# Ulnar Collateral Ligament Repair with Augmentation Rehabilitation Protocol

<table>
<thead>
<tr>
<th>PHASE I</th>
<th>RANGE OF MOTION</th>
<th>IMMOBILIZER</th>
<th>EXERCISES</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6 weeks</td>
<td>0-1 weeks: None</td>
<td>0-1 weeks: splint</td>
<td>0-1 weeks: wrist motion and hand motion</td>
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<tr>
<td></td>
<td>2 weeks: elbow 30-110°</td>
<td>2 weeks: brace 30-110°</td>
<td>2 weeks: active ROM shoulder, scapular isometrics</td>
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<td></td>
<td>3 weeks: elbow 10-125°</td>
<td>3 weeks: brace 10-125°</td>
<td>3 weeks: Elbow AROM progress to 10-125°</td>
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<td></td>
<td>4 weeks: elbow 0-145°</td>
<td>4 weeks: brace 0-145°</td>
<td>Begin wall squats, lateral slide, single leg squats, leg press (no use of operative arm) hip and core exercise (no use of operative arm).</td>
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<tr>
<td></td>
<td><strong>0-1 weeks:</strong> wrist motion and hand motion</td>
<td><strong>2 weeks:</strong> active ROM shoulder, scapular isometrics</td>
<td><strong>4-6 weeks:</strong> Progress AROM and restore full ROM, Initiate wrist flexion and elbow flexion movements against resistance</td>
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<td><strong>2 weeks:</strong> active ROM shoulder, scapular isometrics</td>
<td><strong>3 weeks:</strong> Elbow AROM progress to 10-125°</td>
<td>Start Throwers Ten Program (by ASMI below)</td>
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Before Phase II: must have 0-145°, minimal pain, good manual muscle testing of: elbow flexion/extension; wrist flexion; shoulder internal and external rotation, scapular abduction

<table>
<thead>
<tr>
<th>PHASE II</th>
<th>RANGE OF MOTION</th>
<th>IMMOBILIZER</th>
<th>EXERCISES</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-8 weeks</td>
<td>Progress to full ROM</td>
<td>Discontinue Brace at 6 weeks</td>
<td><strong>Starting Week 6:</strong></td>
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<tr>
<td></td>
<td><strong>Starting Week 6:</strong> Initiate Advanced Throwers Ten program</td>
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<tr>
<td></td>
<td>• Initiate 2-hand plyometrics: chest pass, side-to-side throw, and overhead pass</td>
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<tr>
<td></td>
<td>• Initiate prone plank exercise</td>
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<td><strong>Starting Week 8:</strong></td>
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<td></td>
<td>• Progress to 1-hand plyometrics: 90°/90° ball throw, 0° ball throw</td>
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<td>• Progress to 1-hand plyometrics: 90°/90° ball throw, 0° ball throw</td>
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<tr>
<td></td>
<td>• Continue with Advanced Throwers Ten program</td>
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<tr>
<td></td>
<td>• Initiate side plank with shoulder ER strengthening exercise</td>
<td></td>
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<td></td>
<td><strong>No aggressive weight lifting until 12 weeks post operatively</strong></td>
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<tr>
<td></td>
<td><strong>No chest flies or lifts stressing ligament</strong></td>
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<tr>
<td></td>
<td>Avoid any valgus stress on elbow until minimum 2 months post operatively</td>
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</tbody>
</table>

Before Phase III: Must have full, nonpainful elbow AROM, no pain or tenderness, minimum 70% strength in shoulder and elbow compared to opposite side, appropriate clinical examination, completion of Phase II exercises without difficulty or pain.
### PHASE III
**9-14 weeks**

**Week 9:** Continue all strengthening exercises, Advanced Throwers Ten program, plyometrics

**Week 10:**
- Seated chest-press machine
- Seated row machine
- Biceps/triceps machine or cable strengthening
- Interval hitting program

**Week 12 (if meets Criteria for Starting Interval Throwing):**
Begin interval throwing program progressing from 45ft to 90ft.

Distance level may be increased ONLY when:
- No pain or stiffness while throwing
- No pain or stiffness after throwing
- Strength is maintained and fatigue is minimal after completion of final set
- Throwing motion is effortless with appropriate mechanics
- Accuracy and throwing lines are consistent

To advance to Phase IV:
- Must have full elbow, wrist, and shoulder ROM
- No pain or tenderness
- Functional or isokinetic test that fulfills criteria for goal activity
- Appropriate clinical examination
- Completion of Phase III exercises without difficulty

### PHASE IV
**14+ weeks**

**Weeks 14 – 16:**
- Continue Phase III exercises
- Continue and progress interval throwing program.
- Athletes may progress through ITP at different rates/paces
- Expected to complete throws of 0 to 27 m (0-90 ft) within 3 weeks of starting ITP and throws of 0 to 37 m (120 ft) within 8 weeks

**Weeks 16 to 20**
- Continue ROM and stretching programs
- Continue Advanced Throwers Ten program
- Continue plyometrics
- Initiate ITP phase 2 (off the mound) when phase 1 is complete and athlete is ready
  - Pitchers may begin mound throwing after completing 120 ft distance. NO flat ground pitching.
    - Start with catcher moved forward when throwing from the mound and progress to full distance.

**Weeks 20+**
- Initiate gradual return to competitive throwing
- Perform dynamic warm-ups and stretches
- Continue Advanced Throwers Ten program
- Return to competition decision based on physician and rehabilitation team assessment

Return to play may occur when all conditions are met:
- Trunk, scapula, shoulder motions are normal
- Normal trunk, scapular, shoulder, and arm muscle strength are normal
- No pain while throwing
- Throwing balance, rhythm and coordination are normal

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ROM: range of motion. Note 6 month return to play is possible, but some players may require additional time.

Above protocol adapted from Dugas and Wilk:
Exercises in the Throwers Ten Exercise Program

- Diagonal-pattern D2 extension
- Diagonal-pattern D2 flexion
- Shoulder external rotation at 0° of abduction
- Shoulder internal rotation at 0° of abduction
- Shoulder abduction to 90°
- Shoulder scapular abduction, external rotation (“full cans”)
- Side-lying shoulder external rotation
- Prone shoulder horizontal abduction
- Prone shoulder horizontal abduction (full external rotation, 100° of abduction)
- Prone rowing
- Prone rowing into external rotation
- Press-ups
- Push-ups
- Elbow flexion
- Elbow extension
- Wrist extension
- Wrist flexion
- Wrist supination
- Wrist pronation

All exercises performed against resistance to improve strength.

Full description:
Wilk KE, Arrigo CA, Hooks TR, Andrews JR. Rehabilitation of the overhead throwing athlete: there is more to it than just external rotation/internal rotation strengthening. PM R. 2016; 8: S78– S90.
Exercises in the Advanced Throwers Ten Exercise Program

**Elastic Tubing/Band Resistive Exercises**
- Shoulder external rotation at 0° of abduction while seated on a stability ball*
- Shoulder internal rotation at 0° of abduction while seated on a stability ball*
- Shoulder extensions while seated on a stability ball†
- Lower trapezius isolation while seated on a stability ball†
- High row into shoulder external rotation while seated on a stability ball†
- Biceps curls/triceps extensions while seated on a stability ball†

**Isotonic Dumbbell Resistive Exercises**
- Full can while seated on a stability ball†
- Lateral raise to 90° while seated on a stability ball†
- Prone T's on stability ball†
- Prone Y's on stability ball†
- Prone row into external rotation on stability ball†
- Sidelying shoulder external rotation
- Wrist flexion/extension and supination/pronation

*Contralateral sustained hold performed during exercise
†Exercises are performed in 3 distinct continuous movements per exercise: bilateral active exercise, alternating reciprocal movement, and a sustained contralateral hold
10 - 15 repetitions performed for each movement successively, without rest, to complete 1 set. Goal: perform 2 full cycles of the entire program without pain, using sound technique and no substitution.

Full description:
Criteria to Initiate Phase 1 Interval Throwing (Long Toss)

- Full, painless ROM
  - Shoulder total ER/IR ROM in 90° of shoulder abduction within 5° of nonthrowing shoulder
  - Shoulder horizontal adduction of 40° or greater on throwing shoulder
  - Glenohumeral IR deficit < 15°
  - Elbow and wrist passive ROM within normal limits

- Shoulder, elbow, and wrist strength based on manual muscle test, handheld dynamometer, or isokinetic testing
  - ER/IR ratio of 72% - 76%
  - ER/abduction ratio of 68% - 73%
  - Throwing-shoulder IR > 115% compared to nonthrowing shoulder
  - Throwing-shoulder ER > 95% compared to nonthrowing shoulder
  - Throwing-arm elbow flexion/extension 100% - 115% compared to nonthrowing arm
  - Throwing-arm wrist flexion/extension and forearm pronation/supination 100% - 115% compared to nonthrowing arm

- Satisfactory clinical examination
  - No pain, tenderness, or effusion
  - Negative laxity testing: prone valgus stress and milking maneuver
  - Negative special test for other elbow or shoulder pathology
  - Physician and rehabilitation team clearance

- Successful completion of all steps in the rehabilitation process

- Satisfactory functional test scores
  - Prone ball-drop test (throwing side 110% or greater compared to the nonthrowing side)
  - One-arm ball throws against the wall using a 0.9 kg (2 lb) plyoball for 30 seconds without pain and exhibiting the ability to maintain 90°/90° arm position without compensation (throwing side greater than 90% of nonthrowing side)
  - Throwing into plyoback rebounder with 0.45-kg (1-lb) plyoball for 30 seconds with no pain, normal mechanics (without substitution) with good control
  - Single-leg step-down for 30 seconds, controlling pelvis and lower extremity alignment for both sides (limb symmetry: 95%+)
  - Prone plank test for time

- Minimum Kerlan-Jobe Orthopaedic Clinic throwers' assessment score of 85

ER: external rotation; IR: internal rotation; ROM: range of motion.

Adapted from: