

# Pain Management in Arthritis: Evidence-Based Guidelines

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## INTRODUCTION

Pain is a complex biological, psychological, and social process and a significant factor that influences function and quality of life for individuals with arthritis. Arthritis is a generic term that describes many different and usually painful conditions, the most common of which is osteoarthritis.<sup>1,2</sup> Despite significant advances in the understanding of pain mechanisms, many people with arthritis experience levels of acute and chronic pain that decrease their function and quality of life.<sup>2</sup> In 2002, the American Pain Society (APS), a multidisciplinary pain organization committed to the improvement of the management and study of pain associated with many conditions, published evidence-based guidelines for management of pain in osteoarthritis, rheumatoid arthritis and juvenile chronic arthritis.<sup>2</sup>

Optimal management of individuals with arthritis, in addition to appropriate diagnosis and management of the underlying condition when possible, should address pain management. This article provides highlights of the assessment and management of individuals with pain associated with arthritis.

## PAIN

Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.<sup>3</sup> Pain has biological, psychological, and social components, compounded and influenced by many other variables, including educational level, support systems, social and cultural environment, and personality of the individual.

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Unrelieved pain leads to serious negative consequences, including physiological effects associated with increased catabolic demands.<sup>4</sup> These include muscle breakdown, impaired healing, weakness, impaired respiratory effort, increased risk of pulmonary complications and thromboembolic events, inhibited gastrointestinal motility, and increased sympathetic autonomic stimulation. Persistent pain may be associated with a decrease in immune response, as well as psychosocial effects of anxiety, depression, hopelessness, anger, hostility, poor interpersonal relations, and an overall decrease in quality of life.<sup>2,4</sup> These factors can lead to decreased motility and function, loss of employment, and financial stress on the family.

The neurophysiology of pain has evolved considerably over the past 3 decades. For years, pain was viewed through a simplistic theory of peripheral nociception initiating a neural impulse transmitted by the spinothalamic tract to the brain. However, it is now recognized that there is significant modulation of pain in the peripheral as well as central nervous system. The gate theory of pain, introduced in 1965, led to the intense study of the dorsal horn of the spinal cord and its role in neuromodulation.<sup>5</sup> The role of neurotransmitters such as substance P, norepinephrine, serotonin, GABA, and endorphins have provided targets for pharmacological treatment.<sup>6-7</sup> This knowledge provides a "mechanistic approach" in using pharmacological and physical agents to relieve pain based on pain mechanisms.

Physicians should also recognize the difference between nociceptive and neuropathic pain. Nociceptive pain is a response associated with tissue injury from pathologic process in an intact nervous system, where the intensity of pain is proportionate to the injury, and serves as a protective mechanism for the patient. Neuropathic pain, on the other hand, is due to dysfunction or injury to the nervous system that produces disproportionate pain to the stimulus and does not serve a protective and biologically useful function.

Examples include neuropathy and post herpetic neuralgia.<sup>3,6-7</sup> This differentiation is important because nociceptive pain responds to opioids and non-steroidal anti-inflammatory drugs (NSAIDs), while neuropathic pain responds better to antiepileptic drugs (AEDs) and tricyclic antidepressants (TCAs).<sup>7-9</sup> Therefore, accurate assessment and management of pain requires differentiation of types and causes of pain.<sup>1,8</sup>

Pain is always a subjective experience and a significant stressor for people with arthritis. While acute pain is self limiting and biologically useful, chronic pain is more complex and includes interaction among psychological and social factors and can lead to significant dysfunction and disability.

## ARTHRITIS

Arthritis does not refer to a single disease, but is a term used to describe over 100 different conditions affecting 1 in 6 Americans and is a leading cause of disability.<sup>10</sup> Osteoarthritis (OA) is the most common condition, affecting nearly 23 million Americans.<sup>2</sup> The *Arthritis in Wisconsin* report identifies 1.3 million of the state's adults as having arthritis, with an incidence of 34% of the state's adult population.<sup>10</sup> The prevalence increases with age; 62% of adults over 65 have arthritis compared to 18% of adults aged 18-44 years. Considering the cost of diagnosis; nonpharmacologic, pharmacological, and surgical interventions; and lost productivity, arthritis is one of the most expensive and debilitating diseases in the United States.<sup>11</sup> OA is most often seen in older individuals, but can occur in younger people following injury or repetitive stress. Obesity, lack of exercise, muscle weakness, and intense and traumatic physical activity are modifiable risk factors. In Wisconsin, 64% of adults with arthritis are overweight or obese compared to 51% of adults without arthritis. Age, genetic predisposition, and gender are non-modifiable risk factors.<sup>2,10-11</sup>

Rheumatoid arthritis (RA), the second most common form of arthritis, is a destructive and commonly debilitating systemic inflammatory disease. It affects women more frequently than men (5:1), has peak incidence between ages of 20 and 50, and affects 1.5 million Americans.<sup>2</sup>

Optimal management of the individual with arthritis should include appropriate diagnosis and management of the underlying condition when possible. The primary therapy for arthritis of almost any type includes pharmacological approaches, education, proper nutrition and weight loss, increasing physical activities, re-

habilitation therapy, and support. The establishment of effective patient/physician relationship is also crucial for optimal therapy.

## ASSESSMENT OF ARTHRITIS PAIN

The evidence-based guidelines developed by the American Pain Society through a panel of experts emphasizes comprehensive pain assessment, patient education, cognitive behavioral interventions, pharmacologic management, exercise and physical modalities, and surgical interventions.<sup>2</sup> In addition there is a section addressing the special management needs of children and older adults.

As is the case with any medical condition, it is important to rule out other causes of pain. Most of the pain in OA and RA is nociceptive. However some patients may have neuropathic pain after surgery or with associated conditions such as neuropathy or post herpetic neuralgia.

The consensus recommendation of the expert panel is that "treatment of people with arthritis should include an initial comprehensive pain assessment and ongoing assessment of pain and functional status to identify, implement, and evaluate effectiveness of pain interventions. Assessment of pain should include location, type, quality, intensity, source, time course, duration of pain, and its effect on mood and personal lifestyle."<sup>2</sup>

Self report methods such as numeric pain rating scales, visual analog scales, and verbal rating scales are primary sources of pain assessment. They can be used to assess pain intensity and pain affect. Body maps can assist with identifying location and pain diaries are used to assess the time course of the pain. The measure of functional status should be incorporated since pain is a major cause of disability. This should include asking about work, mobility, household tasks, shopping, activities of daily living, and sleep. The same instrument should be used repeatedly over time to follow the effectiveness of treatment interventions. Selection of an assessment tool should consider the person's cultural, educational, and social background.<sup>2</sup> Comprehensive assessment should also address the psychological and social factors affected by and contributing to the pain and resulting disability.<sup>2,12,13</sup>

## MANAGEMENT

Patient education is an important component and first step in managing arthritis pain. An Arthritis Self Management Program (ASMP), developed in 1985, administered as 2-hour weekly sessions over a 6-week pe-

riod, has been shown to decrease pain and decrease the number of office visits.<sup>14</sup> This program includes basic information about joint anatomy and arthritis, self-help techniques, tips for using joints wisely and conserving energy, pain management, exercise, relaxation, facts about patients medications and their effects, psychological aspects and problem solving, clinician, patient relations, good nutritional habits, methods of heat/cold application, and identification of unproven remedies.<sup>2</sup>

#### *Cognitive Behavioral Therapy*

Cognitive Behavioral Therapy (CBT) interventions can assist in management of pain and disability. CBT is used to reduce pain and psychological disability and to enhance self-efficacy and pain coping. Strategies includes cognitive-coping skills, distraction, mental imagery, cognitive restructuring, activity-pacing methods, pleasant activity scheduling, goal setting, relaxation based skills, stress management, and relapse prevention methods.<sup>2,12,13</sup> CBT enhances, rather than replaces, other medical therapies.

#### *Weight Management*

Weight management should be an integral part of patient education and involves improving awareness of the relationship between healthy body weight and improvement in symptoms of arthritis. Restricted calorie intake, dietary supplements, and nutritional education should be provided. The guidelines recommend that patients with arthritis maintain a body mass index (BMI) of <30, and those above this level should follow a weight management program.<sup>2</sup> In Wisconsin, obesity (BMI  $\leq$  30) has nearly doubled in the last decade, from approximately 11% in 1990 to an estimated 20% in the year 2000.<sup>10</sup>

#### *Physical Activity*

Increase in physical activity should be encouraged by participating in moderate intensity physical activity at least 3-4 times a week as recommended by the US Surgeon General. In Wisconsin, among adults with arthritis, approximately 27% are physically inactive as compared to 19% of those without arthritis.<sup>10</sup> If this is not possible for the patient due to medical or pain issues, it is recommended that a referral to a physical or occupational therapist be considered to evaluate and provide a specific activity and exercise program for each patient. This includes range of motion, flexibility, muscle strengthening, and aerobic conditioning exercises.<sup>2,15</sup> People with OA and RA who have difficulty maintaining minimum levels of physical activity should be referred to appropriate conditioning exercise opportunities in the community or a self directed exercise program instructed by a therapist.<sup>2</sup>

#### *Pharmacological Management*

Pharmacological management should be used in conjunction with nutritional, physical, educational, and cognitive behavioral treatments. The panel consensus/recommendation is that "Physicians consider efficacy, adverse side effects, dosing frequency, patient preference, and cost in selecting medications for pain management."<sup>2</sup> The mainstay in treatment of pain is medication. It is beyond the scope of this article to provide a detailed description of all the medications used in pain management. The reader is referred to references that are provided.<sup>1-2,9, 15,16</sup>

Due to an excellent safety profile, Acetaminophen, in doses of under 4 grams daily, is the medication of first choice for mild OA pain. It has no significant anti-inflammatory activity.

Nonsteroidal anti-inflammatory drugs (NSAIDs) are commonly used to treat pain from arthritis as well as other pain syndromes. They work by inhibiting the cyclooxygenase (COX) pathway. There are two isoforms of the COX enzyme: COX-1 and COX-2. Until recently there were no pharmacological agents that could specifically target the COX-2 enzyme (which is responsible for the inflammatory response and pain), more than the COX-1 enzyme (which is involved with the production of prostaglandin in the gut mucosa, thus protecting the gastro-intestinal [GI] system). With the advent of the new COX-2 inhibitors, such as celecoxib (Celebrex), rofecoxib (Vioxx) and valdecoxib (Bextra), the inflammatory response can be targeted, thus avoiding many of the GI side effects, which have plagued nonselective NSAIDs.<sup>2,9,15,17</sup> For patients with moderate to severe pain and/or inflammation, the panel recommends a COX-2 selective NSAID as the first choice, unless the person is at significant risk for hypertension or renal disorder.<sup>2,15</sup> In persons at increased risk of hypertension and edema, clinicians should use NSAIDs cautiously. Non-selective NSAIDs should be considered only if a person is not responsive to or not able to take a COX-2 selective NSAID and/or an acetaminophen up to 4000 mg per day, and only after risk analysis is done to determine the risk of a significant NSAID-induced GI complication. If such risk factors exist then a prophylactic agent such as a proton pump inhibitor or Misoprostol should be given with a non-selective NSAID. The person at risk for cardiovascular event should be given a daily low dose of aspirin (between 75mg to 160 mg per day), whether the patient is treated with a nonselective or COX-2 selective NSAID.<sup>2</sup>

For the person with RA, disease modifying anti-rheumatic drugs (DMARDs) are the first choice of

pharmacological therapy. Acetaminophen may be used concomitantly for mild pain and COX-2 selective NSAIDs for moderate to severe pain.<sup>2</sup>

Opioid analgesics should be used for patients with OA and RA when other medications and non-pharmacological interventions produce inadequate pain relief and the patient's quality of life is affected by pain. Morphine, oxycodone, hydrocodone or other mu agonist opioids, either as a single agent or combined with an NSAID or with acetaminophen, should be used for moderate to severe OA or RA pain that has not responded to other treatments.<sup>2,15,18</sup> The use of Codeine and Propoxyphene should be avoided because of their side effects and limited effectiveness.<sup>2</sup> There is no standardized dose of opioid for any given patient and no predetermined maximum oral dose. The dose of opioid should be adjusted for each patient. Controlled-release opioids can be considered for those patients requiring continuous scheduled doses. Tramadol, an analgesic that binds the mu opioid weakly and inhibits the reuptake of serotonin and norepinephrine is also an effective analgesic for moderate pain. Tramadol may be used alone or in combination with acetaminophen or NSAID at any time during the treatment of a patient with OA when NSAID alone produces inadequate pain relief.<sup>2,15</sup> For neuropathic pain, tricyclic antidepressants (amitriptyline, Nortriptyline, desipramine) have been shown to be effective.<sup>8,14</sup> gabapentin (Neurontin) has been studied in neuropathic pain and has been approved recently for post-herpetic neuralgia (PHN).<sup>17</sup>

### Physical Modalities

Physical modalities are also useful nonpharmacological approaches to manage pain. Heat produces analgesia, relaxation, reduces muscle spasm, and enhances flexibility of soft tissues. Cold produces analgesia and reduces inflammatory response. Electrotherapy in the form of transcutaneous electrical nerve stimulation may reduce pain and increase function, especially if there is a neuropathic component to the pain.<sup>2</sup>

### Orthotic Devices

A variety of orthotic devices are available to provide rest and stability, and can decrease pain of affected joints. These include hand splints, shoe supports, and functional orthotics. Additionally, when stability and safety of ambulation becomes impaired, a variety of assistive devices such as canes, crutches, walkers, and wheelchairs can maximize mobility in a safe and independent manner.<sup>2</sup>

### Alternative Medicine

There has been considerable interest in complementary

and alternative medicine approaches for arthritis treatment. Many of these are not regulated by the FDA and few evidence-based studies are available to demonstrate their effectiveness. Patients using 1500 mg of oral glucosamine sulphate in a placebo-controlled double blind study demonstrated improvement in pain and physical functioning.<sup>2,19</sup> There is no evidence to support magnet therapy or copper bracelets in treatment of pain associated with arthritis.<sup>2</sup>

### Surgery

Surgery should be considered when pain and functional limitation prevent the minimum amount of activity recommended, especially in obese older people. For optimal functional results, people with disabling arthritis should be referred for surgical care prior to the onset of joint contracture, severe deformity, advanced muscular wasting, and deconditioning.

### CONCLUSIONS

Although OA and RA are different diseases, many treatment principles are common to both. Patient education, achievement and maintenance of healthy body weight, regular physical activity, CBT, assistive devices, pharmacological management, and surgery are used in both conditions.

Physicians who manage individuals with arthritis should be aware of the complexity of factors affecting pain and quality of life. There are several pharmacological, physical, surgery, and psychological approaches that can be provided to the patient and family to decrease disability and improve quality of life.

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