



ScienceDirect

Available online at [www.indianjrhumatol.com](http://www.indianjrhumatol.com) and  
[www.sciencedirect.com](http://www.sciencedirect.com)



## Review Article

## Principles of exercise in rheumatological disorders



Maheswarappa Bhirappa Mahadevappa

Department of Physical Medicine &amp; Rehabilitation, Sakra World Hospital, Bangalore, India

## A B S T R A C T

## Keywords:

Exercise  
 Rheumatologic disorders  
 Physical therapy  
 Strengthening

Exercise programs for patients with arthritis have been shown to produce a variety of benefits like increase and maintenance of range of motion, re-education and strengthening of muscles, increase in static and dynamic endurance, decrease in the number of swollen joints, enabling joints to function better biomechanically, increase the locomotor ability, increase the bone density, decrease in pain, increase in patients' overall function and well-being, decrease inflammation and increase in aerobic capacity. Patients value exercise prescription which is designed to improve function.

Copyright © 2014, Indian Rheumatology Association. All rights reserved.

## 1. Introduction

Arthritis commonly affects biomechanical integrity of joints and their surrounding structures, which results in decreased joint motion, muscle atrophy, weakness, joint effusion, pain, instability, energy in-efficient gait patterns, and altered joint-loading responses. Arthritic patients may lose muscle strength and bulk because of inactivity. A muscle can lose 30% of its bulk in a week and up to 5% of its strength a day when maintained at strict bed rest.<sup>1</sup> Other factors contributing to loss of strength are myositis, myopathy secondary to steroids, inhibition of muscle contraction due to joint effusion and direct effects of the disease itself on muscle. For example, in Rheumatoid arthritis (RA), some destruction of muscle fibers occurs as well as intermuscular and perimuscular adhesions, which may impair blood flow. Muscle fascicles adhere to one another, and the entire muscle may adhere to the intermuscular septum and perimuscular fascia causing inhibition of muscle contraction and normal movement in RA, polymyositis, SLE and systemic sclerosis resulting in weak, painful, and easily fatigable muscle and reduced strength.

Atrophic muscles around joints do not coordinate well are deficient in both static endurance and strength. There is decreased tone and increased spasm in muscle surrounding arthritic joints, resulting in less coordinated motion of the joint.

Exercise programs for patients with arthritis have been shown to produce a variety of benefits like increase and maintenance of range of motion, re-education and strengthening of muscles,<sup>2</sup> increase in static and dynamic endurance, decrease in the number of swollen joints, enabling joints to function better biomechanically, increase the locomotor ability, increase the bone density, decrease in pain, increase in patients' overall function and well-being, decrease inflammation and increase in aerobic capacity.

Exercise prescriptions should be designed to improve function, which patients value most. Once these goals are set, limits need to be established that preserve joint function and do not unduly fatigue inflamed muscle and joint structures. Exercise should be performed with proper joint support. An exercise program should be progressive. It should start with relieving pain of the involved joints with appropriate modalities, and/or pain medications. Once the patient is

E-mail address: [maheshbm12@yahoo.com](mailto:maheshbm12@yahoo.com).  
<http://dx.doi.org/10.1016/j.injr.2014.09.007>

0973-3698/Copyright © 2014, Indian Rheumatology Association. All rights reserved.

comfortable, a combination of stretching, strengthening, and fitness training should be initiated in a progressive manner. A program that shows results in terms of functional activity is best. Isometric exercise is usually the initial approach, with the addition of an Isotonic exercise program for muscle endurance and for strengthening if joints permit. Isotonic low-resistive and low-weight progressive resistive exercise, as well as low-force Isokinetic exercise can be used without damage.

## 2. Types of therapeutic exercise

### 2.1. Flexibility exercise

Arthritis, disuse, habitual or protective positioning (postures) and normal aging can affect flexibility of contractile (muscle and tendon and connective tissues) and non-contractile tissues (capsule, ligaments). Resultant joint stiffness and soft tissue shortening is relieved by regular range of motion (ROM) and stretching exercise.

### 2.2. Joint range of motion exercise

Range of motion exercise refers to activity aimed at improving movement of a specific joint. This motion is influenced by several structures: configuration of bone surfaces within the joint, joint capsule, ligaments, tendons, and muscles acting on the joint. It can be passive or active.

**Passive range of motion exercise:** Passive range of motion is movement applied to a joint solely by another person or persons or a passive motion machine. When passive range of motion is applied, the joint of an individual receiving exercise is completely relaxed while the outside force moves the body part, such as a leg or arm, throughout the available range. Passive exercise can be forced or non-forced (Fig. 1). Non-forced exercises are those used to help maintain normal joint motion and are usually kept within a painless range of motion. Forced passive exercises generally produce movement into tissue resistance and are associated with some discomfort by the individual called stretching.

Patients with acute joint flares should passively or actively move the acute joint through the range once or twice a day, to prevent motion loss. Sometime forced passive exercise may also increase intra-articular pressure in the presence of joint

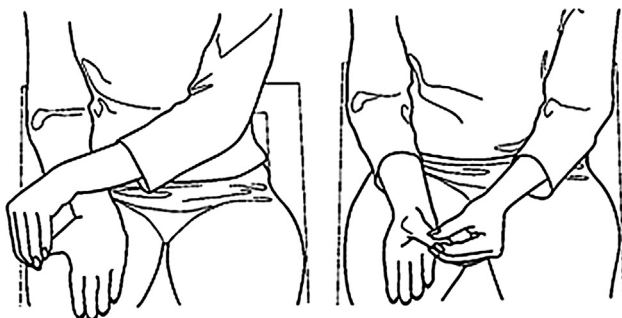


Fig. 1 – Passive range of motion exercise right MTP joint.

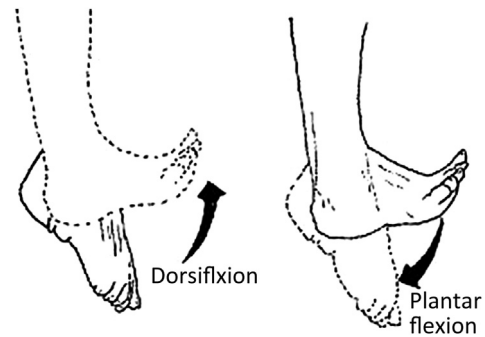


Fig. 2 – Active range of ankle motion.

effusion and has been associated with rupture of the joint capsule with large effusions.

**Active range of motion exercise:** Active range of motion is movement of a joint provided entirely by the individual performing the exercise (Fig. 2). In this case, there is no outside force aiding in the movement. Active assisted range of motion is described as a joint receiving partial assistance from an outside force. This range of motion may result from the majority of motion applied by an exerciser or by the person or persons assisting the individual. It also may be a half-and-half effort on the joint from each source. Active and active-assisted exercises are beneficial for moving the associated joints, regaining neuromuscular control of an affected extremity, and allowing the patient to have control over the exercise. Active exercise requires muscle activity, at least to some degree, during joint movement.

### 2.3. Stretching exercises

**Passive stretch:** Muscle passively lengthens. As the name implies, the muscle is being lengthened while in a passive state (i.e. not being stimulated to contract). An example of this would be the pull one feels in the hamstrings while touching the toes (Fig. 3).

Stretching may be used to prevent contractures and deformity and to maintain or restore ROM by breaking capsular adhesions. These exercises must be graded according to the degree of inflammation, pain and pain tolerance of the patient. Heat may be used to increase collagen extensibility and cold to decrease pain before stretching exercises.

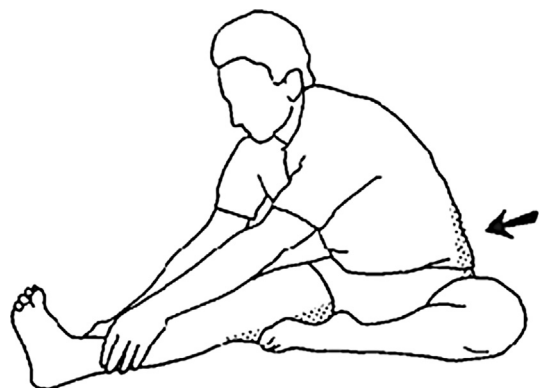


Fig. 3 – Passive self-stretching hamstring.

Download English Version:

<https://daneshyari.com/en/article/3356910>

Download Persian Version:

<https://daneshyari.com/article/3356910>

[Daneshyari.com](https://daneshyari.com)