Managing Joint Pain in Primary Care

Trish Palmer, MD, and James D. Toombs, MD

Joint pain is a common problem seen by family physicians. Although many pain complaints arise from self-limited conditions, a substantial number require immediate and ongoing care. Prompt appropriate treatment can help limit symptoms, prevent disability, and improve outcomes. The differential diagnosis is varied, with both laboratory studies and diagnostic imaging available to help evaluate the joint. At the initial evaluation and at each subsequent re-evaluation, there should be efforts to identify dangerous conditions and distinguish conditions with a disease-specific pathogenesis. Treatment of joint pain consists of both pharmacologic and nonpharmacologic modalities. Pharmacologic therapies may include medications specific for pain, inflammation, and adjuncts specific to the diagnosis. Treatment of pain should proceed in a step-wise fashion providing medications appropriate for treating the level of pain. Inflammation is treated with physical modalities and nonsteroidal anti-inflammatory or cyclo-oxygenase-2 inhibitors. Nonpharmacologic therapies may include protection, rest, ice, compression, elevation, and simple office procedures. Physical therapy and education can assist in the recovery process, and prevent recurrence. (J Am Board Fam Pract 2004;17:S32–42.)

Joint pain is a common complaint presented by patients to family physicians. Each year there are more than 315 million office visits for musculoskeletal complaints.[1] By some estimates, these account for more than 10% of all outpatient visits in general medical practice.[2] In 2001, a telephone survey completed by the Centers for Disease Control and Prevention revealed arthritis and chronic joint symptoms in a third of all adults.[3] Because joint complaints encompass many diagnoses, an appropriate history and physical examination are necessary to determine the cause. It is important to differentiate acute from chronic joint pain, because many treatments have a different short-term risk/benefit ratio compared with the long term. Treatment consists of both pharmacologic and nonpharmacologic modalities.

Differential Diagnosis and Definitions

Acute joint pain is any arthralgia that is expected to resolve within 6 weeks (some authors report 6 months); chronic joint pain persists beyond this defined window. In acute joint pain, there is often an unmistakable cause such as trauma or infection. It is important to keep in mind that acute joint pain may also represent a flare of a chronic condition or be the initial presentation of an undiagnosed chronic condition, such as osteoarthritis, rheumatoid disease, or crystal-induced arthropathy. Acute joint pain may develop into chronic joint pain. Of the 1 million ankle injuries treated in the United States annually, an estimated 40% will produce recurrent symptoms.[4]

Whether acute or chronic, the goals in treating a joint complaint remain the same: (1) reduce pain, (2) reduce inflammation, (3) facilitate healing, (4) preserve function, and (5) reverse or slow the disease process. At the initial evaluation of the patient and at each subsequent re-evaluation, there should be an effort to identify dangerous conditions and to distinguish conditions with a disease-specific therapy or that may benefit from early referral.

The differential diagnosis of joint pain may be divided into the general categories of trauma, infection, crystal-induced arthropathy, degenerative

From the Pisacano Leadership Foundation and the Department of Family and Preventive Medicine, University of Utah, Salt Lake City (TP), and the Department of Anesthesia, University of Iowa Hospitals & Clinics, Iowa City (JDT). Address correspondence to Trish Palmer, MD, Department of Family and Preventive Medicine University of Utah, 1138 E Wilmington, Salt Lake City, UT 84106 (e-mail: trish.palmer@hsc.utah.edu).

The Family Practice Pain Education Project (FP-PEP) acknowledges an unrestricted educational grant from Pfizer to Cardinal Health to produce educational materials for primary care doctors about pain management. The information provided here is the opinions and research of the family physicians who served on FP-PEP.

This work was presented in part at the 2003 American Academy of Family Physicians (AAFP) Scientific Symposium.

Table 1. Differential Diagnosis of Joint Pain

Trauma
Sprain
Strain
Fracture
Dislocation
Tear of ligament, tendon, or meniscus
Tendinitis
Infection
Gonococcal
Nongonococcal-viral, mycobacterial, or fungal
Lyme disease
Secondary to bacterial endocarditis
Secondary to enteric and urogenital infections
Crystal-induced arthropathy
Gout
Pseudogout
Degenerative joint disease
Osteoarthritis
Malignancy
Tumor
Metastases
Leukemia
Rheumatic
Rheumatoid arthritis
Reiter syndrome
Psoriatic arthritis
Lupus erythematosus
Ankylosing spondylitis
Other
Complex regional pain syndrome
Sjögren syndrome
Polymyositis
Scleroderma
Sarcoidosis
Fibromyalgia
Erythema nodosum
Sickle cell disease
Aseptic necrosis
Charcot
Drug reaction
Hypothyroidism
Irritable bowel syndrome
Osteochondritis dissecans

Information from refs. 7, 8, and 13.

joint disease, malignancy, rheumatic, and other (Table 1).

Prevalence and Natural History

Joint pain is a frequent complaint of the active and aging United States population. In a 1998 study, 2.5% of all visits to family physicians were for acute sprains and strains, and 1.8% of visits were for degenerative joint disease.[5] The natural history of acute joint pain depends on the diagnosis, with many causes expected to resolve within 6 weeks to 6 months. For persons aged 65 years and older, chronic joint pain (arthritis) and musculoskeletal complaints are the leading cause of disability.[6] The prevalence of a number of these complaints is listed in Table 2. Osteoarthritis is by far the most common chronic joint condition encountered by the family physician.

Table 2. Prevalence of Selected Musculoskeletal Conditions[6]

Osteoarthritis	20,700,000
Rheumatoid arthritis	2,100,000
Gout	2,100,000
Polymyalgia rheumatica & giant cell arteritis	560,000
Spondyloarthropathy	383,000
Systemic lupus erythematosus	239,000
Juvenile rheumatoid arthritis	40,000

Adapted from ref. 6.

Evaluation of the Patient with Joint Pain

Evaluation of the patient with joint pain begins with an accurate history and physical examination to determine the diagnosis, prognosis, and appropriate treatment.

History

Several key questions will help to elicit the cause of acute joint pain. The first key discrimination point is whether this pain stems from trauma. The mechanism of injury may help to delineate the specific structures involved. A history of high impact or an inability to bear weight indicates the possibility of a more severe injury, such as a fracture, dislocation, or soft tissue tear. Determination of the exact location of the pain, such as specific bony tenderness, may indicate the possibility of a fracture or avulsion of a ligament. Exceptional physical demand (high-intensity exercise or an acute increase in the frequency, duration, or intensity of the activity) may indicate a stress fracture[7] instead of a sprain. Trauma in a patient who is still growing should prompt consideration of epiphyseal fracture.

In chronic joint pain, obtaining the history usually requires directed questioning. In particular, the physician should ask about onset, progression, and systemic symptoms. Although an abrupt onset is most often associated with self-limited conditions, at times rheumatic disease may appear suddenly. Progression of the joint pain should be noted. Chronic knee pain that increases abruptly may need a more intensive work-up. If several joints are involved, it may be helpful to know which were affected first. History taking should also include questions about family history of joint disease and

rheumatic conditions. Many diseases, such as rheumatoid arthritis, osteoarthritis, and gout, occur more often in patients with affected relatives.[8] The absence of certain features can be reassuring. A patient may be concerned that the pain in her hands is rheumatoid arthritis; however, without involvement of the proximal interphalangeal joints, rheumatoid arthritis is unlikely.

Any history of prior injury of the same joint indicates the possibility of a recurrent problem and is thus more likely to be a chronic process instead of an acute one. Injuries that do not heal in the expected amount of time should be re-evaluated, and the differential diagnosis expanded to include more chronic and rare causes of joint pain. Atraumatic joint pain should be a reason to consider diagnoses such as rheumatic disease, degenerative disease, crystal-induced arthropathy, infection, and malignancy.

A review of systems will also assist in determining the possibility of an undiagnosed chronic condition or more serious conditions, such as infection or cancer. Specifics to be assessed include constitutional symptoms, such as unintended weight loss, unexplained fevers, chills, night sweats, unrelenting or nocturnal pain, and significant disability. A personal history of immunosuppression (whether because of disease or medication) or previous joint injection puts the patient more at risk for septic arthritis, and history of tick bite increases the chance of Lyme disease.

Whether the joint pain is chronic or acute, the presence of certain "red flags" in the history should prompt an immediate detailed workup: (1) nocturnal pain/unremitting pain; (2) systemic symptoms (eg, fever, chills, weight loss); and (3) significant disability/change in abilities.

Physical Examination

The important elements of physical examination typically include: inspection, palpation, range of motion, and special tests. It is important to determine whether the joint pain is truly articular. Bursitis and tendinitis can mimic joint pain. Swelling and ecchymosis, if marked, may indicate a fracture or complete ligament or tendon tear. Laxity, gross deformity, and tendon or muscle dysfunction (tested by resisted function) may indicate fracture or partial to complete tear of a ligament, tendon, or muscle. Crepitus indicates a derangement of bone, cartilage, or menisci.[9] Sensory changes indicate possible neurological or vascular problems. If the joint volume is increased, the physician should determine whether this is tissue hypertrophy or a joint effusion. Range of motion (ROM) should be assessed as well. Increased ROM may indicate an unstable joint; decreased ROM may represent effusion, capsule fibrosis, or bony abnormality. Contractures indicate a longstanding condition. Deformity seen in the chronic setting probably represents joint erosion. In rheumatoid arthritis, the synovium lining the joint can hypertrophy, forming a doughy-feeling joint pannus. This clue can be important for early diagnosis and treatment of rheumatic disease, which may change the course of disease progression.

Examination of the entire patient, not just the affected joint, is imperative to assess for possible osteoarthritis or rheumatic processes. Associated rashes or palpable bony hypertrophy may be pathognomonic. Distribution of symptoms can give additional clues regarding the diagnosis. In rheumatoid arthritis, there are certain sentinel joints: proximal interphalangeal, metacarpophalangeal, and metatarsophalangeal. Involvement of the hip, knee, distal interphalangeal joints, or carpometacarpal joint of the thumb is more suggestive of osteoarthritis.

"Red flags" (signs that should prompt an urgent work-up) on physical examination include warmth, erythema, and swelling of the joint, which, taken together, signify the need to consider such diagnoses as infection, rheumatic process, and crystal-induced arthropathy. "Yellow flags" (signs that should prompt the physician to expand the differential diagnosis) include multiple bruises, or bruises inconsistent with the patient's explanation of the problem, and indicate the need for further investigation into the possibility of undetected abuse.

Joint Pain Triage

The two most common chronic joint pain conditions seen in the family physician's office are osteoarthritis and rheumatoid arthritis. In 1990, an estimated 20.7 million adults in the United States had moderate or severe osteoarthritis. In the same year, rheumatoid arthritis was estimated to affect 2.1 million adults.[6] Although there are clear differences between rheumatoid arthritis and osteoarthritis, the diagnostic picture may be confusing, and the diseases may coexist. In one study of rheumatoid arthritis, the median time from presentation to di-

Table 3. Diagnoses Consistent with Findings From Synovial Fluid Analysis[13]

Condition	Appearance	WBCs/mm[a]	%PMNs	Glucose Serum Level (%)	Crystals under Polarized Light
Normal	Clear	<200	<25	95–100	None
Noninflammatory (eg, degenerative joint disease)	Clear	<400	<25	95–100	None
Acute gout	Turbid	2,000–5,000	>75	80–100	Negative birefringence; needle-like crystals
Pseudogout	Turbid	5,000–50,000	>75	80–1000	Positive birefringence; rhomboid crystals
Septic arthritis	Purulent/turbid	>50,000	>75	<50	None
Inflammatory (eg, rheumatoid arthritis)	Turbid	5,000–50,000	50–75	~75	None

Adapted from ref. 15.
[a] WBC, white blood cell; PMN, polymorphonuclear cell.

agnosis was 36 weeks.[10] It is critical to identify inflammatory arthritis when present, because disease-modifying antirheumatic drugs are available that may have a significant impact on disease progression and alter the course of the disease, and early application of these therapies seems critical.[10] Because of this, some rheumatologists suggest immediate referral when inflammatory arthritis is diagnosed or suspected.

Investigations

Laboratory Studies

Rarely do laboratory studies provide the diagnosis in joint pain. Blood testing (eg, erythrocyte sedimentation rate, C-reactive protein, rheumatoid factor, anti-nuclear antibody, uric acid, etc) is only useful if there is a high suspicion of a specific diagnosis. These tests have a high sensitivity, in general, but a low specificity.[11,12] Rheumatoid factor, for example, provides neither the sensitivity nor the specificity to diagnose rheumatoid arthritis. In as many as 30% of cases, it is negative. In persons undergoing normal aging as well as in certain disease states, it may be positive in the absence of rheumatoid arthritis.[10] Erythrocyte sedimentation rate and C-reactive protein are commonly elevated in inflammatory conditions such as rheumatoid arthritis and septic joint, and a complete blood count may reveal anemia of chronic disease, or sometimes leukemia, which can be another cause of acute or chronic joint pain.

Arthrocentesis

Arthrocentesis is urgently indicated when there is a warm, red joint with effusion, especially when there is no history of trauma (recommendation strength C).[13] Presence or absence of fever should not deter consideration of arthrocentesis because it is not a reliable indicator of a septic joint and is frequently found in patients with crystal-induced arthropathies and rheumatic processes.[14] The aspirated synovial fluid should be sent for the "3 Cs": cell count, culture (Gram stain), and crystals. Table 3 indicates the diagnoses consistent with findings on synovial fluid analysis.[15] Another time to consider arthrocentesis is when a significant effusion is present. This can provide significant relief, and subsequent analysis of the fluid may provide a diagnosis.

Diagnostic Imaging

The indications for obtaining a radiograph are gleaned through a thorough history and physical examination. Key indicators are: bony tenderness, inability to bear weight, gross deformity, skeletal immaturity (because of concern for an epiphyseal fracture in the young), and age (bone cancers are more prevalent in both the young and the old). Several features to look for on a radiograph include obvious fracture, malalignment, fat pad sign, osteophytes, erosions, and a widened epiphysis.

No single imaging technique will answer all clinical questions. If there is doubt as to which test is best to order, consultation with a radiologist is recommended. Such consultations enable the radiologist to give imaging advice quickly and accurately and to potentially lower the cost by eliminating inadequate studies.

Plain radiographs remain the screening modality of choice for most joint abnormalities. They should

be performed in all cases of significant trauma, chronic pain, or suspected arthritis. However, data increasingly show that low doses of radiation in childhood increase the risk of solid tumors in late adulthood.[16,17] For that reason, some radiologists recommend limiting the radiation dose in younger patients, in some instances by obtaining only 2 instead of 3 views. Magnetic resonance imaging (MRI) could then be a choice to further evaluate the problem and limit exposure to radiation.

The diagnostic capabilities of computed tomography (CT) have increased dramatically with the advent of multidetector CT. CT is valuable in the evaluation of many extremity fractures that are not well quantified on radiograph. In addition, current generation scanners provide considerable information on soft-tissue structures, allowing the diagnosis of tendon and ligament tears, as well as soft-tissue abscesses and masses. Detail of soft-tissue structures in CT, however, remains somewhat inferior to that shown by MRI.

For clinical questions dealing primarily with soft-tissue problems, MRI is the modality of choice except in patients with indwelling metallic devices. CT is the modality of choice for imaging patients who have indwelling metal and for whom plain radiographs are not diagnostic.

Injection of iodinated contrast can be performed in conjunction with CT (CT arthrography) to provide information about hyaline cartilage, ligaments, and the joint capsule. The superior spatial resolution of CT means that CT arthrography is often preferable to MRI arthrography in the evaluation of small joints, specifically the ankle.[18]

MRI provides unparalleled visualization of soft-tissue abnormalities. It is especially useful for the evaluation of cartilage, muscles, tendons, and ligaments. Higher spatial resolution is possible when the examination is limited to a smaller body part. Therefore, an MRI of the wrist will in most cases have better spatial resolution than an MRI of the forearm. When possible, the referring doctor should specify the area of concern.

MRI with gadolinium injection (MRI arthrography) can be used to visualize intra-articular structures such as tendons and ligaments. MRI with or without gadolinium injection can be used to diagnose inflammatory arthritis before it is apparent on plain radiographs. Ultrasound also has been shown to be equal to MRI for this purpose.[19]

The cost of ultrasound is considerably lower than that of MRI. In experienced hands, the accuracy of diagnosis of rotator cuff tears by ultrasound has been demonstrated to be equal to that of MRI.[20] It also has been used extensively for evaluation of tendon and ligament tears in other joints. The major limitations of ultrasound are the inability of the beam to penetrate bone, and its inability to evaluate abnormalities deep within a joint, such as menisci and cruciate ligaments.

Management of the Patient with Joint Pain

A Joint Pain Treatment Algorithm is shown in Figure 1. The algorithm divides the patient care plan into 5 working areas discussed below, and parallel consideration implies each area is addressed simultaneously.

Pharmacologic Therapy

Acute Joint Pain

In acute joint pain, the key is early, aggressive pain management with an equally rapid medication taper as improvement occurs. For severe pain, opioids may be required. For moderate to severe pain, nonsteroidal anti-inflammatory drug (NSAID) or cyclo-oxygenase-2 (COX-2)-specific inhibitor pain medications are commonly used. For milder pain, acetaminophen may suffice. There is low risk of adverse events from short-term use of any of these medications. It is interesting that there is very little evidence on outcomes specific to acute joint pain and the short-term use of these medications,[21] but there is a great deal of evidence on the safety of these medications in this scenario.[22]

Chronic Joint Pain

For chronic conditions, controlling pain is a key element to maintaining function. Several groups (American College of Rheumatology, American Pain Society, and American Geriatrics Society) recommend increasing or changing medications to gain adequate control of symptoms (recommendation strength B).[23–25] The Joint Pain Treatment Algorithm (Figure 1) shows a "step-wise" approach to reflect this.

Acetaminophen

Acetaminophen in doses up to 4 g per day is widely recommended as a cost-effective initial therapy for osteoarthritis. Although 4- to 6-hour dosing is

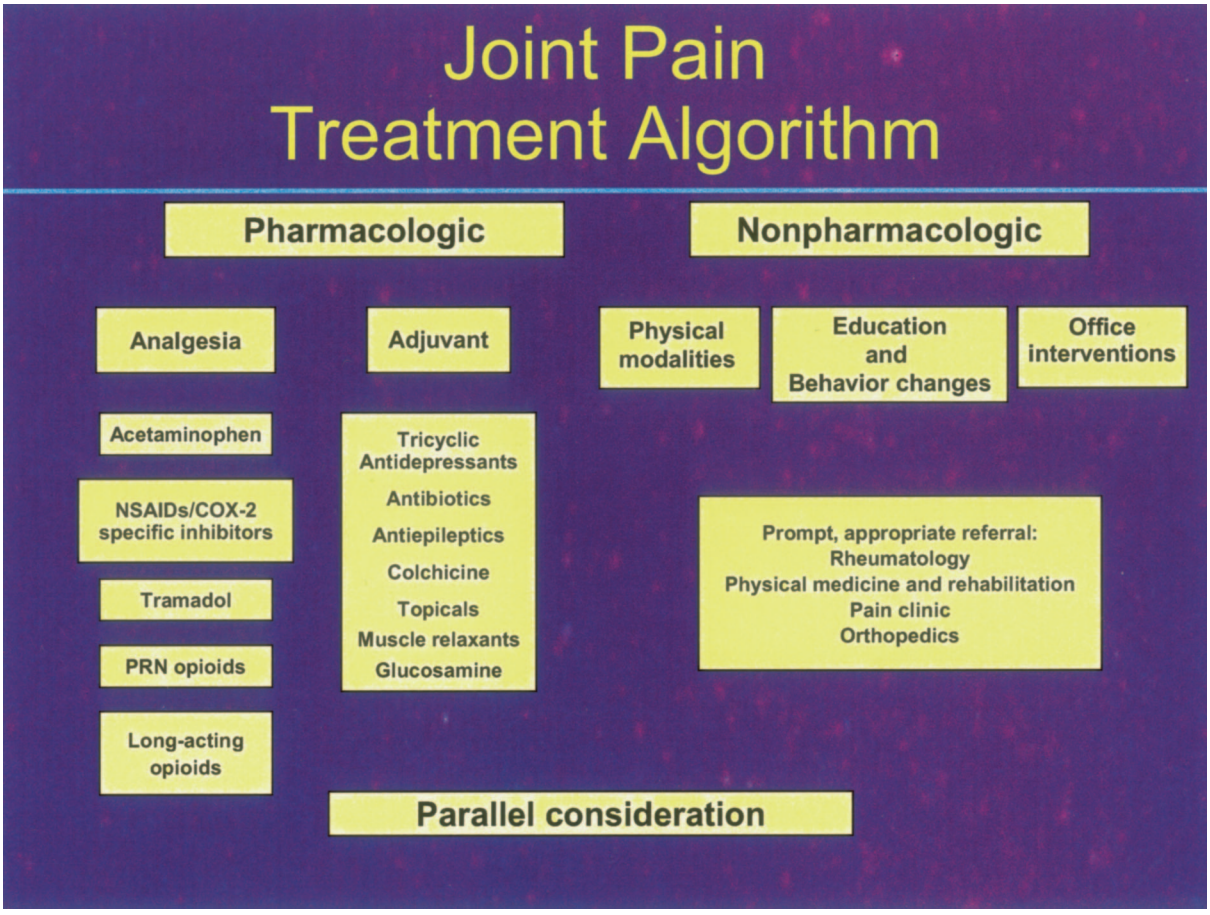

Figure 1. Joint pain treatment algorithm.

usual, an extended release form of acetaminophen is available to increase the interval to 8 hours. Acetaminophen is often rated as "very helpful" but discontinuance rates are higher than for nonselective NSAIDS (recommendation strength B).[26] At higher doses, there are concerns about nephropathy in the form of papillary necrosis and interstitial nephritis as well as an increased risk of gastrointestinal bleeding.[2] There are also cautions about use in patients who use alcohol or have liver disease.

NSAIDs and COX-2 Inhibitors

Inflammation seems to play a role in pain and disease progression and may explain some of the success of NSAIDs and COX-2–selective inhibitors in treating pain in osteoarthritis. Current studies show similar efficacy between COX-2–selective inhibitors and nonselective NSAIDS (recommendation strength B).[27] COX-2–selective inhibitors, however, have reduced gastrointestinal adverse events compared with nonselective NSAIDS. In many circumstances, starting with a nonselective NSAID is appropriate. Listed in Table 4 are certain situations in which starting with a COX-2–specific inhibitor would be recommended (recommendation strength B).[27] With respect to acetaminophen in combination with NSAIDS, or COX-2–specific inhibitors, there is current epidemiologic evidence that they should not be used concurrently because of the increased risk of GI bleeding (recommendation strength B).[28]

Table 4. COX-2–Specific Inhibitors: Relative Indications[27]

Advanced age
History of ulcers
Corticosteroid use
Use of oral anticoagulants
Serious systemic disorder

Table 5. Adjuvant and Concomitant Therapies

Diagnosis	Therapy
Septic joint	Antibiotics
Gout	Colchicine, allopurinol
Muscle spasm	Muscle relaxants
Associated neuropathic pain	Topical capsaicin, antidepressants
Associated muscle pain	Topical or oral NSAID, topical lidocaine
Rheumatoid arthritis	DMARDs,[a] steroids
Osteoarthritis	Glucosamine

[a] DMARD, disease-modifying antirheumatic drug.

Opioids

There are a number of benefits in using opioids where joint pain is unresponsive to acetaminophen or NSAIDs/COX-2 inhibitors. At times, there are relative or absolute contraindications to the use of these medications; for example, acetaminophen in a patient with active hepatitis. The gastrointestinal side effects of opioids are well known, and a stimulant laxative recommendation should accompany each prescription at the initiation of therapy. Often, opioids may only provide a reduction in pain of 15% to 20% (recommendation strength B).[27] Depending on the initial starting dose, it may be necessary to titrate the opioid dose upward. Many times the dose of opioid needed may be lower when opioids are combined with acetaminophen or NSAIDS. There is no dose ceiling on pure opioids, but there is a defined ceiling on the dosing of products combined with acetaminophen or NSAIDS based on the dose of the nonopioid medication.

Adjuvants & Concomitant Therapies—Acute Joint Pain

Adjuvant and concomitant therapies are recommended based on the diagnosis. Table 5 illustrates several of these therapies.

Muscle relaxants in combination with NSAIDs are commonly used in the treatment of muscle spasm and injury.[29] Their primary side effect is sedation.

Topical medications are very useful for the treatment of acute pain. Potential side effects include burning, stinging, and erythema. In Europe and Canada, topical NSAID preparations are available, and studies show equal efficacy with oral NSAIDs (recommendation strength B).[30,31]

Intra-articular injection of corticosteroid may be considered for suppression of inflammation and/or anesthetic for relief of pain. Evidence-based reviews of joint injections have found few studies to support or refute the efficacy of this procedure (recommendation strength B).[32] Indications for injection include treatment of crystal-induced arthropathy, synovitis, inflammatory arthritis, and advanced osteoarthritis. Contraindications to this procedure include septic arthritis, local cellulitis, bacteremia, acute fracture, joint prosthesis, Achilles or patellar tendinopathy, and history of allergy to injectable pharmaceuticals or constituents. Potential side effects include tendon rupture, iatrogenic infection, postinjection steroid flare (self-limited pain and swelling that usually responds to ice), hypopigmentation, and soft tissue atrophy.[33] Steroid injection should not be used to mask the symptoms of an acute injury, which can lead to overuse and further damage of the structure (recommendation strength C).[34]

Aspiration of fluid from a joint is sometimes considered for relief of pain caused by swelling, but the likelihood of re-accumulation of fluid is high.[33] Aspiration is often used diagnostically to determine the cause of pain, as described previously under arthrocentesis. Injection/aspiration requires thorough knowledge of anatomy of the site.

Recommendations specific to gout include large doses of traditional NSAID medications (COX-2 medications have yet to be specifically indicated for gout) started immediately after the onset of symptoms and through 24 hours after the resolution of symptoms (recommendation strength C).[35] As an alternative for those unable to take NSAIDS, steroids can be effective. Intra-articular corticosteroids are recommended if only one joint is involved, or oral steroid tapered over 8 days is recommended for multiple joints (recommendation strength C).[36] Oral colchicine may also be considered in acute gout, but its efficacy is reduced if initiated more than 24 hours after the onset of symptoms. It has anti-inflammatory properties, but no analgesic effects, is not tolerated well in general, and is considered an alternative to NSAIDS.[37] Allopurinol is not indicated for treatment of acute gout, and may actually precipitate a gout attack.[38]

In regard to infectious arthritis, specific treatment includes open or closed drainage (recommendation strength B)[39] along with 2 to 6 weeks of parenteral antibiotic aimed at streptococci and

staphylococci, followed by 3 to 12 weeks of oral antibiotics.[40] Arthrocentesis to diagnose the specific bacteria and sensitivity to antibiotics is of paramount importance. There is no evidence that anticonvulsant drugs are effective for acute pain.[41]

Adjuvants—Chronic Joint Pain

Topical medications recommended by the American College of Rheumatology include capsaicin and methyl salicylate cream (recommendation strength B).[23] Topical capsaicin is devoid of systemic side effects but may cause stinging or burning at the initiation of therapy.[42] Methyl salicylate is a common ingredient in many "arthritis creams," such as Ben Gay. Systemic absorption of methyl salicylate may occur and has some potential to cause salicylism when applied over abnormal skin.[43]

Glucosamine and chondroitin are available over the counter and have favorable side-effect profiles. Both may be used to improve osteoarthritis symptoms, although the benefit of chondroitin has not been demonstrated. In one review, 1500 mg of glucosamine was noted to have efficacy similar to 1200 mg of ibuprofen (recommendation strength B).[44] Glucosamine may also slow joint space narrowing when used consistently (recommendation strength B).[45]

Tricyclic antidepressants and antiepileptics modulate pain signals and are effective in a variety of chronic pain syndromes even in the absence of depression. They have been minimally studied in chronic joint pain. However, where there is a neuropathic quality, the benefit is well-documented in the literature.[46] Where muscle spasm is present, muscle relaxants may be of use.

Nonpharmacologic Therapies—Acute Joint Pain

Physical Modalities

Treatment using physical modalities to limit swelling and pain associated with trauma or arthritis usually consists of the components of the mnemonic PRICE:[47]

Protection with a brace or wrap,

Rest to avoid activities that cause pain or an increase in swelling,

Icing 15 minutes several times per day,

Compression with an elastic wrap,

Elevation of the joint above the level of the heart.

These are all potential modalities and all are not always used. For instance, it is atypical to use protection or compression for crystal-induced arthropathies, but rest and ice are measures that may reduce pain and speed recovery.[38] For septic arthritis, a few days of immobilization may help limit pain but icing and elevation would usually be avoided.[48]

Physical therapists may provide other modalities for pain control, including: phonophoresis, iontophoresis, heat, cryotherapy, counterirritants, and/or transcutaneous electrical nerve stimulation. Massage therapy may also help relieve muscle spasm and facilitate stretching.[49]

Education and Behavior Changes

Education and behavior changes may be necessary to return to activity without harming the affected joint. The patient may engage in other activities to maintain strength and endurance and at the same time protect the joint. Swimming and stationary cycling are commonly recommended for lower extremity joint pain, because both activities, if done correctly, may allow for exercise without direct weight bearing. It is also critical to determine whether the activity that led to a traumatic injury was being done correctly, because changes in technique may prevent recurrent injury. Part of the education process is to give the expected time course to resolution of the pain and to advise the patient to return for evaluation if this does not occur.

Office Interventions

Several office interventions may greatly reduce pain and protect the affected joint. Taping, splinting, and casting, if appropriate, will help to immobilize the joint or minimize pain with activity. However, there is a fine distinction between the positive and negative effects of immobilization. Short-term immobilization is usually beneficial for pain control and protection, but prolonged immobilization may lead to stiffness and loss of function. With a stable joint, early gentle mobilization, usually non–weight- bearing, is recommended to prevent stiffness (recommendation strength B).[50] In addition, immobilization carries with it the risk of deep vein thrombosis (DVT), which could be another reason to recommend gentle mobilization. DVT caused by immobilization has not been well studied, but is estimated in one article to occur up to 10% of the time, with more risk with increasing age, obesity,

and previous DVT.[51] With a stable fracture or other painful lower extremity problem, we typically recommend calf pumps 3 times per day; this theoretically helps prevent DVT; medical prophylaxis should be considered in high-risk patients.

Intra-articular injections as mentioned above may be quite effective to reduce pain and inflammation. In particular, shoulder pain resistant to treatment may respond well to a subacromial injection, thus giving the patient a window in which to pursue physical therapy to prevent adhesive capsulitis. Corticosteroids should never be injected into tendons, cartilage, or ligaments.[52]

Nonpharmacologic Therapies—Chronic Joint Pain

Physical Modalities

Improper or excessive exercise can hasten joint damage and increase osteoarthritis symptoms. However, a supervised walking program showed functional improvement and a decrease in arthritis pain (recommendation strength B).[53] Swimming pool therapy will help limit stress on weight-bearing joints. Physical therapists can teach safe exercises to maintain strength, range of motion, and help prevent functional decline. Occupational therapy can provide assistance with orthotics and assistive devices to maintain independence. Therapists may also teach different ways to use the joint to prevent pain and further stress on the joint.

Office Interventions

Intra-articular steroid injections can provide short-term pain relief lasting several weeks (recommendation strength B).[54] Nearly 80% of patients report improvement at 1 week. The clinical benefit is improved when effusion is present and aspiration of synovial fluid at the time of injection is successful (recommendation strength B).[54] It is not clear that frequent injections will damage articular cartilage or the joint's structure. In common practice, however, intra-articular steroid injections are limited to 3 to 4 per year (recommendation strength C).[55]

Viscosupplementation with hyaluronan is as effective as NSAIDs for improving resting pain and may provide superior relief from pain with physical activity (recommendation strength A).[56] Intra-articular injections are usually completed as a series of 3 to 5 injections with benefits lasting 12 weeks or longer.[56] Two hyaluronan compounds (high molecular weight and low molecular weight) with no appreciable difference in efficacy are commercially available (recommendation strength A).[57] Acupuncture has also been shown to have benefits in relieving chronic symptoms in limited studies (recommendation strength B).[58]

Education and Behavior Changes

Education on what to expect from the disease has been shown to improve outcomes in chronic disease states, including arthritis (recommendation strength B).[59,60] Behavior changes, such as positioning, work pacing, and diet leading to weight loss, may improve symptoms. Depression is often a component of a disabling illness, and psychologists or psychiatrists can help patients learn to cope with chronic disease.

Referral

Prompt referral should be made whenever there is concern about the diagnosis, discomfort in prescribing certain medications, or minimal progress with the treatment plan. When inflammatory arthritis is diagnosed or suspected, immediate referral to a rheumatologist is recommended for confirmation of diagnosis and initiation of disease-modifying antirheumatic drug therapy. Physical medicine and rehabilitation specialists are specifically trained to help maximize physical function and quality of life if this is an issue. Significant disability should prompt referral to an orthopedic specialist for evaluation of possible joint replacement or debridement. Pain clinics may provide assistance with medication management.

Conclusions

Joint pain is a common complaint presented by patients in the family physician's office. Appropriate evaluation should seek to identify urgencies and emergencies. A warm, red, effusion warrants consideration of arthrocentesis to make an accurate and timely diagnosis, which allows definitive treatment. Pain medications, including opioids, NSAIDs or COX-2 inhibitors, and acetaminophen, are used depending on the severity of the pain. In addition, NSAIDS or COX-2 inhibitors are often used in conjunction with pain medications to limit swelling, thus improving pain. Adjunctive medications may be needed for treatment of specific diagnoses. Physical modalities may help greatly with pain control by limiting motion and swelling of the affected joint. Education and behavior changes may

allow the patient to continue activity in a modified fashion and to prevent reinjury.

We thank the FP-PEP group for valuable insights, Ed Bope, MD, for tireless help with organization and revisions, and Julia Crim, MD, for assistance with the radiology information.

References

1. Fauci A, Braunwald E, Isselbacher K, et al, editors. Harrison's principles of internal medicine. 14th ed. New York: McGraw-Hill Professional; 1998.
2. Isselbacher K, Martin J, Braunwald E, et al, editors. Harrison's principles of internal medicine. 13th ed. New York: McGraw-Hill Professional; 1994.
3. Prevalence of self-reported arthritis or chronic joint symptoms among adults—United States, 2001. MMWR Morb Mortal Wkly Rep 2002;51:948–50.
4. Gerber J, Williams G, Scoville, C, Arciero R, Taylor D. Persistent disability associated with ankle sprains: a prospective examination of an athletic population. Foot Ankle Int 1998;19:653–60.
5. Stange KC, Zyzanski SJ, Jaen CR, et al. Illuminating the 'black box,' a description of 4454 patient visits to 138 family physicians. J Fam Prac 1998;46:377–89.
6. Lawrence R, Helmick C, Arnett F, et al. Estimates of the prevalence of arthritis and selected musculoskeletal disorders in the United States. Arthritis Rheum 1998;41:778–99.
7. Reeder MT, Dick BH, Atkins JK, Pribis AB, Martinez JM. Stress fractures. Current concepts of diagnosis and treatment. Sports Med 1996;22:198–212.
8. Littman K. A rational approach to the diagnosis of arthritis. Am Fam Physician 1996;53:1295–310.
9. Richie AM, Francis ML. Diagnostic approach to polyarticular joint pain. Am Fam Physician 2003;68: 1151–60.
10. Klippel J, Weyand C, Wortmann R, editors. Primer on the rheumatic diseases. 11th ed. Atlanta (GA): Arthritis Foundation; 1997.
11. Barth WF. Office evaluation of the patient with musculoskeletal complaints. Am J Med;19:3S–10S.
12. Freed JF, Nies KM, Boyer RS, Louie JS. Acute monoarticular arthritis: a diagnostic approach. JAMA 1980;243:2314–6.
13. Till SH, Snaith ML. Assessment, investigation, and management of acute monoarthritis. J Accid Emerg Med 1999;16:355–61.
14. Learch TJ. Imaging of infectious arthritis. Semin Musculoskel Radiol 2003;7:137–42.
15. Roberts JR, Hedges JR, editors. Clinical procedures in emergency medicine. 3rd ed. Philadelphia: WB Saunders; 1998.
16. Little MP, Hawkins MM, Shore RE, Charles MW, Hildreth NG. Time variations in the risk of cancer following irradiation in childhood. Radiat Res 1991; 126:304–16.
17. Ron E. Cancer risks from medical radiation. Health Phys 2003;85:47–59.
18. Schmid MR, Pfirrmann CW, Hodler J, Vienne P, Zanetti M. Cartilage lesions in the ankle joint: comparison of MR arthrography and CT arthrography. Skeletal Radiol 2003;32:259–65.
19. McGonagle D, Conaghan PG, Wakefield R, Emery P. Imaging the joints in early rheumatoid arthritis. Best Pract Res Clin Rheumatol 2001;15:91–104.
20. Roberts CS, Walker JA 2nd, Seligson D. Diagnostic capabilities of shoulder ultrasonography in the detection of complete and partial rotator cuff tears. Am J Orthop 2001;30:159–62.
21. Stovitz, SD, Johnson, RJ. NSAIDS and musculoskeletal treatment: what is the clinical evidence? Phys Sportsmed 2003;31:35–52.
22. Wolfe MM. Risk factors associated with the development of gastroduodenal ulcers due to the use of NSAIDs. Int J Clin Pract Suppl 2003;135:32–7.
23. Recommendations for the medical management of osteoarthritis of the hip and knee: 2000 update. American College of Rheumatology Subcommittee on Osteoarthritis Guidelines. Arthritis Rheum 2000; 43:1905–15.
24. Guideline for the management of pain in osteoarthritis, rheumatoid arthritis and juvenile chronic arthritis. Glenview (IL): American Pain Society; 2002.
25. The management of persistent pain in older persons. American Geriatrics Society. J Am Geriatr Soc 2002; 50:6:1–20.
26. Pincus T, Swearingen C, Cummins P, Callahan L. Preference for nonsteroidal anti-inflammatory drugs versus acetaminophen and concomitant use of both types of drugs in patients with osteoarthritis. J Rheumatol 2000;27:1020–7.
27. Noble S, King D, Olutade J. Cyclooxygenase-2 enzyme inhibitors: place in therapy. Am Fam Physician 2000;61:3669–76.
28. Garcia Rodriguez L, Hernandez-Diaz S. The risk or upper gastrointestinal complications associated with nonsteroidal ant-inflammatory drugs, glucocorticoids, acetaminophen and combinations of these agents. Arthritis Res 2001;3:98–101.
29. Balano KB. Anti-inflammatory drugs and myorelaxants. Pharmacology and clinical use in musculoskeletal disease. Prim Care 1996;23:329–34.
30. Whitefield M, O'Kane CJ, Anderson S. Comparative Efficacy of a proprietary topical ibuprofen gel and oral ibuprofen in acute soft tissue injuries: a randomized, double-blind study. J Clin Pharmacol Ther 2002;27:409–17.
31. Heyneman CA. Topical nonsteroidal anti-inflammatory drugs for soft tissue injuries. Ann Pharmacother 1995;29:780–2.
32. Buchbinder R, Green S, Youd JM. Corticosteroid injections for shoulder pain. Cochrane Database Syst Rev 2003;(1):CD004016.

33. Cardone DA, Tallia AF. Joint and soft tissue injection. Am Fam Physician 2002;66:283–8, 290.
34. Nelson KH, Briner W, Cummins J. Corticosteroid injection therapy for overuse injuries. Am Fam Physician 1995;52:1811–6.
35. Anon. Effective management of gout often requires multiple medications. Drug Ther Perspect 2001;27: 8–12.
36. Rott KT, Agudelo CA. Gout. JAMA 2003;289: 2857–60.
37. Fam AG. Treating gouty arthritis with selective COX-2 inhibitors. BMJ 2002;325:980–1.
38. Harris MD, Siegel LB, Alloway JA. Gout and hyperuricemia. Am Fam Physician 1999;59:925–34.
39. Broy SB, Schmid FR. A comparison of medical drainage (needle aspiration) and surgical drainage (arthrotomy or arthroscopy) in the initial treatment of infected joints. Clin Rheum Dis 1986;12:501–22.
40. The management of septic arthritis. Drug Ther Bull 2003;41:65–8.
41. Wiffen P, Collins S, McQuay H, Carroll D, Jadad A, Moore A. Anticonvulsant drugs for acute and chronic pain. Cochrane Database Syst Rev 2000;(3): CD001133.
42. Rains C, Bryson HM. Topical Capsaicin. A review or its pharmacological properties and therapeutic potential in post-herpetic neuralgia, diabetic neuropathy and osteoarthritis. Drugs Aging 1995;7:317–28.
43. Bell AJ, Duggin G. Acute methyl salicylate toxicity complicating herbal skin treatment for psoriasis. Emerg Med 2002;14:188–90.
44. Ruane R, Griffiths P. Glucosamine therapy compared to ibuprofen for joint pain. Br J Community Nurs 2002;7:148–52.
45. Richy F, Bruyere O, Ethgen O, Cucherat M, Henrotin Y, Reginster J. Structural and symptomatic efficacy of glucosamine and chondroitin in knee osteoarthritis: a comprehensive meta-analysis. Arch Intern Med 2003;163:1514–22.
46. Sindrup S, Jensen T. Efficacy of pharmacological treatments of neuropathic pain: an update and effect related to mechanism of drug action. Pain 1999;83: 389–400.
47. Mirkin G, Hoffman M. The sportsmedicine book. Boston: Little Brown Co; 1978.
48. Pioro MH, Mandell BF. Septic arthritis. Rheum Dis Clin North Am 1997;23:239–58.
49. Thornton JS. Pain relief for acute soft-tissue injuries. Phys Sportsmed 1997;25:108–14.
50. Eiff MP, Smith, AT, Smith GE. Early mobilization versus immobilization in the treatment of lateral ankle sprains. Am J Sports Med 1994;22:83–8.
51. Micheli LJ. Thromboembolic complications of cast immobilization for injuries of the lower extremities. Clin Orthop 1975;(108):191–5.
52. Preslar AJ, Heckman JD. Emergency department evaluation of the swollen joint. Emerg Med Clin North Am 1984;2:425–40.
53. Kovar P, Allegrante J, MacKinzie C, Peterson M, Gutin B, Charlson M. Supervised fitness walking in patients with osteoarthritis of the knee. A randomized, controlled trial. Ann Intern Med 1992;116: 529–34.
54. Gaffney K, Ledingham J, Perry J. Intra-articular triamcinolone hexacetonide in knee osteoarthritis: factors influencing the clinical response. Ann Rheum Dis 1995;54:379–81.
55. Zuber T. Knee joint aspiration and injection. Am Fam Physician 2002;66:1497–500.
56. Petrella R, DiSilvestro M, Hildebrand C. Effects of hyaluronate sodium on pain and physical functioning in osteoarthritis of the knee: a randomized, double-blind, placebo controlled clinical trial. Arch Intern Med 2002;162:292–98.
57. Lo G, Lavelley M, McAlindon T, Felson D. Intra-articular hyaluronic acid in treatment of knee osteoarthritis: a meta-analysis. JAMA 2003;290:3115–21.
58. Ezzo J, Hadhazy V, Birch S, Lao L, Kaplan G, Hochberg M, Berman B. Acupuncture for osteoarthritis of the knee: a systematic review. Arthritis Rheum 2001;44:819–25.
59. Lorig K, Lubeck D, Kraines R, Seleznick M, Holman H. Outcomes of self-help education for patients with arthritis. Arthritis Rheum 1985;28:680–5.
60. Hirano PC, Laurent DD, Lorig K. Arthritis patient education studies, 1987–1991: a review of the literature. Patient Educ Couns 1994;24:9–54.