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**PHYSICAL THERAPY PROTOCOL
 REALIGNMENT OSTEOTOMY +/- CARTILAGE REPAIR**

<p>Procedure</p>	<p>Date of Surgery: _____ Surgery Type (s): <input type="checkbox"/> Distal Femoral Osteotomy <input type="checkbox"/> High Tibial Osteotomy <input type="checkbox"/> Osteochondral Allograft <input type="checkbox"/> Osteochondral Autograft <input type="checkbox"/> Cell Based Cartilage Repair (MACI, DeNovo, Cartiform) OCA/OATS 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 align="center">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>

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<p>Phase I (0-1 Weeks)</p>	<p>General:</p> <ul style="list-style-type: none"> ▪ Ice and modalities to reduce pain and inflammation ▪ Elevate the knee above the heart for the first 3 to 5 days ▪ Initiate patella mobility drills ▪ Quadriceps setting focusing on VMO restoration ▪ Multi-plane open kinetic chain straight leg raising ▪ Gait training with crutches <p>Precautions:</p> <ul style="list-style-type: none"> ▪ Passive range of motion 0-90 ▪ Use crutches toe touch-weight bearing for 2 weeks. ▪ Brace locked to 0 degrees for ambulation until pt exhibits excellent quad control; brace can then be unlocked to 90 degrees when there is good quad control and worn through week 6.
<p>Phase II (Weeks 1 -6)</p>	<p>General:</p> <ul style="list-style-type: none"> ▪ Maintain program as outlined in week 0 to 1 ▪ Continue with modalities to control inflammation ▪ Initiate global lower extremity stretching program ▪ Proprioception drill emphasizing neuromuscular control ▪ Multi-plane ankle strengthening <p>Goals:</p> <ul style="list-style-type: none"> ▪ Progressive Stretching and Early Strengthening ▪ Control post-operative pain / swelling ▪ Progress passive/active range of Motion 0 – 90° for first two weeks then advance to 120 ▪ 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"> ▪ Ambulate TTWB in brace locked in extension for weeks 0-2. ▪ Progressive weight bearing with crutches after week 2 – <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 4 if gait and quad function allow (nonantalgic gait)

- Postoperative bracing for 6 weeks postoperatively. Discontinue once good quad control.
- Avoid neglect of range of motion exercises

Treatment Strategies:

- Active – Assistive Range of Motion Exercises (Pain-free ROM)
- Towel extensions
- Patella mobilization all planes
- Progressive Weight Bearing as Tolerated with crutches starting after day 14 (D/C crutches when gait is non-antalgic)
- Begin stationary bike and pool exercise program (when incisions healed)
- Implement reintegration exercises emphasizing core stability
- If available, 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) in brace.
- Hip progressive resisted exercises
- Leg Press (60→0° arc) Bilaterally
- 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 → 120°
- Proximal Muscle strength 5/5
- SLR (supine) without extension lag

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**Post – Operative
Phase III (Weeks 6-
12)**

General:

- Normalize gait pattern
- Advance stationary bike program; begin treadmill walking and elliptical trainer; no running and impact activity
- Initiate closed kinetic chain exercises progressing bilateral to unilateral
- Initiate proprioception/balance training

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
- OKC knee extension to 40° – (pain/crepitus free arc)
- Home therapeutic exercise program: Evaluation based

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	<p>Minimum Criteria for Advancement:</p> <ul style="list-style-type: none"> ▪ ROM WNLs ▪ Demonstrate ability to descend 8" step ▪ Good patella mobility
<p>Post – Operative Phase IV (weeks 12-24)</p>	<p>General:</p> <ul style="list-style-type: none"> ▪ Weeks 12-16: <ul style="list-style-type: none"> ○ Initiate gym strengthening-beginning bilateral progressing to unilateral <ul style="list-style-type: none"> ▪ Leg press, heel raises, hamstring curls, squats, lunges ▪ Weeks 16 to 24: <ul style="list-style-type: none"> ○ Continue with advanced strengthening ○ Begin functional cord program <p>Goals:</p> <ul style="list-style-type: none"> ▪ 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 <p>Precautions:</p> <ul style="list-style-type: none"> ▪ Avoid pain with therapeutic exercise & functional activities ▪ Avoid running till adequate strength development and MD clearance. <p>Treatment Recommendations:</p> <p>Progress Squat program Initiate Step Down program Leg Press (90 - 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</p>

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	<p>Criteria for Advancement:</p> <ul style="list-style-type: none"> ▪ Ability to descend 8" stairs with good leg control without pain ▪ 85% limb symmetry on Isokinetic testing & Forward Step Down Test
<p>Post – Operative Phase V (weeks 24+)</p>	<p>General:</p> <ul style="list-style-type: none"> ▪ Follow-up examination with physician ▪ Implement sport specific multi-directional drills ▪ Continue with lower extremity strengthening, cardiovascular training, and flexibility <p>Goals:</p> <ul style="list-style-type: none"> ▪ 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 <p>Precautions:</p> <ul style="list-style-type: none"> ▪ 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 <p>Treatment Strategies:</p> <ul style="list-style-type: none"> ▪ 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 <p>Criteria for Discharge:</p> <ul style="list-style-type: none"> ▪ 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

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