagnosis Neuropathic Pain (NeP)

Algorithm CS excerpted, page 337 of:

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**Figure 2: Flow chart of updated grading system for neuropathic pain.** "History, including pain descriptors, the presence of nonpainful sensory symptoms, and aggravating and alleviating factors, suggestive of pain being related to a neurological lesion and not other causes such as inflammation or non-neuronal tissue damage. The suspected lesion or disease is reported to be associated with neuropathic pain, including a temporal and spatial relationship represent ative of the condition; includes paroxysmal pain in trigeminal neuralgia. The pain distribution reported by the patient is consistent with the suspected lesion or disease (Table 1). The area of sensory changes may extend beyond, be within, or overlap with the area of pain. Sensory loss is generally required but touch-evoked or thermal allodynia may be the only finding at bedside examination. Trigger phenomena in trigeminal neuralgia may be counted as sensory signs. In some cases, sensory signs may be difficult to demonstrate although the nature of the lesion or disease is confirmed; for these cases the level “probable” continues to be appropriate, if a diagnostic test confirms the lesion or disease of the somatosensory nervous system. The term “definite” in this context means “probable neuropathic pain with confirmatory tests” because the location and nature of the lesion or disease have been confirmed to be able to explain the pain. “Definite” neuropathic pain is a pain that is fully compatible with neuropathic pain, but it does not necessarily establish causality."


30. Physiotherapy Alberta. Code of Ethics


41. Turk and Robinson 2010 in Bonica’s Management of Chronic Pain 4th Edition


Acknowledgments

The Chronic Pain Toolkit - was developed by Physiotherapy Alberta College + Association with the following working group members. Their combined knowledge and clinical expertise were invaluable to the development, content and quality of this document. Physiotherapy Alberta would like to thank them for their ongoing commitment to the project.

Working Group

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Geoff Bostick is an Associate Professor in the Department of Physical Therapy at the University of Alberta and Chair of the Canadian Physiotherapy Association’s (CPA) Pain Sciences Division. He obtained his PhD in 2011 in Rehabilitation Sciences at the University of Alberta with clinical and research interests in the field of pain. He routinely teaches physical therapists and trainees in pain assessment and management and has over 50 peer reviewed publications and presentations in the areas of pain assessment and the scholarship of teaching and learning.

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Alex is a clinical physiotherapist on the Burns Plastic team at Foothills Medical Centre in Calgary. She is a graduate of the University of Alberta and has practiced in long term care, private practice and trauma. A member of CPA's Pain Science Division, Alex has a post graduate certificate in Interdisciplinary Pain Management from the University of Alberta and is a Fellow of the Canadian Federation of Clinical Hypnosis. Alex believes the physiotherapy profession blends ‘science with the art of the therapeutic alliance’ and that physiotherapists have a unique skill set with which to treat patients who are in pain.

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Janet Holly BHSc PT, MSc., is Senior physiotherapist in the Locomotor Stream at the Ottawa Hospital Rehabilitation Centre, and a Clinical Specialist in Pain Sciences. She is a clinician researcher with the Ottawa Hospital Research Institute, and her present interests include knowledge translation for early identification and treatment of neuropathic pain in acute care and research on complex regional pain syndrome (CRPS). Janet teaches nationally on CRPS and complex pain. She is on the Executive of the CPA Pain Science Division, a member of the International Association for the Study of Pain CRPS working group COMPACT and the International Research Consortium for CRPS.

Stuart Miller
Stuart has offered presentations and workshops on CRPS and Fibromyalgia and is a member of an Informal CRPS Interest Group. He is a certified hand therapist, and a member of CPA's Pain Science Division. Stuart offers presentations and workshops on CRPS and Fibromyalgia to colleagues and peers, and is a member of a CRPS professional interest group. He received the Alberta Health Services' President's Award for distinguished service for his work developing a Functional Electrical stimulation training program for clinicians who work with patients who have sustained neurological injuries.

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External review panel

The draft document was circulated to a review panel composed of researchers, educators and clinicians. Physiotherapy Alberta wishes to thank the following individuals for their contribution to this project. Their comments and recommendations were essential to the project outcome.


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Other
Figure 1 on page used with permission from G. Bostick 2017
“Strategies for managing patients who demonstrate maladaptive patterns or behaviours.” With thanks and used with permission of Michelle DeLisle reg Psychologist Alberta Health Services and Josie Marino Clinical Psychologist at the Ottawa Hospital
“Resources for the assessment and treatment of common chronic pain conditions - Complex Regional pain Syndrome.” With thanks to J. Holly, 2017.