

# INPLASY PROTOCOL

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submission:** The review has  
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**Conflicts of interest:**  
None.

## Do transverse-couple trainings improve proprioception in patients with scapular dyskinesia ? A systematic review with meta-analyses

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Ma, X<sup>8</sup>.

**Review question / Objective:** The main purpose of this review is to evaluate the effect of transverse force couple training on improving muscle strength and pain relief in patients with scapular dyskinesia. At the same time, we also need to compare the effect of shoulder girdle training and proprioception training.

**Information sources:** Six electronic databases were used to search and retrieve the articles: Cochrane Library, EBSCO (including all its available databases), PubMed (including MEDLINE), Scielo, Scopus, and Web of Science (Core Collection).

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 10 December 2020 and was last updated on 10 December 2020 (registration number INPLASY2020120059).

### INTRODUCTION

**Review question / Objective:** The main purpose of this review is to evaluate the effect of transverse force couple training on improving muscle strength and pain relief in patients with scapular dyskinesia.

At the same time, we also need to compare the effect of shoulder girdle training and proprioception training.

**Condition being studied:** XScapular dyskinesia is defined as the change of the position or trajectory of the scapula during

static or dynamic movement, and the influence of changes in the muscle strength of the scapula on some aspects of normal shoulder joint function. The shoulder consensus group agreed that scapular dyskinesia is an impairment of shoulder function and that it may be a risk factor for clinical shoulder injury. An increasing number of studies have correlated abnormalities in scapular position and motion (dyskinesia) with impingement symptoms, rotator cuff dysfunction, and instability. For patients with an imbalance in the scapular muscles, selective activation of the weaker muscle parts with minimal activity in the hyperactive muscles is important. The balance between the subscapularis muscle and the infraspinatus/teres minor muscles, often referred to as the rotator cuff transverse force couple (TFC), has been proposed to be a critical component for normal shoulder function. The main purpose of this review is to evaluate the effect of transverse force couple training (TFCT) on improving muscle strength, range of motion and pain relief in patients with scapular dyskinesia. Meanwhile, we also need to compare the effect of proprioceptive control protocols.

## METHODS

**Search strategy:** The search for relevant publications had no restriction to a year of publication and included articles until 16th May 2020. The following search strings were employed: “scapular dyskinesia” OR “scapular dysfunction “Scapular Winging” OR “muscle balance training” OR “TFCT” OR “proprioceptive exercise” OR “muscle control training”.

**Participant or population:** Individuals with scapular dyskinesia.

**Intervention:** Transverse force couple training interventions (i.e., participants performed the exercise under supervision of a certified professional).

**Comparator:** The rehabilitation therapy of proprioceptive.

**Study designs to be included:** Randomized controlled trials.

**Eligibility criteria:** Patients meeting the diagnostic criteria of scapular dyskinesia. All the studies are subject to ethical review.

**Information sources:** Six electronic databases were used to search and retrieve the articles: Cochrane Library, EBSCO (including all its available databases), PubMed (including MEDLINE), Scielo, Scopus, and Web of Science (Core Collection).

**Main outcome(s):** Muscle strength, range of motion and pain relief(VAS score), function improvement (Disability of Arm Shoulder and Hand questionnaire, DASH score).

**Additional outcome(s):** None.

**Quality assessment / Risk of bias analysis:** The methodological quality of the included studies will be evaluated based on Cochrane risk bias assessment tool which assesses random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting and other bias. Items will be scored as "yes", "no" or "unclear".

**Strategy of data synthesis:** A pair-wised or meta-analysis of the random-effects model would be performed for the studies similar in TFCT and proprioception exercise and movement direction. Standardized mean difference (SMD) was calculated for all data between CAI patients and controls with 95% confidence intervals (CI). Higher SMD represented larger joint proprioception improvement in CAI, with 0.2~0.5 as weak, 0.5~0.8 as moderate, >0.8 as large-sized effect. To evaluate heterogeneity, Q and I<sup>2</sup> statistics were calculated, with p<0.05 as statistically significant and I<sup>2</sup> values ≥75% as high heterogeneity.

**Subgroup analysis:** There is no pre-subgroup plan for this project. When there are significant differences, we will carry out subgroup analysis according to the control

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group intervention measures and different results.

**Sensibility analysis:** Sensitivity analysis will be conducted by alteration of the analysis model, selection of effect size, and exclusion of individual articles.

**Country(ies) involved:** China.

**Keywords:** scapular dyskinesis, transverse force couple training, protocol, meta-analysis.

**Contributions of each author:**

**Author 1 - Chen Yue - Study design; literature search and selection; data collection; quality rating; statistical analysis; writing of the manuscript.**

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