



Accelerated ACL Rehabilitation Guidelines

	1-2	3-4	5-6	7-8	9-12	4	5	6	7-12
Brace: immobilizer for patient comfort	Х	(X)							
Range of motion minimum goals: 0°-110° 0°-120° 0°-135°	X	x	X						
Weight bearing:									
1/2 body weight Full	Х	x							
Patella mobilization	Х	Х	Х						
Modalities: Electrical muscle stimulation Pain/edema management (cryotherapy)	X X	X X	X X	X	X	Х	X	X	X
Stretching:									
Hamstring, gastroc-soleus, iliotibial band, quadriceps	Х	Х	Х	Х	Х	Х	Х	Х	Х
Strengthening:									
Quadriceps isometrics, straight leg raises, active knee extension	Х	Х	Х	Х					
Closed-chain: gait retraining, toe raises, wall sits, mini-squats	Х	X	Х	Х	Х				
Knee flexion hamstring curls (90°)	Х	Х	Х	Х	Х	Х	Х	Х	Х
Knee extension quadriceps (90°-30°)	Х	Х	Х	Х	Х	Х	Х	Х	Х
Hip abduction-adduction, multi-hip Leg press (70°-10°)	X X								
Balance/proprioceptive training:									
Weight-shifting, cup walking, BBS BBS, BAPS, perturbation training, balance board, mini-trampoline	Х	Х	Х	X X	Х	Х	Х	Х	







Conditioning:									
UBC	Х	Х	Х						
Bike (stationary)		Х	Х	Х	Х	Х	Х	Х	Х
Aquatic program		Х	Х	Х	Х	Х	Х	Х	Х
Swimming (kicking)				Х	Х	Х	Х	Х	Х
Walking				Х	Х	Х	Х	Х	Х
Stair climbing machine			Х	Х	Х	Х	Х	Х	Х
Ski machine			Х	Х	Х	Х	Х	Х	Х
Elliptical machine				Х	Х	Х	Х	Х	Х
Running: straight					Х	Х	Х	Х	Х
Cutting: lateral carioca, figure-8's						Х	Х	Х	Х
Plyometric training						Х	Х	Х	Х
Full sports							Х	Х	Х

BAPS = Biomechanical Ankle Platform System (Camp, Jackson, MI), BBS = Biodex Balance System (Biodex Medical Systems, Inc, Shirley, NY), UBC = upper body cycle (Biodex Medical Systems, Inc, Shirley, NY).



Phase 1. Weeks 1-2

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General	50% weight bearing with 2 crutches when:	
Observation	- Postoperative pain controlled	
	- Hemarthrosis controlled	
	- Voluntary quadriceps contraction achieved	
Factors		Goals
Evaluated	Pain	Controlled
	Hemarthrosis	Mild
	Patellar mobility	Good
	Range of motion (minimum)	0°-110°
	Quadriceps contraction & patella migration	Good
	Soft tissue contracture	None
	Joint arthrometer (day 14)	< 3 mm
Frequency		Duration
3-4 x/day	Range of motion	Duration
10 minutes	Range of motion passive, 0° -90°	
10 minutes	Patella mobilization	
	Ankle pumps (plantar flexion with resistance band)	5 mana w 20 aaaa
	Hamstring, gastroc-soleus stretches	5 reps x 30 secs
2 w/day	Strongthoning	
3 x/day	Strengthening	2 4 10
15 minutes	Straight leg raises (flexion, extension, abduction, adduction)	3 sets x 10 reps
	Active quadriceps isometrics (full extension)	1 set x 10 reps
	Knee flexion (active, $0^{\circ}-90^{\circ}$)	3 sets x 10 reps
	Knee extension (active-assisted. 90°-30°)	3 sets x 10 reps
	Multi-hip machine (flexion, extension, abduction, adduction)	3 sets x 10 reps
	Leg press (70°-10°)	3 sets x 10 reps
	Closed-chain	3 sets x 20 reps
	- Mini-squats (0°-45°, 1/2 weight bearing)	
2 / 1		
3 x/day	Balance training	E (10
5 minutes	Weight shift side/side and forward/back	5 sets x 10 reps
1-2 x/day	A synchia conditioning	
5 minutes	Aerobic conditioning	
5 minutes	UBC	
As required	Modalities	
715 required	Electrical muscle stimulation	20 minutes
	Cryotherapy	20 minutes
Goals	Range of motion 0°-110°	20 mmates
Goals		
	Adequate quadriceps contraction	
	Control inflammation, effusion	
	50% weight bearing	



Phase 2. Weeks 3-4

	Full weight bearing with 1 crutch when:	1
General	- Pain controlled without narcotics - Effusion controlled	
Observation	- ROM 0°-100° - Muscle control throughout ROM	
	Pain	Goals
	Effusion	Mild
		Minimal
Evelvetion	Patellar mobility	Good
Evaluation	Range of motion minimum	0°-120°
	Muscle control	3/5
	Joint arthrometer (day 28)	< 3 mm
	Inflammatory response	None
	Dance of motion	Duration
Frequency	Range of motion	
3-4 x/day	Range of motion passive, 0°-120°	
10 minutes	Patella mobilization	
	Ankle pumps (plantar flexion with resistance band)	5 reps x 30 secs
	Hamstring, gastroc-soleus stretches	1
2-3 x/day	Strengthening	
20 minutes	Straight leg raises (flexion, extension, abduction, adduction)	3 sets x 10 reps
	Isometric training: multi-angle (90°, 60°, 30°)	1 set x 10 reps
	Heel raise/toe raise	3 sets x 10 reps
	Hamstring curls (active, 0°-90°)	3 sets x 10 reps
	Knee extension (active, 90°-30°)	3 sets x 10 reps
	Closed-chain	e sete in ro repe
	- Wall sits	5 reps
	- Mini-squats	3 sets x 20 reps
	Multi-hip machine (flexion, extension, abduction, adduction)	3 sets x 10 reps
	Leg press $(70^{\circ}-10^{\circ})$	3 sets x 10 reps
		5 5005 X 10 10p5
3 x/day	Balance training	5 sets x 10 reps
5 minutes	Weight shift side/side and forward/back	5 5005 X 10 10p5
5 minutes	Balance board/2 legged	
1-2 x/day	Cup walking	5 reps
5 minutes	Single leg stance (level surface)	5 1005
5 minutes		
2 x/day	Aerobic conditioning	
5 minutes	UBC	
5 minutes	Water walking	
	Stationary bicycling (patellofemoral precautions)	
	Modalities	
As required	Electrical muscle stimulation	20 minutes
2 is required	Cryotherapy	20 minutes
Goals	Range of motion 0°-125°	20 mmutes
50415	Muscle control	
	Arthrometer within 3 mm	
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Control inflammation, effusion	
100% weight bearing	

Phase 3. Weeks 5-6

General	Independent ambulation when:	
Observation	- Pain controlled - Effusion controlled	
	- ROM 0°-120° - Muscle control throughout ROM	
Evaluation		Goals
	Pain	No RSD
	Effusion	Minimal
	Patellar mobility	Good
	ROM	0°-135°
	Muscle control	4/5
	Inflammatory response	None
	Gait	Symmetrical
Frequency		Duration
3 x/day	Range of motion	Durution
10 minutes	Range of motion passive, 0°-135°	
10 11114005	Patella mobilization	
	Hamstring, gastroc-soleus stretches	5 reps x 30 secs
	Tunisting, gastice soleds stretches	5 10p5 x 50 5005
2 x/day	Strengthening	
20 minutes	Straight leg raises (ankle weight, not to exceed 10% of body weight)	3 sets x 10 reps
20 minutes	Straight leg raises, rubber tubing	3 sets x 10 reps
	Isometric training: multi-angle (90°, 60°, 30°)	2 sets x 10 reps
	Heel raise/toe raise	3 sets x 20 reps
	Hamstring curls (active, 0°-90°)	3 sets x 10 reps
	- , , ,	3 sets x 10 reps
	Knee extension with resistance (90°-30°) Closed-chain	5 sets x 10 leps
	- Wall sits	5 reps
		3 sets x 20 reps
	- Mini-squats	3 sets x 10 reps
	Multi-hip machine (flexion, extension, abduction, adduction) Les press $(70^{\circ}, 10^{\circ})$	3 sets x 10 reps
	Leg press (70°-10°)	5 sets x 10 leps
2 m/day	Delement territoria	
3 x/day 5 minutes	Balance training	
5 minutes	Balance board/2 legged	
	Lateral step-ups: 2-4"	
2 x/day	A makin and ition in a (matella ferre and manageric and	
2 x/day	Aerobic conditioning (patellofemoral precautions)	
10 minutes	UBC	
	Stationary bicycling	
	Water walking	
	Stair machine (low resistance, low stroke)	
	Ski machine (short stride, level, low resistance)	
	Elliptical (low resistance)	



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As required	Modalities	
-	Cryotherapy	20 minutes
Goals	Range of motion 0°-135°	
	Control inflammation, effusion	
	Muscle endurance	
	Recognition complications (motion loss, pain syndrome, increased AP	
	displacement)	
	Recognition patellofemoral changes	
	Full weight bearing, normal gait	

Phase 4. Weeks 7-8

General	No effusion, painless ROM, joint stability ROM 0°-135°	
Observation	Performs activities of daily living, Full weight	
	can walk 20 minutes without pain bearing	
Evaluation		Goals
	v Manual muscle test	4/5
	Hamstrings, quadriceps, hip abductors/adductors/flexors/extensors	
	v Swelling	None
	v Joint arthrometer (8 weeks)	< 3 mm
	v Patellar mobility	Good
	v Crepitus	None/slight
Frequency		Duration
2 x/day	Range of motion	
10 minutes	Hamstring, gastroc-soleus stretches	5 reps x 30 sees
2 x/day	Strengthening	
20 minutes	Straight leg raises, rubber tubing	3 sets x 30 reps
	Hamstring curls (active, 0°-90°)	3 sets x 10 reps
	Knee extension with resistance $(90^{\circ}-30^{\circ})$	3 sets x 10 reps
	Leg press $(70^{\circ}-10^{\circ})$	3 sets x 10 reps
	Multi-hip machine (flexion, extension, abduction, adduction)	3 sets x 10 reps
	Closed-chain	
	- Wall sits	5 reps
	- Mini-squats	3 sets x 20 reps
3 x/day	Balance training	
5 minutes	Balance board/2 legged	
	Single leg stance	
	Resistance band walking	
	Plyoback ball toss	
	Perturbation training	



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1-2 x/day	Aerobic conditioning (patellofemoral precautions)	
15-20	Stationary bicycling	
minutes	Water walking	
	Swimming (straight leg kicking)	
	Walking	
	Stair machine (low resistance, low stroke)	
	Ski machine (short stride, level, low resistance)	
	Elliptical machine (low resistance)	
As required	Modalities	
1	Cryotherapy	20 minutes
Goals	Increase strength and endurance	

Phase 5. Weeks 9-12

General	No effusion, painless ROM, joint stability ROM 0°-135°	
Observation	Performs activities of daily living, Full weight	
	can walk 20 minutes without pain bearing	
Evaluation		Goals
	v Manual muscle test	4/5
	Hamstrings, quadriceps, hip abductors/adductors/flexors/extensors	
	ν Isometric test (12 wks, mean avg torque/% deficit quads & hams)	30
	v Swelling	None
	v Joint arthrometer (12 weeks)	< 3 mm
	v Patellar mobility	Good
	v Crepitus	None/slight
Frequency		Duration
2 x/day	Range of motion	
10 minutes	Hamstring, gastroc-soleus, quad, ITB stretches	5 reps x 30 secs
2 x/day	Strengthening	
20 minutes	Straight leg raises, rubber tubing	3 sets x 30 reps
	Hamstring curls (active, 0°-90°)	3 sets x 10 reps
	Knee extension with resistance (90°-30°)	3 sets x 10 reps
	Leg press (70°-10°)	3 sets x 10 reps
		· · · · ·
	Multi-hip machine (flexion, extension, abduction, adduction)	3 sets x 10 reps
	Multi-hip machine (flexion, extension, abduction, adduction) Closed-chain	3 sets x 10 reps
		*
	Closed-chain	3 sets x 10 reps 5 reps 3 sets x 20 reps
	Closed-chain - Wall sits	5 reps



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3 x/day 5 minutes	Balance training Balance board/2 legged Single leg stance Resistance band walking Plyoback ball toss Perturbation training	
3 x/week	Aerobic conditioning (patellofemoral precautions)	
15 -20	Stationary bicycling	
minutes	Water walking	
	Swimming (kicking)	
	Walking	
	Stair machine (low resistance, low stroke)	
	Ski machine (short stride, level, low resistance)	
	Elliptical machine (low resistance)	
3 x/week	Running program (straight)	
10 minutes	Jog	1/4 mile
	Walk	1/8 mile
	Backward walk	20 yards
As required	Modalities	
*	Cryotherapy	20 minutes
Goals	Increase strength and endurance	

Phase 6. Weeks 13-26

General	No effusion, painless ROM, joint stability	
Observation	Performs activities of daily living, can walk 20 minutes without pain	
Evaluation	Isokinetic test (isometric + torque 300°/sec, % difference quads & hams, tested monthly) Swelling Joint arthrometer Patellar mobility Crepitus Single-leg function tests (hop distance, timed hop, % inv/uninv)	Goals 20-25% None 3 mm Good None/slight 75%
Frequency 2 x/day 10 minutes	Range of motion Hamstring, gastroc-soleus, quad, ITB stretches	Duration 5 reps x 30 secs



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1 x/day 20-30 minutes	Strengthening (patellofemoral precautions) Straight leg raises, rubber tubing (high speed) Hamstring curls (active, 0°-90°) Knee extension with resistance (90°-30°) Leg press (70°-10°) Multi-hip machine (flexion, extension, abduction, adduction)	3 sets x 30 reps 3 sets x 10 reps
3 x/day	Balance training	
5 minutes	Balance board/2 legged Single leg	
-	Single leg stance Unstable platform	
3 x/week	Aerobic conditioning (patellofemoral precautions)	
20-30	Stationary bicycling	
minutes	Water walking	
	Swimming (kicking)	
	Walking	
	Stair machine (low resistance, low stroke)	
	Ski machine (short stride, level, low resistance)	
	Elliptical machine (low resistance)	
3 x/week	Running program (straight)	
15-20	Jog (progression of speed: 1/2, 3/4, full)	1/4 – 1 mile
minutes	Walk	1/4 = 1 mile $1/8$ mile
	Backward run	20 yards
		20 yards
3 x/week	Cutting program – lateral, carioca, figure 8's	20 yards
		20 Julio
3 x/week	Functional training	
	Plyometric training: box hops, level, double-leg	15 secs,
	Sport specific drills	4-6 sets
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As required	Modalities	
	Cryotherapy	20 minutes
Goals	Increase strength and endurance	



Phase 7. Weeks 27-52

General	No effusion, painless ROM, joint stability	
Observation	Performs ADL, can walk 20 minutes without pain	
Evaluation	Isokinetic test (torque at 180°/sec & 300°/sec, % difference quads &	Goals
	hams, tested quarterly; isometric if symptomatic PF joint	
	Swelling	None
	Joint arthrometer Patellar mobility	< 3 mm Good
	Crepitus	None/slight
	Single-leg function test (hop distance, timed hop, % inv/uninv)	85
Frequency		Duration
2 x/day	Range of motion	Durution
10 minutes	Hamstring, gastroc-soleus, quad, ITB stretches	5 reps x 30 secs
3-4 x/week	Strengthening (patellofemoral precautions)	
20-30 minutes	Straight leg raises, rubber tubing (high speed) Hamstring curls (active, $0^{\circ}-90^{\circ}$)	3 sets x 30 reps
	Knee extension with resistance (90°-30°) Leg press (70°-10°)	1-2 sets x8-12 reps
	Multi-hip machine (flexion, extension, abduction, adduction)	
3 x/day	Balance training	
5 minutes	Balance board/2 legged \rightarrow Single leg Single leg stance - unstable platform w/secondary activity	
3 x/week 20-30 minutes	Aerobic conditioning (patellofemoral precautions) Stationary bicycling Water walking	
	Swimming (kicking) Walking	
	Stair machine (low resistance, low stroke)	
	Ski machine (short stride, level, low resistance) Elliptical (low resistance)	
3 x/week 20 minutes	Running program (straight) Interval training (20, 40, 60, 100 yards) Walk/rest phase (3:1 rest: work)	
	Backward run	20 yards
3 x/week	Cutting program – lateral, carioca, figure 8's	20 yards
3 x/week	Functional training Plyometric training: box hops, level, double-leg Sport specific drills	15 secs, 4-6 sets
As required	Modalities	20 minutes
	Cryotherapy	

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Goals	Increase function, strength, endurance	
	Return to previous activity level	

