

REHABILITATION MANUAL OF PATELLA FOR CARTIGROW®

AUTOLOGOUS ADULT LIVE CULTURED CHONDROCYTES

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INTRODUCTION



- The intent of this protocol is to provide the clinician with a guideline to establish and progress a patient through post-operative rehabilitation. The plan of care should be based upon the patient's clinical exam and individual goals.
- Post-operative rehabilitation will focus on regaining range of motion and allowing the cartilage regeneration.
- As rehabilitation progresses, the focus shifts progressive weight bearing, regaining strength, flexibility and movement control.
- General timeframes for the average rehabilitation are given here but individuals will progress at different rates depending on their age, associated injuries, pre-injury health status, rehabilitation compliance and injury severity.

PHASE I (0-2 WEEKS POST-OPERATIVE)

REHABILITATION PLAN

Weight bearing

- Non-weight bearing

Range of motion

- Knee PROM 0⁰-60⁰
- Initiate CPM day 1 total of 8-12 hours /day.
- Progress CPM ROM as tolerated 5⁰-10⁰/day
- May continue CPM for total of 6-8 hours /day for up to 6 weeks
- Patella immobilization (4-6 times/ day)

Brace

- locked at 0⁰.
- Sleep in locked brace for 2-4 weeks.

Strengthening Program

- Straight leg raises
- Hip abduction
- Ankle pumps
- Active quadriceps isometrics
- Harmstring exercises

Activities

- None



Goals:

- Good patella mobility
- ROM minimum 0⁰-60⁰
- Regaining quadriceps control
- No soft tissue contracture
- Control inflammation and effusion
- Protection of healing tissue from load and shear forces
- Decrease pain and effusion.
- Restoration of full passive knee extension
- Gradual improvement of knee flexion.

PHASE II (3-4 WEEKS POST-OPERATIVE)



Goals:

- Good patella mobility
- ROM minimum 0⁰-90⁰
- Regaining quadriceps control
- No soft tissue contracture
- Control inflammation and effusion
- Protection of healing tissue from load and shear forces
- Decrease pain and effusion.
- Restoration of full passive knee extension
- Gradual improvement of knee flexion.

Rehabilitation Plan

Weight bearing	Range of motion	Brace	Strengthening Program	Activities
<ul style="list-style-type: none"> • Non-weight bearing with crutches 	<ul style="list-style-type: none"> • Knee PROM 0⁰-90⁰ • Progress CPM ROM as tolerated 5⁰-10⁰/day • May continue CPM for total of 6-8 hours /day for up to 6 weeks • Patella immobilization (4-6 times/ day) 	<ul style="list-style-type: none"> • locked at 0⁰. • Sleep in locked brace for 2-4 weeks. 	<ul style="list-style-type: none"> • 4-way Straight leg raises • Isometric training with co contraction of quad and hamstrings • Assisted heel slides • Hip abduction • Hamstring exercise 	<ul style="list-style-type: none"> • None

PHASE III (5-6 WEEKS POST-OPERATIVE)



Goals:

- Good patellar mobility
- ROM: 0°-110°
- Strength >3/5
- Voluntary quad contraction achieved.
- Gradual return to daily activities.
- Control inflammation and effusion.
- Protection of healing tissue from load and shear forces.
- Decrease pain and effusion
- Restoration of full passive knee extension
- Gradual improvement of knee flexion.

REHABILITATION PLAN

Weight bearing

- Partial (25%) weight bearing with crutches

Range of motion

- Knee PROM 0°-110°
- Continue patella mobilization

Brace

- Dorsal closure brace at 6 weeks if muscle control throughout ROM

Strengthening Program

- 4-way straight leg raises with addition of ankle weight, not to exceed 10% of body weight.
- Isometric training
- Weight shifting exercises with knee in extension
- Hamstring exercise

Activities

- Stationary bicycle



Goals:

- Mild pain
- Minimal effusion
- Good patellar mobility
- ROM: 0⁰-120⁰
- Strength >4/5
- Voluntary quad contraction achieved.
- Gradual return to daily activities.

Weight bearing

- Partial (50-75%) weight bearing with crutches

Range of motion

- Knee AROM 0⁰-120⁰

Brace

- Not required

Strengthening Program

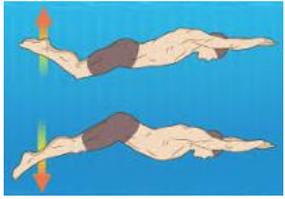
- 4-way straight leg raises with addition of ankle weight
- Standing straight leg raises X 4 with theraband bilaterally
- Hamstring exercise
- Closed chain exercise like initiate weight shifts, wall sits, mini squats, balance training

Activities

- Stationary bicycle
- Water walking

PHASE V (9-12 WEEKS POST-OPERATIVE)

REHABILITATION PLAN



Weight bearing

- Full weight bearing when pain, effusion controlled, muscle control throughout ROM

Range of motion

- Full Knee AROM 0⁰-135⁰

Brace

- Not required

Strengthening Program

- 4-way straight leg raises with ankle weight
- Standing straight leg raises X 4 with theraband bilaterally
- Hamstring curls, knee extension quads, leg press
- Closed chain exercise like initiate weight shifts, wall sits, mini squats, balance training, lateral step-ups, single leg stance

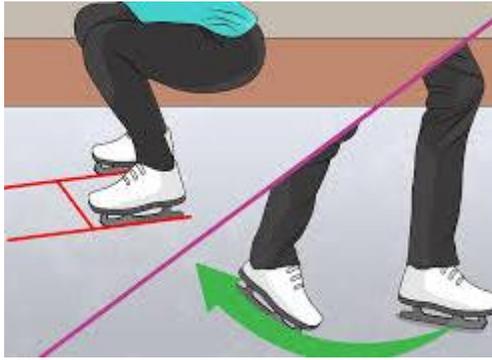
Activities

- Stationary bicycle
- Water walking
- Swimming (straight leg kicking)
- walking

Goals:

- Minimal pain & swelling
- Good patellar mobility
- No crepitus
- Symmetrical gait
- ROM: 0⁰-135⁰
- Strength 4/5
- Muscle control throughout ROM
- Hamstrings within 20% of contralateral extremity.
- Quadriceps within 30% of contralateral extremity
- Balance testing within 30% of contralateral extremity.

PHASE VI (13-24 WEEKS POST-OPERATIVE)



Goals:

- Symmetrical gait
- Gradual return to full unrestricted functional activities
- No effusion, painless ROM, joint stability
- Full AROM 0⁰-135⁰
- Performs ADL, can walk 20 minutes without pain

REHABILITATION PLAN

Weight bearing

- Full weight bearing with symmetrical gait

Range of motion

- Full Knee AROM 0⁰-135⁰

Brace

- Not required

Strengthening Program

- 4-way straight leg raises, rubber tubing
- Hamstring curls, knee extension with resistance, leg press, step-ups and lateral step-ups
- Closed chain exercise like wall sits, mini squats, balance training, balance board, single leg stance

Activities

- Skating, rollerblading, cycling allowed for 6-8 months
- Jogging, running and aerobics allowed for 8-10 months
- Tennis, basket ball allowed for 12-18 months

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