

## PHYSICAL THERAPY PROTOCOLS

### OSTEOCHONDRAL AUTOGRAFT TRANSPLANTATION (Autograft/Obi-Femoral Condyle)

#### I. IMMEDIATE-OPERATIVE PHASE POST (0-6 WEEKS)

<b>Goals:</b>	<b><i>Protection of healing tissue from load and shear forces</i></b> <b><i>Decrease pain and effusion</i></b> <b><i>Restoration of full passive knee extension</i></b> <b><i>Gradual improvement of knee flexion</i></b> <b><i>Regaining quadriceps control</i></b>
<b>Brace:</b>	Locked at 0 degrees during weight bearing activities Sleep in locked brace for 2-4 weeks
<b>Weight Bearing:</b>	Non weight bearing 2-4 weeks (physician direction) If large lesion (>5 cm <sup>2</sup> ) may need to delay WB to Week 4 Toe touch WB (approx. 20-30 lbs.) Weeks 2-4 Partial WB (approx. 25-50% body weight) at Week 6
<b>Swelling/ Inflammation Control:</b>	Cryotherapy (Polar Care or ice pack) Elevation & ankle pumps
<b>Range of Motion:</b>	Immediate motion exercise Full passive knee extension immediately Initiate CPM if ordered day 1 for 8-12 hrs./day (0-40) For 2-3 weeks – progress ROM 5-10 degrees/day May continue CPM 6-8 hrs./day for 6-8 weeks Patellar and soft tissue mobilization (4-6x/day) Passive knee flexion ROM 2-3 times daily Passive knee flexion ROM goal is 90 degrees Weeks 1-2 Passive knee flexion ROM goal is 105-115 degrees by Week 4 and 120-125 degrees by week 6 Stretch hamstrings, calf and quadriceps
<b>Strengthening Program:</b>	Ankle pump using rubber tubing Quad setting Multi-angle isometrics (co-contractions Q/H) Active knee extension 90-40 deg. (if no articulation – no resistance) Straight leg raises (4 directions) Stationary bicycle when ROM allows Biofeedback and electrical muscle stimulation, PRN Isometric leg press at Week 4 (multi-angle) May begin pool for gait training & exercises at Week 6

Functional Activities: Gradual return to daily activities  
If symptoms occur, reduce activities to reduce pain and inflammation  
Extended standing should be avoided

## II. TRANSITION PHASE (6-12 WEEKS)

**Goals:** *Gradually return to daily activities*  
*Gradually improve quadriceps strength/endurance*  
*Gradually increase in functional activities*

*Criteria to Progress to Phase II:*

1. Full passive knee extension
2. Knee flexion to 120 degrees
3. Minimal pain and swelling

Brace: Discontinue brace at 6 weeks

Weight Bearing: Progress WB as tolerated  
75% body weight with crutches by 8 weeks  
Progress to FWB at 10-12 weeks  
May need to delay FWB up to 14 weeks if large lesion  
Discontinue crutches at 10-12 weeks

Range of Motion: Gradual increase in ROM  
Maintain full passive knee extension  
Progress knee flexion to 125-135 degrees  
Continue patellar mobilization and soft tissue mobilization, as needed  
Continue stretching program

Strengthening Exercises: Initiate weight shifts Weeks 6-8  
Initiate mini-squats 0-45 degrees Week 8-10  
Closed kinetic chain exercises (leg press) Weeks 8-10  
Toe-calf raises Weeks 10-12  
Open kinetic chain knee extension, 1lb/wk, Weeks 10-12  
Stationary bicycle (gradually increase time)  
Balance and proprioception drills  
Initiate front and lateral step-ups  
Continue use of biofeedback and EMS, PRN  
Continue use of pool for gait training and exercise

Functional Activities: As pain & swelling diminish, may gradually increase functional activities  
Gradually increase standing and walking

## III. MATURATION PHASE (12-26 WEEKS)

**Goals:** *Improve muscular strength and endurance*  
*Increase functional activities*

*Criteria to Progress to Phase III:*

1. Full ROM
2. Acceptable strength level
  - a. Hamstrings w/in 10% contralateral leg
  - b. Quadriceps w/in 10-20% of contralateral leg
3. Balance testing within 30% of contralateral leg

#### *4. Able to bike for 30 minutes*

Range of Motion:	Patient should exhibit 125-135 degrees flexion – no restrictions
Exercises:	Leg press (0-90 degrees) Bilateral squats (0-60 degrees) Unilateral step-ups progressing from 2" to 8" Forward lunges Begin walking program on treadmill Open kinetic chain knee extension (0-90 degrees) Bicycle Stairmaster Swimming Elliptical/Nordic Trak
Functional Activities:	As patient improves, increase walking (distance, cadence, etc.)
Maintenance Program:	Initiate at Weeks 16-20 Bicycle – low resistance Progressive walking program Pool exercises for entire lower extremity Straight leg raises into flexion Leg press Wall squats Hip abduction/adduction Front lunges Stretch quadriceps, hamstrings, gastroc

#### **IV. RETURN TO ACTIVITY PHASE (16-52 WEEKS)**

**Goals:** *Gradual return to full unrestricted functional activities*

*Criteria to Progress to Phase IV:*

- 1. Full non-painful ROM*
- 2. Strength within 90% of contralateral extremity*
- 3. Balance and/or stability within 75% of contralateral extremity*
- 4. No pain, inflammation or swelling*

Exercises: Continue maintenance program progression 3-4x/wk  
Progress resistance as tolerated  
Emphasis on entire lower extremity strength & flex.  
Progress agility and balance drills  
Impact loading program should be specialized to the patient's demands  
Progress sport program depending on patient variables

Functional Activities: Patient may return to various sport activities as progression in rehabilitation and cartilage healing allows. Generally, low-impact sports such as skating, rollerblading and cycling are permitted at about 6-8 months. Higher impact sports such as jogging, running and aerobics may be performed at 8-10 months. High impact sports such as tennis, basketball and baseball are allowed at 12-18 months.