The Memorial Pain Assessment Card
A Valid Instrument for the Evaluation of Cancer Pain

BARUCH FISHMAN, PhD, SARA PASTERNAK, PhD, STANLEY L. WALLENSTEIN, MS,
RAYMOND W. HOUDE, MD, JIMMIE C. HOLLAND, MD, AND KATHLEEN M. FOLEY, MD

Effective evaluation and treatment of cancer pain require valid and independent measurement of pain intensity, pain relief, and psychological distress. The Memorial Pain Assessment Card (MPAC) is a simple instrument designed to provide rapid evaluation of these subjective experiences. On the 8.5 by 11 inch card are printed the eight pain intensity descriptors, and three visual analog scales which measure pain intensity, pain relief, and mood. Experienced patients can complete it in less than 20 seconds. The authors administered the MPAC to 50 hospitalized cancer patients within 48 hours of referral to the Pain Service for inadequate pain control, together with standard measures: The McGill Pain Questionnaire, Profile of Mood States, Hamilton Depression Scale, and Zung Anxiety Scale. Correlational and multiple regression analyses revealed that the MPAC can distinguish pain intensity from pain relief and from general psychological distress, and it can provide multidimensional assessment that is practically equivalent to the full assessment battery. We conclude that the MPAC is valid and effective for clinical use, and recommend it for the assessment of individual patients, and as an outcome measure in clinical trials.

In the context of a study designed to characterize the dimensions of distress experienced by cancer pain patients, we administered an extensive battery of psychological and pain assessment instruments, which included the MPAC and allowed a determination of its validity relative to the relevant standard measures. The validity of independently administered visual analog and verbal rating scales, as well as their scaling properties, have been determined previously in several studies, and one study validated a VAS for pain intensity in a sample of cancer pain outpatients. In the current report we present evidence that the particular combination and arrangement of scales as presented together on the MPAC, can provide rapid and valid multidimensional assessment of pain in cancer patients. Furthermore, we demonstrate that in the clinical context this assessment can be practically equivalent to the assessment provided by a combination of lengthy and more sophisticated instruments.

**Patients and Methods**

**Subjects**

We considered for inclusion in the study all hospitalized cancer patients who could be assessed within 48 hours of referral to the Pain Service of MSKCC. The common reason for referral was inadequate pain control, and therefore the assessment occurred at a time when the patients were experiencing relatively intense pain. We included only patients 18 years or older with adequate comprehension of English, and excluded patients with severe physical disability (Karnofsky score <40), significant cognitive impairments due to central nervous system dysfunction, and acute psychosis.

During the 1-year duration of the study 235 inpatients were referred to the MSKCC Pain Service. Of these, 88 were ineligible for entry by the inclusion and exclusion criteria. Additional 97 patients were eligible, but could not be evaluated because they refused to participate in the study, or could not be interviewed within 48 hours of referral. We were able to obtain full evaluations on 50 patients, and their sociodemographic characteristics are described below: There were 28 women and 22 men, ranging in age between 18 and 79 years (mean, 50.2 years). Forty-four (88%) of the patients were white, and six (12%) were of other races. Twenty-nine patients (58%) were married, 12 were widowed, divorced, or separated (24%), and nine were single (18%). Twenty-two patients (44%) were Catholic, 14 (28%) were Jewish, nine (18%) were Protestant, and five (10%) reported other religions or none. Thirty-seven patients (74%) had at least high school education, 23 (46%) were college graduates, and seven (14%) had advanced graduate or professional education. The median income was $30,000 a year. This sample is characteristic of the middle to upper-middle class urban population that is being treated at MSKCC in New York City. The patients varied widely with respect to their primary cancer diagnosis: 12 patients (24%) had lung cancer, 10 (20%) had breast cancer, 12 (24%) had gastrointestinal or colon cancer, five (10%) had ovarian or vaginal cancer, and 11 (22%) had other cancers (bone, head, leukemia, lymphoma). Twenty-five patients (50%) had ongoing malignant disease, 17 (34%) had recurrent disease, and eight (16%) had no evidence of disease. At the time of assessment, 19 patients (38%) were receiving narcotic analgesics, five (10%) were receiving nonnarcotic analgesics, and 26 (52%) were receiving a combination of narcotic and nonnarcotic analgesics. In addition, 28 (56%) of the patients were taking tricyclic antidepressants, and 11 (22%) were receiving minor tranquilizers. Only three patients (6%) were taking other psychoactive drugs, such as sedative-hypnotics or neuroleptics. Finally, only three patients experienced pain for less than 1 month, 13 patients (26%) had pain for about 1 to 3 months, and most patients (66%) had pain for more than 3 months.

**Memorial pain assessment card:** The MPAC measures 8.5 by 11 inches, and it is folded in the middle such that four sides can be quickly presented to the patient (Figs. 1 and 2). On each of three sides is printed a 100

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**Fig. 1.** Front side of MPAC. VAS measures of pain intensity and mood. Card is folded along broken line such that each measure is presented to the patient separately, in the numbered order.
mm long VAS, and on the fourth is a set of adjectives adapted from the Tursky rating scale. On side one is printed the Pain Intensity VAS (VASPI), which is anchored by the terms "least possible pain" and "worst possible pain." The patient is asked to place a mark along the line to indicate his or her subjective judgment of pain intensity. The score on this and the other VAS is obtained by measuring in millimeters the distance between the left end of the line and the patient's mark. On the second side of the MPAC is the modified Tursky pain adjectives scale, which is a categorical measure of pain intensity. Eight intensity descriptors that represent a range from "no pain" to "excruciating" are printed in a random arrangement, and the patient is asked to circle the adjective that describes his or her subjective experience of pain severity. Side three of the MPAC is a VAS pain relief (VASPR). Here patients are asked to indicate with a mark the degree of pain reduction they experience following the most recent intervention, which is usually the administration of an analgesic drug. On side four, the VAS measures the subjective experience of mood (VASMOOD), and on it patients are asked to rate their current feeling, from worst to best. The instructions for administration of these scales are simple and readily understood, and an experienced patient can complete the four ratings in less than 20 seconds with minimal effort.

**Standard psychological and pain assessment scales:**

**McGill Pain Questionnaire:** The McGill Pain Questionnaire (MPQ) is an extensively used pain assessment instrument which produces scores on four empirically derived dimensions, as well as several useful summary scores. The instrument consists of 78 adjectives that cluster in 20 categories. Within each category the adjectives are arranged in order of intensity, from low to high. The categories are divided into the four dimensions: sensory, affective, evaluative, and miscellaneous. The patient is asked to choose one adjective from each applicable category that describes an aspect of his or her current pain, and the score for each dimension is obtained by summing the rank values of the selected adjectives. A total summary score, labeled Pain Rating Index (PRI) is derived by summing the scores across the four dimensions, and a Total Word Count (TWC) (total number of adjectives used) also is obtained. Finally, a rating of the Present Pain Intensity (PPI) is made on a five-point scale.

**Profile of Mood States:** The Profile of Mood States (POMS) is a standardized self-report instrument which measures six dimensions of mood reflecting degree and type of psychological distress.

**Hamilton Rating Scale for Depression:** The Hamilton Rating Scale for Depression (HRSD) is a widely used interviewer-rated scale which evaluates the presence and severity of 17 symptoms typical of clinical depression.

**Zung Anxiety Scale:** The Zung Anxiety Scale (ZAS) is a standardized self-report scale which evaluates the presence and severity of various symptoms of anxiety.
Results

The extent to which the findings reported here can be generalized to other patients with cancer pain depends on how representative the current sample is with respect to pain characteristics. This issue was examined by comparing the pain characteristics of the present sample to those of a previously published sample of outpatients with cancer pain,\(^2\) using the indices of the MPQ (Table 1). The report of PPI was similar in both samples, and there were no significant differences on the summary scores of TWC and PRI, or on the evaluative and miscellaneous subscores. However, the current sample scored significantly lower than the Graham et al.\(^2\) sample on the sensory dimension of the MPQ, and significantly higher on the affective dimension. These differences will be considered and interpreted in the Discussion section.

The systematic pattern of correlations among the MPAC scales (Table 2) is consistent with expected relations among pain intensity, pain relief and mood, and it therefore provides support for the construct validity of the MPAC. The correlation between the ratings of pain intensity on the categorical-verbal scale (modified Tursky) and the analog-spatial scale (VASPI) was very high, indicating that the two forms of rating reflect a singular experience, but as indicated below, the two methods of measurement are affected in subtly different ways by emotional experience, and are therefore not completely redundant. The ratings of pain intensity were significantly inversely related to the subjective mood rating (VASMOOD in the table), but they accounted for a relatively small proportion of the variance in VASMOOD (Tursky \(r^2 = 0.014\); VASPI \(r^2 = 0.17\)). The subjective judgment of pain relief (VASPR), though, was much more strongly correlated with mood than either of the pain intensity ratings, and it accounted for as much as 32% of the variance in VASMOOD (\(r^2 = 0.32\)).

The pattern and strength of the correlation between subscales of the MPQ and subscales of the MPAC, as shown in Table 3, indicate that the two instruments can provide reasonably equivalent assessment of the intensity dimension of pain. Both the categorical (Tursky)
rating and the visual analog (VASPI) rating of pain intensity correlated significantly with the affective and miscellaneous subscales of the MPQ, and with the summary scores of PRI and TWC, but the VASPI was more strongly correlated than the Tursky in every case. The correlation of the VASPI with TWC of the MPQ was particularly strong, indicating that patients who rate their pain as more intense using a visual-spatial analog, tend to describe their pain verbally with more words. In order to define more specifically the relations between the MPQ scores and the VASPI, all scale values were converted to Z scores, and all values derived from MPQ except PRI were entered into a stepwise multiple regression analysis with VASPI as the dependent measure.

Table 4 shows that a model including only the TWC and sensory scores of the MPQ predicted 35% of the variance in VASPI, and the addition of other MPQ scores did not increase predictive power significantly. In other words, the significant correlations of VASPI with the affective and miscellaneous scores of the MPQ were accounted for by the overall number of words used, and only the sensory dimension contributed additional predictive power. Hence, the affective and miscellaneous scores of the MPQ can be considered redundant for the assessment of pain intensity. The evaluative scale of the MPQ did not correlate significantly with any of the measures of the MPAC (Table 3), suggesting that the cognitive-judgemental dimension of pain may be independent of the experiences of intensity, relief, and mood. Finally, none of the MPQ subscales correlated significantly with the VAS ratings of mood (VASMOOD) and pain relief (VASPR). It seems particularly contrary to intuition that the VASMOOD rating and the affective scale of the MPQ measure unrelated experiences, and since the affective scale is considered a measure of pain-related affect, this finding raises the question of what subjective experience was being rated on the VASMOOD? Since VASMOOD scores, or any other MPAC subscale, did not correlate significantly with the Karnofsky scores, this rating cannot be considered simply an indication of physical status or illness severity. Instead, examination of the MPAC correlations with the total scores on the POMS, ZAS, and HRSD suggests that the VASMOOD measures a compound subjective experience that can be labeled general psychological distress, rather than pain-related affect.

Table 5 presents the Spearman correlations of the MPAC scales with the scores derived from the POMS, and with the total scores on the HRSD and the ZAS. First, this table indicates that the verbal and visual analog ratings of pain intensity were associated with different aspects of mood. The VASPI was significantly correlated with fatigue and confusion as measured by the POMS, whereas the verbal rating on the modified Tursky scale was strongly correlated only with level of anxiety on the Zung scale. The VASPR was significantly inversely correlated with ratings of tension and confusion on the POMS, which were themselves highly correlated (r = 0.63; P < 0.001). The VASPI was also significantly inversely correlated with the total POMS score, which is considered a measure of general psychological distress. The VASMOOD correlated significantly with all of the psychological measures, and particularly strong with self report of depression, tension, and confusion on the POMS, and with the total POMS score. There was also a strong correlation with interviewer rat-
TABLE 6. Stepwise Multiple Regression With POMS Subscales on VASMOOD (Z Scores)

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>Beta in</th>
<th>r</th>
<th>$r^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Confusion</td>
<td>-0.38</td>
<td>0.44</td>
<td>0.18</td>
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<td>2</td>
<td>Vigor</td>
<td>-0.17</td>
<td>0.47</td>
<td>0.22</td>
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Regression equation $\hat{Y} = b_1X_1 + b_2X_2 + \epsilon$

Analysis of variance

<table>
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<th>Source</th>
<th>DF</th>
<th>Sum Sq</th>
<th>Mean Sq</th>
</tr>
</thead>
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<tr>
<td>Regression</td>
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<td>5.49</td>
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<tr>
<td>Residual</td>
<td>47</td>
<td>38.00</td>
<td>0.81</td>
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</table>

$F = 6.70$, $P < .005$.

TABLE 7. Stepwise Multiple Regression With Psychological Distress: Summary Scores on VASMOOD (Z Scores)

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>Beta in</th>
<th>r</th>
<th>$r^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ZAS</td>
<td>-0.33</td>
<td>0.46</td>
<td>0.21</td>
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<tr>
<td>2</td>
<td>POMS</td>
<td>-0.29</td>
<td>0.53</td>
<td>0.28</td>
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</table>

Regression equation $\hat{Y} = b_1Y_1 + b_2Y_2 + \epsilon$

Analysis of variance

<table>
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<tr>
<th>Source</th>
<th>DF</th>
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<tr>
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<tr>
<td>Residual</td>
<td>47</td>
<td>35.10</td>
<td>0.75</td>
</tr>
</tbody>
</table>

$F = 9.33$, $P < 0.005$.

Discussion

This study assessed pain and distress in a sample of inpatients with acute exacerbation of chronic cancer pain by using the MPAC, and the results support its validity as a multidimensional pain assessment instrument. A comparison with a previously published sample of cancer pain patients suggests that the pain characteristics of the study's sample generally were representative of this population. On the MPQ, which is a standard pain assessment instrument, the two samples were similar on the summary scores PRI and TWC, and on all subscores except for the sensory and affective scales. Since the specific distribution of choices on the sensory dimension in the Graham et al. sample is not available for comparison, it is difficult to speculate on the reason for the higher sensory score of their sample. But the remarkable difference in pain report on the affective dimension clearly indicates that the current sample was more emotionally distressed, on average, than the comparison sample. This interpretation is supported by a number of studies validating the affective subscore of the MPQ as a measure of pain-related emotional distress, independent of measures of quality and intensity. Since the distribution of sociodemographic variables seems similar, this difference in distress is best attributable to the fact that the current sample was assessed as inpatients with acute exacerbation of cancer pain, whereas the comparison sample was assessed as outpatients in a relatively stable condition. Since it is possible that the generalizability of the present findings may be restricted to inpatients with exacerbation of cancer pain, the conclusions discussed below are offered with caution. Replication studies with other cancer pain samples are currently under way.

The construct validity of the MPAC was supported by the systematic pattern of correlations among its subscales (Table 2), which is consistent with expected relations among pain intensity, pain relief, and mood. Pain intensity as measured by the categorical-verbal scale (modified Tursky) was highly correlated with rating on the analog-spatial scale (VASPI), but the two modes of rating expressed subtly different aspects of pain-related distress. The VASPI correlated significantly with fatigue and confusion as measured by the POMS, whereas the verbal rating was strongly correlated only with level of anxiety of the Zung Anxiety scale. This finding suggests that nonverbal ratings of pain intensity were affected by the more global and undifferentiated experiences of fatigue and confusion (reflecting physical illness), whereas verbal ratings were affected by the conscious experience of anxiety. Further consideration of this speculation, however, requires replication of these findings and a specifically controlled investigation.

The pattern and strength of the correlations between the MPAC and MPQ indicated that subscales of the two...
instruments could provide reasonably equivalent assessment of the intensity dimension of pain. This conclusion is also supported by the report of Ahles et al., who correlated VAS of pain intensity with MPQ subscales in a smaller sample of outpatients with cancer pain. Pain intensity, as measured by the MPAC, was inversely related to subjective mood, but only a small proportion of the variance in VASMOOD was explained by VASPI. The subjective judgment of pain relief (VASPR), on the other hand, was much more strongly related to mood, and it accounted for almost twice the amount of variance in VASMOOD as did VASPI or TURSKY.

These findings imply that patients can make pain-mood differentiations when they are explicitly asked to, and that the perceptions of pain intensity and pain relief have different weights as components of psychological distress. The existence of such distinctions has important clinical and theoretical significance, and although this was a correlational study, some speculation regarding the causal relationships among these factors is warranted at this point of the discussion. If the VASMOOD rating is considered a global measure of subjective distress (as we propose below), this pattern of correlations suggests that whereas the perception of pain intensity contributes significantly to subjective distress, the perception of inadequate pain relief is a more important factor. The independent effect this factor might have on overall sense of suffering is further emphasized by the findings that, the perception of pain relief was not correlated with any of the scores obtained from the MPQ (which focuses on qualitative aspects of the pain experience, rather than on pain relief), but it inversely correlated with the tension, confusion, and total POMS scores (which can be considered global measures of distress). The proposed causal interpretation of these findings would suggest that in addition to the assessment of pain intensity, specific consideration should be given to assessment of the perception of pain relief, in order to adequately evaluate the experience of patients with cancer pain. There also is a need to conduct focused experimental research on this hypothesis in order to replicate the current findings, to elucidate the determinants of the perception of pain relief, and to study its interaction with the judgment of pain intensity and the experience of psychological distress.

The specific meaning of the VASMOOD rating on the MPAC was explored through multivariate comparisons with the validation instruments (MPQ, POMS, HRSD, ZAS). Although the VASMOOD was strongly correlated with measures of depression, tension, and confusion on the POMS, the best fitting multivariate model included only scores of the confusion and vigor subscales. It seems therefore that the correlations with the other POMS subscales reflected the general sense of confusion and a lack of vigor (a feeling of "sickness") which is likely to be a component of all mood states experienced by hospitalized cancer pain patients. When the summary scores of the POMS, HRSD, and ZAS were entered into a stepwise multiple regression analysis, a model including only the ZAS and the POMS provided the best prediction of VASMOOD scores. This pattern of results suggests that the VASMOOD rating of the MPAC is not a measure of clinical depression or any other specific mood state, but a measure of a compound experience characterized by confusion, anxiety, and lack of vigor, which can be labeled general psychological distress, or suffering.

We conclude that the subscales of the MPAC provide valid multidimensional information for the evaluation of pain and distress in cancer patients. The MPAC can distinguish pain intensity from pain relief and from global suffering, and it may be used to study subtle interactions of these factors. Further studies are currently being conducted in order to determine the validity and reliability of the MPAC for repeated administration in patients with cancer related pain, and preliminary results from 24 patients are encouraging. Patients find the MPAC easy to use and nondisruptive, and with repeated use they seem to better differentiate their experience along the rated dimensions. It also seems that the correlations between the subscales and their relevant validation tests actually increase with repeated administrations. Therefore, it is expected that further research along these lines would promote the use of the instrument as a routine measure in clinical and experimental contexts. The MPAC is a simple, short, easy to administer and readily understood assessment instrument, which can be used to obtain important subjective information from medically ill patients without contributing significantly to their distress. It is recommended for use in the clinical evaluation of individual patients, and as an outcome measure in clinical trials.

REFERENCES