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CONTINUING EDUCATION ACTIVITY

Multidisciplinary Treatment for Chronic Low Back Pain: An Evidence-Based Approach

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Learning Objectives: After participating in this continuing professional development activity, the provider should be better able to:

1. Define the multidisciplinary treatment approach for chronic low back pain and differentiate between usual care and multidisciplinary treatment approaches.
2. Develop evidence-based treatment plans encompassing psychosocial, physical, pharmaceutical, and interventional therapies for patients with chronic low back pain.
3. Explain the benefits of a biopsychosocial approach to chronic pain.

Key Words: Biopsychosocial approach, Chronic low back pain, Multidisciplinary treatment for low back pain

In This Issue

Chronic low back pain (CLBP) is a global public health crisis with a mounting socioeconomic burden. CLBP, defined as pain lasting more than 12 weeks, has immense psychosocial and socioeconomic consequences.[1] Low back

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pain has a lifetime prevalence of 84% and is the leading cause of years lived with disability and workdays lost.[1] In the United States, low back pain and neck pain had the highest health care spending of 154 studied conditions resulting in $134.5 billion in expenditures with increasing prevalence.[2] Indirect costs, including disability and work absenteeism, are estimated to be greater than $50 billion per year.[3]

CLBP is a multidimensional condition. Biopsychosocial components adversely impact mental health, employment status, and social and family functioning. Patient prognostic factors that contribute to the conversion from acute to chronic low back pain include pain severity and functional impairment, prior episodes of low back pain, and both psychosocial and workplace factors.[1] The usual care directed for CLBP is often at the discretion of the treating health care provider, most often without consideration for a multidisciplinary approach. Patients with CLBP resistant to standard care have ongoing and recurrent symptoms and bear the most significant disease burden.[4] Treatment of CLBP is challenging, as many treatment strategies are supported by low-level evidence resulting in mixed outcomes. Furthermore, the opioid epidemic is a health crisis with unprecedented rates of fatal overdoses, many of which are attributed to prescription medications.[5]

Multidisciplinary treatment approaches for CLBP are based on the biopsychosocial model identifying chronic pain as a complex interaction of physiological, psychological, and social factors.[6] Screening for comorbid psychological and emotional disorders should be performed for all patients with chronic pain at the onset of treatment due to the frequency

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Table 1. Multidisciplinary Team Members' Roles and Responsibilities

Team Member	Job Duties
Physician	Medical director
	Pharmacologic management
	Performs interventional procedures
Nurse	Coordinates team meetings and communication
	Patient follow-up
Physical therapist	Manages physical exercise program
	Manual therapy
	Provides pain physiology education
Occupational therapist	Manages vocational and physical determinants of disability
	Activities of daily living
Psychologist	Psychological evaluation
	Cognitive-behavioral therapy

and negative influence of these factors on pain outcomes.[6] Individualized treatment plans are developed targeting all facets of chronic pain, including physical, psychological, educational, social, and work-related components delivered by a team of health care providers.[7] Multidisciplinary treatment teams, comprising a physician, nurse, psychologist, physical therapist, and occupational therapist, work synergistically to develop comprehensive patient treatment plans (Table 1).[8] Multidisciplinary treatment goals include reducing pain and restoring physical functional capacity and psychosocial performance.[7] An individualized approach, which underscores the patient's responsibility in healing, addresses symptomatology and response to treatment instead of being pain-free.

Multidisciplinary treatment approaches are based on the biopsychosocial model identifying chronic pain as a complex interaction of physiological, psychological, and social factors.

Multidisciplinary treatment is an effective evidence-based approach for decreasing pain, disability, long-term work impairment, and opiate prescriptions.[2] Conservative nonpharmacologic therapy is trialed before initiating pharmacologic or interventional treatments in a stepwise fashion (Figure 1). Multidisciplinary treatment has historically been focused on patients with CLBP that is resistant to standard therapies; however, early multidisciplinary treatments decrease work absenteeism and pain in patients with moderate pain, expanding program use beyond only those cases resistant to standard therapies.[2] Described next are the specific components that comprise the multidisciplinary approach for the treatment of CLBP.

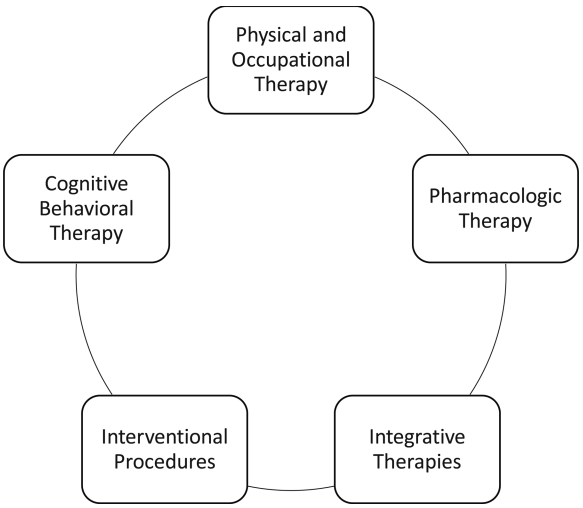

Figure 1. Multimodal treatment therapies used in a multidisciplinary program.

Physical Therapy

Physical therapy is a conservative treatment modality recommended for most patients with CLBP.[6,7] Evidence-based treatments include general and specific exercise, manual therapy, education, relaxation training, functional modifications, and mobilization. Therapeutic exercises aim to strengthen muscles, increase soft tissue stability, restore range of motion, reduce kinesiophobia, and improve cardiovascular conditioning and proprioception.

In patients with CLBP without generalized pain, moderate- to high-intensity exercise is recommended. Patients with generalized pain should incorporate progressive, low-intensity, submaximal fitness, and endurance activities.[9,10] Stabilization exercise programs may be substituted in patients who cannot tolerate general exercise with equivalent effectiveness.[9]

Thrust manipulation and nonthrust mobilization improve spine and hip mobility, reducing pain and disability.[9] In patients with referred lower extremity pain, treatments using repeated movements in a specific direction promote centralization of symptoms, which in turn reduces pain.[9,10]

Patient education and reinforcement are integral to patient ownership; therapies incorporating both fear avoidance and traditional physical therapy are more effective than monotherapy.[3] Compared with usual care, patient-focused education decreases disability, reduces pain catastrophizing, improves pain beliefs, and increases range of motion.[9] Inclusion of evidence-based pain neuroscience education improves the overall prognosis for low back pain. Educational topics should include active pain-coping strategies; reducing fear and catastrophization; and early resumption of everyday activities focusing on improvement in activity levels.[9]

Treatments addressing fear avoidance combined with physical therapy are more effective than physical therapy alone, based on long-term follow-up.[10]

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Occupational Therapy

Occupational therapists identify individual physical determinates of disability and effects on occupational and vocational activities, developing a cost-effective treatment plan. An estimated one-third of chronic pain patients cannot live independently, and two-thirds cannot perform routine daily activities without assistance. Interventions including graded activity, pacing, energy conservation strategies, and ergonomic modifications at work and home have reduced pain and increased return to work in patients with CLBP. Occupational therapists also give instruction on body posture and mechanics, which can further improve patient outcomes. However, few randomized controlled trials detail the benefits of occupational therapy with the need for further investigation.[11] Improvement in physical function is directly correlated to changes in pain beliefs.[12]

Cognitive-Behavioral Therapy

Patients with chronic pain disorders often have comorbid psychological conditions and maladaptive cognition. This includes catastrophizing and fear-avoidance beliefs, which are predictive of low back chronicity.[12] Furthermore, motivation for secondary gain and perceived financial incentives for remaining disabled is an independent risk factor for treatment failure. This results in increased disability days and reduced treatment adherence. The biopsychosocial approach addresses and manages this psychopathology.[7] Patients who adopt a sick role and are preoccupied with pain and disability often relinquish social and occupational responsibilities.[8]

Cognitive-behavioral therapy (CBT) encourages a proactive role in the recovery process, developing motivation and accepting a multidisciplinary treatment approach with the goal of using positive reinforcement to replace maladaptive cognitions, emotions, and behaviors through the use of coping strategies. Focus is transferred from a passive recipient of curative treatment to an active participant in functional and vocational restoration, reducing health care use, despite the pain.[13]

Pharmacologic Therapy

Nonpharmacologic therapy is preferred over pharmacologic treatment for management of CLBP. A short-duration treatment may provide symptomatic relief of CLBP while allowing patients to participate in active therapies. The American College of Physicians Clinical Practice Guidelines recommend pharmacologic therapies when patients have had an inadequate response to conservative nonpharmacologic treatment and recommend against using chronic opiate therapy in the treatment of CLBP.[14]

Nonsteroidal anti-inflammatory drugs (NSAIDs) are first-line pharmacologic therapy for back pain.[15] NSAIDs inhibit cyclooxygenase (COX) isoenzymes, which in turn block the conversion of arachidonic acid to prostaglandins. Prostaglandins mediate inflammation and sensitize peripheral nociceptors.[16]

NSAIDs should be used at the lowest effective dose for the shortest duration to limit renal, cardiovascular, and gastrointestinal systemic side effects.[15] Acetaminophen may be substituted as first-line therapy when there are contraindications to NSAIDs. Acetaminophen weakly inhibits COX isoenzymes inhibiting prostaglandin synthesis.[16] Acetaminophen is inferior to NSAIDs when used for CLBP but has a lower risk for adverse events and lower cost.[17] Acetaminophen overdose is the most common cause of acute liver failure in the United States. Patients must exercise caution when using concomitant acetaminophen-containing drugs.[15]

Antispastic and antispasmodic muscle relaxants indirectly act on skeletal muscle. These medications do so by inhibiting central polysynaptic neuronal events.[15] There are limited trials investigating muscle relaxant effectiveness in CLBP. Antispastic agents are not recommended for nonspecific CLBP. Instead, they may treat spasticity secondary to central nervous system injury. Antispasmodic agents are effective for acute symptomatic relief of CLBP flairs when used in a short duration (<2 weeks). Side effects include dizziness and drowsiness.[18] Benzodiazepine muscle relaxants are not recommended for treatment of CLBP due to increased risk of addiction potential and side effects including drowsiness, fatigue, and respiratory depression.[18]

Tramadol and more potent opiates should only be considered in severe, disabling pain refractory to more conservative modalities and only for a limited duration.[15] Tramadol is a prodrug metabolized by CYP3A4 and CYP2D6, inhibiting serotonin-norepinephrine reuptake and acting as a partial μ-opioid receptor agonist.[13] Tramadol use in CLBP is associated with a moderate decrease in pain and a slight improvement in function. Still, it is associated with an increased risk of suicide, seizures, abuse, and serotonin syndrome.[15,19]

Opioids are not recommended in the routine management of chronic pain. Long-term use has been shown to precipitate hyperalgesia and central sensitization. Opioids act on G-protein-coupled opioid receptors inhibiting adenyl cyclase,

decreasing voltage-gated calcium channels' conductance, and opening rectifying potassium channels.[15] Complications of opioid use include nausea, dizziness, constipation, drowsiness, dry mouth, respiratory depression, and abuse disorders. If opioid medications are prescribed, patient screening is integral, as a history of mental health or substance use disorders increases the risk for developing opioid misuse.[5] A discussion of risks and practical benefits is recommended before treatment, with frequent reevaluations of efficacy, adverse effects, and aberrant behavior.[17,18] Interdisciplinary pain care decreases opioid use and misuse in chronic pain patients resulting in improved functioning, psychological symptoms, and emotional quality of life.[15]

It is estimated that 50% of patients with CLBP experience comorbid depression, with the treatment of both depression and pain resulting in improved outcomes.[18] Serotonin-norepinephrine reuptake inhibitors (SNRIs) provide analgesic effects by inhibiting serotonin and norepinephrine reuptake and modulating descending pain inhibition. Duloxetine is the most effective SNRI, decreasing pain intensity and improving functionality when compared with placebo.[17] The most common side effects of SNRIs are dry mouth, nausea, dizziness, headache, and insomnia.[15] Tricyclic antidepressants and selective serotonin reuptake inhibitors result in no difference in pain or depression compared with a placebo.[17]

Antiepileptics are commonly prescribed for neuropathic pain; however, there is limited evidence supporting their use in the treatment of CLBP with and without sciatica. Gabapentinoids inhibit voltage-dependent presynaptic calcium channels. These medications act at the α-2-δ-1 subunit, inhibiting the release of excitatory neurotransmitters.[20]

In a 2017 meta-analysis, patients with chronic pain who took gabapentin and pregabalin showed no difference in pain scores when compared with those taking a placebo. Associated drowsiness and fogginess were limiting their use.[20] Antiepileptic topiramate has multiple binding sites. The medication inhibits voltage-sensitive sodium and calcium channels, potentiates γ-amino butyric acid (GABA), and inhibits glutamate receptors. Topiramate is effective in CLBP, decreasing pain, pain sensitivity, disability, and promoting weight loss, but has significant side effects.[17]

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Interventional Procedures

Patients resistant to medical therapy are evaluated for interventional procedures, which decrease opioid use and increase functionality in properly selected patients.[21]

Predictors of treatment failure with interventional treatment include:

1. Poorly controlled psychiatric disorders;
2. Catastrophizing and fear-avoidance behavior;
3. High baseline levels of disability and pain scores;
4. Chronic opioid use;
5. Previous spine surgery; and
6. Poor patient selection.[15]

The most common cause of CLBP lumbar facet joint degeneration is exacerbated with lumbar extension and rotation.[22] Facet joints are innervated by 2 medial branches of the dorsal ramus of a spinal nerve root, 1 from the same level and 1 from the level above. A diagnostic medial branch block with small amounts of local anesthetic is the most reliable diagnostic test. After a successful diagnostic block, a therapeutic radiofrequency (RF) ablation of the medial branches may be performed, providing pain relief and functional improvement lasting 6 to 12 months.[22] Intra-articular facet joint corticosteroid injections have limited supporting evidence but may be substituted in patients with contraindications to RF ablation.[22]

Sacroiliac (SI) joint pain is located primarily in the gluteal region and is most common in patients with spondyloarthropathies, advanced age, or post-lumbar fusion.[15] SI joints innervation is supplied by ventral rami of L4 and L5, dorsal rami of L5, S1, and S2, and the superior gluteal nerve. Intra-articular corticosteroid injections, although diagnostic, have limited evidence supporting short- or long-term pain relief.[22] Cooled RF ablation is more effective than conventional RF, which spares dorsal branches. Cooled RF can improve pain, disability, physical function, and quality of life for more than 9 months.[22]

Epidural corticosteroid injection (ECI), performed via interlaminar, transforaminal, or caudal approaches, may provide pain relief for up to 3 months in selected patients.[15] Level I evidence supports the use of ECI in radiculitis and herniated disc pain.[23] Level II evidence exists for interlaminar or caudal ECI for spinal stenosis (lumbar extension causing neurogenic claudication). Level II evidence also exists for caudal ECI for the postlaminectomy syndrome.[23] Fluoroscopic or CT guidance improves effectiveness and decreases complications.[22] Serious complications, although rare, include intrathecal (IT) injection, epidural hematoma, spinal cord injury, and embolic infarction after intra-arterial injection of particulate corticosteroids.

CLBP causes changes in the neurophysiological processing of nociceptive information. These changes include hyperalgesia, reduced endogenous analgesia, and decreased mechanoreceptive and proprioceptive perception.[24]

Neuromodulation delivers targeted electrical impulses to nerves, modulating abnormal neural pathways to decrease

pain. Spinal cord stimulation (SCS) effectively prevents mixed neuropathic pain and refractory CLBP with predominant limb pain-reducing pain scores, improving quality of life, and reducing cost.[24] Traditional SCS delivers electrical impulses to myelinated sensory fibers in the dorsal column, interrupting pain transmission.[25]

Stimulation is provided through percutaneously or surgically placed electrodes in the epidural space. The electrodes are connected to an external power source with 40- to 60-Hz pulse frequencies.[24] The trial period for the temporary leads usually lasts between 3 and 10 days. The trial results are used to determine whether the placement of a subcutaneously implantable pulse generator is indicated.[22] High-frequency (10,000 Hz) SCS provides a subthreshold stimulation without producing paresthesia. This form of stimulation is more effective for back, leg, and radicular pain than traditional SCS. SCS is regarded as a safe, minimally invasive procedure with reversible minor complications occurring up to 40% of the time. Serious complications such as infection, allergic reaction, epidural hematoma, dural puncture, and neurologic injury are rare.[24] Tolerance to SCS may occur in as many as 29% of patients, where increased pulse amplitude is needed to achieve analgesic benefit.[22]

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Dorsal root ganglion (DRG) SCS is useful to treat localized areas of pain, which are difficult to treat with traditional SCS. The DRG contains the cell bodies of peripheral sensory neurons at each spinal level. DRG SCS delivers electrical impulses to these afferent fiber types.[25] Peripheral nerve field stimulation (PNFS) stimulates primary afferent neurons.[26] Multiple stimulator leads are placed subcutaneously at the sites of maximal lumbosacral pain. There have been few serious complications.[22] PNFS in combination with SCS is more effective in reducing pain scores in chronic axial back pain when compared with SCS alone.

IT infusion devices are used in refractory noncancer pain to control pain and reduce opiate medication usage and systemic side effects. A catheter is placed within the dural sac, delivering medication directly to the spinal fluid, bypassing the blood-brain barrier. IT therapy is more resistant to tolerance than is SCS, with effectiveness for up to 6 years. However, IT use in noncancer pain has mixed evidential support. IT infusion is indicated only after the failure of more conservative treatments. Candidates must complete a detailed physical and psychosocial examination due to high costs and severe side effects.[27] Specifically, IT granuloma formation at the catheter tip can result in spinal cord compression.[22] Ziconotide, a first-line therapy for neuropathic and nociceptive pain, blocks presynaptic N-type calcium channels in the dorsal horn of the spinal cord. This medication has been shown to raise creatine kinase values, and levels should be checked at baseline and intermittently during use.

Integrative Therapies

Movement-based treatments can also play a significant role in multidisciplinary treatment strategies. Yoga is a total mind-body workout that combines strengthening and stretching poses with deep breathing and meditation. In patients with mild CLBP, yoga offers improvements in pain and function. Aerobic exercise alone improves pain, disability, and mental health in patients with nonspecific CLBP.[28] Spinal mobilization techniques such as thrust manipulation and nonthrust mobilization can improve spine and hip mobility, reducing pain and disability.[28] The improvements may not be clinically meaningful due to low baseline pain or disability.[29]

Acupuncture and acupuncture-related therapies such as dry needling and electroacupuncture are based on the amalgamation of health systems worldwide, including China, Japan, Russia, Canada, Korea, France, and the United States. The proposed mechanism of action for acupuncture is that it stimulates high-threshold small-diameter nerves located in the spinal cord, brainstem periaqueductal gray matter, and hypothalamic neurons. This, in turn, triggers endogenous opioid mechanisms.[13] The evidence supports the use of this therapy to treat pain and prevention and treatment of nausea and vomiting.[28] In CLBP, acupuncture is a cost-effective therapy resulting in short-term improvement in pain and function, when compared with usual care.[10] However, many of the clinical studies performed on acupuncture lack sufficient sample size, follow-up, and outcome measures, decreasing statistical power and significance. Side effects are uncommon but include bleeding, infection, dermatitis, and retained needle fragments.[13]

Limitations of Multidisciplinary Treatment for CLBP

Establishing a multidisciplinary team requires substantial upfront costs and creates reimbursement challenges from third-party insurance payers.[8] Comprehensive pain care decreases overall health care costs by reducing additional surgical procedures and overall health care use. Furthermore, patients are more likely to return to work and have improved quality of life when compared with conventional treatment. Early use of a multidisciplinary approach is imperative, as the first year of chronic pain treatment is the most expensive and

labor-intensive.[8] Further studies are needed comparing the direct and indirect costs of a multidisciplinary approach compared with usual care. Such data could lead to increased program use and reimbursement.[8]

> Establishing a multidisciplinary team requires substantial upfront costs and creates reimbursement challenges.

Intensive and integrated rehabilitation may span 6 to 8 hours per day over 6 weeks, resulting in noncompliance in patients who continue to work.[8] A less time-intensive program of 4 days per month can improve disability, pain, work outcomes, and psychological status in patients with moderate pain, allowing broader implementation.

Communication is paramount so that all clinical team members develop integrative treatment plans.[8] Coordinating treatment team meetings may be complicated; however, the implementation of virtual platforms has made communication easier. The Reboot Online randomized controlled study compared evidence-based, multidisciplinary online treatment programs to usual care in chronic pain patients. Participants in the Reboot Online group reported more significant improvements in pain self-efficacy, pain severity, movement-based fear-avoidance, pain-related disability scores, and psychological distress versus those in the usual care treatment group.[29] The use of telemedicine has expanded access to multidisciplinary care and improves patient coordination and treatment team communication for patients with CLBP, but limits physical examinations and raises concerns over reimbursement.[29]

> With increasing use of telemedicine, the multidisciplinary approach could become more accessible.

Conclusion

CLBP is a global pandemic with increasing prevalence and health care expenditures. Multidisciplinary treatment programs provide evidence-based care for patients with CLBP, decreasing pain and work absenteeism while improving functionality. An individualized, evidence-based treatment program comprising CBT, physical therapy, occupational therapy, and pharmacologic, interventional, and integrative therapies can reduce health care use and expenditures. Traditionally, access to care from multidisciplinary teams has been limited; however, with increasing use of telemedicine, the multidisciplinary approach could become more accessible, resulting in increased use and improved outcomes. ■

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Coming Soon:

- The Impact of Discrimination in Pain Management: Strategies to Improve Pain Outcomes

NYU Study Reports Computerized Brain Implant Relieved Short- and Long-Term Pain in Rodents

Researchers at New York University (NYU) reported that a computerized brain implant effectively relieved short-term and chronic pain in rodents, according to a press release issued by NYU Langone Health.[1,2]

The experiments were conducted by investigators at NYU Grossman School of Medicine and published on June 21 in the journal *Nature Biomedical Engineering*. The researchers said the study offers a "blueprint" for the development of brain implants to treat pain syndromes and other brain-based disorders such as anxiety, depression, and panic attacks.

The authors reported that device-implanted rats withdrew their paws 40% more slowly from sudden pain, compared with when their device was turned off. According to the study authors, this suggests that the device reduced the intensity of the pain the rodents experienced. Animals in sudden or continuous pain spent about two-thirds more time in a chamber where the computer-controlled device was turned on than in a chamber where it was not.

"Our findings show that this implant offers an effective strategy for pain therapy, even in cases where symptoms are traditionally difficult to pinpoint or manage," said senior study author Jing Wang, MD, PhD, the Valentino D.B. Mazzia, MD, JD, Associate Professor in the Department of Anesthesiology at NYU Langone Health. Wang is also the Vice Chair for Clinical and Translational Research at NYU Langone.

Researchers said the investigation is the first to use a computerized brain implant to detect and relieve bursts of pain in real time, and that it is also the first of its kind to target chronic pain.

Computerized brain implants, previously investigated to prevent epileptic seizures and control prosthetic devices, may avert the risk of addiction and other issues associated with opioids, said Wang. The technology, known as a closed-loop brain-machine interface, detects brain activity in the anterior cingulate cortex, a region of the brain that is critical for pain processing. A computer linked to the device then automatically identifies electrical patterns in the brain closely linked to pain. When signs of pain are detected, the computer triggers therapeutic stimulation of another region of the brain, the prefrontal cortex, to ease it.

Because the device is only activated in the presence of pain, Wang said, it lessens the risk of overuse and any potential for tolerance to develop. Furthermore, because the implant does not offer a reward beyond pain relief, as do opioids, the risk of addiction is minimized.

As part of the study, the researchers installed tiny electrodes in the brains of dozens of rats and then exposed them to

carefully measured amounts of pain. The animals were closely monitored for how quickly they moved away from the pain source. This allowed the investigators to track how often the device correctly identified pain-based brain activity in the anterior cingulate cortex and how effectively it could lessen the resulting sensation.

> Because the implant does not offer a reward beyond pain relief, as do opioids, the risk of addiction is minimized.

According to the study authors, the implant accurately detected pain up to 80% of the time.

"Our results demonstrate that this device may help researchers better understand how pain works in the brain," said lead study investigator Qiaosheng Zhang, PhD, a doctoral fellow in the Department of Anesthesiology, Perioperative Care and Pain at NYU Langone. "Moreover, it may allow us to find non-drug therapies for other neuropsychiatric disorders, such as anxiety, depression, and post-traumatic stress."

Zhang added that the implant's pain detection properties could be improved by installing electrodes in other regions of the brain beyond the anterior cingulate cortex. He cautioned, however, that the technology is not yet suitable for use in people, but said plans are underway to investigate less invasive forms with potential to be adapted for human use.

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In addition to Wang and Zhang, other NYU Langone researchers included Sile Hu, MS; Robert Talay; Amrita Singh, BA; Bassir Caravan, BS; Zhengdong Xiao, MS; David Rosenberg, BS; Anna Li, BM; Johnathan D. Gould; Yaling Liu; Guanghao Sun; and Zhe S. Chen, PhD.

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ICYMI: IN CASE YOU MISSED IT

Notes from recent studies related to pain management, compiled by Elizabeth A.M. Frost, MD, co-editor of *Topics in Pain Management*

Corticosteroid Injections in the TMJ Moderately Relieved Pain for Patients with Rheumatoid Arthritis

Pain in the temporomandibular joint (TMJ) in patients with rheumatoid arthritis (RA) is related to systemic inflammatory activity and can be debilitating.

The authors studied 35 patients (median age 54 years), of whom 89% were female. They documented maximum mouth opening capacity, degree of anterior open bite (AOB), TMJ pain intensity at rest, and crepitus. The researchers also determined serum levels of rheumatoid factor (RF), erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), serotonin, and plasma levels of interleukine-1β (IL-1β).

Of the 70 joints, 53 received a corticosteroid (methylprednisolone) injection after the clinical examination at baseline (T0). The examination was repeated for all patients at T1 (median 3.1 weeks after T0), and for 21 patients at T2 (median 6.3 weeks after T1). Twenty patients received a second injection at T1.

Maximum mouth opening capacity significantly increased, and TMJ pain intensity significantly decreased between T0 and T1 but not by T2. No differences were found in AOB between the time points. Of the joints that were injected at T0, 19 had pretreatment crepitus, which resolved in 8 joints by T1. No correlations were determined between the increase in mouth opening capacity or decrease of TMJ pain intensity and ESR, CRP, serotonin, or IL-1β.

The researchers concluded that methylprednisolone injections in the TMJ alleviate pain and improve mouth opening capacity for approximately 3 weeks, allowing patients to perform jaw exercises during this time. Thus, these injections would seem to be useful for the short-term management of TMJ involvement in RA. Corticosteroid injections could be used to facilitate and support additional noninvasive, conservative treatment options. (See: Kroese JM, Kopp S et al. Corticosteroid injections in the temporomandibular joint temporarily alleviate pain and improve function in rheumatoid arthritis. *Clin Rheumatol*. 2021 Jul 21 [Epub ahead of print]).

Genicular Nerve Radiofrequency Ablation: A Review of Current Status

Genicular nerve radiofrequency ablation (RFA) has been advocated for the past 7 years as management of knee osteoarthritis (KOA). A review of PubMed revealed 73 articles, as use of this technique is increasingly being performed to treat chronic knee pain.

In this article, the authors offer a summary of the relevant neuroanatomy, randomized controlled trials, appropriate patient selection, and safety relating to genicular RFA.

They note that cadaveric studies indicate considerable variability in the location of the genicular nerves, leading to ensuing debate over the appropriate target locations for genicular RFA.

Nevertheless, good outcomes have been obtained in studies targeting only the superior medial genicular nerve, inferior medial genicular nerve, and superior lateral genicular nerve. Other randomized controlled trials demonstrate superiority of genicular RFA compared with intra-articular steroid, visco-supplementation, and oral analgesics.

The researchers conclude that while genicular RFA of the superior medial genicular nerve, inferior medial genicular nerve, and superior lateral genicular nerve appears to be effective for painful KOA, targeting additional sensory nerves may further improve treatment success.

Based on the available data, genicular RFA appears safe, but additional large-scale studies are needed to improve confidence. (*See*: Conger A, Gililland J, Anderson L, Pelt CE. Genicular nerve radiofrequency ablation for the treatment of painful knee osteoarthritis: current evidence and future directions. *Pain Med*. 2021 Jul 25; 22[Supplement_1]: S20-S23.)

THE PAIN NARRATIVE

Part of an occasional series of reviews by *Topics in Pain Management* staff and readers

The Pharmacist: When the Opioid Overdose Crisis Becomes Personal

Streaming services and book publishers have released at least 2 TV series and several books on the opioid crisis, particularly at some of the people at the heart of it. We will get to the newer ones in future months, but although I was waiting for Alex Gibney's HBO series on Purdue Pharma to become available, I watched *The Pharmacist*, a 4-episode documentary series on Netflix.

The Pharmacist pulls no punches as it exposes the workings of a "pain center" in Louisiana run by one physician who handed out so many opioid prescriptions that a local pharmacist could not help but notice the alarming pattern. Fueled by a personal loss—the earlier tragic drug-related murder of his son—the pharmacist begins a 1-man crusade to get federal and state law enforcement to shut down the clinic, which turns into a 2-man crusade when an unlikely partner emerges.

I found this series especially compelling, having interviewed pain specialists after Hurricane Katrina in 2005. Although the disaster had a far-reaching effect on pain patients and physicians, one of the issues the physician mentioned was a recent growth in "pill mills" handing out a disproportionate number of opioid prescriptions. Watching the pharmacist in the series talk about his frustration at the blatant abuse of patient trust, I was reminded of the same frustration in the voice of the Louisiana pain specialist I interviewed after Katrina.

The talking heads in *The Pharmacist* include a former sales representative for Purdue Pharma going into detail about the company's sales tactics, and investigators for the Drug Enforcement Agency, the Federal Bureau of Investigation and state prosecutors. One of the bright spots is the significant role played by the state medical board.

As with nearly all true crime documentaries, there is some dramatization and repetition, so you may want to skim through some parts. Episodes 3 and 4 are the most important, as the investigation closes in on the physician, taking some unexpected turns.

Topics in Pain Management CME/NCPD Quiz

To earn CME credit using the enclosed form, you must read the CME article and complete the quiz and evaluation assessment survey on the enclosed form, answering at least 70% of the quiz questions correctly. **Select the best answer and use a blue or black pen to completely fill in the corresponding box on the enclosed answer form.** Please indicate any name and address changes directly on the answer form. If your name and address do not appear on the answer form, please print that information in the blank space at the top left of the page. Make a photocopy of the completed answer form for your own files and mail the original answer form in the enclosed postage-paid business reply envelope. Your answer form must be received by Lippincott CME Institute by **September 30, 2023**. Only two entries will be considered for credit.

Online CME quiz instructions: Go to **http://cme.lww.com** and click on "Newsletters," then select *Topics in Pain Management*. Enter your ***username*** and ***password.*** First-time users must register. After log-in, follow the instructions on the quiz site. You may print your official certificate ***immediately.*** **Please note:** Lippincott CME Institute, Inc., ***will not*** mail certificates to online participants. **Online quizzes expire on the due date.**

To earn NCPD credit, you must take the quiz online. Go to **www.nursingcenter.com**, click on Continuing Education on the toolbar at the top, select Browse Journals, and select *Topics in Pain Management.*

Log-in (upper right hand corner) to enter your ***username*** and ***password.*** First-time users must register. As a subscriber benefit, nurses can earn contact hours when taking CPD activities from *Topics in Pain Management* for free. You must enter your subscription number preceeded by LWW, in your registration profile where there is a field for **Link to my subscription**. The 100% discount is applied when payment is requested. Non-subscribers pay a $49.00 fee to earn ANCC contact hours for this activity.

After log-in, locate and click on the CPD activity in which you are interested. There is only one correct answer for each question. A passing score for this test is 7 correct answers. If you fail, you have the option of taking the test again. When you pass, you can print your certificate of earned contact hours and access the answer key. For questions, contact Lippincott Professional Development: 1-800-787-8985. The registration deadline for NCPD credit is **September 6, 2024.**

1. **Physical therapists and other multidisciplinary providers should include which one of the following concepts in pain physiology conversations with patients with CLBP?**
   A. Being mindful of one's level of fear to avoid activities and prevent reinjury
   B. The early resumption of normal or vocational activities, even when still experiencing pain
   C. In-depth review of patient imaging and pathology
   D. Catastrophizing is a normal response to a perceived threat
2. **Which one of the following is a barrier to use of the multidisciplinary approach to CLBP treatment?**
   A. Substantial upfront costs create reimbursement challenges with third-party payers.
   B. Providers are not satisfied with the format of multidisciplinary teams for CLBP.
   C. The programs are easily accessible for patients who continue to have work and social commitments.
   D. Patients prefer to be seen and managed by a single provider.
3. **Which one of the following is a prognostic factor that contributes to conversion from acute to chronic low back pain?**
   A. Pain location and the presence of sciatica
   B. Previous episodes of low back pain
   C. Family history of CLBP
   D. Current and past smoking history
4. **Which one of the following patients should be screened for comorbid psychological and emotional disorders at initiation of treatment?**
   A. Patients on chronic opioid therapy
   B. Patients with spinal cord stimulators
   C. All patients with chronic pain
   D. Patients who failed usual care treatment
5. **Which one of the following describes when chronic opiate therapy should be initiated for the treatment of CLBP?**
   A. After failure of conservative therapy
   B. After failure of nonopiate analgesics
   C. Chronic opiate therapy is not recommended in the treatment of CLBP
   D. In patients who showed improvement of functionality after a short course of opiate treatment
6. **Which one of the following is a goal of multidisciplinary treatment programs?**
   A. Treatment plans only for patients with refractory and debilitating pain
   B. Development of a generalized treatment approach suitable to most patients
   C. Trial of pharmacologic treatment before initiation of conservative nonpharmacologic treatment
   D. Restoration of physical functional capacity and psychosocial performance
7. **Which one of the following is the goal of CBT?**
   A. Use positive reinforcement to replace maladaptive cognitions, emotions, and behaviors through the use of coping strategies.
   B. Encourage the patient to take on a passive role in their treatment plan.
   C. Determine whether the patient is motivated by secondary gains.
   D. Reinforce the sick role thinking process to increase treatment compliance.

8. **Which one of the following limits the use of muscle relaxants for CLBP?**
   A. Low risk of addiction potential or respiratory depression with other central-acting drugs
   B. Contraindicated in patients with muscle spasticity from central nervous system injury
   C. Common central nervous system side effects including dizziness and drowsiness
   D. They are recommended for long-term use in nonspecific low back pain only
9. **High-frequency SCS**
   A. can produce more paresthesia than traditional SCS
   B. delivers pulse frequencies from 2 to 1200 Hz
   C. requires a trial period for temporary leads for 14 to 21 days
   D. is more effective than traditional SCS for back, leg, and radicular pain
10. **Implementation of telemedicine for patients with CLBP can**
   A. increase reimbursement for treatment
   B. improve access to care for multidisciplinary treatment
   C. improve patient adherence to activity recommendations
   D. enhance thorough documentation of physical examinations

NEWS IN BRIEF

American Headache Society Consensus Statement on Integrating New Migraine Treatments

As more acute and preventive migraine treatments have been approved in recent years, and as evidence grows about postapproval usage, the American Headache Society (AHS) published an updated consensus statement in the journal *Headache* in June 2021.

"[T]he appropriate and cost-effective integration of these new treatments remains a high priority for prescribing clinicians," the authors wrote. "The American Headache Society, consistent with its mission of improving the lives of individuals impacted by headache, previously established indications for which the initiation and continuation of novel acute and preventive treatments might be appropriate."

The AHS had already published a consensus statement on the use of newly introduced treatments for adults with migraine. The 2021 update is based on the expanded evidence base and emerging expert consensus concerning post-approval usage, and provides practical recommendations in the absence of a formal guideline, according to the article.

"The integration of new treatments into clinical practice should be informed by the potential for benefit relative to established therapies, as well as by the characteristics and preferences of individual patients," the authors wrote.

However, they also noted that the consensus statement is not a clinical practice guideline.

The update involved a review of data about the efficacy, safety, and clinical use and review and commentary by the Board of Directors of the AHS and patients and advocates associated with the American Migraine Foundation.

Newly introduced acute treatments include:

- Two small-molecule calcitonin gene-related peptide (CGRP) receptor antagonists (ubrogepant, rimegepant);
- A serotonin (5-HT1F) agonist (lasmiditan);
- A nonsteroidal anti-inflammatory drug (celecoxib oral solution); and
- A neuromodulatory device (remote electrical neuromodulation).

New preventive treatments include eptinezumab, an intravenous anti-CGRP ligand monoclonal antibody.

Several modalities that may be appropriate for either acute or preventive treatment include:

- Neuromodulation (electrical trigeminal nerve stimulation, noninvasive vagus nerve stimulation, single-pulse transcranial magnetic stimulation); and
- Biobehavioral therapy (cognitive behavioral therapy, biofeedback, relaxation therapies, mindfulness-based therapies, acceptance and commitment therapy)

(*See*: Ailani J, Burch RC, Robbins MS. The American Headache Society consensus statement: update on integrating new migraine treatments into clinical practice. *Headache*. 2021;61(7)1021-1039. https://doi.org/10.1111/head.14153.)