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## ACL RECONSTRUCTION (patellar tendon and hamstring graft) PROTOCOL

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<b><i>Preoperative</i></b>	<u>Goal</u>	<u>EXERCISE/METHODS</u>
<b>Phase 1</b>	Decrease swelling Restore terminal extension and flexion	CryoCuff with elevation (10-15 min) Extension: prone hangs or heel props (7-10/min) Flexion: wall slides, heel slides, active assist flxn
	Normalize gait	Weight bearing as tolerated Treadmill: forward/backward (5-10 min)
	Normalize strength	Closed chain: leg press, total gym (10-50 deg), toe raises Open chain: Quad & hamstring machine (90-30 deg) 4-way SLR. All exercises 3-5 sets, 12-15 reps Electrical stimulation for VMO PRN
	Maintain aerobic fitness	Low-impact activities (bike, treadmill walking)
	Home program	Ice/elevation: 20 min on/60 min off Passive extension/flexion activities Lower extremity strengthening as indicated All activities 3-4 times/day or as indicated
<b>Phase 2</b>	Control swelling	Ace wrap with elevation-ankle pumps (20 min)
<b><i>Postoperative</i></b>		
<b>Days 1-2</b>	Restore terminal extension & flexion to 90	Extension: heel props (7-10 min) Flexion: heel slides (7-10 min) *avoid pillow under knee: lock-out brace in extension*
	Normalize gait	Weight bearing as tolerated

	Increase strength	SLR, quad sets, glute sets, hamstring sets
	Home program upon D/C	As above 4-5 times/day
<b>Phase 3</b>	Control swelling	Ace wrap with elevation-ankle pumps (20 min)
<b>Postop</b>	Restore terminal extension & flexion to 110 deg	Extension: prone hangs or heel props (7-10 min) Flexion: wall slides, heel slides, active assist flexion
<b>Days 3-14</b>	Normalize gait	Weight bearing as tolerated Treadmill: forward/backward (5-10 min) Calf, hamstring, hip flexor stretching (3 times, 30 sec hold) *emphasize heel to toe gait*
	Increase strength	4-way SLR, quad sets, multi-angle isometrics (0-45-90 deg) Electrical muscle stimulation PRN (15 min) Partial squat (10-40 deg), toe raises with assistance PRN All exercises 3-5 sets, 12-15 reps Total Gym Level 1-3
	Home program	Ice/elevation: 20 min on/60 min off Passive extension/flexion activities Lower extremity strengthening as indicated All activities 3-4 times/day or as indicated *avoid pillow under knee: brace locked out in extension*
<b>Phase 4</b>	Control swelling	Ice PRN. Ace wrap or compression stockings PRN.
<b>Postoperative</b>		
<b>Weeks 2-5</b>	Full passive knee extension and flexion (0-125 by 4 wks)	Extension: prone hangs or heel props (7-10) Flexion: wall slides, heel slides, active assist flexion, bike (7-10 min)
	Normal ambulation	Treadmill: forward/backward (5-10 min) Increase grade with treadmill as tolerated Calf, hamstring, hip flexor stretching (3 times 30 sec hold)
	Pain-free strengthening	Closed chain: leg press (10-50), Total gym level (4-5) Push FROM without pain hamstring stretch, 4-way SLR, Toe raises, step ups, mini squats All exercises 3-5 sets, 12-15 reps

\*Implement within painfree ROM once normal gait and effusion control are achieved  
HS curls start at – 2 weeks for bone–patella–bone grafts and 4 weeks for HS grafts.

Initiate proprioception exercises (pain-free)

\*BAPS (start with ball 1 sitting and progress to standing - 3-4 min)  
\*Double leg stand with rebounder  
\*Single leg stance/grid exercises (lunges, reaches) with eyes open/eyes closed  
\*Standing 4-way hip theratubing exercises  
\*Lateral treadmill walking both directions  
\*Implement once patient is able to ambulate normally without pain (3-5 min)

**Phase 5** Criteria for progression to Phase 5:

**Postop** \*No effusion  
**Week 6-12** \*Minimal crepitus.  
\*Full, Painless ROM  
\*Lysholm Score greater than 80 with no locking or instability

Improve aerobic level of fitness

Painfree low impact activity (bike, treadmill walking, stepper on own)  
3-4 times per week, 20-30 minutes

Improve proprioception

Trampoline hopping bilaterally progressing To jogging, then single leg hopping (10 min)  
Fitter with ski poles progressing to no ski poles (7-10 minutes) BAPS – single leg  
Body blade Proprioceptive Star Exercises  
\*Week 10 – Light double leg hopping (multi-directional), lateral shuffles  
\*Only if all previous activities were completed without pain or increased swelling

Improve Strength

Total gym level 8-10 without pain, leg press (10-50), toe raises, step ups  
Hamstring machine, 4-way SLR  
All exercises 3-5 sets, 12-15 reps  
Mini squats, Partial lunges, single-leg toe raise

**Phase 6**  
**Postop**  
**Week 13-24**

Criteria for progression to Phase 6:  
\*no effusion, painless full ROM,  
\*minimal crepitus.  
\*Lysholm score > 90 with no locking  
or instability  
\*Ratio of 80% involved to uninvolved  
on isokinetic test at 6 months post-op  
\*Ratio of 80% on one-legged jump

Improve aerobic level of fitness  
(Usually 3-4 months)

Painfree low impact activity (bike, treadmill  
Walking, stepper on own) 3-4 times per  
Week, 20-30 minutes

Improve strength

Closed chain: leg press (10-50 deg), toe  
raises. Total gym level 8-10 without Pain.  
Open chain: Quad machine (90-30 deg),  
Hamstring machine  
All exercise's 3 sets 15-20 each

Implement running program

Walk/jog cycles  
3-5 min warm-up (walk)  
\*10-30 sec jog/60 sec walk for 10-20 min  
3-5 min cool-down (walk)  
\*increase jog time and decrease walk time  
based upon patient response.

Implement sport specific activity

\*Progression program of strength training  
And agility/speed drills  
\*Program should be based upon specific  
patient needs.



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