Flexibility - From Theory to Practice

Many trainees tend to invest in strength training characterized by muscle shortening. If they don't maintain proper stretching during workouts, this could have a cumulative negative effect on joint range of motion.

These effects manifest in, among other things, loss of joint range of motion and decreased quality and execution of movement. Short muscles also cause pressure on internal organs, muscle imbalance, and consequently the formation of pain-sensitive points. A short muscle reduces the tone (muscle tension) of the antagonist, which inhibits muscle strength development. Therefore, strength training and flexibility training complement each other.

Good flexibility improves physical athletic achievements and significantly reduces the risk of injury to soft tissues: muscles, tendons, ligaments, fascia, and capsules.

Flexibility has many important advantages:

✓ Reducing muscle resistance to movement

✓ Improving blood flow to and from muscles

✓ Improving and enriching movement variety and range

✓ Helping efficient use of strength, speed and endurance, and energy conservation

✓ Helping improve athletic performance

✓ Reducing injury risk factors thanks to range of motion and leaving a large "Movement reserve" for muscles

✓ Creating balance between muscle groups in the body

✓ Helping with muscle relaxation and relieving physical and mental tension

Before describing common methods for developing flexibility, let's recall the factors limiting joint range of motion. Intra-articular factors: for example, joint bone structure and joint type (ball, axis, saddle, etc.). Extra-articular factors: for example, joint ligaments and capsules (joint membranes) or muscle length and volume. Additional limitations relate to factors such as: age, gender, temperature (internal or external), fatigue, mental state, genetic factors, personality, and occupation. To these can be added pathological factors, degenerative changes, traumatic damage, and more.

During a person's life, there is a decrease in the secretion of hyaluronic acid, which serves as a lubricant for collagen fibers movement. Collagen is a protein that is a main component in connective tissues in bones, cartilage, ligaments, and skin. As a result, more cross-links are formed which impair the muscle's ability to lengthen, and joint flexibility decreases. Without physical activity, joint range of motion and flexibility decrease significantly.

Since flexibility training has a positive effect on joint structure, it's important to inform all trainees, particularly beginners (to educate them in the early training stages), that flexibility training should be incorporated into every training unit. In flexibility training, it's important to maintain gradual progression and individuality (moving from joint to joint). It's recommended to work in a specific order to cover most joint stretches, such as by body parts (top to bottom or vice versa) or by starting position (standing, sitting, lying down).

The main focus of flexibility training is through stretching exercises. Training can be considered flexibility training when stretches are performed at the maximal-optimal range (maximum range of motion without causing damage). Below this range, the training is defined as stretching training. Stretching exercises should only be performed after proper preparation (raising body temperature) and gently to avoid stretch reflex damage. Passive stretching performed with a partner, where the person being stretched relaxes their muscles and their partner performs the stretch, is the most effective stretching method. It's important to note that a muscle can only lengthen through an external force while it can shorten on its own.

There are three main methods for improving flexibility:

1. The Moderate Static Method is a method where flexibility development is done without movement and is based on activating the joint in the maximal-optimal range slowly and continuously. The exercises use the limb's weight and/or the body part being trained and/or the force of adjacent muscles that enable direct activation (without external assistance) of the joint. The training effect in this method is relatively moderate, the risk of tissue damage is small, and the method is considered the safest. This method can overcome the stretch reflex due to slow and prolonged activity. Critics of this method argue that in the absence of dynamic exercise, the development of dynamic flexibility (done during movement) needed for various sports activities is delayed.

2. The Vigorous Dynamic Method, also called the "Ballistic Method," is characterized by fast, momentum-based and rhythmic movements, where the antagonist muscles will be stretched as a result of the agonist muscles' work. The method is based on activating the joint at maximal-optimal range while using external force – for example, by a partner – to increase the stretch of joint tissues. The method is suitable for specific activities

requiring joint activation in large ranges of motion and at high speed, such as a strong leg swing in high jump. The training effect in this method is relatively high, but care must be taken not to trigger the stretch reflex. Some incorporate music during dynamic stretches to encourage the trainee to continue stretching their muscles and distract from the pain threshold. Before dynamic stretches, proper warm-up must be maintained. To prevent possible injury to muscles and connective tissues related to the stretched joint, training should be performed with bodily self-control. Optimal ranges of motion should not be exceeded.

3. The Contract and Relax Method (Proprioceptive Neuromuscular Facilitation) – assists in neuromuscular information reception, known in professional literature also as Contract Relax with Agonist Contract. Contract – the agonist muscles, and Relax – the antagonist muscles. This method is based on the combination of passive stretching (by an external factor), isometric or dynamic contraction, relaxation, and repeated stretching. It is known as the most effective method for developing flexibility. Performing isometric contraction at maximum stretch allows high muscle relaxation from the stretch reflex, thus enabling additional increase in joint range of motion.

The method is usually performed in pairs; the trainee performs an isometric contraction with their partner's help for several seconds and then releases the contraction. Immediately after muscle relaxation, the muscle is stretched to a greater range. Example for stretching chest muscles: Starting position – trainee A stands and extends their arms behind their back as close as possible to shoulder height. They try to perform horizontal adduction (hugging motion) of the arms toward the front of the body, while trainee B prevents this (the effort is isometric). After trainee A relaxes, trainee B brings trainee A's palms together behind the back while raising them in a controlled manner to shoulder height. It's important to bring the agonist (in this case the chest muscle) to an elongated position. The isometric contraction should last six to eight seconds, relaxation for four to six seconds, and muscle stretching for 12 to 15 seconds. Each exercise should be performed four to five times with eight seconds rest between repetitions. As a result of the repetitions, chest muscle stretching will be noticeable, as trainee A will eventually succeed in clasping hands behind their back as close as possible to shoulder height. Care should be taken during isometric contraction to avoid closing air passages and during stretching to avoid tissue damage.

Before performing the exercises, it's important and worthwhile to read the following guidelines:

✓ Before any stretching activity, remember to perform active warm-up including raising temperature and heart rate for about 5-10 minutes

✓ Relax the muscle being stretched as much as possible for the stretch to be effective

✓ Listen to your body, avoid developing too high a pain threshold (every person is individual, avoid competition)

✓ Stretching is always performed at a slow and controlled pace

✓ Stretches are performed at maximum range of motion (until discomfort)

✓ Avoid bouncing or swinging during stretching

✓ Concentrate and listen to the muscle groups being stretched

✓ Each stretch is performed about 3 times

✓ During stretching exhale air, breathe continuously and in a controlled manner during stretching, don't hold your breath

✓ Stretch duration before activity is 8-15 seconds, after activity 20-30 seconds, the effect on the muscle is plastic (doesn't return to its original state)

In summary, flexibility is a vital component of physical fitness that improves overall health, prevents injuries, enhances physical performance, and contributes to a better quality of life over time. So what are you waiting for? "Start with Flexibility... 😊