Many causes of arthritic pain are encountered in clinical practice. Osteoarthritis is the most common form of arthritis in the United States, afflicting tens of millions of people. The authors review current literature on the treatment of patients with osteoarthritis. They discuss nonpharmacologic therapy such as physical therapy, weight reduction, and osteopathic manipulative treatment. Pharmacologic treatment of patients with osteoarthritis includes acetaminophen, nonsteroidal anti-inflammatory drugs, tramadol hydrochloride, and opiate analgesics in patients who failed all other treatment modalities. Patients who failed medical management should be referred for consideration for surgery.

Physicians encounter many causes of arthritic pain in clinical practice. Osteoarthritis is the most common form of arthritis in the United States, afflicting tens of millions of people and predominantly seen in the elderly. Although no cure exists for osteoarthritis, treatment can decrease pain, improve range of motion (ROM) in the affected joints, and lead to increased activities of daily living (ADL). All treatment for arthritis should begin with a comprehensive evaluation of the patient that should include pain assessment and evaluation of function. Management of patients should start with nonpharmacologic modalities, followed by pharmacologic therapy. If these first two modalities are ineffective, the patient should be referred for a surgical evaluation.

Adequate pain control is essential as it allows nonpharmacologic modalities to be effective. The American Pain Society (APS) has recommended the use of acetaminophen for mild to moderate arthritic pain. Nonsteroidal anti-inflammatory drugs (NSAIDs) are the preferred drugs for moderate to severe pain. Both the APS and American Geriatrics Society Panel on Persistent Pain in Older Persons, recommended caution when using traditional NSAIDs in treating patients who require long-term daily analgesic therapy. The cyclooxygenase-2 (COX-2) selective (or nonacetylated salicylates) agents are preferred in this patient population. Opiate analgesics can be safely used in treating patients with severe arthritic pain resistant to nonopioid medications.

In this article, we review treatment modalities for arthritic pain.

Arthritic pain can arise from inflammation of one or more joints. The causes of arthritis are listed in Figure 1. Arthritic pain occurs from afferent stimulation of nociceptors within or around the joint. Mechanical receptors are distributed in the interstitial and perivascular tissue located below the synovial membrane within the joint capsule.

**Clinical Evaluation**

Evaluation of arthritic pain includes a comprehensive history, physical examination, laboratory testing, and diagnostic x-ray films. Patients have pain as the predominant symptom for seeking medical attention. Patients can have pain at one or multiple joints. It is a nociceptive pain that is characterized by an intermittent pain that is worse with mechanical movement of the joint. The pain is usually described as a “dull ache” or “throbbing pain” associated with stiffness and restricted ROM. Patients may express signs and symptoms of depression or anxiety secondary to the chronic debilitating state of arthritis.

Physical examination may reveal reproducible tenderness along the joint line and surrounding tissues. Decreased ROM can occur as the result of pain or pathologic changes. Signs of inflammation of the synovium, called synovitis, characterized by warmth, swelling, effusions, and stress pain, may be present. Instability or deformity of the joint is a late sign that suggests anatomic and physiologic changes of the joint periauricular structures. A patient who has a long-term history of arthritis may have additional muscle wasting and weakness. Last, functional analysis should be done by having the patient ambulate and imitate ADL.

Clinical examination documentation should include physical function, ROM of the affected joint(s), gait assessment, assistive devices needed (eg, cane, walker, or wheelchair), abilities to accom-
plish ADL, and social and psychosocial factors that have an impact on the patient’s perception of pain.

**Treatment Modalities**

**Nonpharmacologic Treatment**

The goals of treatment are (1) control of pain and (2) improvement of function and quality of life with minimal toxic effects from therapy. Modes of therapy include nonpharmacologic, pharmacologic, and surgical. The nonpharmacologic modes of therapy include patient education, self-management programs, weight loss, aerobic exercise programs, physical therapy, occupational therapy, and the use of assistive devices for ADL (Figure 2). It has been reported that individuals who participate in self-management programs notice decrease in joint pain and frequency of arthritis-related physician visits, increases in physical activity, and overall improvement in quality of life.

Patients with arthritic pain tend to be deconditioned; therefore, physicians should emphasize exercise through patient education and referral for physical therapy. An exercise program under the supervision of a physical therapist combines warm-up using heat, ROM exercises, followed by muscle-strengthening techniques. In addition, patients also require aerobic conditioning. Swimming is the best therapy for patients with arthritic pain. It has been reported that 8 weeks of simple aerobic training increases physical ability and improves functional status.

The psychological rewards of exercise such as appearance and self-image are additionally beneficial as depression and mood alterations tend to develop in patients with chronic pain. Similarly, occupational therapists can assess patients and recommend proper assistive devices and use of splints to improve joint function. Studies using occupational therapy and NSAIDs improved disability in 49% of treated patients. Although no formal control studies of occupational therapeutic interventions have been done, clinical practice has demonstrated their effectiveness.

Osteopathic manipulative treatment (OMT) consisting of thrust, muscle energy, counterstrain, articulation, and myofascial release can improve arthritic pain, promote healing, and increase mobility. Although not many studies have been done using OMT alone, studies have been done that demonstrate OMT combined with standard medical care was more efficacious than standard care alone in treating patients with chronic pain syndromes.

**Pharmacologic Treatment**

- **Natural Compounds**—Glucosamine and chondroitin is an amino sugar produced from shellfish. It is a key component of cartilage. It works to stimulate the synthesis of glycosaminoglycan, proteoglycan, and hyaluronic acid. Although the precise mechanism of action is unknown, glucosamine has been shown by clinical experience to help decrease arthritic symptoms. Glucosamine short-term clinical trials have demonstrated effective symptomatic relief in patients with arthritic knee pain due to osteoarthritis.

- **Anti-inflammatory Drugs**—Primary pharmacologic management of arthritic pain includes the use of analgesics and anti-inflammatory drugs. Acetaminophen is a drug with purely analgesic properties that allows patients to avoid NSAIDs, thereby resulting in fewer side effects and potential cost savings. The dose of acetaminophen can be up to 4000 mg/d, and acetaminophen should be combined with nonpharmacologic therapeutic modalities. Although acetaminophen is a safe analgesic, it can be associated with clinically important adverse events such as prolonging half-life of warfarin sodium. It can cause hepatic toxicity and should be used cautiously in patients with known chronic alcohol abuse or liver disease.

For patients with severe pain, NSAIDs are statistically superior to acetaminophen. Risk factors with NSAIDs are bleeding perforation, edema, hypertension and/or congestive heart failure. COX-2-specific inhibitors might offer a lower instance of risk factors than non-specific NSAIDs. One recent exception is rofecoxib (Vioxx), which was recently withdrawn from the market because of

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**Checklist**

- Osteoarthritis
- Rheumatoid arthritis
- Ankylosing spondylitis
- Reiter’s syndrome
- Psoriatic arthritis
- Gout
- Pseudogout
- Infectious arthritis

**Checklist**

- Education
- Occupational assessment
  - aides
  - appliances
  - joint protection
- Physical therapy
  - aquatherapy
  - aerobic exercises
  - heat
  - strengthening
  - ultrasound stimulation
  - transcutaneous electrical nerve stimulation (TENS)
- Weight loss
- Acetaminophen (up to 4 g/d)
- Nonsteroidal anti-inflammatory drugs
- Cyclooxygenase-2 selective inhibitors (celecoxib and valdecoxib)
- Topical creams
  - nonsteroidal anti-inflammatory cream
  - capsaicin cream
- Glucosamine chondroitin
  - Tramadol hydrochloride
  - Opioid therapy
  - Intervertebral injections
  - corticosteroids
  - hyaluronic acid replacement
- Radiofrequency neuroablation for facet joint arthropathy only
- Surgical intervention

**Figure 1. Causes of arthritic pain.**

**Figure 2. Modes of therapy for arthritic-related pain.**
increased risk of cardiovascular complication. Overall caution still must be exercised in patients with hypertension, congestive heart failure, renal insufficiency, and gastric ulcer disease. The American College of Gastroenterology (ACR) endorsed the use of nonselective NSAIDs with gastroprotective agents in patients at high risk, as described in 1995 ACR recommendations as an alternative to the use of COX-2 specific inhibitors.18

> **Topical Analgesics**—Topical analgesics (eg, methylsalicylate or capsaicin cream) are adjunctive modes of therapy for patients who cannot take systemic anti-inflammatory therapy. Quantitative systemic review of topically applied NSAIDs have shown these agents to be effective in patients with osteoarthritis.19 Capsaicin cream is available over the counter in single-strength (0.025%) or triple-strength (0.075%) ointment that can be applied to the symptomatic joint four times daily.

Tramadol hydrochloride is a central-acting oral analgesic that has a unique dual mechanism of action. It is a very weak μ-agonist that also inhibits the reuptake of norepinephrine and serotonin. It has been approved for the use of moderate to severe pain and can be used as adjunctive therapy for arthritic pain. It has been shown that tramadol hydrochloride can allow a significant reduction in the dose of NSAID without compromising relief of pain.20 In patients who are unable to tolerate NSAIDs, tramadol has been found to be comparable to the analgesic effects of ibuprofen in patients with arthritis.21 The most common side effects are dizziness, nausea, constipation, and somnolence.22 Tramadol is given in 50-mg doses every 4 to 6 hours and should be titrated slowly to reduce side effects. The total daily dose should not exceed 400 mg.

Tramadol should be used with caution in patients taking serotonin selective reuptake inhibitors because it may lead to an increase in serotonin and increase the risk of seizures or serotonin syndrome. Tramadol is not a controlled substance; however, it can be addictive in patients with addictive tendencies.

> **Opiate Analgesics**—Opiate analgesics cannot replace anti-inflammatory therapy. They should be used as an adjunctive therapy when patients’ pain may not be responsive to other pharmacologic modes of therapy. They are recommended for severe intractable chronic pain to improve a patient’s quality of life.5 The American Pain Society and the American Academy of Pain Medicine have published joint guidelines on the use of more potent opioids in the management of chronic nonmalignant pain.23 Opiate analgesic therapy should include a clear diagnosis, integrate interdisciplinary treatment modalities, and include appropriate ongoing patient monitoring.22

Because arthritic pain occurs primarily with mechanical movement, patients usually describe an intermittent pain associated with activity. Short-acting or immediate-release opiates are recommended for this type of pain. For those patients who have pain at rest and are not opiate naïve, opiate analgesics in controlled-release formulations may be recommended. Some continuous-release medications include morphine, oxycodone, and transdermal fentanyl. In addition, methadone is an opiate that has a half-life of approximately 23 hours and can provide a longer duration of action similar to the controlled-release medications.

In treating patients with chronic nonmalignant arthritic pain with opiate analgesics, physicians should do an evaluation of patients, provide a written treatment plan stating the objectives and goals, obtain informed consent and agreement for treatment including monitoring of urine and serum medication levels, periodic review, additional consultations if needed, and accurate and complete medical records. The Federation of State Medical Boards of the United States (Web site: www.fsmbo.org) has specific guidelines for the use of controlled substances for the treatment of pain.

> **Procedures and Surgical Treatment**

Intra-articular steroid injections can provide relief lasting for months. However, Neustadt24 states that corticosteroids may actually increase the progression of osteoarthritis. Local anesthetics are used in conjunction with corticosteroids to offer immediate relief and improve accuracy of diagnosis. It has also been noted that local anesthetics can be more effective than a placebo in treatment of osteoarthritis.25

Patients with spondyloarthropathy and associated arthritic pain may also benefit from corticosteroid injections into the facet joint in the spine. In addition, patients who have obtained short-term relief with facet joint injections may have longer relief with radiofrequency neuroablation of the medial nerves that innervate the facet joint. This is a low-risk procedure that can be offered to patients with isolated and severe low back pain due to facet joint arthritis.

Hyaluronic acid (sodium hyaluronate, hyaluronan) is a hyaluronic acid that is found in synovial fluid of articular joints. It is a viscous compound that provides lubrication to the joint. As people age, the body produces less and less hyaluronic acid. Hyaluronic acid replacement, referred to as viscosupplementation, is done by injecting hyaluronic acid directly into the painful joint. Studies are inconclusive; however, some studies show viscosupplementation affording pain relief for up to 6 months.25

Patients with severe symptomatic arthritis and associated arthritic pain that has failed to respond to medical therapy or minimally invasive therapy (or both) and who have limitations in ADL may require referral to an orthopedic surgeon for evaluation for joint replacement. Surgical treatment modalities may include arthroscopic debridement, osteotomies, and total joint arthroplasties.

> **Comment**

Arthritic pain is one of the most ubiquitous complaints for which patients are seen in their physicians’ offices. Treatment modalities should be tailored to an individual patient’s needs. Patient education, exercise, weight reduction, NSAIDs, systemic analgesics, and topical analgesic agents have all been found to be beneficial.26

Patients benefit from a multidisciplinary approach that includes education and physical therapy. The goals of the treatment of patients with arthritis include pain control and improvement of function while minimizing the side effects of pharmacologic therapy.
References


Editor’s Note

Production of this supplement to the JAOA was under way 6 months before Merck & Co voluntarily withdrew rofecoxib (Vioxx) from the market because of increased cardiovascular events associated with the medication’s long-term use.