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Physical Therapy Protocol: Distal Femoral / High Tibial Osteotomy

Goals for All Phases:

- Protect osteotomy fixation site and promote bone healing
- Early, pain-free full range of motion of the knee
- Minimal loss of quadriceps strength
- Normalize gait

Phase I (0-6 Weeks)

Ice/Compression/Elevation:

- Ice, compression, and elevation as tolerated and as needed based on symptoms

Weight bearing:

- Heel-touch / toe-touch weight bearing with crutches (non–weight bearing or touchdown per surgeon for opening-wedge); progress only as cleared by physician and radiographs

Brace:

- Hinged knee brace locked in full extension at all times (including sleep); may remove for hygiene and exercises only

Range of motion:

- Emphasize full extension
- Progress flexion to 0°–90° as tolerated; can progress to full ROM as tolerated after 2 weeks

Therapeutic exercises:

- Quadriceps sets: 30 repetitions, 10 times a day

- Straight leg raises. No weights. The knee must be held in full extension (no sag); perform in brace
- Patellar mobilizations (4 planes)
- Ankle pumps and calf stretches
- No closed-chain or resisted exercises

Precautions:

- Strict adherence to weight-bearing restrictions to protect osteotomy site

Phase II (6-12 Weeks)

Weight bearing:

- Progress weight bearing as tolerated per physician and serial radiographs (typically advance 25% weekly to full weight bearing by 8–10 weeks)

Brace:

- Unlock brace for ambulation; discontinue when good quadriceps control and no extensor lag (usually by 8-10 weeks)

Range of motion:

- Full, symmetrical

Therapeutic exercises:

- Progress above exercises
- Closed-chain strengthening (mini-squats 0°–45°, leg press 0°–60°, step-ups)
- Stationary bike with low resistance (begin at 6 weeks)
- Floor-based core and gluteal activation
- Proprioception and balance training (weight shifts, single-leg stance)
- Continue patellar mobilizations and flexibility (hamstrings, gastrocnemius, ITB)

Precautions:

- No deep squats or lunges until cleared
- Avoid descending stairs reciprocally until excellent quadriceps control
- Physician examination and radiographs recommended at 6–8 weeks

Phase III (12+ Weeks)

Weight bearing:

- Full, normal gait

Brace:

- Discontinue (may use patellofemoral sleeve for comfort)

Range of motion:

- Full, symmetrical

Therapeutic exercises:

- Continue at least 20 minutes of daily exercise bike program; progressively increase resistance
- Progress to weight-room exercises (leg press, squats 0°–70°, single-leg work)
- Hamstring curls and open-chain quadriceps (pain-free arc)
- Advance proprioception (unstable surfaces, perturbations)
- Treadmill walking and pool exercises
- Initiate walk-to-run program once cleared by surgeon and quadriceps strength ≥80 – 90% of contralateral side

Precautions:

- Verify radiographic healing and quadriceps strength by physician at 12 weeks prior to advancing

- Limit closed-chain knee flexion >70°–90° initially if needed
- No running, jumping, or plyometrics

Phase IV (16+ Weeks)

Brace:

- Optional unloading or patellofemoral brace during high-risk activities or competition (if necessary)

Range of motion:

- Full, symmetrical

Therapeutic exercises:

- Continue isotonic/isokinetic strengthening exercises
- Continue flexibility exercises
- Continue proprioceptive activities
- Continue sport-specific/agility/running drills and plyometrics (double-leg progressing to single-leg)

Precaution:

- Return to competition or high-impact activity once full motion and strength return, the patient passes a sport functional test (quad strength ≥ 90% contralateral, hop testing ≥ 90%, no effusion/instability), and is cleared by the physician

References:

- Allina Health Sports & Orthopaedic Specialists. Criterion Based High Tibial Osteotomy Protocol.
- Boston Joint Preservation. Postoperative Rehabilitation Guidelines Distal Femoral Osteotomy (DFO).
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- Mass General Hospital. Rehabilitation Protocol for High Tibial Osteotomy.
- Ohio State University Sports Medicine. High Tibial/Distal Femur Osteotomy Clinical Practice Guideline (2023).
- University of Virginia Orthopaedics. Post-operative Rehabilitation Protocol: High Tibial Osteotomy / Distal Femoral Osteotomy.
- Virginia Commonwealth University or similar institutional protocols (adaptable principles).
- Wolcott M, Traub S, Efird C. High Tibial Osteotomies in the Young Active Patient. International Orthopaedics. 2010;34(2):161-166.