

DENOVO PHYSICAL THERAPY PROTOCOL

Rehabilitation Protocol Allograft Articular Cartilage Transplant (Patella and/or Trochlea)

Description of Procedure: A small amount of juvenile donor articular cartilage is harvested, tested, and stored as 1 mm cubicles. The tissue is then implanted in the knee with fibrin glue or sometimes a Bio-patch sutured over the defect. The cells then produce extracellular matrix to form hyaline-like cartilage to resurface the areas of prior cartilage loss. Until the new cartilage is fully mature (6-24 months), the goals are full motion with protected loading.

Safety Warning: Do not overload the implant, especially with shear forces, as patch delamination could occur. Early approved Range of Motion (ROM) is important to avoid excessive scarring and to stimulate the chondrocytes to form hyaline-like extracellular matrix. If the patient has had concomitant tibial tuberosity surgery, the weight bearing restrictions of that procedure take precedence.

	WEIGHT BEARING	BRACE	ROM	THERAPEUTIC EXERCISES
PHASE I (0-6 WEEKS)	<p>0-2 weeks: Foot flat weight bearing 20 lbs; 2 crutches</p> <p>3-6 weeks: partial weight bearing with crutches and locked brace, no limping; gradual progression to one crutch then full weight bearing (avoid stairs and inclines for 6 months)</p>	<p>0-3 weeks: locked at 0-30 (removed for CPM and exercise). Brace is worn until independent straight leg raise can be performed without extension lag.</p> <p>3-6 weeks: locked 0-60°</p>	<p>0-4 weeks: CPM: use in 2 hour increments for 8 hours per day at 1 cycle/minute-begin at 0-30° increasing 5-10° daily per patient comfort</p> <p>-patient should gain at least 60° by week 4 and 90° by week 6</p>	<p>1-6 weeks: Prone hangs, heel props, quad sets, SLR, hamstring isometrics-complete exercises in brace if quad control is inadequate; Core proximal program; normalize gait; FES biofeedback as needed</p>
PHASE II (6-12 WEEKS)	<p>6-12 weeks: Full weight bearing if normal gait. No loading with knee bent, stairs one leg at a time</p>	None	Full active range of motion	<p>6-12 weeks: Progress bilateral strengthening using resistance less than patient's body weight, progress to unilateral closed chain exercises; continue opened chain knee strengthening (no squats, wall slides, lunges or knee</p>

				extension exercises
PHASE III (12 WEEKS- 9 MONTHS)	12 weeks- 6 months: Full with a normalized gait pattern 6-9 months: Full, with a normalized gait pattern (avoid stairs and inclines for 6 months)	12 weeks- 6 months: none 6-9 months: none	12 weeks- 6 months: Full active ROM 6-9 months: full and pain free	12 weeks- 6 months: Advance bilateral and unilateral closed chain exercises with emphasis on concentric/ eccentric control, continue with biking, elliptical, and treadmill, progress balance activities. Form exercises for desired sport if no pain or effusion. No squats, no lunges 6-9 months: Advance strength training, initiate light jogging—start with 2 minute walk/ 2 minute jog, emphasize sport specific training. No squats, no lunges
PHASE IV (9 MONTHS- 24 MONTHS)	Full, with a normalize gait pattern (allow stairs and inclines if no knee pain or effusion)	None	Full and pain free	Continue strength training emphasize a single leg loading, begin a progressive running and agility program—high impact activities (Basketball, tennis, etc.) may begin at 12-24 months if pain-free