

## HOW MUSCULAR IMBALANCES OCCUR AND THE PROBLEMS IT CREATES FOR ALL ATHLETES & MOTOCROSS IN PARTICULAR

As with any athlete, motocross specific training requires certain ranges of motion (involving more than one muscle group and associated joint) that are completed to improve the skills necessary for better performance. By recognizing that each movement within the muscles involves a concentric action (the muscle shortens and acceleration of the body part) and an eccentric action (the muscle lengthens to decelerate the body part), and that movement requires traveling through more than one plane of the body (i.e. front, back, top, bottom, side to side), you immediately see how important it is to focus on engaging more than one muscle at any one time during your strength training.

To perform actions specific to riding & racing, the primary moving muscles tend to become over developed at the expense of the antagonist muscles limiting the range of motion that can be performed by the necessary muscle groups. Muscular imbalances can create the following symptoms:

- ♣ Poor Body Position: the primary movers do not allow the antagonist muscles to complement the range of motion. Example, if the quads are overly tight, the hamstrings will not become fully engaged which limits the body's ability to properly get into the "attack" position and forces the body to compensate which can put excess force on other body parts and lead to injury.
- ♣ Late Moto Fatigue: if the primary mover is overly tight, the antagonist muscle cannot bring the muscle back to its proper position which increases resistance and ultimately creates fatigue within the muscle since it is working harder to produce the same movement. It is similar to trying to move just your arm vs. moving your arm while holding a small weight. Which is easier?
- ♣ Dropped Elbows in Turns: if there is limited range of motion within a muscle, the body will compensate to perform the movement in a non-biomechanically efficient manner and the extra fatigue in the muscles limits their ability to hold a certain position for any length of time.
- ♣ Increased risk of injury: a tight muscle is similar to a rubber band that has been pulled tightly; the tension in the middle becomes high and is susceptible to tearing if asked to extend beyond its capable range of motion. Over time microtears can occur which can lead to muscle strains.

### THREE DIRECT BENEFITS OF STRENGTH TRAINING

1. It will increase the amount of force your muscles can exert on a particular object (muscular strength). As a racer, strength is a key component for finishing a race as strong as you started.
2. Strength training will permit your muscles to reach a maximum output of force in a shorter period of time. This helps shorten your reaction time and is beneficial when the bike gets out of control at high speeds; when you are strong, your muscles are able to pull the bike back quickly.
3. The duration of time your muscles can sustain the level of force before exhaustion is extended (muscular endurance). The primary muscle groups are the main muscles that are responsible for making a movement happen. The secondary muscle groups typically smaller muscles that aid or all the primary movers to work. However, once the primary muscle groups fatigue, the secondary muscles are required to step up to finish the task at hand. Since they are usually smaller, they do not have the same strength and endurance abilities and fatigue and are injured more easily. Strength training makes this task familiar to the secondary muscle groups at both the muscular and neuromuscular levels.

### THREE INDIRECT BENEFITS OF STRENGTH TRAINING

1. Stronger tendons and ligaments. Strength training will increase the size and overall strength of both which will increase the stability of the joints that they surround.
2. Greater bone density. Bone density will increase as a byproduct of tensile force being placed on the bones – without this tensile force, the bones will actually become brittle and susceptible to breaking.
3. Enhanced joint range of motion. Increased strength will enhance the ease of mobility within the joint due to tendon and ligament strength and resulting efficiency. The greater the range of motion a joint is able to move through, the less chance it has of injury during extreme ranges of motion.

### FUNCTIONAL INTEGRATION – THE FOUNDATION TO FASTER SPEEDS ON THE TRACK

As racers, you understand that your core muscles (i.e. your stomach, lower back and butt) are the foundation for all of our movements – nearly every movement originates (directly or indirectly) from your core muscles. As you move around on the track, your core strives to maintain balance and provides a foundation for the other muscles to interact with for correct biomechanics and ultimately optimum strength & endurance. To ensure that you are forcing your sport specific muscle groups to engage in a more functional way (i.e. through all three planes-front/back; left/right; top/bottom), you have to incorporate a training program that does this also.

A simple illustration of what this “feels” like, simply stand on one leg and close your eyes with your head facing forward. As your core strives to maintain balance (i.e. not fall over), you will

feel the functional integration of the muscles starting at the foot and coming all the way up into your gluts, core and lower back. This is a simple example of Functional Integration in a nut shell. Your body makes these subtle adjustments every time you ride or cross train off of the track. However, you are moving so fast, you don't "feel" the balance taking place. So, during you training, utilize exercise that stress the core and force you to balance such as using a stability ball, BOSU ball, TRX device, and any other number of items available.

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