AUCKLAND BONE AND JOINT SURGERY

Dr. Matthew J. Boyle, BSc, MBChB, FRACS
AUT Millennium, 17 Antares Place, Mairangi Bay
& Ascot Hospital, 90 Green Lane E, Remuera
P: (09) 281-6733 F: (09) 479-3805
office@matthewboyle.co.nz
www.matthewboyle.co.nz

POSTERIOR CRUCIATE LIGAMENT (PCL) RECONSTRUCTION REHABILITATION PROTOCOL

GENERAL GUIDELINES

- No open chain hamstring work
- Assume 12 weeks graft to bone healing time
- Caution against posterior tibial translation (gravity, muscle action)
- PCL with posterolateral corner or lateral collateral ligament repair follows different post-op care (eg. crutches x 3 months)
- Supervised physical therapy takes place for approximately 3-5 months post-op

GENERAL PROGRESSION OF ACTIVITIES OF DAILY LIVING

Patients may begin the following activities at the dates indicated (unless otherwise specified by Dr. Boyle):

- Bathing/showering without brace (surgical incisions should be healed before immersion in water): 1 week post-op
- Sleeping without brace: 8 weeks post-op
- Driving: 6-8 weeks post-op
- Full weightbearing without crutches: 8 weeks post-op (with Dr. Boyle's clearance)

PHYSIOTHERAPY ATTENDANCE

The following is an approximate schedule for supervised physiotherapy visits:

Phase I (0-1 month):	2 visit/week
Phase II (1-3 months):	2-3 visits/week
Phase III (3-9 months):	2 visits/month
Phase IV (9-12 months):	1 visit/month

REHABILITATION PROGRESSION

The following is a general guideline for progression of rehabilitation following PCL reconstruction. Progress through each phase should take into account patient status (e.g. healing, function) and Dr. Boyle's advisement. Please consult Dr. Boyle if there is any uncertainty concerning advancement of a patient to the next phase of rehabilitation.

PHASE I:
Begins immediately post-op through approximately 4 weeks

Goals:
- Protect healing bony and soft tissue structures
- Minimise the effects of immobilisation through early protected range of motion (protect against posterior tibial sagging)
- Patient education for a clear understanding of limitations and expectations of the rehabilitation process

Brace:
- Locked at 0° for 1 week
- At 1 week post-op the brace is unlocked for passive range of motion performed by a physiotherapist
- Technique for physiotherapy assisted knee flexion range of motion (ROM) is as follows: patient supine, maintain anterior pressure on proximal tibia as knee is flexed (it is important to prevent posterior tibial sagging at all times)
- Instruct patients in self administered passive ROM with the brace on with emphasis on supporting the proximal tibia

Weightbearing Status
- Weight bear as tolerated (WBAT) with crutches, brace is locked

Special Considerations:
- Pillow under proximal posterior tibia at rest to prevent posterior sag

Therapeutic Exercises:
Instructed in hospital
- Quad Sets
- Straight leg raise (SLR)
- Hip abduction/adduction
- Ankle pumps

Add at first post-op visit:
- Hamstring and calf stretching
- Calf press with theraband progressing to standing calf raises with full extension
- Standing hip extension from neutral
- Continue exercises as above
  *Note Functional Electrical Stimulation may be used as needed for poor quad contraction

PHASE II:

Begins approximately 4 weeks post-op, and extends to the 12 weeks post-op. Criteria for advancement to Phase II:

- Good quad control (good quad set, no lag with SLR)
- Approximately 60° of knee flexion
- Full knee extension
- No signs of active inflammation

Goals:

- Increase range of motion (flexion)
- Restore normal gait
- Continue quadriceps strengthening and hamstring flexibility

Brace:

- 4-6 weeks: brace is unlocked for controlled gait training only (patient may ambulate with brace unlocked while attending physiotherapy or when at home)
- 6-8 weeks: brace is unlocked for all activities
- 8 weeks: discontinue brace as advised by Dr. Boyle

Weightbearing Status:

- 4-8 weeks: WBAT with crutches
- 8 weeks: may discontinue crutches if patient exhibits:
    - No quad lag with SLR
    - Full knee extension
    - Knee flexion 90-100°
    - Normal gait pattern (may use one crutch or cane until normal gait is achieved)

Therapeutic Exercises:

- 4-8 weeks (when patient exhibits independent quad control, may begin open chain):
    - Wall slides (0-45°); begin isometric, progress to active against body weight, then progress to mini-squats etc.
    - Hip flexion, abduction, adduction, extension from neutral with knee fully extended
    - Ambulation in pool (work on restoration of normal heel-toe gait pattern in chest deep water)
- 8-12 weeks:
    - Stationary bike: foot is placed forward on the pedal without use of toe clips to minimize hamstring activity, seat slightly higher than normal
    - Closed kinetic chain terminal knee extension utilizing resisted band or weight machine (use caution to place point of resistance to minimize tibial displacement)
    - Stairmaster
    - Balance and proprioception activities (eg. single leg stance)
    - Seated calf raises
    - Leg press (knee flexion should be limited to 90° during exercises)

PHASE III:

Begins approximately three months post-op, and extends to nine months post-op. Criteria for advancement to Phase III:

- Full, pain free range of knee motion (note that it is not unusual for flexion to be lacking 10-15° for up to 5 months post-op)
- Normal gait
- Good to normal quadriceps strength
    - No patellofemoral complaints
    - Clearance by Dr. Boyle to begin more concentrated closed kinetic chain progression

Goals:

- Restore any residual loss of motion that may prevent functional progression
- Progress functionally and prevent patellofemoral irritation
- Improve functional strength and proprioception utilising closed kinetic chain exercises
- Continue to maintain quadriceps strength and hamstring flexibility

Therapeutic Exercises:

- Continue closed kinetic chain exercise progression
- Treadmill walking
- Jogging in pool with wet vest or belt
- Swimming – no breaststroke

PHASE IV:

Begins approximately 9 months post-op and extends until the patient has returned to work or desired activity. Expectations for advancement to Phase IV:

- Release by Dr. Boyle to resume full or partial activity
- No significant patellofemoral or soft tissue irritation
- Presence of the necessary joint range of motion, muscle strength and endurance, and proprioception to safely return to work or athletic participation

Goals:

- Safe and gradual return to work or athletic participation
    - This may involve sports specific training, work hardening or job restructuring as needed
    - Patient education is essential to provide the patient with a clear understanding of their possible limitations
- Maintenance of strength, endurance and function
- Sports specific functional progression which may include but not be limited to:
    - Slide board
    - Jog/run progression
    - Figure 8 running, backward running, cutting
    - Jumping (plyometrics)
- Work hardening program as directed by Dr. Boyle