



Upper 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)		
Return to Participation (High control) <i>Graded exposure to:</i>	Strength	Isokinetic strength	Shoulder IR @ 60, 180 & 300 deg/sec (<i>Modified neutral</i>)	ER:IR strength ratio = 61-64%	≥ 75%	Elbow Shoulder	
			Shoulder ER @ 60, 180 & 300 deg/sec (<i>Modified neutral</i>)	ER % PT:BW = 12% (60 deg/sec) 14% (180 deg/sec) 10% (300 deg/sec)	≥ 75%	Elbow Shoulder	
	Handheld Dynamometry (HHD) Strength	Grip strength (<i>ABER</i>)		≥ 80%	All UE		
		HHD shoulder scaption		≥ 75%	All UE		
		HHD shoulder IR (<i>Neutral</i>)	IR % PT:BW ≥ 18%	≥ 80%	All UE		
		HHD shoulder ER (<i>Neutral</i>)	ER % PT:BW ≥ 14%	≥ 80%	All UE		
		HHD shoulder IR (<i>ABER</i>)	IR % PT:BW ≥ 15%	≥ 75%	All UE		
		HHD shoulder ER (<i>ABER</i>)	ER % PT:BW ≥ 10%	≥ 75%	All UE		
	Unrestricted UE strength training Double arm plyometric progression	Biomechanics / Movement Quality	Force Plate Biomechanics	ASH Test I position T position Y position		Peak force ≥ 75% Force plate RFD ≥ 70%	All UE
			Functional Testing	Closed-kinetic-chain upper extremity stability test (CKCUEST)	≥ 20 reps		All UE
UE Y-balance Superior reach Inferior-medial reach Inferior-lateral reach				≥ 70% ≥ 70% ≥ 70%	All UE		
Psychological Readiness	Patient Reported Outcomes	QuickDASH	≤ 30%		All UE		
		WOSI	≥ 80		Shoulder		
		SIRSI	≥ 40		Shoulder		



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Activity Initiation	Clearance Category	Tools / Technology	Metrics	Passing Criteria		Validated Body Regions
				Absolute values	Limb symmetry index (LSI)	
Return to Sport / Training (Control > chaos) <i>Graded exposure to:</i> Throwing Swinging / hitting Fielding / diving Contact Individual and team-based drills	Strength	Isokinetic strength	Shoulder IR @ 60, 180 & 300 deg/sec (<i>ABER</i>)	ER:IR strength ratio = 61-64%	≥ 90%	Elbow Shoulder
			Shoulder ER @ 60, 180 & 300 deg/sec (<i>ABER</i>)	ER % PT:BW = 12% (60 deg/sec) 14% (180 deg/sec) 10% (300 deg/sec)	≥ 90%	Elbow Shoulder
		Handheld Dynamometry (HHD) Strength	Grip strength (<i>ABER</i>)		≥ 90%	All UE
			HHD shoulder scaption		≥ 90%	All UE
			HHD shoulder IR (<i>Neutral</i>)	IR % PT:BW ≥ 21%	≥ 90%	All UE
			HHD shoulder ER (<i>Neutral</i>)	ER % PT:BW ≥ 15%	≥ 90%	All UE
			HHD shoulder IR (<i>ABER</i>)	IR % PT:BW ≥ 18%	≥ 80%	All UE
	HHD shoulder ER (<i>ABER</i>)	ER % PT:BW ≥ 14%	≥ 80%	All UE		
	Biomechanics / Movement Quality	Force Plate Biomechanics	<u>ASH Test</u> I position T position Y position		Peak force ≥ 90% Force plate RFD ≥ 80%	All UE
			Functional Testing	Closed-kinetic-chain upper extremity stability test (CKCUEST)	≥ 22 reps	
		Seated shot-put test (<i>throwing & hitting</i>)			≥ 90%	
		Single arm hop test (<i>contact</i>)		Time ≤ 10 sec	≥ 90%	
		<u>UE Y-balance</u> Superior reach Inferior-medial reach Inferior-lateral reach			≥ 90% ≥ 90% ≥ 90%	All UE
		Psychological Readiness		Patient Reported Outcomes	QuickDASH	≤ 30%
WOSI			≥ 85			Shoulder
SIRSI	≥ 55				Shoulder	



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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>Contact and game / scrimmage progressions</p> <p>Return to pre-injury competition volume</p>	Strength	Isokinetic strength	Shoulder IR @ 60, 180 & 300 deg/sec (<i>ABER</i>)	ER:IR strength ratio = 61-64%	≥ 90%	Elbow Shoulder
			Shoulder ER @ 60, 180 & 300 deg/sec (<i>ABER</i>)	ER % PT:BW = 14% (60 deg/sec) 16% (180 deg/sec) 12% (300 deg/sec)	≥ 90%	Elbow Shoulder
		Handheld Dynamometry (HHD) Strength	Grip strength (<i>ABER</i>)		≥ 90%	All UE
			HHD shoulder scaption		≥ 90%	All UE
			HHD shoulder IR (<i>Neutral</i>)	IR % PT:BW ≥ 21%	≥ 90%	All UE
			HHD shoulder ER (<i>Neutral</i>)	ER % PT:BW ≥ 15%	≥ 90%	All UE
			HHD shoulder IR (<i>ABER</i>)	IR % PT:BW ≥ 21%	≥ 90%	All UE
	HHD shoulder ER (<i>ABER</i>)	ER % PT:BW ≥ 15%	≥ 90%	All UE		
	Biomechanics / Movement Quality	Force Plate Biomechanics	<u>ASH Test</u> I position T position Y position		Peak force ≥ 90% Force plate RFD ≥ 85%	All UE
			Functional Testing	Closed-kinetic-chain upper extremity stability test (CKCUEST)	≥ 30 reps	
		Seated shot-put test (<i>throwing & hitting</i>)			≥ 90%	
		Single arm hop test (<i>contact</i>)		Time ≤ 6 sec	≥ 90%	
		<u>UE Y-balance</u> Superior reach Inferior-medial reach Inferior-lateral reach			≥ 90% ≥ 90% ≥ 90%	All UE
		Sport specific performance tests	≥ 90% of pre-injury metrics			
	Psychological Readiness	Patient Reported Outcomes	QuickDASH	≤ 10%		All UE
WOSI			≥ 90		Shoulder	
SIRSI			≥ 60		Shoulder	



Key:

ABER = abducted and externally rotated

ASH Test = Athlete Shoulder Stability Test

BW = bodyweight

CKCUEST = Closed Kinetic Chain Upper Extremity Stability Test

ER = external rotation

ER: IR = external rotation : internal rotation strength ratio

HHD = hand-held dynamometry

IR = internal rotation

LSI = limb symmetry index

PT:BW = peak torque to body-weight

QuickDASH = Disabilities of Arm, Shoulder & Hand (quick)

RFD = rate of force development

SIRSI = Shoulder Instability Return to Sport after Injury

UE Y-Balance = Upper Extremity Y-Balance (closed-chain UE reach assessment)

WOSI = Western Ontario Shoulder Instability Index