

# A Research Protocol on Effectiveness of Active Release Technique on Pain, Range of Motion and Strength in middle – aged individuals with post-operative wrist stiffness: Randomized Controlled Trial

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## Abstract

Wrist injury are the most common type of injury seen in young individuals due to RTA and traumatic injuries, which affects individuals function of daily living. the most common mechanism of injury for wrist fracture is direct trauma, fall on outstretched hand, which require surgical intervention to correct the deformity following the injury stiffness is the most common complication leading to difficulty in toileting activities, and activities of daily living. The aim of this protocol is to assess and compare the effectiveness of active release technique versus myofascial release technique along with conventional physiotherapy protocol including exercises like strengthening and stretching to maintain the new achieved range of motion. the outcome measures uses for the study for assessment is range of motion using goniometer, strength using dynamometer, and pain using numerical pain rating scale. the assessment will be perform at the beginning, after one week and final assessment at the end of the study to check the effectiveness of the intervention.

**Keywords:** Ulnar styloid process fracture, flexor carpi ulnaris injury, physiotherapy management, open reduction and external fixation,

## 1. Introduction:

Wrist Stiffness is a most common complication after a joint fracture and bone fixation (1). Prevalence of wrist stiffness is 5-85 % following the surgical procedure(2). It affects the activities of daily living with reduction in range of motion and decreased strength. Any joint related pathology may lead to stiffness. Wrist stiffness can occur as a result of intra articular or extra articular involvement or both depending on

the etiology. Intra articular causes can be any damage to the structures of the joints such as cartilage, synovium, intra articular ligaments whereas extra articular causes occur due to damage to the extra articulating structures such as tendons, muscles, fascia, bursa and overlying skin.(3)

Myofascial release is procedure used to manipulate and reduce the myofascial restrictions. When combined with other conventional treatments, its helps to minimize the tissue discomfort, breakdown the adhesions and gives instant pain relief. Various Conventional Physiotherapeutic treatments are used to treat wrist stiffness including stretching exercises, isometric exercises and manual therapy coupled with hot fomentation, given for pain reduction, improving range of motion, reducing tightness, improving strength, breaking down the adhesions and enhancing the patient condition (4).

Active Release Technique is a soft tissue mobilization used for reduction of pain, increasing flexibility and range of motion (5).The tissue is placed in shortened position, the therapist presses on the affected area maintaining the contact while the patient actively moves the structure which is affected.

Several literatures are available which shows the effectiveness of both the techniques either individually or combined with some other technique but there is dearth in the literature comparing the effectiveness between this two techniques - Active release technique and Myofascial release technique in patients of middle- aged with post-operative wrist stiffness.

## 2. Study Hypothesis:

- **Null Hypothesis (H0):** Active release technique will not be effective on Pain, Strength and Range of motion in middle aged individuals with post-operative wrist stiffness
- **Alternate Hypothesis (H1):** There will be positive effect of Active Release technique on Pain, Range of motion and Strength in middle aged individuals with post-operative stiffness.

**Aim:** The aim of the study is to find out and compare the effectiveness of Active Release Therapy on Pain, Range of Motion and Strength in middle - aged individuals with post-operative wrist stiffness.

### Objectives:

1. To evaluate efficacy of Active Release Technique v/s Myofascial release technique on pain in middle - aged individuals with post-operative wrist stiffness.
2. To evaluate efficacy of Active Release Technique v/s Myofascial release technique on Strength in middle - aged individuals with post-operative wrist stiffness.
3. To evaluate efficacy of Active Release Technique v/s Myofascial release technique on Range of motion in middle - aged individuals with post-operative wrist stiffness.

## 4. Material and Methodology

### Material Required

1. Plinth / Chair
2. Pillow
3. Goniometer
4. Handheld dynamometer
5. Pen and Paper for recording the assessment

### Methodology

**Study Type:** Intervention study

**Study Design:** This study will be carried out in the OPD setting of Dr. D.Y Patil College of Physiotherapy, Pimpri, Pune. All participants will be educated about the details of the intervention, research and data confidentiality prior to the start of the study. Those participants who will satisfy the inclusion criterion will have to sign an informed consent before participation. Those who full fill the inclusion criteria will then be included in the study for the duration of 6 months.

**Study Population:** Middle aged individuals with post-operative wrist stiffness

**Inclusion Criteria:** The individuals within middle aged group male and female, diagnosed with post-operative wrist stiffness.

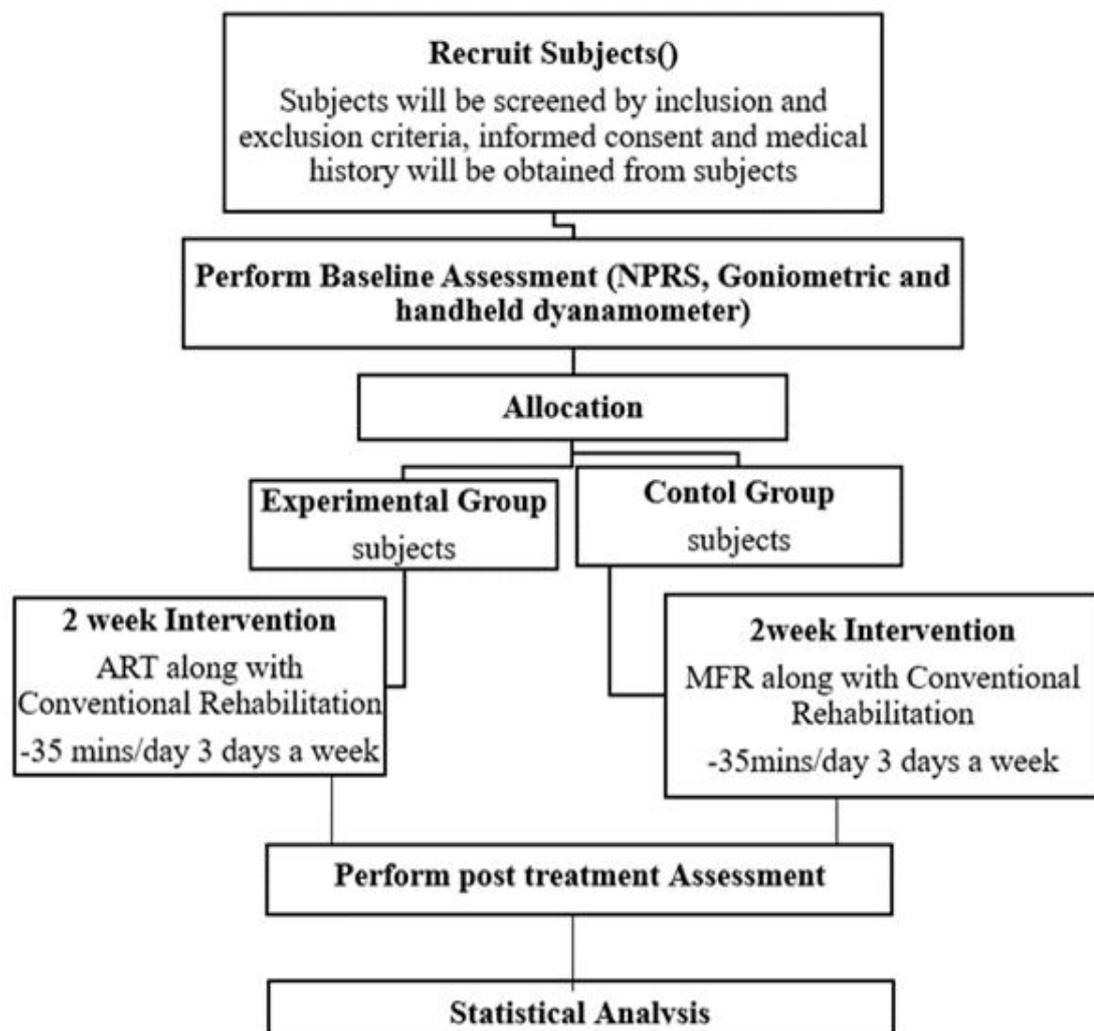
**Exclusion Criteria:** Individual who are having any degenerative diseases, neurological involvement, impaired cognition, systemic disorder or unstable fracture.

**Participants Timeline:** The duration of the study is 6 months and the duration of intervention is 2 weeks so, the participants will be enrolled during first 5 months of the study so 2 week intervention will be completed successfully. Assessment will be done on 1<sup>st</sup> day of the visit then in midway (1<sup>st</sup> week) and end (2<sup>nd</sup> week) of the intervention

**Implementation:** Research coordinator and principal investigator will supervise randomization. Participants will be asked to manually select from the envelope, sealed group allocation for the recruitment info either group.

**Blinding:** Single Blinding will be used during the trial. Participants will be blinded in the trial.

Fig1.



**Randomization:** using chit method

**Dependent Variables:** Pain and Decreased functional Range of motion and Strength

Independent Variables: Active Release Technique and Myofascial Release Technique.

## 5. Procedure:

Assessment of the patient was started after approval from the concerned authority individuals are first screened on the basis of inclusion and exclusion criteria, the individuals fulfilling the criteria were then explained about the purpose of the study.

### **Group A: Experimental Group**

- **Active Release Technique:** The patient is taken in sitting position. The patient hand is rested and therapist palpates the painful area on the hand then the patient is instructed for active movements of the wrist (flexion/extension) hold for 90 seconds and same is repeated for 3 times. 3 such sets are delivered to patient in one session for 3 days a week for a period of 2 weeks.

### **Group B: Control Group**

- **Myofascial release technique:** Rest the patient's hand on the pillow. The therapist is positioned to the side of the table at the level of patients shoulder. The therapist applies pressure from origin of common extensor/ flexors over the periosteum by using the fingertips and carried this down inferiorly through common extensor/flexor tendon For 90 seconds and same is repeated for 3 times. 3 such sets are delivered to patient in one session for 3 days a week for a period of 2 weeks.

### **Conventional Treatment**

Conventional physiotherapy is given to both the groups, which consists of stretching, isometric exercises, along with hot pack. All this exercises are performed 3 times with 10 sec hold

- For stretching ask the patient to extend their arm in front of them with palm facing down. Bend the wrist up and down, holding for 10 seconds. Repeat it for 3 times
- For isometric exercises place the patient's forearm on the table over the edge and ask to extend the wrist while therapist will be applying the resistance over the dorsal aspect of the wrist. Hold the position for 10 seconds and then relax, same procedure is carried out for the flexors. Repeat it for 3 times
- For hot pack, a standard hot pack covered with the 2 layers of towel kept over the wrist for 15 minutes.

## Outcome Measures

### 1. *Numerical Pain Rating Scale*

It's a 0-10 rating scale in which 0 denotes no pain and 10 denotes unbearable pain, the scale is explained to the participants then asked to mark a number on the scale.(6)

### 2. *Goniometer*

It's a standard device used for assessment of range of motion. For measurement of wrist ROM, the stationary arm was placed on the ulnar styloid process next to the little finger.(7)

### 3. *Handheld Dynamometer*

It's a device used to assess the muscle strength. The patients was instructed to perform maximum isometric contraction during dynamometry measures. 3 trials were performed with rest period of one minute between each.(8)

## 6. Data Management:

**Data collection:** Information about study given at time of recruitment (elaborating the purpose, nature procedure, benefits and after effects of the intervention) with all baseline tests and assessment will be repeated on 2 more occasions.

## 7. Discussion

The Protocol will be conducted as to see the effect of Active Release Technique versus Myofascial Release Technique. In Active release technique for post-operative wrist stiffness the patient is instructed to be in sitting position. The patient's hand is rested and the therapist palpates and presses the painful area on the hand then the patient is instructed to perform the active movements of the wrist (flexion/extension). This is given in 3 sets of 90 seconds, this will increase the flexibility by breaking the adhesions and then ROM will be assessed. Myofascial Release Technique is given to release the tension from the soft tissues and to break down the myofascial restrictions followed by conventional treatment in both the treatment group.

## 8. Conclusion:

The conclusion of the study will be drawn after the data is collected, analysed and afterwards conclusion will be drawn.

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