

ValleyOrtho ACL Recovery Guide

Keep Your Rehabilitation On Track!

This program will highlight some key exercises and activity progressions to help you reach your goals and perform at your best for your upcoming return to full activity test. These activity recommendations are based on the American College of Sports Medicine guidelines for cardiovascular and resistance strength training.

Recovery for 12 Weeks & Beyond

Cardio Training Guidelines

Goal:

- Safely and gradually return to pre-injury level of cardiovascular conditioning.

Training Intensity:

Moderate Intensity = Elevated breathing and sweating but can still hold a conversation.

Vigorous Intensity = Breathing hard with a definite feeling of fatigue. Cannot hold a conversation during this level of activity.

Before Passing Return to Run Test:

- Non-running cardio: stationary bike, stair master, hiking and elliptical.
- Target: moderate intensity, 150 total minutes per week, via training 5x/week.

After Passing Return to Run Test:

- See page 3 for VVH Return to Run Program description.
- For non-running cardio, each week increase the training time by 5-10 minutes if no pain or swelling occurs.
- Target: vigorous intensity, start at 75 total minutes per week, via training 3-5x/week.

Strength Training Guidelines

Goal:

- Safely and gradually return knee to pre-injury level of strength and control.
- Training every other day (3-4x/week).

Before Passing Return to Run Test:

- Plyometrics with proper knee control:
 - ~ Double leg with full bodyweight.
 - ~ Single leg with reduced bodyweight.
- Total lower extremity strengthening.
- 12-15 reps/set. Use a weight that makes it difficult to complete the final 2 reps of each set with full motion and without pain. Perform 2-4 sets per activity, rest 1 minute between sets of the same muscle.

After Passing Return to Run Test:

- Progressive single leg strengthening.
- Controlled single leg plyometric progressions.
- 8-10 reps/set. Use a weight that you can hardly complete the final 2 reps of each set with full motion and without pain. Perform 1-3 sets per activity, rest 2 minutes between sets of the same muscle.

Sport Training Guidelines

Goal:

- Safely and gradually return to your activities at your pre-injury level.

Before Passing Return to Run Test:







- Stepping ladder drill training (excludes single leg jumping) at <50% intensity with controlled and steady progressions with proper knee control (see pages 2+6).

After Passing Return to Run Test:

- High level single leg balance training with and without gentle perturbations.
- Ladder drills including single leg progressions within proper knee control.
- Start with controlled progressions of non-contact and undefended sport specific drills/patterns at 50% intensity.
 - Contact and defended activities only after clearing ValleyOrtho PASS Program with a Physical Therapist (PT) and clearance from your physician.
 - Progress drill intensity % slowly. See page 7 for a more descriptive process.

If you experience pain with any part of your training program: 1. Decrease the activity's intensity, speed, and/or resistance to avoid the pain. 2. If in 2 weeks of modifying activity you are unable to return to training progressions without an increase in pain please contact your physician for help.

PROPER KNEE CONTROL: Training Tips & Tricks

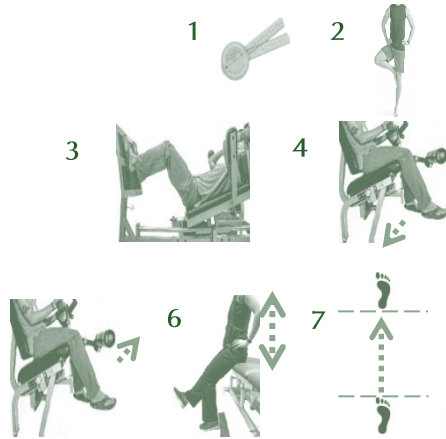
POSITIONS TO AVOID WITH ALL EXERCISE & ACTIVITY	POSSIBLE FACTORS	POSSIBLE FIXES
<p>Knee Valgus</p> 	<ol style="list-style-type: none"> 1. Poor hip control can cause the upper leg to rotate inward. This rotation puts strain on the ACL graft. 2. Poor arch control can cause pronation at the ankle that rotates the lower leg and knee inward. This puts strain on the ACL graft. 	<ol style="list-style-type: none"> 1. Increased hip abduction and hip external rotation strength can help support the upper leg from rotating inward. 2. Increased arch support through balance training, strengthening and/or improved footwear, with or without orthotics, can decrease the amount of rotation of the lower leg. 
<p>Knee Hyperextension</p> 	<ol style="list-style-type: none"> 1. Poor quad/hamstring strength can lead to landing with a straight rigid knee, with more likelihood of a hyperextension incident. 	<ol style="list-style-type: none"> 1. Increased single leg squat and/or reduced weight jumping / landing practice can help train the knee to land in a soft and controlled way. 

CARDIOVASCULAR TRAINING: VVH Return to Run

Phase 1: Pass VVH Return to Running Test with PT

All percentages are a comparison of a 1 repetition max isometric test of your injured leg to the uninjured leg.

1. Knee motion: $\leq 0^\circ$ EXT and flexion to 95%
2. Stork test $\geq 70\%$
3. Isometric leg press $\geq 70\%$
4. Isometric HS $\geq 70\%$
5. Isometric Quad $\geq 70\%$
6. Timed Single Leg Squat Test $\geq 70\%$
7. Single leg hop test $\geq 70\%$



Phase 2: Walk / Jog Progressions Every Other Day

Progress to next level: If you are pain free at the current level, and have no discomfort or swelling later that day, or the following day.

	Fast Walk	Easy Jog	Repetitions	Total Time
Level 1:	5 Minutes	1 Minute	5 Times	30 Minutes
Level 2:	4 Minutes	2 Minute	5 Times	30 Minutes
Level 3:	3 Minutes	3 Minute	5 Times	30 Minutes
Level 4:	2 Minutes	4 Minute	5 Times	30 Minutes
Level 5:	1 Minutes	5 Minute	5 Times	30 Minutes
Level 6:	30 minutes of continuous jogging			

Phase 3: Athletic Progression Tips

This section is for those athletes with activity demands that are greater than a 30 minute jog for general health maintenance.

- Going Beyond Phase 2:
 - Increase running volume less than 10% in your weekly distance and/or time each week to minimize irritation.
 - Try increasing how hard and fast you are running before you increase your total running time.
 - If you want to increase the number of days you are running each week, decrease the total running time on each running day to avoid overuse symptoms.

Recognizing When to Slow Down Your Program

Catching early signs of irritation, and adjusting your training, will keep your program moving forward as quickly as possible.

- If you notice knee joint pain and/or swelling with program:
 - Immediately increase the days of rest between training.
 - Decrease to the level of training before you had symptoms.
- If you notice muscle soreness:
 - That decreases in intensity during training: Continue at same level but do not progress your program.
 - That increases in intensity during training: Stop and rest. Resume at lower level of training in 2 days.
- Experiencing pain at night or in the mornings:
 - Rest until pain free, resume at lesser distance and intensity.

STRENGTH TRAINING: VVH Favorite Four



Lunges

- Keep vertical alignment of the ankle, knee, hip and spine.
- Use dumbbell weights for more work.

REPS: 8-10/leg
REST: 2 mins
SETS: 2-3



Suitcase Deadlift

- Hold weight on surgical side.
- Squat like you are sitting into a chair.
- Do not let the knees go forward of the toes.

REPS: 8-10
REST: 2 mins
SETS: 2-3



Single Leg Deadlift

- Hold weight opposite the stance leg.
- Keep back and swing leg straight.
- Do not let the knee go forward of the toes.
- Do not rotate pelvis.

REPS: 8-10/leg
REST: 2 mins
SETS: 2-3

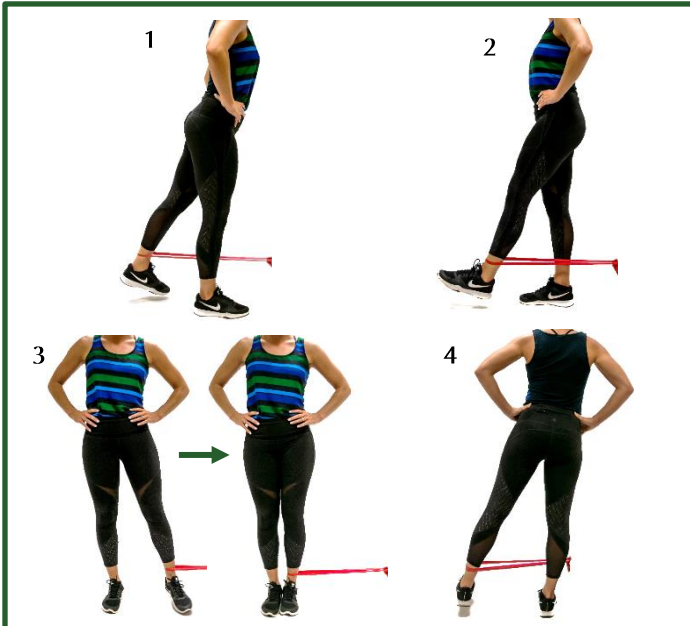


SLOW-MO Side Steps

- Wrap band around knees.
- Keep pelvis and shoulders level.
- Side step with emphasis on long single leg holds.

REPS: 10 steps to right and left
REST: 2 mins
SETS: 2-3

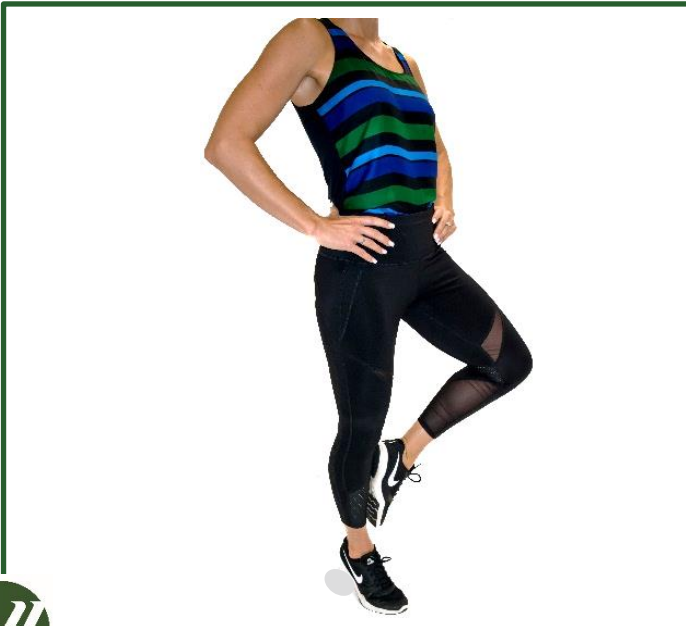
BALANCE TRAINING: VVH Favorite Four



4-Way Hip

- Wrap band non-surgical ankle.
- Keep pelvis and shoulders level.
- Slowly pull against band while staying on one leg.

REPS: 10 each
REST: 30 secs
SETS: 2-3



Stork Stance

- Stand on 1 leg, opposite foot on inside stance thigh or shin, hands on hips.
- Balance in position as long as possible with heel off of floor.
- Advanced: Lift toes off ground.

REPS: 2 mins
REST: 30 secs
SETS: 2-3



½ Kneeling Balance

- One knee down on pillow.
- Keep ear, shoulder, hip, and knee vertical.
- Front knee at 90°. Keep > 80% weight on kneeling knee.
- Close eyes.

REPS: 2 mins
REST: 30 secs
SETS: 2-3/leg



Single Leg Ball Toss

- On one leg.
- Hold mini squat with good knee alignment.
- Toss ball to wall / partner.
- Advanced: Lift toes off ground and vary ball toss direction.

REPS: 2 mins
REST: 30 secs
SETS: 2-3/leg



AGILITY TRAINING: VVH Favorite Four



Box Jumps

- Start with 4 inch box.
- Jump and land with equal pressure and timing of both feet.
- Stand tall with knees straight at top.

REPS: 15
REST: 2 mins
SETS: 2-3

Sample patterns can be applied to double or single leg drills. Descriptions direct the lead foot for the trailing foot to follow. The show you where to start and which direction to face the ladder for proper descriptions.

↑, ↓, →. Repeat.

→, →, ←. Repeat.

←, ←, →. Repeat.

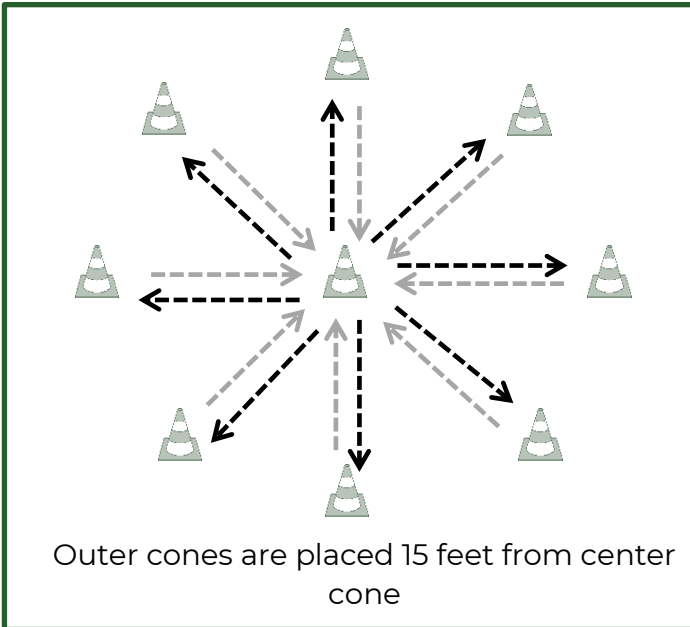
→, →, ←. Repeat.

Change lead foot and/or movement direction for each drill. You can make your own up too!

Ladders

- Move quickly but controlled for each pattern.
- Stop pattern for knee pain or knee valgus.
- Only attempt single leg patterns if you've cleared your run test with PT.

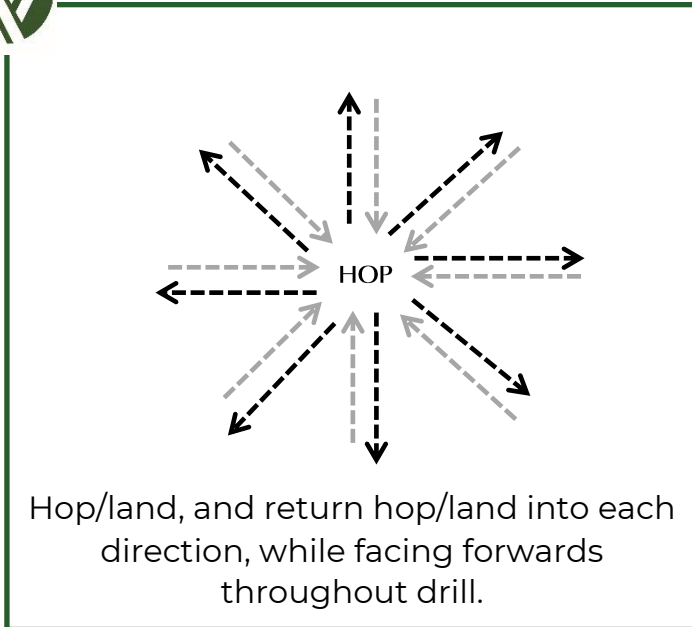
TIME ON: 2 min
REST: 30 secs
SETS: 5



Star Shuttle

- Start at center cone.
- Sprint quickly but controlled.
- Stop pattern for knee pain or knee valgus.
- Keep torso facing top cone.
- Tap each cone with hand.

REPS: 8 cones
REST: 1 min
SETS: 5



Star Hops

- Stand on 1 leg in center.
- Hop once in each direction then back.
- Stop pattern for knee pain or knee valgus.
- Only attempt having cleared run test with PT.

REPS: 1
REST: 30 secs
SETS: 10

RETURN TO SPORT TRAINING: VVH Guiding Principles

This section will help you determine how to progress back into your sport in the safest way possible. Only progress from controlled low intensity activities when you can maintain good knee control (as discussed on page 2) and do not experience pain. If you experience any knee control issues or knee pain with an activity try using the scale below to quantify the knee control difficulty of the activity. Lowering the knee control point total of the activity, by decreasing the difficulty level of the variables, can help you train at the highest level possible with minimized re-injury risk. If you are working with coaches, trainers, or parents: they can watch for knee valgus and hyperextension positions as you train and help you modify activity if you are experiencing pain or difficulty with knee control.

<u>Variable Category</u>	<u>Activity & Knee Control Difficulty Points</u>			
Intensity/Speed	25% Max Effort 1	50% Max Effort 5	75% Max Effort 15	100% Max Effort 20
Fatigued State	No Fatigue 1	Mildly Fatigued 5	Moderately Fatigued 15	Severely Fatigued 20
Running Pattern	Straight Forward/Back 1	Wide Arcing Turns 5	Tight Arcing Turns 10	Lateral Shuffling 15
Jumping & Changing Direction	Wide Angle 5	Tight Angle 10	180 Degree Turn 15	Jump, Land & Pivot 20
Training Surface	Predictable & Firm 1	Predictable & Soft 5	Unpredictable & Firm 10	Unpredictable & Soft 15
Manipulating an Object (catch/throw/pass/kick)	Planned and/or Predictable Task 10		Reactional and/or Unpredictable Task 20	
Moving Around Objects (cones, players)	Planned and/or Predictable Adjustments Required 10		Reactional and/or Unpredictable Adjustments Required 20	

Example 1: You dribbled a soccer ball (10) around cones(10) in a wide arcing pattern(5) at 75% max effort(15) when you were mildly tired(5) on a new soft grass field(5). Total score for this activity is 50.

Example 2: During a 75% intensity(15) basketball scrimmage against defenders(20), requiring lateral shuffling for defensive guarding(15), you often dribbled the ball around defenders(20), and jumped for rebounds(20) on an old cracked concrete basketball court(10) when you were moderately fatigued(15). Total score for this activity is 115.

If you **did not** experience pain, knee valgus or hyper extension positions with the activity, you can continue to increase the challenge of your activities. If you **did** experience pain or some knee valgus or hyper extension positions while doing the activity you should modify the components in the activity to lower the knee control total point level to minimize your re-injury risk as you continue to get back to your prior level of activity.