



United States Military-Baylor University
Post-professional Sports Medicine-Physical Therapy Doctoral Program
Keller Army Community Hospital, West Point, New York
"Academic, Research, and Clinical Excellence"

PCL AND/OR PLC RECONSTRUCTION REHABILITATION GUIDELINES

PRE-OP:

- EVALUATION:** KT2000, AROM
Biodex Test - Only w/ Non-Acute or per Ortho/P.T.
Functional Test
- CRUTCHES:** Instruction in PWB 3-point gait
- BRACE:** Fit post-op brace (Brace/Cast shop)
- EXERCISE:** Instruct in POD 1 exercises
- PNT EDUCATION:** Necessity of Compliance in Rehabilitation, Goals, Precautions
& Discharge Criteria

PHASE 1: IN-PATIENT REHAB (Typically DOS-3days post-op)

DOS (Nursing Staff):

- CRUTCHES:** PWB
- BRACE:** Locked at 0°.
- EXERCISE:** Static Quad Sets in brace
Calf pumping
Ice in extension with elevation
OOB with nursing assistance in evening
- WOUND:** Dressing remains intact
Bilateral compressive stockings
- PRECAUTIONS:** Nursing to review falling precautions, bed positioning, importance of
extension in brace and elevation of leg. Patient to remain in brace at all
times (to include sleeping).

POD 1 - D/C (Generally 2-3 days):

- CRUTCHES:** PWB x 4-6 weeks per Ortho/P.T.

(Chondroplasty/Meniscus Repair – TTWB (for balance only) x 6-8 weeks)

BRACE: Locked at 0° x 4-6 wks per Ortho (Assoc. PLC repair may prolong immobilization period ~8 wks)

WOUND: POD 1 Remove HEMOVAC (unless extensive drainage, per Ortho)
Debulk dressing / Dressing changed POD 2
Check for Erythema/Abnormal Temperature/Excessive Effusion/Drainage

PRECAUTIONS: No active knee flexion ROM, only passive knee flexion ROM within range limits as specified by time frame. Emphasize extension to 0 degrees for PCL, but NO hyperextension past 0 degrees or varus forces for PLC reconstructions. Avoid OKC Hamstring exercises which increase posterior tibial translation and graft loading for the first 8 weeks.

EXERCISE: **Note: Exercise prescription is dependent upon the tissue healing process and *individual* functional readiness in *all* stages. If any concerns or complications arise regarding the progress of any patient, physical therapy will contact the orthopedic doctor**

PATIENT'S ROOM (Patient to be instructed by PT):

Every waking hour - 100 Quad Sets, 10 SLRs (in brace),
10 Patellar mobilizations, and 20 min of ICE (or Cryocuff) in extension

with towel under heel cord.

Calf Pumping w/ Tubing
Brace locked at 0 for sleeping - Emphasize knee extension while in bed

A.M. SESSION:

Static Quad Set or SLR w/ E-Stim x 15 min (Muscle Re-education).
(begin flexion SLR when good quad set is present and no extension lag)
Progress to Short Arc ROM (0 – 30) w/ Active Quad Contraction per Ortho
Passive ROM in Prone (0-30°) 30 reps
Active Assisted Weight Shifts x 30 reps
Gentle HS Stretching
Prone Hang w/ MHP or Supine Ext. w/ bolster (Do not do for PLC)
Progress Intensity of Exercise as Tolerated

P.M. SESSION:

Repeat A.M. session
UBE or Well Leg Cycle - 10 min. (Optional)
Passive ROM in Prone (0-30°) 30 reps

CPM: Generally, only w/ Chondroplasty (per Ortho)

DOCUMENTATION: Neurovascular status

Pain Level and how managing pain (ie meds, modalities)
ROM by Passive Flexion Active Extension (PFAE)
Quad Function (Tone/SLR)
Patellar Mobility
Precautions and Gait status (ie Independent and safe crutch amb PWB on stairs and level surfaces)

Goals for Hospital Discharge:

1. *Good quad contraction (able to perform good Quad Set/SLR w/o lag)*
2. *0-30° PROM*
3. *Good patellar mobility*
4. *Independent PWB ambulation with crutches*
5. *No evidence of infection*
6. *Understanding of Outpatient Rehab*
7. *Effusion & Pain controlled*

PHASE 2: OUT-PATIENT REHAB - Maximum Protection Phase (generally 0-3 wks)

FOLLOW-UP: P.T. - Every 7-10 days for first 2 months; MONTHLY thereafter.
Ortho – (4–6 weeks)

IN CLINIC TREATMENT: QD x 6 wks, TIW thereafter

PRECAUTIONS: Continue to avoid Active HS work
Continue to emphasize patellar mobility to prevent:

- Infrapatellar Contracture Syndrome
- Patellar Entrapment

Avoid Knee Flexion Contracture by emphasizing bilaterally symmetric extension ROM, but avoid excessive hyperextension and PLC emphasize only to 0 deg extension.

- Brace Locked @ 0°
- Contact Physician if early signs of Arthrofibrosis develop
 - ◆ Patella Entrapment
 - ◆ Losing ROM
 - ◆ Plateau in ROM progress in a 2 wk period
 - ◆ Increased Pain
 - ◆ Increased Effusion
 - ◆ Skin and Temp. changes that suggest infection

DOCUMENTATION: Progress notes weekly for 2 months, then biweekly or monthly thereafter

Should include:

- Pain and how managing pain (meds or modalities)
- Gait Status
- Effusion
- PFAE/AROM of quads only
- Brace (type and setting)
- Quad function (Tone/SLR)
- Incision Site
- Patellar Mobility
- Exercises & modalities

- CRUTCHES:** Continue PWB
- BRACE:** Locked at 0° x 4-6 wks per Ortho. PLC may be extended (~8wks).
- EXERCISE:** Progress to the following exercises when ready:
 Double-leg Calf Raise (PWB) ≈ 1-2 wks
 Prone Passive / Short Arc ROM to 45° ≈ 2-3 wks
 Short Arc Quad Contractions 45 to 0 (over bolster)
 Straight Leg raises Abduction and Adduction (with PLC avoid any varus forces on knee by placing resistance above knee)
- WOUND:** Remove staples/sutures @ 7-10 days per P.T.
 May shower the morning after sutures are removed
 Begin scar massage after incision site sloughs/scar is formed.
 Remove compressive stocking and begin ACE wrap (prn)

- GOALS:**
1. 0-45° by 3 wks
 2. Wound Closure
 3. 30 “No Lag” SLRs

PHASE 3: Minimal Protection Phase (generally 3-6 wks)

- CRUTCHES:** Progress to FWB @ 4-6 weeks per P.T./Ortho
 (PLC will remain PWB x 6-8 weeks)
 D/C Crutches when: Effusion is under control
 0-60° AAROM,
 Performs: 30 SLRs w/o an extension lag
 15 sec single leg balance
- BRACE:** Locked at 0 till 4 weeks. Unlock to 60 at 4-6 wks.
- EXERCISES:** Progress to the following exercises when ready:
 Short Arc ROM (PFAE) 0-45 till 3rd wk, then 90° by 4th wk and 110 by 6th wk.
 Double-leg Mini-Squats w/ Trunk Erect (0 – 45)
 Resisted Hip Ext. w/ Knee Ext at 0. (Do not do for PLC)
 Unrestricted Double-leg Calf Raises
 Active Assisted BAPS / Double-leg K.A.T (if has sufficient quad control).
 Single-leg Stance / Weight Shift
 Single-leg Calf Raise
 Medium Arc Quads (0-60°) w/ PRE
 Progress Intensity of Exercises as tolerated
- ACTIVITIES:** Upper body workout at gym as desired
 Phase I Aquatic Therapy (**by P.T. Instruction**; see Aquatics Program)
 Pool Walking (Forward and Lateral)
 High Step March with no active knee flexion.
 Standing SLRs (flex, add, abd, ext with knee at 0)
 1/2 Squats 0 - 45

Note: The Aquatic Program begins only after the incision site is completely closed and sloughing.

- GOALS:**
1. 0-90° ROM by 4 wks and 0-110° ROM by 6 wks
 2. FWB w/ Normal Gait Pattern by 6 wks (may be extended per ortho to 8 wks if PLC)
 3. Brace Open to 60° if not D/C by 6 wks (may be extended per ortho to 8 wks if PLC)

PHASE 4: Intermediate Strengthening Phase (generally 6-12 wks)

AMBULATION: Continue FWB with open brace (if PLC open brace to 0-60 at ~ 8 wks)

BRACE: D/C Brace Between 6-8 wks per Ortho
Brace Discharge Criteria:

1. Minimal effusion
2. Appropriate Quad Control
3. Functional one leg 1/4 squats, non-antalgic gait, and NML stair ambulation

Functional brace prn

EXERCISES: Progress to the following exercises when ready:

Leg Press (0-70) (Low weight, high repetitions in painless ROM
(note: instruct patient in co-contraction of quads with leg press and keep legs in hip width stance)

Double leg mini-squat (with co-contraction) (0-45)
Single-leg Mini-Squat (with co-contraction) (0-45)
PROM knee flexion 0-110 at 6 wks, 0-130 by 12 wks
Progressive AAROM as tolerated
Bike - Rocking for ROM (no toe clips)
Standing / Prone HS Curls w/ co-contraction at 8 wks
Stairmaster or Elliptical x 10 minutes (~8-12 wks)
Stationary Bike as ROM permits (Moderate) with no toe clips
Single leg Body Blade
Single-leg BAPS/K.A.T.
Cone Walking
Soleus Press
Medium Arc Quads or Knee extension 0-60 (add wt prn)
Step-ups
Swimming (Phase II (outlined in next Phase) at appr. 8 weeks)
Progress Intensity of Exercise as tolerated

- GOALS:**
1. Brace D/C by 8 wks
 2. 0-130° ROM by 12 wks
 3. Normal Stair Ambulation by 12 wks

PHASE 5: Advanced Strengthening Phase (generally 12-22 wks)

AMBULATION: Promote NML gait out of functional brace in clinic

BRACE: Functional knee brace (prn - per Ortho)

EXERCISE: May progress to the following exercises when ready:
Retrowalking on the Treadmill/ Nordic Track/ Moderate Biking
Aggressive Stairmaster or Elliptical
Active HS Curls w/ Ankle Weights (low weight, high reps)
Plyoback training
Progressive Quad Strengthening (Leg Press/Knee Ext.)
Cone Hopping ≈ 16 wks
Aggressive Biking ≈ 16 wks
Active HS Curls (Low Weight, High Reps) ≈ 16 wks
Straight line Jogging (up to 50% speed on level terrain) ≈ 16 wks
Progress Intensity of Exercises as tolerated

ACTIVITIES: Phase II Aquatic Therapy: (Until appr. 16 weeks)
(**per P.T. Instruction;** see Aquatics Program)
Weightless jogging with water jog vest
Flutter Kick with knee at 0 degree
Treading water at ~ 8 wks
Kickboard swimming at ~ 8 wks
Pool Running, Shuffling, & Carioca (**More Advanced**)
Swimming (**More Advanced**)
Modified aquatic sports (**More Advanced**)
Phase I Return to Sport Rehab (at appr. 16 weeks)

GOALS: 1. *FAROM by 16 wks*
2. *No difficulty with Stairs / ADLs by 16-20 wks*

PHASE 6: Return to Activity Phase (generally 22-30 wks)

BRACE: Functional Brace Cutting/Sports Activities only

EXERCISES: Begin Skier's Edge or Slide Board
Progressive Quad Strengthening
Running
Carioca, Figure-8, Cutting, other Agility Drills (Begin slow & wide and progress as tolerated)
Active HS Curls (Unrestricted)
Phase II Return to Sport Rehab Program

6 MONTHS:

EVALUATION: KT2000
Girth
Posterior Drawer, Active Quadriceps @ 90°, Reverse Pivot Shift
Biodex Test (Complete)
Functional Testing

ACTIVITIES: Continue Rehab prn
Return to Sports per Ortho

- GOALS:** 1. *Return to Full Activity w/o Difficulty*
2. *Biodex \geq 90% contralateral side*
3. *Functional Testing \geq 90% contralateral side*
4. *Ability to pass the APFT*

12 MONTHS: (Annual evaluation through 3 years)

EVALUATION: KT2000
Girth
Posterior Drawer, Active Quadriceps @ 90°, Reverse Pivot Shift
Biodex Test (Complete)
Functional Testing

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APPROVE / DISAPPROVE

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