

## **Effective ACL Rehabilitation with Fitter**

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## Effective ACL Rehabilitation with Fitter

by Cindy Merrick M.S.P.T. and Lisa Lehman, S.P.T.

Active participation in an effective rehabilitation program following and ACL reconstruction is crucial to the functional outcome of the lower extremity. Treatment protocols must be specifically designed for patients based upon their pre- and post-operative state. A successful rehabilitation program helps the patient achieve full motion, early weight bearing, appropriate patellar tracking and strength gains of the VMO and posterior knee musculature. Improving coordination, agility, balance and endurance will also aid in the return to full participation in pain-free activities.

This article presents a Fitter rehabilitation protocol specifically designed for the patient following ACL reconstruction. This program, based on recent research and clinical experiences, is designed to incorporate techniques for ROM and strength while preserving the stability of the knee joint.

Use of the Fitter can easily accommodate the needs of a post surgical ACL individual. By adjusting the tension, one can vary the required muscle contraction. The tension ranges from 0 (passive) to 4 (maximum resistance).

This variable becomes significant during the progressive states of the rehabilitation program. Passive, isometric and isotonic exercises can all be performed on the Fitter.

All major muscle groups surrounding the knee can be strengthened with the Fitter. It provides unique techniques to actively strengthen the posterior musculature of the knee, important in preventing anterior excursion of the tibia. By emphasizing closed kinematic chain activities, the Fitter also places a functional stress on the lower extremity in ways similar to weight-bearing activities. Thus, the Fitter provides inherent joint stability and a strenuous workout without the sheering forces seen in most open chain activities. By carefully selecting proper foot position while exercising, the Fitter can also emphasize appropriate patellar tracking by recognizing the VMO and lateral stabilizers.

It is, however, the clinician's responsibility to recognize the signs and symptoms of an exercise inappropriate for a specific individual. The chart below progressively outlines several ACL rehabilitation exercises using the Fitter.

## Effective ACL Rehabilitation with Fitter

**Developed by Cindy Merrick and Lisa Lehman of Therapy in Motion in conjunction with the University of Oklahoma**

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Days 1-7	Weeks 2-3	Weeks 4-5	Weeks 6-12	Mos. 3-4

### 1. Heel Slides



## 1. Heel Slides



Sit in chair. Place uninvolved foot on platform with involved foot resting on top. The uninvolved leg performs the active movement passively taking the involved leg through the available ROM

Tension:	Tension:
0	0
ROM:	ROM:
0-90	5 -110
Time:	Time:
5-10 mins	5-10 mins

*Rationale:* restore ROM, prevent adhesions

## 2. Wall Leg Press



Sit on platform. Place feet on wall with knees bent at 20. Push into the wall with the feet maintaining the bent knee position.

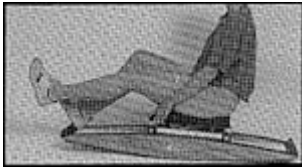
Tension:	Tension:	Single Leg	Single Leg	Single Leg
2-3	2-3	Tension: 4	Tension: 4	Tension: 4
Reps:	Reps	Reps:	Reps:	Reps:
10-20	15-25	10-20	15-25	15-25
Sets:	Sets:	Sets:	Sets:	Sets:
3-4	3-4	3-4	4-5	3-4

*Rationale:* increase gastrocnemius & soleus strength, promote poster knee stability, improve venus return & decrease edema.

Hold each rep 5-10 seconds, Keep knee bent at 30°

Hold each rep 5-10 seconds, Keep knee bent at 30°

### 3. Quad/ Hamstring Co-Contractions



Sit on platform, placing uninvolved leg on edge. Lift involved leg six inches and hold. Slowly push into Fitter with uninvolved lower extremity, holding involved lower extremity in air.

*Rationale:* co-activates quads & hamstrings, increases hip flexor stability, provides sensory motor input from uninvolved leg contractions.

Tension:	Tension:
2-3	2-3
Reps:	Reps:
10-20	15-25
Sets: 3-4	Sets:
	3-4

Keep knee bent at 30°

### 4. Hamstring Strengthening



Sit in chair. Place foot on far edge of platform. Bend knee in attempt to pull foot to chair.

*Rationale:* increase hamstring strength, improve posterior stability

Tension:	4	ROM:	0-105	ROM:	0-120	ROM:	0-130
Isometrics							
ROM:	0-90	Tension:	2	Tension:	2-3	Tension:	3
Tension:	1-2	Reps:	10-15	Reps: 15	Reps: 15	Reps: 15	Reps: 15
Reps: 10		Sets:	3-5	Sets: 3-5	Sets: 3-5	Sets: 3-5	Sets: 3-5
Sets: 3							

*Rationale:* increase hamstring strength, improve posterior stability of knee.

Sets: 3

## 5. Reverse Action Hamstrings



Sit on platform with edge of seat placed on far edge of Fitter. Pull buttocks to feet.

*Rationale:* increase hamstring strength, contract hamstring in reverse action.

Double Leg Tension: 1-2	Single Leg Tension: 1-2	Single Leg Tension: 2-3	Increase Tension
Reps: 10	Reps: 10	Reps: 10	Increase Reps
Sets: 3-4	Sets: 3-4	Sets: 3-4	Increase Sets

## 6. Quad Strengthening



Sit on chair placing foot on platform. Press foot into Fitter to straighten the leg.

*Rationale:* increase quad strength, can promote appropriate patellar tracking and provide close kinematic chain rehabilitation.

Tension: 4	ROM: 90-30	ROM: 90-20	ROM: 90-10	ROM: 90-0
Isometrics ROM: 90-49	Tension: 2	Tension: 2-3	Tension: 3-4	Increase Benison
Tension: 1-2	Reps: 10	Reps: 15	Reps: 15	Increase Reps
Reps: 10	Sets: 3-4	Sets: 3-5	Sets: 3-5	Increase Sets
Sets: 3				

rehabilitation.

## 7. Sitting Leg Press



Sit on platform with feet placed on edge of Fitter. Straighten legs to move platform away from the Fitter.

*Rationale:* increase quad strength, provide close kinematic chain rehabilitation.

Double Leg	Single Leg	Single Leg	Increase
Tension: 2-3	Tension: 20-3	Tension: 3-4	Tension
Reps: 10	Reps: 10-12	Reps: 12-15	Reps
Sets: 3-4	Sets: 3-5	Sets: 3-5	Sets
ROM: 90-30	ROM: 90-20	ROM: 90-10	ROM: 0-10

## 8. Hip Extension



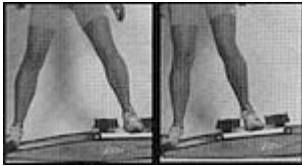
Stand on edge with back towards platform, weight on uninvolved leg. Bend involved knee & place bottom of foot on edge of platform (could be performed with involved leg as weight bearing pillow).

*Rationale:* increase glutea strength, provides co-contraction efforts.

Double Leg	Single Leg	Single Leg	Increase
Tension: 1	Tension: 2-3	Tension: 3-4	Tension
Reps: 10	Reps: 10-12	Reps: 12-15	Reps
Sets: 3-4	Sets: 3-4	Sets: 3-5	Sets
ROM: 90-30	ROM: 90-20	ROM: 90-10	ROM: 90-0

co-contraction efforts.

### 9 & 10. Hip Adduction/Abduction



Stand with uninvolved leg on end of Fitter. Place involved foot between foot plates and pull involved leg towards body.

Tension:	Tension:
1	1/2-3
Reps:	Reps:
10-20	10-22
Sets:	Sets:
3	3-4

*Rationale:* increase adductor/abductor strength, initiate VMO strengthening.

### 11. Single Leg Mini-Squats



Stand with involved leg on platform and uninvolved leg off to side. Slowly flex involved leg and hold at 30°.

Tension:	Tension:	Tension:
4	4	4
Reps:	No poles	Increase Weights
8-10		
Sets:	Add handheld dumbbell weights	Increase Reps
3-4		
Use poles		Increase Sets

*Rationale:* increase eccentric quad strength, provide closed kinematic, chain rehabilitation.

chain rehabilitation.

## 12. Step Ups/Downs



Slowly step up and down from platform. Secure platform stability by setting tension at 4. Stepping may be in lateral & forward fashion.

*Rationale:* provides eccentric quad strengthening.

Emphasize step downs	Step up & down		
	No poles		
Use poles & uninvolved leg to push up	Add hand weights	Increase Weights	
	Tension: 4	Increase Reps	
	Reps: 10	Increase Sets	
	Sets: 3-5		

## 13. Balance Activity



Stand on platform with weight on involved extremity, poles in each hand. Maintain balance as long as possible. Progress to balancing with eyes closed, balancing while foot in plate, balancing without poles.

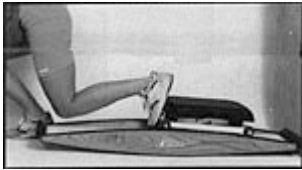
*Rationale:* improve proprioceptive input

Tension: 4	Tension: 4	Tension: 4	Tension: 4
Use poles	Use poles	Use poles	Use poles
Eyes open	Eyes closed	Eyes open	Eyes closed
		Foot in plate	Foot in plate



*rationale:* improve proprioceptive input

## 14. Runner's Lunge



Assume runner's start position with hands on floor. Place involved foot against platform and press back into platform to achieve contraction of heop extensors, hamstrings, quads & calf muscles.

*Rationale:* increase strength of major leg muscles, improve endurance.

Tension: 1-2	Tension: 2-3	Tension: 3-4	Increase tension
Reps: 10-15	Reps: 10-15	Reps: 10-15	Increase reps
Sets: 3-4	Sets: 3-4	Sets: 3-4	Increase sets
ROM: 90-40	ROM: 90-30	ROM: 90-10	ROM: 90-0

## 15. Lateral Shifts



Place feet in footpads. Perform small side-to-side movements using poles for stability. Progress by increasing ROM and not using poles.

*Rationale:* improve balance & motor coordination.

Use poles	Full range Tension 3-4
Short range Tension: 2-3	Reps: 15-25
Reps: 10-15	Sets: 3-5
Sets: 3-5	

*Rationale:* improve  
balance & motor  
coordination.

## 16. Front to Back Shifts



Stand on platform.  
Face the end with  
uninvolved foot in  
front of involved foot.  
Slowly move platform  
in a front to back  
fashion. Keep knees  
bent, use poles for  
support, progress to  
positioning feet  
side-by-side or with  
involved foot in front.

*Rationale:* improve  
balance,  
proprioception,  
coordination & weight  
shifts.

Use poles	Use poles	Use poles
Foot in back	Side by side	Foot in front
Tension: 1-2	Tension: 3	Tension: 3-4
Reps: 15-20	Reps: 15-20	Reps: 20-30
Sets: 3-5	Sets: 3-5	Sets: 3-5