

# **The role of Exercise, Education, Assistive Devices, and Occupational/Physical Therapies in Rheumatoid Arthritis.**

**Rheumatoid arthritis (RA)** is the most common form of autoimmune arthritis. About 75% of RA patients are women. In fact, 1 – 3% of women may get rheumatoid arthritis in their lifetime. The disease most often begins between the ages of 30 and 50. However, RA can start at any age.

An external trigger (eg, cigarette smoking, infection, or trauma) that triggers an autoimmune reaction, leading to synovial hypertrophy and chronic joint inflammation along with the potential for extra-articular manifestations, is theorized to occur in genetically susceptible individuals. In most patients with RA, onset is insidious, often beginning with fever, malaise, arthralgias, and weakness before progressing to joint inflammation and swelling.

## **Goals of rehabilitation for RA patients include the following:**

- Relief of pain
- Improvement in range of motion (ROM)
- Enhancement of strength and endurance
- Prevention or correction of deformities
- Provision of counseling and educational services
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**Non pharmacologic therapeutic modalities** that are available to the physiatrist to assist patients in achieving these goals include the following:

- Splints and orthotics
- Assistive equipment
- Joint-protection and energy-conservation techniques
- Education
- Therapeutic exercise programs

## **Heat and cold therapies**

Application of heat, either superficial or deep, is an effective modality for the relief of joint pain and stiffness caused by RA. In addition, it is used to treat joints in preparation for ROM, stretching, and muscle-strengthening exercises. Superficial and deep heating methods have been shown to raise the intra-articular temperature in patients with RA.

Heat may be delivered via the following:

- Moist hot packs
- Electric mittens
- A hot shower
- Spas
- Ultrasonography
- Diathermy
- Paraffin

Cold is preferable for treatment of an acutely inflamed joint.

Application of cold results in decreased pain and decreased muscle spasm. Cold may be delivered via ice packs, ice sticks, topical sprays, or ice water.

### **Orthotics and splints**

Orthotic devices play an important role in the rehabilitation management of patients with RA. These devices are used to decrease pain and inflammation, improve function, reduce deformity, and correct biomechanical malalignment.

Lower-extremity orthoses are prescribed to provide stability and proper alignment or to shift weight-bearing off the affected limb. The most common orthoses used for the lower extremity involve the foot and ankle joints.

Approximately 80% of patients affected by RA have significant foot involvement. These problems are easily accommodated by providing a deep, wide, soft leather shoe. A metatarsal pad or bar is typically used to remove weight from painful metatarsophalangeal (MTP) joints, and a rocker-bottom sole can be used to facilitate rolloff.

Hindfoot pronation should be addressed with custom inserts.

Knee orthoses may be used to control the following problems:

- Edema
- Pain
- Patellar misalignment
- Hyperextension
- Collateral or cruciate ligament instability

### **Therapeutic exercise**

Fatigue and decreased endurance are frequent symptoms in patients with RA. When these patients are compared with age-matched subjects who do not have RA, a reduction in aerobic capacity and muscle strength is noted, both because of the disease itself and because of the lack of physical activity in these patients. Thus, exercise is an important part of rehabilitation management of RA.

Aerobic conditioning in affected patients (if tolerated) improves maximum oxygen uptake and decreases perceived exertion at submaximal workloads, reportedly without causing adverse effects in

the joints. In addition, patients undergoing long-term endurance training have been known to feel less isolated, to take less sick leave, and to develop improved function in activities of daily living (ADLs). Patients with well-controlled RA should be encouraged to engage in 30 minutes of daily aerobic exercise several times a week.

A 21-week study by Katz et al in 96 patients with RA found that providing a pedometer and step-monitoring diary, with or without a step target, increased activity levels and decreased fatigue. A control cohort that received education only showed a trend toward decreased steps.

Muscle atrophy often accompanies RA and is exacerbated by inactivity, bed rest, splints, and medications. Isometric exercises restore and maintain strength in affected patients without producing pain. Resistance exercises may be initiated when the isometric program has been well established and when the patient is free of pain

In a review addressing hand function in RA patients, O'Brien suggested that strengthening hand exercises could yield significant improvements in the overall functioning of patients with this disease. If surgery is not an option, medical management should be pursued in conjunction with rather thorough physical therapy in order to maintain and preserve hand function.

### **Occupational therapy**

Occupational therapy can be very useful for patients with RA. Occupational therapy is initiated to help patients achieve the following:

- Using joints and tendons efficiently without stressing these structures
- Decreasing tension on the joints with specially designed splints
- Coping with daily life through adaptations to the patients' environment and the use of different aids

An occupational therapist may work in conjunction with the physical therapist to ensure that patients are able to meet their goals. The occupational therapist may also assist in the recommendation and use of splints and orthotics, especially when the upper extremity is affected.

Upper-extremity orthoses may be classified as either static or dynamic. Static splints are used to support a weak or unstable joint, to rest a joint for pain relief, or to maintain functional alignment. Dynamic splints traditionally have been used to manage the postoperative hand, but they may also be used to increase manual dexterity. The most commonly used splints for the hand are the

finger-ring splint and the thumb-post splint. The functional wrist splint and the resting hand splint are commonly used for wrist splinting.

### **Adaptive equipment**

Many assistive devices are available to patients with RA and are used to maximize function, maintain independence, reduce joint stress, conserve energy, and provide pain relief. Equipment is available to assist patients with transfers, dressing, feeding, toileting, cooking, and ambulation. Physical and occupational therapists can assist with training in the use of adaptive equipment.

### **Joint-protection education**

Joint-protection education provides the patient with techniques and recommendations for preventing joint overuse and avoiding of biomechanical torques that excessively bend the joint.

The use of adaptive equipment is important. Other components of a good joint-protection program include the following:

- Maintenance of good posture
- Avoidance of overuse during inflammation
- Modification of tasks to decrease joint stress
- Use of appropriate splints

### **Energy-conservation education**

Fatigue is a major component of RA, and it is due to the systemic nature of the disease, as well as to the decreased cardiovascular endurance observed in patients with this inflammatory disorder.

The goal of energy conservation techniques is to save energy while maximizing function. Adaptive equipment is an essential part of this program. Other elements include maintaining joint ROM and strength, improving cardiovascular fitness, and taking short rest periods during the day. Every individual with RA should implement joint-protection and energy-conservation programs into his or her lifestyle.

Williams et al found that in older women with either RA or osteoarthritis of the lower limb, an individualized home program of balance-training exercise can improve balance and gait stability. In this study, 39 women (mean age, 69.3 years) underwent a 4-month program of balance exercises conducted by a physical therapist. Before exercise training, 64% of patients reported having had fallen during the previous 12 months, and 42% of patients had a moderate fall-risk score.

After the 4-month program, the patients demonstrated improvement on most balance measurements, including their fall-risk score and measurements of activity level, fear of falling, functional reach, and

step width. Improvements were also seen in patients' body mass index (BMI) and in their sit-to-stand rising index.

References available on request.

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