The Athlete's Road to Recovery
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An inevitable part of every athlete's career involves injury. Some injuries may sideline the athlete for a day or two, some years. Coming back to an activity safely is something that is different for every athlete. The question remains, what is the safest, most logical method to rehab an injury? If the injury was serious enough to require surgery, how much time will it take to recover without risk of re-injury? With so many types of rehab available to an athlete today, recovery can be a stressful, uncertain time.

It is important to remember that no one has the same genetic makeup, history, neuro-muscular ability and structure. To compare recovery time of an athlete with his or her first injury with that of someone who has sustained multiple injuries and chronic conditions is impossible. That being said, these two groups may not respond to the same treatment protocols. Most physicians prescribe a mixture of rest, ice, some sort of bracing, exercises, stretching and, in some instances, medication. Many athletes are sent to physical therapy or to an athletic trainer to rehab the injured area and monitor progress. The determining factor of whether these types of treatments will be successful is ***muscle inhibition***, or impaired communication between the brain and a muscle.

The word "inhibition" refers to the inability of a muscle to contract fully on demand. Muscles lose this ability from stress, trauma/ surgery, overuse, mineral deficiency and dehydration. The central nervous system (CNS) can make the decision to "shut off" a muscle after an injury. When this happens, antagonistic muscles will tighten as a means to protect the body from moving into a position of weakness or vulnerability. We know from the science of biomechanics that when one part of a joint has been interrupted, whether a prime mover, synergist, or stabilizer, the entire function of the joint is lost. One reason that athletes are athletes is their ability to compensate and substitute once this happens. One joint will affect another as stress is shifted to other areas of the body. Muscles can even attempt to control joints that they do not cross.

When a muscle is inhibited, the muscle will not have the ability to move into the extreme ranges of motion. It may have strength in the middle of a range, but become very weak when moving into the shortened position. When looking at the central nervous system, there are two fiber types associated with muscle contractions, intrafusal and extrafusal. The intrafusal fibers contain the muscle spindle, which is the tension regulator that tells the brain what kind of message to send out to the alpha motor neurons of the agonist muscle (directly responding to force) and antagonist muscle (the opposite side of the agonsist). As a force comes into the body, the muscle (extrafusal fibers) is placed under a stretch, the muscle spindle (intrafusal fibers) sense tension as they are also placed under a stretch. The sensory receptors that encompass the intrafusal fibers send information back to the CNS, stimulating the alpha motor neurons, which, in turn, send feedback to the muscle telling it to contract in order to resist the tension. The antagonistic muscles are also given the message to allow for the agonist to contract, by relaxing a bit. This is a normal response to a muscle when placed on a stretch.

Now, if we have an inhibition response, this sequence is interrupted. As extrafusal fibers of a muscle shorten due to contraction, the muscle spindle or intrafusal fiber would not be able to fully shorten and be placed on a slack. This in turn would make the muscle incapable of regulating the load being placed on the muscle. If a muscle has been traumatized, due to factors such as stress, surgery or overuse, the sensitivity of the spindle will be lessened and the muscle will become less capable of regulating tension relative to a stretch or a load. The result is a reduction in the gamma motor neuron stimulation allowing the muscle spindle to shorten as the extrafusal fibers contract. The more that the muscle shortens (as in a muscle contraction), there is greater slack surrounding the muscle spindle as it becomes less and less responsive. This results in decreased proprioceptive input into the muscle as it moves into the shortened range. The muscle cannot fully contract, and the antagonistic muscles do not get the message to release some tension for the muscle to resist the force. The result is tightness, weakness and pain.

Athletes spend the bulk of their time in the extreme positions. For most of us, we avoid positions that hurt and that are weak. We tend to perform the activities that we are good at. If it hurts to bring the shoulder into full flexion, we avoid bringing our arm overheard and perform exercises with a reduced range of motion. This is often not an option for athletes. This is why pitchers end up with a lot of shoulder trauma – the game is spent working at the end range of the gleno-humeral joint with increased force and inertia needed to hurl the baseball towards the batter. This is unavoidable if that is the profession one chosen and an injury can be career ending. By comparison, when the exercise enthusiast gets injured, he or she can switch to a new activity. This is a temporary fix, however, as the inhibited muscles are still inhibited. Compensation still takes place and we are simply substituting one injury for another potential injury.

The most important part of an athlete's recovery is detection of the inhibited muscle, and the process by which that weakness is eliminated. It is completely incorrect that a "functional" exercise using several joints at once in multiple planes of motion with instability devices will help whatever is weak to "catch up" to the stronger muscles. You cannot look at someone's posture or athletic performance and tell what is weak or tight. As a matter of fact, the more athletic the individual, the better they are at masking the symptoms! This is such a huge trend in our industry today. Why have we lost the idea that in order to *progress* in some areas, we must *regress* in other areas of our fitness programs? We have to ISOLATE the weak areas first, get them stronger and then incorporate them into more "functional" movements. If a teacher had a classroom of students and a few were completely *lost,* giving the class more homework would not help the confused students to catch up. The class would need to slow down for a time.

There is a new system called Muscle Activation Techniques (MAT)™ that can detect these vulnerable positions and treat weak muscles individually. First, a Range of Motion (ROM) evaluation is used to analyze specific joint motions. It is to find positions of asymmetry with the thought process that if one muscle is tight, some other muscle must be weak. The focus is not about stretching, massaging or manipulating tissue to increase range of motion. The focus is about finding the PROBLEM, not treating the symptoms. How do we know that the body has tightened a muscle as a form of protection? To stretch a tight muscle without this information is malpractice. We must know that when we increase range of motion through modalities like stretching or massage that there is also stability through that increased range. In MAT™ we use a method of muscle testing that is based on the ROM evaluation to identify weak muscles. Weak or inhibited muscles can create the need for other muscles to tighten in order to help stabilize the joint. The goal of MAT® is to identify the inhibited or weak muscles that are creating a protective response and then 'jumpstart' these muscles in order to improve their contractile capability. A specific and precise palpation technique with low-grade isometrics is used to re-connect inhibited muscles to the CNS. MAT® provides a checks and balances system to make sure that this happens. That is why MAT® is a great adjunct to all forms of exercise and therapy. If we assign exercises to someone for rehabilitation purposes, we need to know that the muscles we are challenging are, a) part of the problem and, b) getting neurological input necessary to perform what we are asking it to do.

Once we have isolated specific muscles and made them stronger, Yoga can be a great next step. This puts isometric positions together and helps the athlete to be able to start incorporating the weak muscles. We learn to develop strong internal forces. By rehabilitating an athlete with a thought process using microprogression®, we can now add challenge and external loads to the muscles. This way we are able to ensure increased athletic performance with decreased risk of compensation in regards to further injury, and create the environment necessary for improved joint proprioception and overall joint wear.

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www.muscleactivation.com: Muscle Activation Techniques™
www.rts123.com: Resistance Training Specialist®
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