Improving Recovery

Many coaches give their athletes one to two days of complete rest following a difficult competition or an intense week of workouts. It is important that athletes do everything that they can to facilitate muscular recovery during these rest days. This article will detail some recovery-day concepts and present a short program that athletes can use to get the most out of their day off.

Nutrition

An athlete's diet on recovery-days should not differ much from the training or competition diet as far as nutrient content is concerned. Clinical research has shown that an athlete's metabolism can be elevated for up to 36 hours following intense exercise (1). It is important to consume adequate calories to compensate for this elevation or else subsequent training may be compromised.

Stick to the basics – eat a balanced diet including 5-7 servings of fruits and vegetables. There is evidence that the some of the nutrients unique to fruits and vegetables dilate capillaries resulting in improved blood flow to tissues (2). Supplemental protein or carbohydrate may or may not be needed depending on athlete preference and metabolic level. Drink lots of fluids to promote hydration.

Stretching

Flexibility training is a common part of many athlete's training regimens. Stretching can be used as a way to facilitate recovery by helping to maintain current levels of flexibility and promoting blood flow to stretched muscles. Furthermore there is some evidence that stretching can reduce muscle soreness after intense exercise (3).

There are two types of stretching that should be employed in a recovery-day program, dynamic and static.

Dynamic stretching - sport-specific mobility drills

Example - walking lunges for runners or arm swings for swimmers

- Used to increase muscle and tendon temperature
- Prepares the elastic collagen in muscles and tendons for static stretching (3).

Chronic static stretching - traditional stretching

Example - touching toes, holding stretch for 30 seconds

- Benefits include (3)
    - improved force production
    - increased jump height
    - increased flexibility

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- improved sprinting speed

Our complete recovery-day program includes dynamic stretching to warm up the muscles and tendons and static stretching to maintain flexibility levels. Static stretching should be light, the point of stretching during a recovery–day program is to stay loose, not increase flexibility.

Massage

According to *Mosby's Fundamentals of Therapeutic Massage*, the proper application of massage can speed recovery from intense exercise (6). Although much research has been conducted on the topic of massage and recovery from exercise, a definitive conclusion cannot be drawn due to conflicting results (6). It is likely that the discrepancy between studies is a result of differences in massage techniques and methods used in the study.

That being said, there is no evidence that a correctly applied massage has a negative impact on long-term recovery from exercise (there is evidence that it can produce "a transient loss of muscle strength" (7)). Therefore we advise the use of massage to promote recovery on an off day.

As part of the recovery-day program, a circulatory massage will be employed. Circulatory massage enhances blood flow, nutrient delivery, and removal of metabolic by-products (8). To perform a circulatory massage, you must facilitate blood movement first to the tissues (arterial circulation) and then assist its return to the heart (venous circulation).

To encourage arterial circulation
Begin to lightly squeeze the muscles on your left shoulder and progressively move down your arm to your hand – repeat this process four times. This will help to move blood toward the muscle tissues.

To encourage venous circulation
Stroke the skin in the reverse direction (from hand to shoulder). This will move the blood from muscle tissues back into the venous circulation picking up waste products for removal.

This same process should be repeated for the left leg, right leg, and right arm in this order.

Relaxation

Although sitting on the couch and watching TV all day does sound relaxing, evidence shows that different relaxation techniques can promote a hormonal environment that encourages muscle growth and repair (9). Essentially, using relaxation techniques results in lower cortisol (stress hormone) and higher testosterone (muscle building hormone) over time (9)

For our recovery-day program, we will employ diaphragmatic breathing and progressive muscular relaxation (PMR). Both techniques are advocated by the National Strength and Conditioning Association as safe and effective forms of relaxation training (3).

Diaphragmatic breathing – also known as belly breathing, focuses the athlete on inspiration and expiration resulting in a clearer mind. Diaphragmatic breathing reduces heart rate and muscle tension through a link between respiratory and cardiac control centers in the brain (3).

To perform diaphragmatic breathing

- Lie on your back with hands relaxed at the top of your abdomen
- Bring your focus away from your chest and to the rise and fall of your stomach
- Your stomach should rise when you breathe in, and fall when you breathe out
- Stay focused on the breath and continue this technique for 5 minutes

Progressive Muscular Relaxation – uses the control of muscular relaxation to regulate psychological arousal levels. Essentially you alternate periods of muscular contraction with periods of muscular relaxation in order to become aware of chronic muscular tension (3).

To perform PMR

- Begin after finishing a session of diaphragmatic breathing
- Forcefully contract the your left and right calf muscles for 10 seconds
- Attempt to relax the muscles previously contracted (imagine waves of warmth) for 10 seconds
- Repeat this process for the hamstrings, quadriceps, hips flexors, glutes, lower back, abdomen, chest, traps, shoulders, biceps, and triceps
- At the completion of this routine try to stay relaxed for an additional 5 minutes

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