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# Chronic Pain: Fundamental Scientific Considerations, Specifically For Legal Claims

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*Previously published versions of this discussion:*

- *Barth RJ. Chronic Pain: Fundamental Scientific Considerations, Specifically for Legal Claims. AMA Guides Newsletter, Jan/Feb 2013. American Medical Association.*

*NOTE: The AMA's editorial process involves an unusually extensive review. The unusual thoroughness is exemplified by the AMA's typical recruitment of nine reviewers (in addition to the primary editors). In contrast, other editorial processes (such as the editorial work that I do for the Journal of Bone and Joint Surgery) typically involve only three reviewers. The AMA's extensive review process failed to lead to the identification of any additional scientific findings of relevance to this paper – thereby indicating that this paper summarizes the relevant scientific knowledge base in a relatively comprehensive fashion.*

*The AMA version of this project can be purchased by calling the AMA at (800) 621-8335 (the option for purchasing directly off the website is no longer available).*

- *Barth RJ. Chronic Pain: How to Make Sense of It Within Orthopaedic Claims. In: Melhorn JM and Carragee E. 14th Annual American*

*Academy of Orthopaedic Surgeons Occupational Orthopaedics and Workers Compensation: A Multidisciplinary Perspective. 2012. American Academy of Orthopaedic Surgeons.*

- *NOTE – the following planned future publication will be most similar to the version that you are reading now: Barth RJ. Chronic Pain: Fundamental Scientific Considerations, Specifically for Legal Claims. In: Melhorn JM. 15th Annual American Academy of Orthopaedic Surgeons Occupational Orthopaedics and Workers Compensation: A Multidisciplinary Perspective. 2013. American Academy of Orthopaedic Surgeons*

## **I. Introduction**

### **I. A. Chronic pain is a normal, non-injury-related part of life**

Chronic pain is normal. The normal nature of chronic pain was demonstrated by a Gallop poll in 2011 (Brown). Findings from that poll included:

- 31% of U.S. adults have chronic neck or back pain
- 26% have chronic knee or leg pain
- 18% have some other chronic pain
- 47% of the adults had at least one of these chronic pain problems.

The normal nature of chronic pain is often overlooked within legal claims, and the pain is instead misinterpreted as an indication that an injury has occurred (with the corresponding misinterpretation that an injury is the cause of the pain's persistent nature).

### **I. B. The tendency for legal claims to misrepresent pain as a purely injury-related or general medical issue is inconsistent with the psychological nature of pain.**

Apparently because of the misdirected emphasis on injury within legal claims, general medical clinicians (meaning clinicians who do not specialize in psychological issues) are regularly asked to evaluate chronic pain complaints within such claims. Referral to a general medical clinician for such a presentation is often a compounding of the misdirection, in that the definition of pain (Merskey & Bogduk) actually notes that:

- Pain is “always a psychological state”
- Pain is “always” “an emotional experience”
- “Activity induced in the nociceptor and nociceptive pathways by a noxious stimulus is not pain...”

- “Many people report pain in the absence of tissue damage or any likely pathophysiological cause; usually this happens for psychological reasons. There is usually no way to distinguish their experience from that due to tissue damage if we take the subjective report.”

Similarly, each of the two most recent editions of the American Medical Association’s *Guides to the Evaluation of Permanent Impairment* (Rondinelli; Cocchiarella and Andersson) have specified that pain is definitionally an “emotional experience”.

The American Medical Association has also published additional definitional considerations (Evans), which have been specifically built on the IASP definition that was discussed above:

- Those AMA materials (Evans) specify that “pain is a perception and not a sensation”:
  - Sensation is defined as “the process or experience of perceiving through the senses” (VandenBos)
  - Perception is defined as “the process or result of becoming aware of objects, relationships, and events by means of the senses, which includes such activities as recognizing, observing, and discriminating. These activities enable organisms to organize and interpret the stimuli received into meaningful knowledge.” (VandenBos)
  - Consequently, this distinction that is made in the AMA materials (Evans) regarding the nature of pain emphasizes that pain is not an automatic sensory phenomenon, but is instead a process of the individual recognizing, observing, discriminating, organizing, and interpreting the sensation, and is also the result of all of that psychological activity. In other words, pain is inherently psychological.
- These AMA materials (Evans) summarize the significance of the above distinction in the following fashion: “In all cases, the reality that pain is a perception indicates the potential for profound influence of psychological and emotional factors...”
- These AMA materials (Evans) additionally emphasize a hierarchical model which also highlights the primarily psychological nature of pain. The primarily psychological nature of pain is indicated by the strictly psychological nature of two of the three components of that hierarchy [“a motivational–affective component (e.g., depression, anxiety), and a

cognitive-evaluative component (*e.g.*, thoughts concerning the cause and significance of the pain)”. The third component involves sensation, but indicates that the sensation aspects of pain are inextricably linked to the psychological/perceptual aspects [“a sensory-discriminative component (*e.g.*, location, intensity, quality)”].

- These AMA materials (Evans) additionally specify that there is not an inherent relationship between pain and general medical phenomena. Relevant passages include:
  - “There is an important implication of both the IASP definition and the hierarchical model of pain: As a perception, pain may or may not correlate with an identifiable source of injury.”
  - “...pain can develop and be unrelated to any identifiable physical process...”

Consistent with these definitional considerations, scientific findings have indicated that psychological and social factors are the driving forces behind most chronic benign pain presentations (especially when the presentation occurs within a legal claim context). The relevant scientific knowledge base has been discussed in a variety of publications from the American Medical Association. For example, the *Fifth Edition* of the AMA’s *Guides to the Evaluation of Permanent Impairment* (Cocchiarella and Andersson) provided a summary of relevant scientific knowledge base which emphasizes that “a variety of nonbiological factors strongly influence” presentations of pain. The “nonbiological” factors that are specified in the associated text include:

- “beliefs, expectations, rewards, attention, and training”
- “social and environmental factors”
- “spouse solicitousness”
- “job dissatisfaction, lack of support at work, stress and perceived inadequacy of income”
- “financial compensation, receipt of work-related sickness benefits, and compensation-related litigation”
- “poor education, language problems, and low income”
- “tendencies to be preoccupied with one’s body and symptoms”
- “depression and daily hassles at work”

Discussions of psychological and social factors that have been scientifically indicated as being the dominant driving forces behind legal claims involving a focus on pain are also provided in other publications from the American Medical Association's Guides Library (examples include: Barth November/December, 2006; Barth September/October 2007; Barth May/June 2009; Barth November/December 2009; Barth March/April, 2011; Barth 2013; Melhorn and Ackerman; Melhorn, Talmage, Ackerman, & Hyman).

A more detailed discussion of such scientific findings is provided throughout the remainder of this chapter.

The significance of this scientific knowledge base is highlighted by its relevance for at least three of the AMA Guides:

- *Guides to Evaluation of Disease and Injury Causation* (Melhorn and Ackerman; Melhorn, Talmage, Ackerman, & Hyman): For example, these findings are directly relevant to the fourth step of the causation analysis protocol, which calls for “determining if other risk factors provide a better explanation for the clinical presentation, than that which is provided by the claimed cause” (Barth 2012).
- *AMA Guides to Work Ability and Return to Work* (Talmage 2011): These findings provide direction for determining which scientifically established risk factors for chronic pain are of relevance to the individual case, so that an individualized rehabilitation/treatment plan can be formulated.
- *Guides to the Evaluation of Permanent Impairment* (Rondinelli et al.): These findings provide direction for determining the factors that are driving the claims of impairment, and for apportionment of impairment ratings.

## **II. The Dominant Role of Financial Compensation**

A wide variety of scientific findings have strongly indicated that eligibility for compensation is the dominant factor for chronic pain claims.

### **II. A. Prospective Research**

Prospective research designs provide the most credible and reliable scientific information (Melhorn & Ackerman). Because of the unique value of prospective research, this article begins the review of scientific findings by focusing on Carragee's one-of-a-kind prospective project. The results of that low back pain (LBP) project were first presented at the 2005 Annual Meeting of the North American Spine Society (NASS), and then published in 2006, with discussions in both *Spine* and *The Spine Journal*.

The researchers actually recruited 200 participants who denied any history of significant problems with low back pain. For each participant, the researchers:

- Gathered detailed general medical data at baseline (e.g. spine imaging, detailed physical examination with an intense focus on the back)
- Gathered minimal, but significant, psychological data at baseline. This was limited to the Modified Somatic Perception Questionnaire (which addresses somatoform phenomena) and the Zung Depression Inventory. Although this is a minimal set of data, it is significant because scientific findings have indicated that these questionnaires have predictive power for the development of low back pain, and yet they are insensitive to the effects of low back pain (Mannion). Consequently, there is no "chicken or the egg" issue with these questionnaires. The relationship between abnormalities on these questionnaires and the development of pain is largely unidirectional: abnormal responding on these questionnaires is predictive of the development of pain, but the development of pain does not significantly change the response pattern on these questionnaires.
- The researchers then followed each participant for five years. Over the course of the project, the status of each participant was checked every six months.
- The experience of physical trauma was monitored over the course of the project. The project's definition of physical trauma included lifting (as well as falls, road traffic accidents, sports/exercise injuries, and an "other" category). These phenomena were considered traumatic if they were associated with the definitions of "serious low back pain", "minor trauma", or "major injury" provided below.

In order to fully comprehend the findings that are reported below, the following definitions must be understood. The researchers defined "serious low back pain" as "pain intensity defined by a numerical rating scale  $\geq 6/10$  for at least one week". The researchers defined "minor trauma" as "any perceived injury to the low back area with a back pain intensity  $>2/10$  for at least 48 hours but not meeting the major injury definition". The "major injury" definition was "low back pain episodes associated with high energy trauma resulting in serious visceral injury, proximal long bone, or pelvic or spinal fracture or dislocation".

Extensive details of the findings from this project were published in *Spine* and *The Spine Journal* in 2006 (see the Carragee references in the reference list). However, for the purpose of this discussion, the primary author's simplest summary statement regarding the findings was part of a presentation at the Annual Meeting of the North American Spine Society (as documented in *The Back Letter*, Volume 20, No. 11, November 2005). In that presentation, Dr. Carragee explained: "Minor trauma was only associated with serious low back pain in a compensation setting."

In other words, eligibility for compensation was actually a necessary factor for the development of serious low back pain following minor trauma in this research sample. None of the participants who were not eligible for compensation developed serious low back pain following minor trauma.

Consistent with the finding that serious low back pain following minor trauma was limited to participants who were eligible for compensation, the findings revealed a lack of overall association between minor trauma and adverse low back pain events. This was the case in terms of a lack of difference in serious low back pain events between people who reported experiencing any number of minor traumatic events, versus people who reported that they had not experienced any trauma. In contradiction of "cumulative trauma" claims, the findings also included a lack of significant increase in serious low back pain reports for people who reported experiencing more than four minor traumatic events, compared to those who reported experiencing none.

The researchers further reported that, "serious low back pain episodes were most frequently seen arising spontaneously or with usual daily activities rather than involving trauma of any sort".

For motor vehicle accidents, the risk of serious low back pain was significantly greater when the subject perceived others to be at fault for the incident (19%), compared to when the participant perceived the accident to be their own fault, or no one's fault (2.1%, and none of these instances of serious low back pain were associated with disability). When the participant did perceive the accident to be his/her own fault or no one's fault, the episodes of serious low back pain were limited to relatively high-speed accidents (30 and 35 mph). In contrast, for the participants who reported serious low back pain following a motor vehicle accident that they perceived to be caused by someone else, only one was reported as occurring at a speed over 30 mph, the majority were reported as occurring between 20 and 30 mph, several were reported for speeds of less than 20 mph, and two were reported for speeds less than 10 mph. In the report of results that was published in *Spine*, the researchers noted:

- "serious low back pain events were more likely at low speed when others were perceived as responsible for the accident (P = 0.001)".
- "It is interesting that traumatic episodes associated with the least relative forces described were highly correlated with compensation claims or the perception of others being at fault for an accident."

In terms of anatomical findings, the researchers' summary statements included:

- "Subjects with advanced structural findings were not more likely to become symptomatic with minor trauma events than with spontaneously evolving low back pain episodes."
- "Follow-up magnetic resonance imaging evaluating new serious low back pain illness rarely revealed new clinically significant findings." Only 3% of the cases of new back pain produced new imaging findings that were clinically relevant.

For the subjects who developed disability lasting more than one month during the course of the study, only 14% had new findings on spine MRI (one subject had new spondylolisthesis, progression of end plate changes and advanced stenosis; one had

extruded disc herniation with root compression; and one had an advance of degenerative disc disease from grade 1 to grade 3-4). The researchers pointed out that the most important of these findings (new disk extrusion, new spondylolisthesis, and progression to severe stenosis) occurred in the absence of any trauma.

In the discussion of results that was published in *Spine*, the researchers explained that, even though subjects with compensation claims were more likely to have a new MRI performed after minor trauma, they were actually less likely to have new or progressive findings on the new MRI. In the discussion of results that was published in *The Spine Journal*, the researchers further explained that: "No patient with a compensation claim had a clear new finding of significant pathology." The researchers further expressed concern in regard to the finding that factors which indicate a lack of need for spine imaging (the filing of a medical-legal claim, pre-pain abnormal responding to psychological questionnaires, pre-existing chronic pain, a history of smoking) were all actually predictive of a higher likelihood of spine imaging being conducted (researchers reference previous scientific findings which indicate that such unjustified use of imaging is predictive of a lesser sense of well-being for the patients).

In regard to specific types of anatomical findings, the researchers reported:

- "Serious low back pain events were not significantly more common in subjects with disc degeneration or annular fissures, whether the subjects had a minor trauma or not".
- 21% of subjects with no disc degeneration had a disability event during the course of the study, compared to 22% with disc degeneration.
- "There was no increased disability in subjects with end plate changes compared to those without."
- Moderate to severe end plate changes were not significantly associated with back pain.
- Moderate to severe spinal canal stenosis was not significantly associated with low back pain.
- Severe loss of disc height was not significantly associated with back pain.

In the discussion of results that was published in *The Spine Journal*, the researchers additionally emphasized the common nature of several spine findings for individuals who are free from pain. They noted that such spine findings are often mistakenly interpreted as an explanation for pain complaints, and even as evidence of injury. They warned that the common nature of these findings among people who do not have any pain causes the premise that there is an association between these findings and pain, other symptoms, or injury to become "untenable". They offered the following examples of spine imaging findings which are common for people who are free from pain:

- disc protrusion or extrusion (50% of their sample of pain-free individuals)
- annular fissures (nearly 30% of their sample of pain-free individuals)
- potential root irritation (22% of their sample of pain-free individuals)

In the discussion of results that was published in *Spine*, the researchers provided a review of previous literature which similarly documented the lack of relationship between spine imaging and back pain. In the discussion of results that was published in *The Spine Journal*, the researchers provided a more extensive literature review, and commented that all of the following have been hypothesized as causes of low back pain, but those hypotheses have been thwarted by scientific findings that all of these issues can be found in subjects with no back pain or only minor problems:

- acute annular tear extending into the enervated outer annulus
- an existing annular fissure may become inflamed and appear as a bright annular signal on MRI
- minor end plate failures causing rapid structural failure of the disc
- disc herniation and distention of the annulus or compression of neural elements

Also in the discussion of results that was published in *The Spine Journal*, the researchers reported that the most common imaging finding (progressive loss of disc signal intensity) has been shown (in the findings from previous scientific investigations) to be primarily an aging phenomenon that is not well correlated with symptoms. Similarly, they reported that their second most common finding (progressive facet arthrosis) is a slowly evolving process that is unlikely to be related to trauma or any other recent event.

In the discussion of results that was published in *The Spine Journal*, the researchers specified that their findings supported both of the following conclusions:

- There is not a causative relationship between structural changes in the spine and serious low back pain.
- There is not a credible basis for an “injury model” for low back pain.

As was reported above, minor trauma was not predictive of the development of serious low back pain. The baseline factors which did predict the development of serious low back pain were (a prediction model utilizing the following four factors correctly predicted 80% of the serious low back pain events):

- previous history of chronic pain complaints for another part of the body
- a history of smoking

- abnormal responding to the psychological questionnaires at baseline
- a previous history of filing medical-legal claims.

Similarly, a prediction model utilizing only abnormal responding on the baseline psychological questionnaires and a previous history of medical-legal claims correctly predicted 93% of the disability events attributed to back pain during the course of the project.

In the report of results that was published in *Spine*, the researchers provided a review of previous projects which had similarly found that pre-existing psychological factors were significant predictors of the development of back pain and work incapacity (while spine imaging did not provide significant predictors in this regard). In the report of results that was published in *The Spine Journal*, the researchers summarized previous scientific findings which indicated that: "Progression of subclinical common backache or acute back pain to serious disabling low back pain illness appears to be associated with various nonstructural issues such as emotional distress, poor coping strategies, compensation disputes, and other chronic pain problems." They also reiterated that previous scientific projects have repeatedly found that psychological and social issues were better predictors of significant low back pain than were general medical findings.

The dominant role of financial factors in these findings is especially noteworthy because of some other features of the research design:

- The researchers recruited participants who were at high risk for the development of significant back pain. Factors that determined this high risk status included previous complaints of chronic pain for other body parts, previous medical-legal claims, and abnormal responding on the somatoform and depression questionnaires that were discussed above.
- The researchers also emphasized the recruitment of participants with spinal degenerative disease, even though such disease is not a risk factor for pain. They recruited such participants specifically for the purpose of addressing the unvalidated premise which they reported has "gained currency in the last century". That premise is that spinal degenerative disease is a significant risk factor for the development of significant back pain.
- Trauma was specifically analyzed for a potential role as a risk factor for the onset of serious back pain.

Because of these design features, this project was especially well-suited for potentially revealing the predictive strength of the non-financial factors (it can be said that the pond was stocked, or the deck was stacked, in favor of validating non-financial issues as risk factors for the development of chronic pain). In spite of these design features, eligibility for compensation still emerged as a necessary condition for the development of chronic

pain in response to minor trauma. None of the other risk factors resulted in the development of chronic pain, unless eligibility for compensation was in place. This finding highlights the dominant role of eligibility for compensation as the primary risk factor for the development of chronic pain claims.

## II. B. Meta-Analyses

### II. B. 1. Rohling et al. 1995

In 1995, Rohling et al. published a meta-analysis specifically focused on the relationship between financial compensation and chronic pain. They reported that they were able to find 157 relevant published studies, but only 32 contained quantifiable data that was sufficient for purposes of meta-analysis. Those 32 articles led to a sample of 3802 compensated chronic pain patients and 3849 non-compensated chronic pain patients.

Their simplest/broadest finding was: "patients who received compensation also reported greater experience of pain" (effect size equal 0.60,  $p < 0.0002$ ). Details of this broad finding include "receiving financial compensation is associated with a greater experience of pain and reduced treatment efficacy".

Because back pain dominates the general body of scientific research on chronic pain, the next step in their analysis investigated the possibility that the significant effect of compensation on chronic pain presentations is limited to back pain. When back pain projects (effect size 0.62) were considered separately from projects which focused on other types of chronic pain (effect size 0.50), the difference in effect sizes was not statistically significant.

The researchers utilized both liberal and conservative methods of calculation, in order to provide for consideration of "publication bias" (the risk that the effect size is exaggerated by the project's focus on published research, due to non-significant research findings leading to other studies going unpublished). They reported that an overall effect size in the range of 0.50 to 0.60 was obtained regardless of which calculation method was utilized. They additionally explained: "Moreover, it is unlikely that there are a sufficient number of unpublished or unidentified studies in existence to diminish the finding to non-significance."

The researchers conducted several subsequent analyses in order to address the following questions:

*"What is the most likely understanding of this association?  
Does compensation result in increased pain,  
does increased pain result in compensation,  
or is a third factor controlling the obtained association?"*

Their subsequent analyses produced the following conclusion: "the most likely interpretation of this association is that compensation results in an increase in pain perception and a reduction in the ability to benefit from medical and psychological treatment." The reasons for this conclusion included all of the following considerations:

- For treatment outcome studies, all of the projects which were included in this analysis used a control group of non-compensated chronic pain patients that were either matched to the compensated group on pain and general medical variables, or considered to be sufficiently similar to the compensated group.
- More specifically in regard to injury, one of their subsequent analyses addressed this consideration: "It might be argued that compensated patients were more physically injured, which would justify their need for compensation." In order to address this issue, they conducted a new analysis which only included projects which adjusted for the extent of physical injury, or which matched patients for the extent of physical injury. This analysis included relevant treatment outcome studies (as was discussed above), and also relevant studies which simply contrasted compensated and non-compensated patients with respect to their pain experience. That analysis produced an effect size (0.57) that was almost identical to the original effect size (0.60).

Because being away from work is reliably detrimental for pain complaints, they additionally analyzed the data in a manner that would allow for a determination of whether the association between compensation and pain was an artifact of employment status. That analysis did not eliminate the significance for the effect of compensation, or indicate that employment status had a stronger effect on chronic pain presentations than that which was provided by compensation status.

Additional analyses which failed to justify any modification of the researcher's conclusions included all of the following:

- The effect size did not significantly differ when treatment outcome studies were compared to studies which simply contrasted compensated and non-compensated patients with respect to their pain experience.
- An analysis focused on the duration of the pain complaints did not reduce the significance of the effect size.
- An analysis focused on the quality of the research design for the incorporated projects did not reveal a significant difference in effect size (three levels of study quality were utilized for this analysis).
- A comparison of objective (e.g. number of days missed from work due to the pain) and subjective (e.g. pain severity) measures did not reveal a difference in effect size (although there was a trend for objective measures to be more strongly influenced by compensation than subjective measures).
- The comparison of clinician ratings to patient ratings did not reveal a significant difference in the effect size (although there was a trend toward clinicians' ratings being more strongly impacted by compensation than patients' ratings).

- A comparison of participants who were simply granted benefits without an adversarial process, versus participants had engaged in an adversarial process in an attempt to gain compensation, also failed to significantly impact the effect sizes.

In regard to the significance of their findings, the researchers explained that the effect of compensation can be translated as indicating that the non-compensated chronic pain patients have an experience that averages, across different outcome measures, 24% better than the experience of compensated patients. Depending on which measures are utilized, this could mean pain severity that is 24% less, 24% less lost days of work, a 24% less rate of complete withdrawal from work, a 24% better chance of benefiting from treatment, etc.

The researchers warn that the averaging on which this 24% figure is based can be misleading. For example, referring to a published typology that distinguishes between different chronic pain scenarios, they explained the following:

- The subtype of chronic pain patients who are found to have objective general medical explanations for their pain complaints, and who are competently coping with their pain, may experience no change in their experience of pain as a result of the elimination of financial compensation.
- In contrast, a different subtype involving chronic pain patients who do not have general medical explanations for their pain complaints, and who are coping poorly, would balance the average by experiencing a 48% improvement associated with the elimination of compensation.

### II. B. 2. Harris, et al. 2005

In 2005, Harris et al. published a meta-analysis focused on the association between compensation and surgery outcomes. Pain scores were accepted as an outcome measure that would allow a project to be included in Harris's analysis. However, many other outcome measures were also acceptable, and the authors did not separately report the effect of compensation on pain. As an indication of the relative lack of attention that this important issue has received, it can be noted that the only meta-analyses that Harris et al. referenced as relevant predecessors were Rohling's meta-analyses on pain (discussed above) and recovery from brain injury.

For outcome variables as a whole, Harris et al. reported that the summary odds ratio for an unsatisfactory outcome in compensated patients was 3.79. This was based on 129 studies, involving 7244 compensated patients and 13,254 non-compensated patients. All but five of the studies had individually produced results which indicated that compensation leads to worse outcomes (in a larger review of 211 studies which included studies that could not be included in the meta-analysis, 175 reportedly produced results

which indicated that compensation leads to worse outcomes, 30 reported no difference between the groups, and 1 reported a better outcome for compensated patients).

The researchers explained that, for studies which allowed for comparison of compensation to other potential predictors of outcomes, “compensation status was the most significant predictor of outcome” (when compared to all other demographic, diagnostic, and treatment variables).

Most of the surgeries were orthopedic, plastic, or spine. The odds ratios were similar for the five most common surgeries (shoulder acromioplasty, carpal tunnel release, lumbar discectomy, lumbar spine fusion, and lumbar intradiscal injection of chymopapain). Revision surgeries were more strongly affected by compensation than were primary surgeries.

There was not a difference between studies that exclusively focused on workers compensation, versus those that included non-WC personal injury lawsuit participants (no studies were found which looked at non-WC personal injury lawsuit plaintiffs exclusively).

The researchers provided a review of other projects which revealed:

- There is a dose-response relationship between level of compensation and health outcomes (more compensation is associated with worse outcomes).
- Legal systems that discourage compensation for pain produce better health outcomes. This has actually been demonstrated in systems which changed the nature of their legal systems, with better outcomes resulting after the legal system changed in a manner that discouraged compensation for pain (as well as in comparison of stable systems).

### II. C. Societal experimentation on a grand scale

In 2000, Cassidy et al. published a report of the results of a large-scale (if unintentional) societal experiment. The experiment was made possible by a radical revision (which took place in 1995) of the compensation system for motor vehicle accidents in Saskatchewan, Canada. As part of that revision, payments for “pain and suffering” were eliminated. The researchers compared whiplash claims from the era when pain could be compensated, to the era when pain would not be compensated.

Findings included all of the following:

- The six month cumulative incidence of claims dropped from 417 per 100,000 persons in the last six months of the pain-compensated era, to 302 in the first six months of the non-compensated era, and 296 in the second six months of the non-compensated era. The researchers noted that this represented a 28% decrease in injury claims, in spite of an increase in accidents associated with the non-compensated time frame.

- The median time from the date of the accident to the closure of a claim decreased from 433 days, to 194 days for the first six months of the non-compensated era, and 203 days for the second six months of the non-compensated era. The researchers reported that this represented a 54% decrease in the length of claims. The researchers conducted analyses which demonstrated that time to case closure was an indication of reported pain severity, and that recovery from complaints of pain was indeed more rapid in the non-compensated era.

The researchers concluded:

- “Our findings confirm that providing compensation for pain and suffering after a whiplash injury increases the frequency of claims for compensation and delays the closure of claims and recovery.”
- “We conclude that the type of insurance system has a profound effect on the frequency and duration of whiplash claims and that claimants recover faster if compensation for pain and suffering is not available.”

Additional findings from this study included:

- Hiring a lawyer led to worse outcomes, and this factor was as important as any other factor in determining outcome. The researchers reference previous research projects which produced similar results.
- Working with a chiropractor or physical therapist led to worse outcomes (even after controlling for pain severity), and this factor was as important as any other factor in determining outcome.
- Minimizing health care in the acute period after the accident produces better outcomes (consistent with randomized trials referenced by the researchers).

#### II. D. “Outside the Medical-Legal Context”

Lithuania’s judicial and compensation systems provide “minimal possibilities for economic gain” (Mickeviciene et al.). Consequently, Lithuania has provided a natural laboratory for contrasting against the claims of injury-related chronic pain that are prevalent in the USA and other societies which provide ample opportunities for gaining compensation by complaining of pain.

Scientific study of Lithuanian accident and injury survivors has revealed that the following scenarios simply do not exist in circumstances which, as phrased by Obelieniene et al., are “outside the medical-legal context”:

- Chronic injury-related neck pain (“whiplash”) (Obelieniene et al.; Schrader et al.)
- Chronic injury-related temporomandibular pain (Ferrari et al.)

- Persistent posttraumatic headache (Mickeviciene et al.; Schrader et al.)
- Persistent postconcussion syndrome (Mickeviciene et al.)

## II. E. Disability Data from the Official Disability Guidelines

The Official Disability Guidelines (<http://www.disabilitydurations.com>) allow for a comparison of disability duration datasets of indemnity claimants only, versus all absence data including non-claimants . In almost every instance involving pain, the harmful effect of compensation is evident in the ODG data. Examples of relevant midrange data as of August 13, 2013 include:

- Headache (ICD-9 784.0): 15 days for claimants, versus 1 day for the entire data set
- Cervicalgia (723.1): 20 days, versus 13 days
- Neck sprain (847.0): 25 days, versus 6 days
- Lumbar sprains and strains (847.2): 17 days, versus 10 days
- Sprains and strains of shoulder and upper arm (840): 19 days, versus 10 days
- Ankle sprains (845.0): 22 days, versus 8 days
- Carpal tunnel syndrome (354.0): 42 days, versus 24 days
- Tear of medial cartilage or meniscus of knee (836.0): 37 days, versus 22 days
- Lumbago (724.2): 17 days, versus 10 days
- Myalgia and myositis, unspecified (729.1): 22 days, versus 14 days
- Pain in or around eye (379.91): 14 days, versus 3 days
- Otogenic pain (388.71): 13 days, versus 2 days

## II. F. Carpal Tunnel Syndrome

Readers should note that the previous section discussed the tendency for compensation to dramatically extend the length of claims of disability due to carpal tunnel syndrome. This section discusses additional relevant scientific findings.

In 2008, Sperka et al. published the results of a project which studied the impact of workers compensation on outcomes for carpal tunnel syndrome. Claimants had worse outcomes than non-claimants, with an odds ratio of 5.1.

The claimants differed from non-claimants not only in terms of compensation, but also in that the claimants received a higher rate of treatments (e.g. surgery, physical therapy). Consequently, the researchers conducted a follow-up analysis that controlled for treatment history. This actually increased the odds ratio to 9.6.

The researchers summarized their findings in the following terms: the results are suggestive of poorer outcomes among claimants despite greater use of treatment and comparable severity of disease.

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## II. G. Complex Regional Pain Syndrome (CRPS)

CRPS, and the failed concept of reflex sympathetic dystrophy (RSD) which preceded one type of CRPS, provide especially strong examples of the association between compensation incentives and chronic pain:

- In a large scale epidemiological study, Allen et al. discovered that 71% of cases involved a workers compensation claim or personal injury lawsuit.
- Similarly, Verdugo and Ochoa discovered an 81% rate of workers compensation claims among people who had been given a diagnosis of CRPS.
- In a study of RSD (the failed concept that was replaced by CRPS type 1), Nelson discovered that 67% of the research participants with that diagnosis were receiving workers compensation benefits.

These findings are noteworthy for at least two reasons:

- The concept of CRPS was actually created in a manner that causes it to be inherently non-injury-related (Barth RJ. *The Guides Newsletter*, November/December, 2009). In spite of this definitional lack of injury-relatedness, cases involving this diagnosis are somehow dominated by legal claims of injury-relatedness. This makes the dominant role of litigation/compensation incentives in such presentations especially noteworthy – the effect of litigation/compensation is so powerful that it has actually overwhelmed (within legal systems) a definitional lack of injury-relatedness.
- Less than 10% of all injuries are work-related, and yet scientific findings indicate that the overwhelmingly majority of cases of CRPS involve claims of work-related injury (Talmage et al., 2013). This disparity also highlights the dominant role that compensation incentives play in this diagnosis.

## II. H. “Posttraumatic” Headache

In 2009, the American Medical Association published a review of scientific findings of relevance to claims of persistent posttraumatic headache (Barth, May/June 2009). Findings which are reviewed in that publication include:

- Posttraumatic headaches have an excellent prognosis, typically resolving quickly.
- When such complaints persist, the most well-established predictor of such persistence is compensation incentives (aspects of the head trauma are not predictive of persistence).
- When compensation is not available for the headache complaints, there is no dose-response gradient between trauma and headache (neither in terms of severity of trauma or frequency of trauma). This indicates against a causative relationship between trauma and persistent headache.
- When posttraumatic headache was studied “outside the medical-legal context” (see the relevant discussion above), the longest duration for any such complaint was 20 days.
- “The scientific findings ... indicate that the phenomenon of permanent (or even persistent) “posttraumatic” headache is best predicted by compensation/litigation incentives, and does not apply to people who are free from those incentives.”

## II. I. Rotator Cuff studies

Studies of outcomes for rotator cuff surgery patients have repeatedly demonstrated that compensation leads to worse outcomes. This issue has even received coverage in the popular press, in the form of an article published in Time Magazine (Haig), which used rotator cuff tears as an example for the generalized phenomenon of compensation leading to a more severe experience of pain, and worse health outcomes.

Misamore et al. reported the following discrepancies, even though the compensation and non-compensation groups were comparable in terms of age, gender, size of the tear of the rotator cuff, preoperative strength, preoperative pain, and preoperative active range of motion of the shoulder:

- 92% of the non-compensation patients had good/excellent outcomes, compared to only 54% of the compensation patients
- 94% of the non-compensation patients returned to full activity, compared to only 42% of the compensation patients.

Henn et al. controlled for age, sex, comorbidities, smoking, marital status, education, duration of symptoms, work demands, expectations, and tear size. In spite of all of these controls, their results indicated that compensation was predictive of a worse outcome for pain and a variety of other outcome measures.

## II. J. Additional findings of relevance to back pain

In a systematic review published by the International Association for the Study of Pain, Sanders reported: "The vast majority of evidence supports the notion that receiving compensation for low back pain or being unemployed is predictive of developing a chronic disability."

In a long-term study focused specifically on sciatica associated with herniated lumbar disc, Atlas et al. (2000, 2006) reported that patients who had been receiving workers' compensation were more likely to be receiving disability benefits (odds ratio 3.5) and were less likely to report relief from symptoms and improvement in quality of life at the time of the four year follow-up, when compared to patients who had not been receiving workers' compensation at baseline. The effect of compensation was significant even after controlling for treatment history and other clinical factors.

In another study focused predominantly on radicular symptoms, this time involving patients who underwent excision of a lumbar disc, Hanley reported that the development of disabling low back pain post-surgery was predicted by coverage under Workmen's Compensation (p less than 0.00001), a history of more than fifteen pack-years of cigarette-smoking (average, one pack a day for fifteen years) (p less than 0.01), and an age of more than forty years (p less than 0.05).

In 2002, Suter published findings from a study that followed 200 chronic back pain patients for two years. His results revealed that litigating patients scored higher on measures of pain and disability than did patients who were not litigating. His conclusions included:

- Involvement in the litigation process is associated with increased pain and disability.
- Litigation is a risk factor for chronicity of pain and disability.

Sutter additionally reported:

- "Litigants scores on all measures (e.g. pain severity, disability associated with pain, etc.) show that the scores of the litigation group decreased after the settlement of litigation".
- On all measures, litigants returned to "much the same level as non-litigants by the final stage (of the research project), namely once litigation was concluded."

Suter's discussion pointed out that various issues that were specific to the non-litigating participants (older age, longer pre-study duration of pain) should have contributed to more severe pain and worse outcomes in that group (compared to the litigating group). However, in spite of the influence of those issues, reported pain severity and disability were greater for the litigant group. This result provides more evidence (over and above the evidence that emerged from the projects discussed above) of the dominant role that litigation/compensation plays in chronic pain claims. The effect of litigation/compensation is so strong that it actually overwhelms risk factors for chronic pain that would normally move the research findings in another direction.

Suter's results also indicated:

- Returning to work/staying at work had beneficial effects on pain.
- Litigation and being away from work are also risk factors for higher levels of claimed depression.

Rainville et al. conducted a prospective controlled long-term study, and found that chronic back pain patients who were being compensated for their pain reported more pain and disability, and less treatment benefit (compared to back pain patients who were not being compensated for their pain). In fact, the long term outcome involved a lack of benefit for the compensated patients in terms of their reports of pain (while the non-compensated patients enrolled in the same rehabilitation program reported a reduction in their pain).

#### II. K. Additional research findings focused on chronic pain and disability:

Chibnall and Tait discovered, in a sample of over 1000 chronic pain patients, that compensation/litigation claims were associated with more severe claims of disability (relative to chronic pain patients who did not have any legal claims).

#### II. L. "Non-organic" findings on physical examination

In the Rohling et al. meta-analysis that was discussed above, the researchers conducted an additional analysis as a result of discovering two studies (involving 357 participants) that looked at the relationship between compensation status and "non-organic" physical examination findings (such as non-dermatomal sensory loss). The effect size for compensation from these two studies was 0.50. The researchers explained that these results mean there is "some support" for the premise that compensation is a risk factor for "nonorganic signs".

That meta-analysis did not include consideration of Hayes' study of the relationship between compensation and the Waddell signs. Hayes' project revealed that the Waddell signs were 90% accurate in discriminating between patients who were anticipating compensation, and patients who were not. The researchers explained, "Almost all non-

AFC (not anticipating financial compensation) subjects scored "0" on nonorganics, whereas 83% of AFC (anticipating financial compensation) subjects scored "2 or higher." The project also revealed that a set of 5 Waddell signs was not demonstrated by any of the patients who were not anticipating financial compensation, while compensation-seeking patients demonstrating a set of five Waddell signs were well represented in this research. Consequently, when a claimant/plaintiff demonstrates five Waddell signs, the conclusion should be that the examinee's presentation is not of a health-related nature, but is instead of a uniquely compensation-driven nature.

### II. M. Controlling for psychopathology fails to eliminate the detrimental effect of compensation

Given the fact that psychopathology is a risk factor for chronic pain (relevant literature discussed below), and given scientific findings which have revealed that psychopathology is also a risk factor for the filing of a medical-legal claim (e.g., Simon RI; McDonald), there could be concern that the scientifically demonstrated role of compensation is simply an artifact of the effects of psychopathology. At least two scientific projects have addressed this concern.

Talo et al. attempted to control for both psychopathology and general medical pathology. In spite of such efforts, workers compensation claimants failed to experience treatment benefits that were demonstrated strongly by non-claimants (specifically, in response to a multi-disciplinary treatment program).

Rainville et al. similarly compared the effects of compensation on outcome for a chronic pain rehabilitation program (involving aggressive physical conditioning/exercise), and attempted to control for baseline levels of depression, pain, and disability. In spite of such controls, the compensation group reported worse outcomes after treatment, including worse depression, worse disability, and a complete lack of benefit in terms of pain.

### III. Personality Disorders

The information that was discussed above indicates that compensation contingencies are the primary risk factor for chronic pain within a legal claim context. Of course, compensation contingencies are not a health issue. Among health issues, personality disorders appear to be the most important risk factor for the development of legal claims involving chronic pain.

Personality disorders are a pervasive form of mental illness (American Psychiatric Association 2000, 2013). By definition, they are pre-existing for the purposes of any adult legal claim (because they are defined as first manifesting in adolescence or, at the latest, early adulthood). Also by definition, they lead to distress or impairment regardless of whether the individual has experienced an injury.

The two most recent editions of the American Psychiatric Association's diagnostic manual (American Psychiatric Association 2000, 2013) formally recognized 10 personality disorders, and expressed open-mindedness to the potential existence of additional personality disorders. The recognized personality disorders are:

- Obsessive-Compulsive Personality Disorder (characterized by perfectionism and preoccupation with orderliness/control)
- Paranoid Personality Disorder (characterized by distrust and suspiciousness)
- Antisocial Personality Disorder (characterized by disregard for and violation of the rights of others)
- Borderline Personality Disorder (characterized by instability in interpersonal relationships, self-image, emotionality, and behavior)
- Histrionic Personality Disorder (characterized by excessive emotionality and attention seeking)
- Avoidant Personality Disorder (characterized by social inhibition, feelings of inadequacy, and hypersensitivity to negative evaluation)
- Dependent Personality Disorder (characterized by submissiveness, clinging behavior, and an excessive desire to be taken care of)
- Schizoid Personality Disorder (characterized by detachment from social relationships and restricted emotional range)
- Schizotypal Personality Disorder (characterized by acute discomfort in close relationships, cognitive/perceptual distortions, and eccentric behavior)
- Narcissistic Personality Disorder (characterized by grandiosity, need for admiration, and lack of empathy)

When chronic pain populations have been credibly studied for purposes of determining the extent to which personality disorders are risk factors for the development of chronic pain, the findings have dwarfed all other risk factors, with the exception of compensation contingencies. For example:

- When Dersh et al. evaluated a population of workers compensation claimants who were claiming to be disabled by chronic back pain, they found a 73% rate of personality disorders (compared to reports of 10-13% for the general population; Hales).
- When Monti et al. evaluated a population of people who had been given a diagnosis of complex regional pain syndrome type I, they found a 60% rate of

personality disorders (in the same project, they found a 64% rate among “patients with chronic low back pain from disc pathology”).

- For fibromyalgia, Martinez et al. reported a 63.8% rate of personality disorders, and Rose et al. reported a 46.7% rate.
- For temporomandibular pain, Gatchel et al. (1996) reported a 42% rate of personality disorders.
- For 283 consecutive admissions to a chronic pain specialty clinic, Fishbain found a 58% rate of personality disorders.
- A review of research regarding personality disorders among chronic pain patients of all types (published prior to some of the above information) reported rates of 31%-64% (Gatchel et al., 2000).
- Based on a review of relevant scientific findings, First and Tasman reported that approximately 75% of cases which present for medical help with complaints of pain will not lead to any significant or explanatory general medical findings, and at least half of those cases will involve “major personality problems”. Of note, their review process was open to all presentations of pain (it was not limited to chronic pain).

Given the prominence of personality disorders as a risk factor for chronic pain, it is noteworthy (and distressing) that scientific findings have indicated that workers compensation claimants are almost never evaluated for the possibility of a personality disorder, even when a mental health specialist provides a direct evaluation (Melhorn & Ackerman; Melhorn, Talmage, Ackerman, and Hyman).

#### **IV. Narcotics**

Given the American epidemic of misuse of prescription narcotics for chronic benign pain, the role of narcotics as a risk factor for the development of chronic pain must be emphasized as a primary consideration for relevant legal claims.

A review of relevant considerations was published by the American Medical Association in 2011 (Barth). Aspects of that review that are of most direct relevance to this discussion include:

- The United States is experiencing an increasingly severe epidemic of excessive prescription, overuse, abuse, and death involving prescription narcotics.
- Recent publications have emphasized that this epidemic is of specific relevance to legal claims (such as workers compensation).

- Narcotic medications appear to cause more harm than good for chronic benign pain patients.
- Narcotics reliably cause a worsening of pain, especially for chronic pain presentations.
  - Scientific findings have indicated the narcotics reliably cause an abnormally severe sensitivity to pain, termed hyperalgesia. For example, in what was claimed to be the only prospective study of the effect of narcotic medications on pain sensitivity among chronic low back pain patients, all of the participants demonstrated increased vulnerability to pain after just one month of utilizing prescription narcotics. The participants' pain thresholds reportedly dropped by an average of 16%, and their pain tolerance reportedly dropped by an average of 24%.
  - In subsequent literature, the same researchers warned that the hyperalgesic effects of narcotic medications might be manifested in ways which include some of the common perplexing complaints from chronic pain patients, including unexplained pain reports (which is the essential nature of chronic benign pain), pain complaints which are discrepant from previous complaints, diffuse pain complaints, and allodynia.
  - In a separately published “qualitative systematic review”, members of the same research team warned of the obvious risk that the hyperalgesic effects of narcotics will cause a worsening of the specific pain for which the narcotics were originally prescribed as a treatment.
- In a large-scale study involving almost 2000 participants reporting pain, those who were utilizing narcotic medications were more likely to have a current experience of severe pain, were more likely to perceive their health as being poor in general, were more likely to be unemployed, were utilizing the healthcare system more extensively, and reported a worse quality of life in all areas. The researchers noted the remarkable nature of the findings that narcotics do not seem to have even a superficial beneficial effect on any of the key goals of pain treatment – pain reduction, improvement of quality of life, or improvement of function.
- Similarly, other research projects have repeatedly produced results indicating that the prescription of narcotics leads to dramatically higher rates of disability.
- The harmful effects of prescription narcotics do not appear to be permanent. For example, a recent review has emphasized findings which indicate that pain presentations demonstrate improvement subsequent to the discontinuation of narcotics. The benefit that comes from eliminating narcotic prescriptions appears to be very reliable. For example, in one sample, 21 of 23 chronic pain patients reported a significant decrease in pain after they were detoxed from narcotics.

- A claimant/plaintiff who has a prescription for narcotic medication in place cannot credibly be considered to have reached a point of maximum medical improvement (MMI), or to be demonstrating permanent impairment. The medication can actually be creating an artificially severe presentation of pain, and other forms of impairment. The elimination of the medication can lead to an improvement in the pain. Therefore, until the examinee's use of narcotics is eliminated, the permanence (or lack thereof) of the pain, and other forms of impairment, cannot be known.
- Narcotic detoxification should take place prior to an impairment evaluation being conducted, in order for the evaluation results to actually be a reflection of permanent impairment.

The review of scientific findings of relevance to headache that was discussed above (Barth, 2009) also highlighted the detrimental effects of narcotics and other medications prescribed to address pain. Relevant findings include:

- The vast majority of a large sample of chronic refractory headache patients over-utilized the medications that had been prescribed to treat their headaches. The researchers concluded that the majority of persistent headache sufferers were experiencing medication-induced headaches.
- An empirical test was directed at the medication-induced headache hypothesis in a sample of patients who were not over-utilizing (note: the relevant research project was additionally noteworthy because all of the research participants had originally been diagnosed as experiencing chronic posttraumatic headache). They found that discontinuation of even appropriately used medications led to relief from the headaches for the vast majority of the sample.
- Such scientific findings have led to conclusions in published reviews that medication (e.g. narcotics, ergotamine derivatives, NSAIDs, etc.) is the necessary and sufficient cause of chronic daily headache complaints, and that treatment will not be successful unless the patient is detoxified from such medications.

Consistent with the above discussion of the harmful effects of narcotics, previous publications from the American Medical Association and the American Academy of Orthopaedic Surgeons have highlighted scientific findings which reveal that a short trial of narcotic medication is actually capable of producing a CRPS-like presentation (see the Barth and Haralson references).

## **V. Malingering**

There is very little published data regarding empirically established base rates of malingering, specifically for chronic pain presentations. Consequently, the best evidence for this portion of the discussion is the review of scientific findings regarding malingering for all type of claims that was provided by Larrabee. Larrabee's review revealed "base rates of malingering that approach or exceed 50%".

Readers are referred to a recently published review of diagnostic and scientific approaches to the issue of malingering (Patterson).

## **VI. A focus on one painful part of the body will usually be misdirected**

In medical-legal claims focused on chronic pain, it is common for the claim to be focused on a single body part (e.g., chronic headache, chronic back pain, chronic pain for one upper extremity, chronic pain for one lower extremity, chronic neck pain, etc.). Von Baer et al. have speculated that this is an artifact of the narrow focus of various specialties (neurologists tend to limit their focus to headache; gastroenterologists tend to limit their focus to abdominal pain; orthopedists tend to specialize on specific body parts such as the upper extremities, lower extremity, back, neck; etc.). Carnes et al. reported their suspicion that patients tend to prioritize their presenting complaints to accommodate the specialty of the clinician that they happen to be meeting with at any given moment (e.g. limiting their presenting complaints to the hand when meeting with a hand specialist, even if their headaches are more problematic), especially because patients are aware of the tendency for clinicians to spend a very limited amount of time in direct consultation with the patient. Such a focus on anatomically isolated pain complaints is usually going to be misdirected, because chronic pain is seldom limited to one body part for any individual patient.

As was discussed above in section II. A., Carragee's research revealed that a previous history of chronic pain complaints for another part of the body was one of the best predictors for the development of serious low back pain.

Other relevant scientific findings include:

- Carnes et al discovered that 73% of chronic pain patients had pain in multiple sites. Consequently, they emphasized that such multi-site chronic pain was almost three times more common than single-site chronic pain. Only 13% of chronic low back pain sufferers were free from chronic pain in other body parts.
- Von Korff et al. discovered that 68.6% of individuals with chronic "spine" pain were simultaneously experiencing some other form of chronic pain. The comorbid conditions accounted for one third of the disability reported by such individuals.
- Saunders et al. discovered that chronic migraine patients had an elevated rate of

other forms of chronic pain complaints (odds ratio 3.3), as did patients with other types of chronic headache complaints (odds ratio 3.5). Comorbid conditions accounted for 65% of the role disability reported by chronic migraine patients, and all of the role disability reported by patients with other types of chronic headache complaints.

- Raspe et al. discovered that more than 70% of chronic back pain claimants acknowledged simultaneously experiencing chronic extremity pain.
- In a general population sample of over 2000 children and adolescents, Kroner-Herwig et al discovered that a majority (54%) reported recurrent pain associated with at least two anatomical sites. Only 27% reported being free from recurrent pain. The pain reports demonstrated stability when re-assessed after one year.
- Walker et al. (2010) did follow-up research with adults who had experienced functional abdominal pain during childhood. Of the adults who are continuing to experience abdominal pain, 48.1% were also experiencing chronic non-abdominal pain (compared to 13.3% in the control group;  $p < 0.01$ ). Even the adults who reportedly had recovered from their childhood abdominal pain reported an elevated rate of chronic non-abdominal pain (24.7%). The researchers provided a literature review of studies which revealed a high comorbidity of functional gastrointestinal disorders with other chronic pain syndromes including fibromyalgia, headache, and back pain.
- Peterlin et al discovered that migraine was a risk factor for the development of complex regional pain syndrome, including being a risk factor for earlier development of CRPS, and the development of more widespread complaints within a presentation of CRPS.
- Kamaleri et al (Pain, 2009) conducted a 14 year prospective population-based study and found that the extent to which any individual reported multiple anatomical sites to be painful at any given moment was a relatively stable phenomenon. Only 13.2% of the participants reported being pain free at the beginning of the project. Only 5.4% of the participants who reported pain at the beginning of the project reported being pain free 14 years later. 599 of the 1644 (36%) participants who were available for the full-length of the project reported that they were experiencing pain in five or more anatomical sites at the beginning of the study; of those, 68.8% were still reporting pain in five or more sites 14 years later. Similarly, of those participants who reported pain in fewer than five sites at the initiation of the project, 75% still reported pain in fewer than five sites 14 years later. Participants who reported no pain at initiation also demonstrated a stable pattern over the 14 year course. 80% of the variance in the number of pain sites reported by an individual at the end of the study was accounted for by the number of pain sites that they reported 14 years earlier. The researchers concluded that a relatively stable pattern of pain experience seems to be established early in life. They concluded that the tendency to experience pain,

including pain in multiple sites, was a reliable individual characteristic (rather than an indication that something external to the individual, such as injury, was causing the pain complaints).

- In a separate publication, Kamaleri et al (European Journal of Pain, 2009) reported that the number of pain sites that an employed individual reported at the beginning of their project was predictive of whether that individual would claim disability 14 years later (participants who reached retirement age by the end of the project were excluded from this analysis). Their analysis revealed a “strong dose-response relationship between number of pain sites (14 years ago) and (current claims of) disability with a 10-fold increase from 0 to 9-10 pain sites”.
- This latter Kamaleri analysis was a replication of Andersson’s finding that the development of chronic pain was best predicted by the number of pain complaints a participant had endorsed prior to the onset of the chronic pain (odds ratio = 15.8). Andersson’s project used a 12 year prospective design.
- Tschudi-Madsen et al. discovered that pains in various musculoskeletal sites were not only associated with one another, but individuals experiencing such pains were also more likely to endorse non-musculoskeletal complaints (e.g. palpitations/extra heartbeats, breathing difficulties, diarrhea, constipation, eczema, tiredness, dizziness, etc.). They concluded that the strong associations between this wide variety of complaints indicated that the complaints could have a common etiology.
- Hestbaek et al. (2006a) discovered that adult-onset chronic back pain was predicted by a history of back pain in adolescence, a history of significant headache complaints during adolescence, and a history of asthma during adolescence. Another discussion of their research (Hestbaek et al. 2006c) demonstrated such a strong relationship between adolescent back pain and a much later onset of adult back pain, that the researchers concluded that the research focused on prevention of adult back pain should focus on the adolescent age frame.
- Verne et al. discovered that irritable bowel syndrome patients commonly demonstrated allodynia/ hyperalgesia for the hands and feet.
- Carragee (Spine, 2006) provides references for other projects which have similarly indicated that it is typical for chronic pain in one body part to develop for people who have a history of chronic pain for other body parts (rates of such comorbidity reported as 60-70%).

In response to such findings, Carnes et al pointed out that it will often be inappropriate to target healthcare or scientific investigation for chronic pain on single anatomical sites. For example, given the finding that only 13% of chronic back pain sufferers were free from chronic pain in other parts of the body, it does not make sense to focus on the spine

or any other part of the back as a pain generator or target of treatment. Patients would instead be more likely to benefit from scientifically validated treatment approaches that are not anatomically specific, such as exercise and cognitive behavioral psychotherapy.

Additionally in response to such findings, Von Baeyer et al. provided a portrayal of functional pain syndromes as not being separate disorders, but as largely comprising various manifestations of an underlying propensity or vulnerability to respond to stressors with the experience and report of pain. They provide a review of scientific findings and theory from diverse sources which point to the possibility that multiple pains cluster together because of an underlying susceptibility of the patient which has been referred to as pain vulnerability or pain sensitivity.

## **VII. Other forms of mental illness**

In addition to the extreme prominence of personality disorders as risk factors for the development of chronic pain, other forms of mental illness have also been established as risk factors. This issue has been discussed extensively in American Medical Association publications (see all of the Barth references provided in the reference list), and are consequently only being addressed in a highly summarized fashion for this chapter.

All of the following categories of mental illness have been scientifically established as significant risk factors for the development of chronic pain:

- personality disorders
- mood disorders  
(NOTE: While this project was being worked on, a new edition of the American Psychiatric Association’s diagnostic manual was published (American Psychiatric Association, 2013). That new edition of the manual has done away with the “Mood Disorders” category, in favor of two new categories (at least) – “Depressive Disorders” and “Bipolar and Related Disorders”. This will cause significant confusion, because the history of scientific research has been based on a category of mental illness that no longer exists.)
- anxiety disorders  
(NOTE: While this project was being worked on, a new edition of the American Psychiatric Association’s diagnostic manual was published (American Psychiatric Association, 2013). That new edition of the manual divides the historical “Anxiety Disorders” category into three new categories (at least) – “Anxiety Disorders”, “Obsessive-Compulsive and Related Disorders”, and “Trauma- and Stressor-Related Disorders”. This will cause significant confusion, because the history of scientific research has been based on a category of mental illness that no longer exists in the form that the research focused upon.)
- substance related disorders  
(NOTE: While this project was being worked on, a new edition of the American Psychiatric Association’s diagnostic manual was published

(American Psychiatric Association, 2013). That new edition of the manual renames this category as “Substance-Related and Addictive Disorders”. This will cause significant confusion, because the history of scientific research has been based on a category of mental illness that no longer exists in the form that the research focused upon – e.g. the new category includes “disorders” that do not involve substances in any way, such as “Gambling Disorder”.)

- psychotic disorders  
(NOTE: While this project was being worked on, a new edition of the American Psychiatric Association’s diagnostic manual was published (American Psychiatric Association, 2013). The name for the category in the new edition is “Schizophrenia Spectrum and Other Psychotic Disorders”.)
- somatoform disorders  
(NOTE: While this project was being worked on, a new edition of the American Psychiatric Association’s diagnostic manual was published (American Psychiatric Association, 2013). That new edition of the manual has done away with the “Somatoform Disorders” category. There is a new category entitled “Somatic Symptom and Related Disorders”, but the content of that category is drastically different from the historical “Somatoform Disorders” category. This will cause significant confusion, because the history of scientific research has been based on a category of mental illness that no longer exists.)
- factitious disorders  
(NOTE: While this project was being worked on, a new edition of the American Psychiatric Association’s diagnostic manual was published (American Psychiatric Association, 2013). That new edition of the manual has done away with the “Factitious Disorders” category. The construct of factitious disorders is now included in the new category entitled, “Somatic Symptom and Related Disorders”. This will cause significant confusion, because the history of scientific research has been based on a category of mental illness that no longer exists, and because the categorical distinction between factitious disorder and somatoform disorders has been lost (consequently, the history of previously relevant science will be irrelevant to the new diagnostic system).

In order to address a common “chicken or the egg” question which involves a premise that the mental illness might be caused by the pain, rather than vice versa, it can be noted that scientific findings have repeatedly indicated that presentations of mental illness are far more likely to manifest prior to complaints of pain, rather than vice versa. For example:

- Arnold et al. discovered that presentations of mood disorders, anxiety disorders, and eating disorders preceded the onset of fibromyalgia presentations in 80% of the co-morbid cases.

- McBeth et al. (2001) discovered, in a prospective study, that pre-existing somatoform tendencies were the necessary and sufficient risk factor for the development of fibromyalgia-like presentations.
- Dersh et al (as was discussed above) found a 73% rate of pre-existing personality disorders among workers compensations claimants who were claiming chronic disabling back pain. The other research findings regarding personality disorder as a risk factor for any type of chronic pain, as were summarized above, are also relevant to this section (given the definitionally pre-existing nature of personality disorders).
- Polatin et al. discovered that, among chronic back pain patients with a positive lifetime history for mental illness, 54% of those with a depressive mental illness, 94% of those with substance abuse, and 95% of those with anxiety disorders acknowledged that manifestations of the mental illness preceded the onset of their pain. The overwhelming probability that an anxiety disorder will have preceded the development of chronic pain, rather than followed it, is especially notable given scientific findings which have indicated that anxiety accounts for 54% of the variance in pain severity report and associated claims of disability (McCracken et al.). While the Polatin results indicated that it is probable that a depressive disorder will precede the onset of chronic pain in any one case, the magnitude of this probability is likely to be substantially larger than the research findings indicated, due to the established strong tendency for depressive mental illness to present with only physical complaints (a tendency that was demonstrated by 95% of the patients who satisfied diagnostic criteria for major depressive disorder in at least one sample), and the tendency for depressed individuals to actually deny any emotional symptoms (Simon GE et al.).
- Mykletun et al. found that pre-existing levels of depression and anxiety were predictive of the reporting of whiplash injury and of associated disability pensions two years later.

The relationship between mental illness and the development of chronic pain is perhaps most easily understood in light of scientific findings which have indicated that mental illness is inherently painful. For example, King discovered that 87% of psychiatric patients endorsed a current experience of physical pain when asked, and 58% reported that their pain was of greater than two years duration. Consequently, it is clear that pain is simply a normal and expected manifestation of mental illness. The inherently painful nature of mental illness has been reflected in formal definitions of mental illness (American Psychiatric Association 2000; Shahrokh), which have repeatedly incorporated pain as a defining issue.

### **VIII. Chronic pain as a learned phenomenon, which can be un-learned**

This section summarizes material from the International Association for the Study of Pain's (IASP) most recent attempt to publish a relatively comprehensive book on the subject of chronic pain (Flor and Turk). That book has some significant limitations, including:

- The emphases of this book take the discussion of psychodynamics to a depth that will not be helpful for most readers.
- The book appears to completely avoid discussion of the dominant role of eligibility for litigation/compensation in legal claims involving chronic pain, and appears to even avoid the topic of legal claims involving chronic pain altogether (e.g. none of the following words are listed in the book's index: litigation, compensation, financial, claim, workers compensation, legal, lawsuit, tort, attorney, lawyer).

Consequently, it appears as if the book has been written from a perspective that is irrelevant to the current article's focus on legal claims involving chronic pain. Therefore, this section presents a highly summarized discussion of the information from that text.

Consistent with the scientific findings discussed above, this IASP book (Flor and Turk) emphasizes:

- "Pain is a multidimensional experience based on psychosocial as well as physiological processes".
- Scientific findings "demonstrate that psychological variables predict disability, doctor visits, and other pain related behaviors of chronic pain patients to a much larger extent than do physiological variables".

However, instead of focusing on the issues that have been highlighted in this paper, the book focuses on the following list of psychodynamic components in the development and maintenance of legitimate chronic benign pain presentations (the following list is an extreme simplification of the extensive discussions that are available in the full text):

- The etiology of chronic pain begins with a predisposition to developing pain. This premise is consistent with the discussions provided above of personality disorders and other forms of mental illness as scientifically established risk factors for the development of chronic pain. This is also consistent with the tendency, discussed above, for chronic pain complaints to manifest in multiple body parts for any one person. The book emphasizes a genetic basis for such predispositions, which is also consistent with the mental illness risk factors, given scientific findings which have indicated that mental illness is primarily a genetic phenomenon (First & Tasman). The book also emphasizes prior learning as a cause of such predispositions – such as parental modeling, during childhood, that

pain is to be paid attention to and responded to in maladaptive ways.

- The next reported step in the development of chronic pain involves some precipitating stimuli for acute pain. The book explains this may or may not actually be an experience that causes pain in most people. It could be some stressor that does not cause pain in most people, but does cause pain for an individual with a relevant predisposition. The book offers the specific example of a disagreement with a family member precipitating pain for an individual who is relevantly predisposed. The book explains further that the precipitating stimuli can be completely internal to the individual (e.g. a thought, an emotion, increased muscle tension, etc.).
- The acute pain can be an unconditioned stimulus which plays a role in a learning experience that leads to the development of chronic pain; or, depending on the person's previous learning experience, such acute pain could already be a conditioned stimuli (e.g. an experience of pain that is already a consequence of conditioning/learning can serve as the beginning of a new round of conditioning/learning).
- The pain has many components (e.g. behavioral, cognitive, physiological). The person who becomes a chronic pain patient develops maladaptive responses in one or more of these components. The book emphasizes that the maladaptive response can involve physiological mechanisms that may not be under voluntary control (such as Pavlov's dogs having no voluntary control of salivation, and yet demonstrating learned/conditioned salivation).
- The maladaptive response is adopted in an attempt to modulate the impact of aversive environmental or internal stimuli. The maladaptive response is reinforced if it successfully modulates such aversive stimuli.
- An especially important role is played by the cognitive components of the pain experience, such as over-interpretation of physical sensations, preoccupation with physical sensations, etc.
- Learning processes contribute significantly to the development and maintenance of the pain.
  - The learning can occur through classical conditioning (e.g. the person learns to experience pain in response to circumstances that were not originally associated with pain). A common example of this phenomenon is a fear of activity and consequent excessive disuse/inactivity (with the disuse/activity consequently contributing to the experience and duration of pain).
  - The learning can occur through operant conditioning: such as the experience of pain, and demonstration of pain-related behaviors, being

reinforced by various forms of reward (e.g. access to narcotics, relief from responsibilities, financial compensation, family supportiveness, etc.).

- The learning can occur through observation (e.g. other people have modeled pain behavior, have been seen being rewarded for their pain behavior, etc.).
- These learning processes contribute to the formation of powerful pain memories “on all levels of the nervous system”, which, for chronic pain sufferers, maintain pain in the absence of peripheral nociceptive input.

All of this psychodynamic learning leads to central nervous system “sensitization”. The text classifies such “sensitization” as “a behavioral learning factor”, and defines it as “an increase in the intensity of a response when an identical stimulus is presented multiple times over an extended period of time”. “Sensitization” is a learned phenomenon. As such, it can be un-learned. The treatment discussion from the book is focused on such un-learning (for example, through appropriate utilization of cognitive behavior psychotherapy).

Based on such discussion of the etiology and nature of chronic pain, the book offers direction for general medical evaluation of chronic pain presentations, psychological evaluation, and treatment (the emphasis is on psychological treatment, in accordance with the primarily psychological nature of chronic benign pain).

## **IX. Smoking**

As was discussed above in section II. A., Carragee’s research revealed that a history of smoking was one of the best predictors for the development of serious low back pain. Similarly, section II. J. summarized Hanley’s finding that smoking was predictive of the development of disabling low back pain following surgery for radicular symptoms (excision of a lumbar disc).

Shiri et al (2010a) discovered, through meta-analysis, that smoking is a risk factor for the development of chronic back pain, and for associated disability. Active smokers were at greatest risk, but former smokers were at higher risk than participants who had never smoked.

Hestbaek et al. (2006b) discovered through a longitudinal study that the relationship between smoking and the onset of low back pain was even significant when the smoking occurred during adolescence, and the onset of back pain occurred during adult years. Their findings satisfied several Bradford Hill criteria for causation analysis, including temporality (smoking preceding the pain).

Viikari-Juntura et al. discovered, through systematic review, that smoking was associated with chronic shoulder pain among workers.

In a review paper, Shi et al. summarized scientific findings which indicated that smoking is a risk factor for chronic pain (e.g. back pain, face pain, fibromyalgia, arm pain, knee pain, etc.), greater intensity of chronic pain, increased number of painful anatomical sites in any one chronic pain patient, more severe claims of functional disability among chronic pain patients, greater depression among chronic pain patients, worse outcomes for chronic pain patients, and longer duration of chronic pain complaints.

In an analysis of over 6000 cases from a community health registry, Mitchell et al. found that smoking was associated with a wide variety of chronic pain presentations, and they also discovered a dose-response gradient for that relationship (daily smokers demonstrated the highest odds ratio, occasional active smokers demonstrated a medium odds ratio, and former smokers demonstrated a lower odds ratio than active smokers – but still elevated compared to individuals who had never smoked).

Hooten et al. found that smoking was predictive of greater consumption of narcotics among chronic pain patients, while increased pain severity was not predictive of greater consumption of narcotics. Potential implications of such findings include: the narcotic consumption is driven by a general vulnerability to substance abuse, which is indicated by the smoking, rather than the narcotic consumption being driven by general medical factors (there is a wealth of additional scientific findings which clarify that narcotic prescriptions and consumption are not driven by general medical factors or by the pain complaints – see Barth March/April, 2011); the pain complaints are a manifestation of the general vulnerability to substance abuse (an association that is strongly supported by scientific findings), in that the complaints provide access to prescription narcotics.

The relationship between smoking and chronic pain has apparently produced an artifact that might lead to a misdirected conclusion that heavy physical labor is a risk factor for chronic pain. Specifically, a relationship between heavy physical labor and chronic pain was discovered in a preliminary analysis, but that relationship disappeared when the effect of smoking was considered (McBeth & Jones, 2007).

## **X. Obesity**

Shiri et al (2010b) discovered, through meta-analysis, that obesity is a risk factor for the development of chronic back pain. They also found a dose-response relationship between body mass index and chronic back pain. They reported that this effect was still significant, even when meta-analysis was limited to studies which attempted to control for confounders.

Obesity has also been scientifically established as a risk factor for the development of chronic shoulder pain (Rechartd et al., 2010) (Viikari-Juntura et al.).

Research findings from Heuch et al. indicated that the relationship between obesity and pain is unidirectional (obesity predicts the development of pain, but pain does not predict the development of obesity).

The relationship between obesity and pain may be an artifact of the relationship between mental illness and obesity. For example, Bruffaerts et al. discovered a relationship between mental illness and obesity, discovered that obesity by itself did not predict lost work days, but mental illness did predict lost work days.

## **XI. Childhood abuse and neglect**

A great deal of research has focused on an association between childhood abuse or neglect and adult-onset chronic pain. Much of that research was summarized in Davis et al.'s 2005 meta-analysis, which demonstrated a reliable association, and a dose response gradient, for childhood abuse or neglect being a risk factor for adult onset chronic pain.

Arnow's 2004 review summarized such findings, including the strong nature of the relationship, and the dose-response gradient, for chronic pain in adult life, and also for mental illness in adult life.

Arnow also commented on the manner in which the effect of childhood abuse/neglect on chronic pain overlaps with the effect on other forms of mental illness. This raises the possibility that the relationship between childhood abuse/neglect and chronic pain is simply an artifact of the role that mental illness plays as a risk factor for chronic pain (e.g. childhood abuse/neglect leads more directly to mental illness, and indirectly, as a consequence of the mental illness, to chronic pain).

Of relevance to this possibility that the relationship between childhood abuse/neglect is reducible to an artifact of the relationship between childhood abuse/neglect and mental illness, some limited research has indicated that childhood neglect/abuse is nine times more likely to lead to adult mental illness which specifically involves a wide variety of pain complaints (and a wide variety of additional physical complaints), rather than mental illness that specifically involves episodes of significant depression (Spitzer et al.). Similarly, fibromyalgia-like presentations are especially strongly associated with severe maltreatment in childhood (Imbierowicz & Egle; Winfield; Walker et al. 1997), and prospective research has indicated that pre-existing somatoform tendencies are the necessary and sufficient risk factors for such presentations (McBeth et al. 2001).

## **XII. Excessive health care**

The scientific findings reviewed above have included indications that better outcomes are obtained for pain complaints when health care is of a relatively minimal nature, and worse outcomes are obtained when relatively extensive healthcare is provided (e.g., see sections II. C. and II. F.).

Such findings are consistent with a larger scientific knowledge base (extending beyond the focus of this chapter), which indicates that excessive health care is a risk factor for disability (Caruso).

### **XIII. Being away from work as a causative factor for chronic pain**

The scientific findings that were reviewed above have included several which revealed that being away from work is a risk factor for the development and continuation of chronic pain (e.g., Rohling, Sanders, Suter).

Such findings are consistent with a larger scientific knowledge base (extending beyond the focus of this chapter), which indicates that being away from work is a risk factor for poor health outcomes and disability (Barth 2003; Waddell & Burton; Talmage 2011; Caruso).

### **XIV. Recommendations for Evaluators / Reviewers to Consider in Any Individual Case**

The scientific knowledge base, such as the findings discussed above, indicates general medical (i.e., non-psychological) evaluation will seldom be able to identify an adequate explanation for a legal claim of chronic pain. Consistent with this, Frist and Tasman explained (in their textbook review of the subject) that the process of attempting to find a general medical explanation for chronic pain is “exasperating”.

It can be said that the recommendations provided below are limited to cases in which general medical investigation fails to provide an explanation for the chronic pain. However, since most legal claims of chronic pain will not involve explanatory general medical findings, this is not much of a limitation. Consequently, these recommendations will be almost universally applicable.

XIV. A. The evaluation/review process should attempt to clearly determine whether general medical findings provide a comprehensive explanation for the chronic pain.

XIV. A. 1. Given the low level of correlation between general medical findings and chronic pain, any claim that the general medical findings actually provide a comprehensive explanation for the pain should be referenced with scientific literature that can be reviewed in order to find independent confirmation of that claim.

XIV. A. 2. Additionally, any such claim should only be offered, and will only be credible, if it has arisen through application of the protocol from the AMA’s Guides to the Evaluation of Disease and Injury Causation (Barth 2012; Melhorn and Ackerman; Melhorn, Talmage, Ackerman, & Hyman).

XIV. A. 3. In the typical case where general medical findings do not provide an explanation for the chronic pain, the evaluator/reviewer should consider explaining that this is not a surprising result, in that the scientific knowledge base indicates psychological and social factors play a more significant role in the development of chronic pain, while general medical

factors are generally not significant. This can help to prevent an iatrogenic search for general medical issues that are unlikely to be found.

XIV. B. The evaluator/reviewer should consider recommending education for the claimant/plaintiff about the potential health benefits of extricating himself/herself from the claim/lawsuit as soon as possible (given scientific indications that were discussed above, which indicate that a legal claim context is a dominant factor in the genesis and continuation of chronic pain).

XIV. C. The evaluator/reviewer should consider recommending that the claimant/plaintiff be educated about the primarily social and psychological nature of chronic pain, and encouraged to seek out credible psychological evaluation. That evaluation should focus on the scientifically established risk factors for chronic pain (as have been discussed above) so that a relevant treatment plan can be developed for whatever findings emerge. To ensure a quality evaluation, guidance can be found in the AMA's Guides to the Evaluation of Disease and Injury Causation (mental illness chapter) (Melhorn, Talmage, Ackerman, & Hyman). Because any mental illness is unlikely to be injury or work-related, and since involvement in workers' compensation or personal injury claims is reliably detrimental for health outcomes (as was discussed above; also see Caruso), the psychological evaluation and treatment should take place outside of a workers compensation or any other claims context.

XIV. D. The claimant/plaintiff should also be educated regarding other scientifically established risk factors for chronic pain, especially those that are modifiable, such as prescription narcotics, smoking, obesity, etc. (relevant scientific findings were discussed above).

XIV. E. The claimant/plaintiff should be educated in scientifically validated treatments for chronic pain, which have a high probability of success regardless of the risk factors. Examples include the activity paradigm (responding to pain by increasing activity, instead of withdrawing from activity), and cognitive-behavior psychotherapy.

XIV. F. If someone else has claimed there is a general medical explanation for the clinical presentation (e.g. injury-relatedness, work-relatedness, etc.), the evaluator/reviewer should scrutinize such claims by applying the protocol from the AMA's Guides to the Evaluation of Disease and Injury Causation (Barth 2012; Melhorn and Ackerman; Melhorn, Talmage, Ackerman, & Hyman). If application of that protocol is beyond the scope of the evaluator/reviewer's referral issues, then consideration should be given to recommending that any such seemingly untenable causation claims should be given a full review in accordance with that protocol.

- Note: If the evaluator/reviewer is specifically aware of scientific literature which contradicts an opinion that the general medical findings explain the chronic pain, then consideration can be given to referencing that literature (even if a causation analysis has not been requested).

XIV. G. If the claimant/plaintiff is not working, or considering withdrawing from work, consider recommending that the claimant/plaintiff be educated about the health benefits of work, including the benefits for pain, and advised to vigorously pursue returning to work.

XIV. H. If the claimant/plaintiff is consuming narcotics or considering beginning narcotics for chronic pain, consider recommending education regarding the reliably detrimental effects of narcotics, and recommending elimination/avoidance of such medications.

XIV. I. If a case involves a focus on chronic pain in a single body part, consider recommending a thorough investigation of the claimant/plaintiff's history, given the improbability of this being their only significant pain complaint. Before a conclusion can be credibly drawn that the current chronic pain is a unique event in this individual's history, records from his/her entire life should be reviewed to determine whether this case follows the typical pattern of multiple complaints developing over time.

Readers are also referred to Cornerstones of Disability Prevention and Management (Caruso) for a long list of additional relevant recommendations (e.g. avoiding "Aggressive, extensive, or prolonged medical treatment of benign conditions such as non-specific low back pain because it increases the risk of iatrogenic and advocagenic impairment and work disability.")

## **XV. Model report language**

The following examples are offered of language that an evaluator/reviewer can consider using, in order to efficiently and effectively communicate the significance of information found in a chronic pain claim, and the relevance of the scientific knowledge base for such claims.

This first section focuses on orienting stakeholders regarding the primarily psychological and social nature of chronic pain claims:

*The findings from this (evaluation process / record review / evaluation process, including a review of records,) did not reveal a general medical explanation for the complaints of chronic pain.*

*This is not a surprising result. The scientific knowledge base clearly indicates that psychological and social factors play a more significant role in the development of such chronic pain presentations, and that general medical factors generally do not play a significant role.*

*It is therefore recommended that further attempts to assist this claimant/plaintiff focus on the scientifically established risk factors for such chronic pain presentations, rather than focusing on general medical issues which are highly unlikely to provide an adequate explanation.*

*For example, because scientific findings have revealed that compensation incentives are a dominant risk factor for the development of chronic pain, the claimant/plaintiff should be educated about the potential health benefits of extricating (himself or herself) from compensation contingencies as soon as possible.*

*Additionally, the claimant/plaintiff should be adequately educated in regard to the primarily psychological nature of chronic pain. Subsequent to such education, the claimant/plaintiff should seek out a credible psychological evaluation (because scientific findings have revealed that psychopathology is another dominant risk factor for the development of chronic pain). The scope of that evaluation should include an intensive focus on the scientifically established risk factors for chronic pain (e.g. personality disorders), so that a relevant treatment plan can be developed for whatever findings emerge. For purposes of making sure that such an evaluation is credibly conducted, clear guidance can be found in the American Medical Association's Guides to the Evaluation of Disease and Injury Causation, Second Edition (mental illness chapter). [See reference Melhorn, Talmage, Ackerman, & Hyman] Because the relevant issues are extremely unlikely to be injury-related or work-related, and because involvement in legal claims is reliably detrimental for health outcomes, the psychological evaluation and treatment should take place outside of a legal claims context (e.g., outside of the workers compensation system).*

*[If relevant to the case at hand] The claimant/plaintiff should also be educated in regard to other scientifically established risk factors for chronic pain, such as narcotic medications, smoking, obesity, and diabetes.*

*The claimant/plaintiff should be educated in regard to scientifically validated approaches to chronic pain, which have a high probability of being helpful regardless of what risk factors are actually applicable. Examples include the activity paradigm (responding to pain by increasing activity, instead of withdrawing from activity), and cognitive behavior psychotherapy.*

If someone else has claimed that there is a general medical explanation for the chronic pain claim, language such as the following will typically apply:

*The previously documented claim that general medical findings fully explain the clinical presentation is not consistent with my understanding of the relevant scientific knowledge base. The documentation of that claim was not accompanied by the presentation of any scientific literature which could be reviewed in order to find independent confirmation for the claim. The documented claim appears to be a matter of idiosyncratic opinion, rather than having any basis in scientifically established facts. If, at any time, relevant scientific findings are provided which supposedly support the documented claims, then I will be willing to review such science and*

*determine whether it actually provides an explanation for this clinical presentation. However, I do not have any awareness of the existence of any such scientific literature, and I suspect that it does not exist.*

Note: If you are specifically aware of scientific literature which contradicts the documented claim that the general medical findings provide an explanation for the presentation of chronic pain, then you can consider referring all stakeholders to that literature, and explaining that such literature reveals a lack of reliable scientific support for the documented claims.

If someone is claiming that the presentation of chronic pain is work-related, then consider using language such as the following (it will almost always be applicable):

*The documented claims of work-relatedness appear to have been formulated in a non-professional, non-scientific, and non-credible manner. For example, the associated documentation does not include any documentation of utilization of any professional standards that might provide credible justification for such a claim. Examples of professional standards that could have been utilized for this purpose include the scientifically credible protocol from the American Medical Association's Guides to the Evaluation of Disease and Injury Causation [see references Barth May/June 2012; Melhorn & Ackerman; Melhorn, Talmage, Ackerman, & Hyman], and its scientifically credible predecessors. I was not able to find any mention of utilization of any such professional standards within the documentation that involves the claim of work-relatedness. I also did not find any explanation for why the people who are making the claim of work-relatedness would choose to avoid professional standards in this manner. In the absence of the utilization of such professional standards, the claim of work-relatedness is baseless.*

If the claimant/plaintiff is not working, or considering withdrawing from work, then consider using language such as the following (see reference Talmage 2011 for a discussion of relevant scientific considerations):

*The claimant/plaintiff should be educated in regard to the harmful effects of being away from work. (He or she) should vigorously pursue returning to work and staying at work. If the claimant/plaintiff perceives (himself or herself) to be unable to independently implement a relevant plan, then (he or she) should seek assistance from (his or her) employer, and perhaps from relevant clinical/rehabilitation professionals.*

If the claimant/plaintiff is consuming narcotics or considering doing so, then consider using language such as the following:

*The claimant/plaintiff should be educated about the harmful effects of narcotic medications, specifically including the scientific findings which indicate that such medications are associated with a worse experience of*

*pain, and a worse outcome for chronic pain presentations. (He or she) should specifically ask (his or her) clinicians for a plan that will eliminate such harmful medications from the treatment plan.*

If a relevant case involves a focus on chronic pain in one part of the body, report language such as the following can be considered:

*This individual's legal claim seems to be based on a premise that one body part has become chronically painful, and that such pain is an indication of persistent effects from an injury. This would be an extremely unlikely scenario. Injury is not likely to be a cause of chronic pain. Additionally, it is highly unlikely for chronic pain in one body part to develop for someone who has not had significant problems with pain in other body parts previously. A variety of scientific findings have revealed that a far more probable scenario involves current chronic pain complaints being a continuation of a pattern of previous pain complaints (as well as other types of health complaints). Consequently, before a conclusion is drawn that the current chronic pain complaints are a unique event in this individual's history, records from the individual's entire life should be reviewed in an effort to determine whether this individual has followed the typical pattern of multiple complaints developing over time.*

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