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Preventative Injury Strategies for MMA Athletes

MMA athletes need to focus more on functional anatomy, biomechanics and motor behavior. Proper posture and movement is the key to developing training methods that will ensure success.

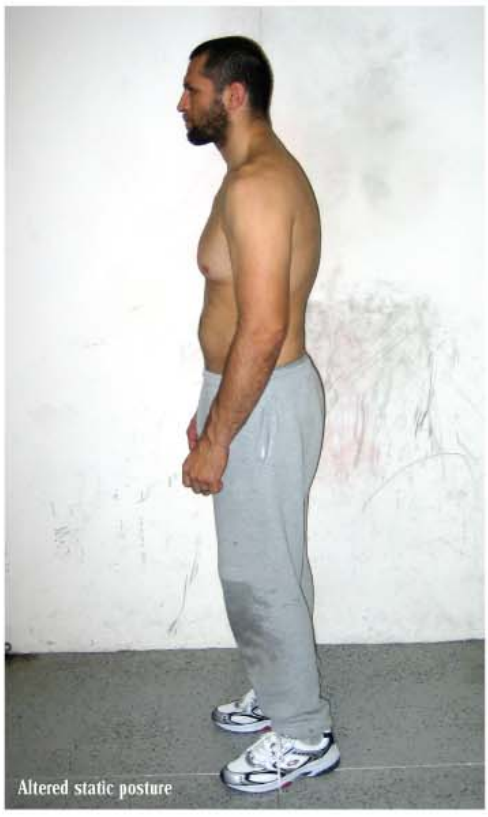
Mixed martial arts, with its variety of movements and positions, is perhaps the most highly skilled combat sport of this era. Since the first UFC in 1993 MMA has garnered wide spread enthusiasm and rightfully so. To a mixed martial artist, the sport is a stage where they can test their techniques developed by grueling physical sacrifice driven by the depth of their athletic spirit. However, to the world of sport science, MMA is a mechanical encyclopedia of power output, endurance, multiplanar movement, and technical skill in which these modern day warriors continually test the integrity and durability of the entire human body.

The Human Movement System

The human movement system can be defined as the nervous and musculoskeletal systems (brain and spinal cord, bones, muscles) and how they work together in order to produce dynamic movement throughout a constantly changing environment. During the season one finale of The Ultimate Fighter, Forrest Griffon and Stephan Bonnar painted the Octagon with an epic display of synergistic and dynamic movement, presenting a myriad of changes in the body's static posture and dynamic movement.

Static Posture and Dynamic Movement

Static posture allows for optimum alignment of the human movement system. In viewing this preferable alignment from the side, the line of gravity falls just behind the ear and hip, slightly in front of the knee, and through the middle of the foot. A close marriage exists between posture and dynamic movement because ideal posture allows for more efficient movement patterns. It is essential for an athlete to attain ideal posture for several reasons including prevention of injuries, increased flexibility, decreased muscle aches and pains, fluid and dynamic movement with less energy, optimum force production of muscles, and optimum expansion of the ribs during breathing. According to the National Academy of Sports Medicine, functional efficiency may be defined as the ability of the brain and spinal cord to


Altered static posture


A typical fighter's posture

An SMR self-massage technique

communicate and monitor movement during dynamic movement patterns. Any postural distortions throughout the movement system may cause a decrease in fight performance.

Repetitive Movement Patterns

In the world of MMA there seems to be a contest of who can develop the most innovative performance program, which has fighters clamoring about pushing and dragging tractor tires, carrying kettle bells, and pushing the human body to extremes. Unfortunately, some of these programs not only lack best evidence with respect to progression, they lack the corrective strategies necessary to stave off a likely episode of injury. Combative sports are plagued with habitual and repetitive movement patterns including stances, punching, kicking, pummeling, grappling, and ground work. It is these patterns that may cause poor posture and muscle imbalance resulting in mechanical chaos throughout the entire human movement system. A typical fighter's stance is characterized by ankle flexion (toe pointed), knee flexion, hip flexion, rounded shoulders, elbow flexion, and a forward head position.

Overactive tight muscles (traps, lats, upper back, pecs, hips, lower back and calfs) and underactive weak muscles (deep neck muscles, mid back, glutes, hamstrings, abdominals, respiratory) may be negatively affected as a result of an altered body position. As the athlete journeys through the many facets of training he will undoubtedly develop these compensatory issues throughout the musculoskeletal system. As these repetitive movement patterns persist, there seems to be significant translation into the athletes' static posture. This poor posture, if not addressed, may cause a cumulative and repetitive injury cycle.

Cumulative Injury Cycle

A cumulative injury cycle is characterized by injury stress, followed by inflammation and pain, knots, and altered muscle control. Soft tissue areas along lines of stress will lead to the knotted areas throughout the muscle that athletes typically complain about. It is these knots that may alter muscle contraction, leading to decreased fight performance

Preventative Techniques

The primary goal of any performance program should be injury prevention. There are several techniques that may be used as a preventative measure prior to MMA-specific training including (in sequential order) self myofascial release, (SMR/foam rolling massage), proprioceptive neuromuscular facilitation (PNF), and static stretching.

Using a foam roller and body weight to eliminate muscle knots

SMR: Using a foam roller, apply pressure to any and all knots, allowing the bundled muscle fiber to relax. The athlete holds on a tender spot for 20-30 seconds or until pain decreases.

PNF: The strength and conditioning coach will have the athlete resist the intended motion, followed by instructing the athlete to relax and then gently moving the leg into a stretched position.

Static stretching: The most common mode of flexibility training is characterized by gently stretching a muscle to tension. During a static stretch the athlete may hold the stretch for 20-30 seconds and 2-3 sets per muscle group.

Conclusion

As a strength and conditioning coach it is imperative, when working with amateur, collegiate, and professional athletes, I devise a system that is scientifically valid and uses current best evidence (not what worked for the last guy). MMA is a multifaceted sport that requires the human body to work synergistically to produce force, reduce stress, and dynamically stabilize the entire body in all planes of motion at varying speeds and multiple angles. It is a unique sport and as a result each individual athlete should undergo a comprehensive movement analysis in order to allow the performance specialist to prescribe a progressive program which is systematic and generates increased athletic performance.

For more information on getting a comprehensive movement analysis go to www.dfperformance.net

Brian Richardson

About the Author

Upon finishing his career as a world class athlete, Brian Richardson attended San Diego State University where he earned a B.S. in Kinesiology. He then completed graduate school, earning a Masters in Exercise Science with an emphasis in performance enhancement and injury prevention from the California University of Pennsylvania. Brian is a member of the National Strength and Conditioning Association (NSCA) and is a performance enhancement specialist through the National Academy of Sports Medicine. In 2005, Brian founded Dynamic *Fitness High Performance Kinesiology* which seeks to combine science, passion, and motivation, with the art of personal training in order to assist the athlete with maximum and attainable results. For more information visit www.dfperformance.net.