

# INPLASY PROTOCOL

To cite: Eapen et al. UPPER QUARTER MUSCLE IMBALANCES IN STIFF SHOULDER CONDITIONS: A SYSTEMATIC REVIEW. Inplasy protocol 2020110015. doi: 10.37766/inplasy2020.11.0015

Received: 04 November 2020

Published: 04 November 2020

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**Support:** None.

**Review Stage at time of this submission:** Piloting of the study selection process.

**Conflicts of interest:**  
All the authors of the study declare that there are no conflicts of interests in our systematic review.

## INTRODUCTION

**Review question / Objective:** The stiff shoulder is a debilitating condition which mainly deals with decreased range of shoulder motion leading to functional

## UPPER QUARTER MUSCLE IMBALANCES IN STIFF SHOULDER CONDITIONS: A SYSTEMATIC REVIEW

Eapen, C<sup>1</sup>; Prabhakar, AJ<sup>2</sup>; Jaideep, A<sup>3</sup>; Tedla, JS<sup>4</sup>.

**Review question / Objective:** The stiff shoulder is a debilitating condition which mainly deals with decreased range of shoulder motion leading to functional limitations. A good prognosis requires a proper understanding of the underlying condition and goal-directed treatment. This study aims for a detailed description of the literature that exists on upper quarter muscle imbalances in stiff shoulder conditions.

**Condition being studied:** Stiff shoulder refers to any painful shoulder condition associated with restriction in range of motion. It is inclusive of stiff shoulder conditions like frozen shoulder, clinically known as adhesive capsulitis previously also referred to as periartthritis shoulder. The diagnosis of an idiopathic stiff shoulder condition is made after excluding all other possible diagnosis pertaining to a painful shoulder condition. It is also known to present as a common debilitating postoperative complication following surgical repair of shoulder conditions including rotator cuff pathology and acromioclavicular joint arthritis.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 04 November 2020 and was last updated on 04 November 2020 (registration number INPLASY2020110015).

limitations. A good prognosis requires a proper understanding of the underlying condition and goal-directed treatment. This study aims for a detailed description of the literature that exists on upper quarter

muscle imbalances in stiff shoulder conditions.

**Rationale:** This study helps in a better understanding of the contractile structure involvement and resultant altered shoulder and scapular mechanics that may prevail. Current literature pertaining to the subject is limited but holds the utmost importance in assessment and treatment planning. The persistence of such muscular disparities might lead to long-standing shoulder dysfunctions even after the resolution of the primary condition. Thus, comprehensive knowledge of the probable structural and mechanical disparities is essential in understanding the complete picture of a stiff shoulder.

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## METHODS

**Search strategy:** stiff shoulder AND muscle imbalance/involvement; frozen shoulder AND muscle imbalance/involvement; periarthritis AND muscle imbalance/involvement; adhesive capsulitis AND muscle imbalance/involvement.

**Participant or population:** Subjects with stiff shoulder/frozen shoulder/peri arthritis/adhesive capsulitis.

**Intervention:** Studies with any kind of medical or alternative medical interventions were included provided they mention about the muscle involvement.

**Comparator:** It not compulsory to have a comparator group for intervention. However they study should focus on muscle structures involvement for stiff shoulder.

**Study designs to be included:** Observational, Cross Sectional, Experimental, Quasi Experimental, Case study, Case series, Randomized Controlled trials.

**Eligibility criteria:** All published literature that is in the desired language, consisted the chosen keywords irrespective of the sample size and the methods used to assess muscular discrepancy in the stiff shoulder conditions will be screened for the study. Only full-text articles in English language published up to April 2020 and articles that emphasize the role of contractile tissues in stiff shoulder conditions. i.e. upper back or neck muscle imbalance/ tightness/ shortening/ weakness will be considered. Epidemiological studies including experimental as well as observational studies will be taken into account

**Information sources:** Scopus, PubMed, Web of Science, Clinical Key, ProQuest, Ebsco, Saudi Digital Library, Cochrane Library, Cinhal, and Google Scholar.

**Main outcome(s):** The causes of a limited shoulder range of motion in the stiff shoulder can be classified into two categories. The first category involves a range of motion restriction owing to structural changes occurring in the periarticular structures like adhesion formation, shortening of the shoulder capsule, associate ligaments, and muscles. The second category involves changes not associated with primary structural changes leading to loss of range of motion but secondary problems e.g. pain and prolonged immobilization and the associated protective muscle contraction and guarding mechanisms to prevent painful movements. In the absence of proper treatment, such muscular disparities might lead to long-standing shoulder dysfunctions in the form of pain

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and limited ranges even after the resolution of the primary condition. Differential soft tissue diagnosis of a stiff and painful shoulder should be made by the clinician, after determining the soft tissues or periarticular structures.

**Quality assessment / Risk of bias analysis:** The National Institutes of Health (NIH) quality assessment tool for observational cohort and cross-sectional studies and the Physiotherapy Evidence Database (PEDro) scales were used for the methodological analysis of the studies included.

**Strategy of data synthesis:** Our plan of study does not include any meta-analysis. The qualitative analysis of the included studies will be done.

**Subgroup analysis:** Subgroup analysis of shoulder, scapular, and neck muscles involvement in the stiff shoulder will be conducted if sufficient literature is available.

**Sensitivity analysis:** The articles involving suitable diagnosis, and logically explaining the muscle involvement in stiff shoulder conditions will be given high priority.

**Language:** Articles published in English language were only considered for this review.

**Country(ies) involved:** Department of Physiotherapy, Kasturba Medical College, Mangalore, Manipal Academy of Higher education, India in Collaboration with Department of Medical Rehabilitation Sciences, College of Applied Medical Sciences, King Khalid University, Saudi Arabia.

**Keywords:** Stiff shoulder, adhesive capsulitis, frozen shoulder, muscular/muscle imbalance, muscle length.

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