THE ROLE OF PHYSICAL THERAPY AND PHYSICAL MODALITIES IN PAIN MANAGEMENT

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This article discusses a variety of physical modalities with specific reference to effectiveness in reducing arthritis-related pain. As the practitioner considers selection of a specific modality, two facts must be remembered: the physiologic component of pain may be of musculoskeletal origin (muscle spasm, restricted movement, joint derangement, biomechanical stress, activity-related injury) and from the disease itself (metabolites, immune exudates, effusion), and physical relief of pain of musculoskeletal origin is short lived at best, unless accompanied by some form of exercise that alters the source of the pain. A multidisciplinary team should be available to evaluate pain and function and to recommend appropriate therapy. Each team member brings a particular body of knowledge and competencies, addressing only particular aspects of the complex problems faced by the person with arthritis. Therefore, the care of a person with arthritis requires the coordinated efforts of a number of health professionals, including occupational and physical therapists.

Each health profession approaches arthritis care with its own objectives and clinical tools. The goals of physical therapy in the care of the person with arthritis are to (1) relieve pain, (2) decrease impairment, (3) improve or maintain function, (4) prevent or minimize disability, both primary and secondary, and (5) educate the patient to be an effective

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self-manager.[2] Therapeutic effect is sought through the informed use of a variety of physical interventions in clinical and self-management settings. Pain relief becomes a primary objective when needed to allow the person with arthritis to engage in a therapeutic exercise program, sleep more comfortably, function more successfully, or maintain adequate levels of physical activity during the course of the day. Arthritis pain management may be the primary goal of treatment, or it may occur as the consequence of other therapeutic interventions. This article presents the role of physical interventions in arthritis care, with a particular focus on pain management.

HEAT

Heat can provide analgesia, promote relaxation, reduce muscle spasm, and enhance flexibility of muscle and periarticular structures.[58] Superficial heat can be delivered by radiation (light) or conduction (hot pack, paraffin, water). Diathermy and ultrasound are sources of deep heat. In a physical therapy program, heat is generally used in combination with other interventions, most commonly exercise. Superficial, local heat is the most commonly used thermal agent in clinical and self-care settings.[12] Pain reduction has been documented in trials of two common forms of superficial heating, hydrotherapy[28] and paraffin[14, 33]; however, the relevant clinical information from these studies is that heat alone produces only short-term, immediate pain relief. When heat was combined with an active exercise program (range of motion and strengthening), pain relief was greater and longer lasting, strength and function improved, and stiffness was reduced.

In a controlled trial of paraffin with and without exercise for patients with RA,[14] paraffin without exercise produced immediate short-term pain relief, whereas exercise, with or without paraffin, produced a significant reduction of pain and stiffness, and increased function. The groups receiving paraffin were the only ones to report less pain immediately after treatment, and the group which received paraffin and exercise showed the most improvement in grip strength. Evidence supports the application of superficial heat before an exercise session to optimize benefit. Experience suggests that acceptance of and benefit from an exercise regimen may be enhanced when pain and discomfort are reduced before the activity.

Deep heat in the form of diathermy (shortwave, microwave) and ultrasound requires professional application and is available only in a clinical setting. Although ultrasound (US) has been used in musculoskeletal conditions for a while, a 1990 review of US research in arthritis concluded that effectiveness could not be confirmed for either pain relief or increased motion.[20] In recent controlled trials, US was no better than placebo in an exercise program for knee osteoarthritis (OA),[19] and produced no improvement in pain or function in lateral epicondylalgia.[27]

Some studies have reported increased pain with deep heat. Continu-

ous US increased postexertional muscle soreness[7] and pain in traumatized soft tissue.[35] In a study comparing relative efficacy of US, short wave diathermy (SWD), and galvanic current in hip and knee OA, most patients and physicians judged the benefits to be similar; however, SWD was the only agent associated with worsening of symptoms.[76] In a similar study with RA and OA patients, SWD, paraffin, infrared light, and electrical stimulation were studied, all used with a therapeutic exercise program. Similar improvements in motion were achieved in all groups. Pain was not reported.[30]

There is little scientific evidence that deep heat contributes to pain relief or improves exercise outcomes in arthritis. In addition, economic considerations for optimal use of resources and a philosophy of self-management and self-care discourage the prescription of deep heat in a treatment regimen.

COLD

Cooling has a local analgesic effect and reduces inflammatory responses and muscle spasm. The analgesic effect may arise from altered neural transmission, reduced muscle spasm, altered blood flow to muscle and nerve, or increased endorphin production.[59] Cold is applied by cold packs, ice massage, immersion, or vapocoolant sprays. There is no indication that a particular type of cold application consistently produces superior results.

In the treatment of arthritis, pain relief, reduction of muscle spasm, and management of overuse injuries are the principal uses for cold therapy. Cold seems to be effective and well tolerated. Cold packs applied three times a day for 1 month to one knee of patients with RA produced a decrease in self-reported pain and increased motion in the treated knee. Patients also reported improved sleep and decreased use of analgesic medications. There were no differences in synovial fluid composition between the treated and untreated knees.[41] In knee OA, cold provided significant pain relief earlier than heat.[8] Following total knee arthroplasty, cold application produced a significant decrease in knee swelling; however, cold was no better than heat or placebo for pain reduction or knee motion.[37]

Superficial heat and cold have similar positive effects on pain in OA and RA, but, there is no convincing evidence that either alters immunologically controlled inflammatory processes.[41, 53] Pain reduction from these modalities is most likely caused by its effect on common sources of pain, muscle spasm, and activity-related trauma associated with biomechanical stress, shortened soft tissue, and fibrosis. Both seem to be equally acceptable and effective in reducing pain and improving function when used in conjunction with an exercise program.[42, 82] An advantage of cold is its more immediate analgesic effect[8] and reduction of post-traumatic inflammation and edema when applied shortly after an injury[10] or surgical procedure.[37] Heat holds the advantage of produc-

ing an increase in connective tissue extensibility and promoting relaxation.

TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION

Transcutaneous electrical nerve stimulation (TENS) is widely accepted as an effective method of pain control for a number of chronic and acute conditions. The major biophysical effect is stimulation of afferent nerve fibers that transmit or inhibit noxious input through the spinal cord to the brain.[31] The initial rationale for TENS application arose from the gate control theory of pain. More recent research has proposed that TENS also stimulates the sympathetic nervous system and brain stem nuclei to produce endorphins[31, 47] and may inhibit arthritis-related inflammation.[19]

In RA, pain reduction, improved hand function, and minimal adverse reactions have been reported for TENS.[1, 47, 54] Effectiveness in OA is less clear. Controlled trials have reported significant pain relief,[78] longer duration of pain relief, and no benefit above placebo.[50] A study of TENS for reduction of acute postoperative knee pain, including total joint arthroplasty, found that TENS-treated patients showed improved function, used less analgesic medication, and had shorter hospital stays.[34] TENS also has shown effectiveness for pain reduction in patients with ankylosing spondylitis.[25] Conversely, in a study of TENS in chronic low back pain, Deyo and colleagues found TENS provided no additional benefit to a home exercise program.[15]

Published reports of TENS suggest it is effective for reduction of inflammatory and traumatic pain in peripheral joints. This is possibly explained by a local anti-inflammatory effect. In an animal model of acute arthritis, the TENS-stimulated joint exhibited a significant reduction in intra-articular pressure, synovial fluid volume, total leukocyte count, and an absence of inflammatory exudate compared with the untreated joint.[19]

Findings have not supported claims that more recent TENS technology or remote stimulation produce superior results.[48, 54] High-frequency or burst-mode TENS seems to provide relief lasting from 2.5 to 18 hours and are the most appropriate modes for pain reduction[36] in arthritis. Most reports of efficacy have come from studies using conventional frequency and wave form TENS at a submotor amplitude to produce a paresthesia or tingling sensation within the painful area.[22] A major advantage of TENS is its applicability to a home program and patient control of the treatment schedule. The effectiveness of TENS depends on proper instruction and monitoring of its use.

TOPICAL APPLICATIONS

Application of ointments to painful joints and muscles is a traditional self-management practice. Pain relief from the traditional prepara-

tions may be due to a chemically produced counterirritant effect, to the beneficial effects of massage, or to the power of placebo.[61] There is also current interest in topical applications that contain active ingredients intended to achieve neuromodulation effects.

Capsaicin, an alkaloid derived from plants of the nightshade family, produces an analgesic effect through its action as a depletor of substance P from central and peripheral neurons. In a double-blind randomized study, 70 patients with OA and 31 patients with RA applied capsaicin or placebo to painful knees four times a day. Patients with RA reported a 57% reduction in pain compared to OA patients who reported 33%. The placebo effect in the RA and OA groups was 32% and 16%, respectively.[13] In a well-controlled study of hand pain, 7 patients with RA and 14 with OA used capsaicin for 4 weeks. Results showed significant decreases in tenderness and pain in OA, but not in RA. There were no improvements in functional measures in either group.[56] The therapeutic effect of capsaicin depends on regularly scheduled applications. It is not effective if applied symptomatically as other traditional ointments and creams. The patient should be informed of the initial side effects of tingling and burning and he or she must understand the rationale for use.

The subdermal delivery of topically applied anti-inflammatory agents includes both phonophoresis and iontophoresis. Iontophoresis uses direct current and phonophoresis uses ultrasound to introduce topically applied medications below the level of the skin. Although these procedures are used clinically for treatment of soft-tissue inflammation and pain, most reports of effectiveness have come from case studies and uncontrolled trials. In a controlled trial of iontophoresis with diclofenac sodium for shoulder and elbow tendinitis, a month of treatment produced significantly better pain reduction than placebo. The placebo group, however, also showed significant pain reduction.[60] In a randomized trial of phonophoresis with trolamine salicylate to decrease delayed onset muscle soreness, the phonophoresis group was not different in pain reduction or range of motion than the groups which received various combinations of sham phonophoresis. In fact, the group that received active ultrasound and placebo cream exhibited an increase in muscle soreness.[7]

LOW-ENERGY LASER

Lasers are a source of radiant energy with distinctive properties. High-power lasers produce biological effects through heat and are used for surgical procedures. Low-energy or cold lasers produce no thermal response and are used as physical agents for pain control and tissue healing. The biophysical effects of laser irradiation are not well described.

Low-energy lasers have been studied in RA and OA. In studies of laser treatment to metacarpal and phalangeal joints of persons with

RA, significant improvements in pain and strength and reduction in circulating immune complexes were reported by Goldman and colleagues[26]; whereas several other well-controlled studies reported no significant improvements.[5, 28, 38, 40] Laser treatment of thumb OA showed no benefit over placebo for pain reduction, joint tenderness, or hand function[3]; however, a study comparing active and placebo lasers in treatment of patients with knee OA reported significant improvement in pain and function in both laser-treated groups but not in placebo.[72] A meta-analysis of the evidence of laser efficacy in musculoskeletal pain management concluded that use of laser treatment cannot be recommended.[4]

EXTERNAL DEVICES

Compression gloves have been theorized to decrease pain and improve function by decreasing swelling in the fingers. In two controlled studies with RA patients, compressive gloves significantly improved subjective symptoms (morning stiffness, pain, and nighttime throbbing), compared with controls who wore noncompressive gloves.[11, 66] Although there was a measurable decrease in finger joint circumference, there was no measurable difference in hand volume, grip strength, pinch strength, or dexterity; most patients did not elect to continue wearing the gloves. It has been suggested that the positive effects of compression gloves indicate trial use. When hand or finger swelling is present, nighttime or 24-hour glove compression may provide symptomatic relief in some patients.[66]

The use of elastic wrist extensor orthoses to decrease pain and increase function in RA has been investigated several times with varying results, which may relate largely to individual preferences and functional needs. Nordenskiöld found that 22 women with serpositive RA who wore an elastic wrist brace reported reduced pain and improved grip strength.[65] Kjelen and colleagues also found that wrist orthoses improved grip and pinch strength by 25% and 12%, respectively, with a 50% decrease in pain.[43] A study designed to compare three types of commercial wrist splints reported reduced grip strength when first applied, and after a week of use, grip strength returned to normal in only one of the designs. The investigators concluded that commercial wrist orthoses reduced manual dexterity similarly and significantly, although they did recognize a significant learning effect, mentioning that longer-term use might reduce awkwardness.[75] A variety of factors seemed to influence patient satisfaction or dissatisfaction: adjustability; overall length of orthosis; padding that produces warmth; edges causing chafing; durability; color; slick or hard palmar components affecting grip; and degree of interference with clothing. Patients were able to select a preferred orthosis within a few minutes of wear and investigators suggested that several options should be available for brief functional testing before selection. Early referral to occupational therapy for assessment of hand function, pain, and joint integrity is recommended. The occupational therapist is

the best-suited health professional to determine needs and to recommend appropriate orthotics, exercise, and joint protection techniques.

Shoes and shoe inserts such as orthotics, heel pads, and lifts, can provide considerable relief of pain and improve gait. Viscoelastic materials used for shoe soles and insoles decrease the shock of heel strike measured at the proximal tibia by 42% at a walking speed of 2.4 mph (4 kph).[51, 81] These materials are incorporated in commercially available shoe insoles orthotics and may be obtained in athletic shoe departments. A controlled trial of the effect of off-the-shelf orthopedic footwear (P.W. Minor & Son, Inc., Batavia, New York, Xtra Depth shoes) for people with RA and at least one year of foot pain studied changes in pain, gait, and physical function after 2 months of wearing the extra depth shoe. The footwear group improved significantly on self-reported disability, weightbearing and nonweightbearing pain, and gait.[23] In addition to extra depth in the shoe toe box, these shoes also have an extended counter that increases rear foot stability and arch support and a padded heel collar for improved fit. In this study, it was found that walking pain accounted for 75% of the physical function level.

When hip OA is present, cane use is recommended for pain reduction and joint protection during disease flares. Proper use of a cane to protect the hip joint requires that the cane be held in the hand opposite the hip to be protected then advanced in a reciprocal gait pattern, and the weightbearing occurs simultaneously on the cane and involved lower extremity. Proper use of a cane can decrease hip joint pressure by up to 50%.[63]

EXERCISE

Persons with arthritis demonstrate limited range of motion, decreased muscle strength and endurance, abnormalities in gait and posture, functional limitations, and general deconditioning.[60] Appropriate regular exercise can improve deficits in these areas and reduce pain, fatigue, and depression. Therapeutic exercise is prescribed for the person with arthritis to reduce impairment (range of motion and flexibility, muscular function, pain, fatigue); maintain or improve function (activities of daily living, locomotion, balance); and to prepare for safe participation in adequate levels of regular exercise or physical activity needed for cardiovascular health and general fitness.

The evidence supporting various modes of exercise in the comprehensive care of arthritis is growing rapidly, providing information necessary to guide practice and decision making. Dynamic exercise, resisted and nonresisted, can improve range of motion, strength, endurance, function, and gait without exacerbation of disease or increased joint symptoms.[18, 24, 74] Regular joint motion and intermittent weight bearing seem to protect cartilage and bone, whereas joint immobilization leads to cartilage and periarticular tissue weakening and related pathologic

conditions.[39, 57] Some positions and muscular activity can momentarily increase joint pressure; however, these pressure increases occur with static rather than dynamic activities. For example, in persons with knee joint effusions, prolonged isometric contraction of the quadriceps and extreme knee flexion can increase intra-articular pressure,[57] and maximal contraction of muscle around the joint can increase hip joint contact pressure.[16]

In addition to traditional recommendations for aquatic exercise and stationary bicycling, weight-bearing exercise, such as walking and low-impact aerobic dance, can be performed safely by persons with symptomatic weight-bearing joints. Improvements in flexibility, strength, endurance, function, cardiovascular fitness, and general health status with no aggravation of symptoms have been documented.[18, 24, 45, 62, 67] In persons with rheumatoid arthritis, clinically meaningful reduction in joint swelling has been reported in a number of aerobic exercise studies.[62, 67]

Some weight-bearing activities do increase joint loading and probably should be avoided or minimized in the presence of joint inflammation, swelling, or pain. Stair descent and ascent and carrying loads greater than 10% of body weight significantly increase loading of the hip[63]; faster walking speeds increase biomechanical stress at the knee.[70] Although walking does not increase intra-articular pressure in a healthy knee joint, pressure during walking does increase in effused knees. A recent report of exercise effects on synovial blood flow in effused knees, however, demonstrated that dynamic exercise (cycling and walking) improved circulation, whereas isometric contraction of the quadriceps did not.[39]

There is no doubt that participation in a regular, appropriate exercise program and daily life that includes adequate levels of physical activity are important and effective for people with arthritis. The choice of exercise mode, levels of duration, frequency and intensity, and proper instruction and feedback are crucial if the initial exercise experience is to be successful. Referral to a health professional whose expertise is exercise and patient education can increase the likelihood that the exercise recommendation will be appropriate, effective and maintained. Exercise can be categorized broadly as (1) flexibility and range of motion exercise, (2) muscle conditioning exercise, and (3) aerobic exercise. Each type has a place in the exercise regimen of a person with arthritis. The key to a successful client-centered exercise program is one that makes sense to the patient, produces meaningful changes or benefits, and is reasonable to perform. Professional consultation and follow-up is necessary.

Range-of-Motion and Flexibility Exercise

In arthritis, active and active self-assisted exercise is recommended to relieve stiffness, increase or maintain joint motion, and increase length and elasticity in muscle and peri-articular tissues. During acute joint

inflammation, joint motion should be maintained with at least one complete range-of-motion (ROM) exercise daily. It is important not to overstretch inflamed tissues, because tensile strength can be reduced by as much as 50% and tears and overstretching can occur. Application of cold or heat prior to exercise may be beneficial for pain reduction. When joint symptoms are subacute or chronic, range-of-motion and flexibility goals can include increasing range with gentle, controlled stretching.

Active range-of-motion exercise can produce benefits and maintain flexibility and joint motion. Gentle range-of-motion exercise performed in the evening can significantly reduce morning stiffness for persons with rheumatoid arthritis.[6] An exercise program of active exercise and relaxation (the ROM dance program) has shown significant improvements in self-reported function and pain.[79]

Muscle Conditioning Exercise

Decreased muscle function (strength, endurance, power) in persons with arthritis arises from a number of sources: intra-articular and extra-articular inflammatory disease processes; side-effects of medication; disuse; reflex inhibition in response to pain and joint effusion; impaired proprioception; and loss of mechanical integrity around the joint.[71] Muscle conditioning programs can be effective for improving strength, endurance, and function without exacerbating pain or disease activity.[9, 17, 18, 21, 44, 52, 68] In fact, knee-strengthening exercise in knee OA is an effective method to reduce pain. Strengthening may be achieved with a number of methods, the main distinction being isometric or dynamic modes.

Isometric Exercise

Initially, isometric exercise may be indicated to provide improved muscle tone, static endurance, and strength, and prepare joints for more vigorous activity. Isometric exercise is muscle contraction without joint movement. Isometric contractions can increase strength significantly. Successful isometric regimens include contractions at several combinations of muscle length and joint angles.[21] Although isometric exercise does avoid the concern of joint motion and mechanical irritation, it can produce other unwanted effects. Isometric exercise at more than 40% maximal voluntary contraction constricts blood flow through the exercising muscle. Restricted circulation in the muscle can generate unnecessary postexercise muscle soreness, and the increased peripheral vascular resistance produces increased blood pressure. In the knee and hip, high-intensity isometric contraction increases intra-articular pressure.[39, 77] Instructions to a patient for isometric exercise should include the following: contract at no more than two thirds of the maximal voluntary contraction; hold for 6 seconds, and repeat five to ten times per day;

exhale during the contraction and inhale during a similar time period of relaxation; and do not contract more than two muscle groups at a time.

Dynamic Exercise

Dynamic exercise is repetitive muscle contraction and relaxation involving joint motion and changes in muscle length. Muscle strengthening is achieved when resistance (physiologic overload) is supplied by weight of the body part or by external resistance in the form of free weights, elastic bands, or a variety of resistive exercise equipment.

Pain and poor muscle strength are major factors associated with disease progression and disability in persons with knee OA.[55, 71] Progressive resistive strength training consistently produces positive results in pain and function[9, 18, 21, 69] in these patients. Progressive resistance training performed in supervised and unsupervised settings has demonstrated significant increases in strength and function among persons with RA.[41, 52, 68] Determination of an appropriate resistance and training schedule, attention to joint protection, monitoring for overexertion, and patient education are crucial components for a safe and effective dynamic exercise program.

Aerobic Exercise and Physical Activity

Contemporary knowledge of the health benefits of regular, moderate exercise has encouraged aerobic exercise research in rheumatology. This research indicates that many people with arthritis, although markedly deconditioned, can participate in aerobic exercise regularly and vigorously enough to improve health and function without exacerbation of disease.[18, 24, 62, 67, 74]

In a study of physical training for persons with RA, Ekblom and colleagues found no difference between the exercise and control groups in activity-related pain during the initial exercise intervention; however, at 6-month follow-up, the exercise group reported less pain than the controls.[16] Similarly, 6 weeks of stationary bicycle training by women with RA resulted in decreased pain, increased pain tolerance, and less morning stiffness in the training groups.[32] Studies of dance-based aerobic exercise for persons with RA found that the aerobic exercise groups exhibited less general and articular pain, joint swelling, and depression.[67] A randomized trial of walking, aquatic, and range-of-motion exercise for persons with RA or OA showed that the walking and range-of-motion groups reported a significant decrease in general pain whereas the aquatic group reported a significant decrease in morning stiffness and number of clinically active joints.[62] Persons with knee OA who participated in fitness walking studies reported significantly less pain and improved function and aerobic power as compared with those who did not exercise.[45, 74] In all of these studies, exercise subjects trained at

levels sufficient to produce improvements in various aspects of physical fitness and self-reported health status (physical activity, mobility, social activity, depression, and pain) relative to controls.

Pain and Exercise

Pain can be assessed in a number of ways: as a general experience, with respect to performance of a specific physical activity, or by the impact pain has on performance of daily activities. The apparent effect of exercise on arthritis-related pain depends to some extent on the questions used to assess pain. Research in exercise and arthritis has found improvement and no improvement in general pain following a course of exercise. Studies that have assessed pain in relation to the performance of specific activities have documented significant reductions in pain with exercise. A study that compared outcomes from exercise programs for persons with RA who were instructed either to use pain as an exercise guide or to set exercise goals and not consider pain, found that the goal-setting group increased exercise performance and reported less pain than the pain-attention group.[73] A consistent finding in exercise research in arthritis is improvement in function and physical activity levels without increased pain or arthritis symptoms. Furthermore, of all the physical modalities, exercise appears to be the most consistently effective in reducing pain.[61]

The most common pain reports at the beginning of an exercise program arise from delayed-onset muscle soreness and overstretching. Both are situations that can be corrected in subsequent exercise sessions. Overuse of the joint is usually accompanied by swelling, heat, and pain. Immediate treatment consists of ice, elevation, and rest to reduce the swelling; modification of the exercise regimen to avoid re-injury; and implementation of appropriate exercise to condition the joint for future activity. Increased joint pain in weight-bearing joints most often follows periods of prolonged standing, fast walking, or walking on uneven ground. Planned periods of nonweight bearing, slower walking speeds, use of shock absorbing footwear, and walking on level surfaces can be helpful.

Exercise Adoption and Maintenance

The most important requirements for the successful adoption and maintenance of an exercise routine include consultation between the patient and a knowledgeable health professional to: (1) assess current fitness and exercise status, (2) establish meaningful goals, (3) develop a reasonable program, (4) establish strategies for periodic review and revision, and (5) teach self-management skills. For people with few involved joints, mild disease, and recent onset, this process is fairly straightforward. For people with multiple-joint involvement, fluctuating

or severe disease, and functional loss, the decision making is more complex.

Both the health care provider and the person with arthritis need measures of success. Effectiveness can be evaluated with measures of disease activity, such as joint swelling or stiffness; with measures of impairment, such as range of motion, strength, endurance, pain, or fatigue; or functional assessments, such as gait, activities of daily living, or depression. It also may be reasonable for an exercise program to affect physical activity levels, occupational performance, or social factors. When the exercise recommendation is based on clear goals important to both the health professional and patient, and the program is designed to achieve those goals, the choice of evaluation tools is relatively straightforward. When and how often to evaluate outcomes are important considerations and should be based on sound reasoning about when and what changes can be expected.

The person with arthritis must be able to make the day to day decisions about exercise adaptation and modification. Pain, joint swelling, and fatigue are good markers to use in this decision making; they are important, well-known experiences to the individual and have clinical relevance. Increases in pain, swelling, or fatigue may indicate increased disease activity, overexertion in the exercise program, or aggravation of symptoms from other daily activities. In any case, the appropriate initial response is modification of current exercise until the problem subsides or additional treatment is undertaken. Self-management skills in this area are essential for exercise maintenance. At the same time, the person with arthritis should be able and encouraged to readily discuss changes in pain, swelling, and fatigue with a knowledgeable health care provider.

CONCLUSION

Arthritis is a chronic, often progressive disease, and care providers must be conscious of the potential trajectory of the disease and long-range outcomes. Most individuals seek care when pain interferes with function and social roles; thus, clinical care focuses on resolution of the immediate crisis, and pain reduction is usually a major therapeutic goal. Resolution of acute pain is only one aspect of pain management, however, and pain management is only one component of comprehensive care and rehabilitation. The physical measures used in arthritis, aimed at decreasing impairment and improving function, often provide pain relief both as an adjunct to a successful treatment session and as an independent treatment goal. Pain reduction is an important outcome and process measure. Pain reduction within the therapeutic process, to allow or encourage exercise and activity, is an important event and may contribute to overall therapeutic benefit.

No one health care provider can be a knowledgeable expert about all facets of comprehensive care; however, care providers can understand

when and to whom to refer when additional or specialized services are required. A commitment to education, interdisciplinary communication, and a firm stance on the importance and effectiveness of self-management will enable the person with arthritis to find his or her way to the appropriate resource at the optimal time.

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