

POSTERIOR CRUCIATE LIGAMENT (PCL) RECONSTRUCTION REHABILITATION PROTOCOL

General notes:

"As tolerated" should be understood to include with safety for the reconstruction/repair; pain, limp, swelling, or other undesirable factors are indicators that you are doing too much too soon. If any of these should occur, decrease activity level, ice and elevate the leg.

Ice should be applied to the knee for 15-20 minutes following each exercise, therapy, or training session.

Return to sport based on provider team (physician, physician assistant, athletic trainer, therapist) input and appropriate testing.

All times and exercises are to serve as guidelines. Actual progress may be faster or slower, depending on each individual patient, as agreed upon by the patient and his/her team of providers.

Pre-op

Brace:

As needed

Weight Bearing:

Full, crutches as necessary

ROM (range of motion) Goals:

Extension: Full with back of leg supported at all times to protect from tibial sag

Flexion: 135 degrees

Therapeutic Exercise: Learn exercises for post-op regimen

Goal: Minimal to no swelling, full knee extension

Post-Operative Phase I: (Weeks 0 to 4)

Brace:

- Locked in full knee extension

Function:

- Ambulation foot flat weight bearing; MUST use crutches

Therapeutic Exercises:

- Quad sets (tighten thigh muscles), three-way SLR (straight leg raises: backwards and each side, NO flexion)
- No open chain hamstring strengthening
- Upper body strengthening permitted when seated or lying down

Manual:

- Scar and soft tissue massage, patella mobilizations
- Passive knee flexion (someone bends knee for you) to 90° with anterior tibial force

Cardio:

- UBE (upper body ergometer)

Modalities:

- NMES for quadriceps atrophy, strengthening as needed

- HVPC for effusion reduction as needed
- Cryotherapy six to eight times per day for 15 to 20 minutes each

Progression to Phase II:

- Hip flexion SLR without knee extension lag
- Full active knee extension
- Minimal joint effusion
- Knee flexion to 90°

Post-Operative Phase II: (Weeks 4 to 9)

Brace:

- Open 0° to 30° weeks 5 and 6
- Open to 60° weeks 7 and 8

Function:

- Ambulating in brace partial to full weight bearing by week 9
- Wean off crutches by week 9

Therapeutic Exercises:

- Quad sets, four-way SLR
- Begin 1/4 squat and step down weeks 7 and 8
- No closed kinetic chain (CKC) strengthening with knee flexion angle greater than 30°
- No open chain hamstring strengthening
- Core strengthening, not in standing

Manual:

- Scar and soft tissue massage, patella mobilizations
- Passive knee flexion to 110° with anterior tibial force

Proprioception:

- Single limb stance (SLS), BAPS board
- Joint repositioning

Cardio:

- UBE, stationary bike without resistance and without toe clips

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Modalities:

- NMES for quadriceps atrophy, strengthening as needed
- HVPC for effusion reduction as needed
- Cryotherapy six to eight times per day for 15 to 20 minutes each

Progression to Phase III:

- Knee ROM 0°-110°
- No effusion
- Normal gait with brace without crutches
- No pain
- Good eccentric control of involved knee

Post-Operative Phase III: (Weeks 9 to 24)

Brace:

- Open

Function:

- Ambulating with full weight bearing in open brace

Therapeutic Exercises:

- CKC strengthening in unrestricted knee flexion ROM, 1/2 squats, step downs, progression to multi-lane CKC activities
- No open chain hamstring strengthening
- Hip and core strengthening

Manual:

- Scar and soft tissue massage, patella mobilizations
- Initiate and progress posterior tibial glides and joint mobilizations
- Passive knee flexion to full°

Proprioception:

- SLS, BAPS, unstable surfaces
- Joint repositioning
- Perturbation training

Cardio:

- UBE, stationary bike without toe clips, treadmill ambulation, elliptical machine

Modalities:

- Cryotherapy after activity for 15 to 20 minutes

Progression to Phase IV:

- Full knee ROM without end range pain
- Proprioception 80 to 100% of non-involved side
- Isometric quad strength 80% of non-involved side

Functional Training and Return to Sports Phase:

Recommend pursuing Transitional Therapy for return to sport activities during this phase

- *Transitional Therapy* – a strength and conditioning program that is lead by medical professionals with a sports medicine background with the goal of transitioning from therapy back to sport
- Contact Elite Sports Medicine for details

In addition to ongoing strength, balance, and cardio conditioning, initiate agility drills and sport-specific plyometric activities as tolerated such as:

Soccer/Football: Two foot ankle hop, double-leg hop, front barrier hop, lateral barrier hop, single-leg hop, power skip, backward skip, double-arm alternate-leg bound, and cycled split squat jump

Basketball/Volleyball: Two foot ankle hop, double-leg hop, squat jump, double-leg vertical jump, single-leg hop, single-leg vertical jump, power skip, backward skip, double-arm alternate-leg bound, alternate-leg push off box drill, and side-to-side push-off box drill

Baseball/Softball/Overhead throwing sports: Two foot ankle hop, double-leg hop, front barrier hop, lateral barrier hop, single-leg hop, power skip, backward skip, double-arm alternate-leg bound, cycled split squat jump, and return to throwing program

1 Year Follow up Testing:

- Isokinetic testing to assess strength of hamstring/quadriceps
- Jump and hop testing