Assessment of Chronic Pain: Domains, Methods, and Mechanisms

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Abstract: Accurate classification of chronic pain conditions requires reliable and valid pain assessment. Moreover, pain assessment serves several additional functions, including documenting the severity of the pain condition, tracking the longitudinal course of pain, and providing mechanistic information. Thorough pain assessment must address multiple domains of pain, including the sensory and affective qualities of pain, temporal dimensions of pain, and the location and bodily distribution of pain. Where possible, pain assessment should also incorporate methods to identify pathophysiological mechanisms underlying the pain. This article discusses assessment of chronic pain, including approaches available for assessing multiple pain domains and for addressing pathophysiological mechanisms. We conclude with recommendations for optimal pain assessment.

Perspective: Pain assessment is a critical prerequisite for accurate pain classification. This article describes important features of pain that should be assessed, and discusses methods that can be used to assess the features and identify pathophysiological mechanisms contributing to pain.

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Accurate pain assessment is critical to the classification of chronic pain conditions. Indeed, the Core Diagnostic Criteria proposed in Dimension 1 of the Analgesic, Anesthetic, and Addiction Clinical Trial Translations, Innovations, Opportunities, and Networks (ACTTION)-American Pain Society (APS) Pain Taxonomy (AAPT) includes symptoms and signs of the pain disorder, and pain is, of course, the primary symptom for all chronic pain conditions.[27] Therefore, reliable and valid pain assessment is an essential component of the AAPT framework. In addition to its diagnostic importance, pain assessment serves several other valuable functions. First, pain assessment provides information regarding the severity of the condition. In addition to its diagnostic value, this information is critical for guiding treatment decisions. Also, pain assessment allows clinicians and scientists to monitor the longitudinal course of the pain disorder and to quantify treatment effects. Repeated pain assessment should inform pain treatment in much the same way as repeated blood pressure measurement informs treatment for hypertension. Finally, pain assessment can yield clues regarding the pathophysiological mechanisms underlying the pain condition, which can help guide treatment selection. The purpose of this article, included as part of a special supplement to the *Journal of Pain*, is to highlight important issues in pain assessment in the context of the AAPT.[27] Although other reviews and book chapters have addressed pain assessment,[8,31,39] this article presents a heuristic model for conceptualizing pain assessment in the context of evidence-based pain classification, and for conducting pain assessments that can ultimately provide information regarding pathophysiological mechanisms (Fig 1). Assessment of the patient with chronic pain should also include assessment of other clinically important
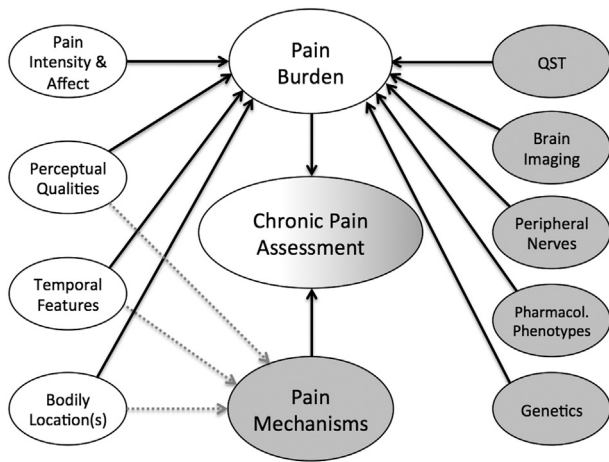
Fig 1. Heuristic model of pain assessment. This model depicts the 2 major goals of pain assessment: 1) assessment of pain burden, and 2) assessment of pain mechanisms. The left side of the figure depicts the domains of pain burden that should be measured. These measures primarily fulfill the goal of assessing pain burden (as indicated by the solid arrows), but some of these domains can also provide information regarding pain mechanisms (as indicated by the dashed arrows). The right side of the figure displays several common and emerging methods for assessing pain mechanisms (as indicated by the solid arrows).

domains, such as psychological and physical functioning and quality of life. However, those issues are addressed in separate articles in this Supplement (see Turk et al and Edwards et al); hence, this article focuses solely on assessing features related to pain and its underlying mechanisms. Specifically, we discuss important domains of clinical pain that should be assessed and identify appropriate measurement tools. In addition, we describe existing and emerging approaches to assessing pain mechanisms in clinical populations. The article concludes with some recommendations for implementing pain assessment in order to enhance pain classification.

Domains of Clinical Pain to Assess

Sensory and Affective Qualities of Pain

Because pain is an internal private experience, self-report remains the gold standard for its measurement. The most commonly assessed aspect of clinical pain is its sensory intensity. As summarized in Table 1, multiple approaches are available for assessing pain intensity, including categorical scales (eg, mild, moderate, severe), numerical rating scales (NRS), visual analog scales (VAS), and well-validated verbal descriptor scales that have excellent statistical properties (eg, the Descriptor Differential Scale[32]). The advantages and disadvantages of these different methods have been well described elsewhere.[8,31,39] The NRS is the most commonly used method in clinical settings due to its ease of administration and scoring. A recent systematic review concluded that NRS showed higher compliance and ease of use than VAS.[38] These authors also reported a large variety of verbal anchors for the upper end of NRS and VAS; the most frequently used were "worst

possible pain," "worst pain imaginable," and "most intense pain imaginable." Consistent with these findings, for most purposes we recommend using an 11-point or 101-point NRS, on which 0 represents "no pain" and 10(0) represents either "the worst possible pain" or "the most intense pain imaginable." However, in young children or in populations with limited verbal abilities, we recommend the Faces Pain Scale, which presents a series of pictures of facial expression depicting different levels of pain experience.[59] The time frame over which pain intensity is assessed deserves some mention. Because current pain may not accurately reflect a patient's overall pain experience, instruments such as the Brief Pain Inventory[14,45] and the Graded Chronic Pain Scale[88,89] ask patients to report their worst, least, and average pain intensity over some period of time (eg, the past 24 hours or the past week). This provides important information regarding the patient's overall pain burden for a given period of time.

Pain intensity reflects the sensory component of pain; however, another important component of pain severity is pain affect, which refers to how unpleasant or disturbing the pain feels. Pain affect can be assessed using categorical scales, as well as NRS and VAS, where the scale end points are modified to range from "not at all unpleasant" to "most unpleasant feeling imaginable." Although in most instances, pain intensity and pain affect are highly correlated, under some circumstances these 2 pain dimensions can be independently modulated.[33,66] Therefore, assessing both dimensions of pain can provide valuable information.

Although single-item measures are most frequently used to assess pain intensity and pain affect, multiple-item instruments can provide additional information regarding the sensory and affective qualities of pain. For example, a pain described as shooting and burning differs from a dull aching pain, even though the 2 pains might be rated as equally intense on an NRS scale. One of the most widely used multiple-item instruments for collecting information regarding pain qualities has been the McGill Pain Questionnaire (MPQ),[42] which also has 2 validated short forms (SF-MPQ).[23,42] The MPQ presents 20 groups of words and the patients select all the words that describe their pain. The MPQ yields several subscale scores, including sensory, affective, and evaluative scores. The original MPQ and the SF-MPQ-2 both show high reliability and validity, and some evidence suggests that these instruments can distinguish among different types of clinical pain.[23,42] A valuable aspect of these instruments is their ability to provide information regarding the perceptual qualities of the pain.

Several additional multiple-item instruments have been developed as screening tools to specifically assess neuropathic qualities of pain, several of which are listed in Table 1. These instruments assess self-reported features such as dysesthesias, electric shock-like or shooting pain, numbness, pain in response to heat or cold, allodynia, etc, and some include responses to evoked stimuli. Most of these instruments have reasonable sensitivity