

Prisma Health
 Blue Ridge Orthopaedics-
 Easley
 309 E. 1st Ave
 Easley, SC 29640
 P: 864-850-2663
 F: 864-306-0012



Prisma Health
 Blue Ridge Orthopaedics-
 Powdersville
 11402 Anderson Road
 Greenville, SC 29611
 P: 864-631-2799
 F: 864-522-1245

Dr. Gabriella Ode
 Sports Medicine and Shoulder Surgery
www.GOsportsmed.com

**PHYSICAL THERAPY PROTOCOL
 CARTILAGE REPAIR**

<p>Procedure</p>	<p>Date of Surgery: _____ Surgery Type: <input type="checkbox"/> Osteochondral Allograft <input type="checkbox"/> Osteochondral Autograft <input type="checkbox"/> Cell Based Cartilage Repair (MACI, DeNovo, Cartiform) Location: <input type="checkbox"/> MFC <input type="checkbox"/> LFC <input type="checkbox"/> Trochlea <input type="checkbox"/> Patella <input type="checkbox"/> MTP <input type="checkbox"/> LTP Brace use: ___ weeks <input type="checkbox"/> TTWB <input type="checkbox"/> PWB x ___ weeks <input type="checkbox"/> WBAT Notes:</p>
<p>Plan</p>	<p>Physical Therapy for R L B/L Lower Extremity 2-3x Per Week x 12 Weeks</p>
<p>General Guidelines</p>	<p>Please read and follow guidelines below. Progression is both criteria-based and patient specific. Phases and time frames are designed to give the clinician a general sense of progression. Phases and time frames are designed to give the clinician a general sense of progression. Concomitant injuries such as degenerative joint disease may alter the guidelines. Follow physician's modifications as prescribed</p>
<p>Phase I (Weeks 0-6)</p>	<p>Goals:</p> <ul style="list-style-type: none"> ▪ Control post-operative pain / swelling ▪ Range of Motion 0 – 90° for first two weeks then advance to 130 ▪ Prevent Quadriceps inhibition ▪ Restore normal gait ▪ Normalize proximal musculature muscle strength ▪ Independence in home therapeutic exercise program <p>Precautions:</p> <ul style="list-style-type: none"> ▪ Progressive weight bearing with crutches after week 1 – <ul style="list-style-type: none"> ○ <i>In general, start patient with TTWB with 2 crutches for first week then progress to WBAT with 1 crutch</i>

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- (in opposite arm) x 1 week and then discontinue crutches starting at end of week 2 if gait and quad function allow.

- Avoid neglect of range of motion exercises

Treatment Strategies:

- Active – Assistive Range of Motion Exercises (Pain-free ROM)
- Towel extensions
- Patella mobilization all planes
- TTWB postoperative week one with two crutches
- Progressive Weight Bearing as Tolerated with crutches (D/C crutches when gait is non-antalgic)
- Postoperative bracing for 2 weeks postoperatively then can D/C
- Underwater treadmill system (gait training) if incision benign
- Quadriceps re-education (Quad Sets with EMS or EMG)
- Multiple Angle Quadriceps Isometrics (Bilaterally – Submaximal, Avoid lesion)
- Short Crank ergometry → Standard ergometry
- SLR's (all planes)
- Hip progressive resisted exercises
- Leg Press (60→0° arc) Bilaterally
- Bracing / Patella sleeve per MD preference
- Pool exercises
- Cryotherapy
- Plantar Flexion Theraband
- Lower Extremity Flexibility exercises
- Upper extremity cardiovascular exercises as tolerated
- Home therapeutic exercise program: Evaluation based
- Emphasize patient compliance to home therapeutic exercise program and weight bearing progression

Criteria for Advancement:

- Normalized gait pattern
- ROM 0 → 130°
- Proximal Muscle strength 5/5
- SLR (supine) without extension lag

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Phase II (Weeks 6-12)

Goals:

- ROM 0° → WNL
- Normal patella mobility
- Ascend 8" stairs with good control without pain (may need to modify for patellar & trochlear lesions)

Precautions:

- Avoid descending stairs reciprocally until adequate quadriceps control & lower extremity alignment is demonstrated
- Avoid pain with therapeutic exercise & functional activities

Treatment Strategies:

- Continue Progressive Weight Bearing as Tolerated /Gait Training with crutches (if needed)
- Brace / Patella sleeve per therapist and patient preference
- Underwater treadmill system (gait training)
- Gait unloader device
- AAROM exercises
- Patella mobilizations
- Leg Press (90→0° arc) Bilaterally → Eccentric
- Mini Squats
- Retrograde treadmill ambulation
- Proprioception/Balance training:
 - Proprioception board / Contralateral Theraband Exercises / Balance systems
- Initiate Forward Step Up program
- Stairmaster
- SLR's (progressive resistance)
- Lower extremity flexibility exercises
- Blood Flow Restriction as tolerated per PT
- OKC knee extension to 40° – (pain/crepitus free arc)
- Home therapeutic exercise program: Evaluation based

Minimum Criteria for Advancement:

- ROM WNLs
- Demonstrate ability to descend 8" step
- Good patella mobility

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Phase III
(Weeks 12-18)

Goals:

- Demonstrate ability to descend 8" stairs with good leg control without pain
- 85% limb symmetry on Isokinetic testing & Forward Step Down Test
- Return to normal ADL
- Improve lower extremity flexibility

Precautions:

- Avoid pain with therapeutic exercise & functional activities
- Avoid running until adequate strength development and MD clearance.

Treatment Recommendations:

- Progress Squat program
- Initiate Step Down program
- Leg Press (90 to 0° emphasizing eccentrics)
- OKC knee extensions 90
- 0° (pain/crepitus free arc)
- Advanced proprioception training (perturbations)
- Agility exercises (sport cord)
- Elliptical Trainer
- Retrograde treadmill ambulation / running
- Hamstring curls / Proximal strengthening
- Lower extremity stretching
- Forward Step Down Test (NeuroCom)
- Isokinetic Test
- Home therapeutic exercise program: Evaluation based

Criteria for Advancement:

- Ability to descend 8" stairs with good leg control without pain
- 85% limb symmetry on Isokinetic testing & Forward Step Down Test

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**Phase III
(Weeks 12-18)**

Goals:

- Lack of apprehension with sport specific movements
- Maximize strength and flexibility as to meet demands of individual's sport activity
- Isokinetic & Hop Testing > 85% limb symmetry

Precautions:

- Avoid pain with therapeutic exercise & functional activities
- Avoid sport activity till adequate strength development and MD clearance
- Be conscious of Patellofemoral overload with increased activity level

Treatment Strategies:

- Continue to advance LE strengthening, flexibility & agility program
- Forward running
- Plyometric program
- Brace for sport activity (MD preference)
- Monitor patient's activity level throughout course of rehabilitation
- Reassess patient's complaint's (i.e. pain/swelling daily – adjust program accordingly)
- Encourage compliance to home therapeutic exercise program
- Home therapeutic exercise program: Evaluation based

Criteria for Discharge:

- Isokinetic & Hop Testing > 85% limb symmetry
- Lack of apprehension with sport specific movements
- Flexibility to accepted levels of sport performance
- Independence with gym program for maintenance and progression of therapeutic exercise program at discharge