



TRAIN FAST. BE EXPLOSIVE.

STRENGTHEN-FAST-TWITCH-MUSCLE FIBERS WITH CROSSOVER'S HIGH SPEED PLYOMETRICS

Jim Moran, PT, Shoulder Specialist

Why do many athletes focus on strengthening fast twitch muscle fibers in their legs by performing plyometrics and explosive lower body exercises but when it comes to the upper extremities they target the slow twitch muscle fibers with the exercises they are doing?

Why aren't athletes training their arms to be explosive weapons just as sprinters are training their legs?

Most skeletal muscle is a mixture of all three types of muscle fibers: Type I slow twitch, Type IIA fast twitch, Type IIB super-fast twitch. Their proportion varies depending on the usual action of the muscle. For example, postural muscles of the neck, back, and leg have a higher proportion of type I fibers. Muscles of the shoulders and arms are not constantly active but are used intermittently, usually for short periods, to produce large amounts of force such as in lifting and throwing. These muscles have a higher proportion of type I and type II B fibers. The Type IIA fast twitch muscle fibers move 5 times faster than the slow twitch, and the super-fast Type IIB muscle fibers move 10 times faster than the slow twitch fiber.

No matter what the workout intensity, slow twitch muscle fibers are recruited first. If the workout intensity is low, these fibers may be the only ones that are recruited, i.e. traditional rotator cuff exercises. However, if the workout intensity is high, such as when performing plyometric exercises or high velocity throwing, slow twitch muscle fibers are recruited first followed by Type IIA fast twitch and Type IIB super-fast twitch, if needed.

Plyometric exercise provides the most powerful contraction in the body targeting the type IIB super-fast twitch muscle fibers. This is done by eccentrically contracting or elongating the muscle followed by an explosive concentric contraction very

similar to the dynamics of a rubber band.

This powerful contraction recruits and strengthens the Type IIB super-fast twitch muscle fibers.

Traditional rotator cuff exercises were developed in the rehabilitation setting and target the Type I (slow twitch) muscle fibers in non sports specific positions. These exercises were designed to rehab and strengthen the shoulder back to normal health and function. Normal health and function for your average person does not include overhead throwing at high velocities. However these are the same exercises that many athletes are still doing. There is a place for strengthening the Type I (slow twitch) fibres in sports because they do assist in the dynamic stability of the shoulder, however when talking about sports performance, particularly high velocity throwing, the Type II fast twitch fibres are doing the bulk of the work.

The Crossover Symmetry Advanced Plyometric Workout is the most effective tool for strengthening the Type IIB super-fast twitch muscle fibers in the shoulder. Where is the proof? We performed a pilot needle electrode EMG study (Electromyography: tests the electrical activity of muscles) to test the effectiveness of our advanced plyometric workout and the result were incredible. The Crossover Symmetry Advanced Plyometric Exercises produced an average of 36% more muscle activation when compared to standard rotator cuff exercises.

The Crossover Symmetry System strengthens the rotator cuff and scapular muscles in sport specific positions at speeds that have never been completed short of doing the sport itself. Strengthening the fast twitch muscle fibers is a major ingredient in improving velocity and lowering the rate of injury in overhead athletes at the high school, collegiate and professional levels.

- Updated April 24, 2009.