SKYLINE ORTHOPEDICS
Orthopedic Surgery, Sports Medicine & Arthroscopy Specialists

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REHABILITATION PROTOCOL- PCL reconstruction

The rehabilitation guidelines are presented in a criterion based progression program. General time frames are given for reference to the average, but individual patients will progress at different rates depending on their age, associated injuries, pre-injury health status, rehab compliance, tissue quality and injury severity. Specific time frames, restrictions, and precautions may also be given to protect healing tissues and the surgical repair/reconstruction. It should not be a substitute for one's clinical decision making regarding the progression of a patient's post-operative course based on their physical exam findings, individual progress, and/or the presence of post-operative complications. The therapist should consult the referring physician with any questions or concerns.

Special attention must be given to impairments that caused the initial problem. For example, if the patient is s/p partial medial meniscectomy and they have a varus alignment, post-operative rehabilitation should include correcting muscle imbalances or postures that create medial compartment stress.

INDIVIDUAL CONSIDERATIONS: S/p

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PHASE 1- Surgery to 6 weeks

REHAB GOALS	1. Protection of the post-surgical repair 2. Passive knee extension to neutral and full knee flexion 3. Restore leg control – no lag with straight-leg-raise 4. Restore/maintain patellar mobility 5. Eliminate effusion/swelling 6. Gait training and mobility with crutches
PRECAUTIONS	1. Crutches and non-weight bearing with brace locked in extension for 3 days. Transition to PCL rebound brace at that time. No knee flexion past 90 degrees for 2 weeks, then progress as tolerated. 2. Brace on at all times for 6 months, including sleep and PT. 3. Cryocuff 3-5 times per day for 20 minutes and ice after every therapy session 4. Avoid hyperextension, posterior tibial translation for 12 weeks 5. Avoid isolated hamstring strengthening for 4 months
RANGE OF MOTION EXERCISES	○ Prone passive ROM ○ Patellar mobilization- superior/inferior and medial/lateral ○ Calf stretches

SUGGESTED THERAPEUTIC EXERCISES	○ Quad sets, straight leg raises ○ Hip abduction/adduction ○ Upper body & core strengthening as tolerated, maintain precautions ○ NMES as tolerated
CARDIOVASCULAR EXERCISE	Upper body circuit training or UBE.
PROGRESSION CRITERIA	○ Minimal pain & swelling ○ Passive extension to neutral ○ Good quad set, able to perform SLR without lag ○ At least 120 deg of knee flexion

PHASE 2- 6-12 weeks

REHAB GOALS	1. Protection of the post-surgical repair 2. Restore knee range of motion – full knee flexion 3. Regain quadriceps control 4. Minimize pain and swelling 5. Restore normal gait
PRECAUTIONS	1. Crutches and progression to full weight bearing, weaning crutches. Discontinue crutches when good quad control and able to walk normally without assistive device. 2. PCL brace at all times 3. Avoid hyperextension and posterior tibial translation for 1st 12 weeks 4. Cryocuff 3-5 times per day for 20 minutes and ice after every therapy session 5. No isolated hamstring strengthening for 4 months
RANGE OF MOTION EXERCISES	○ Continue phase 1 exercises ○ Supine and prone ROM starting after week 6 ○ Patellar mobilizations ○ Light hamstring stretching
SUGGESTED THERAPEUTIC EXERCISES	○ Continue phase 1 exercises ○ Weight shifts, Gait training ○ Double leg press 0-70 deg ○ Hamstring bridges on ball with knees extended ○ Squats- progress to squat with calf raise then squat with weight shift
CARDIOVASCULAR EXERCISE	Upper body circuit training (seated), core strengthening or UBE Pool walking Stationary bike zero resistance when >115 deg flexion

PROGRESSION CRITERIA	○ Minimal pain & swelling ○ Good quad set, SLR without lag ○ At least 120 deg of flexion ○ Able to walk without assistive device with normal gait

PHASE 3- 13-18 weeks postop

REHAB GOALS	○ Protection of graft during healing ○ Maintain/restore full ROM ○ Improve quad strength & endurance ○ Improve hip & core strength, balance, stability
PRECAUTIONS	○ PCL brace at all times ○ Avoid isolated hamstring strengthening until week 16 ○ Continue ice after PT ○ Avoid post activity swelling
RANGE OF MOTION EXERCISES	○ Continue exercises from phase 2. ○ Soft tissue/scar mobilizations as needed ○ Hip ROM as tolerated, avoid excessive ER/IR that would torque knee
SUGGESTED THERAPEUTIC EXERCISES	○ Continue phase 2 exercises ○ Hip & core strengthening- 4 way hip exercises, side steps, diagonal walking w/bands, planks, pelvic tilts, bridging, lateral side support ○ Balance- Begin proprioceptive exercises. Single leg balance, knee extended. Progress to single leg knee flexed 30 deg. If minimal deviations, can progress further to unstable surface then eyes closed. ○ Progress double leg press to single leg 0-70 deg ○ Squat progression ○ Week 16- hamstring strengthening, single leg bridges
CARDIOVASCULAR EXERCISE	UBE, swimming (flutter kick only), pool walking, stationary bike- ok to increase resistance
PROGRESSION CRITERIA	○ Minimal pain & swelling ○ Symmetrical passive & active extension and flexion ○ Able to perform single leg stance for 15 seconds without pelvic drop/knee valgus ○ At least 4/5 quadriceps strength

PHASE 4- 19-24 weeks postop

REHAB GOALS	○ Restore/maintain full ROM ○ Improve strength ○ Continue neuromuscular progression ○ Improve muscular endurance
PRECAUTIONS	PCL brace at all times Caution when progressing strengthening in this phase. The graft is at risk of failure and aggressive rehab could be detrimental Post-activity soreness should resolve within 24 hours Avoid post activity swelling Continue ice after PT
RANGE OF MOTION EXERCISES	Continue with flexibility exercises Hip, IT band stretching & sport specific stretches if precautions followed
SUGGESTED THERAPEUTIC EXERCISES	○ Progress phase 3 activities with resistance/weight ○ Balance/neuromuscular- continue progression with unstable surface, perturbations, etc ○ Continue open and closed chain exercises, progress with weight/resistance ○ Light sport specific drills at week 22
CARDIOVASCULAR EXERCISE	Continue previous phase exercises
PROGRESSION CRITERIA	○ Full, painless active and passive ROM ○ Progression of neuromuscular/proprioceptive training ○ Clearance by physician

PHASE 5- 6-9 months postop

REHAB GOALS	○ No pain/swelling/instability ○ Full ROM ○ 90% quad strength ○ Begin walk/run progression
PRECAUTIONS	Post-activity soreness should resolve within 24 hours Avoid post activity swelling Begin weaning PCL brace during this phase
RANGE OF MOTION EXERCISES	Continue with flexibility exercises
SUGGESTED THERAPEUTIC	○ Progress strengthening from phase 4 ○ Balance/neuromuscular- continue to progress and advance difficulty

EXERCISES	○ Agility training- Completion of running progression prior to initiating: lateral shuffling, forward/backward shuttle runs, carioca, ladder drills. Start with 50% effort at single plane activities, progress slowly to 100% and multi plane. ○ Plyometrics, cutting drills, sport specific activities- ok to begin after running progression and tolerance of agility training at 100% effort.
CARDIOVASCULAR EXERCISE	○ Continue from phase 4 ○ Initiate walk/run progression: 20 minutes, 4 min walk/1 min jog, then 3 min walk/2 min jog, etc.
PROGRESSION CRITERIA	○ No pain/swelling ○ Full ROM symmetrical ○ Quad index at least 90% ○ Hop test scores at least 80%: single leg hop for distance, single leg triple hop, single leg triple crossover hop, timed 10 meter hop. ○ Tolerating full effort agility, jumping/hopping, cutting and sprinting without symptoms or movement abnormalities

PHASE 6- 9-12 months postop

REHAB GOALS	○ No pain/swelling/instability ○ Full ROM ○ Greater than 90% quad strength ○ Return to sport/work
PRECAUTIONS	Post-activity soreness should resolve within 24 hours Avoid post activity swelling
RANGE OF MOTION EXERCISES	Continue with flexibility exercises
SUGGESTED THERAPEUTIC EXERCISES	○ Progress from phase 4 ○ Agility training- continue, incorporate sport specific activities ○ Plyometrics- jumping & hopping more challenging by changing height/distance, speed, directions, combination of tasks ○ Cutting drills: include anticipated and unanticipated movements, incorporate sport specific activities ○ Return to sport test: see below
CARDIOVASCULAR EXERCISE	○ Advance to baseline
PROGRESSION CRITERIA- RETURN TO SPORT	○ Full ROM equal to contralateral ○ No pain or swelling ○ Quadriceps index and hop test >90% of contralateral ○ Tolerating all drills without symptoms

	○ Passing return to sport test

RETURN TO SPORT TEST

- 10 rep max single leg squat with external weight
- Single broad jump landing on one foot
- Triple broad jump landing on one foot
- Single leg forward hop
- Single leg crossover hop
- Single leg medial and lateral hop
- Single leg medial and lateral rotating hop
- Single leg vertical hop
- Single leg triple hop
- Timed 6 meter hop
- 10 yard lower extremity functional test
- 10 yard pro agility run