Pain Psychology For Neuropsychologists: An Update

Kevin J. Bianchini, Ph.D., FACPN

38th Annual NAN Conference

October 17 - 20, 2018

New Orleans, LA

Clinical circumstances of pain psychological evaluation:

Predicting response to procedures or rehabilitation

Understanding difficult-to-explain outcomes

Identifying treatment approaches, including treatment of comorbidities

Components of Evaluation:

Medical Record Review

Interview

Psychological Testing

Performance and Symptom Validity Testing

- Pain-related complaints are extremely common in the general population
- The presence of pain influences recovery in neuropsychological conditions.
- Psychosocial factors that influence recovery in pain likely influence recovery in conditions addressed by neuropsychologists

Explicit Question:

Are (will) physical symptoms and disabilities, including response to treatment, (be) altered in some way by psychological factors?

OVERVIEW

Louisiana Workforce Commission Guidelines

Delayed Recovery:
Strongly consider a psychological evaluation, if not previously provided, as well as initiating interdisciplinary rehabilitation treatment & vocational goal setting for those patients who are failing to make expected progress 6 to 12 weeks after injury.

Six Month Time Frame:

Prognosis drops precipitously for returning an injured worker to work once he/she has been temporarily totally disabled for more than 6 months. The emphasis within these guidelines is to move patients along a continuum of care and return-to-work within a 6-month time frame, whenever possible. It is important to note that time frames may not be pertinent to injuries that do not involve work-time loss or are not occupationally related.

Chronic pain is defined as "pain that persists for at least 30 days beyond the usual course of an acute disease or a reasonable time for an injury to heal or that is associated with a chronic pathological process that causes continuous pain." The very definition of chronic pain describes a delay or outright failure to relieve pain associated with some specific illness or accident. Delayed recovery should prompt a clinical review of the case and a psychological evaluation by the health care provider. Referral to a recognized pain specialist for further evaluation is recommended.

Formal psychological or psychosocial evaluation should be performed on patients not making expected progress within 6 to 12 weeks following injury and whose subjective symptoms do not correlate with objective signs and test results.

Personality/psychological/psychosocial evaluations consist of 2 components: clinical interview & psychological testing.

Results should help clinicians with a better understanding of the patient in a number of ways.

Psychometric testing is a valuable component of a consultation to assist the physician in making a more effective treatment plan.

It is useful in the assessment of mental conditions, pain conditions, cognitive functioning, treatment planning, vocational planning & evaluation of treatment effectiveness.

There is no general agreement as to which standardized psychometric tests should be specifically recommended for psychological evaluations of chronic pain conditions.

It is appropriate for the mental health provider to used their discretion & administer selective psychometric tests within their expertise & within standards of care in the community.

Psychosocial treatment is recommended as an important component in the total management of the patient with chronic pain & should be implemented as soon as the problem is identified.

Psychosocial treatment may enhance the patient's ability to participate in pain treatment rehabilitation, manage stress, and increase their problem-solving & self-management skills.

Association Between Compensation Status and Outcome After Surgery A Meta-analysis

Harris, I., et al.

Journal of American Medicine

2005:293(13):1644-1652

- 211 studies satisfied the inclusion criteria
- Of these, 175 stated that the presence of compensation (worker's compensation with or without litigation) was associated with a worse outcome
- 35 found no difference or did not describe a difference
- 1 described a benefit associated with compensation

- A meta-analysis of 129 studies with available data (n = 20, 498 patients) revealed the summary odds ratio for unsatisfactory outcome in compensated patients to be 3.79 (95% confidence interval, 3.28-4.37 by random-effects model).

- Grouping studies by country, procedure, length of follow-up, completeness of follow-up, study type, and type of compensation showed the association to be consistent for all subgroups.

Part 1

General Issues in Pain

Chronic Pain

- Symptoms do not follow the natural course of healing after injury
- or
- Symptoms persist for three months without biological value

(Merskey & Bogduk, 1994)

Scope of the Problem

Pain complaints result in:
millions of physician office visits per year
and
as many as **150 million lost work days**

The lifetime incidence of low back pain:
11 to 84%

Lifetime incidence of neck pain:
10 to 15%

Scope of the Problem

- Pain often occurs in the context of a legally compensable event such as a work-related injury or incident in which some other party is potentially liable.
- **Back pain** is the most common reason for filing a workers compensation claim.
- **30-50%** of all Workers Compensation claims involve back pain

Scope of the Problem

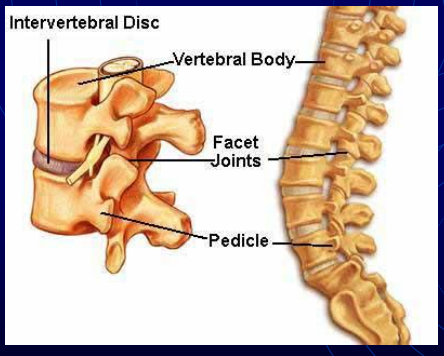
Return to work rates are lowest for back pain patients relative to all work related injuries.

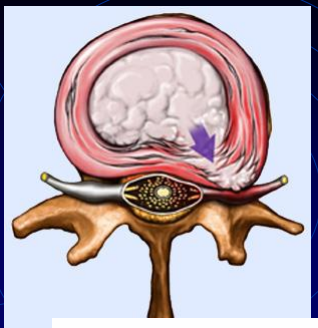
Review of Pain-Related Conditions

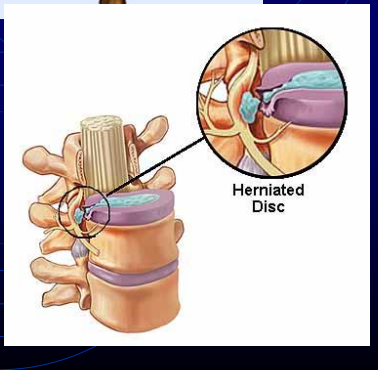
- Headache
- Complex Regional Pain Syndrome / Reflex Sympathetic Dystrophy
- Fibromyalgia

- Neurosurgical / Orthopedic Conditions
  - Spine
  - Spinal musculature
  - Joints

Spinal Pathology: Herniated Nucleus Pulposus







Objective physical findings do not fully explain the breadth and magnitude of disability seen in many patients with pain.

Boden, S. D., Davis, D. O., Dina, T. S., Patronas, N. J., & Wiesel, S. W. (1990). Abnormal magnetic-resonance scans of the lumbar spine in asymptomatic subjects. A prospective investigation. *The Journal of Bone and Joint Surgery. American Volume , 72*, 403-408.

- **Lumbar** MRI on 67 patients who had never had:
  - Low-back pain
  - Sciatica
  - Neurogenic Claudication
- Interpretation by neuro-radiologists blind to presence or absence of clinical symptoms.

Lumbar Findings

- **Age < than 60:**
  - 1/3 had a substantial abnormality
  - 20% had a herniated nucleus pulposus
  - patient had spinal stenosis
- **Age > 60:**
  - 57% of scans abnormal
  - 36% had a herniated nucleus pulposus
  - 21% had spinal stenosis

Boden, S. D., McCowin, P. R., Davis, D. O., Dina, T. S., Mark, A. S., & Wiesel, S. (1990). Abnormal magnetic-resonance scans of the cervical spine in asymptomatic subjects. A prospective investigation. *The Journal of Bone and Joint Surgery. American Volume, 72*, 1178-1184.

- Followed the same method as the first study but focused on the **cervical** spine.

Cervical Findings

- **< 40 years old:**
  - 10% had a herniated nucleus pulposus
  - 4% had foraminal stenosis
- **> 40 years old:**
  - 5% had herniated nucleus pulposus
  - 3% had bulging of the disc
  - 20% had foraminal stenosis

Cervical Findings

- The disc was degenerated or narrowed at one or more levels:
  - in 25% of those < 40 years old
  - in almost 60% of those > 40.

Prediction of future symptomology

- Cervical and lumbar findings did not differentially predict future neck or back complaints
- In contrast, certain psychological risk factors and psychometric findings do predict future pain complaints.

PSYCHOLOGICAL RISK FACTORS

Relevant Psychological Constructs

Childhood Adversity

Somatization

Pain Catastrophizing

Fear-Avoidance

Demoralization/Patient Activation

Childhood Adversity

1. Childhood Adversity

Childhood psychological trauma negatively influences outcome in pain cases

Schofferman, J., Anderson, D., Hines, R., Smith, G., & White, A. (1992). Childhood psychological trauma correlates with unsuccessful lumbar spine surgery. *Spine, 17,* S138-S144.

- Retrospective study of 86 patients who underwent lumbar spine surgery.
- Risk Factors: serious childhood psychological traumas
  - physical abuse
  - sexual abuse
  - emotional neglect or abuse
  - abandonment
  - chemically dependent caregiver
- 85% of patients with >= 3 of 5 risk factors had an unsuccessful surgical outcome.
- 5% of patients with no risk factors had an unsuccessful surgical outcome.
- Put another way . . .
- In patients with a poor surgical outcome, the incidence of these traumas was 75%.

Schofferman, J., Anderson, D., Hines, R., Smith, G., & Keane, G. (1993). Childhood psychological trauma and chronic refractory low-back pain. *The Clinical Journal of Pain, 9,* 260-265.

- Retrospective chart review survey of 101 consecutive patients who had undergone multidisciplinary evaluation for ***refractory back pain***.
- SAMPLE:
  - failed back surgery syndrome (n =56).
  - no prior surgery (n = 45).
- RESULTS:
  - Failed back surgery syndrome group
    - 48% had 3+ risks.
    - 70% had 2+ risks.
    - 55% of patients with not significant pathology had 3+ risks.
  - No prior surgery
    - 58% had 3+ risks
    - 84% had 2+ risks
    - 60% of patients with not significant pathology had 3+ risks.

Childhood adversities as a predictor of disability retirement

Harkonmaki, K., Korkeila, K., et al.

Journal of Epidemiology And Community Health
2007;61:479-484

Methods:

- Data were derived from the Health & Social Support Study.
- Information was gathered from postal surveys in 1998 (baseline) & in 2003 (follow-up questionnaire).
- Analyzed data consisted of 8817 non-retired respondents aged 40-54 (5149 women, 3668 men).

Results:

The risk of disability retirement increased in a dose-response manner with increasing number of childhood adversities. Respondents who had experienced multiple childhood adversities had a 3.46-fold increased risk (95% CI 2.09 to 5.71) of disability retirement compared with those who reported no such adversities.

Low socioeconomic status, depression (Beck Depression Inventory-21), use of drugs for somatic diseases as well as health-related risk behavior, such as smoking, heavy alcohol consumption and obesity, were also predictors of disability retirement. After simultaneous adjustments for all these risk factors, the association between childhood adversities and the risk of disability retirement attenuated, but remained significant (OR 1.90, 95% CI 1.07 to 3.37).

Brown, Schrag, & Trimble, 2005

Physical/emotional abuse was more common & more extreme in patients with unexplained neurological symptoms who met DSM criteria for Somatization Disorder than those with a neurologically-based dystonia.

A higher degree of family conflict was present in the somatization group.

There were no group differences for neglect, sexual abuse, or witnessing violence.

Exposure to emotional abuse accounted for 50% of the variance in unexplained symptoms.

These effects are not simply explained by psychiatric comorbidity.

Spitzer, Barnow, Gau, Freyberger & Grabe, 2008

The odds of having been sexually abused in childhood were 9 times higher in persons who met DSM criteria for Somatization Disorder than in those meeting criteria for Major Depressive Disorder

SOMATIZATION

2. Somatization

- refers to the way "certain patients use their physical symptoms as a way of dealing with, and communicating about, their emotional lives . . . in this type of symptom magnification, physical symptoms may be easier to accept as causing current unhappiness and discontent than admitting that some psychological reason is contributing to it."

Gatchel, R. J. (2004). Comorbidity of chronic pain and mental health disorders: the

Somatization

- Reflects:
  - the expression of psychological problems manifested in physical symptoms and complaints.
  - a tendency to complain of or develop physical symptoms and illness when under emotional stress.
  - a potentially maladaptive means of coping with stress in one's life.

Barsky, A. J., Orav, E. J., & Bates, D. W. (2005). Somatization increases medical utilization and costs independent of psychiatric and medical comorbidity. *Archives of General Psychiatry, 62*, 903-910.

- Sample: 2668 consecutive adults visiting primary care doctors.
- 1546 of these had complete data.
- 299 patients (19.3%) received a provisional diagnosis of somatization

Fink, P., Steen Hansen, M., & Sondergaard, L. (2005). Somatoform disorders among first-time referrals to a neurology service. *Psychosomatics, 46*, 540-548.

- Sample: first time referrals to a neurology clinic
- 61% of the patients had at least one medically unexplained symptom
  - 59% of the female patients
  - 63% of the male patients
- 34% fulfilled the diagnostic criteria for an ICD-10 somatoform disorder:
  - 41.3% female patients
  - 27.7% male patients
  - 20.5% inpatients
  - 43.2% outpatients

A sample of studies of the MMPI in spine surgery outcome

Block AR, Ohnmeiss DD, Guyer RD, Rashbaum RF, Hochschuler SH. 2001 The use of presurgical psychological screening to predict the outcome of spine surgery. Spine J. 1:274-82.

Cashion EL, Lynch WJ. 1979 Personality factors and results of lumbar disc surgery. Neurosurgery. 2:141-5.

Doxey NC, Dzioba RB, Mitson GL, Lacroix JM. 1988 Predictors of outcome in back surgery candidates.J Clin Psychol. 44:611-22.

Dzioba RB, Doxey NC. 1984 A prospective investigation into the orthopaedic and psychologic predictors of outcome of first lumbar surgery following industrial injury. Spine. 9:614-23.

Herron L, Turner JA, Ersek M, Weiner P. 1992 Does the Millon Behavioral Health Inventory (MBHI) predict lumbar laminectomy outcome? A comparison with the Minnesota Multiphasic Personality Inventory (MMPI). J Spinal Disord. 5:188-92.

Kuperman SK, Golden CJ, Blume HG. 1979 Predicting pain treatment results by personality variables in organic and functional patients. J Clin Psychol. 35:832-7.

Kuperman SK, Osmon D, Golden CJ, Blume HG. 1979 Prediction of neurosurgical results by psychological evaluation. Percept Mot Skills. 48:311-5.

Long CJ. 1981 The relationship between surgical outcome and MMPI profiles in chronic pain patients. J Clin Psychol. 37:744-9.

Pheasant HC, Gilbert D, Goldfarb J, Herron L. 1979 The MMPI as a predictor of outcome in low-back surgery. Spine. 4:78-84.

Riley JL 3rd,Robinson ME, Geisser ME, Wittmer VT, Smith AG. 1995 Relationship between MMPI-2 cluster profiles and surgical outcome in low-back pain patients. J Spinal Disord. 8:213-9.

Sorensen LV, Mors O, Skovlund O. A prospective study of the importance of psychological and social factors for the outcome after surgery in patients with slipped lumbar disk operated upon for the first time. Acta Neurochir (Wien). 1987;88(3-4):119-25.

Sorensen LV. 1992 Preoperative psychological testing with the MMPI at first operation for prolapsed lumbar disc. Five-year follow up. Dan Med Bull. 39:186-90.

Spengler DM, Ouellette EA, Battie M, Zeh J. 1990 Elective discectomy for herniation of a lumbar disc. Additional experience with an objective method. J Bone Joint Surg Am. 72:230-7.

Turner JA, Herron L, Weiner P. 1986 Utility of the MMPI Pain Assessment Index in predicting outcome after lumbar surgery.J Clin Psychol. 42:764-9.

Uomoto JM, Turner JA, Herron LD. 1988 Use of the MMPI and MCMI in predicting outcome of lumbar laminectomy. J Clin Psychol. 44:191-7.

Bigos, S. J., Battie, M. C., Spengler, D. M., Fisher, L. D., Fordyce, W. E., Hansson, T. H. et al. (1991). A prospective study of work perceptions and psychosocial factors affecting the report of back injury. *Spine, 16*, 1-6.

- A longitudinal, prospective study of aircraft employees (n = 3,020).
- Premorbid data included individual physical, psychosocial, and workplace factors.
- 279 (9.2%) subjects reported back problems during the 4 year follow-up.

- Significant Predictors
  - A history of current or recent back problems
  - Subjects scoring highest on Scale-3 (Hy) of the MMPI were **2.0 times** more likely to report a back injury than subjects with the lowest scores.

Applegate, K. L., Keefe, F. J., Siegler, I. C., Bradley, L. A., McKee, D. C., Cooper, K. S. et al. (2005). Does personality at college entry predict number of reported pain conditions at mid-life? A longitudinal study. *The Journal of Pain, 6*, 92-97.

- **PURPOSE:**
  - Evaluate whether personality traits, as assessed by the Minnesota Multiphasic Personality Inventory (MMPI), at time of college entry can predict the number of reported pain conditions at an approximate 30-year follow-up.
- **SAMPLE:**
  - 2332 college students administered the MMPI between 1964 and 1966.
- **RESULTS:**
  - The 1997 follow-up asked whether they had experienced 1 or more chronic pain conditions.
  - Males: elevations of Scales 1 (Hypochondriasis), 3 (Hysteria), and 5 (Masculinity/Femininity) were associated with more chronic pain.
  - Females: Scales 1, 3, and 6 (Paranoia) were associated with more chronic pain.
- **CONCLUSION:**
  - This study found a small, but significant relationship between elevations on MMPI scales measuring hypochondriasis and hysteria and the report of chronic pain conditions.

Block, A. R., Vanharanta, H., Ohnmeiss, D. D., & Guyer, R. D. (1996). Discographic pain report: Influence of psychological factors. *Spine*, *21*, 334-338.

- Injection into disrupted discs provokes pain, whereas injection into nondisrupted discs does not. However, discordant results are sometimes obtained and create a more difficult diagnostic challenge.
- Sample was 72 patients who underwent computed tomography/discography at the three lowest lumbar levels for diagnostic purposes and completed the MMPI.
- The mean scores on the MMPI Hs & Hy scales were significantly higher for patients reporting reproduction of clinical pain than for patients not reporting pain on injection of a **nondisrupted** disc (hypochondriasis: 77.2 vs. 68.6, $P < 0.01$; hysteria: 74.5 vs. 68.3). The scores on the depression scale followed a similar trend (68.6 vs. 63.6).
- Patients with elevated scores on the Hs, Hy, & D scales may tend to **over-report** pain during discographic injection. Among such patients, even those with a concordant computed tomography/discographic image, selection of therapeutic modalities should be made with caution.

Block, A. R., Vanharanta, H., Ohnmeiss, D. D., & Guyer, R. D. (1996) Discographic pain report. Influence of psychological factors. Spine, 21, 334-338.

- RESULTS
  - The mean scores on the MMPI Hypochondriasis (Hs) and Hysteria (Hy) scales were significantly greater for patients reporting reproduction of clinical pain than for patients not reporting pain on injection of a nondisrupted disc
    - Hs: 77.2 vs. 68.6, ($p < 0.01$)
    - Hy: 74.5 vs. 68.3, ($p < 0.05$)
    - D: 68.6 vs. 63.6, $P < 0.15$)
  - Patients with elevated scores on the Hs, Hy, and D scales may tend to over-report pain during discogram.

FEAR AVOIDANCE/ PAIN CATASTROPHIZING

3. Pain Catastrophizing

A tendency to . . .

- fear pain
- have a fear-inducing understanding of the meaning of pain (e.g., the presence of pain is an indication of harm)

and/or

- a tendency to allow pain to be a dominant focus of ones life.

Proctor, T., Gatchel, R. J., & Robinson, R. C. (2000). Psychosocial factors and risk of pain and disability. *Occupational Medicine*, *15*, 803-12.

Pain Catastrophizing

- A relatively stable personality disposition whose manifestation may be influenced by situational variables such as changes in physical condition or implementation of specific cognitive interventions.

Turner, J. A., & Aaron, L. A. (2001). Pain-related catastrophizing: what is it? *Clinical Journal of Pain*, *17*, 65-71.

Pain Catastrophizing mechanisms of action

1. interfering with pain coping and beneficial health behaviors.
2. increasing attention to pain.
3. amplifying pain processing in the central nervous system.
4. maladaptive impacts on the social environment.

Edwards, R. R., Smith, M. T., Stonerock, G., & Haythornthwaite, J. A. (2006). Pain-related catastrophizing in healthy women is associated with greater temporal summation of and reduced habituation to thermal pain. *Clinical Journal of Pain, 22*, 730-737.

Pain catastrophizing

- predicts the development of chronic pain complaints in the general population (Severeijns, Vlaeyen, van den Hout, & Picavet, 2005).
- associated with greater pain vigilance and preoccupation with pain and physical problems (Goubert, Crombez, & Van Damme, 2004)
- may mediate the reduced activity level seen in some clinical patients (Sullivan, Stanish, Sullivan, & Tripp, 2002).
- related to variety of important functional and outcome variables, pain intensity, psychological distress, and level of disability independent of level of physical injury or impairment (Severeijns, Vlaeyen, van den Hout, & Weber, 2001; Turner, Jensen, Warms, & Cardenas, 2002; Woby, Watson, Roach, & Urmston, 2004).
- There is evidence that pain catastrophizing is a precursor to the development of pain-related fear (Leeuw et al., 2007).

Fear-Avoidance

- Emotional, cognitive, and behavioral factors discussed above interact with the pain experience to contribute to a reinforcing cycle of fear and anxiety towards pain-related stimuli (see Asmundson, Vlaeyen, & Crombez, 2004; Vlaeyen, Kole-Snijders, Boeren, & van Eek, 1995; Vlaeyen & Linton, 2000).
- Fears can be directed towards pain itself, reinjury, or specific activities such as movement (i.e., kinesiophobia).
- Avoidance of activities, in turn, contributes to the development and maintenance of functional disability (Leeuw et al., 2007; Woby, Watson, Roach, & Urmston, 2004).

Leeuw, M., Goossens, M. E., Linton, S. J., Crombez, G., Boersma, K., & Vlaeyen, J. W. (2007). The fear-avoidance model of musculoskeletal pain: current state of scientific evidence. Journal of Behavioral Medicine, 30, 77-94.

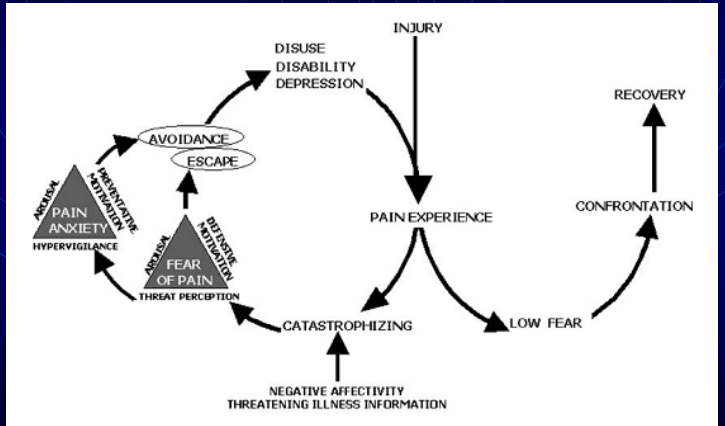


Fig. 1. The fear-avoidance model of chronic pain. Based on the fear-avoidance model of Vlaeyen and Linton (2000), and the fear-anxiety-avoidance model of Asmundson *et al.* (2004).

Severeijns, Vlaeyen, van den Hout, & Picavet, 2005

Pain catastrophizing predicts the development of chronic pain complaints in the general population

64

Goubert, Crombez, & Van Damme, 2004

Pain catastrophizing is associated with greater pain vigilance & preoccupation with pain & physical problems

65

Sullivan, Stanish, Sullivan & Tripp, 2002

Pain catastrophizing may mediate the reduced activity level seen in some clinical patients

Severeijns, Vlaeyen, van den Hout, & Weber, 2001; Turner, Jensen, Warms, & Cardenas, 2002;Woby, Watson, Roach, & Urmston, 2004.

Pain Catastrophizing is also related to variety of important functional & outcome variables, pain intensity, psychological distress, & level of disability.

Leeuw, et al., 2007

There is evidence that pain catastrophizing is a precursor to the development of pain-related fear

Healthcare
2016, Vol. 4, No. 1, 11.

http://doi.org/10.3390/healthcare4010011

Demoralization, Patient Activation, and the Outcome of Spine Surgery

Andrew R. Block
Texas Back Institute, Plano, Texas

- Ben-Porath (2012), defines demoralization as "a pervasive and affect-laden dimension of unhappiness and dissatisfaction with life." Demoralization, assessed by a 24-item scale exclusive to the MMPI-2-RF, scale RCd, includes items that "reflect the presence of dysphoric affect, distress, self-attributed inefficacy, low self-esteem and a sense of giving up" (p. 53).
- Solid Psychometrics: Simms, Casilas, Clark, Watson and Doebbeling (2005) found that among military veterans RCd elevations correlate strongly with both current and lifetime diagnosis of depressive and anxiety disorders, and with negative emotionality. Scale RCd, demonstrates desirable psychometric properties, including strong test-retest reliability r2 = 0.88, and internal consistency (r2 ranging from 0.87 to 0.93 depending on the population tested), with no significant differences between average scores of men and women (Tellegen & Ben-Porath, 2008, pp. 24–25).

- Marek, Block, and Ben-Porath (2015) and Block, Marek, Ben-Porath and Ohnmeiss (2014), has found that elevated scores on the demoralization scale, RCd, are strongly correlated with poorer results at six months post spine surgery, including less improvement in pain and in self-reported physical disability, lower return to work rates, greater use of opioid medication, poorer satisfaction with surgical outcome, and worse overall outcome.
- Specific components of demoralization assessed by the MMPI-2-RF, including scales measuring Helplessness/Hopelessness, Self-Doubt and Inefficacy (a belief that one is incapable of making decisions and coping with difficulties), are significantly associated with poorer satisfaction and reduced results of both spine surgery (Block, Ben-Porath, Marek & Ohnmeiss, 2014) and poorer results of spinal cord stimulation (Block, Marek, Ben-Porath & Kukal, 2015).

- *Demoralization is distinct from depression*, although both may include strong experience of negative emotions. Individuals who are depressed, in addition to displaying vegetative symptoms such as sleep disturbance, psychomotor retardation and lethargy, exhibit anhedonia, i.e., inability to experience pleasure (de Figueiredo, 1993). **Demoralized individuals, on the other hand, can experience positive emotion, but are plagued by feelings of helplessness, loss of hope and meaninglessness (Sansone & Sansone, 2010).**
- Patient Activation The feelings of ineffectiveness, helplessness and the sense of giving up that comprise the core of demoralization stand in sharp contrast to the behaviors and general health orientation that are associated with positive health outcomes. In order to achieve and maintain good health, individuals must be able take control over diet and exercise and seek out health information. Individuals also need to recognize when illness occurs, and be able to communicate with health care providers.

Patient Activation Measure (PAM)

1) Belief that taking an active role in health is important
2) Having the confidence and knowledge to take action
3) Taking health-related action
4) Staying the course under stress

Hibbard, J. H., Stockard, J., Mahoney, E. R, & Tusler, M. (2004). Development of the Patient Activation Measure (PAM): Conceptualizing and measuring activation in patients and consumers. *Health Services Research, 39*(4 Pt 1), 1005-1026. doi: 10.1111/j.1475-6773.2004.00269.x

- Patients in the highest level (upper quartile) of PAM scores showed greater reduction in reported pain levels at post-op follow up than did patients with lower levels of patient activation.
- Even though patients with highest PAM levels reported less pain at baseline.

Skolasky, R. L., Mackenzie, E. J., Wegener, S. T., & Riley, L. H. (2011). Patient activation and functional recovery in persons undergoing spine surgery. *Journal of Bone and Joint Surgery, 93*(18), 1665-1671. doi: 10.2106/JBJS.J.00855.

- Patient in the upper quartile of PAM scores showed greatest improvement in functional ability.

Skolasky, R. L., Mackenzie, E. J., Wegener, S. T., & Riley, L. H. (2011). Patient activation and functional recovery in persons undergoing spine surgery. *Journal of Bone and Joint Surgery, 93*(18), 1665-1671. doi: 10.2106/JBJS.J.00855.

PSYCHOLOGICAL COMORBITIES

Prevalence of psychiatric disorders in patient with chronic disabling occupational spinal disorders

- 65% of patients diagnosed with at least one concurrent disorder (not including Pain Disorder)
- 56% Major Depressive Disorder
- 14% Substance Use Disorders
- 11% Anxiety Disorders
- 70% Axis II Personality Disorders

Dersh, J., Gatchel, R. J., Mayer, T., Polatin, P. & Temple, O. R. (2006). Prevalence of psychiatric disorders in patients with chronic disabling occupational spinal disorders. Spine, 31(10), 1156-1162. doi: 10.1097/01.brs.0000216441.83135.6f

Carroll, Cassidy, & Cote, 2000; Currie & Wang, 2004

Depression is an important consideration in patients with chronic pain. Studies have shown a near linear association between self-reported pain intensity & depressive symptoms.

78

Trief, Grant, & Fredrickson, 2000

Higher levels of pre-surgical anxiety significantly predicted poorer functional outcome one year after receiving lumbar spine surgery to relieve pain.

79

Substance Abuse

- Addiction
- Overuse
- Overdose/Death
- Diversion

Risk Factor Assessment for Problematic Use of Opioids for Chronic Pain

Jamison, R., & Edwards, R.

The Clinical Neuropsychologist
2013:Vol.27 (1):60-80

82

Risk Factors for Opioid Misuse

- Young age
- Family or personal history of substance abuse
- History of criminal activity and/or legal problems (e.g., DUI)
- Smoking cigarettes
- Frequent contact with high-risk individuals or environments
- History of previous problems with employers, family, & friends.
- History of risk-taking/thrill-seeking behavior
- History of severe depression or anxiety
- Multiple psychosocial stressors
- Previous drug and/or alcohol rehabilitation

83

Part 3

Contextual Risk Factors

Education

- Lower education is a predictor of increased work-related disability (Breslin et al., 2008; Hagen, Holte, Tambs, & Bjerkedal, 2000).
- Lower education is associated with longer pain duration following back injury and a higher rate of pain recurrence (Dionne et al., 2001).
- Lower education is significantly associated with higher self-perceived disability (Roth & Geisser, 2002) and this relationship is mediated by:
  - maladaptive pain beliefs and coping strategies like catastrophizing (Roth & Geisser, 2002).
- Patients with lower education have more misconceptions about back pain (Goubert, Crombez, & De Boudeauhuij, 2004).

Rashiq & Dick, 2009

Lower education is associated with the presence of chronic pain

Abasolo, Lajas, Leon et al., 2012; Hagen, Holte, Tambs, & Bjerkedal, 2000.

Lower education has been identified as a prognostic indicator of work-related disability.

Dionne et al., 2001

Lower education is associated with longer pain duration following back injury and a higher rate of pain recurrence.

Janowski, Steuden, & Kurylowicz, 2010

Even after controlling for age, pain duration, sex, & incentive status, lower education is significant associated with higher self-perceived disability.

Education and SES

Breslin, F. C., Tompa, E., Zhao, R., Pole, J. D., Amick Iii, B. C., Smith, P. M., et al. (2008). The relationship between job tenure and work disability absence among adults: a prospective study. Accident Analysis and Prevention, 40(1), 368-375.

Chibnall, J. T., Tait, R. C., Andresen, E. M., & Hadler, N. M. (2005). Race and socioeconomic differences in post-settlement outcomes for African American and Caucasian Workers' Compensation claimants with low back injuries. Pain, 114(3), 462-472.

Hoofien, D., Vakil, E., Gilboa, A., Donovick, P. J., & Barak, O. (2002). Comparison of the predictive power of socio-economic variables, severity of injury and age on long-term outcome of traumatic brain injury: sample-specific variables versus factors as predictors. Brain Injury, 16(1), 9-27.

Roth, R.S. & Geisser, M.E. (2002) Educational Achievement and Chronic Pain Disability: Mediating Role of Pain-Related Cognitions. Clinical Journal of Pain, 18, 286-296.

Sherer, M., Bergloff, P., High, W., Jr., & Nick, T. G. (1999). Contribution of functional ratings to prediction of longterm employment outcome after traumatic brain injury. Brain Injury, 13(12), 973-981.

Tate, D. G. (1992). Workers' disability and return to work. Am J Phys Med Rehabil, 71(2), 92-96.

Turner, J. A., Franklin, G., Fulton-Kehoe, D., Sheppard, L., Wickizer, T. M., Wu, R., et al. (2006). Worker recovery expectations and fear-avoidance predict work disability in a population-based workers' compensation back pain sample. Spine, 31(6), 682-689.

Satisfaction with Company and Job

- *Hagen et al. (2000).*
  - Unskilled workers are two to three times more likely to retire due to disability than professionals.
  - this relationship may be partly due to a social class effect, rather than just physical job demands, as the relationship between professional level and disability retirement remained consistent at higher levels of levels of the socioeconomic scale
- *Volinn, Van Koevering, and Loeser (1991)*
  - lower pay is associated with longer back pain chronicity.
- *Tate (1992)*
  - younger workers with higher preinjury wages, greater seniority, and less severe injuries were more likely to return to work post injury.

Satisfaction with Company and Job

- Elements of the relationship between the worker and the company, including job satisfaction and availability of accommodations can also impact outcome and even the initiation of symptom reports.

- ***Bigos et al., 1991***
  - employees who reported that they "hardly ever" enjoyed their work were 2.5 times more likely to report a back injury than those who reported more positive feelings about their job/work
- ***Shaw, Pransky, Patterson, & Winters (2005)***
  - elements of the patient's job characteristics, including job tenure, physical work demands, availability of modified duty, and earlier reporting to employer, were more predictive of outcome than physical examination.
- ***Turner, Franklin, Fulton-Kehoe, Sheppard, Wickizer, and Wu (2007)***
  - found that baseline demographic variables, symptom severity, functional limitations, lack of job accommodation, job physical demands, job psychosocial conditions, and psychosocial characteristics predicted chronic disability following a claim for carpal tunnel syndrome.

Satisfaction with Company and Job

Bigos, S. J., Battie, M. C., Spengler, D. M., Fisher, L. D., Fordyce, W. E., Hansson, T. H. et al. (1991). A prospective study of work perceptions and psychosocial factors affecting the report of back injury. Spine, 16, 1-6.

Ellis, R. A., Novak, C. B., Mackinnon, S. E., & Cheng, C. J. (2007). Workers' compensation, return to work, and patient satisfaction after carpal tunnel decompression. American Journal of Orthopedics, 36(4), E63-66.

Hagen, K. B., Tambs, K., & Bjerkedal, T. (2002). A prospective cohort study of risk factors for disability retirement because of back pain in the general working population. Spine (Phila Pa 1976), 27, 1790-1796.

Hoogendoorn, W. E., Bongers, P. M., de Vet, H. C., Ariens, G. A., van Mechelen, W., & Bouter, L. M. (2002). High physical work load and low job satisfaction increase the risk of sickness absence due to low back pain: results of a prospective cohort study. Occupational and Environmental Medicine, 59(5), 323-328.

Shaw, W. S., Pransky, G., Patterson, W., & Winters, T. (2005). Early disability risk factors for low back pain assessed at outpatient occupational health clinics. Spine, 30, 572-580.

Tate, D. G. (1992). Workers' disability and return to work. Am J Phys Med Rehabil, 71(2), 92-96.

Turner, J. A., Franklin, G., Fulton-Kehoe, D., Sheppard, L., Wickizer, T. M., Wu, R., et al. (2007). Early predictors of chronic work disability associated with carpal tunnel syndrome: a longitudinal workers' compensation cohort study. Am J Ind Med, 50(7), 489-500.

Wickizer, T. M., Franklin, G., Fulton-Kehoe, D., Turner, J. A., Mootz, R., & Smith-Weller, T. (2004). Patient satisfaction, treatment experience, and disability outcomes in a population-based cohort of injured workers in Washington State: implications for quality improvement. Health Services Research, 39(4 Pt 1), 727-748.

Volinn, E., Van Koevering, D., & Loeser, J. D. (1991). Back sprain in industry. The role of socioeconomic factors in chronicity. Spine, 16, 542-548.

Work Duties and Environment

Breslin, F. C., Tompa, E., Zhao, R., Pole, J. D., Amick Iii, B. C., Smith, P. M., et al. (2008). The relationship between job tenure and work disability absence among adults: a prospective study. Accident Analysis and Prevention, 40(1), 368-375.

Carragee, E. J., Alamin, T. F., Miller, J. L., & Carragee, J. M. (2005). Discographic, MRI and psychosocial determinants of low back pain disability and remission: a prospective study in subjects with benign persistent back pain. Spine J, 5(1), 24-35.

Fransen, M., Woodward, M., Norton, R., Coggan, C., Dawe, M., & Sheridan, N. (2002). Risk factors associated with the transition from acute to chronic occupational back pain. Spine, 27(1), 92-98.

Roelen, C. A., Koopmans, P. C., de Graaf, J. H., van Zandbergen, J. W., & Groothoff, J. W. (2007). Job demands, health perception and sickness absence. Occup Med (Lond), 57(7), 499-504.

Shaw, W. S., Pransky, G., Patterson, W., & Winters, T. (2005). Early disability risk factors for low back pain assessed at outpatient occupational health clinics. Spine, 30(5), 572-580.

Stover, B., Wickizer, T. M., Zimmerman, F., Fulton-Kehoe, D., & Franklin, G. (2007). Prognostic factors of long-term disability in a workers' compensation system. J Occup Environ Med, 49(1), 31-40.

Tate, D. G. (1992). Workers' disability and return to work. Am J Phys Med Rehabil, 71(2), 92-96.

Turner, J. A., Franklin, G., Fulton-Kehoe, D., Sheppard, L., Wickizer, T. M., Wu, R., et al. (2007). Early predictors of chronic work disability associated with carpal tunnel syndrome: a longitudinal workers' compensation cohort study. Am J Ind Med, 50(7), 489-500.

Turner, J. A., Franklin, G., Fulton-Kehoe, D., Sheppard, L., Wickizer, T. M., Wu, R., et al. (2007). Early predictors of chronic work disability associated with carpal tunnel syndrome: a longitudinal workers' compensation cohort study. Am J Ind Med, 50(7), 489-500.

Turner, J. A., Franklin, G., & Turk, D. C. (2000). Predictors of chronic disability in injured workers: a systematic literature synthesis. Am J Ind Med, 38(6), 707-722.

Part 4

Financial Incentive and Compensation

The presence of potential monetary compensation is associated with greater symptoms & disability and poorer outcome in pain.

Cassidy, J. D., Carroll, L., Cote, P., Berglund, A., & Nygren, A. (2003). Low back pain after traffic collisions: a population-based cohort study. *Spine, 28*, 1002-1009.

- ***STUDY DESIGN***: A population-based, incidence cohort study was conducted.
- ***OBJECTIVE***: To measure the incidence and prognosis for collision-related low back pain before and after a change in the insurance compensation system.
- ***METHODS***: An incidence cohort of 4473 low back pain injury claims was formed between July 1, 1994 and December 31, 1995 in Saskatchewan.
- On January 1, 1995 the public insurance system changed from a tort system to a no-fault system, eliminating compensation for pain and suffering.
- The incidence of claims and the time to claim closure were calculated before and after this change. Prognostic models were built using baseline and follow-up data.

Cassidy JD, Carroll L, Cote P, Berglund A, & Nygren A. (2003). Low back pain after traffic collisions: a population-based cohort study. *Spine*, *28*, 1002-1009.

- 4473 low back pain injury claims for period of 7/01/1994 to 12/31/1995.
- 1/01/1995: public insurance system changed from a *tort system* to a *no-fault system*
  - Compensation for pain & suffering was eliminated

Cassidy JD, Carroll L, Cote P, Berglund A, & Nygren A. (2003). Low back pain after traffic collisions: a population-based cohort study. *Spine*, *28*, 1002-1009.

- The 6-month incidence of claims:
  - Tort claims period: **256 per 100,000**
  - No-fault period: **176 per 100,000**
- The median time to claim closure:
  - Tort claims period: **505 days**
  - 1st 6 month no-fault period: **210 days**
  - 2nd 6 month no-fault period: **216 days**

Rohling et al. (1995). Money Matters: A Meta-Analytic Review of the Association Between Financial Compensation and the Experience and Treatment of Chronic Pain. *Health Psychology*, *14*, 537-547.

- Meta-analytic procedures were used to determine the relation between disability compensation and pain.
- Of the 157 relevant identified studies, only 32 contained quantifiable data from treatment and control groups.
- The majority of these exclusively examined chronic low back pain patients (72%).
- Overall, 136 comparisons were obtained, on the basis of 3,802 pain patients and 3,849 controls.
- Liberal procedures for estimating effect sizes (ESs) yielded an ES of .60 ($p < .0002$).
- Conservative procedures yielded an ES of .48 ($p < .0005$).
- Both ESs differed from zero, indicating that compensation is related to increased reports of pain and decreased treatment efficacy.

Harris et al. (2005). Association Between Compensation Status and Outcome After Surgery: A Meta-analysis. *Journal of American Medical Association 293*, 1644-1652.

- 211 studies satisfied the inclusion criteria.
- 175 studies found that the presence of compensation (worker's compensation with or without litigation) was associated with a worse outcome
- 35 found no difference or did not describe a difference
- 1 study reported compensation was associated with improvement

Harris et al. (2005). Association Between Compensation Status and Outcome After Surgery: A Meta-analysis. *Journal of American Medical Association 293*, 1644-1652.

- 129 studies, 20,498 patients, with appropriate data.
- Odds Ratio = **3.79** (±.58) for unsatisfactory outcome in compensated patients.

Harris et al. (2005). Association Between Compensation Status and Outcome After Surgery: A Meta-analysis. *Journal of American Medical Association 293*, 1644-1652.

- Effect was consistent across:
  - country
  - procedure
  - length of follow-up
  - completeness of follow-up
  - study type
  - type of compensation

Table. Subgroup Analysis of the Association Between Compensation Status and Unsatisfactory Outcome

Subgroup	No. of Studies	Odds Ratio (95% Confidence Interval)
Study type		
Randomized controlled trial	2	5.03 (3.22-7.86)
Cohort study	30	3.59 (2.74-4.67)
Case series	97*	3.87 (3.25-4.61)
Minimum time to follow-up, mo		
0-6	21	3.81 (2.72-5.34)
7-12	30	4.02 (3.08-5.25)
13-24	34*	4.36 (3.17-6.01)
>24	30	3.44 (2.60-4.55)
Completeness of follow up, %		
≥80	111*	3.84 (3.30-4.47)
<80	18	3.61 (2.39-5.47)
Prospective vs retrospective design		
Prospective	15	3.60 (2.70-4.80)
Retrospective	114*	3.84 (3.27-4.50)
Procedure		
Shoulder acromioplasty	13	4.46 (2.71-7.40)
Lumbar spine fusion	10	4.33 (2.81-6.62)
Lumbar spine discectomy	24	4.77 (3.51-6.50)
Lumbar intradiscal chymopapain injection	9	3.67 (2.45-5.51)
Carpal tunnel decompression	10	4.24 (2.43-7.40)
Country of origin		
United States	106*	3.77 (3.20-4.43)
Canada	12	4.02 (2.65-6.09)
Europe, all	6	7.42 (4.37-12.60)
Australia	5	2.23 (1.49-3.36)
Study designed to assess compensation effect		
Yes	16	3.60 (2.50-5.20)
No	113*	3.85 (3.29-4.51)
Compensation type		
Workers' compensation only	86*	3.89 (3.26-4.64)
Workers' compensation and litigation	43	3.69 (2.88-4.73)
Revision vs primary surgery		
Primary surgery only	81	3.66 (3.07-4.36)
Revision surgery only	10	5.54 (3.47-8.83)

*Includes 1 study with an unestimatable odds ratio (no unsatisfactory outcomes).

Voorhies, R. M., Jiang X., & Thomas, N. (in press). 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. *The Spine Journal*.

- Prospective study with 12 month follow-up.
- Sample:
  - 110 adults who failed conservative treatment, had neurological deficit, or truly intolerable pain.
  - Symptoms associated with disc herniation, synovial cyst, or foraminal stenosis.
  - Signs and symptoms correlated with imaging studies.
  - All had a single symptomatic spinal nerve.
- Procedure:
  - Surgical decompression of a single spinal nerve

Voorhies, R. M., Jiang X., & Thomas, N. (in press). 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. *The Spine Journal*.

Assessment:

- Prolo Functional Economic Outcome Rating Scale
- McGill Pain Questionnaire
- Visual Analogue Score (10 point scale)
- Modified Ransford Pain Drawing Score
- Psychological comorbidity (yes/no)
- Personal Injury Claim (yes/no)
- Workers Compensation Claim (yes/no)

Voorhies, R. M., Jiang X., & Thomas, N. (in press). 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. *The Spine Journal*.

- Good outcome based on patient assessment was a 50% of greater reduction in VAS.
- All patients with psychiatric comorbidity or personal injury claim had poor outcomes.
- 23% of compensation cases had good outcomes.
- High pre-operative McGill scores were associated with poor outcome (< 50% with good outcome).

Conclusion

The presence of financial incentive is associated with . . .

- Poorer functional outcome overall
- Poor response to a range of treatments and interventions designed to manage pain.

. . . even in unambiguous surgical cases

Neuropsychological Evaluation of Somatoform and Other Functional Somatic Conditions

Assessment Primer

Edited by Kyle Brauer Boone

14

THE FINANCIAL INCENTIVE EFFECT

It's Not Just Malingering

Kevin J. Bianchini, F. Charles Frey, StephenBrewer, Joy Bui, and Luis Aguerrevere

Work Injuries:
Patient
Company Claims Personnel
Insurance Adjuster
Case Manager
Attorneys:
For Patient in WC Litigation
For Company or Carrier in WC Litigation
Attorneys for separate 3rd Party Litigation

1. Elements of the system that contribute to poor outcome.

2. Patient indicators for elevated risk for poor outcome.

The probability of recovery and return to work from work disability as a function of time

J. Crook & H. Moldofsky

Quality of Life Research
1994;3(1):S97-S109

Determinants of Escalating costs in Low Risk Workers' Compensation Claims

Bernacki, E.J., et al.

Journal of Occupational and Environmental Medicine
2007;49:780-790

Certain attributes, particularly attorney involvement and claim duration, are associated with unanticipated cost escalation in a small number of claims that drastically affect overall losses.

The Relationship Between Attorney Involvement, Claim Duration, and Workers' Compensation Costs

Bernacki, E. J., & Tao, X

Journal of Occupational and Environmental Medicine
2008;50:1013-1018

- Compared: 738 claims with attorney involvement
- and 6191 claims without attorney involvement
- injured between August 1, 2003 and July 31, 2004 whose claims were paid by the Louisiana Workers' Compensation (LWCC).

- 97% of claims not involving attorneys and 57.5% of claims involving attorneys were closed (resolved)

The Impact of Cost Intensive Physicians on Workers' Compensation

Bernacki, E. J., et al.

Journal of Occupational and Environmental Medicine
2010;52:22-28

- To identify physicians linked to high-cost workers' compensation claims.
- Contrast the cost and duration of claims associated with cost intensive physicians (CIPS) and other physicians (OPS) on 5 years of closed claims paid by the Louisiana Workers' Compensation Corporation

- Identified 77 CIPs of 2034 physicians who treated Louisiana Workers' Compensation Compensation claimants.
- CIPs made up 3.8% of physicians but accounted for 72% of costs.

- CIPs treated 16 times more claimants, and their average claim cost was 4 times higher than the OPS ($46,239 vs. $11,390, P<0.01).
- CIP claims settled in 697 versus 278 days for OPS. Adjusted for age, sex, marital status, International Classification of Diseases, 9th revision group, and initial reserve, the odds ratio of CIP claims with a final cost of >$50,000 was 5.4.

Administrative Delays & Chronic Disability in Patients With Acute Occupational Low Back Injury

Sinnott, P., PT, PhD, MPH

Journal of Occupational and Environmental Medicine 2009;51:690-699

- Assessed whether an organizational factor, delays to claim acceptance or administrative delays had an influence on outcomes for individuals with acute back injuries in the workers' compensation system. 35,304 workers from the California Workers Compensation Institute Claim Information System.
- Multivariate logistic regression was used to test whether individuals who experienced administrative delays were more likely to develop chronic disability than those who did not experience delays.

- Beyond the first 2 weeks, each interval of administrative delay was associated with increased odds of developing chronic disability.
- Injury severity, physician experience and weeks to medical treatment were additionally very strong predictors for the development of disability.

TABLE 2
Adjusted and Unadjusted Odds Ratios for Developing Chronic Disability (n = 35,304)

	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI) Least Severe Cases Only
Administrative delay			
≤14 d	0.586 (0.559–0.613)**	Reference	Reference
>14 and ≤28 d	1.313 (1.242–1.390)**	1.349 (1.264–1.440)**	1.433 (1.327–1.547)**
>28 and ≤56 d	1.340 (1.237–1.452)**	1.353 (1.234–1.484)**	1.423 (1.277–1.586)**
>56 and ≤90 d	1.540 (1.383–1.715)**	1.475 (1.305–1.666)**	1.477 (1.281–1.704)**
≥91 d	2.081 (1.903–2.276)**	1.562 (1.407–1.735)**	1.837 (1.626–2.077)**
Weeks to treatment			
≤2	0.323 (0.305–0.341)**	Reference	Reference
>2 and ≤4	1.596 (1.445–1.762)**	1.593 (1.426–1.779)**	1.746 (1.530–1.992)**
>4 and ≤8	2.295 (2.039–2.583)**	2.145 (1.879–2.448)**	2.522 (2.150–2.957)**
>8 and ≤12	2.594 (2.204–3.053)**	2.437 (2.034–2.921)**	2.530 (2.041–3.137)**
>12 and ≤26	2.964 (2.608–3.368)**	2.674 (2.311–3.095)**	3.088 (2.587–3.686)**
≥26	3.989 (3.622–4.394)**	3.975 (3.534–4.471)**	4.944 (4.287–5.700)**
Severity of injury			
Most severe	5.794 (5.071–6.619)**	6.467 (5.609–7.455)**	
Moderately severe	3.884 (3.672–4.107)**	3.572 (3.362–3.796)**	
Least severe	0.215 (0.204–0.227)**	Reference	
Provider experience			
Least—average of ≤2 patients/yr	2.699 (2.570–2.834)**	2.296 (2.158–2.443)**	2.726 (2.533–2.935)**
Minimal—average of >2 and ≤3 pts/yr	0.796 (0.718–0.883)**	1.384 (1.226–1.564)**	1.502 (1.302–1.733)**
Moderate—average of >3 and ≤60 pts/yr	0.408 (0.386–0.432)**	Reference	Reference
Most—average of >60 pts/yr	0.439 (0.398–0.485)**	0.588 (0.520–0.666)**	0.652 (0.565–0.752)**
Age			
14–25 yrs	0.657 (0.616–0.702)**	0.707 (0.651–0.767)**	0.703 (0.639–0.773)**
26–35 yrs	0.924 (0.881–0.969)**	Reference	Reference
36–45 yrs	1.153 (1.098–1.212)**	1.167 (1.094–1.244)**	1.222 (1.133–1.318)**
46–55 yrs	1.276 (1.202–1.355)**	1.289 (1.193–1.393)**	1.385 (1.264–1.518)**
56–65 yrs	1.224 (1.113–1.346)**	1.297 (1.156–1.455)**	1.364 (1.189–1.564)**
≥66 yrs	1.126 (0.859–1.475)	1.042 (0.767–1.416)	1.076 (0.737–1.572)
Age missing	0.583 (0.437–0.776)**	0.603 (0.439–0.827)**	0.57 (0.390–0.833)**

Average weekly wage			
≤$259	1.165 (1.107–1.226)**	1.158 (1.073–1.250)**	1.177 (1.077–1.287)**
$260–$399	1.142 (1.086–1.203)**	1.104 (1.028–1.186)**	1.094 (1.006–1.189)*
$400–$644	1.052 (1.000–1.108)	Reference	Reference
≥$645	0.702 (0.665–0.741)**	0.696 (0.645–0.750)**	0.753 (0.688–0.824)**
Tenure			
≤6 mo	1.274 (1.211–1.341)**	1.171 (1.095–1.252)**	1.168 (1.081–1.262)**
>6 mo and ≤12 mo	1.114 (1.039–1.192)*	1.073 (0.986–1.167)	1.077 (0.977–1.188)
>12 mo and <6 yrs	1.083 (1.032–1.136)**	Reference	Reference
≥6 yrs and ≤10 yrs	0.896 (0.839–0.956)**	0.888 (0.818–0.964)**	0.883 (0.801–0.974)*
≥11 yrs and <20 yrs	0.771 (0.713–0.833)**	0.748 (0.678–0.825)**	0.751 (0.667–0.846)**
≥20 yrs	0.877 (0.774–0.995)*	0.752 (0.646–0.877)**	0.762 (0.630–0.922)*
Tenure missing	0.337 (0.291–0.391)**	0.405 (0.344–0.476)**	0.357 (0.294–0.433)**
Gender			
Female	1.170 (1.112–1.230)**	Reference	Reference
Male	0.808 (0.769–0.849)**	0.926 (0.871–0.984)*	0.885 (0.824–0.950)**
Missing	1.744 (1.514–2.008)**	1.081 (0.913–1.280)	1.087 (0.891–1.327)
Employer size			
1 employee only	1.285 (1.110–1.486)**	0.953 (0.807–1.127)	1.067 (0.876–1.299)
2–50 employees	0.889 (0.848–0.932)**	Reference	Reference
51–100 employees	1.074 (0.997–1.157)	1.095 (0.999–1.200)	1.129 (1.015–1.256)*
101–500 employees	1.128 (1.060–1.200)**	1.042 (0.962–1.129)	1.045 (0.951–1.148)
501–1,000 employees	1.149 (1.004–1.305)*	1.153 (0.983–1.352)	1.138 (0.944–1.372)
1,000 employees	0.854 (0.752–0.969)*	0.934 (0.798–1.093)	0.924 (0.764–1.118)
Occupational sector			
Agriculture and mining	0.873 (0.835–0.913)**	Reference	Reference
Construction	0.967 (0.887–1.053)*	1.162 (1.045–1.293)**	1.139 (1.005–1.291)*
Manufacturing	1.302 (1.212–1.399)**	1.183 (1.078–1.299)**	1.203 (1.080–1.342)**
Transportation	1.026 (0.857–1.227)	1.055 (0.859–1.297)	0.967 (0.757–1.235)
Wholesale	0.855 (0.752–0.973)*	0.962 (0.829–1.117)	0.999 (0.840–1.187)

Effects of Presenteeism in Chronic Occupational Musculoskeletal Disorders: Stay at Work Is Validated

Howard, K. J., Mayer, T.G., & Gatchel, R. J.

Journal of Occupational and Environmental Medicine
2009;51:724-731

- 2191 Consecutive chronic disabling musculoskeletal disorder pts., classified as either presentees (N=704), or absentees (N=1487)
- Admitted to a functional restoration program
- Measures included medical evaluations, demographic data, psychiatric diagnoses at admission, a 1-yr. follow-up socioeconomic outcome assessment and validated questionnaires evaluating pain, depression & function

The findings revealed that patients classified as presentees were significantly more likely:

- To complete the prescribed functional restoration treatment program
- To return to work (full-duty or full–time)
- To retain work 1-yr posttreatment, and not to have a decrease in job demand from preinjury to posttreatment

Health Services Research
2004, Vol. 39, No. 4p1, 727-748.

https://doi.org/10.1111/j.1475-6773.2004.00255.x

Patient Satisfaction, Treatment Experience, and Disability Outcomes in a Population-Based Cohort of Injured Workers in Washington State: Implications for Quality Improvement

Thomas M. Wickizer
Gary Franklin
Deborah Fulton-Kehoe
Judith A. Turner
Robert Mootz
Terri Smith-Weller

- Workers who reported less favorable treatment experience were 3.54 times as likely to be receiving time-loss compensation for inability to work due to injury 6 or 12 months after filing a claim, when compared to patients with a positive treatment experience.

Journal of Occupational and Environmental Medicine
2004, Vol. 46, No. 4, 331-339.

http://dx.doi.org/10.1097/01.jom.0000121130.79868.e6

Use of Attorneys and Appeal Filing in the Washington State Worker's Compensation Program: Does Patient satisfaction matter?

Thomas M. Wickizer
Judith A. Turner
Robert Mootz
Gary Franklin
Deborah Fulton-Kehoe
Terri Smith-Weller

- It was observed that workers who were less satisfied with claims procedures were more likely to retain an attorney or file an appeal.

- Summary:
- On either "side" of the claim when individual members of the patient-care system behave in way that actualizes or gratifies their own incentives (e.g., lawyers referring patients to doctors who prolong disability), it ultimately results in a greater level of disability/poor outcomes for individual patients.
- Different elements of the system may interact in ways that lead to worse outcomes.
- One way this happens is through delays, including administrative delays but also delays linked to the presence of attorneys and cost-intensive physicians. Time, and, in particular, delays in rehabilitation are associated with a greater likelihood of long-term disability, while earlier return to work and remaining on the job ("presenteeism") are linked with better long-term outcome.
- Clearly an important goal should be rapid rehabilitation with return to some form of work/increased levels of functioning.
- For example, the Bernacki studies show that attorney retention and the choice of physicians are associated with longer claim duration and longer period of disability (and thus a greater likelihood of long-term disability).

- However, in the research of Wickizer's group, patients who are displeased with interpersonal or technical aspects of their care are more likely to retain attorneys.
- Thus, claims personnel who do not handle important aspects of patients' care properly may actually be part of what drives patients to retain attorneys.
- These lawyers may then, in turn, refer PFIs to CIPs to care for the patients who prolong the period of disability and therefore increase the likelihood of permanent disability.
- In this sense different interpersonal interactions within different elements of the system lead to the same net result: rehabilitation delays and greater risk of poor outcome.

Part 5

Malingering

Malingering Essentials:

intentional symptom production

. . . motivated by

external incentive

Baserates of Malingering

Population	Survey Estimates*	Direct Assessment
Mild TBI	39%	40%
Mod-Severe TBI	9%	14%
Chronic Pain	31%	25%
Toxic Exposure	27%	40%
Criminal Forensic	19%	54%

*Mittenberg, W., Patton, C., Canyock, E. M., & Condit, D. C. (2002). Base rates of malingering and symptom exaggeration. *Journal of Clinical and Experimental Neuropsychology, 24*, 1094-1102.

Direct assessment of malingering

Traumatic Brain Injury

- Larrabee, G. J. (2003). Detection of malingering using atypical performance patterns on standard neuropsychological tests. *The Clinical Neuropsychologist, 17*, 410-425.
- Bianchini, K. J., Curtis, K. L., & Greve, K. W. (2006). Compensation and Malingering in Traumatic Brain Injury: A Dose-Response Relationship? *The Clinical Neuropsychologist, 20*, 831 - 847.

Chronic Pain

- Greve, K. W., Ord, J. S., Bianchini, K. J., & Curtis, K. L. (2009). The prevalence of malingering in chronic pain patients referred for psychological evaluation in a medico-legal context. *Archives of Physical Medicine & Rehabilitation, 90*, 1117-1126.

Toxic Exposure

- Greve, K. W., Bianchini, K. J., Black, F. W., Heinly, M. T., Love, J. M., Swift, D. A., Megan Ciota, M. (2006). The Prevalence of Cognitive Malingering in Persons Reporting Exposure to Occupational and Environmental Substances. *NeuroToxicology, 27*, 940-950.

Criminal Forensic

- Ardolf, B. R., Denney, R. L., & Houston, C. M. (in press). Base Rates of Negative Response Bias and Malingered Neurocognitive Dysfunction Among Criminal Defendants Referred for Neuropsychological Evaluation. *The Clinical Neuropsychologist*.

Bianchini, K. J., Greve, K. W., & Glynn, G. (2005). On the Diagnosis of Malingered Pain-Related Disability: Lessons from Cognitive Malingering Research. *The Spine Journal, 5,* 404-417.

- How can you tell someone is malingering when you deal with a subjective complaint?
- If someone says "I hurt," how do you approach trying to understand whether or not that is valid?
- Is anything about that claim measurable?

Bianchini, K. J., Greve, K. W., & Glynn, G. (2005). On the Diagnosis of Malingered Pain-Related Disability: Lessons from Cognitive Malingering Research. *The Spine Journal, 5,* 404-417.

- What is measurable is the claimed degree of disability.
- The degree of disability may also be the thing most relevant for the claim.

Disability = Financial Damages

- This is the rationale for shifting the emphasis from subjective report to measurable level of disability and is the basis for the concept of ***Malingered Pain-Related Disability***.

Malingered Pain-Related Disability (MPRD)

- the intentional exaggeration or fabrication of cognitive, emotional, behavioral, or physical dysfunction attributed to pain for the purposes of obtaining financial gain, to avoid work, or to obtain drugs (incentive) (Bianchini, Greve, & Glynn, 2005).

Intent is inferred as a result of ***the combined improbability of events*** rather than relying on a single definitive indication of intent.

Larrabee, G. J., Greiffenstein, M. F., Greve, K. W., & Bianchini, K. J. (2007). Refining Diagnostic Criteria for Malingering. In G. J. Larrabee (Ed.), *Evaluation of Malingering In the Neuropsychological Examination*. New York: Oxford University Press.

Bianchini, K. J., Greve, K. W., & Glynn, G. (2005). On the Diagnosis of Malingered Pain-Related Disability: Lessons from Cognitive Malingering Research. *The Spine Journal, 5,* 404-417.

Central Points

- Disability is multimodal (cognitive, physical, emotional).
- Aspects of the disability claim may or may not be related to the nature of the injury.
- In other words, if the goal is disability, logic may not constrain the nature of the disability complaints.

Modalities

- Cognitive
- Emotional
- Physical
- Sensory

Vectors

- Intentional exaggeration of symptoms
- Intentional exaggeration of diminished capacity (under-performance)

Malingered Pain-Related Disability

Bianchini, Greve, & Glynn (2005)

Criterion A: Evidence of significant external incentive

Criterion B: Evidence from physical evaluation

1. Probable effort bias
2. Discrepancy between subjective report of pain and physiological reactivity
3. Non-organic findings
4. Discrepancy between the patient's physical presentation during formal evaluation and their physical capacities documented when they are not aware of being observed

Criterion C: Evidence from cognitive/perceptual (neuropsychological) testing

1. Definite negative response bias
2. Probable response bias
3. Discrepancy between cognitive/neuropsychological test data and known patterns of brain functioning
4. Discrepancy between test data and observed behavior

Criterion D: Evidence from self-report

1. Compelling inconsistency
2. Self-reported history is discrepant with documented history
3. Self-reported symptoms are discrepant with known patterns of physiologic or neurological functioning
4. Self-reported symptoms are discrepant with observations of behavior
5. Evidence from formal psychological evaluation that the person has significantly misrepresented their current status

Criterion E: Behavior meeting necessary criteria from groups B, C, and D are not full accounted for by psychiatric, neurological or developmental factors

Malingered Pain-Related Disability

Bianchini, Greve, & Glynn (2005)

I. Definite MPRD

- Presence of substantial external incentive [Criterion A]
- "Definitive" evidence of intent [Criterion C1 or D1]
- Behaviors meeting the criteria for "definitive" intent [C1 or D1] are not fully accounted for by psychiatric, neurological or developmental factors. [Criterion E]

II. Probable MPRD

- Evidence of significant external incentive [Criterion A]
- Two or more types of "probable" evidence of intent from Criterion B [B1-B5], Criterion C [C2-C5] and/or Criterion D [D2-D6]. This evidence must be well-validated and have a known error rate.
- Behavior meeting necessary criteria from groups B, C, and D are not fully accounted for by psychiatric, neurological or developmental factors. [Criterion E]

III. Possible MPRD

- Evidence of significant external incentive [Criterion A]
- Evidence does not rise to the level sufficient for a diagnosis of Probable MPRD.

  Only one type of quantitative "probable" evidence of intent from Criterion B [B1-B5], Criterion C [C2-C5] and/or Criterion D [D2-D6].

  OR

  One or more forms of qualitative evidence of intent from Criterion B [B1-B5], Criterion C [C2-C5] and/or Criterion D [D2-D6].

  OR

  Evidence sufficient for a diagnosis of MPRD is present BUT Criterion E is not met.

SVT's

- **Bianchini, K. J.**, Aguerrevere, L. E., Curtis, K. L., Roebuck-Spencer, T. M., Frey, F. C., Greve, K. W., & Calamia, M. (2018). Classification accuracy of the Minnesota Multiphasic Personality Inventory-2 (MMPI-2)-Restructured from validity scales in detecting malingered pain-related disability. *Psychological Assessment, 30*(7), 857-869. doi: 10.1037/pas0000532.

- Aguerrevere, L. E., Calamia, M. R., Greve, K. W., **Bianchini, K. J.**, Curtis, K. L., Ramirez, V. (2018). Clusters of financially incentivized chronic pain patients using the Minnesota Multiphasic Personality Inventory-2 Restructured Form (MMPI-2-RF). *Psychological Assessment, 30*(5), 634-644. doi: 10.1037/pas0000509.

- **Bianchini, K. J.**, Aguerrevere, L. E., Guise, B. J., Ord, J. S., Etherton, J. L., Meyers, J. E., Soignier, R. D., Greve, K. W., Curtis, K., & Bui, J. (2014). Accuracy of the Modified Somatic Perception Questionnaire and Pain Disability Index in the detection of malingered pain-related disability in chronic pain. *The Clinical Neuropsychologist, 28*(8), 1376-1394. doi: 10.1080/13854046.2014.986199.

- **Bianchini, K. J.,** Etherton, J. L., Greve, K.W., Heinly, M. T., & Meyers, J. E. (2008). Classification accuracy of MMPI-2 validity scales in the detection of pain-related malingering: A known-groups approach. *Assessment*, *15*(4), 435-449. doi: 10.1177/1073191108317341.

- Aguerrevere, L., Greve, K. W., **Bianchini, K. J**., & Meyers, J. E. (2008). Detecting malingering in traumatic brain injury and chronic pain with an abbreviated version of the Meyers Index for the MMPI-2. *Archives of Clinical Neuropsychology, 23*(7-8), 831-838. doi: 10.1016/j.acn.2008.06.008.

PVT's

- Greve, K. W., **Bianchini, K. J.,** & Brewer, S. T. (2013). The assessment of performance and self-report validity in persons claiming pain-related disability. *The Clinical Neuropsychologist*, *27*(1), 108-137. doi: 10.1080/13854046.2012.739646.

- Greve, K. W., **Bianchini, K. J.,** Etherton, J. L., Meyers, J. E., Curtis, K. L., & Ord, J. (2010). The Reliable Digit Span Test in chronic pain: Classification accuracy in detecting malingered pain-related disability. *The Clinical Neuropsychologist, 24*(1), 137-152. doi: 10.1080/13854040902927546.

- Greve, K. W., Etherton, J. L, Ord, J., **Bianchini, K. J.,** & Curtis, K. L. (2009). Detecting malingered pain-related disability: Classification accuracy of the Test of Memory Malingering. *The Clinical Neuropsychologist, 23*(7), 1250-1271. doi: 10.1080/13854040902828272.

- Greve, K. W., **Bianchini, K. J.,** Etherton, J. L., Ord, J. S., & Curtis, K. L. (2009). Detecting malingered pain-related disability: Classification accuracy of the Portland Digit Recognition Test. *The Clinical Neuropsychologist, 23*(5), 850-869. doi: 10.1080/13854040802585055.

- Greve, K. W., Ord, J., Curtis, K. L., **Bianchini, K. J.,** & Brennan, A. (2008). Detecting malingering in traumatic brain injury and chronic pain: a comparison of three forced-choice symptom validity tests. *The Clinical Neuropsychologist, 22*(5), 896-918. doi: 10.1080/13854040701565208.

- Etherton, J. L., **Bianchini, K. J.,** Heinly, M. T., & Greve, K. W. (2006). Pain, malingering, and performance on the WAIS-III Processing Speed Index. *Journal of Clinical and Experimental Neuropsychology, 28*(7), 1218-1237.

- Etherton, J. L., **Bianchini, K. J.,** Ciota, M. A., Heinly, M. T., & Greve, K. W. (2006). Pain, malingering and the WAIS-III Working Memory Index. *The Spine Journal, 6*(1), 61-71.

- Etherton, J. L., **Bianchini, K. J.,** Greve, K. W., & Heinly, M. T. (2005). Sensitivity and specificity of reliable digit span in malingered pain-related disability. *Assessment, 12*(2), 130-136.

- Etherton, J. L., **Bianchini, K. J.**, Greve, K. W., Ciota, M. A. (2005). Test of Malingering Performance is unaffected by laboratory-induced pain: Implications for clinical use. *Archives of Clinical Neuropsychology, 20*(3), 365-373.

- Etherton, J. L., **Bianchini, K. J.,** Ciota, M. A., & Greve, K. W. (2005). Reliable Digit Span is unaffected by laboratory-induced pain: Implications for clinical use. *Archives of Clinical Neuropsychology, 12*(1), 101-106.

- **Bianchini, K. J.,** Etherton, J. L., & Greve, K. W. (2004). Diagnosing cognitive malingering in patients with work-related pain: Four cases. *Journal of Forensic Neuropsychology, 4*(1), 65-85. doi: 10.1300/j151v04n01_04.

Conceptual Papers

- Greiffenstein, M. F. & Bianchini, K. J. (2013). Introduction to pain psychology special issue. *The Clinical Neuropsychologist, 27*(1), 14-16. doi: 10.1080/13854046.2012.739645.

- Greve, K. W., Ord, J. S., **Bianchini, K. J.,** & Curtis, K. L. (2009). Prevalence of malingering in chronic pain patients referred for psychological evaluation in a medico-legal context. *Archives of Physical Medicine & Rehabilitation, 90*(7), 1117-1126. doi: 10.1016/j.apmr.2009.01.018.

- **Bianchini, K. J.**, Greve, K. W., Glynn, G. (2005). On the diagnosis of malingered pain-related disability: Lessons from cognitive malingering research. *The Spine Journal, 5*(4), 404-417.

- Greve, K. W. & **Bianchini, K. J.** (2004). More on the clinical and scientific relevance of "symptom amplification" and psychological factors in pain. *Pain, 110*(1-2), 499-500. [letter].

Waddell's signs

- Wygant, D. B., Arbisi, P. A., **Bianchini, K. J.**, & Umlauf, R. L. (2017). Waddell non-organic signs: New evidence suggests somatic amplification among outpatient chronic pain patients. *The Spine Journal, 17(*4), 505-510. doi: 10.1016/j.spinee.2016.10.018.

The Clinical Neuropsychologist
2014, Vol. 28, No. 8, 1376-1394.

https://doi.org/10.1080/13854046.2014.986199

Accuracy of the Modified Somatic Perception Questionnaire and Pain Disability Index in the Detection of Malingered Pain-Related Disability in Chronic Pain

Kevin J. Bianchini
Jefferson Neurobehavioral Group, Metairie, Louisiana

Brian J. Guise
University of New Orleans

Joseph L. Etherton
Texas State University

R. Denis Soignier
Nicholls State University

Kelly L. Curtis
High Point University

Joy Bui
Jefferson Neurobehavioral Group, Metairie, Louisiana

Luis E. Aguerrevere
Stephen F. Austin State University

Jonathan S. Ord
University of New Orleans

John E. Meyers
Center for Neuroscience, Dakota Dunes, South Dakota; Meyers Neuropsychological Services, Mililani, Hawaii

Kevin W. Greve
Jefferson Neurobehavioral Group, Metairie, Louisiana

- Tait, R. C., Chibnall, J. T., & Krause, S. (1990). The Pain Disability Index: Psychometric properties. *Pain, 40*, 171-182.

- Main, C. J. (1983). The Modified Somatic Perception Questionnaire (MSPQ). *Journal of Psychosomatic Research, 27*, 503-514.

METHOD

Participants

Clinical pain patients. Clinic cases were obtained from the records of a series of 772 referrals for psychological pain evaluation at a clinical psychology practice in the Southeastern United States from 1998 through 2003. Referral sources included physicians, workers compensation companies, and attorneys.

Table 1. Injury / symptom characteristics of entire chronic pain sample (n = 305)

	n	%
Primary back/spine injury	243	74.1
Head injury in accident	35	10.7
Pain symptoms / area of body		
Head	104	31.7
Spine	267	81.4
Chest / abdomen	11	3.4
Upper extremity	135	41.2
Lower extremity	191	58.2
Spine Findings		
any spine findings	205	62.5
degenerative disc/spine	124	37.8
herniated nucleus pulposus	21	6.4
disc bulge/protrusion	154	47.0
neural impingement	17	5.2
Spinal Surgery		
discectomy / fusion	78	23.8
decompression/laminectomy	38	11.6
Other pain diagnoses		
Complex regional pain syndrome	11	3.4
Fibromyalgia	3	0.9
Myofascial pain syndrome	9	2.7

Note that an individual patient may be positive in more than one category so the sum of percentages may be greater than 100.

Seven groups:

(1) No incentive (*n* = 23, 7.0%).

(2) Negative on all indicators (*n* = 32, 9.8%).

(3) A single ambiguous psychometric finding, no inconsistencies (*n* = 19, 5.8%).

(4) One ambiguous psychometric finding, no positive psychometric findings or one inconsistency (*n* = 37, 11.3%).

(5) >= one positive psychometric finding or >= one inconsistency but did not meet full malingering criteria (*n* = 112, 34.1%).

(6) Met criteria for probable malingering (*n* = 90, 27.4%).

(7) Met criteria for definite malingering (*n* = 15, 4.6%).

Table 2. Demographic and some injury-related characteristics of the chronic pain sample as a function of malingering status

	No-Inc		Inc-Only		Indeterm.		Poss MPRD		Prob MPRD		Def MPRD		
	M	*(sd)*	*M*	*(sd)*	*M*	*(sd)*	*M*	*(sd)*	*M*	*(sd)*	*M*	*(sd)*	*F*	*p* =	*eta*^{2}
Age	47.1	(15.5)^{a}	39.9	(9.6)^{ab}	41.9	(10.3)^{ab}	43.8	(9.0)^{ab}	44.2	(8.6)^{ab}	42.2	(8.8)^{b}	2.4	0.04	0.03
Education	12.5	(1.7)	12.8	(2.4)	12.6	(2.1)	11.8	(2.3)	11.8	(2.0)	11.9	(2.5)	2.2	0.05	0.03
TSI[1]	20.4	(23.7)	32.9	(21.2)	32.5	(31.1)	43.1	(30.2)	43.3	(29.9)	40.4	(23.5)	2.3	0.05	0.04
Current	5.1	(2.3)^{a}	5.2	(2.1)^{a}	6.7	(2.2)^{b}	6.7	(2.0)^{b}	6.8	(2.0)^{b}	6.8	(2.4)^{b}	5.8	≤ .001	0.08
Best	3.2	(1.9)^{a}	3.6	(2.1)^{ab}	5.4	(2.5)^{c}	4.8	(2.4)^{bc}	5.0	(2.2)^{bc}	6.1	(2.5)^{c}	6.3	≤ .001	0.10
Worst	8.8	(1.5)	9.0	(1.9)	9.2	(1.5)	9.2	(1.5)	9.4	(1.3)	9.6	(0.7)	1.2	0.34	0.02

^{abc}Row means with the same letter are not significantly different at alpha < .05.

[1]Only 1 in 10 No-Incentive patients had data for months post-injury.

TSI = time since injury; Inc = Incentive; Indeterm = Indeterminate; Poss = Possible; Prob = Probable; Def = Definite; MPRD = Malingered Pain Related Disability; Current, Best, & Worst corresponds to pain levels.

TABLE 3. MEDICO-LEGAL CHARACTERISTICS OF THE CHRONIC PAIN SAMPLE AS A FUNCTION OF MALINGERING STATUS

	No-Inc	Inc-Only	Indeterm	Poss MPRD	Prob MPRD	Def MPRD
Status of legal representation						
No attorney	100	49.0	51.4	41.1	52.2	13.3
Represented by attorney	0	51.0	48.6	58.9	46.7	86.7
Attorney status unknown	0	0.0	0.0	0.0	1.1	0.0
Referral source:						
doctor	100	23.5	16.2	19.6	17.8	26.7
case manager / adjuster	0	45.1	62.2	50.9	50.0	33.3
attorney	0	29.5	21.6	27.7	29.1	40.0
Claim type:						
workers compensation	–	68.6	89.2	75.0	72.2	60.0
personal injury	–	29.4	10.8	24.1	22.2	40.0
disability	–	0.0	0.0	0.0	1.1	0.0

The number represents the percentage of patients in each group meeting the medico-legal characteristic; Def = definite; Inc Only = incentive present but not malingering; Indeterm. = malingering status is indetermi- nate; MPRD = Malingered Pain-Related Disability; Poss = possible; No Inc = no incentive; Prob = probable.

Table 4. Percentage of injury/symptom characteristics of the chronic pain sample as a function of malingering status

	No-Inc	Inc-Only	Indeterm	Poss MPRD	Prob MPRD	Def MPRD
Primary back/spine injury	70	71	73	78	77	53
Head injury in accident	0	0	11	11	13	7
Pain symptoms/area of body						
head	0	29	30	35	38	33
spine	65	71	84	83	84	73
chest / abdomen	26	4	3	2	6	7
upper extremity	57	37	51	40	36	33
lower extremity	48	49	62	62	61	87
Spine findings						
any spine findings	57	65	68	63	63	47
degenerative disc/spine	48	31	46	36	39	33
herniated nucleus pulposus	17	4	8	4	7	7
disc bulge/protrusion	22	51	57	51	46	27
neural impingement	9	51	3	4	8	0
Spinal surgery						
discectomy / fusion	26	25	19	27	20	25
decompression/laminectomy	9	14	8	14	8	17
Other pain diagnoses						
complex regional pain syndrome	0	4	0	1	8	7
fibromyalgia	0	0	0	2	1	0
myofascial pain syndrome	0	0	0	3	6	7

[1]Value represents the percentage of patients within a group with the indicated presentation, symptom, finding, or procedure. Note that an individual patient can be positive in more than one category so the sum of percentages in a particular category may be greater than 100.

Table 5. Descriptive statistics for MSPQ and PDI scores as a function of malingering status and results of analyses of variance

	Controls M(sd)	No Inc M(sd)	Inc Only M(sd)	Indeterm. M(sd)	Poss MPRD M (sd)	Prob MPRD M (sd)	Def MPRD M(sd)	Sim M (sd)	F^1	eta^2
MSPQ	3.2 (2.9)[a]	5.9 (4.0)[a]	9.1 (5.0)[bc]	11.9 (6.9)[cd]	13.4 (6.4)[d]	15.5 (7.5)[de]	17.8 (6.6)[e]	14.1 (7.5)[de]	30.1	0.34
PDI	5.4 (7.1)[a]	35.4 (11.2)[b]	42 (13.7)[bc]	49.9 (15.6)[cd]	51.5 (11.5)[cd]	52.7 (12.3)[d]	54.1 (17.9)[d]	46.3 (11.9)[cd]	40.7	0.44

[abcde]Row means with the same letter are not significantly different at alpha < .05.
[1]F ratios for all variables are significant at alpha < .001
M = mean; sd = standard deviation; MSPQ = Modified Somatic Perception Questionnaire; PDI = Pain Disability Index; Inc = incentive; Indeterm = indeterminate; Poss = possible; Prob = Probable; Def = definite; Sim = simulators; MPRD = Malingered Pain-Related Disability.

Table 6. Cumulative percentages of patients and simulators with scores at or below the indicated raw score on the MSPQ and PDI

	MSPQ								PDI							
>Score	No Inc	Inc Only	All Not MPRD	All MPRD	*LR*	*+PP*	Sim	>Score	No Inc	Inc Only	All Not MPRD	All MPRD	*LR*	*+PP*	Sim
30				4			3	70				1			
29				6			3	69		0	0	1	–	1	
28				9			3	68		2	1	5	5	0.73	
27				10			6	67		2	1	8	8	0.81	
26				11			3	66		4	3	9	3	0.62	0
25				16			11	65		4	3	13	4.3	0.7	3
24				16			14	64		4	3	20	6,7	0.78	3
23		0	0	19	–	1	17	63		4	3	22	7.3	0.8	6
22		4	3	23	7.7	0.81	17	62		4	3	24	8	0.81	6
21		4	3	26	8.7	0.82	22	61		8	6	28	4.7	0.72	6
20		6	4	30	7.5	0.8	22	60		10	7	38	5.4	0.75	6
19		6	4	33	8.3	0.83	28	59		13	10	38	3.8	0.67	8
18		6	4	35	8.8	0.82	36	58		14	11	46	4.2	0.69	8
17	0	8	5	39	7.8	0.81	47	57		14	11	54	4.9	0.73	17
16	5	14	11	48	4.4	0.7	50	56		20	14	54	3.9	0.68	19
15	5	14	11	55	5	0.73	50	55	0	20	14	56	4	0.68	25
14	5	16	12	61	5.1	0.73	50	50	18	32	29	73	2.5	0.58	39
13	11	22	18	70	3.9	0.68	53	45	41	48	44	83	1.8	0.45	69
12	11	28	22	75	3.4	0.65	56	40	41	66	59	87	1.5	0.44	81
11	16	31	26	79	3	0.62	58	30	59	82	74	93	1.3	0.4	92
10	16	41	32	82	2.6	0.58	64	20	92	87	91	97	1.1	0.36	94
5	68	82	76	93	1.2	0.4	94	10	100	97	99	99	1	0.35	97
0	100	100	100	100	1	–	100	0	100	100	100	100	1	–	100

LR = likelihood ratio; MPRD = Malingered Pain-Related Disability; MSPQ = Modified Somatic Pain Questionnaire; +PP = predictive power of a positive test assuming a baserate of 35%; PDI = Pain Disability Index.
LR and PP+ come from the comparison of the All Not MPRD and All MPRD groups; it does not include the Simulators.

Psychological Assessment
2018, Vol. 30, No. 7, 857-869.

1040-3590/18/$12.00 http://dx.doi.org/10.1037/pas0000532

Classification Accuracy of the Minnesota Multiphasic Personality Inventory-2 (MMPI-2)-Restructured Form Validity Scales in Detecting Malingered Pain-Related Disability

Kevin J. Bianchini
Jefferson Neurobehavioral Group, Metairie, Louisiana

Kelly L. Curtis
High Point University

Luis E. Aguerrevere
Stephen F. Austin State University

Tresa M. Roebuck-Spencer, F. Charles Frey, and Kevin W. Greve
Jefferson Neurobehavioral Group, Metairie, Louisiana

Matthew R. Calamia
Louisiana State University

Method

Participants

Data were culled from the archival records of 660 patients seen for psychological pain evaluations at a clinical psychology practice in the Southeastern United States from 1998 through 2013; 97.9% (n = 646) of the sample was sequential with an additional 2.1% (n = 14) of *Not-MPRD* cases added later. Pain patients were referred by physicians, workers' compensation insurers, or attor- neys.

Medical records were reviewed in the context of these evaluations to provide objective medical diagnostic test results, physicians' clinical diagnoses, and injury descriptions. The initial inclusion criteria were (a) referral for persisting pain-related com- plaints (87% of the patients endorsed persisting spine-related com- plaints), (b) completion of the MMPI-2, and (c) availability of individual response items as MMPI-2-RF scores were calculated from the MMPI-2 item pool. Exclusionary criteria were (a) age lower than 18 or greater than 59, (b) time since injury of less than 6 months or more than 15 years, (c) education lower than 6 years or greater than 15 years, and (d) a brain injury more severe than a concussion (as defined by National Academy of Neuropsychology; Ruff et al., 2009). Finally, patients were screened according to their MMPI-2-RF CNS, VRIN-r scale and TRIN-r scale score. As recommended by Ben-Porath (2012) cases with CNS scores equal or greater than 15 or that had VRIN-r or TRIN-r scores 80 or higher were considered not to be following content-independent responding and thus, were excluded from the study. The final sample was comprised of 501 cases, 200 of which were previously included in the Bianchini et al. (2008) study sample examining the classification accuracy of the MMPI-2.

Procedure

As part of the psychological evaluation, the Minnesota-Multiphasic Personality Inventory-2 was administered in standard fashion as part of a psychological assessment, which also included an inter- view, clinical/behavioral observations, and review of files. The Minnesota Multiphasic Inventory-2-Restructured Form (MMPI-2- RF; Ben-Porath and Tallegen, 2008a) consists of 338 items, all of which are included in the MMPI-2. Thus, it was possible to score MMPI-2-RF scales for patients that had all MMPI-2 items avail- able. MMPI-2-RF variables that were included in this study were the RF validity scales (F-r, Fp-r, Fs, FBS-r and RBS) and the RF clinical scales (RCd and RC1). *t* scores were analyzed for all variables.

Table 2

Cutoffs and Malingering Indicators for Malingered Pain-Related Disability[2]

Indicator	Negative	-PP	Ambiguous	Positive	+PP
Test of Memory Malingering					
Trial 2	50–49	.82	48–45	44–0	.85
Retention	50–49	.83	48–45	44–0	.91
Portland Digit Recognition Test					
Easy	36–28	.86	27–23	22–0	.97
Hard	36–23	.86	22–18	17–0	.93
Total	72–50	.88	49–45	44–0	.95
Word Memory Test					
IR	100–80	.83	78.5–72.5[a]	70–0	.86
DR	100–80	.83	78.5–72.5[a]	70–0	.85
CNS1	100–75	.83	72.5–57.5[a]	55–0	.88
Wechsler Adult Intelligence Scale					
RDS	17–8	.87	7	6–0	.84
DS	30–8	.85	7–5	4–0	1.00
WMI	155–81	.88	80–76	75–45	.86
PSI	155–76	.84	75–71	70–45	.89
California Verbal Learning Test					
Rec Hits	16–12	.82	11–10	9–0	.91
Millon Multiaxial Clinical Inventory-III					
Disclosure	0–55	.85	56–70	71–115	.84
Debasement	0–65	.86	66–70	71–115	.88
Desirability	115–60	.77	59–55	54–0	.87
Battery for Health Improvement-II					
Self-disclosure[b]	0–60		60–66	66–90	

Note. -PP = Negative Predictive Power, the minimum probability that a negative score was produced by a non-malingering case assuming a malingering baserate of .35; +PP = Positive Predictive Power, the minimum probability that a positive score was produced by a malingering case assuming a malingering baserate of .35; CN1 = consistency of recall between IR and DR from the Word Memory Test; DR = delayed recall trial from the Word Memory Test; DS = Digit Span scales score; IR = Immediate recall trial from the Word Memory Test; PSI = Processing Speed Index; Rec Hits = Recognition Hits from the California Verbal Learning Test; WMI = Working Memory Index.

[a] The WMI scores are recorded in increments of 2.5% so scores between 80 and 78.5 and between 72.5 and 70 are not possible. [b] Based on manual recommendations.

Table 3
Malingering Classification Based on Malingered Pain-Related Disability Criteria

Set	Initial malingering classification	*N*	%
0	No incentive	6	1.2
1	Negative on all indicators	14	2.8
2	Only one ambiguous finding	25	5.0
3	More than one ambiguous finding but no positive findings	71	14.2
4	At least one positive finding but does not meet criteria for malingering	171	34.1
5	Meets criteria for Probable MPRD	174	34.7
6	Meets criteria for Definite MPRD	40	8.0
	Final Malingering Classification		
	Not MPRD (groups 0, 1 and 2)	45	9.0
	Indeterminate (group 3)	71	14.2
	Possible MPRD (group 4)	171	34.1
	Probable MPRD (group 5)	174	34.7
	Definite MPRD (group 6)	40	8.0
Total		501	100

TABLE 4
DEMOGRAPHIC AND SOME INJURY-RELATED CHARACTERISTICS OF THE SAMPLE AS A FUNCTION OF MALINGERING STATUS

	Not MPRD	Indeterm.	Poss. MPRD	Prob. MPRD	Def. MPRD			
Variable	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*F*	*p* <	Partial eta^2
N	45	71	171	174	40			
Age	42.9 (9.5)	41.3 (9.1)	42.4 (9.2)	41.7 (8.5)	45.2 (7.6)	1.2	.303	.01
Education	12.0 (1.4)^{a}	11.7 (1.7)^{ab}	11.4 (1.7)^{ab}	10.9 (1.9)^{b}	11.3 (2.2)^{ab}	4.1	.003	.04
Months post injury*	39.2 (43.6)	33.2 (25.7)	42.2 (35.0)	40.5 (35.7)	42.1 (25.1)	.9	.424	.01
Current pain	6.1 (2.0)	5.9 (2.3)	6.5 (1.9)	6.8 (2.0)	6.7 (1.9)	2.5	.056	.02
Best pain	4.6 (1.7)	4.5 (2.3)	4.8 (2.3)	5.2 (2.2)	5.3 (2.0)	1.8	.137	.01
Worst pain	9.0 (1.3)	9.1 (1.3)	9.1 (1.4)	9.3 (1.4)	9.2 (1.1)	.3	.857	<.01

Note. Def = definite; Indeterm. = malingering status is indeterminate; MPRD = Malingered Pain-Related Disability; Poss = possible; Prob = probable;

SD = standard deviation.

^{ab} Means with the same letter are not significantly different at alpha < .05; when no letters are present, there was no significant group main effect using Tukey's *b* post hoc statistics.

* Only 10 'No Incentive' patients had data for months post injury.

TABLE 5

PERCENTAGE OF MEDICO-LEGAL CHARACTERISTICS OF THE CHRONIC PAIN SAMPLE AS A FUNCTION OF MALINGERING STATUS

Characteristic	Not MPRD	Indeterm.	Poss. MPRD	Prob. MPRD	Def. MPRD	x^2	*p* =
Status of legal representation							
No attorney	34.4	38.3	27.6	28.3	13.0	15.11	.057[a]
Represented	41.0	51.7	57.9	58.9	69.6		
Unknown	24.6	10.0	14.5	12.8	17.4		
Referral source							
Doctor	36.1	31.7	24.3	24.7	28.3	9.81	.876
Case mgr/adj	39.3	50.0	49.1	50.2	41.3		
Attorney	22.9	19.3	25.2	23.2	30.4		
Claim type							
Workers com.	66.2	85.0	81.3	84.5	76.1	7.14	.521
Personal inj.	22.4	13.3	18.2	13.2	23.9		
Disability	.0	1.7	.0	1.4	.0		

Note. Value represents the percentage of patients within a group with the indicated status of legal representation, source of referral and/or type of claim. Def = definite; Not MPRD: not malingering; Indeterm. = malingering status is indeterminate; MPRD = Malingered Pain-Related Disability; Poss = possible; No Inc = no incentive; Prob = probable; unknown = attorney status unkown; mgr = manager; adj = adjuster; com = compensation; inj = injury.

[a] X^2 represents Yates' chi-square because at least one of the cell have expected count less than 5.

Table 6

Percentage of Injury/Symptom Characteristics of the Chronic Pain Sample as a Function of Malingering Status

Characteristic	Not MPRD	Indeterm.	Poss. MPRD	Prob. MPRD	Def. MPRD	x^2	*p* =
Primary back/spine injury	77.0	80.0	79.0	80.7	69.6	3.06	.547
Head injury in accident	13.1	10.8	7.5	13.2	6.5	3.87	.423[y]
Pain symptoms/area of body							
Head	29.5	30.0	25.2	30.1	23.9	1.99	.737
Spine	86.9	86.7	85.0	90.9	82.6	4.45	.348
Chest/abdomen	13.1	5.0	3.7	6.4	6.5	6.02	.198
Upper extremity	34.4	38.3	40.7	37.0	52.2	4.51	.342
Lower extremity	70.5	60.0	70.0	65.3	63.0	4.30	.367
Spine findings							
Any spine findings	34.4	39.2	40.7	36.1	19.6	7.23	.102
Degenerative disc/spine	16.4	20.8	23.8	17.8	10.9	5.59	.232
Herniated nucleus pulposus	11.5	5.8	4.2	5.0	2.2	4.19	.382[y]
Disc bulge/protrusion	13.1	29.2	28.5	23.3	15.2	9.85	.043
Neural impingement	1.6	3.3	2.8	5.0	2.2	1.47	.832[y]
Spinal surgery							
Discectomy/fusion	24.6	30.0	29.4	28.8	26.1	.81	.937
Decompression/laminectomy	9.8	14.2	13.6	13.2	19.6	2.18	.703
Other pain diagnoses							
Complex regional pain syndrome	.0	2.5	2.3	4.1	4.3	3.01	.556[a]
Fibromyalgia	4.9	.0	1.9	.9	2.2	3.98	.408[a]
Myofascial pain syndrome	1.6	2.5	3.7	6.4	6.5	1.81	.771

Note. Value indicated in each cell represents the percentage of patients within the specific classification group with the indicated presentation, symptom, finding, procedure, or other diagnoses. The chi-square statistic is comparing all scores within a particular row. Note that an individual patient may be positive in more than one category so the sum of percentages in a particular category may be greater than 100. Def = definite; Inc Only = incentive present but not malingering; Indeterm. = malingering status is indeterminate; MPRD = Malingered Pain-Related Disability; Poss = possible; No Inc = no incentive; Prob = probable.

[a] X^2 represents Yates' chi-square because at least one of the cell have expected count less than 5.

TABLE 7

DESCRIPTIVE STATISTICS FOR MMPI-2-RF SCORES AS A FUNCTION OF MALINGERING STATUS AND RESULTS OF ANALYSES OF VARIANCE

Variable	Not MPRD *M* (*SD*)	Indeterm. *M* (*SD*)	Poss. MPRD *M* (*SD*)	Prob. MPRD *M* (*SD*)	Def. MPRD *M* (*SD*)	*F*[*]	Partial eta[2]
N	45	71	171	174	40		
F-r	61.5 (11.2)[a]	65.1 (14.0)[a]	83.2 (20.9)[b]	92.0 (21.5)[c]	95.0 (19.9)[c]	36.61	.23
Fp-r	49.9 (10.3)[a]	50.0 (9.3)[a]	60.5 (16.9)[b]	64.8 (18.3)[bc]	70.9 (18.1)[c]	17.60	.13
Fs	54.0 (13.0)[a]	57.4 (14.8)[a]	70.9 (18.2)[b]	78.4 (20.1)[bc]	79.9 (21.1)[b]	25.02	.17
FBS-r	62.0 (10.1)[a]	65.5 (11.6)[a]	79.4 (13.5)[b]	83.7 (13.7)[bc]	88.1 (13.9)[c]	41.84	.26
RBS	60.6 (12.5)[a]	63.6 (14.8)[a]	80.2 (15.7)[b]	87.6 (19.1)[c]	93.4 (19.9)[c]	40.91	.25
RCd	52.0 (8.1)[a]	55.7 (10.5)[a]	66.5 (9.0)[b]	69.5 (10.5)[b]	71.3 (10.2)[b]	36.82	.24
RC1	65.1 (8.9)[a]	68.4 (9.0)[a]	77.7 (10.5)[b]	80.7 (11.0)[bc]	84.1 (11.6)[b]	31.92	.21

Note. Def = definite; Inc Only = incentive present but not malingering; F = Infrequency; Fb = Infrequency back; Fp = Infrequency psychopathology; FBS = Symptom Validity scale; RBS = Response Bias Scale; RCd = Demoralization; RC1 = Somatic scale; Indeterm. = malingering status is indeterminate; MPRD = Malingered Pain-Related Disability; Poss = possible; No Inc = no incentive; Prob = probable.

[abcd] Row means with the same letter are not significant at alpha < .05.

[*] *F* ratios for all variables are significant at alpha < .001.

TABLE 9

CUMULATIVE PERCENTAGES OF CHRONIC PAIN PATIENTS WITH SCORES AT OR BELOW THE INDICATED T SCORE ON THE MMPI-2-RF

	F-r			Fp-r			Fs			FBS-r			RBS			RCd			RC1		
t score	Not MPRD	MPRD	*LR*	Not MPRD	MPRD	*LR*	Not MPRD	MPRD	*LR*	Not MPRD	MPRD	*LR*	Not MPRD	MPRD	*LR*	Not MPRD	MPRD	*LR*	Not MPRD	MPRD	*LR*
N	45	214		45	214		45	214		45	214		45	214		45	224		45	224	
120	2	20	*10.0*		3			3			0			7							
115	2	24	*12.0*		4			8			1			10							—
110	4	31	*7.8*		4			8			1			14						0	
105	4	48	*12.0*		4			15			7			22						1	
100	7	42	*6.0*		6		0	15	—		11			30					0	2	—
95	7	53	*7.6*		6		9	22	*2.4*		26			40					7	11	*1.6*
90	9	53	*5.9*		9		9	33	*3.7*	0	36	—		50			0		9	28	*3.1*
85	11	60	*5.5*		20		9	33	*3.7*	7	52	*7.4*	0	60	—	0	1	—	9	45	*5.0*
80	13	65	*5.0*	0	20	—	13	47	*3.6*	16	71	*4.4*	10	73	*7.3*	4	21	*5.3*	11	57	*5.2*
75	18	73	*4.1*	7	29	*4.1*	13	47	*3.6*	24	78	*3.3*	19	78	*4.1*	7	43	*6.1*	16	67	*4.2*
70	36	85	*2.4*	7	29	*4.1*	16	65	*4.1*	40	86	*2.2*	29	85	*2.9*	7	57	*8.1*	31	84	*2.7*
65	47	92	*2.0*	16	47	*2.9*	24	77	*3.2*	47	89	*1.9*	35	86	*2.5*	13	71	*5.5*	56	93	*1.7*
60	62	93	*1.5*	16	68	*4.2*	24	77	*3.2*	67	94	*1.4*	52	91	*1.8*	31	80	*2.6*	80	96	*1.2*
55	76	98	*1.3*	29	88	*3.0*	40	88	*2.2*	69	96	*1.4*	52	93	*1.8*	51	90	*1.8*	91	99	*1.1*
50	87	100	*1.1*	56	90	*1.6*	76	97	*1.3*	91	100	*1.1*	87	98	*1.1*	62	95	*1.5*	100	100	*1.0*

Note. F-r = Infrequency restructured; Fp-r = Infrequency psychopathology restructured; Fs = Infrequency somatic symptoms; FBS-r = Symptom Validity scale restructured; RBS = Response Bias Scale; RCd = Demoralization; RC1 = Somatic Complaints; *LR* = Likelihood Ratio.

Case Examples

Patient F

42-Year-Old Male

Nature of the Injury

- Hurt his back using a jack hammer and pouring cement
- Next day, severe pain

Medical Records

- MRI results: two degenerated bulged discs at L4-L5, L5-S1
- Neurosurgeon: “Not recommending surgery”
- Occupational medical doctor:
  - “Conflicting objective signs”
  - Waddell's signs
  - FCE showing sub-maximal effort
  - True work capability cannot be determined
- Physical Therapist:

  “I am unable to explain the high degree of restrictions or subjective complaints of pain and hard neurological signs remain undetectable.”

Symptoms

- Daily groin pain
- Constant hip pain
- Constant low back pain
- Tingling in feet
- Pain in legs
- Urinary track infection
- Constipation secondary to the medications
- Tingling in hands

180

PROCEDURES ADMINISTERED

- California Verbal Learning Test 2
- Wechsler Adult Intelligence Scale III
- Wide Range Achievement Test 3 (Reading Subtest)
- Finger Tapping Test
- Portland Digit Recognition
- TOMM
- Word Memory Test
- Wechsler Test of Adult Reading
- Modified Somatic Perception Questionnaire
- Pain Disability Index
- MMPI-2

181

Disability

Patient reported emotional and physical disability

182

Test results

- WAIS III
  - VIQ = 64
  - PIQ = 60
  - FS IQ = 59
- Factor Scores
  - VCI = 68
  - POI = 64
  - WMI = 61
  - PSI = 60
- RDS = 6
- WRAT 3 (SS) = 53
- WTAR (SS) = 59

183

Test Results

- CVLT
  - List 1-5 (t) = 25
  - List A trial 1 = -2.5
  - Rec Hits = 6
  - False positives = 6
- PDI= 64
- MSPQ = 23
- Sullivan (T score) = 99
- Finger tapping = 53.8

Test Results

- PDRT
  - Easy = 25
  - Hard = 17
  - Both = 42
- TOMM
  - Trial 1 = 34/50
  - Trial 2 = 41/50
  - Retention 47/50
- Word Memory Test
  - Immediate Recognition = 52.5
  - Delayed Recognition = 60
  - Consistency = 62.5

MMPI Scales

L	65	4	77
F	76	5	46
K	58	6	97
		7	98
1	99	8	94
2	102	9	45
3	111	0	71

Validity Scales

F = 76

F (B) = 71

F (P) = 70

FBS (raw)= 30

Meyers index= 6

Patient B

39-Year-Old Female

Nature of the Injury

- Sitting at a stop sign in a van when her vehicle was struck from behind.
- Treated and released at ER
- Next day, pain in back, neck and right shoulder

Medical Records

MRI:

"Broad-based central disc herniation"associated with a mild spinal stenosis at L3-4

Intervertebral disc space

Broad-based diffuse posterior bulges of the disc margin that effaces the ventral aspect of the thecal sac and causes a mild foraminal stenosis on the left side

Shoulder X-ray "clean"

Epidural Steroid Injection of the T1-2 and L4-5 discs under fluoroscopy:

" No significant relief"

Treating Orthopedic Spine Surgeon:

- Recommended discogram to examine need for surgery

2nd Opinion Orthopedic Spine Surgeon:

- Described MRI study as "physiologic and normal"
- Patient does have findings of some rotator cuff inflammation but no evidence of underlying structural pathology
- Mechanical low back pain without evidence of neurocompressive lesion
- Noted pre-injury diagnosis of depression
- No discogram

Symptoms

1. Constant back pain
2. Left leg pain to the knee
3. Constant neck pain
4. Right shoulder pain
5. Numbness in 2-3 toes on the left foot
6. Cries often
7. Irritability
8. Constantly pulls her hair
9. Cannot do 75-80% of household chores
10. Does not sleep well without medication
11. Pain when she bends over to pick something up
12. Always tired and has no energy
13. Concentration problems
14. Memory problems

Psychosocial

- Physically abusive husband
- Did not know biological father
- Mother lost custody of child because of mother's age
- Raised in foster care

Disability Claim

Combination of physical, emotional, and cognitive reasons

194

PROCEDURES ADMINISTERED

- NCB Screening & Orientation
- COGNISTAT Comprehension/Commands
- California Verbal Learning Test-2
- Wechsler Adult Intelligence Scale III
- Wide Range Achievement Test 3 (Reading Subtest)
- Finger Tapping Test
- Portland Digit Recognition
- TOMM
- Word Memory Test
- Wechsler Test of Adult Reading
- Modified Somatic Perception Questionnaire
- Pain Disability Index
- MMPI-2
- MCMI-3

195

Test results

- WAIS III
  - VIQ = 94
  - PIQ = 98
  - FSIQ = 96
- Factor Scores
  - VCI = 91
  - POI = 103
  - WMI = 109
  - PSI = 79
- RDS = 9
- WRAT-3 (SS) = 90
- WTAR (SS) = 96

196

Test results

- CVLT
  - List 1-5 (t) = 45
  - List A trial 1 = -1.5
  - Recog Hits = 15
  - False positives = 1
- PDI= 54
- MSPQ = 21
- Sullivan (T score) = 68
- Finger tapping
  - DH = 45.6
  - NDH = 50.6

197

Test results

- PDRT
  - Easy = 22
  - Hard = 24
  - Both = 46
- TOMM
  - Trial 1 = 48/50
  - Trial 2 = 49/50
  - Retention 46/50
- Word Memory Test
  - Immediate Recognition = 82.5%
  - Delayed Recognition = 77.5%
  - Consistency score = 70%

198

MMPI Scales

L	42	4	79
F	92	5	60
K	41	6	92
		7	95
1	86	8	96
2	83	9	56
3	73	0	75

Validity Scales

F = 92

Fb = 101

Fp = 57

FBS (raw)= 29

Meyers index= 6

199

MCMI-3 Br scores

- Modifier Indices
  - Disclosure = 74
  - Desirability= 47
  - Debasement = 89
- Clinical Personality Patterns
  - Avoidant = 88
  - Dependent = 88
- Clinical Syndromes
  - Anxiety = 111
  - Dysthymia = 83
- Severe Clinical Syndromes
  - Major depression = 88

Diagnosis and Rationale

- Depressive Disorder NOS
- Pain Disorder Associated With Both Psychological Factors and A General Medical Condition.
- Malingering

Part 6

Pre-Procedure Evaluations

PRESURGICAL/PREPROCEDURE DECISION MAKING

Mr./Ms. XXX is at Elevated Risk for Poor Outcome from Spine Surgery due to the presence of Psychological Risk Factors described in this report.

Behavioral, psychological, and/or psychosocial risk factors, which empirical research has demonstrated to be associated with elevated risk of poor outcome following spinal surgery, were present in this case. These are described in greater detail in the **SUMMARY and RECOMMENDATIONS** section of this report.

The decision to proceed or not with a pain management procedure includes consideration of both medical and psychosocial risk factors. This report deals with psychosocial risk factors. ***There may be times when the clarity between the medical findings and the symptoms is such that overriding of elevated psychological risks is warranted. However, in cases where the relationship between symptoms and medical findings is less clear, the psychosocial risk factors should be given greater weight in making decisions regarding pursuing surgery.***

Pretreatment Psychosocial Variables as Predictors of Outcomes Following Lumbar Surgery and Spinal Cord Stimulation: A Systematic Review and Literature Synthesis

Celestine, J., Edwards, R., & Jamison, R.

Pain Medicine
2009: Vol.10(4):639-653

204

Objective:
Systematic review to examine the relationship between presurgical predictor variables & treatment outcomes, to review the existing evidence for the benefit of psychological screening prior to lumbar surgery or SCS, and to make treatment recommendations for the use of psychological screening.

205

Results:

753 study titles, 25 studies were identified, of which none were randomized controlled trials & only 4 SCS studies met inclusion criteria.

Positive relationship was found between one or more psychological factors & poor treatment outcome in 92.0% of the studies reviewed. Presurgical somatization, depression, anxiety, & poor coping were most useful in helping to predict poor response (i.e., less treatment-related benefit).

Older age and longer pain duration were also predictive of poorer outcome in some studies, while pre-treatment physical findings, activity interference, and presurgical pain intensity were minimally predictive.

Conclusion:

At present, while there is insufficient empirical evidence that psychological screening before surgery or device implantation helps to improve treatment outcomes, the current literature suggests that psychological factors such as somatization, depression, anxiety, and poor coping, are important predictors of poor outcome. More research is needed to show if early identification & treatment of these factors through psychological screening will enhance treatment outcome.

Assessment

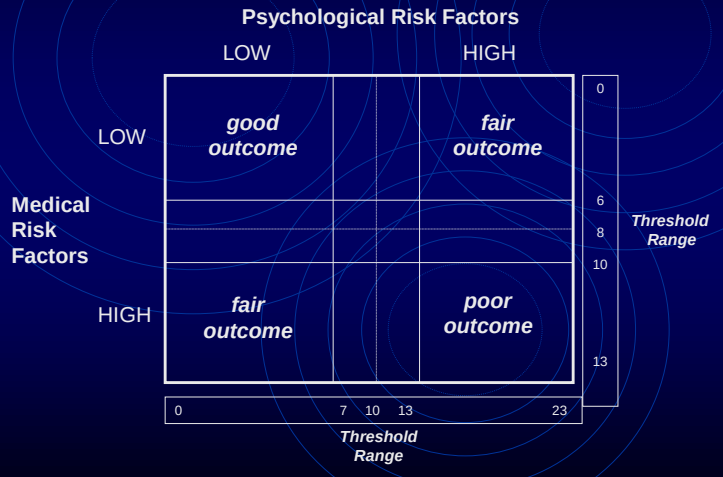
- Intelligence
- Memory
- Personality
- General Health
- Pain Catastrophizing, Coping
- Stand-Alone Cognitive SVTs & Embedded Indicators
- Measures of Physical Symptom and Disability Magnification

Pre-surgical Psychological Screening

Block, A. R., Ohnmeiss, D. D., Guyer, R. D., Rashbaum, R. F., & Hochschuler, S. H. (2001). The use of presurgical psychological screening to predict the outcome of spine surgery. *The Spine Journal, 1*, 274-282.

- **PATIENT SAMPLE:**
  - Presurgical screening and follow-up data collection was performed on 204 patients who underwent laminectomy/discectomy (n=118) or fusion (n=86) of the lumbar spine.
- **OUTCOME MEASURES:**
  - visual analog pain scales
  - the Oswestry Disability Questionnaire
  - medication use.
- **METHODS:**
  - A semi-structured interview and psychometric testing were used to identify specific, quantifiable psychological, and "medical" risk factors for poor surgical outcome.
  - A presurgical psychological screening (PPS) scorecard was completed for each patient, assessing whether the patient had a high or low level of risk on these psychological and medical dimensions.
  - Based on the scorecard, an overall surgical prognosis of "good," "fair," or "poor" was generated.

Spine surgery prognosis determined by medical and psychological risk factors.



Block, A. R., Ohnmeiss, D. D., Guyer, R. D., Rashbaum, R. F., & Hochschuler, S. H. (2001). The use of presurgical psychological screening to predict the outcome of spine surgery. *The Spine Journal, 1*, 274-282.

Block, A. R., Ohnmeiss, D. D., Guyer, R. D., Rashbaum, R. F., & Hochschuler, S. H. (2001). The use of presurgical psychological screening to predict the outcome of spine surgery. *The Spine Journal, 1*, 274-282.

RESULTS

- Spine surgery led to significant overall improvements in pain, functional ability, and medication use.
- Medical and psychological risk levels were significantly related to outcome,
  - the poorest results obtained by patients having both high psychological and medical risk.
- The accuracy of PPS surgical prognosis in predicting overall outcome was 82%.
- Only 9 of 53 patients (16.9%) predicted to have poor outcome achieved fair or good results.

- Block, A. R., Marek, R. J., Ben-Porath, Y. S., & Kukal, D. (2017). Associations between pre-implant psychosocial factors and spinal cord stimulation outcome: Evaluation using the MMPI-2-RF. *Assessment, 24*(1), 60-70. DOI: 10.1177/1073191115601518.
- Marek, R. J., Block, A. R., & Ben-Porath, Y. S. (204). The Minnesota Multiphasic Personality Inventory–2–Restructured Form (MMPI-2-RF): Incremental validity in predicting early postoperative outcomes in spine surgery candidates. *Psychological Assessment, 27*(1), 114-124.
- Block, A. R., Marek, R. J., Ben-Porath, Y. S., & Ohnmeiss, D. D. (2014). Associations between Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF) scores, workers' compensation status, and spine surgery outcome. *Journal of Applied Biobehavioral Research, 19*(4), 248-267. http://dx.doi.org/10.1111/jabr.12028
- Block, A. R., Ben-Porath, Y. S., & Marek, R. J. (2013). Psychological risk factors for poor outcome of spine surgery and spinal cord stimulator implant: A review of the literature and their assessment with the MMPI-2-RF. *The Clinical Neuropsychologist, 27*(1), 81-107. http://dx.doi.org/10.1080/13854046.2012.721007

- Block, A. R., Marek, R. J., & Ben-Porath, Y. S. (2018). Patient activation mediates the association between psychosocial risk factors and spine surgery results. *Journal of Clinical Psychology in Medical Settings*. doi: 10.1007/s10880-018-9571-x. [Epub ahead of print].
- Marek, R. J., Block, A. R., & Ben-Porath, Y. S. (2017). Validation of a psychological screening algorithm for predicting spine surgery outcomes. *Assessment*. doi: 10.1177/1073191117719512. [Epub ahead of print].
- Marek, R. J., Ben-Porath, Y. S., Epker, J. T., Kreymer, J. K., & Bloc, A. R. (2018). Reliability and validity of the Minnesota Multiphasic Personality Inventory-2-Restructred Form (MMPI-2-RF) in spine surgery and spinal cord stimulator samples. *Journal of Personality Assessment*. doi: 10.1080/00223891.2018.1488719. [Epub ahead of print].

Assessment
2017, Vol. 00, No. 0, 1-14.

https://doi.org/10.1177/1073191117719512

Validation of a Psychological Screening Algorithm for Predicting Spine Surgery Outcomes

Ryan J. Marek
Kent State University

Andrew R. Block
Texas Back Institute, Plano, Texas

Yossef S. Ben-Porath
Kent StateUniversity

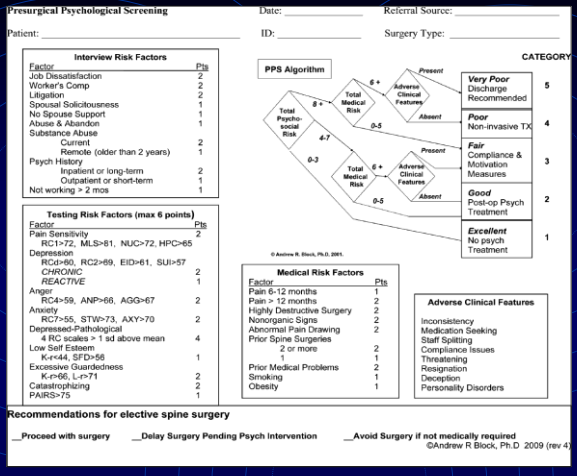


Figure 1. PPS algorithm.
Note. Even if the total for the Testing Risk Factors box is greater than 6, the maximum score that can be used in the algorithm is 6 points. RC1 = Demoralization; RC2 = Low Positive Emotions; SUI = Suicidal/Death Ideation; RC1 = Somatic Complaints; MLS = Malaise; NUC = Neurological Complaints; HPC = Head Pain Complaints; RC4 = Antisocial Behaviors; ANP = Anger Proneness; AXY = Anxiety; SFD = Self-Doubt; AGG = Aggression; RC7 = Dysfunctional Negative Emotions; STW = Stress/Worry; NFC = Inefficacy; FML = Family Problems; SAV = Social Avoidance; AGGR-r = Aggressiveness–Revised; NEGE-r = Negative Emotionality/Neuroticism–Revised; INTR-r = Introversion/Low Positive Emotionality–Revised; L-r = Uncommon Virtues, Revised; K-r = Adjustment Validity; PAIRS = Pain and Impairment Relationship Scale. Adapted from *The Psychology of Spine Surgery* (p. 108), by A. R. Block, E. J. Gatchel, W. W. Deardorff, and D. Guyer, 2003, Washington, DC: American Psychological Association. Copyright 2003 by the American Psychological Association.

Method

Sample

Patients were referred to the Behavioral Medicine Division of Texas Back Institute for a presurgical psychological evaluation (PPS) prior to being cleared for a spine surgery procedure. Referrals were from physicians both inside and outside of the Texas Back Institute.

Spinal Fusion (66.73%), Artificial Disc Replacements (11.15%), Laminectomy/Discectomy/ Decompression (9.15%), a Hybrid (3.99%), Hardware Removal (0.67%), Discogram/Discography (5.49%), Rhizotomy (1.16%). Individuals who did not obtain surgery (1.66%) did not have associated outcome data.

764 consecutively referred individuals who were seeking a spine surgery procedure were invited to participate in a surgical outcome study.

616 consented to participate.

Table 2. Analysis of Covariances Comparing the Presurgical Algorithm Categories and Outcomes After Controlling for Baseline Measures.

	Excellent		Good		Fair to very poor		Inferential statistics				
Outcome measure	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F* (*df*)	*p*	d_1	d_2	d_3
Pain	3.33	2.31	4.41	2.95	5.50	2.54	17.93 (2, 310)	<.001	0.41	0.89	0.40
Oswestry Disability Index	27.10	19.12	40.02	21.86	49.56	17.12	14.98 (2, 259)	<.001	0.63	1.24	0.49
Negative affect	1.32	.68	1.87	.80	2.21	1.05	21.21 (2, 311)	<.001	0.74	1.01	0.36
Dissatisfied with surgical results	2.16	2.69	2.77	2.90	4.33	3.09	13.95 (2, 297)	<.001	0.22	0.75	0.52

Cohen's *d* comparing Excellent category to Fair with Very Poor Category; d_3 = Cohen's *d* comparing Good category with Fair to Very Poor category. *Note. df* = degrees of freedom; *M* = mean at follow-up; *SD* = standard deviation at follow-up; d_1 = Cohen's *d* comparing Excellent category with Fair to Very Poor Category; d_2 =

Table 4. Statistically Significant Relative Risk Ratios Using the PPS Algorithm to Predict Postsurgical Outcome Criteria.

Postoperative pain surgical results					Postoperative ODI				Postoperative negative affect				Dissatisfied with			
	t Score cutoff (◆)				t Score cutoff (◆)				t Score cutoff (◆) if							
PPS predictor	if applicable	SR	RRR	95% CI	if applicable	SR	RRR	95% CI	if applicable	SR	RRR	95% CI	if applicable	SR	RRR	95% CI
MMPI-2-RF component of the PPS algorithm																
RCd	60T	18.39%	1.37	[1.22, 1.55]	60T	17.55%			53T	1.53	[1.34, 1.74]	60T	16.28%	1.67	[1.34, 2.08]	62T	13.38%	2.32	[1.67, 3.21]
RC2	65T	17.06%	1.19	[1.03, 1.37]	65T	17.17%			41T	1.41	[1.22, 1.62]	69T	11.05%	1.43	[1.09, 1.88]	65T	16.39%	1.73	[1.20, 2.47]
SUI	66T	13.71%	1.21	[1.04, 1.40]												
RC1	72T	18.39%	1.23	[1.08, 1.41]	72T	16.98%			53T	1.53	[1.35, 1.74]	72T	16.28%	1.51	[1.19, 1.91]	70T	22.41%	1.79	[1.28, 2.51]
MLS	81T	19.40%	1.33	[1.17, 1.5]	75T	33.77%			49T	1.49	[1.31, 1.71]	81T	15.70%	1.63	[1.3, 2.04]	87T	5.02%	1.82	[1.1, 3.03]
NUC	72T	20.40%	1.23	[1.08, 1.4]	72T	20.00%			46T	1.46	[1.28, 1.67]	80T	11.34%	1.53	[1.18, 1.97]	70T	29.77%	1.54	[1.1, 2.17]
HPC	65T	36.29%	1.19	[1.05, 1.34]	72T	19.25%			29T	1.29	[1.11, 1.5]	65T	37.50%	1.31	[1.05, 1.64]	65T	37.12%	1.52	[1.08, 2.13]
RC4												59T	11.34%	1.89	[1.54, 2.33]	62T	6.69%	1.72	[1.07, 2.77]
ANP	59T	14.38%	1.26	[1.1, 1.45]	66T	8.87%			31T	1.31	[1.09, 1.57]	66T	7.85%	1.41	[1.03, 1.92]	59T	13.04%	1.64	[1.11, 2.43]
AXY	70T	11.54%	1.19	[1.01, 1.4]	59T	26.60%			24T	1.24	[1.07, 1.43]	70T	10.17%	1.27	[0.93, 1.74]				
SFD	56T	26.09%	1.27	[1.12, 1.43]	56T	24.72%			37T	1.37	[1.19, 1.57]	56T	25.00%	1.59	[1.28, 1.97]	56T	25.42%	1.83	[1.32, 2.56]
AGG					67T	3.40%			65T	1.65	[1.44, 1.89]					67T	2.01%	2.25	[1.24, 4.06]
RC7					53T	19.62%			26T	1.26	[1.08, 1.47]					55T	16.05%	1.98	[1.41, 2.79]
STW					73T	6.42%			45T	1.45	[1.22, 1.72]					73T	7.02%	2.21	[1.50, 3.24]
NFC					64T	8.7%			30T	1.30	[1.01, 1.67]					69T	4.2%	2.74	[1.60, 4.68]
FML	63T	9.6%	1.33	[1.11, 1.58]	63T	8.4%			532	[1.27, 1.86]	63T	7.3%	1.705	[1.17, 2.48]	63T	7.1%	2.67	[1.64, 4.33]
SAV					70T	9.1%			399	[1.12, 1.75]									
AGGR-r	56T	20.2%	1.20	[1.02, 1.42]															
NEGE-r					56T	23.6%			309	[1.08, 1.59]	73T	3.6%	1.661	[1.01, 2.73]	73T	3.0%	3.03	[1.83, 5.04]
INTR-r	74T	5.9%	1.50	[1.3, 1.71]	74T	1.554			[1.28, 1.89]	6.5%	74T	5.7%	1.719	[1.15, 2.56]					
Other PPS algorithm components																			
Workers' Compensation												35.52%	1.54	[1.23, 1.92]					
No Spouse Support												17.01%	1.40	[1.1, 1.79]					
Abuse & Abandon												18.51%	1.36	[1.06, 1.73]					
Substance Abuse–Current						1.72%				1.53	[1.17, 2.02]						1.38%	2.44	[1.35, 4.41]
Substance Abuse–Remote (older than 2 years)		7.78%	1.36	[1.15, 1.62]		7.76%				1.28	[1.03, 1.6]		6.87%	1.43	[1.04, 1.98]		6.90%	1.67	[1.04, 2.68]
Psych History–Inpatient or long-term						16.81%				1.34	[1.14, 1.58]		15.52%	1.39	[1.08, 1.79]				
Not Working >2 months		35.99%	1.32	[1.15, 1.51]					35.56%	1.50	[1.3, 1.74]	33.43%		1.52	[1.22, 1.89]				
PAIRS >75		30.16%	1.37	[1.2, 1.56]					30.60%	1.36	[1.17, 1.58]	27.76%		1.74	[1.41, 2.15]	25.86%		2.35	[1.71, 3.23]
Highly Destructive Surgery												63.88%		1.41	[1.08, 1.83]				
Pain 6-12 months																16.55%		1.61	[1.11, 2.32]
Pain >12 months		72.18%	1.19	[1, 1.41]															
Nonorganic Signs		1.36%	1.43	[1.05, 1.95]					1.51%	1.50	[1.1, 2.05]								
Prior Spine Surgeries		39.30%	1.21	[1.05, 1.39]					38.79%	1.27	[1.09, 1.48]					38.28%		1.80	[1.29, 2.52]
Smoking												19.70%		1.39	[1.1, 1.77]				
Resignation		1.36%	1.43	[1.05, 1.95]															
Deception																4.48%		1.78	[1.04, 3.03]

Note. PPS = presurgical psychological screening; ODI = Oswestry Disability Index; MMPI-2-RF = Minnesota Multiphasic Personality Inventory–2–Restructured Form; SR = selection ratio; RRR = relative risk ratio; CI = confidence interval; RCd = Demoralization; RC2 = Low Positive Emotions; SUI = Suicidal/Death Ideation; RC1 = Somatic Complaints; MLS = Malaise; NUC = Neurological Complaints; HPC = Head Pain Complaints; RC4 = Antisocial Behaviors; ANP = Anger Proneness; AXY = Anxiety; SFD = Self-Doubt; AGG = Aggression; RC7 = Dysfunctional Negative Emotions; STW = Stress/Worry; NFC = Inefficacy; FML = Family Problems; SAV = Social Avoidance; AGGR-r = Aggressiveness–Revised; NEGE-r = Negative Emotionality/Neuroticism–Revised; INTR-r = Introversion/Low Positive Emotionality–Revised.

Case Examples

Case BS
Procedure: Spinal Cord Stimulator

- 28-year-old male fitter-welder with 10 years education.
- 5+ years ago suffered a crush injury to his left hand with amputation of index and middle fingers.
- No current medications.
- Pain remains constant and significant (5-7/10).
- He is being considered for implantation of a spinal cord stimulator for pain control.

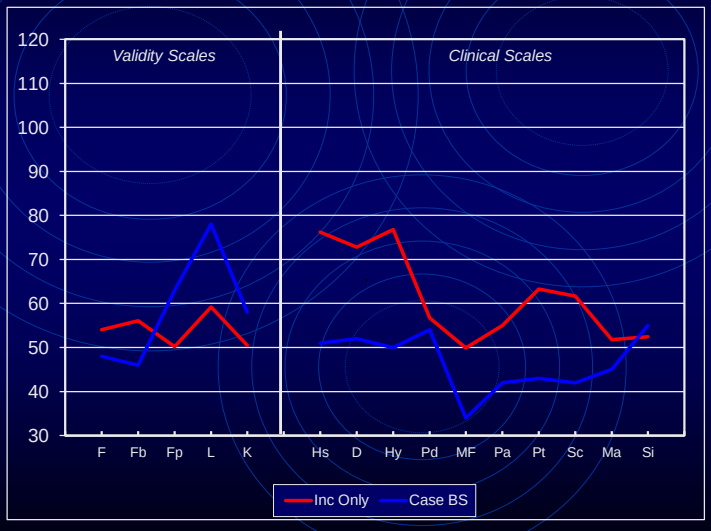
Case BS

- He described his childhood as good.
- Denied any substance abuse problems in his home growing up.
- Denied abuse or mistreatment.
- Denied personal use of tobacco, alcohol, drugs.
- Father is alive, mother died 8 years ago.
- Patient has been working for 4 years, but not as a welder.

Case BS

- He has had a diagnosis of RSD.
- In the first year he took Lortab and that helped; “it put me in a different state of mind.”
- Non-narcotic medications did not help.
- He has had numerous injections.
- Nothing has worked.
- Three years ago he was told a spinal cord stimulator was the last step.
- He declined at that time but now wishes to go forward.

Case BS MMPI



Case BS
Pre-surgical Screen

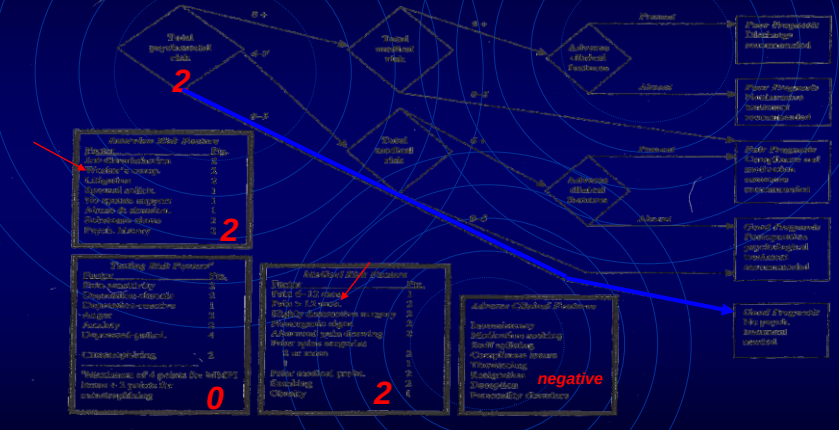


Figure 2.2. Algorithm for determining presurgical psychological screening prognosis. MMPI = Minnesota Multiphasic Personality Inventory.

Case BS
Recomendations

- No significant psychological involvement in this patient's pain complaints was demonstrated.
- The proposed spinal cord stimulator is **not contraindicated** for psychological reasons.
- I cannot address the medical necessity of a spinal cord stimulator as that is outside my area of expertise.

Case BG
Presurgical Screen - Thoracic Fusion

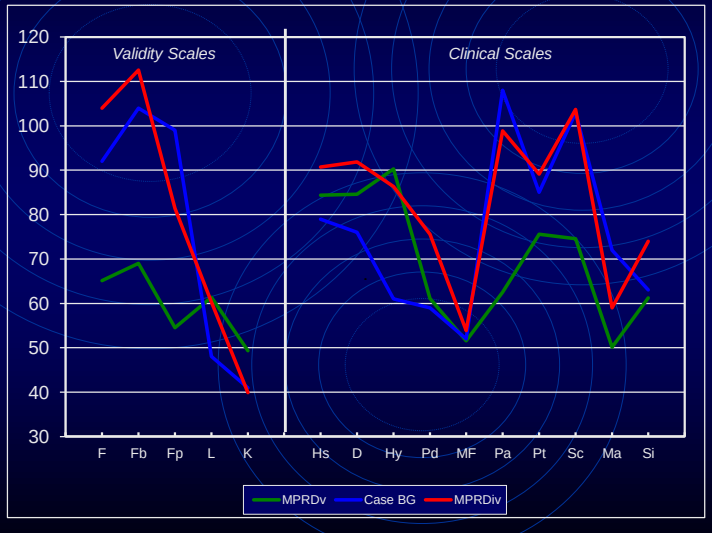
- 50 year old man injured his back > 3 years ago.
- Continued to work until recently.
- Primary complaint:
  - pain in his middle to low back which he rated it at 9/10 during the interview and said it ranges from 4 to 10. He said it is at 10/10 75% of the time and there is nothing he can do about it.

Case BG
Presurgical Screen - Thoracic Fusion

- MRI:
  - spinal cord impingement at T7-8 associated with disc extrusion and a mild left paracentral bulge at T8-9 that does not cause impingement. Degenerative changes were also present
- Myelogram:
  - large disc herniation on the right at T7-8 and a smaller one on the left at T8-9.

- Waddell signs present along with treatment non-compliance.
- Pain complaints were on the left while the pathology was predominantly on the right.
- FCE report noted “all testing was self-limiting due to pain, due to high BP the full FCE was not completed. Testing that was completed revealed definitive signs of non-organic illness behavior.”

Case BG MMPI



Case BG
Pre-surgical Screen

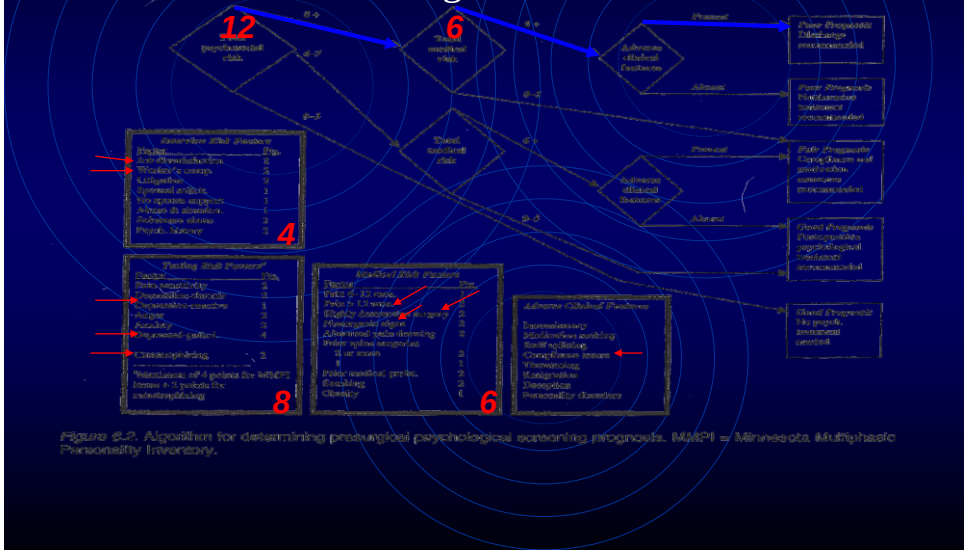


Figure 8.2. Algorithm for determining presurgical psychological screening prognosis. MMPI = Minnesota Multiphasic Personality Inventory.

Case BG
Conclusions

- Current testing demonstrated variable effort. Poorer cognitive test scores are likely due to effort and related factors. The record is replete with evidence of non-organic pain illness behavior and symptom magnification; this evaluation also demonstrated some exaggeration of physical symptoms and an overall presentation consistent with somatization.
- Most striking is the over-report of psychiatric symptoms. Mr. G's presentation was not consistent with severe psychopathology and he did not report symptoms of severe psychopathology in interview. There is no evidence that his elevations of scales sensitive to exaggeration was due to misunderstanding questions or to an indiscriminant response set. It is possible this is intentional.
- Nonetheless, it is reasonable that he be experiencing some psychological distress associated with his perceived condition. This would reflect an adjustment disorder, though it is possible he is experiencing a depressive disorder. The process of psychological intervention should help clarify his true emotional status. The overlaying psychological factors are not disabling but they have/do interfere with recovery.

Case BG Recommendations

- Mr. G should be considered for functional rehabilitation geared to the psychologically complicated pain patient (functional restoration with psychotherapy).
- At this time he is at high risk for psychological reasons for poor outcome from spine surgery.
- Since his doctors have identified a surgical lesion in his spine, if he undergoes and benefits from the recommended treatments, then the possibility of spine surgery should be revisited.