

Home-based exercise program ≥12 weeks following ACL reconstitution

Inspired by the FIFA 11+ Injury prevention program

Introduction

This home-based program is suited for rehabilitation at least 12 weeks following an ACL reconstruction. It is designed to provide you with exercises you can do at home that will help with the recovery of your knee in the later stages of rehabilitation and prevent re-injury. The development of this exercise program was inspired by the *FIFA 11+ Injury prevention program*, and adapted so that it can be done individually at home or in a gym. This program consists of 3 parts: warm up; strength, plyometrics and balance exercises; and agility exercises. Together these 3 parts addresses the key elements of effective injury prevention such as flexibility, core strength, neuromuscular control, balance, eccentric training of the hamstrings, plyometric and agility.

What is FIFA 11+?

The *FIFA 11+ Injury prevention program* is a complete warm-up program that was developed by an international group of experts to reduce injuries among male and female soccer players aged 14 years and older. This warm-up program contains 3 distinct parts with a total of 15 exercises. The first part includes jogging, active stretching and partner contacts, the second contains strength, plyometrics and balance exercises and the final part includes running at higher speed, bounding and changes of direction. The effectiveness of the *FIFA 11+ program* to reduce the risk of injury has been proven in a scientific study conducted in Norway¹ and could therefore be a good model on which to base an ACL re-injury prevention program. For more information about the *FIFA 11+*, visit <http://f-marc.com/11plus/home/>.

General considerations

In order to achieve your rehabilitation and re-injury prevention goals, a key point in this program is to use the proper technique during all of the exercises. Pay full attention to correct posture and good body control, including straight leg alignment (see image below), knee-over-toe position and soft landings.



¹ Soligard, T., Myklebust, G., Steffen, K., Holme, I., Silvers, H., Bizzini, M., Junge, A., Dvorak, J., Bahr, R. & T.E. Andersen (2008). Comprehensive warm-up programme to prevent injuries in young female footballers: cluster randomised controlled trial, *BMJ*; 337; a2469, p. 1-9.

Exercise program

Part 1: Warm up

1. Aerobic exercise

- Exercise: Perform 5-10 minutes of low-intensity aerobic exercise such as walking, jogging, stationary bike or elliptical trainer.
- Important: Your hips, knees and feet should be aligned. Do not let your knees buckle inwards.

2. Sideways Hip Movement



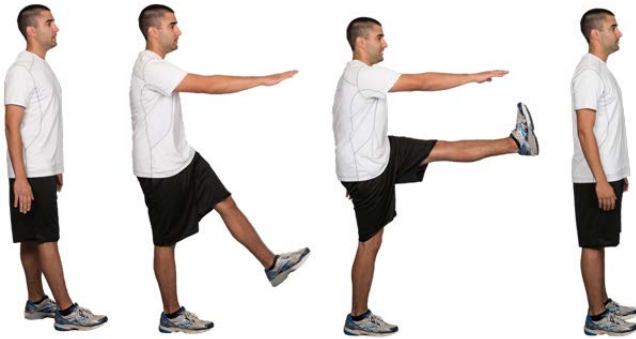
- Starting position: Stand with feet hip-width apart, hands on your hips.
- Exercise: Raise the knee in front of you, move the leg sideways and bring it back in front and return to starting position. Alternate legs. 7-10 repetitions for each leg.
- Important: Make sure that you keep your pelvis horizontal and your core still. The hip, knee and foot of the supporting leg should be aligned. Do not let the knee of the supporting leg buckle inwards.

3. Quad dynamic stretch



- Starting position: Stand with feet hip-width apart.
- Exercise: Grab the ankle of one leg with the same side hand. Keeping your chest tall, bend over at the waist and touch the ground with the opposite hand. Return to standing then return the foot to the ground. Repeat alternating sides. 7-10 repetitions for each leg.
- Important: The hip, knee and foot of the supporting leg should be aligned. Do not let the knee of the supporting leg buckle inwards.

4. Hamstrings dynamic stretch



- **Starting position:** Stand with feet hip-width apart. With one hand, hold on to a stable object such as a counter or the back of a chair.
- **Exercise:** Kick the leg that's closer to the object up in the air to a comfortable height while keeping it extended and trying to touch the toe with the opposite hand. 7-10 repetitions for each leg.
- **Important:** Make sure that you keep your pelvis horizontal and your core still. The hip, knee and foot of the supporting leg should be aligned. Do not let the knee of the supporting leg buckle inwards.

Part 2: Strength, plyometrics and balance

** Each exercise has 3 levels of increasing difficulty. Patients should begin with level 1. Only when an exercise can be performed without difficulty for the specified duration and number of repetitions should the patient progress to the next level of this exercise.*

1. The plank

1.1 Static



- **Starting position:** Lie on your front, support upper body with forearms. Elbows directly under shoulders.
- **Exercise:** Lift upper body, pelvis and legs up until your body is in a straight line from head to foot. Pull in stomach and gluteal muscles and hold the position for 20-30 sec. 3 sets.
- **Important:** Do not sway or arch your back. Do not move your buttocks upwards.

1.2 Alternate legs



- Starting position: Lie on your front, support upper body with forearms. Elbows directly under shoulders.
- Exercise: Lift upper body, pelvis and legs up until your body is in a straight line from head to foot. Pull in stomach and gluteal muscles. Lift each leg in turn, holding for a count of 2 sec. Continue for 40-60 sec. 3 sets.
- Important: Do not sway or arch your back. Do not move your buttocks upwards. Keep pelvis stable and do not let it tilt to the side

1.3 One leg lift and hold



- Starting position: Lie on your front, support upper body with forearms. Elbows directly under your shoulders.
- Exercise: Lift upper body, pelvis and legs up until your body is in a straight line. Pull in stomach and gluteal muscles. Lift one leg about 10-15cm off the ground and hold the position for 20-30 sec. Repeat with other leg. 3 sets.
- Important: Do not sway or arch your back. Do not move your buttocks upwards. Keep pelvis is stable and do not let it tilt to the side

2. Sideways plank

2.1 Static



- **Starting position:** Lie on your side with the knee of lower- most leg bent to 90 degrees, support yourself on forearm and lowermost leg. Elbow of supporting arm directly under shoulder.
- **Exercise:** Lift pelvis and uppermost leg until they form a straight line with your shoulder and hold the position for 20-30 sec. Repeat on other side. 3 sets.
- **Important:** Keep pelvis stable and do not let it tilt downwards. Do not tilt shoulders, pelvis or leg forwards or backwards.

2.2 Raise and lower hip



- **Starting position:** Lie on your side with both legs straight, support yourself on forearm. Elbow of supporting arm directly under shoulder.
- **Exercise:** Raise pelvis and legs until your body forms a straight line from the uppermost shoulder to the uppermost foot. Lower hips to the ground and raise them back up again. Continue for 20-30 sec. Repeat on other side. 3 sets.
- **Important:** Do not tilt shoulders or pelvis forwards or backwards. Do not rest head on your shoulder.

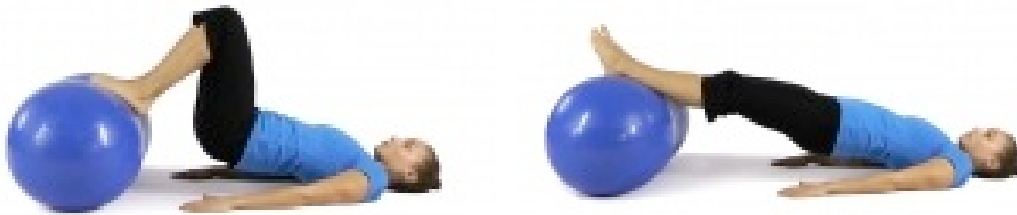
2.3 With leg lift



- **Starting position:** Lie on your side with both legs straight, support yourself on forearm and lower leg. Elbow of supporting arm directly under shoulder.
- **Exercise:** Raise pelvis and legs until your body forms a straight line from the uppermost shoulder to the uppermost foot. Lift uppermost leg up and slowly lower it down again. Continue for 20-30 sec. Repeat on other side. 3 sets.
- **Important:** Keep pelvis stable and do not let it tilt downwards. Do not tilt shoulders or pelvis forwards or backwards.

3. Eccentric hamstrings with swiss ball

3.1 Beginner (double leg)



- **Starting position:** Lie supine with your heels on a swiss ball.
- **Exercise:** Pull the ball toward you without any resistance. Lift the hips off the floor. Extend the knees to return the ball to the starting position. Lower your hips back down to the floor. 10-15 repetitions.
- **Important:** Keep pelvis stable.

3.2 Intermediate (single leg)



- Starting position: Lie supine with your heels on a swiss ball.
- Exercise: Pull the ball toward you without any resistance. Lift the hips off the floor and lift one leg off the ball. Extend the knee of the leg that is on the ball to return the ball to the starting position. Lower your hips back down to the floor. 5-10 repetitions.
- Important: Keep pelvis stable.

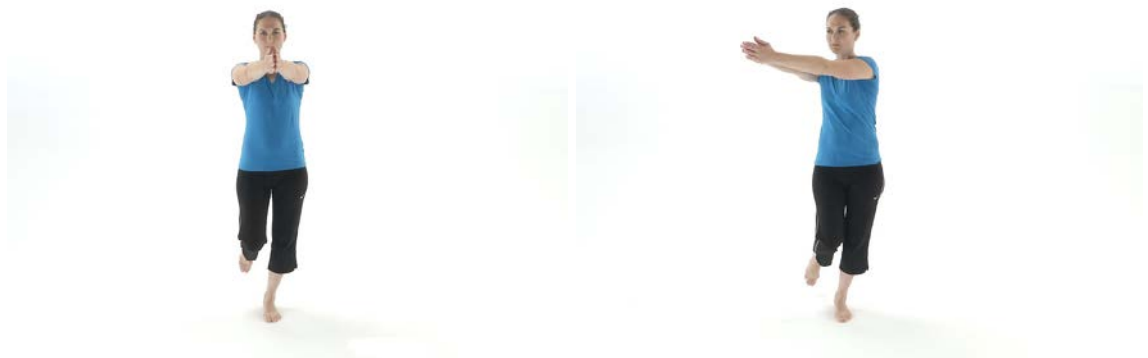
3.3 Advanced (single leg, more repetitions)



- Starting position: Lie supine with your heels on a swiss ball.
- Exercise: Pull the ball toward you without any resistance. Lift the hips off the floor and lift one leg off the ball. Extend the knee of the leg that is on the ball to return the ball to the starting position. Lower your hips back down to the floor 12-15 repetitions.
- Important: Keep pelvis stable.

4. Single leg stance

4.1 Trunk rotation



- **Starting position:** Stand on one leg, knee and hip slightly bend and both arms extended in front of you, hands together.
- **Exercise:** Rotate the trunk to each side while keeping your balance and the body stable. The faster you do the movement the harder the exercise will be. Continue for 30 sec. 2 sets on each leg.
- **Important:** Do not let your knee buckle inwards. Keep pelvis horizontal and do not let it tilt to the side.

4.2 Throwing and catching a ball



- **Starting position:** Stand on one leg facing a wall and holding a ball in your hands.
- **Exercise:** Throw the ball on the wall and catch it using either both hands, the throwing hand or the opposite hand. Try to keep your balance during the entire exercise. If you lose your balance, steady yourself with the opposite foot then continue the exercise. Continue for 30 sec. 2 sets on each leg.
- **Important:** Do not let your knee buckle inwards. Keep pelvis horizontal and do not let it tilt to the side.

4.3 Throwing and catching a ball standing on a pillow



- Starting position: Stand on one leg on a balance disk or pillow facing a wall and holding a ball in your hands.
- Exercise: Throw the ball on the wall and catch it using either both hands, the throwing hand or the opposite hand. Try to keep your balance during the entire exercise. If you lose your balance, steady yourself with the opposite foot then continue the exercise. Continue for 30 sec. 2 sets on each leg.
- Important: Do not let your knee buckle inwards. Keep pelvis horizontal and do not let it tilt to the side.

5. Squats

5.1. With heel raise



- Starting position: Stand with feet hip-width apart, hands on your hips.
- Exercise: Slowly bend hips, knees and ankles until your knees are flexed to 90 degrees. Lean upper body forwards. Then straighten upper body, hips and knees, and stand up on your toes. Repeat for 30 sec. 2 sets.
- Important: Do not let your knee buckle inwards. Lean upper body forward with a straight back.

5.2. Lunge



- **Starting position:** Stand with feet hip-wide apart, hands on your hips.
- **Exercise:** Lunge forward slowly at an even pace. Bend hips and knees slowly until your leading knee is flexed to 90 degrees. The bent knee should not extend beyond the toes. Push through the heel and return to the standing position. 10 lunges on each leg. 2 sets.
- **Important:** Do not let your knee buckle inwards. Keep upper body straight and pelvis horizontal.

5.3. One leg squat



- **Starting position:** Stand on one leg with your foot facing forward.
- **Exercise:** Slowly bend your knee, if possible until it is flexed to 90 degrees, and straighten up again. Repeat on the other leg. 10 squats on each leg. 2 sets.
- **Important:** Do not let your knee buckle inwards, keep the knee cap aligned with the second toe. Keep upper body facing forward and pelvis horizontal.

6. Jumping

6.1 Vertical jumps



- Starting position: Stand with your feet hip-width apart.
- Exercise: Slowly bend hips, knees and ankles until your knees are flexed to 90 degrees. Lean upper body forwards. Hold this position for 1 sec. then jump as high as you can, and straighten whole body. Land softly on the balls of your feet. Repeat for 30 sec. 2 sets.
- Important: Jump off both feet. Land gently on the balls of both feet with your knees bent.

6.2 Lateral jumps



- Starting position: Stand on one leg. Bend hips, knee and ankle slightly and lean upper body forwards.
- Exercise: Jump from your supporting leg approximately 1m to the side onto the other leg. Land gently on the ball of your foot and bend your hips, knee and ankle. Hold this position for about a second and then jump on the other leg. Repeat for 30 sec. 2 sets.
- Important: Do not let your knee buckle inwards. Keep upper body stable and facing forward and pelvis horizontal.

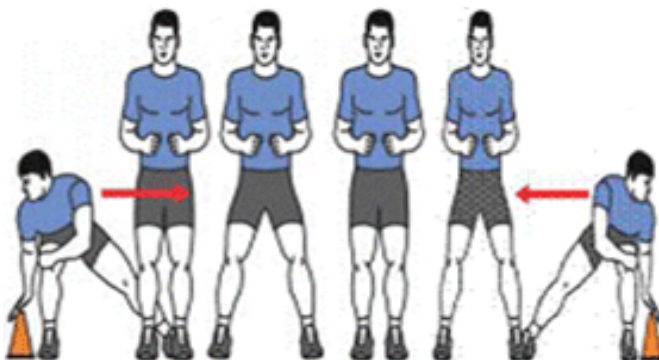
6.3 Jumping in varied directions



- Starting position: Stand with feet hip-width apart, imagine a cross you are standing in the middle of.
- Exercise: Jump with both legs forwards and backwards, from side to side, and diagonally across the cross. Keep upper body slightly leaned forwards. Jump as quickly and explosively as possible. Repeat for 30 sec. 2 sets.
- Important: Land softly on the balls of both feet. Bend hips, knees and ankles on landing. Do not let your knee buckle inwards.

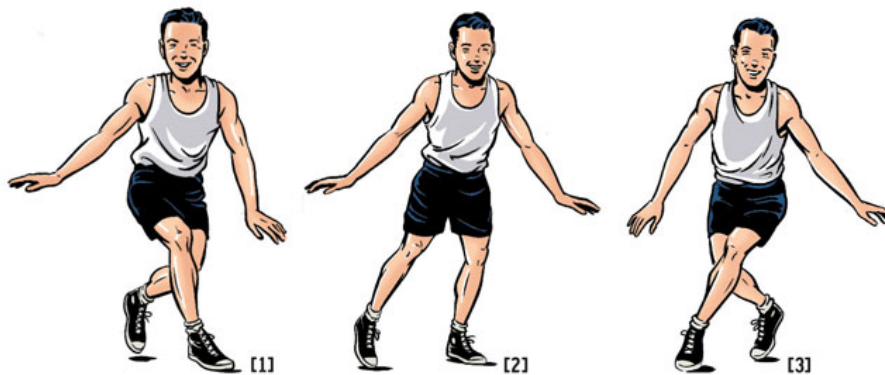
Part 3: Agility

1. Side shuffle



- Starting position: Set 2 objects (ex.: cones or water bottles) 8-12 feet apart from each other. Stand just beside one of the objects.
- Exercise: Shuffle from side-to-side in a straight line between the two objects. At each end, lean down and touch the object with your hand before standing up and shuffling to the other side. Complete as many lengths as possible in 20-30 seconds. 2 sets.
- Important: Keep the knee aligned with the foot, do not let your knees buckle inwards.

2. Grapevine



- Starting position: Start with your legs uncrossed, with your feet apart.
- Exercise: Run sideways while crossing one leg in front of the other, bring the other leg out to the side, then bring the first leg behind the other and the front leg out to the side. Stop and repeat on the other side. Continue for 20-30 sec. 2 sets.
- Important: Do not let your knees buckle inwards.

3. Forward/ backward jogging steps



- Exercise: Run 4 to 6 steps forward. Stop and push backward off your operated leg. Run 4 to 6 steps backward. Stop and push forward off your operated leg. Repeat for 20-30 sec. 2 sets.
- Important: Keep the knee aligned with the foot, do not let your knees buckle inwards.

*This exercise program was developed and written by
Corinne Desgagné
Physiotherapy 2nd year student at the University of Ottawa
August 2015*