Chapter 5
Clinical Measurement of Pain, Opioid Addiction, and Functional Status

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Learning Objectives
- To identify aberrant opioid-related behaviors
- To understand the relationships among opioid misuse, effect, cognitions, suicide, and chronic pain
- To recognize the diagnostic criteria for opioid use disorder as well as clinical indicators of opioid misuse
- To screen for opioid misuse and the psychological factors related to chronic pain

5.1 Introduction

Chronic pain is a complex and multifaceted condition influenced by biological, psychological, and social factors [1]. Due to its complicated nature, the assessment of chronic pain and its underlying factors is often approached from medical, psychological, and substance use disorder perspectives. Recent studies suggest that prescription opioid misuse occurs in up to 45 % of chronic pain patients [2]. Risk factors for opioid misuse include being of a younger age, history of a substance use

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disorder, family history of legal difficulties, and anxiety [3–5]. This chapter offers primary care providers and pain physicians with a greater understanding of the available assessment tools that examine the full pain experience, including physical sensations, psychological appraisals, and possible aberrant opioid-related behaviors.

5.2 Overview of Chronic Pain

From a psychological perspective, patients' cognitive and affective responses to their chronic pain are the focus of assessment and treatment. The co-occurrence of chronic pain and psychological disorders, such as depression, anxiety, insomnia, and posttraumatic stress disorder [1,6–8], necessitate the use of assessments that examine both the psychological distress and physical disabilities associated with chronic pain.

The experience of persistent pain along with a comorbid mental health conditions can result in a cycle of maladaptive coping resulting in further pain [1]. While it is difficult to determine whether emotional distress leads to greater vulnerability to chronic pain or if chronic pain predisposes patients to mental health issues, there is a clear interaction between affect and pain [7]. The psychological assessment of chronic pain extends far beyond patients' reported emotions. In addition to considering patients' reported affect, a thorough evaluation often includes examination of the cognitive styles, motivation, avoidance behaviors, and self-efficacy of those living with chronic pain. Many measures of chronic pain are closely related to the specific modality of treatment and indicate pre- and posttreatment coping. In addition, some assessments are utilized as educational tools, highlighting the interrelations between emotions, cognitions, and pain levels.

5.3 Measurement of Chronic Pain

5.3.1 Intensity and Functional Status

With the competing demands in most primary care clinics, efficient and thorough assessment of pain intensity is essential. The pain Numeric Rating Scale (NRS) offers a brief and unidimensional measure of pain intensity. The most commonly utilized version is the 11-item NRS. The items are rated on a numeric scale ranging from 0 to 10 (0 = no pain to 10 = worst pain imaginable). This measure is available at: www.partneragainstpain.com/prints/A7012AS2.pdf [9] (see Table 5.1).

The Brief Pain Inventory (BPI) evaluates pain intensity and interference. This measure offers rapid assessment of pain intensity and the impact of chronic pain on a patients' overall functioning. The short form of the BPI can be completed within

Table 5.1 Chronic pain

Instruments	Domain assessed
Pain measures	
Numeric Rating Scale (NRS) 11	Pain intensity
Brief Pain Inventory (BPI) 12	Pain intensity, pain interference, and functional status
Short Form McGill Pain Questionnaire (SF-MPQ-2) 13	Affective and sensory aspects of pain
Functional status instruments	
Pain Catastrophizing Scale (PCS) 19	Automatic negative pain thoughts and negative pain schemas
Tampa Scale for Kinesiophobia (TSK) 22	Fear of movement
Pain Acceptance Questionnaire (CPAQ) 25	Willingness to experience pain
Opioid misuse instruments	
Pain Medication Questionnaire (PMQ) 31 32	Opioid misuse
Rapid Opioid Dependence Screen (RODS) 33	Opioid misuse
Current Opioid Misuse Measure (COMM) 34	Aberrant medication behaviors of chronic pain patients
The Opioid Compliance Checklist (OCC) 35	Adherence to opioid agreements and/or contracts

a few minutes and is available in many languages. Because the experience of chronic pain can vary greatly throughout the day and time, the BPI assesses pain intensity over time, such as now, least, average, and over the last 24-h. In addition to measuring pain intensity longitudinally, the BPI also queries patients about the extent to which pain interferes with functional activities in their daily life, including walking, relationships with others, work, mood, sleep, and quality of life [10].

5.4 Measure of Affective and Sensory aspects of Pain

Chronic pain is often associated with diverse experiences, characteristics, and qualities. Comprehending the many aspects of pain is helpful in identifying pain treatment targets and efficacy of pain treatment(s). In addition, assessment of the affective and sensory aspects of pain can assist in identifying patients who may be prone to pain magnification. The Short Form McGill Pain Questionnaire (SF-MPQ-2) is a valid and reliable tool for the assessment of nonmalignant chronic pain. The measure has been revised and consists of 22-items that evaluate pain quality including the perception, emotional, and sensory aspects of pain. The SF-MPQ-2 provides a list of words that described various pain aspects and other related symptoms on an 11-point numeric rating scale (0 = none to 10 = worst possible). The SF-MPQ-2 is comprised of four summary scales: (1) continuous descriptors (throbbing, cramping, gnawing aching, heavy, and tender pain); (2) intermittent descriptors (shooting, stabbing, sharp, splitting, electric shock, and piecing pain); (3) neuropathic

descriptors (hot-burning pain, cold freezing pain, pain caused by light touch, itching, and/or tingling); and (4) affective descriptors (fearful, exhausting, sickening, and punishing cruel). A total score is computed by averaging the numerical ratings across the questions. Information regarding permission to reproduce the SF-MPQ-2 can be obtained at www.immpact.org [11].

5.5 Neurocognitive or Communication Problems

When patients present with communication problems, proxy approaches are highly recommended. Proxy assessments include observing pain behaviors and/or reactions that may suggest that a patient is suffering or is in pain. The use of proxy methods may also be utilized for critically ill patients [12].

While the above instruments indicate the patients' general pain experience, there are additional assessment tools that examine the functional elements of chronic pain. The psychological aspects of pain are highly predictive of pain treatment outcomes [13], and thus, deserve equal attention and merit. Therefore, the subsequent section purposefully presents background and rationale to the psychological measurement of chronic pain.

5.6 Psychological and Functional Assessment of Chronic Pain

5.6.1 Pain Catastrophizing

Evidence-based psychotherapies for chronic pain target patients' appraisals of pain and their resulting behavioral responses [13]. Whether delivered through individual or group therapy modalities, the goals of treatment focus on improving functional performance, increasing coping skills, and preventing secondary disability from the psychological correlates of chronic pain, such as insomnia and anger [7]. For example, cognitive behavioral therapy (CBT) aims to restructure patients' maladaptive and catastrophic cognitions related to their pain [14]. Catastrophizing, which refers to the magnification of the threat of pain, feelings of helplessness, and difficulties inhibiting pain-related thoughts, is associated with increased pain intensity, psychosocial dysfunction, and pain-related disability [8,15,16]. In addition, the tendency to catastrophize has been linked to poor treatment outcomes [7,13].

While it is difficult to decipher if catastrophizing is driven by or a determinant of chronic pain, this construct can be assessed through the use of validated self-report measures. The Pain Catastrophizing Scale (PCS) is a brief psychological assessment of negative pain schemas [17]. Given the profound influence of catastrophizing on the cognitive, affective, and behavioral responses to pain, it is important to identify patients who may benefit from psychological interventions targeting their cognitive appraisals of pain.

5.6.2 Kinesiophobia

In addition to reducing pain catastrophizing, another goal of CBT is behavioral activation through the use of realistic, goal-directed physical activities. Patients are often encouraged to set small, attainable goals as they work toward larger goals. Engagement in physical activities can be especially helpful for chronic pain patients who also demonstrate a consistent fear of movement and reinjury, known as kinesiophobia. This fear of movement leads to avoidance of activities that are perceived to contribute to further pain or nerve damage, which, in turn, results in deconditioning and the perpetuation of chronic pain [18]. Overall, kinesiophobia is strongly associated with functional limitations and self-reported physical disability [18,19].

The most widely utilized assessment of kinesiophobia is the Tampa Scale for Kinesiophobia [20]. This brief, self-report measure allows providers to identify patients whose fear of movement and activity may negatively impact their process of rehabilitation. By conducting such screenings during medical visits, patients who may benefit from concomitant cognitive-based psychotherapies can be identified and referred to appropriate providers.

5.7 Acceptance of Pain

While CBT is one of the most commonly utilized modalities of psychotherapy for targeting maladaptive pain-related cognitions, other types of approaches can also aid in the assessment and treatment of chronic pain. For example, Acceptance Commitment Therapy (ACT), which examines the influence of pain on psychological suffering and the resulting disengagement from personally meaningful activities, is gaining empirical support [21]. ACT aims to disentangle patients from their threatening pain-related cognitions, foster acceptance of the chronic nature of their pain, and encourage commitment of values-based actions [6]. The acceptance of chronic pain is emerging as an important factor to assess and cultivate in treatment [6].

In the context of chronic pan, acceptance is defined as willingness to experience pain and its associated cognitive and affective components without attempts to control or avoid pain sensations [6,21,22]. In addition, acceptance entails continued engagement in meaningful and functional activities, even in the presence of chronic pain. Higher rates of acceptance of chronic pain are associated with less depression, pain-related anxiety, reductions in healthcare use, higher quality of life, and increased levels of activity [21,22].

The acceptance of chronic pain can be quantified through the use of the Pain Acceptance Questionnaire (CPAQ) [23]. Data gathered from the CPAQ can inform providers of their patients' willingness to experience pain and attempts to reduce or avoid the thoughts and emotions associated with pain. Similar to other psychological processes, acceptance is an ongoing and dynamic process. In order to fully cultivate acceptance, one must continue engagement in life activities despite the experience of chronic pain [23]. Therefore, it is important for healthcare profession-

als to provide ongoing encouragement of active coping and acceptance of chronic pain while discouraging maladaptive cognitions regarding patients' inabilities to function in the presence of pain.

5.8 Chronic Pain and Risk of Suicide

As previously noted, clinically significant psychological distress is frequently observed in chronic pain patients [1,7,24]. In fact, depression commonly co-occurs with chronic pain [16,24]. The assessment of depression and its multiple symptoms, such as insomnia and suicidal ideation, is of paramount importance when working with chronic pain patients. According to a number of studies, chronic pain is associated with higher rates of suicidal ideation, self-harm behaviors, and deaths by suicide [8,16,24]. Possible mediators between pain and suicidal ideation include catastrophizing [16,24], avoidance of the pain experience, and the desire to escape from pain [24]. These moderators underscore the importance and utility of assessing patient's catastrophizing and acceptance of pain. The association between chronic pain and suicidal ideation is further complicated by patients' access to opioid analgesics [16]. A recent study found drug overdose to be the most commonly reported plan for committing suicide among chronic pain populations [25].

When treating chronic pain patients, it is important for medical providers to be cognizant of possible mental health issues, particularly when prescribing opioids or benzodiazepines [16]. Brief screening tools, such as the Patient Health Questionnaire—9 (PHQ-9), rapidly provide information on depression severity and the presence of suicidal ideation. Brief mental health screeners allow for the identification of patients in need of psychological and/or psychopharmacological interventions.

5.9 Opioid Use Disorder in Chronic Pain Patients

Chronic pain patients have higher rates of substance use disorders [26] and may be at greater risk for misusing opioids [27]. Thus, valid and reliable assessment of opioid medication adherence and potential misuse is essential for effective management of chronic pain treatment planning and outcomes. A recent study found that of the patients with a substance use disorder history, those who were at greater risk for opioid misuse were more likely to report higher levels of pain, symptoms of depression, and pain impairment. Moreover, pain catastrophizing, which was discussed above, is significantly associated with risk for pain medication misuse [26]. A recent study found that cognitive tasks have prognostic value in identifying patients at risk for musing opioids. Addiction attentional biases toward drug-related cues as well as cue-elicited cravings are strong predictors of opioid misuse. Results from this recent study suggest that chronic pain patients who reported opioid misuse exhibited greater addiction attentional bias [27].

5.10 Opioid Use Disorder Defined

The Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5; American Psychiatric Association, 2013) is the most widely accepted manual used by clinicians and researchers for the classification of mental disorders [28]. The DSM 5 defines an opioid use disorder as a pattern of use associated with significant life impairment and/or distress within a 12-month period. Opioid use disorder is classified on a range of severity varying from mild, moderate, or severe. Features of an opioid use disorder include the following: (1) Taking greater amounts of opioids than planned or taking opioids over a longer period of time than was intended; (2) Being unsuccessful efforts to cut down or control opioid use; (3) Spending a great deal of time in activities necessary to obtain, use, or recover from the effects; (4) Having a craving or experience a strong desire to use opioid; (5) The use of opioids despite failure to fulfill major or important roles at work, school, or home; (6) Ongoing use opioids regardless of experiencing persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of opioids; (7) Giving up important social, occupational, or recreational activities as a result of opioid use; (8) Continuous opioid use in situations that are physically hazardous; (9) Continuing to use opioids even with knowledge of having persistent or recurrent physical or psychological difficulties that are likely to have been caused or exacerbated by opioid use; (10) Tolerance, as defined by either a need for markedly increased amounts of opioids to achieve intoxication or a desired effect or a markedly diminished effect with continued use; and (11) Withdrawal, as noted by either the characteristic opioid withdrawal syndrome, or taking opioids to relieve or avoid withdrawal symptoms. Of importance, the criterion for tolerance and withdrawal is not considered to be met when chronic pain patients are taking opioids solely under appropriate medical supervision [28].

In addition to the DSM 5 criteria, other behavioral indicators, such as requests for early refills, taking pain medication from others, focusing on obtaining additional opioids, running out of pain medication earlier than indicated, reporting loss of pain medication, and obtaining pain medication from multiple providers, may also signal opioid misuse [2].

5.11 Assessing Risk of Aberrant Behaviors and Opioid Misuse

Many physicians appreciate the relevance of monitoring problematic medication-related behaviors among chronic pain patients to improve the management of pain. While evaluating patients for opioid adherence may be a challenge, there are assessment tools that have been developed to monitor and assess possible opioid misuse. Various screening tools are identified and discussed below.

5.12 Ongoing Misuse of Pain Medication

The Pain Medication Questionnaire is a 26-items assessment tool that evaluates the inappropriate use of pain medication. The PMQ has demonstrated good reliability and validity and is predictive of early termination from treatment. It can help to identify chronic pain patients who are more likely to complete and benefit from a pain management program [29,30]. High PMQ scores have been associated with a history of substance abuse, psychosocial distress, and lower level of functioning.

The Rapid Opioid Dependence Screen (RODS) is another helpful brief assessment tool. The RODS is an 8-item measure to evaluate potential opioid dependence. While this measure is based on the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth edition, criteria, it does offer a quick and targeted screening. Items are rated on a dichotomous scale of "yes" or "no." A total score is computed by adding the number of "yes" responses. A total score greater than 3 is highly suggestive of opioid misuse [31].

Long-term use of opioids among chronic pain patients may increase the risk of misuse of opioids [32]. The Current Opioid Misuse Measure (COMM) is a 17-item measure that demonstrates reliable and valid prediction of aberrant medication behaviors of chronic pain patients being prescribed opioid medication. Each item queries chronic pain patients on the occurrence of thoughts or behaviors related to opioid use within the past month on a 0–4 scale (0 = never to 4 = very often). Unlike other measures that identify potential traits based on past history, this assessment tool evaluates current behaviors and cognitions [33].

5.13 Adherence to Opioid Agreements

With the growing use of opioid treatment agreements, determining a patients' compliance is an important aspect of pain treatment planning. A new measure was recently developed that assesses adherence to opioid agreements and/or contracts. The Opioid Compliance Checklist (OCC) consists of 12-items, of which 5 showed to be most useful in identifying potential noncompliance. Because the measure contains items that are often recognized and contained within an opioid agreement, physicians and/or clinicians may prefer to include 10 of the original items, excluding items 9 and 11. OCC items query patient about their use of medication over the past month and any endorsement ("yes") on an item may suggest problems with adherence to opioids. Although this measure may require additional validation, it is a simple and brief assessment tool to administer [34].

5.14 Conclusion

Given the complicated nature of chronic pain, thorough assessment requires comprehensive approaches. The use of reliable and valid instruments to assess chronic pain is of importance in clinical practice and in furthering our

understanding of the interconnections between pain, functional status, and opioid misuse. Assessment tools not only screen for important psychosocial moderators of pain, but they can also identify patients who may benefit from psychological, psychiatric, and/or specialized substance use disorder treatment. Since opioid misuse may be otherwise difficult to detect, assessment of aberrant opioid-related behaviors is especially meaningful within medical settings. Overall, efficacious treatment of chronic pain hinges on the holistic and robust assessment of the pain experience.

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