

OSTEOCHONDRAL AUTOGRAFT TRANSFER SYSTEM (OATS) PROCEDURE REHABILITATION PROTOCOL

This protocol has been developed for the patient following repair of a full thickness articular cartilage defect/injury of the knee, usually of the medial or lateral femoral condyle. Osteochondral autograft transfers healthy articular cartilage from the non-weight bearing (trochlea) part of the knee to the weight bearing (femoral condyle) part of the knee. This restores normal cartilage to the weight bearing part of the knee to reduce pain and also help prevent further progression of the cartilage injury

The goal of this rehabilitation plan is to facilitate return to the pre-injury level of function. Return to activity, sports and work depend upon multiple factors. This decision is based off the healing of the cartilage and the function of the knee. Return to work, sports and cutting activities is allowed after the cartilage is healed and the patient achieves adequate flexibility, strength and endurance of the knee equal to 80-90% of the uninjured side. Generally, return to sports and/or full activity is around 4-6 months after the initial surgery.

For Patients at a glance

- a. The first 48 hours after surgery should generally be spent resting and recovering. Elevate your operative leg above your heart level as much as possible for the first couple days to help control pain and swelling
- b. Use the prescribed ice machine or ice bags 30 minutes every couple hours to help control pain/swelling
- c. **Take 1 tablet (325 mg) of aspirin per day**, starting the day after surgery and continuing **for 2 weeks**. This is done to decrease the risk of blood clots.
- d. If you had a **nerve block at the time of surgery, it usually wears off 12-24 hrs post-operatively**. It is normal to have some numbness in the leg the first few days after surgery as a result.
- e. Take the pain medication as prescribed. You may supplement your pain medication with over the counter Tylenol and Ibuprofen. Please make sure you are not exceeding recommended doses (4 gm of Tylenol per 24 hour).
- f. **Dressing** may be removed 3 days after surgery, but keep the steri-strips in place. Try to keep the wound as dry as possible until follow-up.
- g. It is ok to shower after surgery, but keep the dressings and incision wrapped with saran wrap or something similar. When in the shower, do not scrub or soak the incisions. Just let soap/water run over the knee and pat dry. Do not submerge incisions in bath or pool until fully healed (3-4 weeks).
- h. **Physical therapy** should begin within 7-10 weeks following surgery. You may complete your rehabilitation at the physical therapy center of your choice. Call to schedule your first appointment.
- i. **Weight bearing:** You will be non-weight bearing with crutches for the **first 3 weeks** (your toes may touch the ground for balance only). From post op **weeks 3-6** you will be **50% weight bearing** with crutches. Your therapist will teach you this. After post op week 6, you will advance weight bearing as tolerated and wean off the crutches.

- j. **Brace/Range of motion:** Use the brace at all times except showering and doing your physical therapy exercises for the first 6 weeks. You can remove the brace for sleeping at week 4. The range of motion on your brace should be set from **0-90 degrees** for **the first 2 weeks**. After week 2, Range of motion will be gradually advanced.
- k. **Return to driving:** There is no conclusive data to guide the exact time when it is safe to return to driving. You cannot drive while still on narcotic pain medications. In general, there should be adequate range of motion of the knee, minimal pain/swelling, and enough strength in the leg to allow you to quickly brake if needed.
- l. **Stairs:** When going up stairs, lead with non-surgical side, when going down stairs lead with crutches and surgical side.

For Physical Therapists

I. Rehabilitation Protocol 0-3 Weeks Post Op

- a. **Weight Bearing:**
 - i. **Non-weight bearing Weeks 0-3** (toes may touch ground)
- b. **Brace Use:**
 - i. Use brace at all times except shower/exercises (can be unlocked for walking)
 - ii. Brace set from 0-90 degrees
- c. **Range of Motion:**
 - i. Weeks 0-2: 90 degrees
 - ii. Weeks 2-4: 0-110
- d. Edema control
- e. Emphasize full extension, heel slides, LE stretching
- f. Quadriceps activation: SLR, Quad sets, NMES
- g. Patellar mobilization

II. 3-6 Weeks Post-Op

- a. **Weight Bearing:**
 - i. **50% Partial weight bearing weeks 3-6**
- b. **Brace Use:**
 - i. Use brace at all times except shower/exercises (can be unlocked for walking)
 - ii. Can remove for sleeping week 4
- c. **Range of Motion:**
 - i. Weeks 2-4: 0-110
 - ii. Weeks 4-6: 0-125
- d. Patellar mobility, heel slides, sidelying hip abduction
- e. Emphasize full knee extension
- f. Hip/core strengthening
- g. Continue quad reeducation/NMES. BFR if available
- h. Patellar mobilization emphasize superior glides
- i. Gastroc-soleus stretch
- j. Modalities: cryotherapy, electrical stimulation, edema control, etc.

CRITERIA FOR ADVANCEMENT

- Maintain knee ROM: 0°-90°
- Control post-operative pain/swelling
- SLR flexion without extensor lag
- Adherence to post-operative restrictions
- Independent with HEP

III. 6-12 Weeks Post Op

- a. **Weight Bearing:** Advance to full weight bearing as tolerated and off crutches
 - i. emphasize normal gait pattern
- b. **Brace Use:** wean out of brace
- c. **ROM:** progress ROM as tolerated
- d. Initiate stationary bike training when knee flexion > 110 degrees
- e. Hip/Core/Hamstring/Quad progressive resistive exercises
- f. Squat/step program
 - i. (Limit squat activities to a maximum of 90 degrees knee flexion)
- g. Elliptical trainer
- h. Continue closed chain quadriceps strengthening in full arc (leg press, wall slides)
- i. Continue BFR if available, initiate aquatic program if available
- j. Initiate proprioception program, single leg activities as tolerated
- k. Continue edema control/modalities/patellar mobilization

MINIMUM CRITERIA FOR ADVANCEMENT

- Full pain-free ROM
- Chair/box squats with proper form and without complaints of pain
- SL stance > 30 sec with proper form and control
- Demonstrate ability to ascend 8" step with proper form, no pain
- Descend 6" step with good eccentric control, no pain
- Independent with HEP

IV. 12-16 Weeks Post-Op

- a. Continue exercises from earlier protocol
- b. Advance bilateral and unilateral closed chain exercises
- c. Isokinetic quadriceps exercises
- d. **May begin jogging at 3-4 months**
- e. Emphasize eccentric strength and control
- f. Progress squat program
- g. Progress proprioception/balance activities
- h. Progress cardio, elliptical, stair climber exercises
- i. Begin sport specific exercises week end of phase

CRITERIA FOR ADVANCEMENT

- 80% limb symmetry (quadriceps and hamstring) with hand-held dynamometry and functional testing
- No pain/inflammation after activity
- Movement without asymmetrical deviations and a hip dominant strategy
- Independent with HEP

V. Weeks 16-20+ and Return to Sport

- a. Advance jogging/running progression program
- b. Lateral movements and cutting exercises
- b. Continue advanced strengthening
 - i. Full arc progressive resistance exercises-emphasize quads
- c. Improve multidirectional control, dynamic movements. Improve landing mechanics, focus on sport specific exercises based on patients desired sport.
- d. Progress neuromuscular/functional program
- e. Agility drills

Return to competitive sports and full speed cutting activities

- a. You need to be cleared by Dr. Hazelwood and your athletic trainer
- b. In general, for OATS procedures this is 4-6 months postoperatively
- c. Return to sports and cutting activities is allowed after the patient achieves adequate flexibility, strength and endurance of the knee that is equal to at least approximately 90% of the other side. In some cases we may use other objective testing such as Isokinetic testing and hop testing.