



## PHYSICAL THERAPY PROTOCOLS

### OSTEOCHONDRAL AUTOGRAFT TRANSPLANTATION (Autograft/Obi-Trochlea)

#### 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 4 weeks
<b>Weight Bearing:</b>	Immediate toe-touch WB 25% body weight in brace Locked in full extension 50% body weight Week 2 in brace 75% body weight Weeks 3-4 in brace
<b>Swelling/ Inflammation Control:</b>	Cryotherapy (Polar Care or ice pack) Elevation & ankle pumps
<b>Range of Motion:</b>	Immediate motion exercise Day 1-1 Full passive knee extension immediately Initiate CPM if ordered Day 1 for 8-12 hrs./day (0-60) 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 degrees by Week 4 120-125 degrees by Week 6 Stretch hamstrings, calf and quadriceps
<b>Strengthening Program:</b>	Ankle pump using rubber tubing Quad setting Straight leg raises (4 directions) Toe-calf raises Week 2 Stationary bicycle when ROM allows Biofeedback and EMS as needed Isometric leg press at Week 4 (multi-angle) Initiate weight shifts Week 4 Begin pool therapy for gait & exercises – Week 4

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 115/120 degrees
3. Minimal pain and swelling
4. Voluntary quadriceps activity

Brace: Discontinue brace at 6-8 weeks

Weight Bearing: Progress WB as tolerated  
Progress to FWB at 6-8 weeks  
Discontinue crutches at 6-8 weeks

Range of Motion: Gradual increase in ROM  
Maintain full passive knee extension  
Progress knee flexion to 120-125 degrees by Week 8  
Continue patellar mobilization and soft tissue mobilization, as needed  
Continue stretching program

Strengthening Exercises: Initiate mini-squats 0-45 degrees Week 8  
Closed kinetic chain exercises (leg press) Week 8  
Toe-calf raises Week [?]  
Open kinetic chain knee extension w/o resistance  
Begin knee extension 0-30 degrees then progress > angles  
Stationary bicycle (gradually increase time)  
Balance and proprioception drills  
Initiate front and lateral step-ups  
Stairmaster at Week 12  
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. REMODELING PHASE (13-32 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 20-30% of contralateral leg
3. Balance testing within 30% of contralateral leg
4. Able to walk 1-2 miles or bike for 30 minutes
5. Able to bike for 30 minutes

Range of Motion:	Patient should exhibit 125-135 degrees flexion
Exercises:	<p>Leg press (0-60 degrees; progress to 0-90 degrees)</p> <p>Bilateral squats (0-60 degrees)</p> <p>Unilateral step-ups progressing from 2" to 6"</p> <p>Forward lunges</p> <p>Begin walking program on treadmill</p> <p>Open kinetic chain knee extension (90-40 degrees) – progress 1 lb. every 10-14 days if no pain or crepitation – must monitor symptoms – may delay heavy resistance for up to 6 months</p> <p>Bicycle</p> <p>Stairmaster</p> <p>Swimming</p> <p>Elliptical/Nordic Trak</p>
Functional Activities:	<p>As patient improves, increase walking (distance, cadence, etc.)</p> <p>Light running toward end of phase – per physician</p>
Maintenance Program:	<p>Initiate at Weeks 16-20</p> <p>Bicycle – low resistance, increase time</p> <p>Progressive walking program</p> <p>Pool exercises for entire lower extremity</p> <p>Straight leg raises</p> <p>Leg press</p> <p>Wall squats</p> <p>Hip abduction/adduction</p> <p>Front lunges</p> <p>Step-ups</p> <p>Stretch quadriceps, hamstrings, gastroc</p>

#### IV. MATURATION PHASE (8-15 MONTHS)

**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 months. Higher impact sports such as jogging, running and aerobics may be performed at 8-9 months for small lesions, or 9-12 months for larger lesions. High impact sports such as tennis, basketball and baseball are allowed at 12-18 months.