

Appendix B: Lower Extremity Post-Operative Activity Progression Criteria

Objective testing for activity progression post-surgery should be intentionally selected, and involve a *minimum of 1 assessment in each of the following domains:*

1. Strength
2. Biomechanics and/or movement quality
3. Psychological readiness

Test selection should be guided by:

1. Surgically addressed tissue
2. Timeline post-operatively
3. Available testing equipment
4. Activity and sport-specific demands

Activity Initiation	Clearance Category	Tools / Technology	Metrics	Passing Criteria		Validated Body Regions
				Absolute values	Limb symmetry index (LSI)	
<p style="text-align: center;">Return to Participation</p> <p style="text-align: center;">(High control)</p> <p style="text-align: center;"><i>Graded exposure to:</i></p> <p style="text-align: center;">Impact tasks</p> <p style="text-align: center;">Running progression</p>	Strength	Isokinetic strength	Knee extension @ 60 & 180 deg/sec	Quadriceps PT:BW = 60% - 67% BW (1.8 - 2.0 Nm/kg)	≥ 75%	Knee
			Knee flexion @ 60 & 180 deg/sec		≥ 75%	Knee
		Handheld Dynamometry (HHD) Strength	HHD seated ankle PF	PF force = 100% BW	≥ 75%	Foot/ankle
			HHD seated knee ext @ 90°	Quadriceps PT:BW ≥ 2.0 Nm/kg	≥ 75%	Knee
			HHD seated knee flexion @ 90°		≥ 75%	Knee
			HHD side-lying abd & add	Abd force = 78% - 88% BW	≥ 75%	Hip
			Supine 5 second squeeze test	Force ≥ 92% BW (2.76 Nm/kg) <i>Pain</i> < 3/10	≥ 75%	Hip
			HHD seated hip flexion		≥ 75%	Hip
		Functional Strength	HHD prone hip IR / ER		≥ 75%	Hip
			SL heel raise @ 60 bpm	Peak height ≥ 10 cm Max reps ≥ 26 reps	≥ 71% ≥ 78%	Foot/ankle Foot/ankle
	Biomechanics / Movement Quality	Force Plate Biomechanics	<u>DL squat</u> Force plate eccentric impulse Force plate concentric impulse		≥ 80% ≥ 80%	All LE
			Functional Testing	SL lateral step-down test @ 80+ bpm	≤ 2 errors	
		<u>LE Y-balance</u> Anterior reach			≥ 80%	All LE
	Psychological Readiness	Patient Reported Outcomes	i-HOT 12	≥ 65%		Hip
IKDC			≥ 65%		Knee	
FAAM			≥ 65%		Foot/ankle	

Appendix B: Lower Extremity Post-Operative Activity Progression Criteria

Activity Initiation	Clearance Category	Tools / Technology	Metrics	Passing Criteria		Validated Body Regions
				Absolute values	Limb symmetry index (LSI)	
<p>Return to Sport / Training</p> <p>(Control > chaos)</p> <p><i>Graded exposure to:</i></p> <p>Change of direction / cutting / pivoting</p> <p>Linear sprint / speed work</p> <p>Individual and team-based drills</p>	Strength	Isokinetic strength	Knee extension @ 60 & 180 deg/sec	Quadriceps PT:BW = 67% - 78% BW (2.0 – 2.3 Nm/kg)	≥ 90%	Knee
			Knee flexion @ 60 & 180 deg/sec		≥ 90%	Knee
		Handheld Dynamometry (HHD) Strength	HHD seated ankle PF	PF force = 100% - 115% BW	≥ 90%	Foot/ankle
			HHD seated knee ext @ 90°	Quadriceps PT:BW ≥ 2.3 Nm/kg	≥ 90%	Knee
			HHD seated knee flexion @ 90°		≥ 90%	Knee
			HHD side-lying abd & add	Abd force = 88% - 98% BW	≥ 90%	Hip
			Supine 5 second squeeze test	Force ≥ 96% BW (2.89 Nm/kg) Pain < 2/10	≥ 90%	Hip
			HHD seated hip flexion HHD prone hip IR / ER		≥ 90% ≥ 90%	Hip Hip
		Functional Strength	SL heel raise @ 60 bpm	Peak height ≥ 11 cm Max reps ≥ 30 reps	≥ 75% ≥ 90%	Foot/ankle Foot/ankle
		Biomechanics / Movement Quality	Force Plate Biomechanics	Countermovement Jump		≥ 80%
	Force plate concentric impulse				≥ 70%	
	Force plate eccentric deceleration				≥ 70%	
	RFD					
	Peak landing impulse		1.2 – 1.5 m/s			
	Functional Testing	SL lateral step-down test @ 80+ bpm	≤ 2 errors		All LE	
		Drop jump landing error scoring system (LESS)	≤ 5 errors		All LE	
		SL hop test cluster		≥ 90%	All LE	
		LE Y-balance Anterior reach		≥ 90%	All LE	
Psychological Readiness	Patient Reported Outcomes	i-HOT 12	≥ 80%		Hip	
		IKDC	≥ 80%		Knee	
		FAAM	≥ 80%		Foot/ankle	

Appendix B: Lower Extremity Post-Operative Activity Progression Criteria

Activity Initiation	Clearance Category	Tools / Technology	Metrics	Passing Criteria		Validated Body Regions
				Absolute values	Limb symmetry index (LSI)	
<p style="text-align: center;">Return to Performance (High chaos)</p> <p style="text-align: center;"><i>Graded exposure to:</i></p> <p>Contact and game / scrimmage progressions</p> <p>Return to pre-injury competition volume</p>	Strength	Isokinetic strength	Knee extension @ 60 & 180 deg/sec	Quadriceps PT:BW = 83% - 100% BW (2.5 – 3.0 Nm/kg)	≥ 90%	Knee
			Knee flexion @ 60 & 180 deg/sec		≥ 90%	Knee
		Handheld Dynamometry (HHD) Strength	HHD seated ankle PF	PF force = 127% BW (F) 137% BW (M)	≥ 90%	Foot/ankle
			HHD seated knee ext @ 90°	Quadriceps PT:BW ≥ 3.0 Nm/kg	≥ 90%	Knee
			HHD seated knee flexion @ 90°		≥ 90%	Knee
			HHD side-lying abd & add	Abd force ≥ 98% BW	≥ 90%	Hip
			Supine 5 second squeeze test	Force ≥ 105% BW (3.15 Nm/kg) <i>Pain</i> < 2/10	≥ 90%	Hip
			HHD seated hip flexion		≥ 90%	Hip
		Functional Strength	HHD prone hip IR / ER		≥ 90%	Hip
				SL heel raise @ 60 bpm	Peak height ≥ 11 cm Max reps ≥ 30 reps	≥ 78% ≥ 90%
	Biomechanics / Movement Quality	Force Plate Biomechanics	<u>Countermovement Jump</u> Force plate concentric impulse Force plate eccentric deceleration RFD Peak landing impulse Peak eccentric velocity		≥ 85%	All LE
					≥ 75%	
					≥ 75%	
				≤ 1.2 m/s		
		Functional Testing	SL lateral step-down test @ 80+ bpm	≤ 2 errors		All LE
			Drop jump LESS	≤ 3 errors		All LE
			SL hop test cluster		≥ 90%	All LE
		<u>LE Y-balance</u> Anterior reach		≥ 90%	All LE	
		Sport-specific performance tests	≥ 90% of pre-injury metrics		All LE	
	Psychological Readiness	Patient Reported Outcomes	i-HOT 12	≥ 90%		Hip
IKDC			≥ 90%		Knee	
FAAM			≥ 90%		Foot/ankle	



Appendix B: Lower Extremity Post-Operative Activity Progression Criteria



Appendix B: Lower Extremity Post-Operative Activity Progression Criteria

Key:

ABD = abduction

ADD = adduction

BPM = beats per minute

BW = bodyweight

DL = double leg

ER = external rotation

FAAM = foot and ankle ability measures

HHD = hand-held dynamometry

IR = internal rotation

i-HOT 12 = international hip outcome tool

IKDC = international knee documentation committee subjective questionnaire

LE = lower extremity

LESS = Drop jump landing error scoring system

LE Y-Balance = Lower Extremity Y-Balance (single leg stability reach assessment)

LSI = limb symmetry index

PF = plantarflexion

PT:BW = peak torque to body-weight

RFD = rate of force development

SL = single leg