

Phase 1	Surgery to 8 weeks	
Appointments	Rehabilitation appointments begin 2-3 weeks post-op day 1 and should be 1-2 times per week during this phase.	Hospital physio will see post op and issue standard exercises and ensure safety on crutches
Rehabilitation Goals	Protection of healing graft fixation and swelling and pain management <ul style="list-style-type: none"> <li>• Restore quadriceps function and leg control</li> <li>• Adherence to home exercise program (HEP) and precautions</li> </ul>	
Precautions	Ice to knee 15 mins 4-5 times/day first 2 weeks then reduce as appropriate  Weightbearing: 50% weight bearing (TDWB) for 6 weeks with crutches <ul style="list-style-type: none"> <li>• Brace:</li> </ul> Range of Motion: <ul style="list-style-type: none"> <li>• weeks 1-2: 0-30°</li> <li>• weeks 3-4: 30-60°</li> <li>• weeks 5-6: 60-90°</li> </ul> <ul style="list-style-type: none"> <li>• NOTE: Staying within the range of motion guidelines is imperative to protect the periosteal stitch on the tibia</li> </ul>	Clinic appointment or GP wound check and suture trimming 10-18 days postop
Suggested Therapeutic Exercise	Assisted seated knee flexion for range of motion (ROM) within above guidelines <ul style="list-style-type: none"> <li>• Knee extension range of motion (avoid hyperextension past 5°)</li> <li>• Ankle pumps progressing to resisted ankle ROM</li> <li>• Patellar mobilizations - especially superior mobilizations to minimize adhesions within the fat pad</li> </ul>	

	<ul style="list-style-type: none"><li>• Quad sets: static quads</li><li>•</li><li>• Straight leg raises</li></ul>	
Cardiovascular Exercise	None at this time	
Comments		

<b>Phase 2</b>	<b>8 to 14/16 weeks</b>	
Appointments	Rehabilitation appointments are 1-2 times per week	Clinic appointment with Professor Gupte 6-8weeks
Rehabilitation Goals	Normalize gait <ul style="list-style-type: none"> <li>• Avoid overstressing the fixation site</li> <li>• Closed chain leg control for non-impact movement control</li> <li>• Adherence to HEP</li> </ul>	
Precautions	Weight bearing as tolerated <ul style="list-style-type: none"> <li>• Gradual progression to full knee flexion ROM</li> <li>• Avoid over-loading the fixation site by utilizing low amplitude low velocity movements.</li> <li>• No active inflammation or reactive swelling.</li> </ul>	
Suggested Therapeutic Exercise	Gait drills - forward and backward march walk, soldier walk, <ul style="list-style-type: none"> <li>• Double leg balance drills - balance board, tandem balance</li> <li>• Closed chain strengthening for quadriceps and glutes - double leg squat progressions, split squats, step backs, leg press</li> <li>• Bridging if tolerated</li> <li>• Balance board drills - double leg balance</li> <li>• Hip and core strengthening</li> </ul>	
Range of movement exercises	Supine wall slides to 60 degrees, heel slides knee to chest to gradually improve knee flexion <ul style="list-style-type: none"> <li>• Stationary bike with low resistance</li> <li>• Aquatic therapy as needed</li> </ul>	

Cardiovascular Exercise	Stationary bike with low resistance • Deep water running • Elliptical trainer	
Progression criteria	<ul style="list-style-type: none"> <li>• Normal gait</li> <li>• Symmetric weight acceptance for squats to 60°</li> <li>• No reactive swelling after exercise or activity that lasts for more than 12 hours.</li> </ul>	

<b>Phase 3</b>	<b>14-22 weeks</b>	
Appointments	<ul style="list-style-type: none"> <li>• Rehabilitation appointments as needed. Usually 1 time every 1-2 weeks.</li> </ul>	Clinic appointment Professor Gupte 12-16 weeks
Rehabilitation Goals	Normal gait pattern Good core and gluteus control Stable single leg control 15-20min/day home exercise program	
Precautions	No active reactive swelling or joint pain that lasts more than 12 hours	
Suggested Therapeutic Exercise	Callasthenic low impact exercises and gym/elastic bands  Double and single leg squats to 90 Double Leg presses building up to body weight  Single leg presses to 70% body wt  Hamstring curls  Elastic band 15 min program  Glute bridges  Stretches	

	<p>Full flexion range</p> <ul style="list-style-type: none"> <li>• Quad sets: static quads</li> <li>•</li> <li>• Straight leg raises</li> </ul>	
Cardiovascular Exercise	<p>Stationary bike with moderate resistance •                  Deep water running and swimming                  • Elliptical trainer at moderate intensity</p>	
Progression criteria	<ul style="list-style-type: none"> <li>• Normal fast walking gait</li> <li>• Good single leg balance</li> <li>• Less than 25% deficit on Biodex strength test</li> <li>• No reactive swelling after exercise or activity</li> </ul>	

<b>Phase 4</b>	<b>22-36weeks</b>	
Appointments	<ul style="list-style-type: none"> <li>• Rehabilitation appointments 1 time every 2-4 weeks</li> </ul>	Clinic appointment with Professor Gupte 6 months
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Normal running gait without side to side differences or compensations</li> <li>• Normal double leg landing control without side to side differences or compensations for sub-maximal squat jump</li> <li>• Adherence to HEP</li> </ul>	
Precautions	<ul style="list-style-type: none"> <li>• No active reactive swelling or joint pain that lasts more than 12 hours</li> <li>No pivot training or high impact</li> </ul>	
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> <li>• Low amplitude low velocity agility drills: forward and backward skipping, side shuffle, skater's</li> </ul>	

	<p>quick stepping, carioca, cross overs, backward jog, forward jog</p> <ul style="list-style-type: none"> <li>• Closed chain strengthening for quadriceps and glutes - progressing from double leg strengthening to single leg strengthening: lunge progressions and single leg squat progressions</li> <li>• Single leg balance exercises and progressions, progressing from stationary to deceleration in to holding posture and position</li> <li>• At ~26 weeks initiate low amplitude landing mechanics: med ball squat catches, shallow jump landings, chop and drop stops, etc.</li> <li>• Core strength and stabilization</li> </ul>	
Cardiovascular	<ul style="list-style-type: none"> <li>• Stationary bike with moderate resistance</li> <li>• Deep water running and swimming</li> <li>• Elliptical trainer at moderate intensity</li> </ul> <p>Gentle straight line, soft ground jogging</p>	
Progression criteria	<ul style="list-style-type: none"> <li>• Normal jogging gait</li> <li>• Good single leg balance</li> <li>• Less than 25% deficit on Biodex strength test</li> <li>• No reactive swelling after exercise or activity</li> </ul> <p>80% hamstring and quads performance compared with non operated side</p> <p>Good gluteal control on single leg squat testing</p> <p>Good core control</p>	

<b>Phase 5</b>	<b>6-9months</b>	
Appointments	<ul style="list-style-type: none"> <li>• Rehabilitation appointments 1 time every 2-4 weeks</li> </ul>	Clinic appointment with Professor Gupte 9-12 months

Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Normal multi-planar high vel without side to side differences or compensations.</li> <li>• Normal double leg landing control without side to side differences or compensations.</li> <li>• Adherence to HEP</li> </ul>	
Precautions	<ul style="list-style-type: none"> <li>• No active reactive swelling or joint pain that lasts more than 12 hours</li> </ul>	
Suggested Therapeutic Exercise	<ul style="list-style-type: none"> <li>• Progressive agility drills - forward and backward skipping, side shuffle, skater's quick stepping, cross overs, backward jog, forward jog</li> <li>• Landing mechanics - progressing from higher amplitude double leg to single leg landing drills. Start uni-planar and gradually progress to multi-planar</li> <li>• Movement control exercise beginning with low velocity, single plane activities and progressing to higher velocity, multi-plane activities</li> <li>• Unanticipated movement control drills, including cutting and pivoting</li> </ul> <p>Deceleration training</p> <ul style="list-style-type: none"> <li>• Strength and control drills related to sport specific movements</li> <li>• Sport/work specific balance and proprioceptive drills</li> <li>• Hip and core strengthening</li> <li>• Stretching for patient specific muscle imbalances</li> </ul>	
Cardiovascular Exercise	<ul style="list-style-type: none"> <li>• Progressive running program. Design to use sport specific energy systems</li> </ul>	
Progression Criteria	<ul style="list-style-type: none"> <li>• Patient may return to sport after receiving clearance from the orthopaedic</li> </ul>	

	surgeon and the physiotherapist/athletic trainer. Progressive testing will be completed. Patient should have less than 15% difference in Biodex strength test, force plate jump and hop tests and functional hop tests	
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PHASE 6 (begin after meeting Phase 5 criteria, usually 10-12 months after surgery)

This phase is individualized based on the athlete's sport and continued physical impairment/performance needs. During this phase athletes will be allowed to return to team practices with criteria and limitations from the physiotherapist. This may include time, volume or specific activity.

Practice Continuum:

- 1.Movement Patterns: a. sprinting b. shuffle c. carioca d. zig-zag cutting and e. shuttle change of direction
- 2.Closed Drills – sport-specific drills without opposition in a controlled speed environment
- 3.One-on-one Drills (no-contact) – sport-specific drills/ activities where the athlete is expected to react to his/ her opponent without compensation
- 4.One-on-one Drills – full speed 1 on 1 drills with game necessary contact
- 5.Team practice (no-contact) – patients are asked to wear a different colored jersey to indicate their contact restrictions during team scrimmaging when appropriate
- 6.Team practice – full contact
- 7.Restricted Play – progressing time and situational play as appropriate. 8.Full return to play

Patient may return to sport after receiving clearance from the orthopaedic surgeon and the physiotherapist/athletic trainer. Progressive testing will be completed. Patient should have less than 10-15% difference in Biodex strength test, force plate jump and hop tests and functional hop tests