

# **ELBOW REHABILITATION MANUAL FOR CARTIGROW®**

## **AUTOLOGOUS ADULT LIVE CULTURED CHONDROCYTES**

**Disclaimer:** This document contains confidential and proprietary information of Regrow Biosciences Pvt. Ltd which must not to disclosed to anyone other than the Court Of Law (only if required). This manual is for personal use of treating physician or specialist, commercial use is strictly prohibited. This information can only be used for educational and training purpose. Regrow Biosciences Pvt. Ltd, its officers, directors, agents, attorneys, employees, shareholders, and affiliates do not take any responsibility or liability if the manual is used by anyone for commercial purpose.

# INTRODUCTION

- The purpose of this manual is to provide guidance for the development of a physician-prescribed rehabilitation program that fosters early mobilization and load protection to promote implant maturation and reduce post-operative risk.
- Autologous Adult Live Cultured Chondrocytes (CARTIGROW™) Rehabilitation Manual Guidelines are based on clinical experience\* that supports the use of a controlled rehabilitation program to promote a progressive return to full range of motion and weight bearing as well as muscle strengthening and conditioning.
- The rehabilitation program is designed using knowledge of basic science, anatomy and biomechanics of articular cartilage, as well as the natural course of healing following implantation, and is not intended as a substitute for individual clinical judgment. The goal is to restore optimal function in each patient as quickly and safely as possible.
- Rehabilitation following elbow injury or elbow surgery follows a sequential and progressive multiphased approach.
- The phases of rehabilitation program should overlap to ensure proper progression.
- The ultimate goal of elbow rehabilitation is to return the athlete to his or her previous functional level as quickly and safely as possible.

# PHASE I (DAY 1-7 POST-OPERATIVE)- IMMEDIATE MOTION PHASE

## Goals:

- Minimize the effects of immobilization.
- Re-establish non-painful ROM.
- To retard muscular atrophy.



## Rehabilitation Plan

Range of motion	Activities
<ul style="list-style-type: none"> <li>• Immediate post-operative hand, wrist and elbow exercises like grip strengthening, wrist flexor stretching, wrist extensor stretching, wrist curls, reverse wrist curls, neutral wrist curls, pronation/ supination</li> <li>• Passive ROM elbow extension/ flexion</li> <li>• Begin progressive resisted exercises with 1 lb weight as mentioned above.</li> <li>• Light resistance exercise with tube</li> </ul>	<ul style="list-style-type: none"> <li>• Cryotherapy and high voltage stimulation for reducing pain and inflammation.</li> <li>• Walking, stationary bike- brace on</li> <li>• No treadmill</li> <li>• Avoid running and jumping due to the distractive and compressive forces that can occur at landing.</li> </ul>



# PHASE II (2-4 WEEKS POST-OPERATIVE)- INTERMEDIATE PHASE



## Goals:

- To exhibit full ROM, minimal pain and tenderness
- To enhance elbow and upper extremity mobility
- Improve muscular strength and endurance
- Re-establish neuromuscular control of the elbow complex.

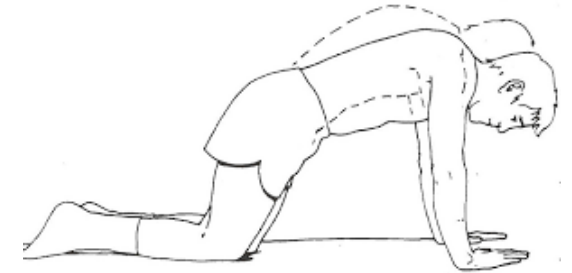
## Rehabilitation Plan

### Range of motion

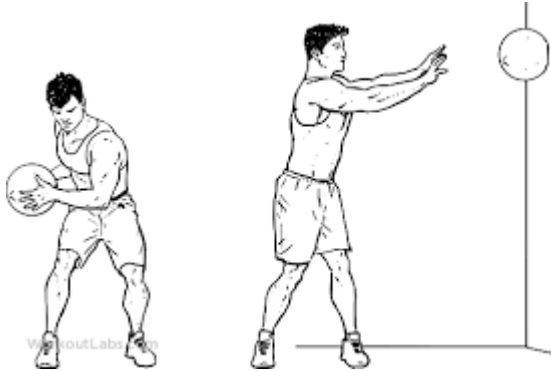
- Addition of biceps curl and triceps extension at week 2.
- Continue to progress PRE weight and repetitions as tolerable.
- Initiate biceps and biceps eccentric exercise program at week 3.
- Initiate rotator cuff exercises programs like external and internal rotators, deltoid, scapulothoracic strengthening
- Neuromuscular control exercises like rhythmic stabilizations, slow-reversal, manual resistance, elbow/wrist flexion drills.

### Activities

- Walking, stationary bike- brace on
- No treadmill
- Avoid running and jumping due to the distractive and compressive forces that can occur at landing.



# PHASE III (5-8 WEEKS POST-OPERATIVE) ADVANCED STRENGTHENING PHASE

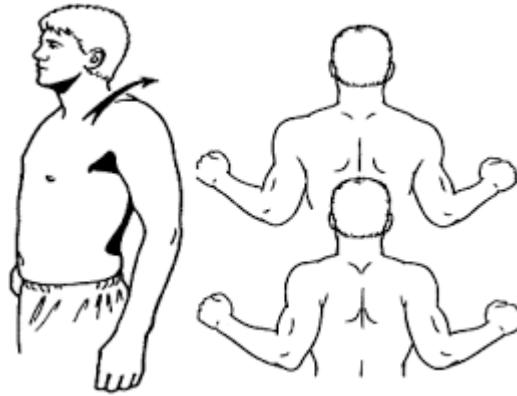


### Goals:

- To increase strength, power, endurance and neuromuscular control in order to prepare for a gradual return to sport.
- Full non-painful ROM, no pain or tenderness and strength i.e. 70% of contralateral extremity.

Rehabilitation Plan	
Range of motion	Activities
<ul style="list-style-type: none"> <li>• Advanced strengthening exercises include high speed and eccentric contraction and plyometric activities.</li> <li>• Elbow flexion exercises</li> <li>• Neuromuscular control exercises include side-lying external rotation with manual resistance.</li> <li>• Plyometric exercise using weighted medicine ball</li> </ul>	<ul style="list-style-type: none"> <li>• Walking, stationary bike- brace on</li> <li>• No treadmill</li> <li>• Avoid running and jumping due to the distractive and compressive forces that can occur at landing.</li> </ul>

# PHASE IV (9-12 WEEKS POST-OPERATIVE)



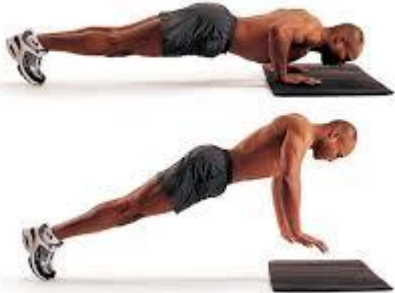
### Goals:

- Increase overall strength and endurance
- Achieve and maintain full elbow ROM
- Transition to entry level plyometrics.

Rehabilitation Plan	
Range of motion	Activities
<ul style="list-style-type: none"> <li>• Full ROM exercises</li> <li>• Progressive isotonic for shoulder and elbow strengthening</li> <li>• Initiate eccentric elbow flexion strengthening</li> <li>• Hip, lower extremity and core strengthening</li> <li>• Scapular strengthening and stabilization</li> </ul>	<ul style="list-style-type: none"> <li>• Walking, stationary bike- brace off</li> <li>• Continue to avoid running and jumping.</li> </ul>



# PHASE V (13-20 WEEKS POST-OPERATIVE)



## Goals:

- Maximize rotator cuff and scapular strength in throwing positions and postures
- Initiate education on throwing mechanics.
- Transition to higher level plyometrics.

<b>Rehabilitation Plan</b>	
<b>Range of motion</b>	<b>Activities</b>
<ul style="list-style-type: none"> <li>• Full ROM exercises</li> <li>• shoulder and elbow strengthening</li> <li>• Initiate rhythmic stabilization drills for the elbow and shoulder</li> <li>• Initiate plyometric 2 hand drills</li> <li>• Begin throwing mechanics education-including slow motion “air throws, posture and position check points</li> <li>• Hip, lower extremity and core strengthening</li> <li>• Scapular strengthening and stabilization</li> </ul>	<ul style="list-style-type: none"> <li>• Athlete may be running and sprinting at 75% speed.</li> </ul>

# PHASE VI (21-28 WEEKS POST-OPERATIVE) RETURN TO ACTIVITY PHASE



## Goals:

- Allows the athlete to progressively return to full competition using an interval return to throwing program.

Rehabilitation Plan	
Range of motion	Activities
<ul style="list-style-type: none"> <li>• Full ROM exercises</li> <li>• Isokinetic testing</li> <li>• Long toss interval throwing program beginning at 45ft and gradually progressing to 120 or 180 feet.</li> <li>• Throwing off a mound program</li> <li>• Breaking balls are initiated once the pitcher can throw 40 to 50 inches at a minimum 80% intensity with symptoms.</li> </ul>	<ul style="list-style-type: none"> <li>• No restriction in any activities.</li> </ul>



## **Regrow Biosciences Pvt. Ltd.**

**Head Quarter:** 2-ABC, Acme Plaza, Andheri-Kurla Road,

Andheri East, Mumbai – 400059., India

Tel: +91-22-67330300 / Fax +91-22-28390556

**Laboratory:** 22, Shah Industrial Estate, Nangargaon,

Lonavala- 410401, Maharashtra, India

**Tel:** +91-2114-273741/42/43

**Toll-Free No.:** 1800 209 0309

**Email ID:** [info@regrow.in](mailto:info@regrow.in)

**Website:** [www.regrow.in](http://www.regrow.in)

**Licensed By:** State Food and Drugs Administration, Pune & Drugs Controller General of India (DCGI), Govt. of India