



FIP Development Goals

Using heat therapy for the management of musculoskeletal pain

Guidance for pharmacists

2024



International
Pharmaceutical
Federation

Colophon

Copyright 2024 International Pharmaceutical Federation (FIP)

International Pharmaceutical Federation (FIP)
Andries Bickerweg 5
2517 JP The Hague
The Netherlands
www.fip.org

All rights reserved. No part of this publication may be stored in any retrieval system or transcribed by any form or means – electronic, mechanical, recording, or otherwise without citation of the source. FIP shall not be held liable for any damages incurred resulting from the use of any data and information from this report. All measures have been taken to ensure the accuracy of the data and information presented in this report.

Authors

Ms Nisa Masyitah, FIP Project and Data Support Coordinator (GPO)
Dr Inês Nunes da Cunha, FIP Practice Development and Transformation Projects Manager
Dr Sherly Meilianti, FIP Data and Intelligence Specialist (GPO)

Editor

Mr Gonçalo Sousa Pinto, FIP Lead for Practice Transformation

Recommended citation

International Pharmaceutical Federation (FIP). Using heat therapy for the management of musculoskeletal pain: Guidance for pharmacists. The Hague: International Pharmaceutical Federation; 2024

Cover image

© Albina Gavrilovic | istockphoto.com

Contents

Acknowledgement	4
1 Introduction	5
1.1 Background.....	5
1.1.1 Pathophysiology of pain.....	5
1.1.2 Duration of pain	5
1.2 Heat therapy for musculoskeletal pain management	6
1.3 Role of community pharmacists in managing musculoskeletal pain.....	6
2 Insight board participants	8
3 Guidance development: context and methodology	9
4 Recommendations on heat therapy for musculoskeletal pain management	10
4.1 Information gathering and patient assessment	11
4.1.1 Information on the patient's symptoms	11
4.1.2 Information on the patient's history.....	12
4.1.3 Physical examinations.....	13
4.2 Red-flag warning signs.....	13
4.3 Management and treatment plan	14
4.3.1 Non-specific low back pain	14
4.3.2 Non-specific neck pain	15
4.3.3 Hip, knee, and/or hand osteoarthritis	16
4.4 Counselling on using heat or cold therapy, and non-prescription medicines	17
4.5 Managing side effects, safety precautions, and general preventive advice.....	18
4.6 Seeking further treatment.....	18
5 Summary and conclusions	20
6 References	22

Acknowledgement

FIP expresses gratitude and appreciation to all the insight board participants. The list of participants contributing to this insight board can be seen in the participants' section.

The insight board and report were supported through unconditional funding from Angelini Pharma.



1 Introduction

1.1 Background

Musculoskeletal (MSK) pain refers to acute or chronic pain affecting bones, muscles, ligaments, tendons, and nerves.¹ This widespread condition affects approximately 1.71 billion people worldwide, making it the second leading cause of disability, accounting for 17% of all years lived with disability (YLDs).² Managing chronic musculoskeletal pain is particularly challenging due to its multifactorial nature, necessitating a collaborative model of care among healthcare professionals, including pharmacists, to achieve better health outcomes.³

Community pharmacists, as the most accessible and frequently visited healthcare professionals, are uniquely positioned to play a significant role in musculoskeletal pain management.⁴ By integrating both pharmacological and non-pharmacological interventions, pharmacists can provide a more holistic approach, ultimately enhancing patient outcomes and improving quality of life.

To guide effective management strategies, it is important to understand both the underlying mechanisms and classification of musculoskeletal pain. The following sections will explore the classification of pain according to pathophysiology and duration, which lay the foundation for the therapeutic approaches discussed later in this guidance.

1.1.1 Pathophysiology of pain

Effective musculoskeletal pain management begins with understanding the pathophysiology of pain. Pain can be categorised into three primary types: nociceptive, neuropathic, and nociplastic.¹

1. Nociceptive pain

Nociceptive pain is the result of tissue damage. It can be described as a throbbing, sharp, or aching pain. This pain is caused by external injuries such as falling, bumping into things, or being hit. Nociceptive pain can be felt in the skin, tendons, muscles, joints, and bones.⁵

2. Neuropathic pain

Neuropathic pain is caused by nerve damage or dysfunction. It can be described as a stabbing, burning, shooting, electric-like, or numbness. It can cause unpleasant or painful sensations in response to touch and even minor changes in temperature. Neuropathic pain can be caused by cancer, alcoholism, stroke, limb amputation, chemotherapy, radiation, or diabetes.⁵

3. Nociplastic pain

Nociplastic pain occurs when pain results from altered nociception, even though there is no clear evidence of actual or potential tissue damage activating peripheral nociceptors, or any signs of disease or lesion of the somatosensory system that would explain the pain.⁶

1.1.2 Duration of pain

Musculoskeletal pain can also be classified into two types according to its duration: acute and chronic pain.

1. **Acute pain** is sudden or urgent pain, typically lasts from a few seconds to three months, and is often caused by specific injuries or events (e.g., surgery, broken bones, and cuts).
2. **Chronic pain** persists for more than three months, varies from mild to severe, and can last for several years. It is frequently caused by health conditions such as diabetes, cancer, fibromyalgia, circulation problems, and spinal pathologies or back problems. Without appropriate treatment, chronic pain can affect a person's quality of life and can lead to depression or anxiety.

1.2 Heat therapy for musculoskeletal pain management

Managing musculoskeletal pain often requires a multidisciplinary and multimodal approach. A multidisciplinary approach incorporates treatments from various clinical disciplines into a comprehensive treatment plan, while a multimodal approach uses a variety of coherent treatment options, recognising that pain is a multifaceted problem requiring multifaceted strategies and continuity of care.^{7,8}

The primary goals in managing musculoskeletal pain are to control and reduce pain, improve function, and enhance health-related quality of life.¹ To achieve these goals, community pharmacists can guide patients on non-pharmacological and pharmacological treatments. Pharmacological approaches include non-prescription (over-the-counter) analgesics, such as topical and oral nonsteroidal anti-inflammatory drugs (NSAIDs) and paracetamol (acetaminophen). For non-pharmacological approaches, pharmacists can encourage patients to make lifestyle modifications as part of the treatment strategy in musculoskeletal care.

In addition to lifestyle modifications, pharmacists can recommend heat and cold therapy to alleviate pain.

1. Heat Therapy

Heat therapy, also known as thermotherapy, is used to relieve stiffness and tension by increasing blood flow through vasodilation. This improved circulation helps deliver oxygen and nutrients necessary for tissue repair, promotes muscle relaxation, and enhances tissue elasticity, ultimately reducing pain and stiffness. Heat therapy is particularly beneficial for alleviating muscle pain, reducing soreness, and loosening tight muscles.^{9,10}

2. Cold Therapy

Cold therapy, or cryotherapy, is effective in reducing pain when associated with swelling and inflammation. By cooling the affected area, cold therapy causes vasoconstriction, which decreases blood flow and metabolic activity, helping to reduce inflammation and pain. It is particularly useful for acute injuries (such as sprains, strains, or minor tears), post-operative recovery, or muscle soreness following intense physical activity. It is especially helpful in the early stages of an injury to control inflammation, swelling, and discomfort.⁹

Both heat and cold therapy are valuable non-pharmacological interventions in musculoskeletal pain management, each serving distinct purposes. While cold therapy is commonly used for acute injuries involving inflammation, this guidance will focus on the use of heat therapy, particularly in cases of chronic non-inflammatory musculoskeletal conditions. Heat therapy is frequently recommended for relieving stiffness, reducing muscle tension, and managing mild to moderate chronic pain.¹¹ Although several clinical guidelines support its use, the overall quality of randomised clinical trials on heat therapy remains limited,^{12,13} highlighting the need for further high-quality research to confirm its efficacy.

1.3 Role of community pharmacists in managing musculoskeletal pain

In November 2023, FIP convened an [international insight board](#) with community pharmacists, policy experts, and researchers to explore the global role of pharmacists in managing musculoskeletal pain. This insight board specifically discussed pharmacological and non-pharmacological approaches, with a focus on heat therapy and strategies for effective patient engagement. A follow-up insight board, held in August 2024, involved multidisciplinary experts and further examined the role of heat therapy as a standalone treatment or in combination with pharmacological options. The list of experts participating in this follow-up insight board can be found in Section 2: Insight board participants.

This guidance provides a summary of the insight board discussion as well as some specific key insights to assist community pharmacists in providing musculoskeletal care. Pharmacists are advised to consider the following premises when using this guidance:

1. **Regulations regarding the scope of practice may vary** by country as legal frameworks are different. Pharmacists are strongly advised to follow the national regulations to ensure compliance and maintain the highest standards of patient care.
2. The recommendations are applicable when pharmacists have received **adequate training** to ensure they possess the necessary skills and knowledge to provide musculoskeletal care. Furthermore, pharmacists should make sure the interventions are not only feasible but also align with the patient's preferences, values, and acceptability.
3. Pharmacists should apply the information from this guidance using their **professional discretion and judgement**. The guidance does not replace the responsibility of the pharmacist to make appropriate decisions that are tailored to the individual's circumstances in collaboration with the patient and/or their caregiver.

It should also be noted that the views shared during the insight board are those of the individuals who expressed them based on their expertise and experience. They do not represent FIP's policy or positions, although they may build on existing positions and statements.

The insights gathered from the board will inform FIP's strategic work, involving its members and other stakeholders, on the role of pharmacists in managing musculoskeletal pain. FIP aims to use the expertise shared during the insight board meeting to support pharmacists and assess the need for further activities, helping guide future plans in this area.

2 Insight board participants

Moderator	
Sherif Guorgui	FIP Community Pharmacy Section's President

Insight board participants		
Prof. Ashok Soni	President of the National Association of Primary Care (NAPC)	United Kingdom
Prof. Dr David Rice	Co-Chairs of the Musculoskeletal Pain Special Interest Group of the International Association for the Study of Pain (IASP)	New Zealand
Ema Paulino	Community pharmacist, Farmácia Nuno Álvares; President of the Portuguese National Association of Pharmacies (ANF)	Portugal
Dr Gustavo Zanoli	Orthopaedic Unit, Casa di Cura Santa Maria Maddalena Rovigo, Occhiobello	Italy
Hilary McKee	Consultant Pharmacist, Northern Health and Social Care Trust	United Kingdom
Joel Alves Sánchez	Pharmacist in the Pharmaceutical Care Department of the General Pharmaceutical Council of Spain	Spain
Prof. Dr Jürgen Freiwald	Department of Movement and Training Science, University of Wuppertal, Wuppertal	Germany
Dr Opeyemi Babatunde	Arthritis Research UK Primary Care Centre, Research Institute for Primary Care & Health Sciences, Keele University, Keele	United Kingdom
Prof. Philip Conaghan	Professor of Musculoskeletal Medicine, University of Leeds; Director of the NIHR Leeds Biomedical Research Centre	United Kingdom
Simoné Eksteen	Primary Care (Prescribing) Pharmacist & Manager, Eksteen Pharmacy	South Africa

FIP team	
Nisa Masyitah	FIP Project and Data Support Coordinator (GPO)
Dr Inês Nunes da Cunha	FIP Practice Development and Transformation Projects Manager
Dr Sherly Meilanti	FIP Data and Intelligence Specialist (GPO)
Mfonobong Timothy	FIP Practice Development and Transformation Projects Coordinator

3 Guidance development: context and methodology

The FIP team conducted a literature review to identify relevant evidence to support the insight board discussion. The literature review involved a thorough search of databases, such as PubMed, Scopus and Cochrane Library, focusing on studies related to the musculoskeletal pain management and the use of heat therapy. A combination of keywords, including “musculoskeletal pain”, “heat therapy”, “superficial heat therapy”, and “thermotherapy”, was used to ensure relevant collection of evidence. Articles were screened for relevance based on their abstracts, and selected studies were further reviewed to ensure they met the criteria of high quality and recent publication. The findings from this literature review informed the development of the preliminary statements.

The experts who participated in this insight board were invited based on their expertise in the fields relevant to musculoskeletal pain care. The selection aimed for a diverse and interdisciplinary representation, ensuring that multiple perspectives were considered (see list of participants in the previous section). These experts were mainly identified through a review of recent publications in the field. Those who accepted the invitation demonstrated a willingness to engage in a group discussion to refine the guidance statements.

A set of preliminary statements was shared with an international and interdisciplinary group of subject matter experts. The experts expressed their level of agreement with these statements on a scale. This was followed by a series of two two-hour sessions at which statements that were not consensual were thoroughly discussed and edited until the group was comfortable to support them. Based on this process, the panel of experts was supportive of this set of statements as guidance for community pharmacists on the management of musculoskeletal pain, and particularly on the use of heat therapy.

4 Recommendations on heat therapy for musculoskeletal pain management

Figure 1 outlines several recommended steps for community pharmacists in providing musculoskeletal care. These recommendations are informed by inputs gathered from insight board discussions, existing clinical guidelines, and relevant studies on musculoskeletal pain management. It covers information gathering and patient assessment; identifying red flags for a referral to a medical practitioner; developing management and treatment plans with a focus on heat therapy; providing instructions on how to take medicines; managing side effects; and advising on when to seek further treatment.

Figure 1. Overview of musculoskeletal pain management in community pharmacies



4.1 Information gathering and patient assessment

Information gathering and patient assessment are critical first steps in the management of adult musculoskeletal pain in a community pharmacy. Pharmacists play an important role in identifying the nature and severity of a patient's pain through probing questions and history taking to ensure appropriate care is provided. By gathering comprehensive information, pharmacists can make informed decisions and refer patients for further medical assessment when necessary.

4.1.1 Information on the patient's symptoms

Pharmacists should gather information on the patient's symptoms, which can include:

1. Location of the pain
2. Duration of the pain (when it started and how long it has lasted)
3. Pain intensity (mild, moderate, severe)
4. How the pain started (e.g., after increased exertion, lifting, or injury)
5. Characteristics of the pain (e.g., sharp, dull, burning, throbbing)
6. Pain course (whether the pain is improving, worsening, or stable over time)
7. Temporal aspect (whether the pain is intermittent, continuous, or occurs at specific times, such as night pain)
8. Sensitivity to changes in temperature or clothing.

To address time constraints faced by community pharmacists, the following structured approach—initial assessment, detailed assessment and comprehensive assessment—can be used to allow flexibility in gathering essential information about the patient's symptoms. An initial assessment may be sufficient for mild or uncomplicated symptoms, while a detailed or comprehensive assessment is necessary for more complex cases, such as those involving severe symptoms, or when the pharmacist needs to gather a more thorough understanding of the patient's condition.

INITIAL ASSESSMENT: Pharmacists should gather the following information for a quick overview of the patient's condition, such as:

1. **Location of the pain.** Different pain locations — muscle, joints, bones or surrounding tissues — may suggest different musculoskeletal conditions. For example, back pain may indicate muscle strain, while joint pain may suggest arthritis.
2. **Duration of the pain (when it started and how long it has lasted).** The onset and duration of the pain help to differentiate between acute pain, which is sudden and usually associated with a specific cause, and chronic pain, which lasts for more than three months and may require a different approach to treatment.
3. **Pain intensity (mild, moderate, severe).** Mild to moderate pain may be manageable with over-the-counter treatments or lifestyle modifications, while severe pain may require different interventions or referral to a medical practitioner. One method of quantifying pain intensity is the [Numeric Rating Scale \(NRS\)](#), in which patients rate their pain on a scale from 1 to 10, with 1 being minimal pain and 10 being the most severe pain imaginable. Another method is the [Brief Pain Inventory \(BPI\)](#) short form, which allows patients to rate the severity of pain and its impact on their functioning.

DETAILED ASSESSMENT: Pharmacists should build on the initial assessments and add the following questions:

1. **How the pain started (e.g., after increased exertion, lifting, or injury).** Understanding the circumstances of the onset of the pain, whether due to increased exertion, lifting, or injury, can provide context to determine the underlying cause.

2. **Characteristics of the pain (e.g., sharp, dull, burning, throbbing).** Sometimes the reported nature of the pain helps to identify the underlying cause. For example, burning pain may indicate nerve involvement, while throbbing pain may indicate inflammation.
3. **Pain course (whether the pain is improving, worsening, or stable over time).** Worsening pain may indicate a worsening problem or inadequate treatment while improving pain suggests that current interventions are working effectively. Stable pain may require adjustments in treatment.

COMPREHENSIVE ASSESSMENT: Pharmacists should build on the initial and detailed assessments and add the following questions:

1. **Temporal aspect (whether the pain is intermittent, continuous, or occurs at specific times, such as night pain).** Continuous pain may indicate a chronic condition, while intermittent pain may indicate mechanical or overuse factors. Persistent night pain that disrupts sleep is a red flag sign, as it may indicate a serious condition that requires referral to a medical practitioner.
2. **Sensitivity to changes in temperature or clothing.** Some patients experience increased sensitivity to changes in temperature or light contact with clothing, which may indicate allodynia. This is an increased pain response to stimuli that would not normally cause discomfort. Allodynia is a red flag sign and requires referral to a medical practitioner.

4.1.2 Information on the patient's history

Pharmacists should gather information on the patient's history, which can include:

1. Age
2. Allergies
3. Pregnancy and lactation status
4. Underlying or co-existing medical conditions, including pre-diagnosed arthritis, cardiovascular disease, and diabetes
5. Family history of rheumatological and/or autoimmune conditions such as rheumatoid arthritis and osteoporosis
6. Recent and long-term medication history (including prescription medicines, vitamins, supplements, and non-prescription medicines)

When assessing the patient's history, pharmacists should consider the above-mentioned key factors to develop an effective treatment plan. The patient's age can influence the management strategies, as older patients may be more susceptible to chronic pain conditions such as osteoarthritis, while younger patients may have different concerns or prefer different treatment approaches. Allergic reactions to medicines or other substances can help prevent adverse effects and ensure that recommended treatments are safe. This includes both known allergies and any previous reactions to medicines. Pregnancy and lactation status are important pieces of information that must be considered in the treatment plan to protect both maternal and foetal health.

Underlying or co-existing medical conditions such as pre-diagnosed arthritis, cardiovascular disease, or diabetes need to be carefully assessed. Furthermore, a family history of rheumatological and/or autoimmune diseases, such as rheumatoid arthritis or osteoporosis, provides valuable information about potential genetic risks. Pharmacists must refer patients to a medical practitioner if they have these underlying conditions or a relevant family history, to ensure appropriate investigation and management.

A detailed medication history, including recent and long-term use of prescription medicines, vitamins, supplements, and non-prescription medicines, is essential for identifying potential drug interactions and providing a safe, effective, and tailored treatment plan. Finally, lifestyle factors such as weight, dietary patterns, and levels of exercise or physical activity are important to consider as they may influence management strategies. Regular physical activity and staying active are first-line interventions for various conditions, such as non-specific low back pain and osteoarthritis.

4.1.3 Physical examinations

Recommendations on physical examinations (if appropriate)

1. When feasible and acceptable to the patient, the pharmacist should assess the patient by observing visible signs such as redness, swelling, or injury in the area of pain and evaluating the patient's range of movements.
2. Where accessible, pharmacists should preferably conduct the assessment in a consulting room.
3. Pharmacists need to consider a patient's religion and beliefs, as these factors may affect their comfort level in discussing or revealing areas of their body where they experience pain.

By assessing the patient's visible signs and range of movements, pharmacists can provide informed recommendations for managing pain and decide whether further medical assessment is required. For instance, redness and swelling may indicate inflammation, while assessing a range of motion helps to determine the impact of the pain on the patient's mobility and function.

Conducting the assessment in a private consulting room provides a comfortable and confidential environment for the patient. This setting helps to minimise distractions and allows the patient to discuss their symptoms and concerns more openly. A private room also allows the pharmacist to perform any necessary physical examinations with greater ease and respect for the patient's privacy.

Pharmacists also need to consider patients' religion and beliefs, as these factors may affect their comfort level in discussing or revealing areas of their body where they experience pain. Understanding and respecting patients' religious and cultural beliefs is essential to build trust and ensure effective communication. Some patients may have restrictions regarding the physical examination or specific preferences, such as having a pharmacist of the same gender perform the physical examination. Sensitivity to these needs can facilitate a more comfortable and collaborative assessment process. This consideration helps to ensure that the patient feels respected and at ease, which is crucial for accurately addressing their pain and recommending appropriate treatment.

4.2 Red-flag warning signs

Identifying red-flag warning signs should be the first step in assessing patients presenting with musculoskeletal pain. Recognising these critical signs early on ensures that pharmacists can make appropriate referrals to medical practitioners when necessary, avoiding unnecessary treatment or assessments. By addressing potential red flags from the beginning, pharmacists can prioritise patient safety and ensure timely interventions from other healthcare providers when required.

Refer the patient to a medical practitioner without starting any treatment plan if:

1. The patient reports inadequate response to the initial treatment from a medical practitioner
2. The patient has severe, persistent, or worsening pain
3. The patient has a history of cancer, osteoporosis, or inflammatory arthritis
4. The patient presents with signs and symptoms indicating serious pathology, such as prolonged morning stiffness of more than one (1) hour (suggestive of inflammatory arthritis), or night pain
5. The patient presents with severe and progressive neurological signs and symptoms, including pins and needles, numbness, and cauda equina syndrome
6. The patient presents with other non-musculoskeletal systemic signs and symptoms, such as fever, malaise, and unexplained weight loss, indicating serious pathology
7. The patient requests opioid treatment
8. The patient is opioid-tolerant or in recovery from opioid use disorder.

Pharmacists are encouraged to consider the patient's overall clinical presentation, including the symptoms and medical history, before making a referral to a medical practitioner. Key red flags that should prompt immediate referral include a lack of response to initial pain treatment, severe or persistent pain, and a history of serious conditions such as cancer, osteoporosis, or inflammatory arthritis.^{14, 15} These conditions indicate the need for specialised care beyond what can be provided in a community pharmacy. Pharmacists must be vigilant in recognising these signs to ensure that patients receive appropriate medical attention promptly.

To streamline the assessment process, pharmacists should consider red flags at the beginning of the consultation. This ensures that any potential issues requiring medical referral are identified before initiating any treatment plans. By taking this approach, pharmacists can confidently manage the treatment of patients without overlooking critical warning signs that may require immediate intervention from other healthcare professionals.

In regions where access to medical specialists is limited, particularly in low-income countries, pharmacists often serve as the first point of contact for patients. In these settings, having clear guidelines on when to refer a patient is especially important. Pharmacists must remain mindful of red flags and be prepared to refer patients, when necessary, even in areas where specialist care may be less accessible. Ultimately, ensuring timely referral will contribute to better patient outcomes and prevent the escalation of potentially serious conditions.

4.3 Management and treatment plan

This section will explore the use of heat therapy both as a standalone treatment and in combination with pharmacological options, such as oral and topical analgesics, for managing low back pain, neck pain, and osteoarthritis. These conditions are among the most common forms of musculoskeletal pain globally,^{1, 16} making them key areas of focus in this guidance. The primary objectives in managing these conditions are to control pain, relieve symptoms, and improve both function and quality of life.¹ By understanding when and how to effectively integrate heat therapy with pharmacological treatments, community pharmacists can offer enhanced pain management strategies, providing patients with a comprehensive, multimodal approach to alleviating musculoskeletal pain.

4.3.1 Non-specific low back pain

Recommendations for non-specific low back pain

1. Reassurance, education, and advice on physical activity, exercise and continuing normal activities are the first-line interventions for non-specific low back pain.
2. Heat therapy can be indicated for non-specific low back pain alongside regular physical activity.
3. Heat therapy can be considered alone or in combination with other therapies, such as topicals and oral NSAIDs.

Low back pain is a symptom rather than a disease and can have various causes. The most common form of low back pain is “non-specific low back pain”, a term used when the underlying pathoanatomical cause cannot be identified. Due to the lack of a known cause, treatment for non-specific low back pain focuses on reducing pain.¹⁷

Low back pain can be categorised into three phases: Acute (0 to 6 weeks), sub-acute (6 to 12 weeks), and chronic (>12 weeks).¹⁸ Although chronic low back pain is generally defined as lasting more than 12 weeks, the definitions of the acute and subacute phases may vary, ranging from less than four to less than 12 weeks.¹⁹

Management of non-specific low back pain in community pharmacies includes reassurance and education, non-pharmacological approaches, and analgesic medicines. In the absence of red-flag warning signs, non-pharmacological approaches are considered first-line therapy. These approaches involve reassuring patients that low back pain is not indicative of a serious illness regardless of symptom duration, or providing reassurance about its favourable prognosis for those with acute low back pain.²⁰ Additionally, pharmacists should encourage physical activity, exercise, and continuing normal activities, including work.^{11, 18, 19} Aerobic exercise helps relieve low back pain by enhancing flexibility, reducing joint stiffness, and improving mood, sleep and stress management. This type of exercise increases blood flow

and nutrient delivery to the joints and surrounding muscles, tendons and ligaments, helping to prevent further damage. Recommended forms of aerobic exercise for low back pain include swimming, biking, yoga and Pilates.^{21, 22}

In cases where there are no signs of acute inflammatory joint pain (localised redness, heat, and swelling), heat therapy can be considered as an option alongside physical activity to reduce pain and aid self-management.¹¹ The effects of heat therapy on low back pain have not yet been extensively investigated.²³ However, Freiwald et al. showed that incorporating heat therapy into a multimodal treatment regimen for chronic low back pain significantly improved muscular strength for both extension and rotation.²⁴

Heat therapy can be considered alone or in combination with other therapies, such as topicals and oral NSAIDs.¹⁹ Pharmacists should consider the patient's age, pre-existing hypertension, and history of gastrointestinal (GI) bleeding when recommending oral NSAIDs. The lowest effective dose of oral NSAIDs should be used for the shortest possible time.^{25, 26} For patients with a history of GI issues, pharmacists should recommend a proton pump inhibitor alongside oral NSAID therapy.

As for paracetamol, there is a lack of evidence supporting its effectiveness for acute and chronic low back pain. A Cochrane review on paracetamol for low back pain concluded that paracetamol does not yield better outcomes than placebo for patients with acute low back pain. No trials have assessed its effectiveness for patients with subacute or chronic low back pain.²⁷

4.3.2 Non-specific neck pain

Recommendations for non-specific neck pain

1. Reassurance, education, and advice on physical activity, exercise and continuing normal activities are the first-line interventions for non-specific neck pain.
2. Heat therapy can be considered alone or in combination with other therapies for neck pain, such as topical and oral NSAIDs or paracetamol.

Neck pain without an identifiable cause is referred to as "non-specific neck pain". It is characterised by the absence of neurological signs and specific pathologies such as fractures, tumours, or infections, which may interfere with daily activities.²⁸ Non-specific neck pain is associated with limited cervical mobility, impaired function, or work-related stress.²⁹

Non-specific neck pain can be categorised into three phases: Acute (<6 weeks), subacute (≤3 months), chronic (>3 months). Acute neck pain often resolves on its own within weeks to months, but some patients may be left with residual or recurrent symptoms.³⁰

Management of non-specific neck pain in community pharmacies includes providing reassurance or education, non-pharmacological approaches, and analgesic medicines. In the absence of red flags or warning signs, pharmacists should encourage patients to exercise and remain active.²⁸ Stretching exercises such as head tilts, head turns, and chin to chest can help to relieve tension and reduce pain by gently stretching the muscles.³¹ While general exercise offers limited benefit for chronic neck pain, specific strengthening exercises of the neck, upper back, and shoulders have been shown to reduce neck pain.³⁰

Heat therapy can be considered alone or in combination with other therapies, such as topical and oral analgesics, to relieve neck pain.¹¹ In rare cases where there are signs of swelling or inflammation associated with acute neck pain, cold therapy may be considered as a treatment option.

Unlike low back pain, the guidelines for neck pain recommend paracetamol as an analgesic option, despite the weak evidence supporting this recommendation.³² Paracetamol is still considered for managing neck pain due to its more favourable adverse effect profile. Furthermore, although the use of NSAIDs has not been extensively studied, they have shown benefits for spinal pain in general.³⁰ Pharmacists may recommend the lowest effective dose of oral NSAIDs for the shortest possible time.^{25, 26} For patients with a history of GI issues, a proton pump inhibitor should be recommended alongside oral NSAID therapy.

4.3.3 Hip, knee, and/or hand osteoarthritis

Recommendations for hip, knee, and/or hand osteoarthritis

1. Exercise, weight management and education are first-line interventions for osteoarthritis.
2. Heat therapy can be considered alone or in combination with therapies for chronic pain and stiffness in patients with osteoarthritis.
3. Heat therapy should NOT be used during acute episodes of joint swelling and redness.
4. Cold therapy can be considered for acute joint swelling.

Osteoarthritis (OA) is a degenerative joint disease that can affect any joint. However, it most commonly occurs in the hips, knees, and hands.^{33, 34} OA symptoms often stay relatively stable over many years, may progressively worsen over time, or may improve in some patients.

Non-pharmacological approaches, aiming to relieve symptoms and improve or maintain physical function, are considered first-line interventions in managing hip and/or knee OA.³⁵ These approaches include exercise and weight management (if appropriate) alongside patient education.²⁵ Various types of exercise can benefit patients with OA, includes stretching, strengthening, and aerobic exercises. Walking, cycling and swimming are highly recommended forms of aerobic exercise for those with OA.³⁶ For patients living with overweight or obesity, pharmacists should offer support to achieve weight loss and maintain healthy weight to improve their quality of life and physical function, and alleviate pain.²⁵ Overweight and obesity are strong risk factors for the development and progression of OA.³⁷

In the absence of acute episodes of joint swelling and redness, heat therapy can be considered alone or in combination with other therapies as an adjunctive treatment for chronic pain and stiffness in patients with hip, knee, and/or hand OA.²⁶ Studies suggest that when used alongside exercise, heat therapy helps reduce pain, improve physical function, and increase the patient's quality of life.³⁸ However, several guidelines report that exercise and education combined with NSAIDs are the most appropriate interventions in OA, while heat has only low-quality evidence of effectiveness.^{39, 40}

Topical and oral NSAIDs can be recommended for patients with knee, hip, and/or hand osteoarthritis. Topical NSAIDs are considered safe and effective in reducing pain. They are generally the most cost-effective medicine for OA.^{25, 26} As for oral NSAIDs, the lowest effective dose should be used for the shortest possible time.^{25, 26} For patients with a history of GI issues, a proton pump inhibitor should be recommended alongside oral NSAID therapy.

4.4 Counselling on using heat or cold therapy, and non-prescription medicines

Recommendations on how to safely use heat or cold therapy and non-prescription medicines

1. Mechanisms of action:
 - a. **Heat therapy** causes vasodilation, increases blood flow, increases metabolism, and increases extensibility. This can be particularly beneficial for chronic pain conditions.
 - b. **Cold therapy** reduces blood flow, reduces inflammation, reduces muscle spasms, and reduces metabolism. This can be particularly beneficial for acute inflammatory pain conditions.
2. Application technique:
 - a. **Heat therapy** Heat packs should not be excessively hot. Sessions should be limited to 15-30 minutes per application, and always advise the use of a cloth or towel as a protective barrier to prevent burns or skin irritation from excessive heat. Pay special attention to patients with diabetes or skin problems.
 - b. **Cold therapy** Use of a cloth or similar barrier when applying cold packs to prevent frostbite and superficial nerve damage or injury. Apply cold therapy for 15-20 minutes at a time, allowing the skin to return to normal temperature between applications.
3. If a topical medicine is recommended alongside heat or cold therapy, advise patients to apply the medicine to the affected area two to four times a day. Avoid using topicals and heat or cold therapy at the same time.

Heat therapy is particularly effective for chronic musculoskeletal conditions, such as osteoarthritis or chronic back pain. Pharmacists should advise patients that heat therapy works by causing vasodilation, increasing blood flow and extensibility. Patients should be advised to use warm, not too hot, heat packs for 15-30 minutes to avoid burns. Special care must be taken when advising patients with diabetes or skin sensitivity issues, as they may have diminished sensation, making them more susceptible to burns. Pharmacists can instruct patients to use a cloth or towel as a protective barrier between heat packs and their skin to prevent irritation and ensure the therapy remains safe and effective.

Cold therapy is important in managing acute injuries and inflammation, such as sprains and strains. Pharmacists should advise patients that cold therapy works by reducing inflammation, swelling, and limiting blood flow. Patients should be advised to use cold packs for short periods, typically 15-20 minutes with breaks in between to allow the skin to return to normal temperature, to prevent frostbite or skin damage. Pharmacists can instruct patients to use a cloth or towel to act as a protective barrier between cold packs and the skin to ensure the safety and effectiveness of the therapy.

When recommending topical medicines in combination with heat or cold therapy, pharmacists should advise patients to avoid heat or cold therapy immediately after using topical treatments, such as NSAIDs or capsaicin, as this can increase the absorption rate of these medications, potentially causing skin irritation or burns. Pharmacists should guide patients to apply topical medications two to four times a day, with adequate spacing between heat or cold therapy sessions. This ensures safe and effective pain management and prevention of complications, whilst allowing patients to benefit from both topical and thermal therapies.

4.5 Managing side effects, safety precautions, and general preventive advice

Recommendations on side effects and safety precautions

1. Educate and advise patients on side effects and safety precautions:
 - a. The use of **heat therapy**, especially at high temperatures, may carry the risk of burns or skin ulceration.
 - b. The inappropriate use of **cold therapy** may carry the risk of local cold-induced injuries, such as frostbite and superficial nerve damage or injury.
2. If topical treatment containing NSAIDs is recommended alongside heat or cold therapy, inform patients about the common side effects of the topical treatment. Advise them to discontinue use or consult a pharmacist or physician if they experience severe, persistent irritation, redness, or allergic reactions.
3. While following the treatment plan, advise patients to consult a pharmacist or a general practitioner if they wish to take other medicines, supplements, vitamins, or herbal medicines.

Pharmacists should educate and advise patients about the potential side effects and safety measures of heat and cold therapy. Heat therapy, especially when applied at high temperatures, can pose a risk of burns or skin ulceration. Pharmacists should stress the importance of moderating the temperature and using protective barriers, like towels, to prevent skin injuries (see section 3.4). Similarly, cold therapy, while beneficial for acute inflammation, carries the risk of cold-induced injuries, such as frostbite or superficial nerve damage, if applied inappropriately. In both cases, providing clear guidance on application techniques will help patients avoid unnecessary complications (see section 3.4).

When recommending topical treatments alongside thermal therapy, pharmacists should guide patients on common side effects, such as skin irritation or allergic reactions. Patients should be advised to discontinue use and consult their pharmacist or a general practitioner if severe reactions occur. It is also essential to avoid applying heat or cold immediately after using topical medications, as this can increase absorption and lead to heightened irritation or burns.

Additionally, pharmacists should guide patients on potential interactions between medications or supplements they might be taking. Patients should always consult a healthcare provider before starting new medications, vitamins, or herbal supplements during their treatment plan.

4.6 Seeking further treatment

Recommendations on when to seek further treatment

1. Advise patients to follow the treatment plan for three to seven days. Actively follow up with patients to monitor treatment safety and effectiveness. If there is no improvement or if the treatment seems inadequate, refer the patient to a medical practitioner.
2. Advise patients to stop the treatment and seek immediate medical attention if they experience worsening or unexpected adverse events.

Pharmacists should advise patients to adhere to the treatment plan for a recommended period of three to seven days. This time frame allows patients to experience some level of relief or symptom improvement, especially for non-chronic conditions. Pharmacists should also schedule a follow-up with patients within this window to actively monitor the safety and effectiveness of the treatment. If the treatment appears ineffective or provides inadequate relief after this period, pharmacists should advise patients to consult a medical practitioner for further evaluation. This guidance ensures that more serious conditions, which may require a medical diagnosis, are not overlooked. While many patients may experience intermittent or chronic pain, a lack of improvement within this window, combined with findings from the follow-up, serves as a red flag indicating the need for medical intervention.

Pharmacists should be vigilant in advising patients to stop treatment and seek immediate medical attention if there are any signs of worsening symptoms or unexpected adverse reactions. These adverse events may include sudden exacerbation of pain, new symptoms that were not initially present, or reactions to any of the treatments being administered. By reinforcing these precautions, pharmacists play a crucial role in ensuring patient safety and preventing the progression of potentially serious conditions.

5 Summary and conclusions

Musculoskeletal pain is a prevalent condition that affects millions of people worldwide, leading to decreased quality of life and increased healthcare costs. It is a frequent reason for consultation in community pharmacies, where pharmacists are often the first point of contact for patients seeking relief from symptoms. Given the key role community pharmacists play in healthcare delivery, there is a need to enhance their ability to effectively manage musculoskeletal pain.

Musculoskeletal pain can be managed with a combination of pharmacological and non-pharmacological treatments. Common pharmacological options include analgesics such as paracetamol, oral NSAIDs, muscle relaxants, NSAID patches, and topical NSAIDs. In addition, heat and cold therapies are widely used to relieve the discomfort of musculoskeletal pain.

The [FIP's 2023 insight board on the management of musculoskeletal pain in community pharmacy](#) provided valuable insights into current practices and challenges faced by pharmacists in the management of musculoskeletal pain. One of the key findings was the potential benefit of integrating non-pharmacological treatments, such as heat and cold therapy, with traditional pharmacological approaches.

This new guidance for pharmacists emphasises the importance of a holistic and multidisciplinary approach to musculoskeletal pain management and highlights the role of heat and cold therapy. The document outlines the importance of a multimodal approach to the management of musculoskeletal pain, including pharmacological treatments such as NSAIDs and non-pharmacological methods such as heat and cold therapies.

Pharmacists are advised to conduct a thorough patient assessment, gathering information about signs, symptoms, medical history, and potential red flags that may require referral to a physician. This includes understanding the intensity, characteristics, and triggers of pain, taking into account patient preferences and values. Non-pharmacological treatments, particularly heat and cold therapy, are emphasised for the relief of pain. Heat therapy is particularly effective for chronic conditions, promoting circulation and muscle relaxation, while cold therapy is recommended for acute inflammation. Pharmacists should educate patients about safe application techniques to avoid adverse effects such as burns or frostbite.

The guidance also outlines treatment approaches for particular conditions such as non-specific low back pain, neck pain and osteoarthritis. For these conditions, heat therapy can be used alone or in combination with other treatments such as NSAIDs. It is important for pharmacists to educate patients about lifestyle measures, such as appropriate exercise, to prevent and relieve musculoskeletal pain. When dispensing pharmacological and non-pharmacological treatments, pharmacists must ensure that patients understand and follow the necessary safety precautions.

Conclusions

- Community pharmacists play a key role in managing musculoskeletal pain and improving patient outcomes through multidisciplinary collaboration.
- Community pharmacists are ideally placed to manage musculoskeletal pain through education and lifestyle recommendations as well as treatment advice, providing guidance on both pharmacological and non-pharmacological options.
- Pharmacological and non-pharmacological treatments, including heat therapy, play a key role in the management of musculoskeletal pain.
- Through careful patient assessment, informed recommendations and appropriate use of pharmacological and non-pharmacological options, pharmacists can improve pain management in a holistic, patient-centred way.

Recommendations for future work

- Further research is needed to strengthen the evidence for the use of heat and cold therapy in musculoskeletal pain management.
- Develop tailored training programmes for pharmacists to improve their skills in musculoskeletal pain management.
- Investigate digital tools and technologies to support patient education and self-management strategies in musculoskeletal care.

6 References

1. El-Tallawy SN, Nalamasu R, Salem GI et al. Management of Musculoskeletal Pain: An Update with Emphasis on Chronic Musculoskeletal Pain. *Pain Ther.* 2021;10(1):181-209. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8119532/pdf/40122_2021_Article_235.pdf.
2. World Health Organization (WHO). Musculoskeletal health: 2022. updated [accessed: 14 September]. Available at: <https://www.who.int/news-room/fact-sheets/detail/musculoskeletal-conditions>.
3. Murphy L, Ng K, Isaac P et al. The Role of the Pharmacist in the Care of Patients with Chronic Pain. *Integr Pharm Res Pract.* 2021;10:33-41. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8096635/pdf/ijprp-10-33.pdf>.
4. Duggan C. Advancing the workforce to meet the Primary Health Care Agenda: pharmacy's contribution to universal health coverage. (2042-7174 (Electronic)). Available at: <https://pubmed.ncbi.nlm.nih.gov/32176414/>.
5. American University of the Caribbean School of Medicine. What are the Different Types of Pain Management? : updated 18 October 2023. [accessed: 10 September]. Available at: <https://www.aucmed.edu/about/blog/types-of-pain-management>.
6. International Association for the Study of Pain (IASP). IASP Terminology: 2020. updated [accessed: 9 September]. Available at: <https://www.iasp-pain.org/resources/terminology/?ItemNumber=1698>.
7. Gatchel RJ, Peng YB, Peters ML et al. The biopsychosocial approach to chronic pain: scientific advances and future directions. *Psychol Bull.* 2007;133(4):581-624. Available at: <https://pubmed.ncbi.nlm.nih.gov/17592957/>.
8. Gatchel RJ, McGeary DD, McGeary CA et al. Interdisciplinary chronic pain management: past, present, and future. *Am Psychol.* 2014;69(2):119-30. Available at: <https://pubmed.ncbi.nlm.nih.gov/24547798/>.
9. Malanga GA, Yan N, Stark J. Mechanisms and efficacy of heat and cold therapies for musculoskeletal injury. *Postgrad Med.* 2015;127(1):57-65. Available at: <https://pubmed.ncbi.nlm.nih.gov/25526231/>.
10. Zanolli G, Albarova-Corral I, Ancona M et al. Current Indications and Future Direction in Heat Therapy for Musculoskeletal Pain: A Narrative Review. *Muscles.* 2024;3(3):212-23. Available at: <https://www.mdpi.com/2813-0413/3/3/19>.
11. Lubrano E, Mazas PF, Freiwald J et al. An International Multidisciplinary Delphi-Based Consensus on Heat Therapy in Musculoskeletal Pain. *Pain Ther.* 2023;12(1):93-110. Available at: <https://pubmed.ncbi.nlm.nih.gov/35932408/>.
12. Côté P, Wong JJ, Sutton D et al. Management of neck pain and associated disorders: A clinical practice guideline from the Ontario Protocol for Traffic Injury Management (OPTIMa) Collaboration. *Eur Spine J.* 2016;25(7):2000-22. Available at: <https://link.springer.com/article/10.1007/s00586-016-4467-7>.
13. Qaseem A, Wilt TJ, McLean RM et al. Noninvasive Treatments for Acute, Subacute, and Chronic Low Back Pain: A Clinical Practice Guideline From the American College of Physicians. *Ann Intern Med.* 2017;166(7):514-30. Available at: <https://pubmed.ncbi.nlm.nih.gov/28192789/>.
14. Finucane LM, Downie A, Mercer C et al. International Framework for Red Flags for Potential Serious Spinal Pathologies. *J Orthop Sports Phys Ther.* 2020;50(7):350-72. Available at: <https://www.iospt.org/doi/epdf/10.2519/iospt.2020.9971>.
15. Queensland Health. Mild, Acute Musculoskeletal Pain - Clinical Practice Guideline [Guideline]. 2024. updated 1 February 2024. [accessed: 27 July]. Available at: https://www.health.qld.gov.au/data/assets/pdf_file/0021/1304247/musculoskeletal-pain-guideline.pdf.
16. Flynn DM. Chronic Musculoskeletal Pain: Nonpharmacologic, Noninvasive Treatments. *Am Fam Physician.* 2020;102(8):465-77. Available at: <https://www.aafp.org/pubs/afp/issues/2020/1015/p465.pdf>.
17. Maher C, Underwood M, Buchbinder R. Non-specific low back pain. *Lancet.* 2017;389(10070):736-47. Available at: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(16\)30970-9/abstract](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(16)30970-9/abstract).
18. Cashin AG, Wand BM, O'Connell NE et al. Pharmacological treatments for low back pain in adults: an overview of Cochrane Reviews. *Cochrane Database Syst Rev.* 2023;4(4):Cd013815. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10072849/pdf/CD013815.pdf>.
19. Zhou T, Salman D, McGregor AH. Recent clinical practice guidelines for the management of low back pain: a global comparison. *BMC Musculoskelet Disord.* 2024;25(1):344. Available at: <https://bmcmusculoskeletdisord.biomedcentral.com/counter/pdf/10.1186/s12891-024-07468-0.pdf>.
20. Oliveira CB, Maher CG, Pinto RZ et al. Clinical practice guidelines for the management of non-specific low back pain in primary care: an updated overview. *Eur Spine J.* 2018;27(11):2791-803. Available at: <https://link.springer.com/content/pdf/10.1007/s00586-018-5673-2.pdf>.
21. Versus Arthritis. Information and exercise sheet: Back pain: 2021. updated [accessed: 7 October]. Available at: <https://www.versusarthritis.org/media/21786/backpain-exercise-sheet.pdf>.

22. Hospital for Special Surgery. Best Types of Exercise for Back Pain: 2023. updated [accessed: 7 October]. Available at: https://www.hss.edu/article_best-exercise-lower-back-pain.asp.
23. Freiwald J, Hoppe MW, Beermann W et al. Effects of supplemental heat therapy in multimodal treated chronic low back pain patients on strength and flexibility. *Clin Biomech (Bristol, Avon)*. 2018;57:107-13. Available at: [https://www.clinbiomech.com/article/S0268-0033\(18\)30517-5/abstract](https://www.clinbiomech.com/article/S0268-0033(18)30517-5/abstract).
24. Freiwald J, Magni A, Fanlo-Mazas P et al. A Role for Superficial Heat Therapy in the Management of Non-Specific, Mild-to-Moderate Low Back Pain in Current Clinical Practice: A Narrative Review. *Life (Basel)*. 2021;11(8). Available at: https://mdpi-res.com/d_attachment/life/life-11-00780/article_deploy/life-11-00780.pdf?version=1627895117.
25. National Institute for Health and Care Excellence. Osteoarthritis in over 16s: diagnosis and management 2022. updated [accessed: 2 September]. Available at: <https://www.nice.org.uk/guidance/ng226/resources/osteoarthritis-in-over-16s-diagnosis-and-management-pdf-66143839026373>.
26. Conley B, Bunzli S, Bullen J et al. Core Recommendations for Osteoarthritis Care: A Systematic Review of Clinical Practice Guidelines. *Arthritis Care Res (Hoboken)*. 2023;75(9):1897-907. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10952362/pdf/ACR-75-1897.pdf>.
27. Saragiotto BT, Machado GC, Ferreira ML et al. Paracetamol for low back pain. *Cochrane Database Syst Rev*. 2016;2016(6):Cd012230. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6353046/>.
28. Hidalgo B, Hall T, Bossert J et al. The efficacy of manual therapy and exercise for treating non-specific neck pain: A systematic review. *J Back Musculoskelet Rehabil*. 2017;30(6):1149-69. Available at: <https://content.iospress.com:443/download/journal-of-back-and-musculoskeletal-rehabilitation/bmr169615?id=journal-of-back-and-musculoskeletal-rehabilitation%2Fbmr169615>.
29. Cerezo-Télliz E, Torres-Lacomba M, Mayoral-Del-Moral O et al. Health related quality of life improvement in chronic non-specific neck pain: secondary analysis from a single blinded, randomized clinical trial. *Health Qual Life Outcomes*. 2018;16(1):207. Available at: <https://hqlo.biomedcentral.com/counter/pdf/10.1186/s12955-018-1032-6.pdf>.
30. Cohen SP. Epidemiology, diagnosis, and treatment of neck pain. *Mayo Clin Proc*. 2015;90(2):284-99. Available at: [https://www.mayoclinicproceedings.org/article/S0025-6196\(14\)00833-7/pdf](https://www.mayoclinicproceedings.org/article/S0025-6196(14)00833-7/pdf).
31. Versus Arthritis. Information and exercise sheet: Neck pain: 2021. updated [accessed: 7 October]. Available at: <https://www.versusarthritis.org/media/21788/neckpain-exercise-sheet.pdf>.
32. Corp N, Mansell G, Stynes S et al. Evidence-based treatment recommendations for neck and low back pain across Europe: A systematic review of guidelines. *Eur J Pain*. 2021;25(2):275-95. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7839780/pdf/EJP-25-275.pdf>.
33. Charlesworth J, Fitzpatrick J, Perera NKP et al. Osteoarthritis- a systematic review of long-term safety implications for osteoarthritis of the knee. *BMC Musculoskelet Disord*. 2019;20(1):151. Available at: <https://bmcmusculoskeletdisord.biomedcentral.com/counter/pdf/10.1186/s12891-019-2525-0.pdf>.
34. Fu K, Robbins SR, McDougall JJ. Osteoarthritis: the genesis of pain. *Rheumatology (Oxford)*. 2018;57(suppl_4):iv43-iv50. Available at: https://academic.oup.com/rheumatology/article-abstract/57/suppl_4/iv43/4753702?redirectedFrom=fulltext.
35. Moseng T, Vliet Vlieland TPM, Battista S et al. EULAR recommendations for the non-pharmacological core management of hip and knee osteoarthritis: 2023 update. *Ann Rheum Dis*. 2024;83(6):730-40. Available at: <https://ard.bmj.com/content/annrheumdis/83/6/730.full.pdf>.
36. Versus Arthritis. Osteoarthritis: 2021. updated [accessed: 7 October]. Available at: <https://www.versusarthritis.org/media/22908/osteoarthritis-information-booklet.pdf>.
37. Hunter DJ, Bierma-Zeinstra S. Osteoarthritis. *The Lancet*. 2019;393(10182):1745-59. [Cited: 2024/08/31]. Available at: [https://doi.org/10.1016/S0140-6736\(19\)30417-9](https://doi.org/10.1016/S0140-6736(19)30417-9)
38. Kim H, Suzuki T, Saito K et al. Effectiveness of exercise with or without thermal therapy for community-dwelling elderly Japanese women with non-specific knee pain: a randomized controlled trial. *Arch Gerontol Geriatr*. 2013;57(3):352-9. Available at: <https://pubmed.ncbi.nlm.nih.gov/23849900/>.
39. Bannuru RR, Osani MC, Vaysbrot EE et al. OARSI guidelines for the non-surgical management of knee, hip, and polyarticular osteoarthritis. *Osteoarthritis Cartilage*. 2019;27(11):1578-89. Available at: [https://www.oarsijournal.com/article/S1063-4584\(19\)31116-1/pdf](https://www.oarsijournal.com/article/S1063-4584(19)31116-1/pdf).
40. 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 (Hoboken)*. 2020;72(2):149-62. Available at: <https://deepblue.lib.umich.edu/bitstream/handle/2027.42/153772/acr24131.pdf?sequence=1>.

International
Pharmaceutical
Federation

Fédération
Internationale
Pharmaceutique

Andries Bickerweg 5
2517 JP The Hague
The Netherlands

-
T +31 (0)70 302 19 70
F +31 (0)70 302 19 99
fip@fip.org

-
www.fip.org

| Musculoskeletal pain / October 2024