

# Chronic Pain Assessment and Validation

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**Abstract.** *The following case presentation and clinical discussion addresses the complex task of objectively evaluating the intensely subjective experience of chronic pain. Pain, when sustained, becomes intertwined with distress and suffering. Clinicians, case managers, life care planners, and consultants must sort through legitimate symptom presentations as well as behaviors supported by environmental factors or external circumstances (secondary gain) in order to formulate sound treatment, case management strategies, and life care plans. Methodically approaching this endeavor from both physical and neuropsychological perspectives addresses the organic and emotional dynamic characteristic of clients with chronic pain. This article offers a case presentation that typifies the two-part exercise of assessment followed by validation of findings and assumptions, as related to a disabling industrial soft-tissue injury.*

## Introduction

Typically, acute pain initiates avoidance and arousal behaviors. However, when a painful condition becomes chronic beyond the identified course of a disease or injury, many physiological manifestations of excitement simply disappear. Instead, such maladaptive psychological responses as anxiety, depression and insomnia become prominent. To the casual observer these substitutions can lead to misinterpretation of chronic pain symptom presentation and behaviors. Since evaluation of chronic pain tends to be more complicated than acute pain, concerted efforts of physicians, psychologists, and physical or other therapists are required. In the face of chronic pain, traditional and non-traditional evaluation methods should be utilized to evaluate these physical (sensory) complaints and emotional (affective) behaviors. Understanding these methods and guidelines should assist clinicians, case managers, and life care planners as they render services to clients with substantial chronic pain-related circumstances. This article addresses methods currently useful in assessment and validation of chronic pain. A case study format is proposed as a valid instructional tool. The following case is representative of one that may be “molded” by societal program entitlement, education, cultural bias, and investigator bias.

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## Case Summary

### *History*

A 31-year-old African-American male had his hand and arm caught between a piece of metal and the machine that molds automobile fenders. He was able to pull his hand out, but he almost immediately noted swelling over his right hand and wrist, which became progressively more painful through the evening. He went directly from work to the emergency room where they diagnosed arm, hand, and shoulder sprain. X-rays were negative for fractures. He reported for work the next day, but was told to see the plant doctor. The physician noted rather pronounced soft tissue swelling. At that time, the right hand and wrist were swollen to approximately 1-1/2 times larger than usual. He was able to move his hand somewhat, but with moderate pain. He also complained of modest weakness in the shoulder. He was taken off work and placed into a physical therapy (PT) recovery program, which provided practically no functional improvement over six weeks. The patient stated that the physical therapy seemed to make his hand more uncomfortable and swollen. He was also unable to attend PT regularly because he had to "take care" of his father and an 11-year-old nephew. The physical therapist encouraged "PRICE" (protection, rest, ice, compression and elevation) in the form of an ACE wrap splint, compression glove and ice packs after each physical therapy episode. By the sixth week, the plant doctor had concurrently prescribed trials of Ibuprofen, Propoxyphene, and Hydrocodone without significant benefit. The patient felt that the non-medication modalities did as much good as the pain medications. Physical therapy and analgesics were subsequently discontinued for lack of clinical response.

Approximately 6-1/2 weeks post-injury, a triple phase bone scan was ordered which revealed "hyperemia and increased blood pool activity in the right hand, wrist and forearm." The study was interpreted as "...suggestive of mild reflex sympathetic dystrophy..." The patient was referred to a pain clinic for diagnostic and therapeutic interventions. Three months after his injury, he was examined by an anesthesiologist/pain management specialist who diagnosed Complex Regional Pain Syndrome (CRPS) -Type I, upper extremity (Reflex Sympathetic Dystrophy - ICD-9 Code 337.21). Parenthetically, CRPS -Type I may be distinguished from CRPS-Type 2 (Causalgia) because partial interruption of a peripheral nerve will produce painful symptoms only distal to the distribution of the injured nerve, whereas CRPS Type -I (RSD) symptoms are circumferential and non-dermatomal in presentation.

Stellate ganglion blocks were recommended and approved by Workers' Compensation. Over the course of the next two months, the patient had 12 right stellate ganglion blocks under fluoroscopic guidance. Symptoms improved transiently after each block, but symptom abatement lasted approximately only 8-10 hours. The patient also tried nonsteroidal anti-inflammatory drugs (NSAIDs), including Valdecoxib and Refocoxib, without benefit. He subsequently tried several anti-epileptiform drugs (AEDs), which included Gabapentin, Oxycarbamazepine and Topiramate. These also failed to produce significant benefit. Ultimately, all opioids, AEDs and NSAIDs were discontinued.

A second opinion evaluation by a physical medicine and rehabilitation interventional pain specialist raised the possibility of benefit from a dorsal column spinal cord stimulator. This was approved by Workers' Compensation and a dual lead dorsal column spinal cord stimulator trial was undertaken by the first pain management specialist. After a 14-day trial, the patient's symptoms had failed to improve and the patient declined implantation of a permanent dorsal column spinal cord stimulator system.

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In the meantime, the plant-employed occupational medicine doctor had also been continuing to see the patient. She reported that the patient's sleep and endurance for social, domestic, recreational, and occupational endeavors were significantly reduced. She placed him on Klonopin and once again re-initiated Hydrocodone/Acetaminophen. Seven months post-injury, the symptoms had gradually stabilized but the patient was having constant pain in the right side of the neck, elbow and shoulder as well as his right arm, forearm, hand, and wrist. Her request for authorization for psychological consult was denied, citing "... depression is not part of the compensable injury." She appealed and is awaiting decision of the Workers' Compensation Office of Medical Services.

### *Work*

The patient had been employed at the same job for three and a half years. It was his first job in heavy industry. Prior to that time, he had been a laborer. He had also driven a truck for a commercial farming operation. While working at the stamping plant, he loaded presses, operated a grinder and did other physical activities such as loading, pushing, stacking, and sorting of large and small parts. This involved frequent lifting, continuous standing, and frequent moving about the plant floor. He was also required to be able to count, write and make non-executive decisions regarding equipment operations in his work locale. One year after the injury, he had not returned to work and he began the process of vocational rehabilitation. The plant physician and the pain clinic specialists believed that he was at maximum degree of medical improvement and that he was not ready to return to his prior work. In fact, one pain management physician said "I have serious concerns about this gentleman ever rejoining the work force at meaningful employment as a laborer." Stated vocational limitations are modest language difficulty, moderate reading skills, impaired writing, having to switch from being right-hand dominant to left-hand dominant and also significant depression attributed to poor concentration abilities and chronic fatigue.

### *Family*

The patient reports that he can no longer provide the same level of care for his father or his young nephew. He specifically stated that playing ball and fishing with his nephew "is out" and that his father requires more help with housework and daily activities (his father is 68 years old with declining health). He has difficulty driving his automobile and can only drive with the left hand. Neither he nor family members were sufferers of alcoholism, illicit drugs or physical, sexual or emotional abuse.

### *Social*

As reported above, no history of illicit drug or alcohol abuse reported. The patient became a convert to Islam at age 19. He has been the "unofficial" guardian of his nephew while his brother (father of the 11-year old boy) is incarcerated. The boy's parents are unmarried; the mother abandoned the family before the son was 5 years old.

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### *Mobility & Independence*

Operating a standard transmission vehicle is "impossible." He has difficulty eating, drinking, buttoning his clothing and shaving. Bathing creates difficulties because the extreme sensitivity of the right arm causes warm water on the left side of his body to feel hot and exquisitely uncomfortable on the right side of his body, especially arm, shoulder and neck. Since the time of the injury, he was not in a sustained sexual relationship, but he had been sexually active and he says that this is difficult for him now. He denies any previous work related injuries or non-work related injuries, and there were no previous injuries to the right arm, hand, wrist, elbow, neck, torso or right leg and foot.

### *Education*

The patient has a high school diploma. He did not score well on PSAT or SAT junior high and high school exams and he was preparing for a skilled trade. He intended, at one time, to be an electrician or carpenter. He had to repeat one of the elementary grades due to reading and writing difficulty, and these same problems persist today.

### *Past Medical History*

He denies any systemic disease. He has never been treated by a licensed mental health professional. He smokes a pack of cigarettes per day since he was 15 years old. He has had no prior surgeries. He does not use alcohol due to a religious intolerance to this habit. He denies use of any street drugs or abuse of any prescription medications for the same reason.

### *Review of Systems*

Occasionally, he experiences productive cough, attributed to cigarettes, otherwise negative system review. His overall health is described as "good and strong." He relates that his weight "ballooned" when he began to earn a steady income, but it soon stabilized once he began to prepare foods for himself and his family, rather than eat "fast food."

### *Associated Symptoms*

Intermittent swelling, occasional blanching, occasional warmth and redness of the entire right arm, forearm and hand, increased sweating in the effected hand, but not on the opposite limb. He developed weakness to grip and hand position, as well as progressive clumsiness with inability to hold small objects. Approximately seven months post injury, he complained of pain involving the right side of the body and the right leg as well as the right arm. He occasionally described dizziness as well as numbness and tingling over his right buttock and hip with subjective weakness in his right leg.

### *Physical Examination*

**General** - 5'7" tall, weight 129 lb., pulse 70 and regular, respiratory rate 16 and unlabored. Blood pressure 123/78. Gait normal. No assist device is used. Discomfort when sitting and lying supine, attributed to painful postures of the right arm, hand,

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shoulder and leg. The right arm and hand is immobilized and flexed against his chest.

**Measurements** - Right arm measurements demonstrated mild hand and arm muscle atrophy. Right forearm circumferences at 10 cm below the lateral epicondyle was 27 cm and the right arm circumference 10 cm above the lateral condyle, was 37 cm. The left arm measured 27 and 30 at similar sites.

**Vascular** - Arterial pulses are normal at the carotid, axillary and radial sites. They are symmetrical and physiologic bilaterally. There is no clubbing, cyanosis or erythema at this examination. There is modest edema of the right hand and fingers.

**Cervical spine** - Reveals no muscle tenderness, no mal-alignment, normal cervical lordosis preserved. Ranges of motion were assessed using net inclinometry. Forward flexion is 48 degrees, cervical extension is 59 degrees, lateral rotation is 58 degrees to the right and 56 degrees on the left. Lateral flexion is moderately diminished on the left with 25 degrees of inclinometry. Lateral flexion on the right is unencumbered at 39 degrees.

**Shoulders** - To palpation, the right shoulder joint is exquisitely tender without any erythema, nodularity, edema, joint swelling or joint crepitation. Ranges of motion right shoulder is flexion 80 degrees, abduction 35 degrees, extension 15 degrees, adduction 20 degrees. Internal rotation is so painful as to be virtually nil and external rotation is 15 degrees. The left shoulder reveals no tenderness, swelling, nodularity or deformity. There is no abnormality. Ranges of motion are normal.

**Elbows** - The right elbow is tender to touch with significant allodynia being evident. There is no blotching or piloerection. Supination of the right elbow is 30 degrees, pronation is 20 degrees, extension is limited to 25 degrees and flexion is limited to 100 degrees. The left elbow is completely normal without evidence of joint nodularity, tenderness, erythema, swelling, etc.

**Wrists** - The right wrist is exquisitely tender with modest swelling. Flexion is 40 degrees, extension is limited to 20 degrees, eversion is 5 degrees and inversion is 10 degrees. The left wrist is unencumbered. There are no anatomic changes, rigidity or swelling. Flexion and extension of the left wrist are both 60 degrees. Eversion is 20 degrees. Inversion is 30 degrees.

**Hands** - The right hand reveals tender, mildly swollen and somewhat blotchy fingers without clubbing. There is moderate allodynia in the entire hand. On neurologic examination, there is significant weakness of the right hand, graded at 3/5. Grip strengths are reduced. Metacarpal phalangeal joint range of motion is dramatically reduced. Finger extension cannot be tolerated beyond 5 degrees and flexion cannot be tolerated beyond 50 degrees. Multiple measurements at the proximal interphalangeal joints of the index and middle finger, ring finger and little finger were conducted. The entire series of measurements suggest the right hand is significantly dysfunctional with inability to grasp and oppose for the thumb. Abduction of the thumb is extremely limited and the patient could not make a fist. Opposition of the thumb is exquisitely painful. None of these findings were evident on the left hand. There is no evidence of arthritis in either hand. Grip strengths were conducted using rapid alternating technique. Grip strength was successively recorded as 3 kg of force on the right and 46 kg on the left. He was unable to pick up coins, button his shirt, or tie his shoe with the right hand. Sensitivity for warm and cold perception was

increased on the right but not on the left.

**Neurologic** - Reflexes were normal at the deltoid, biceps, triceps and brachioradialis. Vibration perception was normal. There was a circumferential alteration of perception of warm and cold sensation in the right hand. With evaporation of alcohol, the right hand became exquisitely tender due to cooling (latent heat of vaporization). Mechanical pressure over the hand, wrist, forearm and elbow was exquisitely tender on the right compared to the left. In addition to the mechanical and thermal allodynia, there was increased perception to pinprick and light touch over the right hand in a circumferential, non-dermatomal pattern (worse over the dorsal and lateral aspect of the right hand). These findings constitute a strongly positive Hendler's Alcohol Drop and Swipe Test (Hendler, 1995) warranting the diagnosis of RSD or complex regional pain syndrome - Type I for the upper extremity.

**Lower Body** - Normal sensation, strength, reflexes, coordination, muscle mass, muscle tone, balance, ranges of motion, gait and symmetry.

### *Clinical Impression*

This young man has experienced a crush injury of the right arm, hand and wrist with subsequent development of Complex Regional Pain Syndrome- Type I. He has undergone aggressive therapy modalities including medications and non-medical interventions, stellate ganglion blocks, dorsal column spinal cord stimulation trial and extensive physical therapy. He has persistent dysesthesias and weakness in the entire right upper extremity. There are also some subjective complaints in the right leg. There are persistent range of motion changes in the shoulder, elbow, wrist, hand and fingers. There is a modest reduction of range of motion of the cervical spine, especially for left lateral bending. Grip strength and manipulative ability are significantly impaired in the right hand. The independent medical examiner determined the patient to have reached his maximum degree of medical improvement. No further specific interventional treatment or diagnostic therapies other than what is listed below are presently warranted. The independent medical examiner opined that other invasive and somewhat unproven technology, such as deep brain stimulation or trials with intrathecal medications, could be considerations for the future care - but not currently.

The patient will require ongoing physical assistance, medication and medical follow up for treatment by pain specialist, physiatrist, psychologist, physical and occupational therapists. He is currently not working and, based on his previous training and prior job description, he is unable to return to work as a laborer/ equipment operator. Significant limitations for vocational rehabilitation exist due to compromise of his reading, writing and dexterity skills, and near complete loss of meaningful use of the right upper extremity.

Based on this evaluation, calculations regarding whole person impairment were conducted from the American Medical Association *Guides to Evaluation of Permanent Impairment*, 4th ed. (1999). Specifically, impairment of the right thumb range of motion, metacarpal phalangeal joint range of motion, loss of abduction, loss of opposition, loss of adduction were also appropriate. Ultimately, the entire upper extremity combined values for range of motion, sensation and strength warrant an 85% impairment of the upper extremity, which translates to a 51% impairment of the whole person. This 51% of the whole person is consistent with near complete loss of function in the right upper extremity and is attributable directly to his injury. The cervical loss of range of motion is attributed to the progression of the reflex sympathetic

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dystrophy. Three percent (3%) impairment for cervical spine diminished lateral flexion is combined for a recommended total of 52% impairment of the whole person for the injury suffered while working at an automobile parts stamping plant.

## Pain Assessment

The most effective tools, when evaluating chronic pain and disability or impairment, are broad clinical experience, an extensive history (including a discerning records review) and a thorough physical examination (McPeak, 2000). Broad clinical experience and ancillary testing support the investigation of symptoms, signs, assertions and circumstances. When an examiner encounters significant examination inconsistencies (not observed in the example case study), concerns arise regarding the basis of observed illness-associated behavior and symptom presentation. Treatment based on inappropriate conclusions derived from amplified, embellished, deceptive or coached symptoms are doomed to be ineffective, expensive, unnecessarily risky and disappointing to all involved.

Assessment of physiological and psychological data should follow a methodic history review and physical examination. When defining the unpleasant experience known as chronic pain, The International Association for the Study of Pain did not attempt to emphasize the importance of either the physical or mental components of the unpleasant, stressful symptoms that are manifest by the chronic pain patient. Their recommendation included investigation of both psychological and medical aspects that could represent any organic cause for pain (Mersky, 1986).

*Medical Pain History Practice Guidelines* for the features of a pain-focused “history of presenting complaints” were detailed by both Mersky (1986) and Longmire (1992) more than a decade ago. They recommended attention to the chief complaint and secondary complaints (not illnesses) as the focus of the initial interview. Detailed information should be acquired as to time and date of complaint onset, conditions at the time of onset, body location of the complaint, severity/intensity of the experience, temporal character of the complaint(s), descriptors, aggravators, alleviators and associated symptoms. The classical features of a detailed medical history were also advocated, including review of systems, past medical-surgical-behavioral history, allergies, social history, family history, occupational history and medication history to include questions regarding abuse or addiction.

*General Physical Examinations for Pain-related Complaints* have been outlined in texts on neurology, physical medicine, orthopedics and chiropractic (McPeak, 2000). Another excellent methodologic approach to assessment of neurological and musculoskeletal complaints is found in the American Medical Association *Guides to the Evaluation of Permanent Impairment* (1999) which includes Table 71 “Spine Impairment Differentiators.” All such examinations are both observational and evocative.

Knowledge of musculoskeletal, neurosensory and autonomic nervous system function form the foundation for sensitive assessment of presented and elicited signs and symptoms. Musculoskeletal examinations require the examiner to consistently and objectively assess strength, ranges of joint motion, gait and posture. Examination should be accompanied by uniform measurements for repetitive and comparative testing. Consistent effort by the patient is also held to be a sign of personal validity. Further structural examination may warrant additional diagnostic imaging including static and dynamic X-rays, Magnetic Resonance Imaging, Computer Augmented Tomography, Bone Scan and Bone Density tests.

Neurosensory examination should assess the integrity or dysfunction of the transmission

pathways for experiencing stretch/reflexes, temperature, touch and vibration. These sensations may be undisturbed, over-sensitive or under-sensitive, depending on the presence of neural irritation or neural destruction. When mapped, the findings are compared to normal patterns of central, peripheral or referred nerve sensation (Forester, 1933; Head, 1983). This examination for chronic pain (not necessarily for CRPS) provides the medical justification for further testing such as Nerve Conduction Studies, Electromyography or Somatosensory Evoked Response. All of this secondary diagnostic information is intended to help rule-in or rule-out a suspected diagnosis.

Autonomic nervous system assessment is warranted if the homeostatic neural pathways in skin, hair and blood vessels are dysfunctional. If the autonomic nerves are irritated, resultant hyperexcitability may manifest as increased sweating or vasoconstriction with mottled, cold skin in the distribution of the affected nerves. If autonomic nerves are destroyed, the lack of nerve tone may be manifest as warm, dry, shiny skin (Gibbons & Wilson, 1992). If the sympathetic portion of the autonomic system becomes injured and dysfunctional to the point of self-sustained activation, a terrible phenomenon called sympathetically maintained neuropathic pain may develop. Most suffers of neuropathic pain exhibit *allodynia*, a painful response to a normally non-painful stimulus (Hutson, 1997). The Hendler Alcohol Swipe & Drop Test easily tests the allodynic component of RSD/CRPS Type I. There are three types of allodynia: thermal (abnormally sensitive to hot or cold), chemical (burning of skin when cutaneous nerves are exposed to fat soluble alcohol) and mechanical (pain reported when the skin is gently stroked) (Kim and Chung, 1995). At least two types of allodynia must be present and the pain must be circumferential to qualify for the diagnosis of RSD/CRPS I.

According to Grabois (1988), chronic pain syndrome presentation is the summation of Organic Factors (Body Experience), Psychological Factors (Mind Experience) and External Pressures (Social Experience). Fordyce (1976) identified three components of chronic pain assessment. First, the *subjective* component is represented by rating scales and questionnaires. Next, *physiological*, as measured by galvanic skin response, muscle tension, blood pressure and heart rate; however, such parameters have only been studied for acute pain in the laboratory. There have been no definitive laboratory studies and few clinical studies in the chronic pain setting, but in the authors' opinion these measures may not be valid indicators for chronic pain syndrome. Last, Fordyce advocated behavioral measures reflecting somatic intervention, impaired functional capacity and pain complaints (Fordyce & Lansky, 1984). As pain population measures, these measurements enjoy great validity. However, for the individual patient, there is no single technique to evaluate chronic pain. As chronicity of complaints increases, the importance of behavioral and motivational factors may predominate as goals shift from pain level reduction (*how much it hurts*) to functional restoration and coping improvement (*how much can I do*) (Reading, 1989).

## Validation

Keen attention should also be devoted to pain behaviors in language, speech pattern, mood, movement, assist devices and avoidance postures. Many pain-related examinations include a variety of self-reported test instruments aimed at teasing out the behavioral accompaniment to chronic pain symptom presentation. A patient may be influenced by the presence of anxiety, mistrust, stoicism, societal mitigating factors and secondary gain. Subsequently, pain symptom presentation may be consciously or unconsciously distorted, diminished/masked, exaggerated/embellished or inconsistent without being totally fabricated.

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The high rate of pain-related symptoms associated with personal injury and workers' compensation has spawned the descriptive term for such behavior as the "Barnum Effect" (Lees-Haley & Williams, 1993/1996). Examiners are advised to limit their opinions regarding suspect pain complaints to "real, imagined, or feigned," but "malingering" requires proof that the person is practicing willful deception (Stein, 1972).

Most examiners rely on a "consistency model" when trying to validate pain or invalidate inappropriate pain reports. Even though pain complaints and behaviors may be inconsistent as a result of psychological changes, treatment outcomes, societal factors and other forces, multi-tiered assessment and validation efforts may help detect deceitful symptom presentation. Hall and Poirier (2001) proposed the following six screening signs as suggestive of distortion:

1. Anatomical Inconsistencies - pain versus temperature, carried by the same pathway but often separated by symptom distortion; sudden "give-way" of an extremity.
2. Drug Response Discrepancies - equipotent doses of different drugs produce disparate response.
3. Clinical Interview Behavior - inconsistencies of self-report and behaviors.
4. Presence of Psychometric Signs - MMPI scores, self-report inventories and other instruments, helpful in building a broad database before reaching conclusions whether behavior is consistent or inconsistent with deception (deliberate or non-deliberate).
5. Inconsistent Community versus Evaluation Behavior - what happens at home should be seen and validated in the evaluation setting, variances warrant exploration.
6. Lack of Response to Common Interventions - almost all patients respond to some intervention (ice, heat, massage, medication, relaxation, stretching, etc.); those who fail to improve with any intervention need to be reevaluated and/or redirected to operant or cognitive treatment (Hall & Poirier, 2001, p. 164-168).

Concurrent pain diaries more accurately chronicle pain levels and contributing variables such as emotional state, sleep pattern, medication utilization, activities of daily living, pain alleviators and pain aggravators. Pain self-reporting is integral to assessment of complaints, but recollection of prior pain levels is unreliable. Most patients simply do not report memory of past pain accurately. Such reports are influenced by anxiety, pain intensity, depression and fear. Patients more reliably remember what they said about the pain rather than what they *felt*. Periodic review of the recorded events may refine activities aimed at improved functionality and self-directed palliative opportunity (Clark, 2001).

Physical examination tests designed to evaluate the possibility of amplified symptom presentation include *Magnuson's* test (inconsistent and/or amplified response to examination which is not duplicated in the face of distraction), *Mannkoph's* sign (increased pulse while palpating a painful locus), *Hoover's* test (when asked to raise a weak leg when supine, force should be applied to the opposite limb in order to comply; absence of contralateral heel pressure is a positive test) and *Burn's Bench* test (person may be seated comfortably, but is unable to complete a kneeling maneuver secondary to reports of pain). *Waddell's* Signs were original-

ly intended to help predict success of orthopedic lumbar surgical intervention; however, they have not proven to represent a reliable measure of somatic symptom amplification (Waddell, 1987). Waddell observed five broad behaviors associated with inconsistent or failed response to surgery. His “non-organic” signs have been inaccurately associated with malingering or deception by some examiners attempting to validate pain behaviors. The *Korbon Somatic Amplification Rating Scale* has been proven to be a more specific measure of symptom distortion than Waddell’s signs (Korbon & DeGood, 1987). Korbon methodologically eliminated most of Waddell’s more unreliable observations by rating four categories (sensory examination, motor examination, tenderness, and straight leg raising in the presence of distraction) to easily and reliably identify patients who demonstrate exaggerated illness behavior.

Behaviors may also be attributed to drug seeking with the intent of diversion (for personal or criminal gain) as well as addiction. Suspicious diversion behaviors cluster around inconsistency, urgency, intimidation and deception. Cole (2001) outlines these behaviors from the perspective of primary care. Whimsical dosing and alcohol abuse do not contribute to compliance with pain treatment tenets.

When pain concurrent to ethanolism is suspected, confrontation and statement of reasonable expectations is the best, first tool. Referral to a formal alcohol treatment program may be necessary for persistent or recurrent ethanol abuse. Screening questionnaires, reliant upon patient veracity, may be of some predictive value. The **C-A-G-E** questions advocated by the American Society of Addiction Medicine (**C**ut down attempts, **A**nnoyed by criticism, **G**uilty about drinking behavior, and **E**ye-opener drug/drink) may elevate an examiner’s quiet clinical concern to active intervention levels (American Society of Addiction Medicine, 1999). Similarly, drug abuse or intoxication may be associated with irresponsible behavior. Two or more positive responses on the *Trauma Test* may indicate problems with substance abuse (fractures as related to sports, traffic injuries, head injuries, altercations or assaults while intoxicated, and injury while intoxicated) (Weaver & Jarvis, 1999).

Objective laboratory test may yield clues when attempting to investigate or validate suspicious or irresponsible behavior. Alcoholism is associated with high red blood cell Mean Corpuscular Volume (MCV) and elevation of the GGT liver enzyme level. Urine drug screens are currently the most widely used and extensively validated testing method to investigate compliant or illicit drug ingestion. Two urine drug tests are widely used, the Immunoassay method and the Gas Column Chromatography/Mass Spectrophotometry (GCC/MS) method. Immunoassay is a fast, inexpensive screening tool that may yield false-positives due to cross-reactivity and false-negatives due to failure to achieve test thresholds or non-specific enzyme line assay. GCC/MS is a more time consuming, definitive test conducted by a reference laboratory that identifies specific drugs and metabolites with minimal cross-reactivity. One should be cautioned to note that no relationship exists between medication dose and urine drug or metabolite concentration (Shults, 1999).

Office agreements such as Consent to Treat, Compliance & Opioid Access Agreement, Prescribing Policy, Duplicate Prescription Pads, and Memorandum of Understanding may increase patient compliance, understanding and validation. Such documents may discourage diversion, multiple providers, multiple pharmacies, altered prescriptions and inappropriate or early refills.

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*Psychological Assessment*

The patient is a 31-year-old, single, right-handed, African-American male, who is appropriately dressed and groomed for the appointment. He readily answers all of the questions posed but initiates little spontaneous conversation. Expressive language is fluent and well articulated. Thought processes are observed to be coherent and goal directed. His insight and judgment at this time appear good. His affect is congruent with thought content. He describes his mood as "somber" and says he has "a lot of depression." He acknowledges suicidal ideation, but denies overt intent. He denies homicidal ideation or intent. He denies anhedonia, but says he is not able to do things like before, such as activities with his nephew or necessary household tasks. He describes his sleep as disturbed; difficulty with both initiation and maintenance of sleep. He estimates his total sleep time at five and a half hours in a 24-hour period. He says he does not feel rested when he awakens in the morning. He says the number of arousals during the night depends on his medications and his pain level. He states his appetite is variable with his pain level. His energy is reported as "tired a lot." Endurance is also reportedly very poor. He ascribes these difficulties to both pain and depression.

The patient reportedly resides with his father and his nephew. The activities of a typical day include arising and spending time with his father. He says he may go outside for a brief period of time and then lie on the sofa. He says, "I just try to stay settled." While he states he is able to do most of his activities of daily living independently, upon closer questioning, it is clear that he requires assistance with fastening his clothing and performing other grooming tasks. He also has difficulty with other than simple meal preparation and states he is clumsy and often drops food while eating. Because of this, he is reluctant to eat out or around others. This limits his socialization.

His attention/concentration is poorly maintained during the evaluation. He appears distracted by his pain at times and he loses his train of thought. He is noted to stroke the affected limb at times in a way reminiscent of someone comforting an infant.

*Psychological Test Results*

The MMPI-2, the MCMI-III, the Oswestry Low Back Pain Disability Questionnaire, The Beck Depression Inventory-2, and clinical interview were used to assess his emotional functioning. On the MMPI-2, the profile produced is valid. The profile is consistent with a 2-1/1-2 high point pain. There is no evidence of over-reporting on this profile. There is a significant somatic focus but not in excess of expectations given his condition. Individuals who produce these validity scale profiles often use repression and denial as a way to cope with psychological difficulties; this may also be related to his religious beliefs since individuals who are religious often elevate the validity scales in this fashion. He has indicated that his self-concept is poor; this is corroborated by his difficulty in providing care for his family, which was one way he derived positive self-esteem and self concept. He is also likely to report weakness, fatigue, and lethargy as opposed to classic depressive symptoms. There is also some evidence of suspiciousness endorsed. The patient has indicated that he is likely to be passive and unassertive in his interactions with others.

On the MCMI-III, the patient produced a valid profile; there is a moderate tendency toward self-abasement, scores have been corrected for this response tendency. Individuals who produce the scores often have low self-esteem, become angry or tearful easily, and feel tense, guilty, and depressed. He presents himself on testing as socially awkward, withdrawn,

and self-conscious. He shows markedly dependent features; based on his self-report, this represents a change from his premorbid level of functioning. When stress is minimal, individuals who produce similar profiles appear generally well-adjusted with few interpersonal problems. When stressed, they are at risk for developing anxiety or depression, or both. The patient has endorsed moderate symptoms of anxiety and many symptoms of depression.

On the Oswestry Low Back Pain Disability Questionnaire, his score of 80% falls in the range typically seen in very severe cases. He has indicated that pain interferes with most aspects of his life. He rates the pain as severe and rapidly worsening. On the Beck Depression Inventory, his endorsement of symptoms is consistent with severe depression.

### *Psychological Analysis*

There are several factors which must be considered in this patient's treatment plan. One is his premorbid learning difficulties. Any information presented should be provided in a manner that is easily understood by an individual who has a high school diploma and who had dyslexia. Provision of instructions and education should be done in concrete and lay terms. Given his present situation, he is unlikely to ask for additional information and the treatment team must be sensitive to the fact that he feels that he is not the man he was before his injury. These factors, combined with the effects of pain on his concentration and recall, will lead to miscommunication and misunderstandings if not considered. Cultural expression of pain is another factor to be considered by the treatment team in this case (Portnoy & Ugarte 2004). He may not express his pain complaints verbally because of his overall style of interacting. Additionally, there is evidence of depression related to his pain. He will be seen for relaxation training to assist him in learning to cope with pain and stress and education regarding the interaction of stress and increased pain from CRPS will be provided to him. Sleep hygiene education will be provided with specific techniques he may use to facilitate sleep. Short term Cognitive Behavior Therapy (CBT) will be provided with treatment goals of preventing catastrophizing and improving his ability to cope with pain. Increasing his activities through social activities will also be a goal of therapy. The patient has provided signed, informed consent and the therapist will meet with his father and nephew to assess the reinforcement contingencies that are present in his home environment. Given the impact of tobacco abuse on CRPS, behavioral assistance in smoking cessation will be provided to him if he is willing to participate.

The diagnosis that is most consistent with his presentation is Adjustment Disorder with Depressed Mood. This is a situational depression that is related, in the authors' opinion, to his work-related injury and subsequent pain disorder. While he is likely to demonstrate improvement, he will require somewhat extended duration of treatment due to his premorbid learning difficulties, his progressive pain, and his inability to engage in his routine activities. He will require periodic treatment throughout his life expectancy, particularly during periods of increased stress or transition. He will also benefit from a driver's evaluation to allow him more independence in driving. Medication with sedative properties is recommended to address both his emotional dysfunction and his sleep disruption, if his physician agrees.

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## **Role of Stress and Psychological Factors**

Complex regional pain syndrome (CRPS) is characterized by pain that is in excess of what might be expected given the degree of injury, accompanied by signs of autonomic nervous system dysfunction. Because of these factors, allodynia, severe pain behaviors, and the non-anatomic distribution of pain (stocking or glove distribution), this disorder has often been attributed to a psychogenic etiology (Ochoa & Verdugo, 1995). While there are studies that appear to support this conclusion, many of them are limited by methodological flaws. There is one ongoing prospective study being conducted by Bruhel, Steger, and Harden (2001) which found support for the hypothesis that depression represents a risk factor in some cases of CRPS. While there is no implication with respect to causality, there are studies to suggest that individuals with CRPS may be more emotionally distressed than other groups with chronic pain. Lynch (1992) concluded that emotional and behavioral changes seen in CRPS I are likely related to pain. However, there seems to be no evidence, based on her review of the literature, that personality factors or other psychological factors predispose to CRPS. This is not to suggest that there are no psychological components in the disorder. Rather, psychological factors that are associated with CRPS include an emotional reaction to pain, conversion disorder, and either behavioral-volitional or unconscious factors.

One of the proposed mechanisms for development of pain processing dysfunction in CRPS is adrenergic activity (Roberts, 1986). It is well-documented that stress and emotional distress are associated with alterations in adrenergic activity (Charney, Woods, Nagy, Southwick, Krystal, & Heninger, 1990). Stress leads to increased adrenergic responses to excitatory stimulation in the locus coeruleus in the brainstem (Charney, et al, 1990). In this way, the interaction of systematic over-responding of the adrenergic system and sensitized adrenergic receptors could produce some of the characteristic symptoms of CRPS. While it cannot be determined whether or not psychological factors have an etiological role in the development of CRPS, once the condition has developed, it is likely to be exacerbated by increased stress or emotional dysfunction.

CRPS is a complex medical condition in which psychological factors may have a role in maintaining or exacerbating. For this reason, it is important to have a close interaction between the physician and pain psychologist treating the patient. There are a number of issues which may affect treatment; these include operant conditioning, coping skills, other psychological conditions, substance dependence, and mood disorders. As with all other pain evaluations, a comprehensive clinical interview is the basis for the evaluation. The interview should include a history of the person's injury and course of treatment in order to determine the effect the injury has had on the person's lifestyle and to evaluate for environmental reinforcers that may serve to reinforce negative behaviors, including the sick role. This is accomplished not only through the patient's self-report but through behavioral observations and, where possible, collateral interview. This allows assessment of any current life stressors that may impact treatment outcome. Fordyce's (1976) model of operant conditioning, whereby reinforcement contingencies serve to maintain and/or exacerbate pain is one common model of conceptualizing the influence of environmental factors. An assessment of pain intensity, persistence, and temporal patterns is also a part of pain evaluation. Other factors that should be considered in the clinical interview are signs and symptoms of comorbid psychological illnesses that may affect treatment and, ultimately, outcome. There is a large body of research documenting the coexistence of depression, anxiety, post-traumatic stress disorder, and other Axis I disorders in chronic pain. Bruhl and Carlson (1992) felt that depression, anxiety, and stress may influ-

ence CPRS through alpha adrenergic mechanisms. Thus as catecholamines are released through anxiety or stress of pain, it creates a feedback loop that becomes cyclic. Research in CRPS documents an incidence of 24% of patients with an Axis I disorder, including anxiety and depression (Monti, Herring, Schwarlzman, & Marchese, 1998). This is generally commensurate with findings of depression and anxiety in other chronic pain populations (Atkinson, Slater, Patterson, Grant, & Garfin, 1998). It has been found in pain populations overall that those patients who have a history of depression predating pain are more resistant to treatment than those who develop depression *de novo* after an injury (Atkinson, Ingram, Kremer, & Saccuzzo, 1986). Therefore, determining premorbid history and initiating treatment early in the process of treatment is likely to result in more positive outcomes. These individuals are more likely to negatively appraise their situation and may become more resistant to both medical and psychological aspects of treatment. As part of the assessment, the patient's potential for substance abuse should also be considered. Individuals with either a personal or family history of substance abuse may be at higher risk for abusing substances prescribed for CRPS. As it has been shown that tobacco and caffeine exacerbate CRPS pain, this should also be assessed.

### **Assessment Measures**

In addition to clinical interview, psychological testing is often used in the assessment of individuals with CPRS. The choice of testing is most often based on clinician familiarity. When a test is chosen, the psychometric properties must be considered to insure that the test is reliable and valid for the individual being tested and it is imperative that the norms be appropriate for the individual being evaluated. It is beyond the scope of this article to describe any of the measures in great detail and only the most commonly utilized are included below.

The most commonly used instrument in assessment of individuals with chronic pain, including CRPS, is the Minnesota Multiphasic Personality Inventory-2 (MMPI-2). This test is a measure of overall psychological functioning (Hathaway & McKinley, 1989), and consists of three validity scales and ten clinical scales. The positive attributes of the test include the body of research that has been developed in the area of chronic pain and the reliability and validity of the instrument. However, the test consists of 567 questions and requires a sixth grade reading level to read the instrument. This is a limiting factor with respect to the utility of the test to discriminate those with CRPS or to predict outcome. There is a modal profile that is often seen in chronic pain patients, including those with CRPS (Nelson & Novy, 1998).

Another measure that is often used to assess pain is the McGill Pain Questionnaire (Melzack, 1975). This assessment instrument is used both clinically and in research settings (Wilkie, Savedra, Holzmier, Tesler, & Paul, 1990). The pain questionnaire consists of pain descriptors that fall into four major categories: Sensory, Affective, Evaluative, and Miscellaneous. The descriptor lists are read to patients with instructions to choose those words that describe his or her feelings or sensations at the time of the evaluation. Three major index scores are obtained. The first is the Pain Rating Index (PRI) which is based on the rank value of the descriptors. These are then summed to derive separate scores on the four major categories. The second index is the Number of Words Chosen. Third is the PPI, which is the number-word combination chosen as the indicator of overall pain intensity at the time of administration. This measure, which has been documented to be reliable, valid, and useful, provides a relatively rapid method of measuring subjective pain experience. Moreover, numerous studies have demonstrated the utility of this measure in the differential diagnosis between various

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pain syndromes (Dubisson & Melzack, 1976; Leavitt & Garron, 1980; Perry, Heller, & Levine, 1991).

The West Haven-Yale Multidimensional Pain Inventory is a 56-item measure with three sections (Kerns, Turk, & Rudy, 1985). The first section includes items regarding the interference of pain with daily activities, work, family relationships and social activities, support from spouse or significant other, pain severity and suffering, and perceived life control, and negative mood. The second section assesses patient's perception of the degree to which spouses or significant others respond with solicitous, distracting, or punishing responses to pain or suffering. The final section assesses the frequency with which patients engage in activities. Recent studies have shown that this measure may be useful in predicting treatment outcome.

The Beck Depression Inventory (BDI) was developed by Aaron T. Beck, MD, to assess the cognitive components of depression and introduced in 1961 (Beck, Ward, Mendelson, Mock & Erbaugh, 1961). Because of the number of items on the scale that assess somatic symptoms, it has been suggested that these items may artificially elevate the scores of patients with chronic pain (Williams & Richardson, 1992). Advantages of this instrument are the brevity and ease of administration.

Several measures have been developed to assess pain specific disability or interference in the performance of activities. Among the most frequently used measure is the Pain Disability Index (Tait, Pollard, Margolis, Duckro, & Krause, 1987). This task is a self-report measure of the extent to which pain limits the performance of daily activities. The Pain Disability Index is widely used in rehabilitation settings to assess family functioning, socialization, recreation, occupation, sex, ADLs, and life support activities. It is similar in some ways to the Sickness Impact Profile (Bergner, Bobbitt, Carter, & Gibson, 1981), which provides a profile of patient disability on twelve dimensions of functioning.

One important factor in managing pain is the patient's ability to cope with pain. Research has documented that using coping self-statements are beneficial in improving pain and conversely, praying, hoping, and catastrophizing are associated with greater anxiety, decreased activity and higher pain ratings (McCracken, Goetsch, & Semenchuk, 1998). One measure that is used to assess this construct is the Coping Strategies Questionnaire or CSQ (Rosenstiel & Keefe, 1983). This instrument assesses six cognitive coping strategies and one behavioral coping strategy and is the most widely used measure of pain coping strategies. Recently, ethnic differences in pain coping strategies were studied utilizing the Revised Coping Strategies Questionnaire (CSQ-R) and significant differences among White and African American subjects were noted. (Hastie, Riley & Fillingim, 2004).

It is imperative that all the above tools be placed in perspective. No single pain "gold standard" test or questionnaire exists. Each tool yields a bit more information in order to estimate the consistency, and, indirectly, the veracity, of reporting the most subjective of sensations, pain and attendant suffering. Empirically, clinical conclusions based on multiple assessments and instruments should be more sensitive than simple impressions or "hunches." Compliance by the patient is dependent on veracity, personal responsibility and self-reporting. Thus, many pain treatment providers rely on compliance as an indirect estimate of believability or veracity. Objective assessment of the host of subjective complaints presented by chronic pain patients is the foundation for clinical judgment and opinion for pain management. In order to insure the most appropriate outcome, it is incumbent upon the clinician to assess symptom validity to the degree possible, especially in the context of potential secondary gain. While over-reporting of symptoms is not equivalent to malingering, it is certainly a factor in treatment and one that may impede progress if not considered in the overall assessment. An

individual may report invalid information because of a behavior that has been operantly conditioned or for other conscious (factitious disorder) or unconscious (conversion disorder) reason. One of the reasons that some clinicians continue to utilize the MMPI-2, in spite of the limitations inherent in the instrument, is the inclusion of validity scales to assist in the interpretation of the instrument and in the treatment plan for the patient. There are other measures that have been designed expressly for the purpose of assessing symptom validity and these tasks are used routinely by neuropsychologists in assessing cognitive complaints. In order to provide the most comprehensive evaluation, medical, behavioral, psychological, and motivational issues should be considered.

From a clinician's point of view, the young man reviewed in the case presentation is faced with significant physical, cultural, educational and social obstacles with regard to his future vocational and financial outlook. Medically, he may also encounter provider bias, professional reticence, insurability dilemmas and unreachable expectations for recovery during his quest for "cure" of his chronic pain. Psychologically, he seems ill-prepared to deal with altered self image, diminished personal capacity and reduced capability to meet expectations of his complicated cultural and family circumstances.

## Conclusion

Anyone in a similar circumstance to the gentleman in the case study would be fortunate to acquire the assistance of a trained life care planner to assist with the complex legal, medical, social, domestic, occupational and rehabilitation needs as a result of catastrophic injury. Most civil, military or industrial injury victims are ill prepared to accommodate the multiple medical, psychological, vocational and domestic dilemmas that accompany their misfortune. The methodology, discipline and objectivity found in the tenants of life care planning and the subsequent work product serve as a bridge between injury and recovery, hopelessness and resourcefulness, apathy and opportunity, despair and determination. In this young man's case, a life care plan may be the difference between poverty and productivity.

Clinicians, case managers and life care planners are well advised to become familiar with physical and psychological testing techniques in order to determine whether symptoms and behavior trends observed during assessment of chronic pain patients can be validated to become the foundations for sound, defensible life care plan documents. The preceding case highlights many of the most useful tools.

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