



**Musculoskeletal**

## Supraspinatus muscle architecture and training mode

How does concentric vs. eccentric training influence supraspinatus muscle architecture?

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Over the last decades has been proven that eccentric exercises have beneficial effects on muscle strength and hypertrophy, but that they also stimulate restoration of a normal tendon architecture. Although improvements on these characteristics have been found both the upper and lower extremity, research on fiber bundle architecture after concentric vs. eccentric training protocols is scarce.

In order to determine the effect an concentric vs. eccentric strength training program has on fiber bundle length, pennation angle, muscle thickness and muscle strength of the supraspinatus muscle, thirteen subjects underwent an eight week training program consisting of either concentric or eccentric contractions. Before and after the program musculoskeletal ultrasound scans and isometric and isokinetic tests of shoulder abduction strength were conducted.



Fiber bundle length decreased significantly as a result of a concentric training program, whereas the eccentric strength training did not result in a decreased fiber bundle length. Pennation angle, muscle thickness and muscle strength increased similarly in both groups. Applying eccentric training may lead to preservation of fiber bundle length, allowing the muscle to sustain force over a greater ROM.

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