

TITLE: Plyometric training of the core and effects on trunk and shoulder outcome measures.

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BACKGROUND: Plyometrics are a popular form of training for performance enhancement of the lower and upper extremities. Core stability training is one of the most popular training techniques at all levels of fitness, training and rehabilitation. However, there is limited research regarding the efficacy of plyometrics and core training.

HYPOTHESIS: The effects of core plyometric training will improve isokinetic and functional testing outcomes of the core and shoulder.

PURPOSE: The purposes of this study were to examine the effectiveness of an 8 week core plyometric training period on stability, function, and performance of the core and shoulder.

STUDY DESIGN: Prospective, randomized, single-blinded, controlled training study

SUBJECTS: 53 college-aged volunteers with no history of shoulder or back injuries.

METHODS: Subjects were stratified on gender and then randomly allocated into a control or a core plyometric training group. Both groups pre and post-tested using core and shoulder isokinetic tests as well as a number of field tests. Cybex isokinetic TEF (trunk flexion-extension) unit was used to test the core and a Cybex isokinetic 340 was used to test shoulder IR and ER. Field tests included the Sorenson test, side plank test bilaterally, timed sit-ups, Underkofler softball throw for distance, and a shot put test. The experimental group trained twice per week for 8 weeks. Exercises consisted of plyometric sit-ups, diagonal core extensions, and core twists. All of the exercises were performed with a medicine ball. The weight of the ball, the number of sets and reps, and the progression of each exercise were based on the subjects' pre-test scores and progressed approximately 10 percent/week as per ACSM guidelines.

RESULTS: There were no significant differences between groups for shoulder outcome measures and isokinetic testing of trunk flexion at 60°/second and 120°/second. Significant differences were found between groups for the following outcome measures: isokinetic testing of trunk extension at 60°/sec ($p < 0.048$) and 120°/sec ($p < 0.026$), timed sit-ups ($p < 0.000$), Sorenson test ($p < 0.000$), and bilateral side plank test (right – $p < 0.037$) (left – $p < 0.045$).

DISCUSSION: There have been many speculations on core training and its effect on shoulder performance. The results of this study did not support the popular trend of shoulder physiologic overflow with core training. However, the findings of this study revealed core specificity with core training.

CONCLUSIONS: The present study indicated that an 8 week core plyometric training program was effective at improving core stability, function, and performance with no physiologic overflow into the shoulder.

CLINICAL APPLICATIONS: The results are the first to objectively and functionally document the efficacy of plyometric training on core stability, function, and performance. The results of this study can be used to tailor plyometric programs for the core muscles.