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Flexibility

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Flexibility is an important component of physical fitness. Flexibility refers to the ability to move a joint through its full range of motion (ROM) with ease. Flexibility is joint specific. This means that good flexibility in one joint is not necessarily related to that of other joints. A person could, for example, have excellent ROM in her shoulders but have limited flexibility in her hips. Athletes such as gymnasts and hurdlers clearly must have exceptional ROM to excel in their competitive events, but for all individuals, good flexibility makes everyday movements easier. Although having good flexibility often is touted as being protective against injury, the scientific evidence is lacking. Good ROM in hips and low back along with strong abdominal muscles may help prevent or alleviate low back pain, but this point is controversial.

FACTORS LIMITING FLEXIBILITY

Flexibility in a joint is limited by several factors including the bony structures of the joint. For example, the elbow (a hinge joint) cannot move in the same way as the shoulder (a ball and socket joint). Other factors that impact ROM in a joint include age, activity, sex, disease, and characteristics of the soft tissues (muscles, tendons, etc.). Females often have greater ROM in joints, but there are exceptions to this generality. Regardless of sex, flexibility tends to decline with age. Some of this decrease is due to the aging process, but some of the lost ROM may be reflective of being less active and not aging, *per se*. A joint that is not routinely taken through its ROM will become less flexible. There also are characteristics of the soft tissues that vary among individuals making some people more flexible than others. Although there is a genetic component to flexibility, training to improve ROM is effective in increasing the ability of soft tissues to extend beyond their resting lengths, thus providing greater ROM.

A disease that frequently decreases flexibility is arthritis. In arthritis, the cartilage within a joint is worn away, making movement restricted and painful. With this disease, it is important to perform gentle stretching exercises to maintain as much ROM as possible.

IMPROVING FLEXIBILITY

Slowly moving a joint to the end of its ROM and holding it in that position is called *static stretching*. This type of stretching is the most commonly recommended approach to improve ROM. Soft tissues move more easily when warm, so for the best results, light-to-moderate aerobic activity leading to increased muscle blood flow and elevated temperature should precede static stretching. After this warm-up, the joint should be moved through its ROM until tension, not pain, is felt. This position should be held for 15 to 30 seconds. A total of two to four repetitions should be performed. Range-of-motion exercise should be performed a minimum of 2 to 3 days per week, or optimally 5 to 7 days per week. Individuals should devise a program to improve overall ROM. Some problem areas that often deserve special attention are the following: hamstrings, hip flexors, low back muscles, the Achilles tendon, and the muscles controlling shoulder movement. Some discomfort may result when beginning flexibility routines. This discomfort, often felt as stiffness, should subside within a week of beginning stretching exercises. It is important to progress slowly and consult a health care professional if pain or joint swelling occurs.

A number of movement forms focus attention on developing good ROM. Yoga, Tai Chi, and Pilates improve flexibility when performed correctly. Individuals can learn these techniques through classes or even using exercise videos. It is important to remember that if joint injury or disease is present, it is best to consult a medical professional before engaging in new exercise routines.

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