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Opioid-Induced Hyperalgesia

Case Law on Medical Causation Opinions

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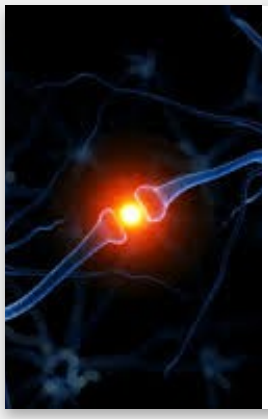

MEDICAL

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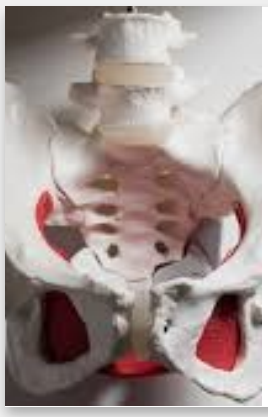

LEGAL

Case Law: Causation

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Is Opioid-Induced Hyperalgesia a Nociplastic Pain Syndrome?

James B. Talmage, MD, Assistant Medical Director, TN BWC

AdMIRable Review has published issues on the current "opioid epidemic" in the Spring 2021 issue and on the new 2022 Centers for Disease Control Chronic Opioid Treatment Guidelines in the Winter 2023 issue (See References – AdMIRable Review). *AdMIRable Review* has also published on the International Association for the Study of Pain (IASP) newly described pain mechanism "nociplastic pain." When the Fall 2022 *AdMIRable Review* article on this pain mechanism was being written, there were 127 article citations retrievable by searching PubMed for "nociplastic pain." Today there are 184 citations, as additional publications have appeared and are now indexed by the National Library of Medicine. The reader of this article may benefit from reading the feature article in those 3 issues before reading further in this article.

This article will briefly revisit opioid-induced hyperalgesia (OIH) and nociplastic pain to examine their similarities, and then consider Complex Regional Pain Syndrome, Type 1 (CRPS), and "Failed Back Surgery Syndrome" (FBSS) as examples where both may be present, since a high percentage of patients with either CRPS or FBSS is on Chronic Opioid Therapy.

As we reviewed in the Spring 2021 issue, OIH develops sooner and more commonly than many physicians suspect, even after brief courses of oral opioids. There is no generally accepted laboratory or imaging test that can be performed to document the presence of OIH in a particular patient. The diagnosis is confirmed by a trial of opioid weaning. If the opioid dose is gradually decreased over time and if the patient's chronic pain paradoxically decreases, OIH is present, as decreasing the dose of pain medicine that was effective should logically result in increased, not decreased, pain. Several reviews of OIH have been published (Mercadante, 2019; Higgins 2019; Glare 2019; Colvin, 2019; Sampaio-Cunha, 2022).

While there is no test to detect which patients have OIH, the questionnaires for nociplastic pain and the physical exam signs for nociplastic pain may strongly hint that the diagnosis of OIH should be considered in those taking opioids (See below).
The IASP introduced the concept of "nociplastic pain" to explain pain out of proportion to the "objective findings" of either a peripheral cause (e.g. knee osteoarthritis) or an easily documented injury to or disease of the nervous system (e.g. lacerated median nerve, or radiculopathy from a disc herniation, or brain damage from multiple sclerosis) with loss of motor or sensory pain receptive function (Aziz et al, 2019; Nicholas et al, 2019). True radiculopathy was discussed in the *AdMIRable Review*

Spring 2022 issue. These two IASP 2019 publications use CRPS and FBSS as examples of nociplastic pain.

In *AdMIRable Review,* we used the analogy to computer malfunctions, with nociceptive pain (like knee osteoarthritis) being analogous to a defective mouse not permitting normal computer function, neuropathic pain (like a lacerated peripheral nerve) being analogous to a defective cable attaching the mouse to the computer, and nociplastic pain (like CRPS or FBSS) being analogous to defective software (not hardware) causing the computer malfunction. A computer hardware malfunction would be analogous to a medically recognizable brain lesion on imaging in an area of the brain involved in pain processing (neuropathic pain).

A PubMed (National Library of Medicine) search for "opioid induced hyperalgesia" and "nociplastic pain" on April 10, 2023, yielded only one citation about inducing nociplastic pain in mice, so the literature so far seems not to have connected these entities.

The importance of connecting these concepts is by IASP and other reviewer publications the presence of a significant nociplastic pain syndrome, or component of nociplastic pain in cases of "mixed" pain, predicts non-response to "peripherally directed therapies such as anti-inflammatory drugs and opioids, surgery, or injections." (Fitzcharles, MA 2021). Thus,

> [I]f we accept that chronic pain is a disease or a long-term condition, "then the philosophy of care may change from a biomedical model that views chronic pain as a symptom to that of a biopsychosocial one that views chronic pain as a disease or long-term condition" (Nicholas et al, 2019).

Both of these reviews emphasize that recognition of nociplastic pain should result in a change in treatment focus. Also, as reviews of each condition have pointed out, both OIH and nociplastic pain have in common pain out of proportion to objective findings in the biomedical model, so considering OIH as mediated by a nociplastic pain mechanism is logical. Pain out of proportion to objective disease is like beauty, in the eye of the beholder (Kosek et al, 2021; Nijs et al, 2021). Some physicians view all patient encounters through the biomedical model in which they were trained. They assume pain must be a symptom of nociceptive or neuropathic pain. They also seem not to recognize illness presentations consistent with the biopsychosocial model, which teaches that chronic pain is frequently a learned response to injury or pain illness influenced heavily by mental stressors and social circumstances. This hinders recognition of "pain out of proportion to disease or injury findings." In a future article, we will explore imaging of normal, asymptomatic individuals, and the

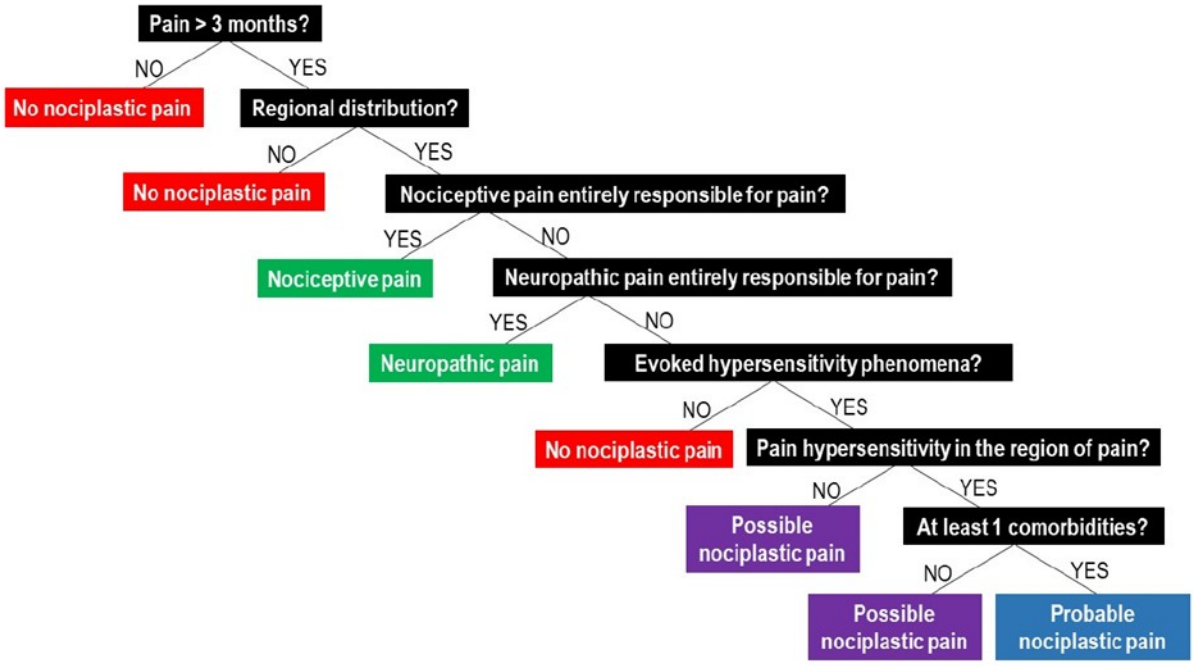
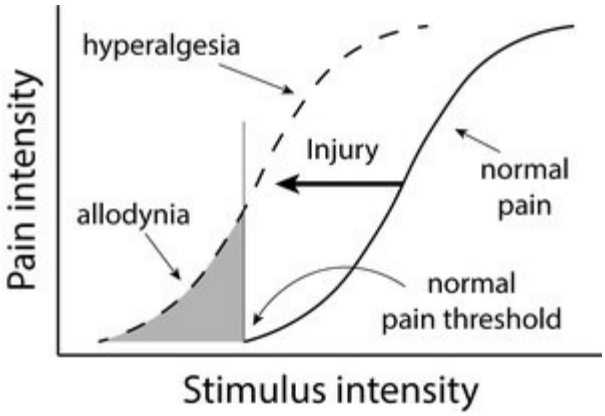


Figure 1. Clinical decision-making tree of the IASP clinical criteria for nociplastic pain.

normal aging changes on imaging that can be mischaracterized as the "pain-generating structure."

As reviews of each condition have pointed out, both OIH and Nociplastic pain have in common "central sensitization" causing allodynia and hyperpathia, so listing OIH as mediated by a nociplastic pain mechanism is logical. Allodynia is pain provoked by what should be a non-painful stimulus. Examples in the patient history would be hypersensitivity to environmental smells, sounds, or lights. Examples on physical exam would be brushing the skin with a small paint brush while asking the patient, "On a zero to ten pain intensity scale, where zero is no pain and ten is the worst pain you can imagine, what number describes what you feel when I do this?" Note this is different from asking rhetorically, "How badly does it hurt when I do this?" A similar physical exam test would be the sign described by Gordon Waddle of lightly pinching the skin.



Hyperpathia is present when a normally mildly painful stimulus is perceived as more painful to this person than to most people. An example would be the "tender point" exam for fibromyalgia in the original Wolfe 1990 criteria for that diagnosis. These exam-

ination tests are even more meaningful if positive in areas remote from the patient's chief complaint (e.g. test on the shoulder of a back pain or knee pain patient).

The most recent reconceptualization of fibromyalgia dropped the criterion of tender point count and uses instead criterion based on the Widespread Pain Index , which considers how many of 19 places on the body have pain,. Additionally, the new criteria scores the severity of fatigue, cognitive symptoms, headaches, daytime sleepiness, lower abdominal pain, and depression (Wolfe et al, 2016). This list of the location of pain complaints is rarely documented in the medical records sent to the BWC when patients on long-term opioid therapy, or their doctors, initiate Utilization Review appeals. These non-pain symptoms are present in many chronic opioid therapy patients further strengthening the association of OIH and nociplastic pain. Yet, these symptoms are rarely listed or commented upon by treating physicians in medical records submitted to the Bureau (Els et al, 2017; AHRQ, 2020).

The Central Sensitization Inventory (CSI -see references) is a questionnaire in the public domain that can be downloaded and given to patients. It has been validated and is available in multiple languages.

Table 3
Fibromyalgia criteria—2016 revision

Criteria
A patient satisfies modified 2016 fibromyalgia criteria if the following 3 conditions are met:
(1) Widespread pain index (WPI) ≥ 7 and symptom severity scale (SSS) score ≥ 5 OR WPI of 4–6 and SSS score ≥ 9.
(2) Generalized pain, defined as pain in at least 4 of 5 regions, must be present. Jaw, chest, and abdominal pain are not included in generalized pain definition.
(3) Symptoms have been generally present for at least 3 months.
(4) A diagnosis of fibromyalgia is valid irrespective of other diagnoses. A diagnosis of fibromyalgia does not exclude the presence of other clinically important illnesses.

Ascertainment
(1) WPI: note the number of areas in which the patient has had pain over the last week. In how many areas has the patient had pain? Score will be between 0 and 19

Left upper region (Region 1)	*Right upper region (Region 2)*	*Axial region (Region 5)*
Jaw, left[a]	Jaw, right[a]	Neck
Shoulder girdle, left	Shoulder girdle, right	Upper back
Upper arm, left	Upper arm, right	Lower back
Lower arm, left	Lower arm, right	Chest[a]
		Abdomen[a]
Left lower region (region 3)	*Right lower region (Region 4)*	
Hip (buttock, trochanter), left	Hip (buttock, trochanter), right	
Upper leg, left	Upper leg, right	
Lower leg, left	Lower leg, right	

(2) Symptom severity scale (SSS) score
Fatigue
Waking unrefreshed
Cognitive symptoms
For the each of the 3 symptoms above, indicate the level of severity over the past week using the following scale:
0 = No problem
1 = Slight or mild problems, generally mild or intermittent
2 = Moderate, considerable problems, often present and/or at a moderate level
3 = Severe: pervasive, continuous, life-disturbing problems
The symptom severity scale (SSS) score: is the sum of the severity scores of the 3 symptoms (fatigue, waking unrefreshed, and cognitive symptoms) (0–9) plus the sum (0–3) of the number of the following symptoms the patient has been bothered by that occurred during the previous 6 months:
(1) Headaches (0–1)
(2) Pain or cramps in lower abdomen (0–1)
(3) And depression (0–1)

The final symptom severity score is between 0 and 12
The fibromyalgia severity (FS) scale is the sum of the WPI and SSS

The FS scale is also known as the polysymptomatic distress (PSD) scale.
[a] Not included in generalized pain definition.

The CSI is frequently referenced in articles on nociplastic pain. A score of 30 suggests the possibility of a nociplastic pain mechanism is present, and a score ≥40 is felt to document the problem.

Nociplastic pain is NOT a mental illness, and a referral to a psychologist will not diagnose it. Psychologists are not trained in general medicine and cannot confirm "pain out of proportion to objective findings." They don't perform physical examinations, and they rarely have all the medical records. The treating physician must be the person to recognize that nociplastic pain is present and say as much when referring the patient to a psychologist.

Psychologists can be helpful to patients with this disorder by offering work-focused cognitive behavior therapy and reinforcing gradual increases in activity while supporting opioid weaning efforts. Physical therapy can contribute by helping patients choose exercises they tolerate and gradually increasing exercise schedules (Franco et al, 2020; Van Griensven et al, 2020).

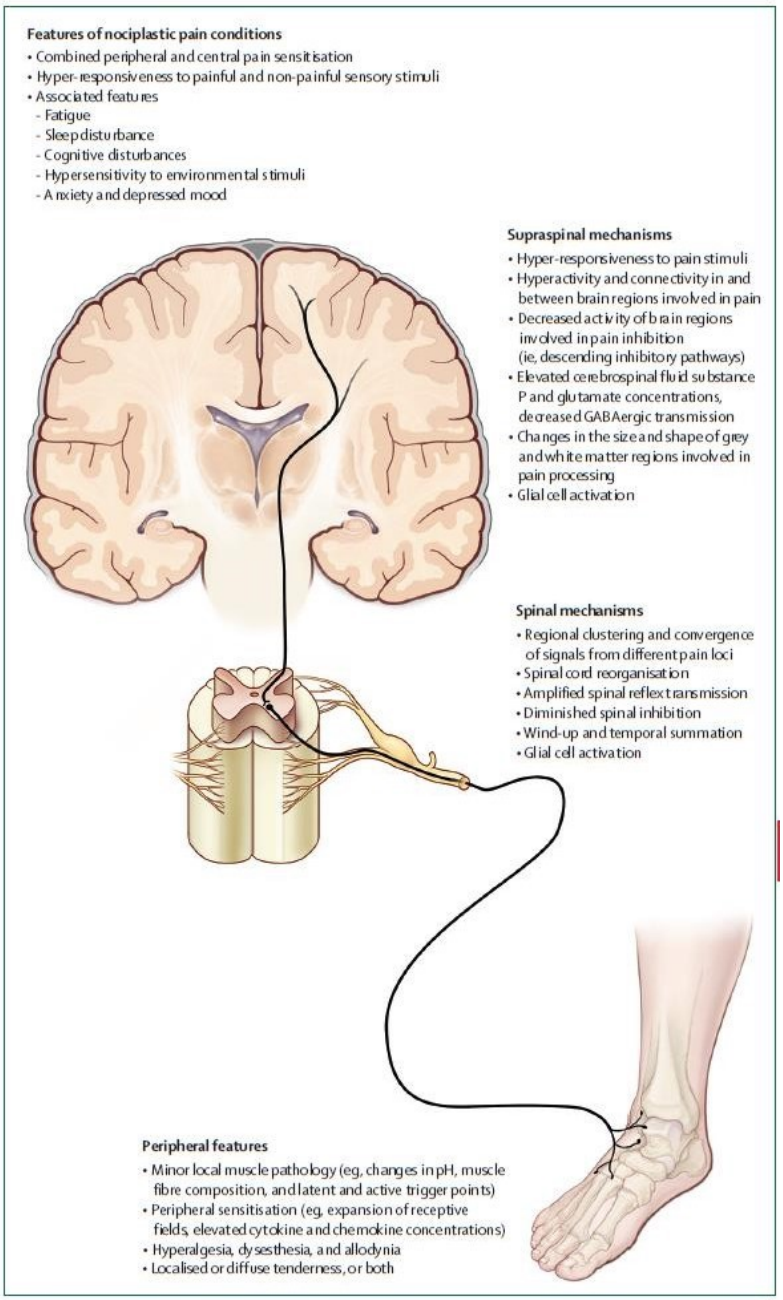


Figure: **Mechanisms and features of nociplastic pain**
Figure created by Joe Kanasz.

If OIH is present but not recognized by the treating physician, and if this is a nociplastic pain syndrome, which means that the biomedical approach to treatment, such as performing invasive procedures with injections or surgery, is likely to be unhelpful, then recognition of OIH should change treatment recommendations from those that were based on the biomedical model to therapy recommended for nociplastic pain. This recognition might occur with a second opinion consultation by a physician who is open to the concept of nociplastic pain syndromes.

In light of this, when Utilization Review denies requests for injections, surgeries, and other invasive treatment for long-term opioid patients, and the treating physician subsequently appeals the denial to the Bureau Medical Director, the medical records submitted in the appeal should contain the following:

- A statement of when opioids were started, the pain rating (Visual Analog Scale 0 -10) and function level of the patient when opioids were started, whether the opioid dose has been increased over time, the current pain rating and function level.
- *This information facilitates recognition of whether opioids have benefit – have improved pain and function, and longer duration opioid therapy indicates the need for longer, slow opioid weaning by the 2022 CDC Opioid guidelines.*
- A statement of whether a trial of opioid weaning to look for opioid induced hyperalgesia has occurred and if "yes" the outcome.
- *A reduction in pain and improvement in function would suggest OIH, and further reductions in the opioid dose may be more logical than invasive treatment indicated only for pain relief.*
- A Review of Systems that documents complaints of fatigue, pain in other body locations, cognitive impairment, sleep disturbance, hypersensitivity to environmental noises, smells, light, etc., lower abdominal pain syndromes, headaches, level of depression and anxiety symptoms.
- *This would help confirm the presence of "central sensitization" or nociplastic pain.*
- A physical exam for objective evidence of an inflammatory disease, for neurologic deficit that is consistent over time in a given location, and for signs of allodynia and hyperpathia both in the area of the current pain complaint and in body areas remote from the chief pain complaint.
- *This would clarify whether objective pathology or "pain out of proportion" to objective findings is the issue being treated.*
- Imaging that documents a potential pain-generating pathology that correlates with the physical exam and a rationale why this is not just a finding commonly seen in asymptomatic populations as they age.
- *This would clarify whether objective pathology or "pain out of proportion" to objective findings is the issue being treated.*

If these items were routinely available in the appeals file, the Bureau Medical Director could more easily determine whether the patient likely had nociceptive pain or neuropathic/nociceptive pain, and thus whether a biopsychosocial model treatment approach might be more appropriate, given the relative risk of complications. Similarly, the Director could determine if OIH was likely present and whether the re-

quested invasive treatment should be deferred until a trial of opioid weaning has occurred.

("Primum non nocere" – first do no harm).

Progress is slow in medicine, despite the remarkable speed with which scientific information can now be disseminated (Rubin et al 2023). But progress does occur eventually. There is hope for the future, in general health care and in the care of injured workers.

References:

AHRQ 2020: Agency for Healthcare Research and Quality Comparative Effectiveness review number 229: Opioid Treatments for Chronic Pain. AHRQQ Publication No. 20-EHC011. AHRQQ Publication No. 20-EHC011.

Aziz, Q., Giamberardino, M. A., Barke, A., Korwisi, B., Baranowski, A. P., Wesselmann, U., Rief, W., Treede, R. D., & IASP Taskforce for the Classification of Chronic Pain (2019). The IASP classification of chronic pain for ICD-11: chronic secondary visceral pain. Pain, 160(1), 69–76. https://doi.org/10.1097/j.pain.0000000000001362
Central Sensitization Inventory. https://www.pridedallas.com/wp-content/uploads/2016/04/csi_english.pdf

Colvin, L. A., Bull, F., & Hales, T. G. (2019). Perioperative opioid analgesia-when is enough too much? A review of opioid-induced tolerance and hyperalgesia. Lancet (London, England), 393(10180), 1558–1568. https://doi.org/10.1016/S0140-6736(19)30430-1

Els, C., Jackson, T. D., Kunyk, D., Lappi, V. G., Sonnenberg, B., Hagtvedt, R., Sharma, S., Kolahdooz, F., & Straube, S. (2017). Adverse events associated with medium- and long-term use of opioids for chronic non-cancer pain: an overview of Cochrane Reviews. The Cochrane database of systematic reviews, 10(10), CD012509. https://doi.org/10.1002/14651858.CD012509.pub2

Ferro Moura Franco, K., Lenoir, D., Dos Santos Franco, Y. R., Jandre Reis, F. J., Nunes Cabral, C. M., & Meeus, M. (2021). Prescription of exercises for the treatment of chronic pain along the continuum of nociplastic pain: A systematic review with meta-analysis. European journal of pain (London, England), 25(1), 51–70. https://doi.org/10.1002/ejp.1666

Glare, P., Aubrey, K. R., & Myles, P. S. (2019). Transition from acute to chronic pain after surgery. Lancet (London, England), 393(10180), 1537–1546. https://doi.org/10.1016/S0140-6736(19)30352-6

Higgins, C., Smith, B. H., & Matthews, K. (2019). Evidence of opioid-induced hyperalgesia in clinical populations after chronic opioid exposure: a systematic review and meta-analysis. British journal of anaesthesia, 122(6), e114–e126. https://doi.org/10.1016/j.bja.2018.09.019

Hina, N., Fletcher, D., Poindessous-Jazat, F., & Martinez, V. (2015). Hyperalgesia induced by low-dose opioid treatment before orthopaedic surgery: An observational case-control study. European journal of anaesthesiology, 32(4), 255–261. https://doi.org/10.1097/EJA.0000000000000197

Kosek, E., Clauw, D., Nijs, J., Baron, R., Gilron, I., Harris, R. E., Mico, J. A., Rice, A. S. C., & Sterling, M. (2021). Chronic nociplastic pain affecting the musculoskeletal system: clinical criteria and grading system. Pain, 162(11), 2629–2634. https://doi.org/10.1097/j.pain.0000000000002324

Mercadante, S., Arcuri, E., & Santoni, A. (2019). Opioid-Induced Tolerance and Hyperalgesia. CNS drugs, 33(10), 943–955. https://doi.org/10.1007/s40263-019-00660-0

Nicholas, M., Vlaeyen, J. W. S., Rief, W., Barke, A., Aziz, Q., Benoliel, R., Cohen, M., Evers, S., Giamberardino, M. A., Goebel, A., Korwisi, B., Perrot, S., Svensson, P., Wang, S. J., Treede, R. D., & IASP Taskforce for the Classification of Chronic Pain (2019). The IASP classification of chronic pain for ICD-11: chronic primary pain. Pain, 160(1), 28–37. https://doi.org/10.1097/j.pain.0000000000001390

Nijs, J., Lahousse, A., Kapreli, E., Bilika, P., Saraçoğlu, İ., Malfliet, A., Coppieters, I., De

Baets, L., Leysen, L., Roose, E., Clark, J., Voogt, L., & Huysmans, E. (2021). Nociplastic Pain Criteria or Recognition of Central Sensitization? Pain Phenotyping in the Past, Present and Future. Journal of clinical medicine, 10(15), 3203. https://doi.org/10.3390/jcm10153203

Rubin R. (2023). It Takes an Average of 17 Years for Evidence to Change Practice-the Burgeoning Field of Implementation Science Seeks to Speed Things Up. JAMA, 329(16), 1333–1336. https://doi.org/10.1001/jama.2023.4387

Sampaio-Cunha, T. J., & Martins, I. (2022). Knowing the Enemy Is Halfway towards Victory: A Scoping Review on Opioid-Induced Hyperalgesia. Journal of clinical medicine, 11(20), 6161. https://doi.org/10.3390/jcm11206161
van Griensven, H., Schmid, A., Trendafilova, T., & Low, M. (2020). Central Sensitization in Musculoskeletal Pain: Lost in Translation?. The Journal of orthopaedic and sports physical therapy, 50(11), 592–596. https://doi.org/10.2519/jospt.2020.0610

Wolfe, F., Smythe, H. A., Yunus, M. B., Bennett, R. M., Bombardier, C., Goldenberg, D. L., Tugwell, P., Campbell, S. M., Abeles, M., & Clark, P. (1990). The American College of Rheumatology 1990 Criteria for the Classification of Fibromyalgia. Report of the Multicenter Criteria Committee. Arthritis and rheumatism, 33(2), 160–172. https://doi.org/10.1002/art.1780330203

Wolfe, F., Clauw, D. J., Fitzcharles, M. A., Goldenberg, D. L., Häuser, W., Katz, R. L., Mease, P. J., Russell, A. S., Russell, I. J., & Walitt, B. (2016). 2016 Revisions to the 2010/2011 fibromyalgia diagnostic criteria. Seminars in arthritis and rheumatism, 46(3), 319–329. https://doi.org/10.1016/j.semarthrit.2016.08.012

Wilson, S. H., Hellman, K. M., James, D., Adler, A. C., & Chandrakantan, A. (2021). Mechanisms, diagnosis, prevention and management of perioperative opioid-induced hyperalgesia. Pain management, 11(4), 405–417. https://doi.org/10.2217/pmt-2020-0105

Yang, D. Z., Sin, B., Beckhusen, J., Xia, D., Khaimova, R., & Iliev, I. (2019). Opioid-Induced Hyperalgesia in the Nonsurgical Setting: A Systematic Review. American journal of therapeutics, 26(3), e397–e405. https://doi.org/10.1097/MJT.0000000000000734

Review. Lancet. 2019 Apr 13,

Perioperative opioid analgesia-when is enough too much? A review of opioid-induced tolerance and hyperalgesia

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PMID: **30983591**
DOI: 10.1016/S0140-6736(19)30430-1

Abstract

Opioids are a mainstay of acute pain management but can have many adverse effects, contributing to problematic long-term use. Opioid tolerance (increased dose needed for analgesia) and opioid-induced hyperalgesia (paradoxical increase in pain with opioid administration) can contribute to both poorly controlled pain and dose escalation. Hyperalgesia is particularly problematic as further opioid prescribing is largely futile. The mechanisms of opioid tolerance and hyperalgesia are complex, involving μ opioid receptor signalling pathways that offer opportunities for novel analgesic alternatives. The intracellular scaffold protein β-arrestin-2 is implicated in tolerance, hyperalgesia, and other opioid side-effects. Development of agonists biased against recruitment of β-arrestin-2 could provide analgesic efficacy with fewer side-effects. Alternative approaches include inhibition of peripheral μ opioid receptors and blockade of downstream signalling mechanisms, such as the non-receptor tyrosine kinase Src or N-methyl-D-aspartate receptors. Furthermore, it is prudent to use multimodal analgesic regimens to reduce reliance on opioids during the perioperative period. In the third paper in this Series we focus on clinical and mechanism-based understanding of tolerance and opioid-induced hyperalgesia, and discuss current and future strategies for pain management

Review > Eur J Pain. 2021 Jan; 25 (1): 51-70.

Prescription of exercises for the treatment of chronic pain along the continuum of nociplastic pain: A systematic review with meta-analysis

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PMID: **32976664**
DOI: 10.1002/ejp.1666

Background and Objective

To compare different exercise prescriptions for patients with chronic pain along the continuum of nociplastic pain: fibromyalgia, chronic whiplash-associated disorders (CWAD), and chronic idiopathic neck pain (CINP).

Databases and data treatment

Randomized controlled trials comparing different exercise parameters were included. The search was performed in the databases Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, CINAHL and PEDro. Data on the parameters for the physical exercise programs for pain management were extracted for analysis.

Results

Fifty studies with 3,562 participants were included. For fibromyalgia, both aerobic strengthening exercises were similar and better than stretching exercises alone. Exercises could be performed in 50- to 60-min supervised sessions, 2 to 3 times a week, for 13 weeks or more. For CWAD, body awareness exercises were similar to combined exercises, and there was no difference in adding sling exercises to a strengthening exercise program. The exercises could be performed in 90-min supervised sessions, twice a week, for 10 to 16 weeks. For CINP, motor control exercises and nonspecific muscle strengthening had a similar effect. Exercises could be

performed in 30- to 60-min supervised sessions, 2 to 3 times a week, for 7 to 12 weeks.

Conclusions:

he choice of parameters regarding exercises should emphasize global exercises in nociplastic pain conditions (such as fibromyalgia and CWAD) and specific exercises in non-nociplastic pain conditions (such as CINP) and be based on patient's preference and therapist's skills.

Prospero Registration Number:

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Significance

The pain mechanism must be considered to optimize exercise prescription in patients with different chronic pain profiles. The main message of this article is that low to moderate intensity global exercises performed for a long period of treatment should be performed in patients with nociplastic pain predominance. Additionally, focused and intense exercises for a short period of treatment can be prescribed for patients with nociceptive pain predominance.

Review. J Clin Med. 2021; (15) : 3203

Nociplastic Pain Criteria or Recognition of Central Sensitization? Pain Phenotyping in the Past, Present and Future

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Abstract

Recently, the International Association for the Study of Pain (IASP) released clinical criteria and a grading system for nociplastic pain affecting the musculoskeletal system. These criteria replaced the 2014 clinical criteria for predominant central sensitization (CS) pain and accounted for clinicians' need to identify (early) and correctly classify patients having chronic pain according to the pain phenotype. Still, clinicians and researchers can become confused by the multitude of terms and the variety of clinical criteria available. Therefore, this paper aims at (1) providing an overview of what preceded the IASP criteria for nociplastic pain ('the past'); (2) explaining the new IASP criteria for nociplastic pain in comparison with the 2014 clinical criteria for predominant CS pain ('the present'); and (3) highlighting key areas for future implementation and research work in this area ('the future'). It is explained that the 2021 IASP clinical criteria for nociplastic pain are in line with the 2014 clinical criteria for predominant CS pain but are more robust, comprehensive, better developed and hold more potential. Therefore, the 2021 IASP clinical criteria for nociplastic pain are important steps towards precision pain medicine, yet studies examining the clinimetric and psychometric properties of the criteria are urgently needed.

Keywords

central sensitization; neuropathic; nociceptive; nociplastic pain; precision medicin

Conflict of Interest Statement

J.N. and the Vrije Universiteit Brussel received lecturing/teaching fees from various professional associations and educational organizations, and J.N. authored a Dutch book on central sensitization. The remaining authors have nothing to disclose.

Case Law: Panel Affirms Complicated Post-judgment Pain Management Case

Jane Salem, Staff Attorney, Nashville

Earlier this year, a Tennessee Supreme Court workers' compensation Panel upheld a trial court decision rejecting an employer's request to terminate medical benefits—pain management—when it argued that the employee's symptoms weren't caused by the work injury but rather her preexisting personality disorder.

The employee had been injured approximately two decades ago, but her pain persists. Because of the date of injury, the Panel decided the case under pre-Reform Act law. Had it been tried under the new law, the result might have been different.

Facts

In 2001, Kathryn Wilburn fractured her pelvis while working for Food Lion, which accepted the claim. An orthopedist assigned a ten-percent impairment rating, and Dr. Edward Workman, an authorized treating physician, assigned a three-percent rating for "pain control."

Dr. Workman diagnosed Wilburn in 2004 as having "[m]yofascial leg and hip pain, pain disorder mixed, [and] severe psychiatric co-morbidity, including pain exacerbated panic episodes." He noted at that time that her "mood dysregulation is complicated by severe cluster B Axis II pathology." Dr. Workman prescribed eight different medications: Celexa, Premarin, Soma, Prevacid, Klonopin, trazodone, Duragesic, and MiraLAX.

In 2007, the case settled for the combined thirteen-percent impairment rating and open medical benefits with Dr. Workman.

In 2019—more than a decade after the settlement agreement was entered—Food Lion obtained an independent psychiatric evaluation from Dr. J. Sidney Alexander.

Dr. Alexander reviewed Wilburn's medical records and examined her personally. He also administered two tests: the Structured Inventory of Malingered Symptomatology, or "SIMS," which is used to detect malingering; and the Central Nervous System Vital Signs, or "CNSVS," a set of tests used to assess cognitive skills.

Dr. Alexander wrote that her SIMS results suggested that she "strongly malingered," while the CNSVS indicated that she "purposely tried to score exceedingly lower than are her actual abilities," and further "showed that she actively malingered."

Dr. Alexander diagnosed mixed personality disorder with borderline narcissistic, histrionic and dependent features. He explained that personality disorders are "formed from genetics and from childhood parenting and experiences." He noted that Dr. Workman also documented from testing results that Wilburn showed "serious Axis II pathology." Dr. Alexander described serious axis II pathology as "synonymous for a serious personality disorder" of the type he had diagnosed.

In Dr. Alexander's opinion, Wilburn's psychiatric symptoms weren't caused by the work injury, but rather by her mixed personality disorder, which pre-existed the work injury. Moreover, the need for treatment was "due to genetics, childhood difficulties, and adult life choices."

In 2020, Food Lion requested an order finding that Dr. Workman's treatment wasn't causally related to the pelvic fracture, so it would no longer be responsible for his treatment. At trial, Food Lion relied on the deposition testimony and report from Dr. Alexander, while Wilburn introduced a C-32 form from Dr. Workman.

Dr. Alexander's deposition testimony faulted Dr. Workman for failing to formally diagnose a personality disorder and for not adequately considering the possibility of malingering. He acknowledged that Dr. Workman's diagnoses in 2019 and 2004 were essentially the same, and that his "attempts at treating" her were appropriate.

In response to questions on the C-32, Dr. Workman attached an office note from a 2014 examination, as well as records from a 2021 office visit. Those records showed he was continuing to treat Wilburn for "[p]ain disorder with related psychological factors," "[l]ow back pain," "[u]nspecified inflammatory spondylopathy, lumbar region," "[s]acrococcygeal disorders," "[g]eneralized anxiety disorder," "[p]ain in right leg," and "[m]ood disorder due to known physiological condition."

Dr. Workman performed neuropsychiatric testing at the 2021 visit, which allowed him to "assess the veracity of all patient's complaints and reports of symptoms and pain levels." Wilburn's prescribed medications then included Ultram, Lunesta, omeprazole, NuLido, Linzess, cyclobenzaprine, Calypxo, and senna.

The C-32 asked: "From a medical standpoint, considering the nature of the patient's occupation and medical history along with the diagnosis and treatment, did this

injury more probably than not arise out of the patient's employment?" Dr. Workman checked "Yes."

The trial court denied Food Lion's request, and it appealed.

The Opinion

The Panel affirmed the trial court ruling that Food Lion failed to rebut the presumption of correctness that attaches to Dr. Workman's opinion as the authorized treating physician.

"To be sure, Dr. Alexander's IME report and deposition testimony suggest that a personality disorder may be at least partially to blame for Wilburn's myriad psychiatric symptoms and failure to respond to Dr. Workman's attempts at treatment," the Panel observed. "But Dr. Workman was well aware of Wilburn's 'axis II pathology' when he made his initial diagnoses and treatment decisions in 2004. At that time, he considered that this pathology would complicate her treatment, 'limit her functional restoration,' 'lower her pain tolerance,' and limit 'her ability to tolerate stress and pain.'"

The Panel also found it significant, as the trial court had, that Dr. Alexander acknowledged that Dr. Workman's current diagnoses of Wilburn are materially identical to the diagnoses he made in 2004, which served as the basis for the 2007 settlement agreement.

The Panel reasoned: "To the extent Dr. Workman's repeated references to 'axis II pathology' and failure to formally diagnose a personality disorder raise questions about causation, those questions existed in 2004 when Food Lion agreed to provide for Wilburn's future medical expenses. It is unclear why Food Lion did not seek clarification on that issue before entering the settlement agreement or why it waited more than a decade to challenge Dr. Workman's treatment."

Dr. Alexander acknowledged, moreover, that Dr. Workman's attempts to treat Wilburn "were appropriate," that treating Wilburn was a "tough task" given her varied symptoms and "rapidly changing responses to medication," and that Dr. Workman had "worked very diligently to try to help her."

Takeaways

The date of injury was in 2001, so the Panel applied pre-Reform Act law to reach its decision. Notably, the Reform Act states that treating physicians now "shall not con-

sider complaints of pain, notwithstanding allowances for pain provided by the applicable edition of the AMA guides," to assign impairment ratings.

Also, the attorneys made some interesting strategic choices. Usually when one side deposes a medical expert, the other side gets a deposition of its expert, too, so the judge can make more of an apples-to-apples decision. But here, the employee relied just on the responses to the C-32. It was a gamble that paid off. She prevailed and avoided the significant expense of a deposition.

Moreover, the employer's attorney didn't object to the C-32's attached medical records. Under the new law, the Appeals Board wrote in *Sadeekah v. Abdelaziz*, "The rules governing expedited hearings allow a party to introduce '[l]etters or written statements addressing medical causation signed by a physician' at an expedited hearing, but such statements may be excluded at a compensation hearing."

Finally, the opinion was penned by Justice Sarah Campbell, who joined the Tennessee Supreme Court last fall. This was her first workers' compensation panel opinion in that role.

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Kyle Jones is the Communications Coordinator for the Tennessee Bureau of Workers' Compensation. After receiving his bachelor's degree from MTSU, he began putting his skillset to work with Tennessee State Government. You will find Kyle's fingerprints on many digital and print publications from videos to brochures published by the Bureau. Kyle believes that visuals like motion graphics can help explain and break down complex concepts into something more digestible and bring awareness to the Bureau's multiple programs that are designed to help Tennesseans.

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Dr. Snyder was appointed Medical Director for the Bureau of Workers' Compensation in January, 2014 after 37 years of private practice in Orthopaedics. He graduated from Wayne State University School of Medicine in Detroit and completed two years of general surgery training at the University of Pittsburgh before he came to Nashville, completing his residency in Orthopaedics and Rehabilitation at Vanderbilt University. Dr. Snyder has presented lectures for the American Academy of Orthopaedic Surgeons, Arthroscopy Society of Peru, the American Orthopaedic Society for Sports Medicine, the National Workers Compensation and Disability Conference, the National Association of Workers Compensation Judges, and in Tennessee: the Chiropractic Association, the Orthopaedic Society, the College of Occupational and Environmental Medicine, the Pain Society, the Neurosurgical Society, the Tennessee Medical Society, and Tennessee Attorney Memo. He has made numerous other presentations to attorneys, case managers, employers, adjusters and insurers. His activities with the Bureau have focused on Medical Treatment Guidelines, the Drug Formulary, Utilization Review, Case Management, Fee Schedules and physician/provider communications.

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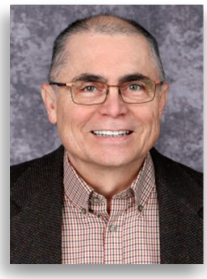

Dr. Talmage is a graduate of the Ohio State University for both undergraduate school (1968) and medical school (1972). His orthopedic surgery training was in the United States Army. He has been Board Certified in Orthopaedic Surgery since 1979 and also was Board Certified in Emergency Medicine from 1987 - 2017. Since 2005 he been an Adjunct Associate Professor in the Division of Occupational Medicine, Department of Family and Community Medicine at Meharry Medical College in Nashville. In 2013 he was Acting Medical Director for the State of Tennessee Division of Worker's Compensation. In 2014 he became Assistant Medical Director for the renamed Bureau of WC. He has been an author and co-editor of the AMA published books on Work Ability Assessment, and the second edition of the Causation book. He was a contributor to the AMA Impairment Guides, 6th Edition,

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