

## OSTEOCHONDRAL ALLOGRAFT OR AUTOGRAFT TRANSPLANTATION

### PHASE I- (Surgery to 6 weeks after surgery)

<b>Appointments</b>	<ul style="list-style-type: none"> <li>• Rehabilitation appointments begin within 3-5 days after surgery and meet about once per week</li> </ul>
<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>• Protection of the post-surgical knee</li> <li>• Restore normal knee range of motion and patellar mobility</li> <li>• Eliminate effusion</li> <li>• Restore leg control</li> </ul>
<b>Weight Bearing</b>	<ul style="list-style-type: none"> <li>• Week 1-3 = non-weight bearing</li> <li>• Week 4-6 = touchdown to 25% weight bearing</li> <li>• 0-6 weeks = locked extension lock splint brace</li> </ul>
<b>Range of Motion Exercises</b>	<ul style="list-style-type: none"> <li>• Full knee extension               <ul style="list-style-type: none"> <li>- Knee extension on a bolster</li> <li>- Prone hangs</li> </ul> </li> <li>• Passive Knee Flexion               <ul style="list-style-type: none"> <li>- Supine wall slides</li> <li>- Assisted heel slides</li> <li>- Continuous passive motion machine</li> </ul> </li> <li>• Week 1-2 = 0-90°</li> <li>• Week 3-4 = 0-110°</li> <li>• Week 5-6 = 0-125°</li> <li>• Biking (week 4)– use contra-lateral leg to create ipsilateral passive range of motion</li> </ul> <p>NOTE: range of motion exercises should be carried out frequently throughout the day with high repetitions to help remodel and contour the healing cartilage. The optimal goal during the first 6 weeks is to do 4-6 hours of range of motion exercises per day.</p>
<b>Suggested Therapeutic Exercise</b>	<ul style="list-style-type: none"> <li>• Quadriceps sets</li> <li>• Straight leg raises</li> <li>• Four way leg lifts in standing with brace on for balance and hip strength</li> <li>• Patellar mobilizations</li> <li>• Soft tissue mobilization</li> </ul>
<b>Cardiovascular Exercise</b>	<ul style="list-style-type: none"> <li>• Upper body circuit training or upper body ergometer</li> </ul>
<b>Progression Criteria</b>	<ul style="list-style-type: none"> <li>• Patients may progress to Phase II if they are 6 weeks post-operative, have met the above stated goals, have trace to no effusion and full knee extension</li> </ul>

PHASE II (begin after meeting Phase I criteria, usually 7 to 12 weeks after surgery)

<b>Appointments</b>	<ul style="list-style-type: none"> <li>• Rehabilitation appointments are once a week</li> </ul>
<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>• Single leg stand control</li> <li>• Normalize gait</li> <li>• Good control and no pain with functional movements, including step up/down, squat, partial lunge (staying less than 60° of knee flexion and avoiding excessive weight bearing at position of the lesion)</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• Avoid post-activity swelling</li> <li>• Avoid loading knee a deep flexion angles</li> <li>• No impact activities until 12 weeks after surgery</li> </ul>
<b>Weight Bearing</b>	<ul style="list-style-type: none"> <li>• Begin progressive weight bearing as tolerated with axillary crutches and no brace</li> </ul>
<b>Suggested Therapeutic Exercise</b>	<ul style="list-style-type: none"> <li>• Weight shifting</li> <li>• Begin pool program – gait drills and initiation of protected weight bearing strengthening exercises</li> <li>• Double leg balance and proprioceptive drills</li> <li>• Stationary bike</li> <li>• Gait drills (start with pool)</li> <li>• Protected weight bearing hip and core strengthening</li> <li>• Stretching for patient specific muscle imbalances</li> <li>• Quadriceps strengthening – closed chain exercises short of 60° knee flex</li> </ul>
<b>Cardiovascular Exercise</b>	<ul style="list-style-type: none"> <li>• Non-impact endurance training, swimming (stiff knee flutter kick), deep water run, upper body circuits</li> </ul>
<b>Progression Criteria</b>	<ul style="list-style-type: none"> <li>• Patients may progress to Phase III if they have             <ul style="list-style-type: none"> <li>- Normal gait on level surfaces</li> <li>- Full range of motion</li> <li>- No effusion</li> <li>- Ability to carry out functional movements without unloading affected leg or pain, while demonstrating good control</li> <li>- Single leg balance greater than 15 seconds</li> </ul> </li> </ul>

**PHASE III- (Begin after meeting Phase II criteria, usually about 4 months)**

<b>Appointments</b>	<ul style="list-style-type: none"> <li>• Rehabilitation appointments 1 time every 1-2 weeks</li> </ul>
<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>• Good control and no pain with sport and work specific movements, including impact</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• Post-activity soreness should resolve within 24 hours</li> <li>• Avoid post-activity swelling</li> <li>• Avoid knee pain with strengthening</li> </ul>
<b>Suggested Therapeutic Exercise</b>	<ul style="list-style-type: none"> <li>• Functional leg strengthening             <ul style="list-style-type: none"> <li>- Squats</li> <li>- Lunges – all three planes</li> <li>- Step backs</li> <li>- Retro step ups</li> <li>- Single leg leg press</li> </ul> </li> <li>• Single leg balance and proprioception progression             <ul style="list-style-type: none"> <li>- Hip and core strengthening</li> <li>- Mini band drills</li> <li>- Physioball</li> </ul> </li> <li>• Stretching for patient specific muscle imbalances</li> </ul>
<b>Cardiovascular Exercise</b>	<ul style="list-style-type: none"> <li>• Non-impact activities; stationary bike, elliptical, Nordic track, swimming</li> </ul>
<b>Return to Sport/Work Criteria</b>	<ul style="list-style-type: none"> <li>• Dynamic neuromuscular control with multi-plane activities, without pain or swelling</li> </ul>

PHASE IV (begin after meeting Phase III criteria, usually about 6 months after surgery)

<b>Appointments</b>	<ul style="list-style-type: none"> <li>• Rehabilitation appointments 1 time every 1-2 weeks</li> </ul>
<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>• Good control and no pain with sport and work specific movements, including impact</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• Post-activity soreness should resolve within 24 hours</li> <li>• Avoid post-activity swelling</li> <li>• Avoid knee pain with impact</li> </ul>
<b>Suggested Therapeutic Exercise</b>	<ul style="list-style-type: none"> <li>• Impact control exercises beginning 2 feet to 2 feet, progressing from 1 foot to other and then 1 foot to same foot</li> <li>• Movement control exercise beginning with low velocity, single plane activities and progressing to higher velocity, multi-plane activities</li> <li>• Sport/work specific balance and proprioceptive drills</li> <li>• Hip and core strengthening</li> <li>• Stretching for patient specific muscle imbalances</li> </ul>
<b>Cardiovascular Exercise</b>	<ul style="list-style-type: none"> <li>• Replicate sport or work specific energy demands</li> </ul>
<b>Return To Moderate Impact Sport Criteria (Jogging, Aerobics)</b>	<ul style="list-style-type: none"> <li>• 8 months post-surgery; and</li> <li>• Good dynamic neuromuscular control with multi-plane activities, without pain or swelling</li> </ul>
<b>Return To High Impact Sport Criteria (Basketball, Soccer)</b>	<ul style="list-style-type: none"> <li>• 10 months post-surgery; and</li> <li>• Good dynamic neuromuscular control with multi-plane activities, without pain or swelling</li> </ul>