



THE ORTHOPEDIC PARTNERS

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# Rehabilitation Protocol for Patella/Quad Tendon Repair

This protocol is intended to guide clinicians through the post-operative course for patella/quad tendon repairs. This protocol is time based as well as criterion based. Specific intervention should be based on the needs of the individual and should consider exam findings and clinical decision making.

Therapeutic interventions should be included and modified based on the progress of the patient.

## PHASE I: IMMEDIATE POST-OP (0-14 DAYS AFTER SURGERY)

<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"><li>• Protect repair</li><li>• Pain management</li><li>• Minimize edema</li><li>• Prevent complications from prolonged immobilization</li><li>• Prevent and recognize early signs of infection</li></ul>
<b>Precautions</b>	<ul style="list-style-type: none"><li>• Hinged knee brace should be locked in extension and worn at all times<ul style="list-style-type: none"><li>◦ Ambulating, sleeping, standing, etc.</li></ul></li><li>• No active knee extension</li><li>• No passive knee flexion beyond 0 degrees<ul style="list-style-type: none"><li>◦ Do not push ROM</li></ul></li></ul>
<b>Weight Bearing Status</b>	<ul style="list-style-type: none"><li>• WBAT with hinged knee brace locked in extension</li></ul>
<b>Intervention</b>	Swelling management <ul style="list-style-type: none"><li>• Rest, Ice and Elevation</li><li>• Retrograde massage</li></ul> ROM/Mobility <ul style="list-style-type: none"><li>• PROM</li><li>• Low intensity, long duration extension stretches</li><li>• Gentle patellofemoral joint mobilization</li></ul>
<b>Suggested Therapeutic Exercises</b>	Strengthening <ul style="list-style-type: none"><li>• Ankle pumps</li><li>• Prone hang</li><li>• Heel prop</li><li>• Seated hamstring/calf stretch</li><li>• Calf raises</li><li>• Quad sets</li><li>• Glute sets</li></ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"><li>• Knee extension to 0 degrees</li></ul>

## PHASE II: IMMEDIATE POST-OP (2-6 WEEKS AFTER SURGERY)

<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>● Continued minimization of post-operative pain/edema</li> <li>● Progress knee flexion PROM</li> <li>● Progress to full weight-bearing status with locked knee brace</li> <li>● Begin proximal/distal strengthening (hip, back, abdominals, ankle)</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>● Knee flexion PROM starts at 50 degrees week 2             <ul style="list-style-type: none"> <li>○ Able to add light overpressure ONLY for PROM</li> </ul> </li> <li>● Progress 10 degrees of flexion/week until 90 degrees of flexion is achieved</li> <li>● Hinged brace locked in extension for standing/walking/sleeping             <ul style="list-style-type: none"> <li>○ Brace worn at night until week 6 unless otherwise specified</li> <li>○ Can unlock for sitting/laying and during PROM</li> </ul> </li> <li>● Assistive device for ambulation as needed</li> </ul>
<b>Weight Bearing Status</b>	<ul style="list-style-type: none"> <li>● Weight-bearing as tolerated with hinged knee brace locked in extension, should be full weight-bearing by 6 weeks</li> </ul>
<b>Intervention</b>	ROM/Mobility <ul style="list-style-type: none"> <li>● Patellofemoral Joint Mobilization</li> <li>● Gradual flexion PROM with light overpressure</li> <li>● Extension PROM with overpressure as needed</li> </ul>
<b>Suggested Therapeutic Exercises</b>	Strengthening <ul style="list-style-type: none"> <li>● Straight leg raise WITHOUT lag</li> <li>● Side lying hip abduction and adduction</li> <li>● Prone leg extension</li> <li>● Standing hip abduction, adduction and extension</li> <li>● Glute bridge with legs straight elevated on a chair</li> <li>● Calf raises</li> <li>● Core strengthening – planks without discomfort in knee, TA brace progression</li> <li>● Continue strengthening exercises from Phase I</li> </ul> Balance/Proprioception <ul style="list-style-type: none"> <li>● Standing weight shifts</li> </ul> Cardio <ul style="list-style-type: none"> <li>● Upper body ergometer</li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>● Full passive knee extension PROM</li> <li>● Passive knee flexion to 90 degrees</li> <li>● FWB with no brace on</li> <li>● Active knee extension with 0 degrees</li> </ul>

### PHASE III: LATE POST-OP (6-15 WEEKS AFTER SURGERY)

<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>● Wean off any assistive device if any are used</li> <li>● Restore full AROM/PROM of knee flexion</li> <li>● Begin stationary bike when able</li> <li>● Initiate progressive quadriceps loading/resistance exercises</li> <li>● Restore static single leg balance</li> <li>● Continue to progress proximal/distal strengthening</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>● No weight-bearing with flexion &gt;90 degrees until after 8 weeks</li> <li>● AROM/PROM should be cautioned not to progress faster than 10 degrees per week before 12 weeks pop-op</li> <li>● Avoid aggressive quad stretching</li> <li>● No MMT until week 16</li> </ul>
<b>Weight Bearing Status</b>	<ul style="list-style-type: none"> <li>● Hinged brace unlocked for ambulation (0-60 degrees) as long as the patient demonstrated sufficient quad control during stance             <ul style="list-style-type: none"> <li>○ Use brace until week 8 unless otherwise specified</li> </ul> </li> <li>● Discharge use of brace when patient can sufficiently demonstrate:             <ul style="list-style-type: none"> <li>○ Sufficient quad control</li> <li>○ Weight bearing tolerance</li> <li>○ Single limb stability</li> </ul> </li> </ul>
<b>Intervention</b>	<p>ROM/Mobility</p> <ul style="list-style-type: none"> <li>● Patellofemoral Joint Mobilization</li> <li>● Flexion PROM with overpressure</li> <li>● Extension PROM with overpressure as needed</li> <li>● All exercises should focus on proper control with emphasis on good proximal stability</li> </ul>
<b>Suggested Therapeutic Exercises</b>	<p>Strengthening</p> <p>*Progress strength gradually as appropriate avoiding anterior knee pain, many of the below exercises will not begin until 8-10 weeks or later</p> <ul style="list-style-type: none"> <li>● Leg press machine</li> <li>● Seated hamstring curl machine and hamstring curl machine</li> <li>● Hip abductor and adductor machine</li> <li>● Hip extension machine</li> <li>● Roman chair</li> <li>● Seated calf machine</li> <li>● Squat to chair</li> <li>● Lateral lunges</li> <li>● Romanian deadlift (single and double leg)</li> </ul> <p>Single Leg Progression</p> <ul style="list-style-type: none"> <li>● Partial weight bearing single leg press</li> <li>● Step ups and step ups with march</li> <li>● Slide board lunges</li> <li>● Lateral step ups</li> <li>● Single leg squats</li> <li>● Single leg wall slides</li> </ul> <p>Proximal Strengthening</p> <ul style="list-style-type: none"> <li>● Double leg bridge</li> <li>● Bridge with feet on physio ball</li> <li>● Single leg bridge</li> <li>● Lateral band walk</li> </ul>

	<ul style="list-style-type: none"> <li>● Clamshell</li> <li>● Fire hydrants</li> </ul> <p>Balance/Proprioception</p> <ul style="list-style-type: none"> <li>● Progress single limb balance including perturbation training</li> </ul> <p>Cardio</p> <ul style="list-style-type: none"> <li>● Upper body ergometer</li> <li>● Stationary bike – begin with partial rotations minimal resistance and gradually progress time and resistance once full motion is achieved</li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>● Good recovery of quadriceps strength</li> <li>● Knee flexion PROM to at least 120 degrees</li> <li>● Single leg stance to 20 seconds on involved side with no compensatory pattern</li> <li>● Symmetrical gait pattern without use of assistive device</li> </ul>

#### PHASE IV: TRANSITIONAL (4-6 MONTHS AFTER SURGERY)

<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>● Restore full ROM and muscle length of quadriceps</li> <li>● Restore quadriceps strength</li> <li>● Restore single leg dynamic balance/eccentric control</li> <li>● Initiate return to jog/run protocol as tolerated</li> <li>● Restore proximal/distal strength to symmetry with contralateral side</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>● Avoid pain more than delayed onset muscle soreness (DOMS) during or following exercise especially in the anterior knee/extensor mechanism</li> </ul>
<b>Weight Bearing Status</b>	<ul style="list-style-type: none"> <li>● Patient should have discharged the use of an assistive device and brace at this point</li> </ul>
<b>Intervention</b>	<ul style="list-style-type: none"> <li>● Begin sport specific training in the sagittal plane</li> <li>● Bilateral PWB plyometrics progressed to FWB plyometrics</li> <li>● Progress to plyometric and agility program (with functional brace if needed)</li> <li>● Return to running program – Must have full ROM, resolved swelling, no pain with walking, at least 80% limb symmetry on handheld dynamometer, and ability to perform SL hop with good form prior to initiating jogging progression</li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>● Quad index of at least 90%</li> <li>● Symmetrical strength measures in hamstrings and hip</li> <li>● Y balance test within 90% of contralateral side</li> <li>● Symmetry in gait when jogging</li> </ul>

#### PHASE V: PROGRESSIVE RETURN TO SPORT (6-8 MONTHS AFTER SURGERY)

<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>● Progress running/sprinting program</li> <li>● Improve multidirectional dynamic movements and control of acceleration/deceleration</li> <li>● Improve power in plyometrics and landing mechanics</li> <li>● Restore full quadriceps strength</li> <li>● Return to sport/competition with minimal risk of re-injury</li> </ul>
<b>Intervention</b>	<ul style="list-style-type: none"> <li>● Add sport specific exercises based on patient's desired sport goals</li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>● Pass all criteria of the MGB Lower Extremity Return of Sport Functional Testing</li> <li>● Quad index of at least 90%</li> </ul>