# Opening Wedge Osteotomy Rehabilitation

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## Phase I Precautions:
Patient may shower with bag over the involved leg until the Dr clears patient to shower without the bag (3-4 weeks). **NO BATHS**

## Phase I Goals:
- 0-120° ROM by 4 weeks postop; Good quad sets and SLR; Decrease in swelling 40% by 4 weeks

<table>
<thead>
<tr>
<th>Phase/Time Frame</th>
<th>Weight Bearing</th>
<th>Brace</th>
<th>ROM</th>
<th>Therapeutic Exercise</th>
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<tr>
<td>I (0-4 weeks)</td>
<td>Touch down WB, balance WB, the patient may stand on both feet for short periods of time. w/ MD approval and if radiographs show enough bone growth has occurred, patient can start PWB at 50% body weight</td>
<td>Knee brace at all times except when working on ROM in CPM or performing exercises. In therapy, patient will remove brace for wound care, ROM, and exercise. Patient will also be taught how to don and doff brace for home CPM, exercise, and icing. Brace locked at 15-20° flexion. May open to sit.</td>
<td>If possible, patient will have a home supine CPM machine to use 8-10 hrs/day to increase ROM. <strong>No open chain or ROM exercises.</strong> Rom should be closed chain, gentle, with no pain. In PT clinic, a supine CPM will be used to measure ROM and assess progress. No AAROM or AROM until ordered by doctor.</td>
<td>Icing with Cryo cuff, elevation, and TEDS to decrease swelling. Only isometric exercises are allowed. It is highly recommended that NMES and surface EMG be used to re-educate the contraction of quad’s and hamstrings. SLR will be done in the brace and <strong>no pain at the osteotomy site.</strong> If pain at the site occurs, SLR will be stopped until x-rays are taken at 4 weeks postop. <strong>Protecting the osteotomy site is very important.</strong> Quad hamstring sets utilizing NMES and EMG as needed for muscle re-education 100 reps/day with 3 second hold on each set; Ball squeezes in long sitting position 100 reps/day with 3 second hold on each squeeze; SLR fwd and ext. no quad lag or pain at osteotomy site is allowed, 30 reps, 3 x/day in brace; Abdominal sets 5 sec hold w/ each set, 10 reps, 4 x/day; Glute sets 5 sec hold w/each set, 10 reps, 4 x/day.</td>
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## Phase II Precautions:
Showering without a lag if MD gives permission. **NO BATHS**

## Phase II Goals:
- 0-140° ROM at 8 weeks postop. Patient mush have full extension; Decrease in swelling by 70%; Excellent quad/hamstring control; 30 independent SLR without a quad lag or pain at osteotomy site; Able to add ankle weight at knee joint for SLR; Standing weight shifts; 2 footed leg press ½ of body weight; Able to use ex. bike to increase ROM; Start sitting BAPS board to encourage proprioception of LE; Standing BAPS 50% WB

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<td>II (4-6 weeks)</td>
<td>w/ MD approval and if radiographs show enough bone growth has occurred, patient can start PWB at 50% body weight</td>
<td>Worn at all times except when patient is working on CPM or exercises. Hinges will be opened to allow for swinging of lower leg during walking and working on ROM on the exercise bike in PT</td>
<td>Icing, elevation, and use of TEDS is recommended. Quad/ham reps are still 100/day. SLR reps are 30 sets 4x/day with weight placed at the knee joint above the osteotomy site to increase intensity of the exercise. <strong>No pain at osteotomy site is allowed.</strong> Start CKC exercises with MD approval w/ knee brace on. If pain should occur at the osteotomy site, the exercises should be stopped until x-rays can be taken. Quad/ham set 100/day w/3 second hold on each set; SLR fwd, abd, and ext w/ankle weight above osteotomy site, 30 reps 4x/day; 2-footed leg press, ½ patient’s body weight 20 reps, 3-4 sets; Exercise bike w/ no resistance to increase ROM and joint movement. Patient will wear knee brace w/ hinges opened to allow for ROM; Sitting BAPS with patient’s eyes looking up or closed to improve proprioception of the involved leg; Use of clinic CPM as needed to increase ROM; Abdominal sets 5 sec w/each set, 10 reps 4x/day; Glute strengthening; Level 1 lumbar stabilization exercises to strengthen pelvic musculature.</td>
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### Phase III Precautions:
Ambulating w/o brace w/crutches. If proximal tibia pain increases, use crutches.

### Phase III Goals:
Full AROM/PROM, ambulate w/o a limp

### Phase IV Precautions:
Bathing and showering per MD clearance.

### Phase IV Goals:
ROM equal bilaterally; Weaning off crutches by 12 weeks postop; Normal gait pattern; Wean out of brace; Swelling decreased by 90%; Make normal complete revolutions on exercise bike with light resistance; Start 2-footed CKC exercises; Start treadmill walking.

### Phase V Precautions:
No running or jumping activities until greater than 6 months.

### Phase V Goals:
Full and equal ROM bilaterally; Normal gait pattern; Swelling 100% resolved; Walking 2 miles/day 3 x/week; Riding an exercise bike 40-50 min with medium/high resistance; Increase the CKC exercises by shifting body weight to involved leg.

### Phases and Guidelines:

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<td>III (6-8 weeks)</td>
<td>WB per surgeon, progressing to FWB w/p brace</td>
<td>Ambulating w/o brace w/crutches</td>
<td>Progressing toward full ROM</td>
<td>CKC ex: wall slides (1/4 depth), mini-squats, leg presses (light and 1/4 depth), step-ups, balance activities, HS curls</td>
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<td>IV (8-12 weeks)</td>
<td>PWB per MD and radiographs. If bone growth continues, WB will continue to full body wt and weaning off crutches when adequate thigh muscle control is obtained.</td>
<td>Must wear out of doors.</td>
<td>Icing, elevation, and use of TEDS stocking is recommended.</td>
<td>Quad/ham sets; SLR fwd, abd, ext; 2-footed leg press 3/4 body weight progressing to FBW, 3 sets of 20 reps; Hamstring curls 2 feet 2 sets of 20; Exercise bike light resistance 20 min 1 x/day. No outdoor biking; Bridging and lumbar stabilization exercises to improve pelvic strength and control; Swimming minimal flutter kick or arms, no kickboard; Rowing machine. Once patient has been cleared for FWB, add step ups, not step downs 20 reps starting at low height; 1/4 wall squats body weight evenly distributed on both feet 10-15 reps; Treadmill walking at slow speed with no elevation; Limited Stairmaster, Nordic Track, and Elliptical Machine (15 min max/day)</td>
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<tr>
<td>V (3-5 months)</td>
<td>FWB</td>
<td>DC’d</td>
<td>Icing after exercise is still recommended as well as elevation of the involved leg when swelling needs to be controlled.</td>
<td>Leg press with single leg 4-5 sets of 15; Hamstring curls 4-5 sets of 15; Step downs 1-2 to fatigue; Wall squats single leg 10-15 reps; Doorway squats single leg 10-15 reps; Exercise 40-50 min with med/high resistance; Single leg balance exercises with eyes open or eyes closed; Pelvic bridging with 2 feet and 1 foot; Advanced lumbar stabilization exercises; Sidelying hip external rotation with weight at knee or theraband around knees to provide resistance; Swimming arms and legs; Stairmaster, Nordic Track, Rowing, and Elliptical machines med resistance 15-20 min/day.</td>
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***UPDATED 12-2008***