

# Chronic pain of the musculoskeletal system – point of view for general practitioner

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## ABSTRACT

Pain is subjective unpleasant feeling of varied origin and once it is chronic (lasting more than 6 month) it could be responsible for significantly decreased quality of life. Pivotal role in pain suffering plays both peripheral and central nervous system and at these levels its intensity could be decreased by several pharmacological and non-pharmacological means. Rationale of chronic management of musculoskeletal pain. This article is a review of contemporary bibliography in order to assess pathomechanism and causes of pain to successfully cope with the condition. Of utmost importance in managing pain is proper diagnosis and identification of its sources. Once this condition is met it is easier to apply diagnosis-specific treatments even including surgeries. In various clinical situations especially in chronic aged patients with multiple comorbidities personalized approach is mandatory. Armamentarium then encompasses complex actions with the use of simple counseling, medical treatment, physiotherapy, orthotics and preferably mini-invasive but also major surgical interventions. Proper management of chronic musculoskeletal pain demands detailed analysis of complex clinical situation basing on medical history, examination and combining these data with possible imaging investigations. Often cooperation of several specialists is mandatory.

**KEY WORDS:** pain mechanisms, chronic pain, pain management, musculoskeletal pain.

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## INTRODUCTION

Chronic pain syndromes of the musculoskeletal system are sporadic in children and adolescents, and in adults, their frequency increases with age [1,2]. After age 65, an increase in these ailments of varying intensity and duration is commonly observed in both sexes. The inflammatory component of musculoskeletal pain is evident in rheumatological disease syndromes, such as rheumatoid arthritis. Often, ailments are related to chronic overload with exercise or forced positioning for a long time, e.g., low-back pain during long-term sitting [1, 3]. The most common pain syndromes in the elderly is associated with degenerative joint changes [1]. Their nature is usually associated with overweight and obesity, and weight reduction results in clinical improvement. A common way to reduce such pain is various types of painkillers (NSAIDS (non-steroidal anti-inflammatory drugs, opioids, and others), but such treatment can disturb systemic metabolism. Not rarely it may also cause additional health problems, such as addiction. However, according to the author, it is justified in periods of severe symptoms due to overload or

provoked, for example, by a systemic infectious disease such as flu. A special type of chronic and periodically exacerbating pain in the musculoskeletal system is that of the spine. This axial organ, with a complex joint and bony structure, protects the pain-sensitive nerve elements in its vicinity. Unfortunately, these elements are often subject to hypertrophic processes in the course of degenerative diseases, e.g., rheumatoid arthritis or gout. Sensitive nerve structures are then compressed by the facet joints as a result of changes that distort the articular ends. In such a pathological situation, ischemia and irritation of the spinal nerves in the area of the intervertebral foramina result, which causes pain symptoms radiating most often from the lower segments of the spine to the lower limbs.

## AIM

This review aimed at briefly presenting up-dated information on treatment of chronic pain of musculoskeletal origin focusing on its diversity and need for complex approach.

## MATERIALS AND METHODS

The research material was a review of the current literature on the treatment of chronic musculoskeletal pain. For this purpose, the available database was searched using the Pub Med website, Google Scholar.

## REVIEW AND DISCUSSION

### RECOGNIZING THE SOURCE OF PAIN

The essential step in the treatment of musculoskeletal pain syndromes is to diagnose the source of the pain. Careful collection of medical history by a person skilled in its examination often allows to determine the probable source of the symptoms. Additional imaging tests (especially CT and MRI) are also invaluable, but often, even a simple X-ray allows a clinical diagnosis to be made [4, 5]. In case of doubt, local infiltration with lignocaine solution under ultrasound control confirms our belief (or the need for further verification) of the source of the pain.

It is evident that after determining the source, removing the established cause of the ailment is rational. Such recommendations can be prosaically simple and effective, such as changing shoes for oversized when these worn insidiously conflict painfully with the foot (most often forefoot). However, such recommendations are often a difficult challenge for doctors without appropriate podiatry training. Fortunately, patients themselves, especially those who observe “what is harmful to them,” prefer the selection of comfortable footwear over its apparent aesthetic value. In this respect, differences in choices depending on gender can be observed.

### CHRONIC PAIN OF THE MUSCULOSKELETAL SYSTEM

It is a complex phenomenon without a strict definition. Some authors try to use the 6-month duration of symptoms as a criterion. This time criterion is often appropriate after multi-site and multi-organ damage, after amputations and in approximately 1/10 cases after arthroplasty of large joints. A particularly complicated type of pain in the musculoskeletal system is chronic lumbar-sacral pain, associated with many conditions resulting from degenerative changes, pressure on nerve and ligament elements, and psychological conditions [6]. Additionally, chronic pain often seems to coexist with a depressive personality, a state of emotional disturbance that takes a psychosomatic form. It is assumed that approximately half of patients with chronic pain have psychogenic disorders, which, of course, requires specialist assessment and treatment.

Before diagnosing chronic pain syndrome of the musculoskeletal system, other removable causes of pain should be excluded, including those of vascular origin, also compression neuropathies, fibromyalgia, and complex regional pain syndrome (formerly the so-called Sudeck pain syndrome), in order to provide effective treatment.

### PAIN PATHOGENESIS

It is believed that Rene Descartes, in the 17th century, was the first to pay attention to the process of creating the pain sensation. His view on the issue was to recognize the transmission of pain stimuli from the body's periphery to the central nervous system, where this unpleasant phenomenon is registered. It is believed that the peripheral nervous system has pain endings, the so-called nociceptors, and is sensitive to their stimulation, e.g., by disturbance of their continuity, too high temperature, etc. This stimulation is then transmitted to the ganglia in the posterior spinal roots and from there to the central nervous system [5,7]. Classically, two types of nociceptors are distinguished: 1. delta myelin fibers, which conduct quickly and precisely determining the type and location of irritation, and 2. unmyelinated C fibers, which slowly conduct the sensations of burning, itching, or diffuse tissue damage. These nociceptors are irritated by local inflammation with the participation of mediators [7,8] such as prostaglandins, leukotrienes, histamine, bradykinins, substance P, glutamate, and calcitonin-gene-related peptides. Production of these substances can be weakened by administering substances such as NSAIDs and aspirin.

Pain transmission at the level of the spinal cord

The spinal cord plays an important role in transmitting pain stimuli. Many processes occur within it, modulating the pain signal and its intensity. Several natural substances take part in this “game,” including endogenous opioids, substance P, exogenous opioids, and antidepressants. Moreover, pain signals can be artificially modified by electrical stimulation, which has been shown in experimental studies on rats to influence the release of endogenous opioids. In humans, similar mechanisms occur during the use of transcutaneous electrical nerve stimulation (TENS), spinal stimulation, and acupuncture.

### TRANSMISSION OF PAIN STIMULI ABOVE THE LEVEL OF THE SPINAL CORD

Processed pain signals reach the brain in the somatosensory cortex via the thalamus, cingulate gyrus, and insular cortex. These structures are believed to play

a pivotal role in creating chronic pain. At this level of therapeutic impact, psychotherapy, exercises using biofeedback techniques, hypnosis, relaxation techniques, alternative medicine, and non-pharmacological activities seem to be helpful [9, 10].

## STANDARD PHARMACOLOGY OF PAIN TREATMENT

### *NON-STEROIDAL ANTI-INFLAMMATORY DRUGS, ASPIRIN, PARACETAMOL*

Cyclooxygenase inhibitors have anti-inflammatory and analgesic effects. This group's oldest (and most natural, because of plant origin) is acetylsalicylic acid, commonly known as aspirin. Acetaminophen (paracetamol) has similar analgesic properties, but this substance lacks anti-inflammatory effects. These drugs should instead be used for acute pain in the musculoskeletal system and are less useful in chronic pain syndromes. In certain clinical situations, e.g., painful gonarthrosis or "tennis elbow," their local use can be very effective. Despite the lack of recommendations, these drugs are chronically used by patients on their own as OTC preparations, which may lead to real health problems at the level of parenchymal organs such as the kidneys or liver and may cause ulcerations of the gastrointestinal tract and bleeding [5, 11-16].

### *OPIATES AND OPIOIDS*

Morphine, as the oldest drug known for over 200 years, is the precursor of the rest of this group. These drugs are effective at the peripheral, spinal, and supraspinal levels. Despite significant effectiveness in the acute pain phase, these drugs are not generally recommended for use in chronic pain due to the risk of addiction and side effects (constipation, nausea, digestive disorders, headaches, euphoria, confusion, drowsiness, urinary retention, lack of decision-making). However, fentanyl patches and certain graduated-release forms of oral morphine are fortunate exceptions that are effective in treating chronic pain. However, these forms of opiates should be reserved for patients unsuccessfully treated otherwise [11, 17-19].

## OTHER PHARMACOLOGICAL AGENTS

### *ANTICONVULSANTS*

Most often used are gabapentin and pregabalin. Sometimes also carbamazepine in chronic neuropathic pain [20, 21].

## ANTIDEPRESSANTS

It can be beneficial when used in moderation in low doses. These include primarily drugs that increase serotonin, noradrenaline, and dopamine levels in the central nervous system [11, 20, 21].

### *TRAMADOL*

This drug has actions similar to both morphine and antidepressant. Extended-release formulations are beneficial here. Unfortunately, although less potent, it also has side effects similar to opiates.

### *MYORELAXANT*

In certain clinical situations, excessive muscle tension may intensify pain, especially in the lumbar spine. Then, for a short period, it is justified to use myorelaxants, such as cyclobenzaprine (Flexeri), tizanidine (Sirdalud), tolperisone (Mydocalm), and baclofen. However, these drugs should not be used as first-line treatment for chronic pain in the musculoskeletal system [22].

### *TOPICAL AGENTS*

Lignocaine patches interrupt pain transmission at the peripheral level and are sometimes effective on the surface. Others used topically in liposomal forms, such as diclofenac, have their therapeutic position. Another substance that has gained recognition in the treatment of chronic pain, affecting substance P, is capsaicin in the form of patches. Other, sometimes recommended OTC preparations are menthol preparations with unclear effects [23].

### *VITAMIN C*

It is used in the early period after fractures of the distal radius (so-called Colles'), reducing the occurrence of algodystrophic syndrome.

## NON-PHARMACOLOGICAL ACTIONS

### *PHYSIOTHERAPEUTIC METHODS*

Transcutaneous electrical stimulation has a recognized place in the treatment of pain in the musculoskeletal system, especially chronic pain. Manual therapies, performed professionally, so-called manipulative procedures in the area of the spine, usually bring relief to suffering patients. Therapeutic ultrasound can also occasionally help. Other non-invasive techniques used to treat chronic pain in the musculoskeletal system in-

clude thermo- and cryotherapy, [24, 25] laser therapy, magnetotherapy, and phonophoresis [26-29].

## INVASIVE METHODS OF TREATING CHRONIC PAIN

Of these, acupuncture comes to the fore, with a centuries-old tradition derived from Traditional Chinese Medicine (TCM). Numerous scientific studies document its effectiveness. Other invasive procedures include trigger point injections, epidural administration of glucocorticoid preparations, cryoablation, and thermal ablations in the spine, especially in the lumbosacral part [30-32].

## CONCLUSIONS

The lack of strict guidelines requires an individualized approach to each patient. Pharmacological agents should be used by accepted principles. Locating the source of pain allows for local actions, preferably pathogenetically targeted, e.g., local administration of long-acting drugs in the form of a microcrystalline suspension, including glucocorticosteroids, taking into account possible contraindications. Drugs such as tramadol, gabapentin, pregabalin, and diclofenac are commonly used. An important part of the therapy should be the reduction of possible obesity and physiotherapy treatment. Obvious pathologies like advanced degenerative changes within joints could be after consideration addressed surgically e.g so common nowadays total joint arthroplasty (TJA).

## REFERENCES

1. Bedson J, Mottram S, Thomas E, Peat G. Knee pain and osteoarthritis in the general population: what influences patients to consult? *Fam Pract.* 2007;24:443–453.
2. James SL, Abate D, Abate KH, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet.* 2018;392:1789–1858.
3. Smith E, Hoy DG, Cross M, et al. The global burden of other musculoskeletal disorders: estimates from the Global Burden of Disease 2010 study. *Ann Rheum Dis.* 2014;73:1462–1469.
4. El-Tallawy SN, Nalamasu R, Pergolizzi JV, Gharibo C. Pain management during the COVID-19 pandemic. *Pain Ther.* 2020;9:453–466.
5. Schug SA, Palmer GM, Scott DA, Halliwell R, Trinca J. Acute pain management: scientific evidence fourth edition, 2015. *Med J Aust.* 2016;204(8):315–317.
6. El-Tallawy S. N., Nalamasu R., Salem G.I., LeQuang J. A.K., Pergolizzi J.V.,Christo P.J. Management of Musculoskeletal Pain: An Update with Emphasis on Chronic Musculoskeletal Pain. *Pain Ther.* 2021 Jun;10(1):181–209.
7. D’Mello R, Dickenson AH. Spinal cord mechanisms of pain. *Br J Anaesth.* 2008;101(1):8–16.
8. Bates D, Schultheis DC, Hanes MC, Jolly SM, Chakravarthy KV, Deer TR, Levy RM, Hunter CW. A Comprehensive algorithm for management of neuropathic pain. *Pain Med.* 2019;20:S2–S12
9. National Institute for Health and Clinical Excellence (NICE). Osteoarthritis: care and management (CG177). London: National Institute for Health and Clinical Excellence; 2014.
10. National Institute for Health and Clinical Excellence (NICE). Low back pain and sciatica in over 16s: assessment and management (NG59). London: National Institute for Health and Clinical Excellence, NICE guideline Published: 30 November 2016
11. Scottish Intercollegiate Guidelines Network (SIGN). Management of chronic pain. Edinburgh: SIGN; 2013, Revised 2019. (SIGN publication no. 136). <https://www.sign.ac.uk/assets/sign136.pdf> [Access November 2024]
12. Graham GG, Davies MJ, Day RO, et al. The modern pharmacology of paracetamol: therapeutic actions, mechanism of action, metabolism, toxicity and recent pharmacological findings. *Inflammopharmacology.* 2013;21(3):201–232.
13. Rawal N. Current issues in postoperative pain management. *Eur J Anaesthesiol.* 2016;33:160–171.
14. Rosenquist RW, Benzon HT, Connis RT, et al. Practice guidelines for chronic pain management: an updated report by the American Society of Anesthesiologists Task Force on Chronic Pain Management and the American Society of Regional Anesthesia and Pain Medicine. *Anesthesiology.* 2010;112:1–1.
15. Da Costa BR, Reichenbach S, Keller N, Nartey L, Wandel S, Juni P, et al. Effectiveness of non-steroidal anti-inflammatory drugs for the treatment of pain in knee and hip osteoarthritis: a network meta-analysis. *Lancet.* 2017;390:e21–33
16. Kolasinski SL, Neogi T, Hochberg MC, et al. 2019 American College of Rheumatology/Arthritis Foundation guideline for the management of osteoarthritis of the hand, hip, and knee. *Arthritis Care Res.* 2020;72(2):149–162.
17. Evidence-based clinical guidelines for multidisciplinary spine care: diagnosis and treatment of low back pain. 2020; North American Spine Society. ASRA Feb 3, 2020; 21:17
18. Abdel Shaheed C, Maher CG, Williams KA, et al. Efficacy, tolerability, and dose-dependent effects of opioid analgesics for low back pain: a systematic review and meta-analysis. *JAMA Intern Med.* 2016;176:958.

19. Raff M, Belbachir A, El-Tallawy S, Ho KY, Nagtalon E, Salti A, Seo JH, Tantri AR, Wang H, Wang T, Buemio KC, Gutierrez C, Hadjiat Y. Intravenous oxycodone versus other intravenous strong opioids for acute postoperative pain control: a systematic review of randomized controlled trials. *Pain Ther.* 2019;8(1):19–39.
20. Hepner S, Claxton R. Anti-epileptic drugs for pain. *J Palliat Med.* 2013;16(7):799–800.
21. Wright ME. An update on the pharmacologic management and treatment of neuropathic pain. *J Am Acad Physician Assist.* 2017;30(3):13–17.
22. Annemans L. Pharmacoeconomic impact of adverse events of long-term opioid treatment for the management of persistent pain. *Clin Drug Investig.* 2011;31(2):73–86.
23. Plested M, Budhia S, Gabriel Z. Pregabalin, the lidocaine plaster and duloxetine in patients with refractory neuropathic pain: a systematic review. *BMC Neurol.* 2010;10:116.
24. Swenson C, Sward L, Karlsson J. Cryotherapy in sports medicine. *Scand J Med Sci Sports.* 1996;6(4):193–200.
25. Gooch JL, Geiringer SR, Akau CK. Sports medicine. 3. Lower extremity injuries. *Arch Phys Med Rehabil.* 1993;74:S438–S442.
26. Fischer E, Solomon S. Physiological responses to heat and cold. In: Licht S, editor. *Therapeutic heat and cold.* 2. Baltimore: Waverly; 1965. pp. 126–169.
27. Kottke FJ, Pauley DL, Rudolph PA. The rationale for prolonged stretching for correction of shortening of connective tissue. *Arch Phys Med Rehabil.* 1966;47:345–352.
28. French SD, Cameron M, Walker BF, et al. Superficial heat or cold for low back pain. *Cochrane Database Syst Rev.* 2006;1:CD004750.
29. Melzack R, Wall PD. Pain mechanisms: a new theory. *Science.* 1965;150:971–977.
30. Trinh KV, Graham N, Gross AR, Cervical Overview Group, et al. Acupuncture for neck disorders. *Cochrane Database Syst Rev.* 2006;3:CD004870.
31. Furlan AD, van Tulder MW, Cherkin DC, Tsukayama H, Lao L, Koes BW, Berman BM. Acupuncture and dry-needling for low back pain. *Cochrane Database Syst Rev.* 2005;1:CD001351.
32. Wu WH, Akande AA. Alternative medicine for chronic pain: a critical review. In: Aronoff GM, editor. *Evaluation and treatment in chronic pain.* 3. Baltimore: Williams & Wilkins; 1998. pp. 627–641.

## CONFLICT OF INTEREST

The Authors declare no conflict of interest

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