PERSONALITY VARIABLES RELATING TO

FACET DENERVATION RESPONSE

THESIS

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By

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The disabling conditions of chronic low-back pain continue to cost patient, family, and society. The intricate mechanisms which perpetuate this medical condition often consist of both organic and functional factors.

This study evaluated personality and psychosocial variables which may control individual responses to facet denervation, a treatment for chronic lumbar distress. The subjects were 47 chronic pain patients whose symptoms conformed to the facet syndrome. Patient responses to the Minnesota Multiphasic Personality Inventory (MMPI) and the Sixteen Personality Factor Questionnaire were reviewed in an effort to predict statistically symptomatic relief. Also, the patients' involvement in litigation and their accuracy in determining their pain level were studied as possible influencing variables. Results show the litigation factor and two scales of the MMPI to be most useful in predicting patient response from facet denervation treatment.
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PERSONALITY VARIABLES RELATING TO
FACET DENERVATION RESPONSE

During 1970 in the state of California, 37.8% of all financial claims regarding compensation for time lost from work due to industrial injury were filed by patients suffering from disorders of the back. This percentage of settlements had increased from 29% in 1961 (Sternbach, Wolf, Murphy, & Akeson, 1973b). Approximately 14 billion dollars were spent in 1976 for the treatment of and compensation for patients complaining of low-back pain (Akeson & Murphy, 1977). These sobering statistics not only mirrored the disabling effects of chronic low-back pain, but were sometimes involved in the intricate mechanisms which perpetuated the condition.

In order to understand the problems of the low-back pain sufferer, one must first study the concept of pain itself and its differentiation into the acute and chronic stages. While pain has been as difficult to define as it has been to describe one of the most valid and accepted attempts was put forth by Sternbach (1968):

Pain is an abstract concept which refers to (1) a personal, private sensation of hurt; (2) a harmful stimulus which signals current or impending tissue damage; (3) a pattern of responses which operate to protect the organism from harm.
These responses can be described in terms which reflect certain concepts, i.e., in neurological, physiological, behavioral, and affective 'languages.' (p.12)

When noxious stimulus is perceived and signals current or impending tissue damage, the autonomic pattern of "flight or fight" responses occur including an increase in the activity of the sympathetic nervous system. The physiological changes which accompany acute pain (increases in blood pressure, respiratory rate, pulse rate, etc.) are also characteristic of those which accompany states of anxiety. Acute pain most commonly elicits an anxiety state (Sternbach, 1977). As it continues, the sympathetic nervous system will show habituation and most of the physiological changes triggered by the episode of acute pain will normalize. This usually occurs after a period of several weeks or months of the continued discomfort. At this time, other changes begin to take place, such as sleeping and appetite disturbances, decreases in libido and social interaction, increased irritability, and increased feelings of helplessness and despair. These changes are characteristic of those which accompany states of depression, which are frequently associated with the experience of chronic pain. As Sternbach (1977) states, "When acute pain shades into chronicity, anxiety shades into depression" (p.152).

The role of emotional factors in the acute and chronic pain experience was emphasized in a study by Delaplaine, Ifabumuyi, Merskey, and Zarfas (1978). From a consecutive
series of 227 psychiatric hospital admissions, the authors found that 38% complained of pain. Of these patients, approximately half had no relevant physiological basis for their discomfort. The study also revealed that women were significantly more often affected by pain than were men. Although pain was found to associate strongly with psychiatric illness, it was less prominent in the more severe disturbances. Treatment of the underlying emotional trauma has been often of great importance in relief of the physical discomfort, even when there has been tissue damage (Spear, 1967).

It has been now routinely accepted that many nonpathogenic factors influence the perception of pain and the ability to tolerate it. This was perhaps most graphically illustrated by the evolution of pain theories. One of the earlier theoretical strongholds in pain literature, the specificity theory, hypothesized that pain perception was purely a neuro-physiological mechanism. In reaction to this proposal, the pattern theory proposed that stimulus intensity and central summation were critical in the perception of pain. This approach was more adequate in explaining some of the clinical phenomena observed in pain sufferers. One of the more recent pain theories to gain support has been the gate-control theory. This approach adopted the evidence which suggested that such variables as personality factors, attention, cultural and personal backgrounds, etc. played a part in the perception and tolerance of pain (Melzack & Wall, 1975).
An example of such evidence which suggested that personality factors could influence the perception of pain, was the study of Lynn and Eysenck (1961). In accordance with Eysenck's personality theory, the authors postulated that extraverts would be more able than intraverts to inhibit painful stimulation and therefore would demonstrate a higher pain tolerance. Their ensuing research found this to be significantly true, and was supported by the investigation of others (Eysenck, 1961; Haslam, 1967). However, other research failed to replicate these findings (Leon, 1974; Levine, Tursky & Nichols, 1966).

Bonica (1977a) wrote that "chronic pain sufferers are characterized by physiological affective and behavioral responses that are quite different than those suffering from acute pain" (p.750). In the same fashion that Spergel, Ehrlich, and Glass (1978) suggested that there may have been a "chronic disease personality," Sternbach (1974) described the chronic pain syndrome, which has been linked to personality problems and reinforcing payoffs in the home and job situation. He characterized the chronic pain sufferer as follows:

(1) having persistent pain complaints and pain behaviors in spite of medical intervention, (2) abusing medication and having multiple surgical experiences, all of which are ineffectual, (3) organic pathology does not fit the extent of suffering experienced by the patient, and (4) the inability to attach satisfactory meaning to the presence and persistence of pain. (p.110)
As can be observed from the description of the chronic pain syndrome, there appeared to be many nonphysiological variables which contributed to the symptoms of the sufferer. Although Sternbach (1977) did not believe it was helpful to think in terms of "organic" versus "functional" descriptors in reference to the perpetuation of pain in the chronic pain sufferer, there has been much research attempting to develop tools to aid in the diagnosis of these patients.

In a study of 141 chronic pain patients, Merskey and Boyd (1978) looked into each patient's life experience concerning their upbringing, neurotic traits, and personality disturbances. They found that patients with an organic cause for their pain reported significantly less family disturbances in childhood, less premorbid personality problems, and less neurotic traits than patients who did not have such a basis for their pain.

Other studies, utilizing various scales of the Minnesota Multiphasic Personality Inventory (MMPI) have found that certain symptoms of emotional disturbances were significantly more characteristic of patients who had relatively little evidence of physiological etiology of their pain (Hanvik, 1951; Louks, Freeman, & Calsyn, 1978; McCreary, Turner, & Dawson, 1977; Towne & Tsushima, 1978). Although these findings were of statistical significance, the authors suggested the use of caution in making predictions and diagnosis concerning functional versus organic pain in individual patients. Even
the most severely disturbed psychiatric patient may have developed a ruptured or herniated disc. Other studies, however, have failed to demonstrate MMPI differences between patients with or without an organic cause for their pain (Fordyce, Brena, Holcomb, DeLateur, & Loeser, 1978; Gentry, Shows, & Thomas, 1974; Sternbach et al. 1973b; Sternbach, Wolf, Murphy & Akeson, 1973a).

In a slightly different approach, Caldwell and Chase (1977) suggested a review of the chronic pain patient's possible social or "secondary" gains in order to understand how the patient became fixated on his low-back pain. The authors defined secondary gain as the reduction of anticipatory pain-fear through the avoidance of the occasions of rearousal of pain. The patient's fear of pain was seen as the mechanism which triggered the pain behavior and led to the chronic pain syndrome. It was further suggested that the Hysterical-conversion scale of the MMPI could be interpreted as a measure of the current level of pain-fear.

Diagnosis of the chronic low-back pain patient could be as difficult as treatment, when psychological and social factors contributed to what may have been a nonexistent or relatively minor, physically pathological condition. In order to evaluate this patient more completely, a physician must make use not only of medical tools such as the pentothal pain test, amytal interview, or differential spinal block, but also of psychological evaluative methods in order to obtain a more
accurate diagnosis and prognosis of the patient (Brown 1975). The concerted effort of these two disciplines would be of more benefit to these patients.

The chronic low-back pain patient has been described by Sternbach et al. (1973a) as the low-back "loser." This term characterized the patient whose pain symptoms have persisted for 6 months or more, who described himself as unable to work, was compensated through Social Security, welfare, or disability payments, and who despite unsuccessful prior surgery continued to seek medical or surgical relief.

In a study of 117 low-back pain patients, Sternbach et al. (1973b) were able to find psychological and biographical variables which identified the low-back loser. One of the most striking features was the occurrence of a psychophysiological reaction as described by the MMPI. This reaction was quite similar to that of the traditional "psychosomatic-V," differing only by a significant elevation of the Depression (D) scale in relation to the Hypochondriasis (Hs) and Hysteria (Hy) scales. In other words, the psychophysiological reaction appeared as a "flatter" psychosomatic-V. Except in acute cases of low-back pain where the Depression scale was less elevated and the psychosomatic-V was more present, the symptoms of the chronic pain sufferer did not "bind" the affect. These patients were clearly more depressed and their illness was termed a psychophysiological musculoskeletal reaction with depression (Sternbach et al., 1973a). The chronic low-
back sufferer was also characterized by less agitation than the acute sufferer as described by the MMPI scales which reflect paranoia and mania.

Pending litigation (referred to lawsuits or unsettled financial claims regarding compensation due to disability) has been another influential aspect of the low-back loser. Sternbach (1973b) found that patients with pending litigation demonstrated a potentiation of the psychophysiological reaction which, with the accompanying elevation of the Psychopathic Deviate (Pd) scale, predicted a poor prospect for improvement.

Biographically, it has been well documented that the low-back loser was characteristically a person with a limited formal education, a depressed intellectual ability, and was frequently employed in jobs requiring a high degree of manual or routinized labor. This person usually has familiar role models for pain and disability, and was typically a later born child from a large family. These patients were also more likely to have had traumatic childhoods, with unmet dependency needs which carried into adulthood. These needs were now met through the socially approved means available to the chronically disabled. Furthermore, these patients traditionally had an initial onset of symptoms at a relatively early age, and in most cases had financial compensation available to them at the time of the symptom onset (Caldwell & Chase, 1977; Chapman, 1977; Gentry et al. 1974; Merskey & Boyd, 1978; Swanson, Swenson, Maruta, & Floreen, 1978; Thomas & Lyttle, 1976).
In an effort to qualify the empirical evidence suggesting a low-back loser character profile, Bradley, Prokop, Margolis, and Gentry (1978) performed a multivariate clustering analysis on 548 low-back pain patients, utilizing the MMPI. Their efforts revealed four profile subgroups of low-back sufferers. Three of the subgroups were common to both sexes, while the fourth subgroup was comprised solely of females. The first subgroup was characterized by elevations on the scales Hs, D, and Hy, representing the psychophysiological reaction as described by Sternbach et al. (1973b). The second group also had elevations on these three scales, but to a lesser extent. The third profile subgroup had an elevation on these same three clinical scales, and was accompanied by a significant elevation of the scale Schizophrenia. The last profile subgroup, consisting only of females, was characterized by the traditional "psychosomatic-V" profile.

Chronic low-back pain sufferers have historically been treated in various manners. Such procedures consisted of multiple lumbar intervertebral disc surgery (Law, Lehman, & Kirsch, 1978), chymopapain injection (Wiltse, 1975), facet denervation (Ogsbury, Simon, & Lehman, 1977; Shealy, 1975), psychotherapy (DeVaul & Zisook, 1978), hypnosis (Barber, 1963), acupuncture (Toomey, Ghia, Mao, & Gregg, 1977), and the relatively successful multidisciplinary team approach of treatment by admittance to a chronic pain clinic (Bonica, 1977b; Ignelzi, Sternbach, & Timmermans, 1977). In these
procedures (and the many others which have been used in the
treatment of lumbar back pain with varying degrees of successful
pain relief), it has been necessary to evaluate the clinical
data in order to define predictors in selecting patient
candidates for these various treatment techniques.

Wiltse (1975) evaluated psychological test scores,
physician ratings, and patient biographical data as predictors
of postoperative success among a group of 130 candidates for
chymopapain injection therapy. The psychological tests used
in their investigation consisted of the MMPI, the Cornell
Medical Index, and the Quick Test. Results from this study
reflected a substantial promise ($r = -.60$) of the Hypochondri-
asis and Hysteria scales of the MMPI to differentiate patients
reporting good symptomatic relief from the treatment. Preop-
erative ratings by the physicians reflecting the degree to
which the patient's symptoms were judged as functional in
origin also proved to have considerable value ($r = -.51$) in
predicting operative success for this patient group.

Toomey et al. (1977) studied the ability of a series of
variables assessing personality, affect, and stress to predict
patient response to acupuncture in the treatment of chronic
pain beneath the level of the waist. The 40 patients were
administered the Zung Depression Scale, State-Trait Anxiety
Inventory, Internal-External Locus of Control Scale, Social
and Readjustment Rating Questionnaire, and the MMPI. The
responder group was defined as having at least 50% reduction
in their pain estimate for a period of 2 weeks or more.
The authors found this group to be less depressed and less passive, overly conventional in thought and behavior, endorsed less frequent exposure to stressors and had less serious nonpain related illnesses. This study supported the importance of considering psychological variables in evaluating patients for treatment strategies.

Facet denervation has been found to be of some success in relieving lumbar pain. In 1971 Rees of Australia reported the successful use of facet denervation for the relief of lumbar distress. In this procedure, the indicated spinal facet joint (innervated by a branch from the corresponding nerve root) was neutralized. This could be done in a temporary fashion through the injection of a local anesthetic or a more permanent maneuver requiring electrical or chemical rhizotomy. This particular treatment approach has been indicated in patients suffering from lumbar pain and accompanying sciatica, often more diffuse and vague than the typical "single nerve root syndrome" associated with nerve root compression (Finneson, 1972). The patients also demonstrated little or no motor, reflex, or sensory changes, and acute tenderness to pressure over the facet joint. Finally, they had virtually normal myelogram findings, or a minimal abnormality of questionable significance (Ogsbury, et al., 1977; Shealy, 1975).

The present study tried to differentiate the responders from nonresponders to facet denervation for the relief of
intractable lumbar pain in a sample of hospitalized pain clinic patients. It was an attempt to determine whether certain psychosocial variables could be used effectively in differentiating between patients who would have poor symptomatic relief from those who would have good symptomatic relief after facet denervation treatment. The general hypothesis underlying the investigation was that selected measures of personality and pain estimate would be predictable of patient response to this treatment approach. Also, the patient's involvement in litigation concerning compensation due to low-back injury was suspected to be an influencing factor of the patient's response.

The personality variables studied were the patient's responses to the MMPI and the Sixteen Personality Factor Questionnaire (16 PF). It was hypothesized that those patients who did not respond to facet denervation treatment would score higher on the Hs and Hy scales of the MMPI, similar to the results of Wiltse's (1975) study concerning chymopapain injection. It was also postulated that the nonresponder group would present characteristics described by Sternbach et al. (1973a) in his proposal of the low-back loser personality profile. Therefore, a psychophysiological reaction similar to that of the low-back loser would be expected of the nonresponder group.

The 16 PF, it was hypothesized, would also be able to predict patient response to facet denervation treatment. It
was expected that the nonresponder group would respond in a similar fashion to how we would expect the low-back loser to respond. Henceforth, a lower Factor B score (less intelligent), a lower Factor C score (emotionally less stable), and a higher Factor L score (less trusting) would be likely of the nonresponder group in consideration of the evidence presented by Sternbach et al. (1973b) on the low-back loser. In regard to the findings by Toomey et al. (1977) that responders tend to be more conventional in thought and behavior, it was expected that responders to facet denervation would score lower on Factor $Q_1$ (traditional ideas).

Consistent with this hypothesis, it was postulated that the nonresponder group would be significantly more often involved in litigation concerning financial compensation due to injury. This expectation was directly traceable to Sternbach's (1973b) finding that pending litigation potentiated the psychophysiological reaction, a poor prognosis.

The patient's accuracy in perceiving his pain was another variable which this investigation assumed to be an influencing factor in moderating facet denervation response. It was postulated that as the low-back loser became more entrenched in his role of disability, secondary or "social" reinforcers as described by Caldwell and Chase (1977) would begin to override primary or "physiological" reinforcers in connection with his chronic pain syndrome. If this were the case, more discrepancy would be expected between the
patient's subjective report of his current pain level and the clinically derived analogue of that pain level.

Method

Subjects

Subjects were 47 chronic pain patients admitted to the Caruth Memorial Rehabilitation Hospital-Spinal Pain Clinic. These patients had been admitted within the previous 24-month period and had received facet denervation as part of their treatment for lumbar pain. They accounted for approximately 64% of the total number receiving this method of treatment during the 24-month period. The remaining 36% were not utilized due to poor follow-up data. There were 26 males and 21 females with the average age of 42.85 years.

Procedure

Each patient was requested verbally upon admission to the clinic to respond to an MMPI, 16 PF, and to complete a Patient History Form (Appendix A). In addition, the patient was given a thorough neurological exam, and was placed in one of the following diagnostic categories: (a) low-back pain only (Lumbar Strain, I), (b) low-back pain with radiation to hip or thighs (Lumbar Syndrome, II), and (c) low-back pain with radiation past the knee(s) (Lumbar Radiculitis, III). The patients were then asked to complete a Patient Pain Drawing (Appendix B) to aid in making the general diagnostic decision to verify facet syndrome and indications for facet denervation treatment.
To more thoroughly evaluate and quantify the patient's current level of pain experience, certain clinical measures were also taken. First, the patient was asked simply to rate his pain verbally along an imagined numerical scale which ranged from 0 (absence of pain) to 100 (degree of pain in which suicide would be a more desired alternative than to continue with the pain experience). Next, the patient underwent a procedure in which experimental pain was introduced to compare his subjective pain experience to his clinically derived pain tolerance and pain analogue. The ischemic method employed venous blood being drained from the extended non-dominant arm by use of an Emarch bandage. A tourniquet was then placed on the arm and inflated to 250mm Hg. The patient then waited 60 seconds and performed 20 squeezes with a hand spring. At this point, pain began to build up slowly in the arm. During this timed interval, the patient signaled when the pain in his arm was analogous to the pain in his lower back. He then continued with this building pain until it was no longer tolerable. At this point, the time interval was marked and the procedure ceased. The clinical pain percentage was then computed from the ratio of time intervals between the analogue pain estimate and the clinical pain tolerance. The derived clinical pain estimate could then be compared to the patient's subjective estimate of his low-back pain experience (Appendix C).
The decision to attempt facet denervation in order to relieve lumbar pain (which was often accompanied by sciatica), was based primarily on the patient's conformity to the facet syndrome. This included diffuse or vague lumbar pain and sciatica, point tenderness over the facet joint, negative or minimal neurological findings, and negative or minimal myelogram findings. It should be noted here that once a patient had been deemed a candidate for facet denervation treatment, his chances for success or failure were equal.

Data was gathered from the MMPI, 16 PF, Patient History Form, neurological exam, Patient Pain Drawing, and tourniquet test which were routinely administered to all patients. Follow-up data and facet denervation response was based on patient discharge summary notes and follow-up appointments to the orthopedic surgeon who administered the facet denervation treatment.

The patients were then differentiated according to their response to the facet denervation procedure. After a period of 2 weeks following the facet injection, a clinical decision was made concerning the effectiveness of treatment. Based on the clinical impressions of the attending orthopedic surgeon, each patient was classified as either a responder or nonresponder. In order to aid in the classification, each patient received a numerical rating.

Nonresponders were defined as those patients reporting no (or minimal) symptomatic relief from the facet injection
after a period of 2 weeks. They received a numerical rating of either 1 or 2. A rating of 1 indicated no change in patient status, either functional or organic. A rating of 2 indicated a report of minimal pain relief, but no decreases in pain medication intake.

Responders were defined as those patients who experienced good symptomatic relief for a period of 2 weeks following the facet injection. Symptomatic relief was based on the patient's verbal pain estimate, follow-up medical and neurological reports, increased activity level as reported by the patient, and in some cases the patient's desire for the more permanent facet rhizotomy. They received a numerical rating of either 3 or 4. A rating of 3 indicated a report of significant pain relief and an accompanying decrease in pain medication intake. A rating of 4 indicated more complete success with the patient able to participate in increased activity levels.

RESULTS

Of the 47 chronic pain patients, 34 were classed as responders and 13 as nonresponders. Their MMPI and 16 PF responses were statistically analyzed by means of t tests, as was the discrepancy between each patient's subjective pain report and his clinical pain analogue. Chi-square was utilized to determine the significance of patient classification in either litigation group as a predictor of facet treatment success.

Table 1 presents the mean scores of MMPI responses on the 13 basic scales for the two groups. Significant differences
Table 1
Means of MMPI Personality Measures

<table>
<thead>
<tr>
<th>Scales</th>
<th>Responders (N = 34)</th>
<th>Nonresponders (N = 13)</th>
<th>df</th>
<th>t</th>
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<td>L</td>
<td>4.00</td>
<td>5.46</td>
<td>45</td>
<td>2.10*</td>
</tr>
<tr>
<td>F</td>
<td>4.53</td>
<td>4.92</td>
<td>45</td>
<td>.33</td>
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<tr>
<td>K</td>
<td>13.85</td>
<td>16.92</td>
<td>45</td>
<td>2.37*</td>
</tr>
<tr>
<td>Hs</td>
<td>21.74</td>
<td>20.23</td>
<td>45</td>
<td>.86</td>
</tr>
<tr>
<td>D</td>
<td>26.97</td>
<td>26.79</td>
<td>45</td>
<td>.08</td>
</tr>
<tr>
<td>Hy</td>
<td>29.47</td>
<td>29.23</td>
<td>45</td>
<td>.12</td>
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<tr>
<td>Pd</td>
<td>22.88</td>
<td>24.46</td>
<td>45</td>
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<td>Mf</td>
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<td>27.53</td>
<td>30.23</td>
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*p < .05

were established between the groups according to the Lie (L) and Defensiveness (K) validity scales, *t* (45) = 2.10, *p < 0.05, and *t* (45) = 2.37, *p < 0.05, respectively. The remaining 11 scales of the MMPI were incapable of differentiating the responders from nonresponders.
Table 2 presents the mean scores of 16 PF responses for the two groups. None of the 16 personality factors measured were able to differentiate the responders from nonresponders employing the 0.05 level of significance.

### Table 2
Means of 16 PF Personality Measures

<table>
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<tr>
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<td>A</td>
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The chi-square analysis of the litigation variable, presented in Table 3 revealed the ability of this factor to distinguish the two response groups, \( \chi^2(1) = 4.659, p < 0.05 \). The discrepancy between each patient's subjective pain report and his clinical analogue, as analyzed by \( t \)-test manipulation, is presented in Table 4. Results indicate this variable to be statistically insignificant in differentiating responders and nonresponders, \( t(41) = 0.256 \).

Discussion

The data reflect partial support for the general hypothesis that selected measures of psychosocial variables are able to significantly aid in the prediction of response to facet denervation in this specialized patient population. However, many of the specific predictions are not supported by the results.

Table 3

Number of Responders and Nonresponders and Their Involvement in Litigation

<table>
<thead>
<tr>
<th></th>
<th>Litigation</th>
<th>No-litigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responders</td>
<td>10 (13.75)</td>
<td>24 (20.25)</td>
</tr>
<tr>
<td>Nonresponders</td>
<td>9 (5.25)</td>
<td>4 (7.75)</td>
</tr>
</tbody>
</table>

Note: Numbers in parentheses indicate the expected

\[ N = 47 \quad df = 1 \quad \chi^2 = 4.659^* \quad *p 0.05 \]
Table 4

Average Patient Verbal Pain Rating and its Clinically Derived Analogue

<table>
<thead>
<tr>
<th></th>
<th>Responder</th>
<th>Nonresponder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal rating</td>
<td>59.38%</td>
<td>56.36%</td>
</tr>
<tr>
<td>Clinical analogue</td>
<td>49.94%</td>
<td>54.09%</td>
</tr>
<tr>
<td>Average individual discrepancy</td>
<td>21.94%</td>
<td>23.36%</td>
</tr>
</tbody>
</table>

Note: N = 43   df = 41   t = 0.256

In reference to data concerning MMPI responses, there are no clear differences between the responders and non-responders according to their mean scores on the first three clinical scales. These three scales combined give the psychosomatic-V, or the psychophysiological type configurations, so common to patients complaining of low-back pain for longer than a 6-month period. The psychophysiological profile as described by Sternbach (1973a) is apparent for both groups in this study. However, the expected magnitude of differences between the two groups' profiles on the three scales is minimal.

In support of Wiltse's (1975) study of chymopapain injection therapy, the nonresponder group demonstrates elevated profiles on scales hypochondriasis and hysteria similar to his nonresponder group. However, due to the fact
that the current responder group likewise had elevations on these two scales, there is no basis for discriminating the two response groups of the present investigation. The failure of the MMPI to discriminate the two response groups on these scales, in contrast to previous findings, is due to the difference in patient populations. The present group is diagnostically special in that there are negative or minimal objective findings for their pain experience, whereas Wiltse's group would ordinarily have been treated with laminectomy.

The remaining seven clinical scales of the MMPI also fails to statistically distinguish the two groups. For all practical purposes, the mean profile of the responders was identical to that of the nonresponders.

A case may be made for the significant differences found between the two groups on two of the three validity scales. The nonresponders scored significantly higher than the responders on both the L and K scales.

The L (Lie) scale is composed of 15 items expressing opinions and behaviors which are valued in our culture and are actually found in the most conscientious of individuals, if they are found at all. Examples of items include:

I do not always tell the truth. (F)
I would rather win than lose a game. (F)
I do not like everyone I know. (F)
I get angry sometimes. (F)

The scale is designed to identify a general, deliberate,
evasive response set, though it is usually only successful with less sophisticated individuals.

The K scale is composed of 30 items which differentiate normal profiles obtained by defensive hospitalized psychiatric patients from those produced by normals. K scale items (in the scored direction) reflect denial of inadequacy in self, family or circumstances, and a hesitance to criticize others. Examples of items include:

At times I feel like smashing things. (F)
I certainly feel useless at times. (F)
I have very few quarrels with members of my family. (T)
I frequently find myself worrying about something. (F)

High K scale scores are usually associated with relatively lower clinical profiles by reflecting the respondent's defensiveness and guardedness.

It appears that the nonresponder group has more need to appear in a socially favorable light and makes a deliberate attempt at this through an evasive and defensive response set. This does not necessarily depict a group of malingerers, but a group who has learned operant behaviors through secondary or social reinforcers, as described by Caldwell and Chase (1977).

The 16 PF fails completely in its ability to differentiate the responders from nonresponders. This may be due simply to faulty experimental design, in that the 16 PF represents only slightly more than half the total number of
patients comprising this study. However, we must presently accept the null-hypothesis that the patient population studied is a homogenous one in regard to the personality factors measured by this test. No support is given to the prediction that the nonresponder group would demonstrate those personality attributes which was outlined by Sternbach et al. (1973b) as depicting the low-back loser.

Another hypothesis of this investigation failing to obtain support is that dealing with the patient's accuracy in perceiving pain. The results suggest that both response groups are equally able in perceiving their pain. That is, the average discrepancy between each individual's verbal pain rating and their clinically derived pain analogue, is approximately the same for both response groups. Therefore a patient's inaccuracy in perceiving his pain experience in no way can predict his response to the facet denervation procedure.

One other important factor in this investigation which differentiates the response groups is the patient's involvement in litigation concerning financial compensation due to injury. From these results, it can be seen that a patient currently involved in litigation has only about a 50-50 chance of symptomatic relief from the facet denervation treatment. Patients not involved in litigation have considerably better chances (approximately 80-20) to receive good symptomatic relief from the same procedure. This is in complete agreement with Sternbach's (1973b) findings that involvement in litigation
decreases the prospects for improvement. This result may be viewed in the same light as the results from the MMPI validity scales. That is, through operant learning, the nonresponse group now behaves in accordance with the newly conditioned set of social or secondary reinforcers (i.e., compensation payments, the removal of personal responsibilities, not having to work, and many others). Using this approach, perhaps as these secondary reinforcers are removed through litigation failures and a less-accepting family and social environment, these patients who failed to get symptomatic relief from facet denervation may well respond more favorably at a later date.

The results of this study can only be viewed in a general way. In deciding whether to attempt a facet denervation for each individual patient, no specific recommendation can be made based on MMPI profile analysis, or by the simple consideration of the patient's legal involvement. As the total group was found to respond more often than not (by nearly three times) it is better to treat all those conforming to the facet syndrome than to take the risk of missing a potential responder by not treating because of psychosocial considerations.
Appendix A

Patient History Form

Date__________________________

Age__________________________

Present job_____________________

How long?_______________________

Last job_______________________

1. What date (roughly at least) did your present pain start?

2. How long have you been unable to work or do normal housework?

3. Did your pain start gradually____ suddenly____ injury____ where____

4. Do you get short of breath or a tight feeling in your chest with your back pain?

5. Do you notice your pain after you exercise or exert yourself?

6. If sudden onset, please describe what happened.

7. My pain is: Check the appropriate box.

<table>
<thead>
<tr>
<th>Sitting in straight chair</th>
<th>Better</th>
<th>Worse</th>
<th>No different</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting in soft easy chair</td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Bending forward to brush teeth</td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Walking up stairs</td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Walking down stairs</td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Lying flat on back</td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Lying flat on stomach</td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>On side with knees bent</td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>With cough or sneeze</td>
<td>______</td>
<td>______</td>
<td>______</td>
</tr>
</tbody>
</table>
Appendix A--Continued

8. My back sometimes gets stuck when I bend forward  yes  No
   After walking, bending forward relieves my pain __  __
   My back feels like giving way when I bend forward __  __
   My pain stops me when I walk a certain distance  __  __

9. Have you been in a hospital for back, leg, or neck pain?

10. Have you had myelograms?
   Number of times________.

11. Have you had neck or back surgery?

13. Do you have any serious medical problems other than back?

14. What treatments have made your pain worse?
   What medicine are you taking?

15. Do you have an attorney helping you?

16. Do other members of your family have significant back trouble?
   Who?

17. Do you have to change jobs?

18. Are you under any pressure at home?____ at work?____
    Mild_____ Moderate____ Severe____

19. What is the most aggravating thing about your pain?

20. Are you presently involved in any legal action because of
    your disability?
Appendix B

Patient's Pain Drawing

Name: ___________________________ Date: ___

Indicate in RED the areas on your body where you feel pain. Shade in BLACK the areas on your body where you feel numbness. Mark areas of radiation. Include all affected areas.
Appendix C

Tourniquet Test

Date

Name: ___________________________ Arm used: ___________________________

<table>
<thead>
<tr>
<th>Pain Levels</th>
<th>Time: Minutes-Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pain Estimate:

Clinical Estimate:

Maximum Level:

Percentage:

Comments:

Signed: ___________________________
References


Thomas, M. R., & Lyttle, D. Development of a diagnostic checklist for low-back pain patients. *Journal of Clinical*
Psychology, 1976, 22(1), 125-129.