



Functional Testing Protocol - KNEE

NAME: _____ DOB: _____ MRN: _____ DATE: _____

Involved: R or L DATE OF SURGERY: _____ PHYSICIAN: _____

Preliminary Functional Test *Week 12 (Prior to 12-week follow-up appointment)*

Test	Dynamic Valgus * (Y/N)	R	L	%
Y-Balance (Anterior only)				
Leg Press Percentage of Body Weight: <input type="checkbox"/> 50% _____ <input type="checkbox"/> 75% _____ Body weight: _____ Seat setting: _____				



Functional Testing Protocol - KNEE

NAME: _____ DOB: _____ MRN: _____ DATE: _____

Involved: R or L DATE OF SURGERY: _____ PHYSICIAN: _____

Return to Sport Test *Weeks 20-24 (Prior to 6-month follow-up appointment)*

Test		Dynamic Valgus * (Y/N)	R	L	%
Hand-Held Dynamometer	Quadriceps	N/A			
	Hamstrings	N/A			
Y-Balance	Anterior:				
	Posterolateral:				
	Posteromedial:				
	Composite:	N/A			N/A
Leg Length (ASIS to medial malleolus): _____ cm					
Single Leg Vertical					
Single Leg Hop with Fatigue Protocol					
Cross-Over Hop					
Figure 8 Hop					
Drop Landing Knee Excursion**					
Leg Press	Body weight: _____ Seat setting: _____				
Percentage of Body Weight: <input type="checkbox"/> 75% _____ <input type="checkbox"/> 100% _____ other % _____					
Additional Comments:					

* **Dynamic Valgus** is defined as the kneecap being medial to the great toe during the test

** **Only perform Drop Landing** if patient passes both the **Single Leg AND Crossover hops**



Functional Testing Instructions

Warm-up

Allow 5-minute bike or elliptical warm-up with moderate resistance.

Demonstration and practice trials

The examiner may demonstrate each test. A maximum of two practice trials will be allowed for each test.

Scoring

Limb symmetry index (LSI) greater than or equal to 90% (involved vs. uninvolved limb) is required for each test, except for Composite Y-balance scoring, which is based on limb length norms.

Hand-Held Dynamometry

Place HHD in mobilization belt with proper stabilization as shown in pictures below. The best of 2 trial should be recorded.

Knee extension

Patient Position: seated

Limb Position: 90 degrees hip and knee flexion, trunk upright

HHD position: anterior ankle with strap stabilized from posterior side



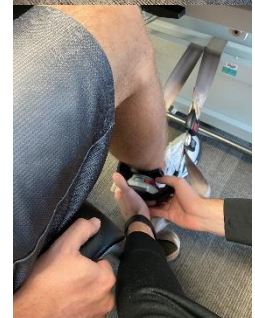
Knee flexion

Patient Position: seated

Limb Position: 90 degrees hip and knee flexion, trunk upright

HHD position: posterior ankle with strap stabilized from anterior side

*Pt may use opposite limb to stabilize on table



Y-balance

Standing with one leg on the center platform with toes behind the red line and hands placed firmly on hips, the subject is instructed to push the indicator with the toes in the desired direction as far as they can while maintaining balance and return to starting position under control. The heel must stay in contact with the platform during the test. The subject may not touch the free leg to the ground during the movement to keep balance or put their foot on the top of the reach indicator to gain support. Once the subject has completed three successful trials with the uninvolved leg they will repeat the process with the involved leg before moving on to the next direction. The **best** of the three reaches is recorded as the patient's reach distance. Reach distances should be recorded to the nearest centimeter. For the Y-balance anterior, a difference of >4cm between limbs constitutes a failed test. Composite score is determined by the following equation: Anterior + Posterolateral + Posteromedial divided by (3 x leg length) multiplied by 100

Leg Press

Choose appropriate percentage of body weight based on current strength of the involved limb. Subject will perform a single-leg leg press for 60 seconds, trying for as many repetitions as possible. Repetitions will not be counted if the subject uses the opposite limb for support or loses proper form including dynamic valgus. Each repetition must be performed from 0-90 degrees.

Single Leg Vertical Leap

The subject is to jump off one leg without an approach step but may land on two legs. The object is to measure the maximal vertical jump, comparing uninvolved to involved. Devices such as the Vertec or the Just Jump (<https://www.power-systems.com>), or best methods available, should be used to objectify vertical leap. Three trials are performed on each side, accepting the **best** score from each of the three trials for comparison.

Hop Tests

Three trials are performed on each limb, and the best score for each limb is recorded. Start with lead toe behind marked line and measure to the nearest centimeter or ½ inch. Landing must be maintained for a minimum of **two** seconds while the toe measurement is being recorded. A failed attempt consists of loss of balance, touching the floor with arms or opposite leg, an additional short hop on landing, or presence of dynamic valgus.

Single Leg Hop after fatigue protocol

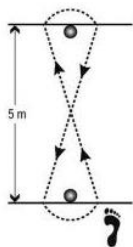
Prior to performing the single leg hop test, participants perform a unilateral step-down from a 12-inch box, tapping their heel to the floor each time, and completing this as many times as possible on a single limb for two minutes. After performing the 2-minute fatigue protocol, single leg hop for distance is performed on the same limb for 3 repetitions. The best score is recorded. This same protocol is then repeated on the opposite limb.

Cross-Over Hop

Standing on one leg, perform three successive hops crossing over a 15-cm wide strip or marker, landing on the same limb. The first hop should be lateral in respect to the direction of the crossover. There should be no pauses between hops.

Figure 8 Hop

With two cones placed 5 meters (16 ft., 5 in.) apart, the participant will hop as fast as possible on one limb twice around the cones in a figure 8 pattern, with time being recorded. Failed test consists of inability to maintain figure 8 course path or touching down with opposite limb. The best time from **two** trials is recorded. (**See next page for calculation instructions for timed values.)



Caffrey E, Docherty CL, Schrader J, Klossner J. The Ability of 4 Single-Limb Hopping Tests to Detect Functional Performance Deficits in Individuals With Functional Ankle Instability. *J Orthop Sport Phys Ther.* 2009;39(11):799-806. doi:10.2519/jospt.2009.3042

****Timed calculation instructions**

First: work out the **difference (decrease)** between the two values. Then: divide the **decrease** by the non-operative and multiply the answer by 100. This gives you the percentage difference. Then subtract the percentage difference from 100.

For example:

Non-operative leg: 8 seconds

Operative leg: 10 seconds

10-8= **2 (difference)** divided by **8 (original value)** = .25 x 100 = **25% (percentage difference)**

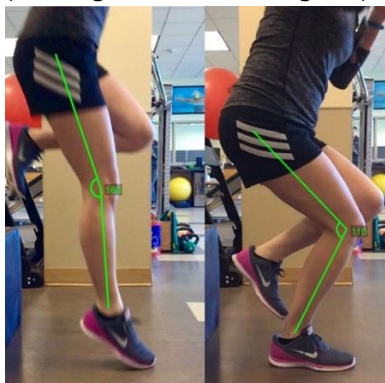
100 – 25= **75 % (final value)**

Drop Landing Knee Excursion

The following testing protocol relies on video analysis capability. If no video analysis is available, skip this test and move on. Mobile device apps are sufficient.

**** Only perform Drop Landing if patient passes both the Single Leg AND Crossover hops ****

Subject stands on 16" box. Therapist stands to the side of the patient with motion capture device prepared to capture video of the drop landing maneuver. The device capturing video should be positioned at the same height as the subject's knee when the patient is standing on the ground. The operator of the motion capture device should be directly lateral from the area where the subject will land so that the video can capture sagittal plane motion of the knee. Upon the examiner's cue (when the video is in place and recording), the subject positions self on single limb then jumps off of the box (anterior direction) and lands on the same limb. The subject must remain on the test limb for two seconds in order for the trial to be counted and may not use the other limb or upper extremities to balance him/herself. The video recording is stopped. Then, using frame-by-frame assessment, the therapist measures knee flexion (in degrees) at two separate points in the drop landing task: at first point of contact to the ground and at greatest depth of knee flexion. The recorded measurement is the difference between knee flexion at greatest depth and knee flexion at initial contact. In the example below, the recorded knee flexion excursion would be 55 degrees (165 degrees minus 110 degrees).



165 degrees at initial contact

110 degrees at greatest depth

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ACL-RSI Scale (Short Version)

Instructions: Please answer the following questions referring to your main sport prior to injury. For each question, circle the number between the two descriptions to indicate how you currently feel relative to the two extremes.

1. Are you confident that you can perform at your previous level of sport participation?

Not at all confident	0	10	20	30	40	50	60	70	80	90	100	Fully confident
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2. Do you think you are likely to reinjure your knee by participating in your sport?

Extremely likely	0	10	20	30	40	50	60	70	80	90	100	Not likely at all
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3. Are you nervous about playing your sport?

Extremely nervous	0	10	20	30	40	50	60	70	80	90	100	Not nervous at all
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4. Are you confident that you could play your sport without concern for your knee?

Not at all confident	0	10	20	30	40	50	60	70	80	90	100	Fully confident
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5. Do you find it frustrating to have to consider your knee with respect to your sport?

Extremely frustrating	0	10	20	30	40	50	60	70	80	90	100	Not at all frustrating
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6. Are you fearful of reinjuring your knee by playing your sport?

Extremely fearful	0	10	20	30	40	50	60	70	80	90	100	Not fearful at all
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