



Realignment Osteotomy (HTO/DFVO)

Rehabilitation following realignment osteotomy surgery is an essential element of the treatment to achieve a full recovery. This protocol is intended to provide the user with instruction, direction, rehabilitative guidelines and functional goals. **It is not meant as a home program.** The physiotherapist must exercise their best professional judgment to determine how to integrate this protocol into an appropriate treatment plan. Some exercises may be adapted depending on the equipment availability at each facility. As an individual's progress is variable and each will possess various pre-operative deficiencies, this protocol must be individualized for optimal return to activity. There may be slight variations in this protocol if there are limitations imposed from the surgery and quality of individuals healing. Complete recovery after osteotomy ranges from 6-9 months or longer, depending upon whether other procedures such as meniscal allograft transplantation or cartilage repair, is also performed.

KEY POINTS

The goal of realignment osteotomy surgery is to reduce the amount of load being placed through a specific part of the knee, thereby reducing pain or reducing the amount of strain on the ligaments or articular cartilage.

It is common that other procedures are performed simultaneously, such as ACL reconstruction or meniscus transplant/cartilage repair; therefore rehabilitation may be tailored to the combination of procedures that are performed.

A similar program will be followed for femoral (DFO) and tibial (HTO) osteotomies, whether they are opening wedge or closing wedge, if using internal locking plate fixators. Osteotomies utilizing the iBalance implant will have a modified protocol (please refer to operating surgeons written instructions).

Phase I: Immediate Post-op (0-2 Weeks)

Brace and Weight Bearing:

- Tracker brace locked only when ambulating; full range of motion when doing ROM exercises; worn 24 hours per day
- Can be removed during therapy
- Flat foot feather touch weight bearing with crutches

ROM:

- Full range of motion

Exercise Suggestions:

- Patellar mobilizations

- Heel slides (+/- slider board), calf & hamstring stretches
- Quad/ham co-contraction, gluteal activation (supine or standing), isometric hip adduction/abduction, ankle pumping, sitting passive leg extension with roll under heel for extension if needed
- Non-weight bearing hip stability exercises: abduction, extension, external rotation, clam shells, supine bridging on swiss ball
- Ankle theraband plantar flexion, sitting calf raises

Modalities: Ice and IFC as needed to reduce pain

Phase II: Progressive Weight Bearing & Strengthening (2-6 Weeks)

Brace and Weight Bearing:

- Advance to weight bearing as tolerated with crutches, continue using tracker brace until adequate quad control
- Ensure normal heel toe gait
- Can remove brace when sleeping

ROM:

- Progress to full ROM as tolerated (flexion and extension)

Exercise Suggestions:

- Patellar mobilizations
- Sitting passive leg extension with roll under heel
- Supine with legs up wall – heels slides (knee flexion) with gravity assisted
- Bike pendulums: high seat 1/2 circles forward/backward → full circles – lower seat as tolerated
- Progress from 2 crutches → single crutch → full weight bearing as tolerated always maintaining normal walking pattern
- Mini wall squat (30°) progress to 60°-90° (+/- wall)
- Shuttle™: (one bungee cord) – 2 leg squat (1/4 - 1/2 range) and 2 leg calf raises, may progress slowly and as tolerated from 2-1 leg squats/calf raises, increasing ROM and resistance
- Sit to stand 2 legs with high seat height +/- with muscle stimulation
- Supine on floor legs on swiss ball: bridging → bridging plus knee flexion (heels to buttocks)
- Wobble boards with support (table, bars, poles) through full ROM: side-to-side, forward/backward

Modalities: Ice, compression and analgesics as needed to reduce pain and swelling

Phase III: Advanced Strengthening (6-12 Weeks)

Brace and Weight Bearing:

- No brace, full weight bearing
- Ensure normal heel toe gait

ROM:

- Full and pain free knee range of motion

Exercise Suggestions:

- Sit to stand 2 legs → progress by decreasing height of seat
- Bungee™ cord walking: forward/backward/side step with slow control on return as tolerated
- Static Lunge (1/4 - 1/2 range) → progress to dynamic lunge step (1/4 - 1/2 range) with proper alignment (shoulders over knees over toes) as tolerated
- Step ups and down 2-4" height: lateral, forward
- Wobble boards side-to-side, forward/backward: without support, without vision
- Single leg stance 30-60 seconds (when full WB) → progress to unstable surface, with and without
- Cardiovascular Fitness

Modalities Ice, compression and analgesics as needed to reduce pain and swelling

Phase IV: Advanced Strengthening & Return to Activity/Light sport (3-6+ Months)**Goals:**

- Dynamic lower chain strengthening
- Sport specific training
- Progress cardiovascular conditioning

Exercise Suggestions:

- Progress resistance of Shuttle™ working on strength & endurance, 2 → 1 leg
- Static Lunge (full range) → dynamic lunge → lunge walking
- Forward and lateral step-ups 4-6-8" (watch for hip hiking or excessive ankle dorsiflexion)
- Eccentric lateral step down on 2-4-6" step with control (watch for hip hiking or excessive ankle dorsiflexion)
- Shuttle™ standing kick backs (hip/knee extension)
- Single leg stance on unstable surface i.e. pillow, mini-tramp, BOSU™, Airex™, Dynadisc™ with/without support - progress to no vision
- Cardiovascular Fitness