Houston Methodist
Thrower's Readiness Inventory (TRI)™

Patient: _____ **Position/Handedness:** _____

Injury/Procedure: _____ **Laterality:** **L** **R**

Date of Injury/Procedure: _____ **Date of Testing:** _____

Subjective Examination	Yes	No	Comments:
1. Pain-free?	☐	☐	
2. Consistent with rehab? • Plyos, eccentrics, etc	☐	☐	
3. Confident to throw?	☐	☐	
4. Thrower's RSI Score:			

Special Tests/Observation				Comments:
1. Effusion	None		Present	
2. Milking Maneuver (Valgus at 90°)	Negative		Positive	
3. Shoulder Special Testing	Negative		Positive	
4. Posture	Good	Fair	Poor	
5. Scapular Rhythm	Good	Fair	Poor	
6. Elbow ROM	WNL		Lacking	
7. Thoracic Mobility	WNL		Lacking	

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Functional Tests				Comments:
1. Single leg step down (30sec)	Good	Fair	Poor	
2. One-arm ball throws against wall (30sec)	Good	Fair	Poor	
3. Low intensity towel-throws	Good	Fair	Poor	
4. Closed kinetic chain upper extremity endurance test [CKCUEST] (15sec)	_____ repetitions			
5. Side plank test	>45 sec	<45 sec		

Range of Motion (PROM)	L	R	Strength (measured with hand-held dynamometer)	L	R
Flexion	°	°	Flexion	lbs	lbs
ER (in 90˚ of abduction)	°	°	Scaption	lbs	lbs
IR (in 90˚ of abduction)	°	°	Abduction	lbs	lbs
Cross-body Adduction	°	°	ER (0˚ at side)	lbs	lbs
			IR (0˚ at side)	lbs	lbs
			Mid-trap (prone)	lbs	lbs
			Low-trap (prone)	lbs	lbs
			ER (90˚ in prone)	lbs	lbs
			IR (90˚ in prone)	lbs	lbs
Hip IR	°	°			
Hip ER	°	°	Hip abduction	lbs	lbs

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Criteria to Initiate Interval Throwing

1. Full, non-painful ROM
    a. Throwing shoulder flexion within 5° of contralateral side
    b. Throwing shoulder total ER/IR arc within 5-10° of contralateral side
    c. Shoulder horizontal adduction of 20° or greater on throwing side
    d. Glenohumeral IR deficit of <15° vs. contralateral
    e. Elbow and wrist passive ROM within appropriate limits
2. Confidence
    a. Patient should feel ready to throw with minimal apprehension
3. Adequate strength
    a. ER:IR ratio (0° and 90°) ≥ 70%
    b. Throwing side IR ≥ 100% of contralateral
    c. Throwing side ER ≥ 95% of contralateral
4. Successful completion of all steps in rehabilitation process
    a. Inclusive of plyometrics
    b. Inclusive of eccentric upper extremity activities
    c. Inclusive of CKC and OKC activities
5. Satisfactory functional test scores
    a. Single leg step down test – x30sec without loss of pelvic stability/control or dynamic knee valgus
    b. One-arm ball throws against wall (1kg) – x30 sec without pain or loss of 90/90° arm position
    c. Low-intensity towel throws – x10 throws with repeatable mechanics at low intensity without pain
    d. CKCUEST – for high school to college-aged males ≥ 18; for high school to college-aged females ≥ 16, should be comfortable to bear weight

References:

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Testing Notes & Instructions:

Special Tests/Observation:

- Observe for any visible effusion/edema, ask about recent trends
- Note quality and location of pain with any special testing
- Thoracic mobility should be observed in transverse and sagittal planes

Functional Tests:

1. Single leg step down: have the patient on a box/step (8-10") and instruct them to reach down and tap their contralateral heel to the ground in a rhythmic pattern (metronome can be used).
    a. Keep hips back and head up. Patient should maintain a consistent cadence without loss of knee alignment or balance.
2. One-arm ball throws against wall: patient uses 1kg ball and is placed in throwing slot. Tester should palpate scapula and observe arm height over 30sec while patient actively dribbles the ball on the wall.
    a. Assess for loss of arm height or scapular position for compensatory patterns secondary to fatigue.
3. Low-intensity towel throws: tie a knot in the end of a towel or pillowcase. Patient performs their entire throwing motion at an instructed "20% effort".
    a. Observe for mechanical faults or apprehension. Any pain should be noted and at what point in the throwing motion (i.e. lay-back vs acceleration vs follow-through).
4. CKCUEST: patient is in "push-up" position with hands ~36in apart (use tape or other visual markers). Patient instructed to tap contralateral hand (alternating) as many times as they can in 15sec without loss of balance. Terminate test if pain is present in weight-bearing.
5. Side plank: patient instructed to hold a "stacked foot" side plank x45sec without loss of frontal-plane height. Terminate test if pain is present in weight-bearing.

ROM:

- Tester should assess for end-feel and potential soft-tissue limitations, note as necessary
- ER/IR should be measured consistently with appropriate support to ensure true neutral plane; ensure anterior support during IR to mitigate scapular movement
- Cross-body adduction requires a firm lateral border block of the scapula

Strength:

- All strength tests measured with hand-held dynamometer should be performed via "make test"
- Ensure proper stabilization and a firm block for the patient to perform maximum effort isometric contraction – consider body mechanics while testing to maximize leverage and reduce variability
    - For IR at 0°, block against their humerus to avoid being overpowered, *see figure to the right*
- Each contraction should last 3 seconds
- Note any pain

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