[IMAGE]

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Falling Behind the Recovery Curve

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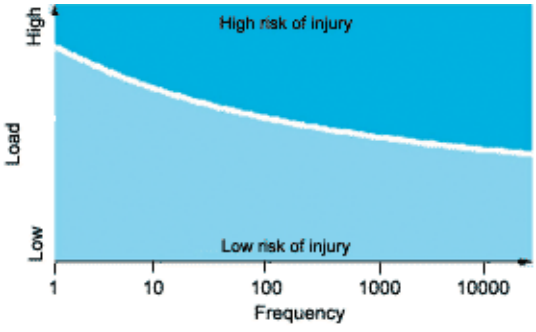
In my article, "Training Effects"[1] (www.massagetoday.com/archives/2003/06/08.html), I discussed sports scientist N.
Yakovlev's model of training and adaptation. After a workout, there is a recovery period, followed by a period of super-compensation. The optimum time for the next workout is at the peak of super-compensation. Work out again too early, and the body is still recovering; wait too long, and the benefits of the last workout are lost. The length of recovery depends on the workout intensity and factors such as nutrition, hydration and sleep.[4]

Yakovlev's model is a guide to understanding adaptation and improvement with regular exercise, but it also contains one of the greatest banes of those who start exercise programs - overuse injuries. Overuse injuries account for 30 percent to 50 percent of all sports injuries, and are among the most common encountered by heath care practitioners. Even injuries with a sudden onset without a clear traumatizing event are often the result of falling behind the recovery curve.



The risk of injury increases both with higher loading applied to the muscle and with higher frequency of repetition. (*Sports Injuries* - 3rd Edition Graphics Package, Human Kinetics, Champaign, Ill.) Overuse injuries frequently occur when an athlete changes exercise patterns or rapidly increases the amount or intensity of exercise. Without sufficient time for recovery, repetitive micro-trauma leads to inflammation and local tissue damage in the form of cellular and extracellular degeneration .[3] Such degeneration can lead to chronic pain or sudden injury. An increase in

injury risk with lighter muscle fiber loading at higher repetitions (Fig. 1) is explicable in terms of decreased tensile strength of over used tissues. Overextension andoverly intense exercise also can be detrimental to immune system functioning.[5] Allowing time, and setting conditions for the recovery period, are important to performing well; recovery is aided by good nutrition and adequate sleep. Best conditioning without breakdown is obtained by catching the Yakovlev curve at its super-compensation maximum. Massage can aid normal training by helping to reduce residual muscle hypertonicity, thus speeding recovery.[1]

If chronic or acute injury has occurred, allow healing while gently maintaining joint mobility. Functional rehabilitation must be done before training can return to pre-injury levels. At the heart of functional rehabilitation are Davis' Law and Wolf's Laws, which state that soft tissue and bone heal along the lines in which they are stressed. For optimal healing, tissue must be stressed gradually to accept a given force. Crossfiber massage can be used to help align healing soft tissue and stimulate healing. Rehabilitation also involves exercise movements to regain joint proprioception.[6] Impaired joint "position sense" is overlooked in many rehabilitation programs and may be a major risk factor for recurrent injuries after the muscles and ligaments have been restored. Restoring proprioception after injury allows the body to maintain stability and orientation during static and dynamic activities.

A massage practitioner can assist clients in restoring joint sense and neuromuscular movement by encouraging them to perform movements against the practitioner's light resistance. Such work also helps identify areas of adhesion that can be normalized by deep tissue work.

Finally, one of the hardest exercises involved in recovery and rehabilitation comes not in exercising the body, but in exercising patience. In coming back from behind the recovery curve, an athlete could do far worse than cooling his or her heels on your massage table. With less than a full workout schedule, each has the time.

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