GALLAND/KIRBY AUTOLOGOUS CULTURED CHONDROCYTES FOR IMPLANTATION (CARTICEL®) POST-SURGICAL REHABILITATION PROTOCOL

POST-OP DAYS 1 – 14

- **Dressing:**
  - POD 1: Debulk dressing, TED Hose in place
  - POD 2: Change dressing, keep wound covered, continue TED Hose
  - POD 7-10: Sutures out, D/C TED Hose when effusion resolved
- **Brace** – Locked in extension
- **Crutches** – non weight bearing (NWB)
- **CPM** – 0-30 degrees (2-hour increments for 8-10 hours/day)
- **AAROM** 0-30 degrees within pain limits
- **Patellar mobilization** (teach patient)
- **Calf pumping**
- **Passive extension with heel on bolster or prone hangs**
- **Electrical stimulation in full extension with quad sets and SLR**
- **Quad sets, Co-contractions quads / HS in extension**
- **Straight leg raise (SLR) x 4 on mat (in brace) – parallel bars if poor quad control**
- **Gentle Hamstring, ITB stretching**
- **Ice pack with knee in full extension after exercise**

**GOALS**

- Pain / effusion control
- Good quad control

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**Weeks 2 - 4**

- **Brace** – Locked in extension
- **Crutches** – Flat foot weight bearing (FFWB)
- **Avoid twisting/pivoting on involved leg**
- **Continue appropriate previous exercises**
- **Scar massage when incision healed**
- **CPM** – 0-40 degrees
• AAROM, AROM 0-40 degrees
• SLR x 4 on mat (no brace) – Add light weight above knee if good quad control
• Pool therapy – Chest deep walking with aqua-jogger floatation device

GOALS
• ROM 0-40 degrees
• No extensor lag

WEEKS 4 - 6
• Brace – 0-30 degrees, continue to open to available range
• Crutches – Partial weight bearing (PWB)
• Continue appropriate previous exercises
• CPM – Add 5 degrees per day up to 90 degrees
• AAROM, AROM 0-90 degrees
• Pool therapy – Kickboard with gentle flutter kick from hip, knee in extension

GOAL
• AROM 0-90 degrees

WEEKS 6 - 8
• Brace – 0-90 degrees, continue to open to available range
• Crutches – PWB
• Continue appropriate previous exercises
• CPM – D/C
• AAROM, AROM 0-120 degrees
• Isometric co-contractions at 0, 30, 60, 90 degrees
• Stationary bike for ROM
• Pool therapy – Chest deep running

GOALS
• ROM 0-120 degrees
• No effusion

WEEKS 8 - 10
• Brace – D/C when good quad control
• Crutches:
  – Weight bearing as tolerated (WBAT) (D/C when gait is normal)
Avoid twisting/pivoting on involved leg

- Continue appropriate previous exercises
- PROM, AAROM, AROM to regain full motion
- SLR x 4 with weight below the knee if quad control adequate
- Weight shifts in full extension
- Stationary bike for progressive resistance and endurance
- Pool therapy – Unrestricted

GOAL

- Full ROM

WEEKS 10 - 12

- Continue appropriate previous exercises
- Avoid twisting/pivoting on involved leg
  - Isometric open chain co-contractions at varying angle
  - Total Gym – Mini squats (level 3-5) – No flexion > 45 degrees
    - Passive flexion to 90 degrees (push up with opposite leg)
  - Leg press with light resistance 0-30 degrees
  - Hamstring curls – Carpet drags or rolling stool (closed chain)
  - Heel raises – Double leg, progress to single leg
  - Proprioceptive training – Double leg BAPS for weight shift
    - Progress to single leg BAPS, ball toss and body blade
  - Elliptical trainer

GOAL

- Normal gait

MONTHS 3 - 6

- Continue appropriate previous exercises
- Standing SLR x 4 with Theraband bilaterally
- Partial wall squats – No knee flexion past 45 degrees
- Forward, lateral, and retro step downs in parallel bars
  - No knee flexion past 45 degrees (small step)
- Leg press with progressive resistance – No knee flexion past 45 degrees
- HS curl weight machine
- Fitter
- Slide board
• Treadmill – Forwards and backwards walking
• Swimming
• Quad stretches

**GOAL**
• Thigh girth equal bilaterally

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**MONTHS 6 - 9**
• Continue appropriate previous exercises with increased resistance
  – Progress to 90 degrees of knee flexion
  – Increase resistance as tolerated
• Hip weight machine x 4 bilaterally
• Step downs with medium to large steps
• Sit-up progression
• Treadmill – Walking progression program

**GOAL**
• Walk 2 miles at 15 min/mile pace

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**MONTHS 9 - 12**
• Continue appropriate previous exercises with progressive resistance
• Agility drills  Plyometrics
• Progressive weight training
• Treadmill – Running progression program
• Low impact activities such as skating, roller blading, cross country skiing, cycling

**GOAL**
• Run 2 miles on treadmill at comfortable pace

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**MONTHS 12 - 18**
• Continue appropriate previous exercises
• Knee extension weight machine
• Agility drills – Slow “S”, figure 8, zigzags, progress to sharper cutting motions
• Plyometrics – Advanced
• Running progression to track
• Repetitive impact activities such as aerobic classes
• Transition to home / gym program
GOAL

• Resume all activities

*NO CONTACT OR CUTTING SPORTS UNTIL 18 MONTHS POST-OP*
KNEE POST-OP PHASE I

Perform exercises below frequently: 30 reps, 3 – 5x a day

Quad Isometrics

Heel Slides

Active Assisted Motion

Ice Position  15 minutes 2-3 x per day