



JOSHUA ALPERT, MD

Dr. Joshua Alpert  
 Post-Operative Rehabilitation Protocol:  
 Knee – MACI Tibiofemoral

	Weight Bearing	Brace	ROM	Exercises
Phase 1 (0-1 week)  Patient follow up	<p>Immediately postop patient will be non-weight bearing</p> <p>Once PT starts, Less than 20% weight bearing, (toe touch weight bearing)</p>	<p>Locked in extension</p> <p>Once in therapy unlock brace to 0-30 degrees</p> <p>Crutches at all times</p>	<p>PROM and AROM 0-30 degrees</p>	<p><b>QUAD SETS:</b>            Place a small towel roll under the operated knee. Push the back of your knee down into the towel and tighten the thigh muscle.            Hold for 5 seconds. X10 3 times a day.</p> <p><b>STRAIGHT LEG RAISE:</b>            Lie on your back. Keep the opposite knee bent, with foot flat on the floor. Lift operated leg about 30cm while keeping knee straight and toes pointed towards you.            Hold for 5 seconds and Repeat 10 times.</p> <p><b>SUPINE HEEL SLIDES:</b>            Heel on gym ball or sliding on floor or other surface.</p> <p><b>SEATED HEEL SLIDES:</b>            Sit on a chair with the foot of the operated leg on a towel on tile or hardwood floor. Slide the foot to bend the knee.</p> <p><b>GLUTE SETS:</b>            Lying on your back with both knees bent, squeeze buttock muscles and hold for 5 seconds and then relax. Repeat 10 times</p>

				<p>STRETCHES SEATED Hamstring and Calf</p> <p>Circulation Exercises – ANKLE PUMPS Keeping your leg straight, flex your ankle to point your toes up towards your head, then point your toes down. Repeat 10 times.</p> <p>SUPINE 3 WAY HIP SLRs Maintain knee in full extension</p>
Phase 2 (2-3 Weeks)	<p>Less than 20% weight bearing, (toe touch weight bearing)</p> <p>On week 3 can do 30% weightbearing</p>	<p>0-30 degrees from 1-2 weeks</p> <p>0-45 degrees week 3</p> <p>Crutches at all times</p>	<p>0-30 degrees AROM and PROM week 2</p> <p>To</p> <p>0-90 degrees AROM and PROM week 3</p>	Same exercises as above
Phase 3 (4-5 weeks)	<p>40% weight bearing week 4</p> <p>50% weight bearing week 5</p>	<p>0-60 degrees week 4</p> <p>0-90 degrees week 5</p> <p>Crutches at all times</p>	<p>0-110 AROM and PROM week 4</p> <p>To</p> <p>0-125 AROM and PROM week 5</p>	<p>STANDING HAMSTRING STRETCH Stand with leg to be stretched on floor or on stool, pull toes towards you and lean forwards keep Hold for 20 secs. Repeat 3 times each leg.</p> <p>STANDING CALF STRETCH (from week 4 only) Place leg to be stretched behind other leg with feet parallel and back heel flat on floor. Bend the front knee until</p>

				<p>you feel stretch in the calf of the back leg. Hold for 30 secs. Repeat 3 times.</p> <p>Rowing machine - no hands or lowest load setting.</p> <p>Exercise bike – build up to 500 revolutions x3 daily (must have 1000 flexion to achieve this).</p> <p>Hydrotherapy/swimming - no breaststroke until week eight.</p>
<p>Phase 3-4 (6-7 weeks)</p> <p>Follow-up at 6-week mark</p>	<p>60% weight bearing week 6</p> <p>80% weight bearing week 7</p>	<p>No bracing</p> <p>1 crutch at all times</p>	<p>0-125 degrees AROM and PROM week 6</p> <p>0-135 degrees AROM and PROM week 7</p>	<p><b>Patient may resume driving</b></p> <p>Functional closed chain activity is allowed including low step ups 0 - 30 degrees of knee bend</p> <p>Progress proprioception: - Trampoline double leg / single leg stand Wobble board Treadmill slow walk ↑ Static Ex Bike / Ordinary Bike Knee Ext 0 - 30 degrees in standing with resistance of T/Band</p>
<p>Phase 4 (8-10 weeks)</p>	<p>WBAT</p>	<p>No bracing</p> <p>1 crutch at all times</p>	<p>Full ROM</p>	<p>Same as above</p>
<p>Phase 4 part 2 (11-12 weeks)</p>	<p>FULL WB</p>	<p>No bracing</p>	<p>Full ROM</p>	<p>Progress proprioceptive/balance activities</p> <p>Introduce cycling, walking, resistance and CKC</p>

Follow-up week 12				activities
<p>Phase 5 (3-6 months)</p> <p>Follow up at 4.5 months</p>	FULL WB	No bracing	Full ROM	<p>Progress proprioceptive/balance activities</p> <p>Progress to more demanding CKC exercises, rowing geometry, elliptical</p> <p>At the 4-month mark: Increased strength work and starting functional exercises shear forces from open chain exercises.</p> <p>During this phase increased load on the articulating patella-femoral surfaces for as long as possible.</p> <p>Therefore, the sequence is a gradual increase in functional load.</p> <p><b>Wall slides are to be avoided</b>  <b>Activities that increase swelling are to be avoided</b></p> <p>Treadmill fast walk – supervised only</p> <p>Stepper / Cross trainer</p> <p>↑ Walking distance</p> <p>Circuit training</p> <p><b>No progression to jogging until 6 months</b></p> <p>Cycling, rowing and cross-trainer but <b>no jumping.</b></p>

				<p>Continue strength training as effusion resolves</p> <p>Begin work conditioning at 4.5 months</p>
<p>Phase 6 (6-9 months)</p> <p>Follow up at 6 months</p> <p>Follow up at 7.5 months</p>	WBAT	No bracing	Full ROM	<p>Progress proprioceptive/balance activities</p> <p>Introduction of controlled mini trampoline jogging</p> <p>Gentle jog, then gentle change of direction single leg hurdle/step over under supervision. Acceleration/Deceleration up to 50% speed. Plyometrics. Skipping and hopping. Star jumps (from 8 months). Acceleration/Deceleration runs 3/4 speed (from 8 months). Figure of 8 runs forwards/backwards. Slalom forwards/backwards. Run-sit-run then gradually introduce cutting/sudden stop. Increasing running distance and progress to sprints 10m-20m-50m.</p>
<p>Phase 7 (9-12 months)</p> <p>Follow up at 9 months</p> <p>Follow up at 12 months</p>	WBAT	No bracing	Full ROM	<p>Return to sports ONLY after 12 months</p> <p>Introduction of agility drills</p> <p>Gentle jog, then gentle change of direction single leg hurdle/step over under supervision. Acceleration/Deceleration up to 50% speed. Plyometrics.</p>

				<p>Skipping and hopping. Star jumps (from 8 months). Acceleration/Deceleration runs 3/4 speed (from 8 months). Figure of 8 runs forwards/backwards. Slalom forwards/backwards. Run-sit-run then gradually introduce cutting/sudden stop. Increasing running distance and progress to sprints 10m-20m-50m.</p>
--	--	--	--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------