



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

	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 at all times</p> <p>Crutches at all times</p>	<p>PROM and AROM 0-20 degrees</p>	<p>QUAD SETS: 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>STRAIGHT LEG RAISE: Lie on your back. Keep the opposite knee bent, with the 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>SUPINE HEEL SLIDES: Heel on gym ball or sliding on floor or other surface.</p> <p>SEATED HEEL SLIDES: 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>GLUTE SETS: 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> <p>Control swelling with ice packs (open brace)</p> <p>Patella mobilization – to prevent tethering of the patella in scar tissue Medial - Lateral: Grade 1-2 Superior - Inferior: Grade 1-2</p>
Phase 2 (2-3 weeks)	<p>20-30% weight bearing 1-2 weeks</p> <p>50% weight bearing week 3</p>	<p>Locked in extension at all times</p> <p>Crutches at all times</p>	<p>0-30 degrees PROM and AROM week 2</p> <p>To</p> <p>0-60 degrees PROM and AROM week 3</p>	Same as above
Phase 3 (4-5 weeks)	75% weight bearing	<p>Locked in extension at all times</p> <p>1 crutch at all times</p>	<p>0-90 degrees PROM and AROM week 4</p> <p>To</p> <p>0-120 degrees PROM and</p>	<p>Same as above</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)</p>

			AROM week 5	<p>Place leg to be stretched behind other leg with feet parallel and back heel flat on floor. Bend front knee until you feel a 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>	WBAT	<p>No bracing</p> <p>1 crutch at all times</p>	<p>0-125 degrees AROM and PROM week 6</p> <p>To</p> <p>0-135 degrees AROM and PROM week 7</p>	<p>Same as above</p> <p>Starting at 7 weeks Functional closed chain activity is allowed including low step ups 0 - 30 degrees of knee bend</p> <p>Progress proprioception - standing exercises on uneven surfaces</p> <p>Trampoline double leg / single leg stand</p> <p>Wobble board</p> <p>Treadmill slow walk</p> <p>↑ Static Ex Bike / Ordinary Bike</p> <p>Knee Ext 0 - 30o in standing with resistance of T/Band</p>
Phase 4 (8-10 weeks)	FULL WB	<p>No bracing</p> <p>1 crutch at all times</p>	Full ROM	Same as above

<p>Phase 4 part 2 (11-12 weeks)</p> <p>Follow-up week 12</p>	<p>FULL WB</p>	<p>No bracing</p>	<p>Full ROM</p>	<p>Same as above</p> <p>Progress proprioceptive/balance activities</p> <p>Introduce cycling, walking, resistance and CKC activities</p>
<p>Phase 5 (3-6 months)</p> <p>Follow up at 4.5 months</p>	<p>FULL WB</p>	<p>No bracing</p>	<p>Full ROM</p>	<p>Progress proprioceptive/balance activities</p> <p>Progress to more demanding CKC exercises, rowing geometry, elliptical</p> <p>Starting at 4 months Wall slides are to be avoided</p> <p>Activities that increase swelling are to be avoided</p> <p>Treadmill fast walk – supervised only</p> <p>Stepper / Cross trainer</p> <p>↑ Walking distance</p> <p>Circuit training</p> <p>No progression to jogging until 6 months</p> <p>Cycling, rowing and cross-trainer but no jumping. Continue strength training as effusion resolves</p>
<p>Phase 6 (6-9 months)</p> <p>Follow up at 6 months</p> <p>Follow up at 7.5</p>	<p>FULL WB</p>	<p>No bracing</p>	<p>Full ROM</p>	<p>Progress proprioceptive/balance activities</p> <p>Introduction of controlled mini trampoline jogging</p> <p>Begin work conditioning at 6 months</p>

months				
<p>Phase 7 (9-12 months)</p> <p>Follow up at 9 months</p> <p>Follow up at 12 months</p>	FULL WB	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.</p> <p>Acceleration/Deceleration up to 50% speed.</p> <p>Plyometrics.</p> <p>Skipping and hopping.</p> <p>Star jumps (from 8 months).</p> <p>Acceleration/Deceleration runs 3/4 speed (from 8 months).</p> <p>Figure of 8 runs forwards/backwards.</p> <p>Slalom forwards/ backwards.</p> <p>Run-sit-run then gradually introduce cutting/sudden stop.</p> <p>Increasing running distance and progress to sprints 10m-20m-50m.</p>