# The McGill Pain Questionnaire

## *Development, Psychometric Properties, and Usefulness of the Long Form, Short Form, and Short Form–2*

JOEL KATZ
RONALD MELZACK

People with acute or chronic pain provide valuable opportunities to study the mechanisms of pain and analgesia. The measurement of pain is therefore essential to determine the intensity, perceptual qualities, and time course of the pain, so that the differences among pain syndromes can be ascertained and investigated. Furthermore, measurement of these variables provides valuable clues that help in the differential diagnosis of the underlying causes of the pain. They also help determine the most effective treatment, such as the types of analgesic drugs, or other therapies, necessary to control the pain, and are essential to evaluate the relative effectiveness of different therapies. The measurement of pain, then, is important (1) to determine pain intensity, quality, and duration; (2) to aid in diagnosis; (3) to help decide the choice of therapy; and (4) to evaluate the relative effectiveness of different therapies.

### DIMENSIONS OF PAIN EXPERIENCE

Research on pain, since the beginning of the 1900s, has been dominated by the concept that pain is purely a sensory experience. Yet pain also has a distinctly unpleasant, affective quality. It becomes overwhelming, demands immediate attention, and disrupts ongoing behavior and thought. It motivates or drives the organism into activity aimed at stopping the pain as quickly as possible. To consider only the sensory features of pain and ignore its motivational–affective properties is to look at only part of the problem. Even the concept of pain as a perception, with full recognition of past experience, attention, and other cognitive influences, still neglects the crucial motivational dimension.

These considerations led Melzack and Casey (1968) to suggest that there are three major psychological dimensions of pain: sensory–discriminative, motivational–affective, and cognitive–evaluative. They proposed, moreover, that these dimensions of pain experience are subserved by physiologically specialized systems in the brain: the sensory–discriminative dimension of pain is influenced primarily by the rapidly conducting spinal systems; the powerful motivational drive and unpleasant affect characteristic of pain are subserved by activities in reticular and limbic structures that are influenced primarily by the slowly conducting spinal systems; neocortical or higher central

nervous system processes, such as evaluation of the input in terms of past experience, exert control over activity in both the discriminative and motivational systems.

It is assumed that these three categories of activity interact with one another to provide perceptual information on the location, magnitude, and spatiotemporal properties of the noxious stimuli, motivational tendency toward escape or attack, and cognitive information based on past experience and probability of outcome of different response strategies (Melzack & Casey, 1968). All three forms of activity could then influence motor mechanisms responsible for the complex pattern of overt responses that characterize pain.

## THE LANGUAGE OF PAIN

Clinical investigators have long recognized the varieties of pain experience. Descriptions of the burning qualities of pain after peripheral nerve injury, or the stabbing, cramping qualities of visceral pains frequently provide the key to diagnosis and may even suggest the course of therapy. Despite the frequency of such descriptions, and the seemingly high agreement that they are valid descriptive words, studies of their use and meaning are relatively recent.

Anyone who has suffered severe pain and tried to describe the experience to a friend or to the doctor often finds him- or herself at a loss for words. The reason for this difficulty in expressing pain experience, actually, is not because the words do not exist. As we shall soon see, there is an abundance of appropriate words. Rather, the main reason is that, fortunately, they are not words we have occasion to use often. Another reason is that the words may seem absurd. We may use descriptors such as splitting, shooting, gnawing, wrenching, or stinging as useful metaphors, but there are no external objective references for these words in relation to pain. If we talk about a blue pen or a yellow pencil we can point to an object and say "That is what I mean by yellow," or "The color of the pen is blue." But what can we point to in telling another person precisely what we mean by smarting, tingling, or rasping? A person who suffers terrible pain may say that the pain is burning and add that "it feels as if someone is shoving a red-hot poker through my toes and slowly twisting it around." These "as if" statements are often essential to convey the qualities of the experience.

If the study of pain in people is to have a scientific foundation, it is essential to measure it. If we want to know how effective a new drug is, we need numbers to say that the pain decreased by some amount. Yet, whereas overall intensity is important information, we also want to know whether the drug specifically decreased the burning quality of the pain, or whether the especially miserable, tight, cramping feeling is gone.

## TRADITIONAL MEASURES OF PAIN INTENSITY

Traditional methods of pain measurement treat pain as though it were a single unique quality that varies only in intensity (Beecher, 1959). These methods include the use of verbal rating scales (VRSs), numerical rating scales (NRSs), and visual analogue scales (VASs) (Jensen & Karoly, 2001). These simple methods have all been used effectively in hospital clinics, and have provided valuable information about pain and analgesia. VRSs, NRSs, and VASs provide simple, efficient, and minimally intrusive measures of pain intensity that have been used widely in clinical and research settings that require a quick index of pain intensity to which a numerical value can be assigned (Katz & Melzack, 1999). The main disadvantage of VASs, NRSs, and VRSs is the assumption that pain is a unidimensional experience that can be measured with a single item scale (Melzack, 1975). Although intensity is, without a doubt, a salient dimension of pain, it is clear that the word "pain" refers to an endless variety of qualities categorized under a single linguistic label, not to a specific, single sensation that varies only in intensity or affect. The development of rating scales to measure pain affect or pain unpleasantness (Price, Harkins, & Baker, 1987) has partially addressed the problem, but the same shortcoming applies within the affective domain. Each pain has unique qualities. Unpleasantness is only one such quality. The pain of a toothache is obviously different from that of a pinprick, just as the pain of a coronary occlusion is uniquely

different from the pain of a broken leg. To describe pain solely in terms of intensity or affect is like specifying the visual world only in terms of light flux, without regard to pattern, color, texture, and the many other dimensions of visual experience.

## THE McGILL PAIN QUESTIONNAIRE

### *Development and Description*

Melzack and Torgerson (1971) developed the procedures to specify the qualities of pain. In the first part of their study, physicians and other university graduates were asked to classify 102 words, obtained from the clinical literature, into small groups that describe distinctly different aspects of the experience of pain. On the basis of the data, the words were categorized into three major classes and 16 subclasses. The classes are (1) words that describe the sensory qualities of the experience in terms of temporal, spatial, pressure, thermal, and other properties; (2) words that describe affective qualities in terms of tension, fear, and autonomic properties that are part of the pain experience; and (3) evaluative words that describe the subjective overall intensity of the total pain experience. Each subclass was given a descriptive label and consists of a group of words considered by most subjects to be qualitatively similar, but whereas some of these words are undoubtedly synonyms, others seem to be synonymous yet vary in intensity, and still others provide subtle differences or nuances (despite their similarities) that may be of importance to a patient trying desperately to communicate to a physician.

The second part of the Melzack and Torgerson (1971) study was an attempt to determine the pain intensities implied by the words within each subclass. Groups of physicians, patients, and students were asked to assign an intensity value to each word, using a numerical scale ranging from least (or mild) pain to worst (or excruciating) pain. When this was done, it was apparent that several words within each subclass had the same relative intensity relationships in all three sets. For example, in the spatial subclass, "shooting" was found to represent more pain than "flashing," which in turn implied more pain than "jumping." Although the precise intensity scale values differed for the groups, all three agreed on the positions of the words relative to each other.

Because of the high degree of agreement on the intensity relationships among pain descriptors by subjects who have different cultural, socioeconomic, and educational backgrounds, a pain questionnaire (Figure 3.1) was developed as an experimental tool for studies of the effects of various methods of pain management. In addition to the list of pain descriptors, the questionnaire contains line drawings of the body to show the spatial distribution of the pain, words that describe temporal properties of pain, and descriptors of the overall present pain intensity (PPI). The PPI is recorded as a number from 1 to 5, in which each number is associated with the following words: 1, "mild"; 2, "discomforting"; 3, "distressing"; 4, "horrible"; and 5, "excruciating." The mean scale values of these words, which were chosen from the evaluative category, are approximately equally far apart, so that they represent equal scale intervals and thereby provide "anchors" for the specification of the overall pain intensity (Melzack & Torgerson, 1971).

In a preliminary study, the pain questionnaire consisted of the 16 subclasses of descriptors shown in Figure 3.1, as well as the additional information deemed necessary for the evaluation of pain. It soon became clear, however, that many of the patients found certain key words to be absent. These words were then selected from the original word list used by Melzack and Torgerson (1971), categorized appropriately, and ranked according to their mean scale values. A further set of words—"cool," "cold," "freezing"—was used by patients on rare occasions but was indicated to be essential for an adequate description of some types of pain. Thus, four supplementary—or "miscellaneous"—subclasses were added to the word lists of the questionnaire (Figure 3.1). The final classification, then, appeared to represent the most parsimonious and meaningful set of subclasses without at the same time losing subclasses that represent important qualitative properties. The questionnaire, which is known as the McGill Pain Questionnaire (MPQ; Melzack, 1975), has become a widely used clinical and research tool (Melzack, 1983; Wilkie, Savedra, Holzemier, Tesler, & Paul, 1990).

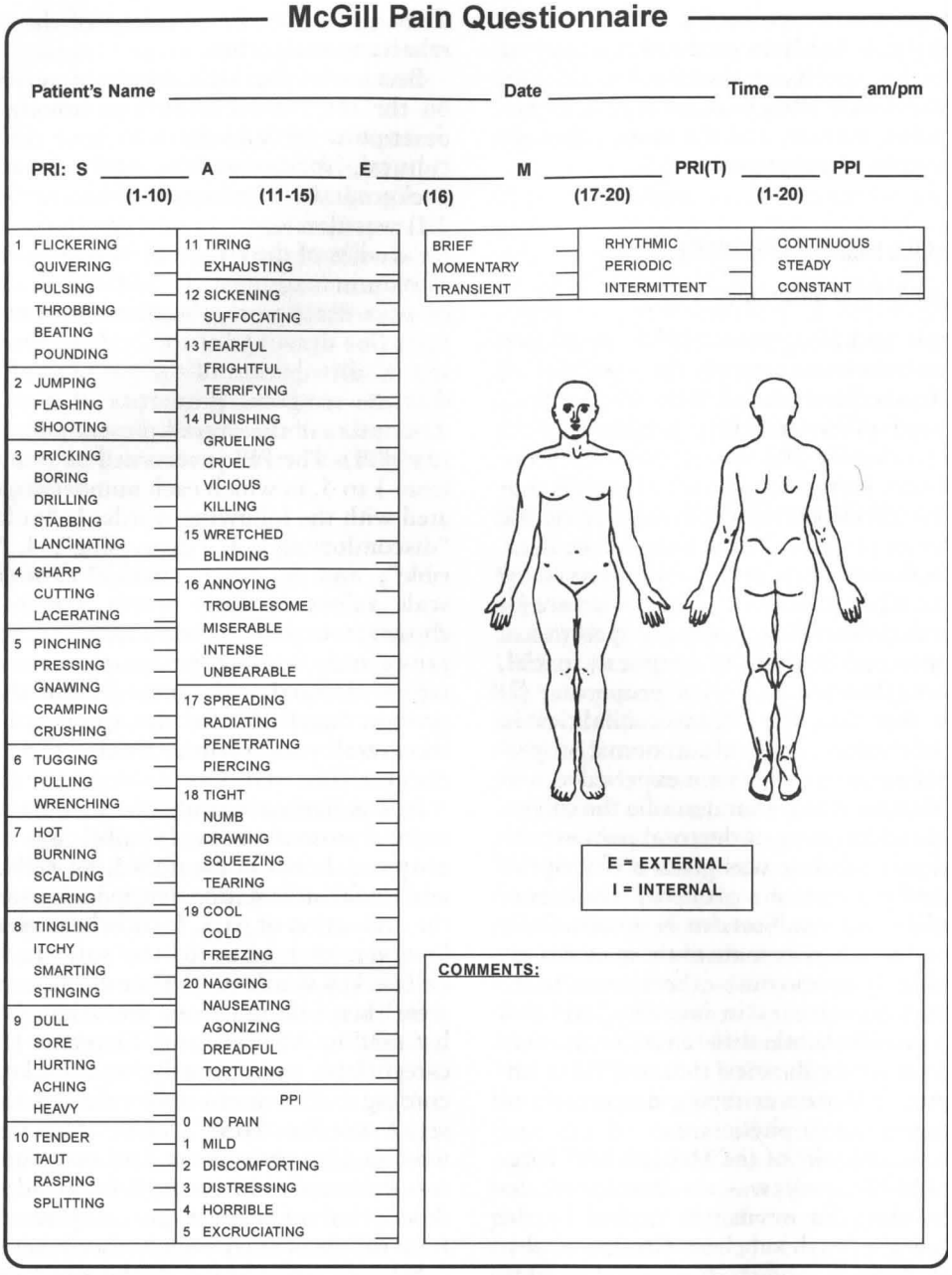


**FIGURE 3.1.** The McGill Pain Questionnaire (MPQ). The descriptors fall into four major groups: Sensory, 1–10; Affective, 11–15; Evaluative, 16; and Miscellaneous, 17–20. The rank value for each descriptor is based on its position in the word set. The sum of the rank values is the pain rating index (PRI). The present pain intensity (PPI) is based on a scale of 0 to 5. Copyright 1996 by Ronald Melzack. Reprinted by permission.

### *Measures of Pain Experience*

The descriptor lists of the MPQ are read to a patient with the explicit instruction that he or she choose only those words that describe his or her feelings and sensations at that moment. Three major indices are obtained:

1. The pain rating index (PRI) based on the rank values of the words. In this scoring system, the word in each subclass implying the least pain is given a value of 1, the next word is given a value of 2, and so forth. The rank values of the words chosen by a patient are summed to obtain separate scores for the sensory (subclasses 1–10), affective (subclasses 11–15), evaluative (subclass 16), and miscellaneous (subclasses 17–20) words, in addition to providing a total score (subclasses 1–20). Figure 3.2 shows MPQ scores (total score from subclasses 1–20) obtained by patients with a variety of acute and chronic pains.
2. The number of words chosen (NWC).
3. The present pain intensity (PPI), the number–word combination chosen as the indicator of overall pain intensity at the time of administration of the questionnaire.

### *Usefulness*

The most important requirements are that a measure be valid, reliable, consistent, and above all, useful. The MPQ appears to meet all of these requirements (Chapman et al., 1985; Melzack, 1983; Wilkie et al., 1990)

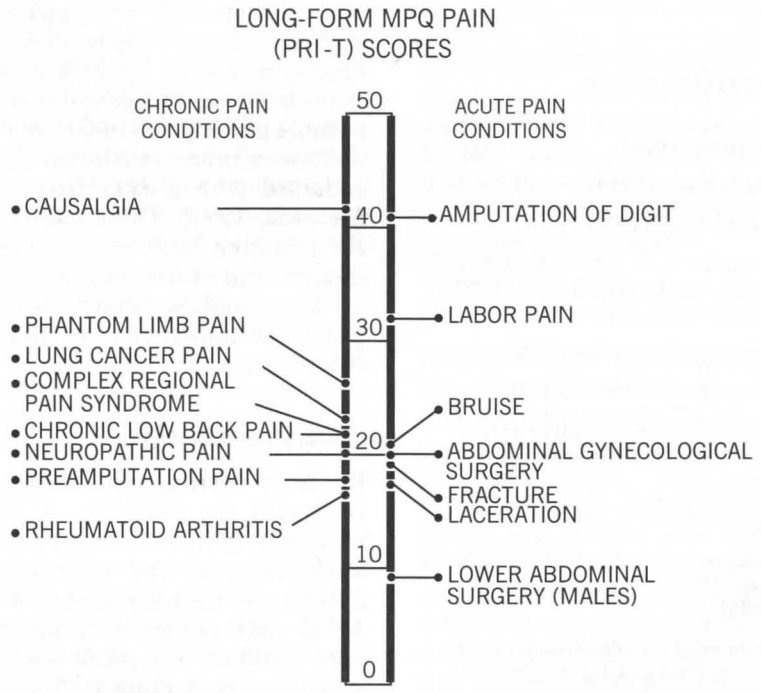


**FIGURE 3.2.** Comparison of pain scores, using the MPQ, obtained from women during labor (Melzack et al., 1981), patients in a general hospital pain clinic (Melzack, 1975), and an emergency department (Melzack et al., 1982). The pain score for causalgic pain is reported by Tahmoush (1981). Other pain ratings come from studies of patients with chronic pain conditions, including lung cancer pain (Wilkie et al., 2001), low back pain (Scrimshaw & Maher, 2001), complex regional pain syndromes (Birklein, Riedl, Sieweke, Weber, & Neundorfer, 2000), neuropathic pain (Lynch et al., 2003), preamputation pain (Nikolajsen, Ilkjaer, Kroner, Christensen, & Jensen, 1997), and rheumatoid arthritis (Roche et al., 2003), as well patients with acute pain after abdominal gynecological surgery (Katz, Cohen, Schmid, Chan, & Wowk, 2003) and lower abdominal surgery (Katz et al., 1994).

and provides a relatively rapid way of measuring subjective pain experience (Melzack, 1975). When administered to a patient by reading each subclass, it can be completed in about 5 minutes. It can also be filled out by the patient in a more leisurely way as a paper-and-pencil test, though the scores are somewhat different (Klepac, Dowling, Rokke, Dodge, & Schafer, 1981).

Since its introduction in 1975, the MPQ has been used in more than 500 studies of acute, chronic, and laboratory-produced pains. It has been translated into several languages and has also spawned the development of similar pain questionnaires in other languages (Table 3.1).

**TABLE 3.1. Pain Questionnaires in Different Languages Based on the McGill Pain Questionnaire**

| Language | Authors |
|---|---|
| Amharic (Ethiopia) | Aboud et al. (2003) |
| Arabic | Harrison (1988) |
| Chinese | Hui & Chen (1989) |
| Danish | Drewes et al. (1993) |
| Dutch (Flemish) | Vanderiet et al. (1987); Verkes et al. (1989); van Lankveld et al. (1992); van der Kloot et al. (1995) |
| Finnish | Ketovuori & Pöntinen (1981) |
| French | Boureau et al. (1984, 1992) |
| German | Kiss et al. (1987); Radvila et al. (1987); Stein & Mendl (1988) |
| Greek | Georgoudis et al. (2000, 2001b); Mystakidou et al. (2002) |
| Italian | De Benedittis et al. (1988); Ferracuti et al. (1990); Maiani & Sanavio (1985) |
| Japanese | Satow et al. (1990); Hobara et al. (2003); Hasegawa et al. (2001) |
| Norwegian | Strand & Wisnes (1991); Kim et al. (1995) |
| Polish | Sedlak (1990) |
| Portuguese | Pimenta & Teixeiro (1996) |
| Slovak | Bartko et al. (1984) |
| Spanish | Laheurta et al. (1982); Bejarano et al. (1985); Lázaro et al. (1994); Escalante et al. (1996); Masedo & Esteve (2000) |

Because pain is a private, personal experience, it is impossible for us to know precisely what someone else's pain feels like. No man can possibly know what it is like to have menstrual cramps or labor pain. Nor can psychologically healthy persons know what psychotic patients are feeling when they say they have excruciating pain (Veilleux & Melzack, 1976). But the MPQ provides us with an insight into the qualities that are experienced. Studies indicate that each kind of pain is characterized by a distinctive constellation of words. There is a remarkable consistency in the choice of words by patients experiencing the same or similar pain syndromes (Graham, Bond, Gerkovitch, & Cook, 1980; Grushka & Sessle, 1984; Katz, 1992; Katz & Melzack, 1991; Melzack, Taenzer, Feldman, & Kinch, 1981; Van Buren & Kleinknecht, 1979). For example, in a study of amputees with phantom limb pain (Group PLP) or nonpainful phantom limb sensations (Group PLS), every MPQ descriptor chosen by 33% or more participants in Group PLS was also chosen by 33% or more participants in Group PLP, although there were other descriptors the latter group endorsed with greater frequency (Katz & Melzack, 1991). These data indicated that the phantom limb experiences of the two groups have in common a paresthetic quality (e.g., tingling, numb), although painful phantoms consist of more than this shared component.

### *Reliability and Validity*

Reading, Everitt, and Sledmere (1982) investigated the reliability of the groupings of adjectives in the MPQ by using different methodological and statistical approaches. Subjects sorted each of the 78 words of the MPQ into groups that described similar pain qualities. The mean number of groups was 19 (with a range of 7 to 31), which is remarkably close to the MPQ's 20 groups. Moreover, there were distinct subgroups for sensory and affective–evaluative words. Since the cultural backgrounds of subjects in this study and in that of Melzack and Torgerson (1971) were different, and the methodology and data analysis were dissimilar, the degree of correspondence is impressive. Gaston-Johansson, Albert, Fagan, and Zimmerman (1990) reported that subjects with

diverse ethnic–cultural and educational backgrounds use similar MPQ adjectives to describe commonly used words such as "pain," "hurt," and "ache." Nevertheless, interesting differences were found between the studies, which suggest alternative approaches for future revisions of the MPQ.

Evidence for the stability of pain measures can be difficult to obtain, since many pains fluctuate over time, resolve spontaneously, or improve as a function of a treatment. In cases such as these, repeated administration of the same pain instrument would not be expected to yield similar estimates. Chronic pain conditions that remain relatively constant over time offer the opportunity to evaluate the stability of pain measures. Evidence of the stability the MPQ comes from a study of patients with chronic low back pain who completed the MPQ on two occasions separated by several days (Love, Leboeuf, & Crisp, 1989). The results showed very strong test–retest reliability coefficients for the MPQ PRIs, as well as for some of the 20 categories. The lower coefficients for the 20 categories may be explained by the suggestion that clinical pains show fluctuations in quality over time yet still represent the "same" pain to the person who experiences it. More recently, a study of patients with rheumatoid arthritis showed a stable pattern of MPQ scores across three pain assessments over a 6-year period (Roche, Klestov, & Heim, 2003). The pain remained moderate over the 6-year period in the presence of ongoing disease activity, and the MPQ revealed a consistent choice of descriptors, with no significant change in MPQ ratings over time.

There are many validity studies of the three-dimensional framework of the MPQ. Generally, the distinction between sensory and affective dimensions has held up extremely well, but there is still considerable debate on the separation of the affective and evaluative dimensions. Nevertheless, several excellent studies (Holroyd et al., 1992; McCreary, Turner, & Dawson, 1981; Prieto et al., 1980; Reading, 1979) have reported a discrete evaluative factor. The different factor-analytic procedures that were used undoubtedly account for the reports of four factors (Holroyd et al., 1992; Reading, 1979), five factors (Crockett, Prkachin, & Craig, 1977), six factors (Burckhardt, 1984), or seven factors (Leavitt, Garron, Whisler, & Sheinkop, 1978). The major source of disagreement, however, seems to be the different patient populations used to obtain data for factor analyses. The range includes brief laboratory-induced pains, dysmenorrhea, back pain, and cancer pain. In some studies, relatively few words are chosen, while large numbers are selected in others. It is not surprising, then, that factor-analytic studies based on such diverse populations have confused rather than clarified some of the issues.

Turk, Rudy, and Salovey (1985) examined the internal structure of the MPQ using techniques that avoided the problems of most earlier studies and confirmed the three (sensory, affective, and evaluative) dimensions. Lowe, Walker, and McCallum (1991) also confirmed the three-factor structure of the MPQ, using elegant statistical procedures and a large number of subjects. Finally, a paper by Chen, Dworkin, Haug, and Gehrig (1989) presented data on the remarkable consistency of the MPQ across five studies using the cold pressor task, and Pearce and Morley (1989) provided further confirmation of the construct validity of the MPQ using the Stroop color-naming task with patients with chronic pain.

### *Sensitivity*

Recent studies show that the MPQ is sensitive to interventions designed to reduce pain of neuropathic origin (Lynch, Clark, & Sawynok, 2003), including phantom limb pain (Nikolajsen et al., 1996), spinal cord injury pain (Defrin, Grunhaus, Zamir, & Zeilig, 2007), and postherpetic neuralgia (Dworkin et al., 2003). The relative sensitivity of the MPQ to change in postoperative pain following administration of oral analgesics was evaluated by comparing it with VAS and VRS measures of pain intensity (Jenkinson et al., 1995). While all three measures of pain revealed the same pattern of change over time, effect sizes for the MPQ were consistently related to self-reported, directly assessed change in pain using a VRS. These findings probably underestimate the MPQ's sensitivity to change, since the benchmark for change was a VRS. In support of this, the MPQ appears to provide a more sensitive measure of mild postoperative pain than

does a simple VAS that assesses pain intensity, only because patients can be more precise in describing their experience by selecting appropriate descriptors (Katz et al., 1994). This increased ability of the MPQ to detect differences in pain at the low end of the pain continuum most likely is a function of the multidimensional nature of the MPQ and the large number of descriptors from which to choose.

### *Discriminative Capacity*

One of the most exciting features of the MPQ is its potential value as an aid in the differential diagnosis among various pain syndromes. The first study to demonstrate the discriminative capacity of the MPQ was carried out by Dubuisson and Melzack (1976), who administered the questionnaire to patients with eight different pain syndromes: postherpetic neuralgia, phantom limb pain, metastatic carcinoma, toothache, degenerative disc disease, rheumatoid arthritis or osteoarthritis, labor pain, and menstrual pain. Discriminant analysis revealed that each type of pain is characterized by a distinctive constellation of verbal descriptors. Furthermore, when the descriptor set for each patient was classified into one of the eight diagnostic categories, a correct classification was made in 77% of cases. Table 3.2 shows the pain descriptors that are most characteristic of the eight clinical pain syndromes in the Dubuisson and Melzack (1976) study.

Descriptor patterns can also provide the basis for discriminating between two major types of low back pain. Some patients have clear physical causes, such as degenerative disc disease, while others suffer low back pain even though no physical causes can be found. Using a modified version of the MPQ, Leavitt and Garron (1980) found that patients with physical ("organic") causes use distinctly different patterns of words from patients whose pain has no detectable cause and is labeled as "functional." A concordance of 87% was found between established medical diagnosis and classification based on the patients' choice of word patterns from the MPQ. Along similar lines, Perry, Heller, and Levine (1988, 1991) reported differences in the pattern of MPQ subscale correlations in patients with and without demonstrable organic pathology.

Further evidence of the discriminative capacity of the MPQ was furnished by Melzack, Terrence, Fromm, and Amsel (1986), who correctly classified patients with trigeminal neuralgia or atypical facial pain with 91% accuracy based on seven key descriptors. The authors then used a second, independent validation sample of patients with trigeminal neuralgia or atypical facial pain and showed a correct prediction for 90% of the patients. Specific verbal descriptors of the MPQ have also been shown to discriminate between reversible and irreversible damage of the nerve fibers in a tooth (Grushka & Sessle, 1984), among various facial pain disorders (Mongini & Italiano, 2001; Mongini, Italiano, Raviola, & Mossolov, 2000), and between leg pain caused by diabetic neuropathy and leg pain arising from other causes (Masson, Hunt, Gem, & Boulton, 1989). Mongini, Deregibus, Raviola, and Mongini (2003) further showed that the MPQ consistently discriminates between migraine and tension-type headache, confirming an earlier report (Jerome et al., 1988) that cluster headache pain is more intense and distressing than other vascular (migraine and mixed) headache pain, and is characterized by a distinct constellation of descriptors. Wilkie, Huang, Reilly, and Cain (2001) compared MPQ descriptors chosen by patients with previously classified nociceptive and neuropathic pain sites due to lung cancer. They found that four descriptors (i.e., "lacerating," "stinging," "heavy," "suffocating") were used significantly more frequently to describe nociceptive pain sites than neuropathic pain sites, and that 11 other descriptors were used more often to describe the latter than the former pain sites. Using a multivariate regression equation, they showed that 78% of the pain sites were accurately identified using 10 MPQ descriptors as nociceptive (81% sensitivity) or neuropathic (59% sensitivity).

It is evident, however, that the discriminative capacity of the MPQ has limits. High levels of anxiety and other psychological disturbance, which may produce high affective scores, may obscure the discriminative capacity (Kremer & Atkinson, 1983). Moreover, certain key words that discriminate among specific syndromes may be absent (Reading, 1982). Nevertheless, it is clear that there are appreciable and quantifiable

**TABLE 3.2. Descriptions Characteristic of Clinical Pain Syndromes**

| Menstrual pain ($n$ = 25) | Arthritic pain ($n$ = 16) | Labor pain ($n$ = 11) | Disc disease pain ($n$ = 10) | Tooth-ache ($n$ = 10) | Cancer pain ($n$ = 8) | Phantom limb pain ($n$ = 8) | Postherpetic pain ($n$ = 6) |
|---|---|---|---|---|---|---|---|
| | | | Sensory | | | | |
| Cramping (44%) | Gnawing (38%) | Pounding (37%) | Throbbing (40%) | Throbbing (50%) | Shooting (50%) | Throbbing (38%) | Sharp (84%) |
| Aching (44%) | Aching (50%) | Shooting (46%) | Shooting (50%) | Boring (40%) | Sharp (50%) | Stabbing (50%) | Pulling (67%) |
| | | Stabbing (37%) | Stabbing (40%) | Sharp (50%) | Gnawing (50%) | Sharp (38%) | Aching (50%) |
| | | Sharp (64%) | Sharp (60%) | | Burning (50%) | Cramping (50%) | Tender (83%) |
| | | Cramping (82%) | Cramping (40%) | | Heavy (50%) | Burning (50%) | Heavy (40%) |
| | | Aching (46%) | Aching (40%) | | | Aching (38%) | Tender (50%) |
| | | | Affective | | | | |
| Tiring (44%) | Exhausting (50%) | Tiring (37%) | Tiring (46%) | Sickening (40%) | Exhausting (50%) | Tiring (50%) | Exhausting (50%) |
| Sickening (56%) | | Exhausting (46%) | Exhausting (40%) | | | Exhausting (38%) | |
| | | Fearful (36%) | | | | Cruel (38%) | |
| | | | Evaluative | | | | |
| | Annoying (38%) | Intense (46%) | Unbearable (40%) | Annoying (50%) | Unbearable (50%) | | |
| | | | Temporal | | | | |
| Constant (56%) | Constant (44%) | Rhythmic (91%) | Constant (80%) | Constant (60%) | Constant (100%) | Constant (88%) | Constant (50%) |
| | Rhythmic (56%) | | Rhythmic (70%) | Rhythmic (40%) | Rhythmic (88%) | Rhythmic (63%) | Rhythmic (50%) |

*Note.* Only those words chosen by more than one-third of the patients are listed, and the percentage of patients who chose each word is shown below the word.

differences in the way various types of pain are described, and that patients with the same disease or pain syndrome tend to use remarkably similar words to communicate what they feel.

### *Multidimensional Pain Experience*

Several groups of researchers have evaluated the theoretical structure of the MPQ using factor-analytic methods (Holroyd et al., 1992; Turk et al., 1985). Turk and colleagues (1985) concluded that the three-factor structure of the MPQ—sensory, affective, and evaluative—is strongly supported by the analyses; Holroyd's "most clearly interpretable structure" was provided by a four-factor solution obtained by oblique rotation in which two sensory factors were identified in addition to an affective and an evaluative factor.

Like most others who have used the MPQ, Turk and colleagues (1985) and Holroyd and colleagues (1992) find high intercorrelations among the factors. However, significant intercorrelations among identified factors should not be taken as evidence for the lack of discriminative capacity and clinical utility of

the MPQ. There is, in fact, considerable evidence that the MPQ is effective in discriminating among the three factors despite the high intercorrelations. First, Gracely (1992) has convincingly argued that factor-analytic methods may be inappropriate for assessing the factor structure of the MPQ, although they provide useful information about patient characteristics. Torgerson (1988) distinguished between semantic meaning (how the MPQ descriptors are arranged) and associate meaning (how patients arrange the MPQ descriptors) to emphasize that factor analysis provides a context-dependent structure of the latter; that is, the outcome depends on how specific patient samples make use of the MPQ descriptors. Gracely (1992) elaborated further on the difference between semantic and associative meaning and concluded that factor-analytic techniques do not "directly evaluate the semantic structure of the questionnaire" (p. 297).

Second, a high correlation among variables does not necessarily imply a lack of discriminant capacity. Traditional psychophysics has shown repeatedly that, in the case of vision, increasing the intensity of light produces increased capacity to discriminate color, contours, texture, and distance (Kling & Riggs, 1971). Similarly, in the case of hearing, increases in volume lead to increased discrimination of timbre, pitch, and spatial location (Kling & Riggs, 1971). In these cases, there are clearly very high intercorrelations among the variables in each modality. But this does not mean that we should forget about the differences between color and texture, or between timbre and pitch, just because they intercorrelate highly. This approach would lead to the loss of valuable, meaningful data (Gracely, 1992).

Third, many papers have demonstrated the discriminant validity of the MPQ (Melzack, Kinch, Dobkin, Lebrun, & Taenzer, 1984; Melzack & Perry, 1975; Melzack et al., 1981; Reading, 1982; Reading & Newton, 1977). In studies on labor pain, Melzack and colleagues (1981, 1984) found that distinctly different variables correlate with the sensory, affective, and evaluative dimensions. Prepared childbirth training, for example, correlates significantly with the sensory and affective dimensions but not the evaluative one. Menstrual difficulties correlate with the affective but neither the sensory nor evaluative dimensions. Physical factors, such as mother's and infant's weight, also correlate selectively with one or another dimension.

Similarly, a study of acute pain in emergency ward patients (Melzack, Wall, & Ty, 1982, p. 33) has "revealed a normal distribution of sensory scores but very low affective scores compared to patients with chronic pain." Finally, Chen and colleagues (1989) have consistently identified a group of pain-sensitive and pain-tolerant subjects in five laboratory studies of *tonic* (prolonged) pain. Compared with pain-tolerant subjects, pain-sensitive subjects show significantly higher scores on all PRIs except the sensory dimension. Atkinson, Kremer, and Ignelzi (1982) are undoubtedly right that high affect scores tend to diminish the discriminant capacity of the MPQ, so that, at high levels of anxiety and depression, some discriminant capacity is lost. However, the MPQ still retains good discriminant function even at high levels of anxiety.

In summary, (1) high intercorrelations among psychological variables do not mean that they are all alike and can therefore be lumped into a single variable, such as intensity; rather, certain biological and psychological variables can covary to a high degree yet represent distinct, discriminable entities; and (2) the MPQ has been shown in many studies to be capable of discriminating among the three component factors.

## THE SHORT-FORM MPQ

The Short-Form MPQ (SF-MPQ; Melzack, 1987; Figure 3.3) was developed for use in specific research settings in which the time to obtain information from patients is limited and more information is desired than that provided by intensity measures such as the VAS or PPI. The SF-MPQ consists of 15 representative words from the sensory ($n$ = 11) and affective ($n$ = 4) categories of the standard, Long-Form MPQ (LF-MPQ). The PPI and a VAS are included to provide indices of overall pain intensity. The 15 descriptors making up the SF-MPQ were selected on the basis of their frequency of endorsement by patients with a variety of acute, intermittent, and chronic pains. An additional word—"splitting"—was added because it was reported to be a key discriminative word for

## SHORT-FORM McGILL PAIN QUESTIONNAIRE

RONALD MELZACK

PATIENT'S NAME: _____ DATE: _____

| | NONE | MILD | MODERATE | SEVERE |
|---|---|---|---|---|
| THROBBING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| SHOOTING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| STABBING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| SHARP | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| CRAMPING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| GNAWING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| HOT-BURNING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| ACHING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| HEAVY | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| TENDER | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| SPLITTING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| TIRING-EXHAUSTING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| SICKENING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| FEARFUL | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| PUNISHING-CRUEL | 0) _____ | 1) _____ | 2) _____ | 3) _____ |

NO PAIN ——— WORST POSSIBLE PAIN

P P I

| | | |
|---|---|---|
| 0 | NO PAIN | _____ |
| 1 | MILD | _____ |
| 2 | DISCOMFORTING | _____ |
| 3 | DISTRESSING | _____ |
| 4 | HORRIBLE | _____ |
| 5 | EXCRUCIATING | _____ |

**FIGURE 3.3.** The Short-Form McGill Pain Questionnaire (SF-MPQ). Descriptors 1–11 represent the sensory dimension of pain experience, and descriptors 12–15 represent the affective dimension. Each descriptor is ranked on an intensity scale of 0 = "none," 1 = "mild," 2 = "moderate," 3 = "severe." The PPI of the standard Long-Form McGill Pain Questionnaire (LF-MPQ) and the VAS are also included to provide overall pain intensity scores. Copyright 1987 by Ronald Melzack. Reprinted by permission.

dental pain (Grushka & Sessle, 1984). Each descriptor is ranked by the patient on an intensity scale of 0 = "none," 1 = "mild," 2 = "moderate," 3 = "severe." The SF-MPQ exists in both Canadian English and French versions (Melzack, 1987).

### *Psychometric Properties*

The SF-MPQ correlates very highly with the major PRI indices (Sensory (S), Affective (A), and Total (T)) of the LF-MPQ (Dudgeon, Ranbertas, & Rosenthal, 1993; Melzack, 1987). Concurrent validity and test–retest reliability of the SF-MPQ were reported in a study of patients with chronic pain due to cancer (Dudgeon et al., 1993). On each of three occasions separated by at least a 3-week period, the PRI-S, PRI-A, and PRI-T scores correlated highly with corresponding scores on the LF-MPQ. Other studies also have demonstrated the SF-MPQ to have good to excellent test–retest reliability (Strand, Ljunggren, Bogen, Ask, & Johnsen, 2008), with lower intraclass correlation coefficients (ICCs) associated with longer intervals between testings (Burckhardt & Bjelle, 1994) and higher ICCs reported when the interval between test occasions is short and not confounded by treatment (Georgoudis, Oldham, & Watson, 2001a; Grafton, Foster, & Wright, 2005; Yakut, Yakut, Bayar, & Uygur, 2007).

Factor-analytic studies of the SF-MPQ have generally supported the two-factor structure proposed by Melzack (1987). The presence of sensory and affective factors has been confirmed using both confirmatory and exploratory analyses and in varied patient populations, including patients with burn injuries (Mason et al., 2008), chronic low back pain (Beattie, Dowda, & Feuerstein, 2004; Wright, Asmundson, & McCreary, 2001), and fibromyalgia or rheumatoid arthritis (Burckhardt & Bjelle, 1994). The most methodologically sound study was conducted by Beattie and colleagues (2004), who cross-validated the two-factor solution obtained using exploratory factor analysis with a subsequent confirmatory factor analysis in a large sample of patients with chronic low back pain. Factor solutions suggesting a structure other than that proposed by Melzack are still consistent with the general distinction between sensory and affective dimensions. For example, Burckhardt and Bjelle (1994) reported a three-factor solution that comprised two sensory factors and one affective factor. As reviewed by Mason and colleagues (2008), two studies have evaluated the cross-cultural validity of the SF-MPQ in African American and European American patients with upper and lower back pain (Cassisi et al., 2004) and in Asian American cancer patients (Shin, Kim, Young Hee, Chee, & Im, 2008). Both studies used exploratory factor-analytic methods and both failed to find a two-factor solution consistent with the sensory and affective dimensions proposed by Melzack (1987). In one study (Cassisi et al., 2004) a four- and five-factor solution emerged, and in the other (Shin et al., 2008) a two-factor solution was found in which both factors contained sensory and affective descriptors. Methodological limitations associated with these studies may, in part, explain the inconsistent findings.

The SF-MPQ is sensitive to change brought about by various therapies—analgesic drugs (Rice & Maton, 2001; Ruoff, Rosenthal, Jordan, Karim, & Kamin, 2003), epidurally or spinally administered agents (Harden, Carter, Gilman, Gross, & Peters, 1991; Melzack, 1987; Serrao, Marks, Morley, & Goodchild, 1992), transcutaneous electrical nerve stimulation (TENS) (Melzack, 1987), acupuncture (Birch & Jamison, 1998), low-power light therapy (Stelian et al., 1992), and an intensive 3½-week multidisciplinary treatment program (Strand et al., 2008). It is notable that the SF-MPQ is also capable of detecting clinically significant reductions in various neuropathic pain conditions associated with pharmacological interventions administered in the context of randomized, placebo-controlled trials (Backonja et al., 1998; Gilron et al., 2005; Lesser, Sharma, LaMoreaux, & Poole, 2004; Lyrica Study Group, 2006).

Voorhies, Jiang, and Thomas (2007) reported the SF-MPQ to be useful in predicting outcome in response to surgical intervention for lumbar radiculopathy. Patients with preoperative SF-MPQ Sensory and Affective scores of 17 and 7 or more, respectively (i.e., 50% of the total possible SF-MPQ scores) had between a 42 and 50% chance of ob-

taining an excellent or good surgical outcome 12 months after surgery.

Figure 3.4 shows SF-MPQ scores obtained by patients with a variety of acute and chronic pains. As can be seen, the SF-MPQ has been used in studies of chronic pain (al Balawi, Tariq, & Feinmann, 1996; Bruehl, Chung, & Burns, 2003; Burckhardt, Clark, & Bennett, 1992; Dudgeon et al., 1993; Gagliese & Melzack, 1997; Grönblad, Lukinmaa, & Konttinen, 1990; Ruoff et al., 2003; Stelian et al., 1992; Turner, Cardenas, Warms, & McClellan, 2001) and acute pain (Hack, Cohen, Katz, Robson, & Goss, 1999; Harden et al., 1991; King, 1993; McGuire et al., 1993; Melzack, 1987; Thomas, Heath, Rose, & Flory, 1995; Watt-Watson, Stevens, Costello, Katz, & Reid, 2000) of diverse etiology, and to evaluate pain and discomfort in response to medical interventions (Fowlow, Price, & Fung, 1995).

An important property of the LF-MPQ is that it is has been shown to distinguish between different pains. Initial data (Melzack, 1987) suggesting that the SF-MPQ may be capable of discriminating among different pain syndromes have been confirmed by Closs, Nelson, and Briggs (2008), who reported that venous leg ulcers were frequently described as "throbbing," "burning," and "itchy," whereas arterial ulcers were described as "sharp" and "hurting." Similarly, modest predictability was reported for distinguishing between pain of neuropathic and

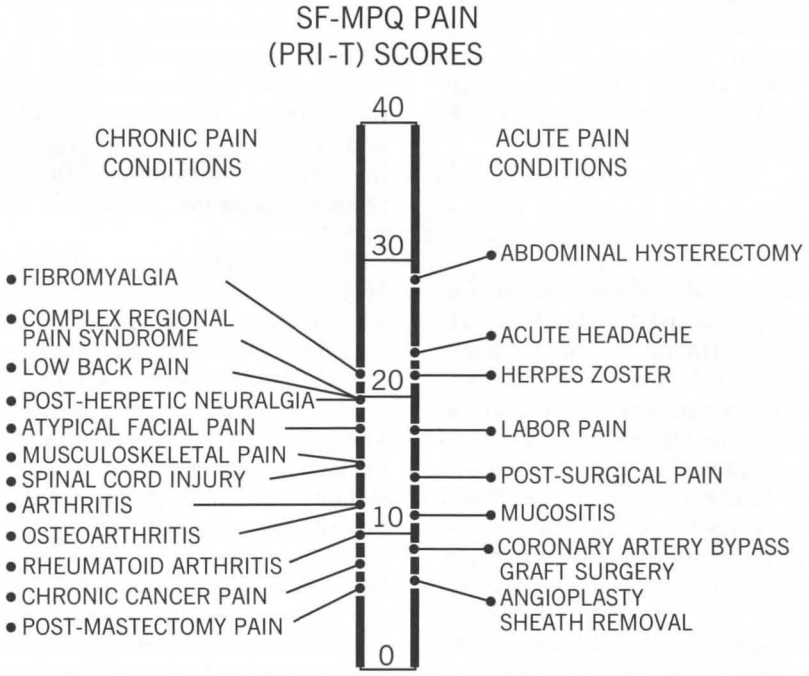


**FIGURE 3.4.** Comparison of total pain rating index (PRI-T) scores using the SF-MPQ for acute and chronic pain conditions. References for the various pain conditions are as follows: labor pain, musculoskeletal pain, and postsurgical pain (Melzack, 1987); abdominal hysterectomy (Thomas et al., 1995); acute headache (Harden et al., 1991); herpes zoster and postherpetic neuralgia (King, 1993); mucositis (McGuire et al., 1993); angioplasty sheath removal (Fowlow et al., 1995); fibromyalgia and rheumatoid arthritis (Burckhardt & Bjelle, 1994); atypical facial pain (al Balawi et al., 1996); arthritis (Gagliese & Melzack, 1997); osteoarthritis (Stelian et al., 1992); chronic cancer pain (Dudgeon et al., 1993); postmastectomy pain (Hack et al., 1999); spinal cord injury (Turner et al., 2001); complex regional pain syndrome (Bruehl et al., 2003); low back pain (Ruoff et al., 2003); and coronary artery bypass graft surgery (Watt-Watson et al., 2000).

musculoskeletal origin among patients with spinal cord injuries (Putzke et al., 2002). Czech (Solcovä, Jacoubek, Sÿkora, & Hnïk, 1990) and Swedish (Burckhardt & Bjelle, 1994) versions of the SF-MPQ have been developed. In addition, an established translation institute (Mapi, 2003), using forward- and backward-translation techniques, has translated the SF-MPQ into 50 languages.

A study of patients with chronic arthritis suggests that the SF-MPQ may be appropriate for use with geriatric patients with pain (Gagliese & Melzack, 1997). In that study, the frequency of failing to complete the SF-MPQ appropriately did not differ among young, middle-aged, and older adult patients. In addition, the subscales showed high intercorrelations and consistency. Although older adult patients endorsed fewer adjectives than their younger counterparts, there was a consistency among the three age groups in the most frequently chosen pain descriptors. These results suggest that pain patients across the lifespan approach the SF-MPQ in a similar manner.

## THE SF-MPQ-2

Recent advances in identifying the mechanisms of neuropathic pain (Treede et al., 2008) and in improving its management (Dworkin et al., 2007) have led to the development of new instruments (Jensen, 2006) designed to measure the unique aspects of pain initiated or caused by a primary lesion or dysfunction in the nervous system. While there are merits to a neuropathic pain-specific questionnaire, there are also disadvantages. For example, measurement of the various qualities of pain can aid in the process of diagnosis. Use of a neuropathic pain-specific questionnaire will clearly bias diagnosis in that direction and miss potentially important information that might suggest the presence of a non-neuropathic pain problem. As well, it is not uncommon for patients to present, clinically, with pains that comprise both neuropathic and non-neuropathic components (e.g., nociceptive, inflammatory, musculoskeletal). Neuropathic pain-specific questionnaires provide descriptions of the qualities and other features of neuropathic but not the non-neuropathic components. Large-scale, population-based, epidemiological studies of chronic pain would be aided by a single, reliable, valid measure of the many qualities of pain. These factors argue for a single pain questionnaire designed to measure the qualities of neuropathic and non-neuropathic pain.

As described earlier, the SF-MPQ has been used successfully in treatment trials of neuropathic pain. However, it does not contain certain descriptors that have been shown to be reliably associated with neuropathic pain conditions. Dworkin and colleagues (2009) developed the SF-MPQ-2, an expanded and revised version of the SF-MPQ, designed to measure of the qualities of both neuropathic and non-neuropathic pain in research and clinical settings.

The following modifications were involved in the development of the SF-MPQ-2 (Figure 3.5): (1) inclusion of seven new descriptors relevant to neuropathic pain; (2) use of an 11-point NRS for each descriptor; (3) addition of the qualifier "pain" to 13 descriptors; and (4) expansion of the instructions to take into account "different qualities of pain and related symptoms" (Dworkin et al., 2009, p. 37).

The SF-MPQ-2 was administered, in a Web-based format, to 882 participants with diverse chronic pain conditions and to 226 patients with painful diabetic peripheral neuropathy enrolled in a randomized controlled trial. Exploratory and confirmatory factor analyses revealed the presence of the following four factors or subscales (Table 3.3); Continuous Pain descriptors, Intermittent Pain descriptors, Predominantly Neuropathic Pain descriptors, and Affective descriptors. Subscale scores are computed by calculating the mean NRS ratings associated with subscale descriptors. The total SF-MPQ-2 score is the mean of the four subscale scores.

Preliminary analyses indicate that the SF-MPQ-2 has very good to excellent psychometric properties, including adequate to high internal consistency reliability estimates for the subscale (.73–.87) and total scores (.91–.95), respectively. Construct validity was demonstrated by correlations with another well-validated measure of pain, the Brief Pain Inventory (Cleeland et al., 1996). Consistent with the goal of developing a questionnaire that is sensitive to both neu-

**Short-Form McGill Pain Questionnaire–2 (SF-MPQ-2)**

This questionnaire provides you with a list of words that describe some of the different qualities of pain and related symptoms. Please put an **X** through the numbers that best describe the intensity of each of the pain and related symptoms you felt during the past week. Use 0 if the word does not describe your pain or related symptoms.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Throbbing pain | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 2. Shooting pain | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 3. Stabbing pain | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 4. Sharp pain | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 5. Cramping pain | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 6. Gnawing pain | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 7. Hot-burning pain | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 8. Aching pain | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 9. Heavy pain | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 10. Tender | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 11. Splitting pain | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 12. Tiring-exhausting | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 13. Sickening | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 14. Fearful | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 15. Punishing-cruel | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 16. Electro-shock pain | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 17. Cold-freezing pain | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 18. Piercing | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 19. Pain caused by light touch | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 20. Itching | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 21. Tingling or "pins and needles" | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| 22. Numbness | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |

**FIGURE 3.5.** The Short-Form McGill Pain Questionnaire–2 (SF-MPG-2). The 22 descriptors comprise the following four subscales: Continuous Pain (Items 1, 5, 6, 8–10); Intermittent Pain (Items 2–4, 11, 16, 18); Neuropathic Pain (Items 7, 17, 19–22); and Affective descriptors (Items 12–15). Each descriptor is rated on an 11-point NRS ranging from 0 = "none" to 10 = "worst possible." Subscale scores are computed by calculating the mean ratings for subscale descriptors. Total score is the mean of the four subscale scores. Copyright by Ronald Melzack and the Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials (IMMPACT). Reprinted by permission. Information regarding permission to reproduce the SF-MPQ-2 can be obtained at *www.immpact.org.*

**TABLE 3.3. SF-MPQ-2 Subscales**

| Subscale | Item |
|---|---|
| 1. Continuous Pain | 1. Throbbing pain |
| | 5. Cramping pain |
| | 6. Gnawing pain |
| | 8. Aching pain |
| | 9. Heavy pain |
| | 10. Tender |
| 2. Intermittent Pain | 2. Shooting pain |
| | 3. Stabbing pain |
| | 4. Sharp pain |
| | 11. Splitting pain |
| | 16. Electric-shock pain |
| | 18. Piercing |
| 3. Predominantly Neuropathic Pain | 7. Hot-burning pain |
| | 17. Cold-freezing pain |
| | 19. Pain caused by light touch |
| | 20. Itching |
| | 21. Tingling or "pins and needles" |
| | 22. Numbness |
| 4. Affective | 12. Tiring-exhausting |
| | 13. Sickening |
| | 14. Fearful |
| | 15. Punishing-cruel |

ropathic and non-neuropathic pain, the SF-MPQ-2 total score and scores on the Intermittent Pain and Neuropathic Pain subscales were significantly higher for the Web-based participants with neuropathic pain than for participants with non-neuropathic pain. In contrast, subscale scores for Continuous Pain and Affective descriptors did not differ significantly between the participants with neuropathic and non-neuropathic pain. Finally, the SF-MPQ-2 subscale and total scores showed sensitivity to change in the context of a randomized controlled treatment trial. Taken together, the results of the study by Dworkin and colleagues (2009) suggest that the SF-MPQ-2 is a reliable, valid, and sensitive measure of chronic pain that is capable of discriminating between neuropathic and non-neuropathic pain. Further psychometric evaluation of the SF-MPQ-2 is required to address some of the shortcomings involved in using a Web-based sample of participants to validate the questionnaire and to confirm the scale's ability to discriminate between pains of neuropathic and non-neuropathic origin (Bouhassira & Attal, 2009).

## CONCLUSION

Accurate, valid, and reliable measurement of pain is essential to progress in (1) better understanding the factors that determine pain intensity, quality, and duration; (2) diagnosis and treatment of pain; and (3) evaluation of the relative effectiveness of different therapies. The MPQ and SF-MPQ have become "gold standards" in the measurement of the various qualities of acute and chronic pain. Both forms have been shown to be psychometrically sound, valid, and reliable instruments with good discriminative capacity. The newly developed SF-MPQ-2 has improved some of the shortcomings of the SF-MPQ and has made available, in one questionnaire, the measurement of both neuropathic and non-neuropathic pain. Further research is needed to determine the psychometric properties of the SF-MPQ-2 in acute pain contexts (e.g., after surgery, work injuries, accidents) and across the lifespan (from adolescents to older adults). Application of powerful statistical techniques, such as item response theory, will permit a more precise evaluation of the psychometric properties of the SF-MPS-2 across a range of pain levels.

## ACKNOWLEDGMENT

This work was supported by a Canadian Institutes of Health Research Canada Research Chair in Health Psychology to Joel Katz.

## REFERENCES

Aboud, F. E., Hiwot, M. G., Arega, A., Molla, M., Samson, S., Seyoum, N., et al. (2003). The McGill Pain Questionnaire in Amharic: Zwai Health Center patients' reports on the experience of pain. *Ethiopian Medical Journal*, *41*(1), 45–61.

al Balawi, S., Tariq, M., & Feinmann, C. (1996). A double-blind, placebo-controlled, crossover, study to evaluate the efficacy of subcutaneous sumatriptan in the treatment of atypical facial pain. *International Journal of Neuroscience*, *86*(3–4), 301–309.

Atkinson, J. H., Kremer, E. F., & Ignelzi, R. J. (1982). Diffusion of pain language with affective disturbance confounds differential diagnosis. *Pain*, *12*, 375–384.

Backonja, M., Beydoun, A., Edwards, K. R.,

Schwartz, S. L., Fonseca, V., Hes, M., et al. (1998). Gabapentin for the symptomatic treatment of painful neuropathy in patients with diabetes mellitus: A randomized controlled trial. *Journal of the American Medical Association, 280*(21), 1831–1836.

Bartko, D., Kondos, M., & Jansco, S. (1984). Slovak version of the McGill–Melzack's Questionnaire on pain. *Ceskoslovenska Neurologie a Neurochirurgie, 47*, 113–121.

Beattie, P. F., Dowda, M., & Feuerstein, M. (2004). Differentiating sensory and affective–sensory pain descriptions in patients undergoing magnetic resonance imaging for persistent low back pain. *Pain, 110*(1–2), 189–196.

Beecher, H. K. (1959). *Measurement of subjective responses.* New York: Oxford University Press.

Bejarano, P. F., Noriego, R. D., Rodriguez, M. L., & Berrio, G. M. (1985). Evaluación del dolor: Adaptatión del cuestionario del McGill [Evaluation of pain: Adaptation of the McGill Pain Questionniare]. *Revista Columbia Anesesia, 13*, 321–351.

Birch, S., & Jamison, R. N. (1998). Controlled trial of Japanese acupuncture for chronic myofascial neck pain: Assessment of specific and nonspecific effects of treatment. *Clinical Journal of Pain, 14*(3), 248–255.

Birklein, F., Riedl, B., Sieweke, N., Weber, M., & Neundorfer, B. (2000). Neurological findings in complex regional pain syndromes—analysis of 145 cases. *Acta Neurologica Scandanavica, 101*(4), 262–269.

Bouhassira, D., & Attal, N. (2009). All in one: Is it possible to assess all dimensions of any pain with a simple questionnaire? *Pain, 144*(1–2), 7–8.

Boureau, F., Luu, M., & Doubrère, J. F. (1992). Comparative study of the validity of four French McGill Pain Questionnaire (MPQ) versions. *Pain, 50*, 59–65.

Boureau, F., Luu, M., Doubrère, J. F., & Gay, C. (1984). Elaboration d'un questionnaire d'autoévaluation de la douleur par liste de qualicatifs [Development of a self-evaluation questionnaire comprising pain descriptors.]. *Thérapie, 39*, 119–129.

Bruehl, S., Chung, O. Y., & Burns, J. W. (2003). Differential effects of expressive anger regulation on chronic pain intensity in CRPS and non-CRPS limb pain patients. *Pain, 104*(3), 647–654.

Burckhardt, C. S. (1984). The use of the McGill Pain Questionnaire in assessing arthritis pain. *Pain, 19*(3), 305–314.

Burckhardt, C. S., & Bjelle, A. (1994). A Swedish version of the Short-Form McGill Pain Questionnaire. *Scandinavian Journal of Rheumatology, 23*(2), 77–81.

Burckhardt, C. S., Clark, S. R., & Bennett, R. M. (1992). A comparison of pain perceptions in women with fibromyalgia and rheumatoid arthritis: Relationship to depression and pain extent. *Arthritis Care and Research, 5*(4), 216–222.

Cassisi, J. E., Umeda, M., Deisinger, J. A., Sheffer, C., Lofland, K. R., & Jackson, C. (2004). Patterns of pain descriptor usage in African Americans and European Americans with chronic pain. *Cultural Diversity and Ethnic Minority Psychology, 10*(1), 81–89.

Chapman, C. R., Casey, K. L., Dubner, R., Foley, K. M., Gracely, R. H., & Reading, A. E. (1985). Pain measurement: An overview. *Pain, 22*, 1–31.

Chen, A. C. N., Dworkin, S. F., Haug, J., & Gehrig, J. (1989). Human pain responsivity in a tonic pain model: Psychological determinants. *Pain, 37*, 143–160.

Cleeland, C. S., Nakamura, Y., Mendoza, T. R., Edwards, K. R., Douglas, J., & Serlin, R. C. (1996). Dimensions of the impact of cancer pain in a four country sample: New information from multidimensional scaling. *Pain, 67*(2–3), 267–273.

Closs, S. J., Nelson, E. A., & Briggs, M. (2008). Can venous and arterial leg ulcers be differentiated by the characteristics of the pain they produce? *Journal of Clinical Nursing, 17*(5), 637–645.

Crockett, D. J., Prkachin, K. M., & Craig, K. D. (1977). Factors of the language of pain in patients and normal volunteer groups. *Pain, 4*, 175–182.

De Benedittis, G., Massei, R., Nobili, R., & Pieri, A. (1988). The Italian Pain Questionnaire. *Pain, 33*, 53–62.

Defrin, R., Grunhaus, L., Zamir, D., & Zeilig, G. (2007). The effect of a series of repetitive transcranial magnetic stimulations of the motor cortex on central pain after spinal cord injury. *Archives of Physical Medicine and Rehabilitation, 88*(12), 1574–1580.

Drewes, A. M., Helweg-Larsen, S., Petersen, P., Brennum, J., Andreasen, A., Poulsen, L. H., et al. (1993). McGill Pain Questionnaire translated into Danish: Experimental and clinical findings. *Clinical Journal of Pain, 9*(2), 80–87.

Dubuisson, D., & Melzack, R. (1976). Classification of clinical pain descriptors by multiple group discriminant analysis. *Experimental Neurology, 51*, 480–487.

Dudgeon, D., Ranbertas, R. F., & Rosenthal, S. (1993). The Short-Form McGill Pain Questionnaire in chronic cancer pain. *Journal of Pain and Symptom Management, 8*, 191–195.

Dworkin, R. H., Corbin, A. E., Young, J. P., Jr., Sharma, U., LaMoreaux, L., Bockbrader,

H., et al. (2003). Pregabalin for the treatment of postherpetic neuralgia: A randomized, placebo-controlled trial. *Neurology*, *60*(8), 1274–1283.

Dworkin, R. H., O'Connor, A. B., Backonja, M., Farrar, J. T., Finnerup, N. B., Jensen, T. S., et al. (2007). Pharmacologic management of neuropathic pain: Evidence-based recommendations. *Pain*, *132*(3), 237–251.

Dworkin, R. H., Turk, D. C., Revicki, D. A., Harding, G., Coyne, K. S., Peirce-Sandner, S., et al. (2009). Development and initial validation of an expanded and revised version of the Short-Form McGill Pain Questionnaire (SF-MPQ-2). *Pain*, *144*(1–2), 35–42.

Escalante, A., Lichtenstein, M. J., Rios, N., & Hazuda, H. P. (1996). Measuring chronic rheumatic pain in Mexican Americans: Cross-cultural adaptation of the McGill Pain Questionnaire. *Journal of Clinical Epidemiology*, *49*(12), 1389–1399.

Ferracuti, S., Romeo, G., Leardi, M. G., Cruccu, G., & Lazzari, R. (1990). New Italian adaptation and standardization of the McGill Pain Questionnaire. *Pain* (Suppl. 1), S300.

Fowlow, B., Price, P., & Fung, T. (1995). Ambulation after sheath removal: A comparison of 6 and 8 hours of bedrest after sheath removal in patients following a PTCA procedure. *Heart and Lung*, *24*(1), 28–37.

Gagliese, L., & Melzack, R. (1997). Age differences in the quality of chronic pain: A preliminary study. *Pain Research and Management*, *2*, 157–162.

Gaston-Johansson, F., Albert, M., Fagan, E., & Zimmerman, L. (1990). Similarities in pain descriptors of four different ethnic–culture groups. *Journal of Pain and Symptom Management*, *5*, 94–100.

Georgoudis, G., Oldham, J. A., & Watson, P. J. (2001a). Reliability and sensitivity measures of the Greek version of the short form of the McGill Pain Questionnaire. *European Journal of Pain*, *5*(2), 109–118.

Georgoudis, G., Oldham, J. A., & Watson, P. J. (2001b). Reliability and sensitivity measures of the Greek version of the short form of the McGill Pain Questionnaire. *European Journal of Pain*, *5*(2), 109–118.

Georgoudis, G., Watson, P. J., & Oldham, J. A. (2000). The development and validation of a Greek version of the Short-Form McGill Pain Questionnaire. *European Journal of Pain*, *4*(3), 275–281.

Gilron, I., Bailey, J. M., Tu, D., Holden, R. R., Weaver, D. F., & Houlden, R. L. (2005). Morphine, gabapentin, or their combination for neuropathic pain. *New England Journal of Medicine*, *352*(13), 1324–1334.

Gracely, R. H. (1992). Evaluation of multidimensional pain scales. *Pain*, *48*, 297–300.

Grafton, K. V., Foster, N. E., & Wright, C. C. (2005). Test–retest reliability of the Short-Form McGill Pain Questionnaire: Assessment of intraclass correlation coefficients and limits of agreement in patients with osteoarthritis. *Clinical Journal of Pain*, *21*(1), 73–82.

Graham, C., Bond, S. S., Gerkovitch, M. M., & Cook, M. R. (1980). Use of the McGill Pain Questionnaire in the assessment of cancer pain: Replicability and consistency. *Pain*, *8*, 377–387.

Grönblad, M., Lukinmaa, A., & Konttinen, Y. T. (1990). Chronic low-back pain: Intercorrelation of repeated measures for pain and disability. *Scandinavian Journal of Rehabilitation Medicine*, *22*, 73–77.

Grushka, M., & Sessle, B. J. (1984). Applicability of the McGill Pain Questionnaire to the differentiation of "toothache" pain. *Pain*, *19*, 49–57.

Hack, T. F., Cohen, L., Katz, J., Robson, L. S., & Goss, P. (1999). Physical and psychological morbidity after axillary lymph node dissection for breast cancer. *Journal of Clinical Oncology*, *17*(1), 143–149.

Harden, R. N., Carter, T. D., Gilman, C. S., Gross, A. J., & Peters, J. R. (1991). Ketorolac in acute headache management. *Headache*, *31*, 463–464.

Harrison, A. (1988). Arabic pain words. *Pain*, *32*, 239–250.

Hasegawa, M., Hattori, S., Mishima, M., Matsumoto, I., Kimura, T., Baba, Y., et al. (2001). The McGill Pain Questionnaire, Japanese version, reconsidered: Confirming the theoretical structure. *Pain Research and Management*, *6*(4), 173–180.

Hobara, M., Fujiwara, H., Clark, W. C., & Wharton, R. N. (2003). A translation of the Multidimensional Affect and Pain Survey (MAPS) from English to Japanese. *Gan To Kagaku Ryoho*, *30*(5), 721–729.

Holroyd, K. A., Holm, J. E., Keefe, F. J., Turner, J. A., Bradley, L. A., Murphy, W. D., et al. (1992). A multi-center evaluation of the McGill Pain Questionnaire: Results from more than 1,700 chronic pain patients. *Pain*, *48*, 301–311.

Hui, Y. L., & Chen, A. C. (1989). Analysis of headache in a Chinese patient population. *Ma Tsui Hsueh Tsa Chi*, *27*, 13–18.

Jenkinson, C., Carroll, D., Egerton, M., Frankland, T., McQuay, H., & Nagle, C. (1995). Comparison of the sensitivity to change of long and short form pain measures. *Quality of Life Research*, *4*(4), 353–357.

Jensen, M. P. (2006). Review of measures of neu-

ropathic pain. *Current Pain and Headache Reports*, *10*(3), 159–166.

Jensen, M. P., & Karoly, P. (2001). Self-report scales and procedures for assessing pain in adults. In D. C. Turk & R. Melzack (Eds.), *Handbook of pain assessment* (2nd ed., pp. 15–34). New York: Guilford Press.

Jerome, A., Holroyd, K. A., Theofanous, A. G., Pingel, J. D., Lake, A. E., & Saper, J. R. (1988). Cluster headache pain vs. other vascular headache pain: Differences revealed with two approaches to the McGill Pain Questionnaire. *Pain*, *34*, 35–42.

Katz, J. (1992). Psychophysical correlates of phantom limb experience. *Journal of Neurology, Neurosurgery, and Psychiatry*, *55*, 811–821.

Katz, J., Clairoux, M., Kavanagh, B. P., Roger, S., Nierenberg, H., Redahan, C., et al. (1994). Pre-emptive lumbar epidural anaesthesia reduces postoperative pain and patient-controlled morphine consumption after lower abdominal surgery. *Pain*, *59*, 395–403.

Katz, J., Cohen, L., Schmid, R., Chan, V. W., & Wowk, A. (2003). Postoperative morphine use and hyperalgesia are reduced by preoperative but not intraoperative epidural analgesia: Implications for preemptive analgesia and the prevention of central sensitization. *Anesthesiology*, *98*(6), 1449–1460.

Katz, J., & Melzack, R. (1991). Auricular TENS reduces phantom limb pain. *Journal of Pain and Symptom Management*, *6*, 73–83.

Katz, J., & Melzack, R. (1999). Measurement of pain. *Surgical Clinics of North America*, *79*(2), 231–252.

Ketovuori, H., & Pöntinen, P. J. (1981). A pain vocabulary in Finnish—the Finnish Pain Questionnaire. *Pain*, *11*, 247–253.

Kim, H. S., Schwartz-Barcott, D., Holter, I. M., & Lorensen, M. (1995). Developing a translation of the McGill pain questionnaire for cross-cultural comparison: An example from Norway. *Journal of Advanced Nursing*, *21*(3), 421–426.

King, R. B. (1993). Topical aspirin in chloroform and the relief of pain due to herpes zoster and postherpetic neuralgia. *Archives of Neurology*, *50*(10), 1046–1053.

Kiss, I., Müller, H., & Abel, M. (1987). The McGill Pain Questionnaire—German version: A study on cancer pain. *Pain*, *29*, 195–207.

Klepac, R. K., Dowling, J., Rokke, P., Dodge, L., & Schafer, L. (1981). Interview vs. paper-and-pencil administration of the McGill Pain Questionnaire. *Pain*, *11*, 241–246.

Kling, J. W., & Riggs, L. A. (1971). *Experimental psychology*. New York: Holt, Rinehart & Winston.

Kremer, E., & Atkinson, J. H. (1983). Pain language as a measure of effect in chronic pain patients. In R. Melzack (Ed.), *Pain measurement and assessment* (pp. 119–127). New York: Raven Press.

Lahuerta, J., Smith, B. A., & Martinez-Lage, J. L. (1982). An adaptation of the McGill Pain Questionnaire to the Spanish Language. *Schmerz*, *3*, 132–134.

Lázaro, C., Bosch, F., Torrubia, R., & Baños, J. E. (1994). The development of a Spanish questionnaire for assessing pain: Preliminary data concerning reliability and validity. *European Journal of Psychological Assessment*, *10*, 145–151.

Leavitt, F., & Garron, D. C. (1980). Validity of a back pain classification scale for detecting psychological disturbance as measured by the MMPI. *Journal of Clinical Psychology*, *36*, 186–189.

Leavitt, F., Garron, D. C., Whisler, W. W., & Sheinkop, M. B. (1978). Affective and sensory dimensions of pain. *Pain*, *4*, 273–281.

Lesser, H., Sharma, U., LaMoreaux, L., & Poole, R. M. (2004). Pregabalin relieves symptoms of painful diabetic neuropathy: A randomized controlled trial. *Neurology*, *63*(11), 2104–2110.

Love, A., Leboeuf, D. C., & Crisp, T. C. (1989). Chiropractic chronic low back pain sufferers and self-report assessment methods: Part I. A reliability study of the Visual Analogue Scale, the pain drawing and the McGill Pain Questionnaire. *Journal of Manipulative and Physiological Therapeutics*, *12*, 21–25.

Lowe, N. K., Walker, S. N., & McCallum, R. C. (1991). Confirming the theoretical structure of the McGill Pain Questionnaire in acute clinical pain. *Pain*, *46*, 53–60.

Lynch, M. E., Clark, A. J., & Sawynok, J. (2003). Intravenous adenosine alleviates neuropathic pain: A double blind placebo controlled crossover trial using an enriched enrolment design. *Pain*, *103*(1–2), 111–117.

Lyrica Study Group. (2006). Pregabalin for peripheral neuropathic pain: Results of a multicenter, non-comparative, open-label study in Indian patients. *International Journal of Clinical Practice*, *60*(9), 1060–1067.

Maiani, G., & Sanavio, E. (1985). Semantics of pain in Italy: The Italian version of the McGill Pain Questionnaire. *Pain*, *22*, 399–405. Retrieved May 18, 2009 from .

Mapi, R. I. (2003). Quality of life instruments data base. *www.qolid.org*.

Masedo, A. I., & Esteve, R. (2000). Some empirical evidence regarding the validity of the Spanish version of the McGill Pain Questionnaire (MPQ-SV). *Pain*, *85*(3), 451–456.

Mason, S. T., Arceneaux, L. L., Abouhassan, W., Lauterbach, D., Seebach, C., & Fauerbach, J. A. (2008). Confirmatory factor analysis of the Short Form McGill Pain Questionnaire with burn patients. *Eplasty*, *8*, e54.

Masson, E. A., Hunt, L., Gem, J. M., & Boulton, A. J. M. (1989). A novel approach to the diagnosis and assessment of symptomatic diabetic neuropathy. *Pain*, *38*, 25–28.

McCreary, C., Turner, J., & Dawson, E. (1981). Principal dimensions of the pain experience and psychological disturbance in chronic low back pain patients. *Pain*, *11*, 85–92.

McGuire, D. B., Altomonte, V., Peterson, D. E., Wingard, J. R., Jones, R. J., & Grochow, L. B. (1993). Patterns of mucositis and pain in patients receiving preparative chemotherapy and bone marrow transplantation. *Oncology Nursing Forum*, *20*(10), 1493–1502.

Melzack, R. (1975). The McGill Pain Questionnaire: Major properties and scoring methods. *Pain*, *1*(3), 277–299.

Melzack, R. (1983). *Pain measurement and assessment*. New York: Raven Press.

Melzack, R. (1987). The Short-Form McGill Pain Questionnaire. *Pain*, *30*, 191–197.

Melzack, R., & Casey, K. L. (1968). Sensory, motivational, and central control determinants of pain: A new conceptual model. In D. Kenshalo (Ed.), *The skin senses* (pp. 423–443). Springfield, IL: Thomas.

Melzack, R., Kinch, R., Dobkin, P., Lebrun, M., & Taenzer, P. (1984). Severity of labour pain: Influence of physical as well as psychologic variables. *Canadian Medical Association Journal*, *130*, 579–584.

Melzack, R., & Perry, C. (1975). Self-regulation of pain: The use of alpha-feedback and hypnotic training for the control of chronic pain. *Experimental Neurology*, *46*, 452–469.

Melzack, R., Taenzer, P., Feldman, P., & Kinch, R. A. (1981). Labour is still painful after prepared childbirth training. *Canadian Medical Association Journal*, *125*, 357–363.

Melzack, R., Terrence, C., Fromm, G., & Amsel, R. (1986). Trigeminal neuralgia and atypical facial pain: Use of the McGill Pain Questionnaire for discrimination and diagnosis. *Pain*, *27*, 297–302.

Melzack, R., & Torgerson, W. S. (1971). On the language of pain. *Anesthesiology*, *34*, 50–59.

Melzack, R., Wall, P. D., & Ty, T. C. (1982). Acute pain in an emergency clinic: Latency of onset and description patterns related to different injuries. *Pain*, *14*, 33–43.

Mongini, F., Deregibus, A., Raviola, F., & Mongini, T. (2003). Confirmation of the distinction between chronic migraine and chronic tension-type headache by the McGill Pain Questionnaire. *Headache*, *43*(8), 867–877.

Mongini, F., & Italiano, M. (2001). TMJ disorders and myogenic facial pain: A discriminative analysis using the McGill Pain Questionnaire. *Pain*, *91*(3), 323–330.

Mongini, F., Italiano, M., Raviola, F., & Mossolov, A. (2000). The McGill Pain Questionnaire in patients with TMJ pain and with facial pain as a somatoform disorder. *Cranio*, *18*(4), 249–256.

Mystakidou, K., Parpa, E., Tsilika, E., Kalaidopoulou, O., Georgaki, S., Galanos, A., et al. (2002). Greek McGill Pain Questionnaire: Validation and utility in cancer patients. *Journal of Pain and Symptom Management*, *24*(4), 379–387.

Nikolajsen, L., Hansen, C. L., Nielsen, J., Keller, J., Arendt-Nielsen, L., & Jensen, T. S. (1996). The effect of ketamine on phantom pain: A central neuropathic disorder maintained by peripheral input. *Pain*, *67*(1), 69–77.

Nikolajsen, L., Ilkjaer, S., Kroner, K., Christensen, J. H., & Jensen, T. S. (1997). The influence of preamputation pain on postamputation stump and phantom pain. *Pain*, *72*(3), 393–405.

Pearce, J., & Morley, S. (1989). An experimental investigation of the construct validity of the McGill Pain Questionnaire. *Pain*, *39*, 115–121.

Perry, F., Heller, P. H., & Levine, J. D. (1988). Differing correlations between pain measures in syndromes with or without explicable organic pathology. *Pain*, *34*, 185–189.

Perry, F., Heller, P. H., & Levine, J. D. (1991). A possible indicator of functional pain: Poor pain scale correlation. *Pain*, *46*, 191–193.

Pimenta, C. A., & Teixeiro, M. J. (1996). [Proposal to adapt the McGill Pain Questionnaire into Portuguese]. *Revista Da Escola de Enfermagem Da USP*, *30*(3), 473–483.

Price, D. D., Harkins, S. W., & Baker, C. (1987). Sensory–affective relationships among different types of clinical and experimental pain. *Pain*, *28*(3), 297–307.

Prieto, E. J., Hopson, L., Bradley, L. A., Byrne, M., Geisinger, K. F., Midax, D., et al. (1980). The language of low back pain: Factor structure of the McGill Pain Questionnaire. *Pain*, *8*, 11–19.

Putzke, J. D., Richards, J. S., Hicken, B. L., Ness, T. J., Kezar, L., & DeVivo, M. (2002). Pain classification following spinal cord injury: The utility of verbal descriptors. *Spinal Cord*, *40*(3), 118–127.

Radvila, A., Adler, R. H., Galeazzi, R. L., & Vorkauf, H. (1987). The development of a German language (Berne) pain questionnaire and its application in a situation causing acute pain. *Pain*, *28*, 185–195.

Reading, A. E. (1979). The internal structure of

the McGill Pain Questionnaire in dysmenorrhea patients. *Pain*, *7*, 353–358.

Reading, A. E. (1982). An analysis of the language of pain in chronic and acute patient groups. *Pain*, *13*, 185–192.

Reading, A. E., Everitt, B. S., & Sledmere, C. M. (1982). The McGill Pain Questionnaire: A replication of its construction. *British Journal of Clinical Psychology*, *21*, 339–349.

Reading, A. E., & Newton, J. R. (1977). On a comparison of dysmenorrhea and intrauterine device related pain. *Pain*, *3*, 265–276.

Rice, A. S., & Maton, S. (2001). Gabapentin in postherpetic neuralgia: A randomised, double blind, placebo controlled study. *Pain*, *94*(2), 215–224.

Roche, P. A., Klestov, A. C., & Heim, H. M. (2003). Description of stable pain in rheumatoid arthritis: A 6 year study. *Journal of Rheumatology*, *30*(8), 1733–1738.

Ruoff, G. E., Rosenthal, N., Jordan, D., Karim, R., & Kamin, M. (2003). Tramadol/acetaminophen combination tablets for the treatment of chronic lower back pain: A multicenter, randomized, double-blind, placebo-controlled outpatient study. *Clinical Therapeutics*, *25*(4), 1123–1141.

Satow, A., Nakatani, K., Taniguchi, S., & Higashiyama, A. (1990). Perceptual characteristics of electrocutaneous pain estimated by the 30-word list and Visual Analog Scale. *Japanese Psychological Review*, *32*, 155–164.

Scrimshaw, S. V., & Maher, C. G. (2001). Randomized controlled trial of neural mobilization after spinal surgery. *Spine*, *26*(24), 2647–2652.

Sedlak, K. (1990). A Polish version of the McGill Pain Questionnaire. *Pain* (Suppl. 1), S308.

Serrao, J. M., Marks, R. L., Morley, S. J., & Goodchild, C. S. (1992). Intrathecal midazolam for the treatment of chronic mechanical low back pain: A controlled comparison with epidural steroid in a pilot study. *Pain*, *48*, 5–12.

Shin, H., Kim, K., Young Hee, K., Chee, W., & Im, E. O. (2008). A comparison of two pain measures for Asian American cancer patients. *Western Journal of Nursing Research*, *30*(2), 181–196.

Solcovä, I., Jacoubek, B., Sÿkora, J., & Hnïk, P. (1990). Characterization of vertebrogenic pain using the short form of the McGill Pain Questionnaire. *Casopis Lekaru Ceskych*, *129*, 1611–1614.

Stein, C., & Mendl, G. (1988). The German counterpart to McGill Pain Questionnaire. *Pain*, *32*, 251–255.

Stelian, J., Gil, I., Habot, B., Rosenthal, M., Abramovici, I., Kutok, N., et al. (1992). Improvement of pain and disability in elderly patients with degenerative osteoarthritis of the knee treated with narrow-band light therapy. *Journal of the American Geriatrics Society*, *40*, 23–26.

Strand, L. I., Ljunggren, A. E., Bogen, B., Ask, T., & Johnsen, T. B. (2008). The Short-Form McGill Pain Questionnaire as an outcome measure: Test–retest reliability and responsiveness to change. *European Journal of Pain*, *12*(7), 917–925.

Strand, L. I., & Wisnes, A. R. (1991). The development of a Norwegian pain questionnaire. *Pain*, *46*, 61–66.

Tahmoush, A. J. (1981). Causalgia: Redefinition as a clinical pain syndrome. *Pain*, *10*, 187–197.

Thomas, V., Heath, M., Rose, D., & Flory, P. (1995). Psychological characteristics and the effectiveness of patient-controlled analgesia. *British Journal of Anaesthesia*, *74*(3), 271–276.

Torgerson, W. S. (1988). *Critical issues in verbal pain assessment: Multidimensional and multivariate issues*. Washington, DC: American Pain Society Abstracts.

Treede, R. D., Jensen, T. S., Campbell, J. N., Cruccu, G., Dostrovsky, J. O., Griffin, J. W., et al. (2008). Neuropathic pain: Redefinition and a grading system for clinical and research purposes. *Neurology*, *70*(18), 1630–1635.

Turk, D. C., Rudy, T. E., & Salovey, P. (1985). The McGill Pain Questionnaire reconsidered: Confirming the factor structures and examining appropriate uses. *Pain*, *21*, 385–397.

Turner, J. A., Cardenas, D. D., Warms, C. A., & McClellan, C. B. (2001). Chronic pain associated with spinal cord injuries: A community survey. *Archives of Physical Medicine and Rehabilitation*, *82*(4), 501–509.

Van Buren, J., & Kleinknecht, R. (1979). An evaluation of the McGill Pain Questionnaire for use in dental pain assessment. *Pain*, *6*, 23–33.

van der Kloot, W. A., Oostendorp, R. A., van der Meij, J., & van den Heuvel, J. (1995). [The Dutch version of the McGill pain questionnaire: A reliable pain questionnaire]. *Nederlands Tijdschrift voor Geneeskunde*, *139*(13), 669–673.

van Lankveld, W., van 't Pad Bosch, P., van de Putte, L., van der Staak, C., & Naring, G. (1992). [Pain in rheumatoid arthritis measured with the visual analogue scale and the Dutch version of the McGill Pain Questionnaire]. *Nederlands Tijdschrift voor Geneeskunde*, *136*(24), 1166–1170.

Vanderiet, K., Adriaensen, H., Carton, H., & Vertommen, H. (1987). The McGill Pain Questionnaire constructed for the Dutch language (MPQ-DV): Preliminary data concerning reliability and validity. *Pain*, *30*, 395–408.

Veilleux, S., & Melzack, R. (1976). Pain in psychotic patients. *Experimental Neurology*, *52*, 535–563.

Verkes, R. J., Van der Kloot, W. A., & Van der Meij, J. (1989). The perceived structure of 176 pain descriptive words. *Pain*, *38*, 219–229.

Voorhies, R. M., Jiang, X., & Thomas, N. (2007). Predicting outcome in the surgical treatment of lumbar radiculopathy using the Pain Drawing Score, McGill Short Form Pain Questionnaire, and risk factors including psychosocial issues and axial joint pain. *Spine Journal*, *7*(5), 516–524.

Watt-Watson, J., Stevens, B., Costello, J., Katz, J., & Reid, G. (2000). Impact of preoperative education on pain management outcomes after coronary artery bypass graft surgery: A pilot. *Canadian Journal of Nursing Research*, *31*(4), 41–56.

Wilkie, D. J., Huang, H. Y., Reilly, N., & Cain, K. C. (2001). Nociceptive and neuropathic pain in patients with lung cancer: A comparison of pain quality descriptors. *Journal of Pain and Symptom Management*, *22*(5), 899–910.

Wilkie, D. J., Savedra, M. C., Holzemier, W. L., Tesler, M. D., & Paul, S. M. (1990). Use of the McGill Pain Questionnaire to measure pain: A meta-analysis. *Nursing Research*, *39*, 36–41.

Wright, K. D., Asmundson, G. J., & McCreary, D. R. (2001). Factorial validity of the short-form McGill Pain Questionnaire (SF-MPQ). *European Journal of Pain*, *5*(3), 279–284.

Yakut, Y., Yakut, E., Bayar, K., & Uygur, F. (2007). Reliability and validity of the Turkish version Short-Form McGill Pain Questionnaire in patients with rheumatoid arthritis. *Clinical Rheumatology*, *26*(7), 1083–1087.