SKYLINE ORTHOPEDICS
Orthopedic Surgery, Sports Medicine & Arthroscopy Specialists

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REHABILITATION PROTOCOL- ACL, PCL & Posterolateral corner 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. Full passive knee extension 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. No open chain exercises for quadriceps/hamstring 5. Avoid hyperextension, posterior tibial translation and varus stress for 12 weeks 6. Avoid tibial & foot/ankle external rotation for 4 months 7. Avoid isolated hamstring strengthening for 4 months
RANGE OF MOTION	○ Prone passive ROM ○ Patellar mobilization- superior/inferior and medial/lateral ○ Hamstring & calf stretches

EXERCISES	
SUGGESTED THERAPEUTIC EXERCISES	○ Quad sets, straight leg raises ○ Gluteal sets (avoid hip abduction- stresses repair) ○ Calf pumps ○ NMES as tolerated
CARDIOVASCULAR EXERCISE	Upper body circuit training or UBE.
PROGRESSION CRITERIA	○ Minimal pain & swelling ○ Full passive extension symmetrical ○ Good quad set, able to perform SLR without lag ○ At least 120 deg of knee flexion

PHASE 2- 7-12 weeks

REHAB GOALS	1. Protection of the post-surgical repair 2. Restore knee range of motion – full knee extension and Knee flexion 3. Regain quadriceps control 4. Minimize pain and swelling 5. Restore normal gait
PRECAUTIONS	1. Crutches and progression to weight bearing as tolerated, 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, varus and posterior tibial translation for 1st 12 weeks 4. Avoid tibial & foot/ankle external rotation for 4 months 5. No isolated hamstring strengthening for 4 months 6. Cryocuff 3-5 times per day for 20 minutes and ice after every therapy session
RANGE OF MOTION EXERCISES	○ Continue phase 1 exercises ○ Supine & prone ROM ○ Patellar mobilizations ○ Light hamstring stretching
SUGGESTED THERAPEUTIC EXERCISES	○ Continue phase 1 exercises ○ Gait training, weight shifts
CARDIOVASCULAR EXERCISE	Upper body circuit training (seated), core strengthening or UBE Stationary bike- high seat, zero resistance when >115 deg flexion

	Pool walking
PROGRESSION CRITERIA	○ Minimal pain & swelling ○ Full passive knee extension, 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 and tibial/foot & ankle external rotation 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 ○ Heel raises, start double leg, progress to single leg ○ 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. ○ Double leg press 0-60 deg up to 25% body weight, squats 0-60 up to 50% body weight 10 reps. Slow progression to body weight. Wall slides 0-60 ○ Single leg mini squats & step ups/downs (3 inches) if able to balance on flexed knee with minimal hip/postural sway. Limit 0-45 deg flexion ○ Week 16- Hip & core strengthening- 3 way hip exercises (exclude abduction), side steps, diagonal walking w/bands, planks, pelvic tilts, bridging, lateral side support (caution w/excessive LE external rotation) ○ Open chain- limited arc extension (**90 to 60 deg flexion ONLY)** Light resistance, advance to machine when tolerating 10lb ○ Week 16- ok to start resisted knee flexion (prone & standing) 0-90 when 100 active knee flexion achieved. Once performed with 10lb can transition to leg curl machine. ○ Closed chain progression- double limb squat, lunges, single limb squat

CARDIOVASCULAR EXERCISE	UBE, swimming (flutter kick only, no whipkick or flipturn), 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 ○ Ok to increase closed chain strengthening exercises ROM to 0-90 ○ Progress Closed chain to single leg: leg press, partial squats, higher level step up/downs ○ Light sport specific drills at week 22
CARDIOVASCULAR EXERCISE	Continue previous phase exercises, increase bike resistance. Add elliptical 22 weeks- treadmill walking
PROGRESSION CRITERIA	○ Full, painless active & passive ROM ○ Progression of neuromuscular/proprioceptive training ○ Clearance by physician

PHASE 5- 6-9 months

REHAB GOALS	○ No pain/swelling/instability ○ Full ROM

	○ 90% quad strength ○ Begin walk/run progression
PRECAUTIONS	Begin weaning PCL brace during this phase Post-activity soreness should resolve within 24 hours Avoid post activity swelling
RANGE OF MOTION EXERCISES	Continue with flexibility exercises
SUGGESTED THERAPEUTIC EXERCISES	○ Progress strengthening from phase 4 ○ Open chain- ok to advance knee extension from 90-60 to 90-45 degrees ○ Closed chain- ok to increase ROM from 0-90 as tolerated. Advance resistance/difficulty as tolerated ○ Balance/neuromuscular- continue to progress and advance difficulty ○ Agility training- Completion of running progression prior to initiating. lateral shuffling, forward/backward shuttle runs, carioca, ladder drills. Start with 50% effort, progress slowly to 100%. ○ Plyometrics- begin when 85% quad strength achieved & running progression completed. Make sure good form with landing. Begin with single forward jumps take off and landing both legs. Progress to side to side jumping, jumping w/rotation, box jumps. As patient improves progress from single to consecutive jumps. Single leg hops when 90% quad strength achieved, perform jumps on both legs with equal weight distribution, follow same progression as jumping above, emphasize correct form.
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. Initiate if able to perform 20 single leg squats to at least 60 deg with good control. Progress to sprinting when quad index >90%. Transition from running to full sprint short distances. Progress from 40 to 100 meters.
PROGRESSION CRITERIA	○ No pain/swelling ○ Full ROM symmetrical ○ Quad index at least 90% ○ Hop test scores at least 85%: 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 Functional brace when thigh muscle girth <1cm side to side difference
RANGE OF MOTION EXERCISES	Continue with flexibility exercises
SUGGESTED THERAPEUTIC EXERCISES	○ Progress from phase 5 ○ Agility training- continue, incorporate sport specific activities ○ Plyometrics- jumping & hopping more challenging by changing height/distance, speed, directions, combination of tasks ○ Cutting drills: Cutting drills when 90% quad strength: begin with running S pattern, progress to 45 deg cuts then sharper cuts. Can begin pivoting & cut and spin drills when able to cut at sharp angles 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