Ulnar Collateral Ligament Reconstruction
Clinical Practice Guideline

Background Information:
The included guideline is intended for post-operative rehabilitation and includes ulnar collateral ligament reconstruction surgical procedures. Please keep in mind that specific precautions may need to be utilized for each procedure and modifications should be followed as prescribed. Progression through this guideline is time dependent on soft tissue healing as well as criterion-based concerning patient demographics and clinical assessment. Please refer to the surgical note for information regarding each procedure.

Precautions: All ROM is staged for brace and exercise use to allow for appropriate tissue healing and reduce strain to the reconstructed ulnar collateral ligament. When following this guideline different precautions may be needed based on the specific surgical procedure.

- Post-operative brace should be worn for 6-8 weeks (discharged by physician)
- Sterile gauze used at incision site. Always check brace for rubbing/irritation
- Compression garment at elbow per physician authorization
- If autograft taken (palmaris longus or gracilis) consider secondary site and modify treatment accordingly
- All ROM should avoid pain or any sensation of pinching
    - If flexor/pronator detached (ex: Figure-of-8 procedure) then wrist extension should be avoided for 6 weeks
    - Docking procedure may require slower ROM progression per physician guidance
- Observe & report any signs related to ulnar nerve irritation (motor/sensory)
    - If ulnar nerve transposition performed then avoid use of cryotherapy

Phase 1: Immediate Post-Operative (0-3 weeks)

GOALS:

- Protect healing tissue
- Decrease pain/inflammation
- Patient education on postoperative restrictions & brace use
- Limit muscular atrophy

PRECAUTIONS:

- Brace should be worn at all times except for self-care (ex: bathing)
- Limit use of UE, stay within staged ROM goals, and avoid lifting with arm.
- All ROM should avoid pain or any sensation of pinching
- Observe & report any signs related to ulnar nerve irritation (motor/sensory)
- Sterile gauze used at incision site. Always check brace for rubbing/irritation
- Compression garment at elbow per physician authorization
- Avoid weight-bearing through involved upper extremity

Post-Operative to 1 week (Days 1-7)	***Weeks 2 to 3***
Brace ▪ Posterior splint at 90 degrees *ROM* ▪ Wrist AROM extension & flexion ▪ Hamstring gentle ROM/flexibility if gracilis tendon autograft utilized *Strengthening* ▪ Gripping exercises ▪ Shoulder ISOM <u>EXCEPT</u> internal rotation AND external rotation ▪ Scapular clocks (manual resistance) ▪ Stationary bike & Isotonic hamstring, hip abduction, hip extension (avoid if gracilis autograft & avoid UE weight bearing) *Trunk/Core* ▪ Thoracic extension ▪ Sidelying thoracic rotation ▪ Pelvic tilts (supine, seated, standing) ▪ Postural Reeducation *Balance* ▪ Safe & progressive in kneeling, half kneeling & single-leg (avoid if gracilis autograft) *Modalities/cryotherapy PRN*	*Elbow Brace* ▪ <u>Week 2</u>: set at 30° ext (away from 0) and 90° flex ▪ <u>Week 3</u>: set at 10° ext (away from 0) and 110° flex *ROM* ▪ Elbow 5° ext (away from 0) to 125° flex (avoid pinch/pain) *Strengthening* ▪ Scapular retraction ISOM or T-band (shoulder blade pinching; <u>fixed</u> elbow position with brace on) ▪ Continue previous UE & LE exercises (avoid holding onto weight/medicine ball) *Trunk/Core/Balance* ▪ Continue previous exercises *Neuromuscular Reeducation* ▪ Light rhythmic stabilization at end range elbow extension *Modalities/cryotherapy & Light compression PRN*

MILESTONES TO PROGRESS TO PHASE 2:

1. Above ROM guidelines met
2. Low controlled pain (0-2/10)
3. Consistently low swelling

Phase 2: Intermediate (4-8 weeks)

GOALS:

- Gradual increase in ROM to WNL
- Promote healing of repaired tissue
- Regain and improve muscular strength
- Progress general conditioning including lower extremity exercise

PRECAUTIONS:

- Post-operative brace should be worn for 6-8 weeks (discharged by physician)
- Avoid valgus stress to medial elbow
- Slow progression of lower extremity strengthening if gracilis autograft used
- Wrist cuff weight should be used (instead of hand weights) to avoid excessive gripping with strengthening exercises

Post-Operative Weeks 4 to 5	***Weeks 6-7***	***Week 8***
Brace ▪ Elbow set at 10° ext (away from 0) and 120° flex *ROM* ▪ Low-load long duration stretching if lacking elbow ext (forearm in neutral position) ▪ Shoulder IR flexibility PRN (avoid med elbow compression) *Strengthening* ▪ UBE (low resistance) ▪ Continue hand gripping exercises ▪ Wrist isotonic (flex, ext, pronation, supination) ▪ Elbow isotonic (flexion & extension) with end range ext rhythmic stabilization ▪ Prone isotonic scapular exercises (rows, ext, horizontal abd with palm down) ▪ Standing shoulder isotonics (flexion, abduction, scaption all to 90° elevation) ▪ Shoulder ER & IR <u>ISOM</u> in neutral/scapular plane ▪ Supine protraction isotonic (manual resistance <u>ABOVE</u> elbow) *Manual Therapy* ▪ Scar massage *Conditioning* ▪ Initiate elliptical and/or stair stepper ▪ Begin leg press and mini lunges (if gracilis autograft) ▪ Continue core strengthening (No WB through UE) ▪ No upper-body weight-lifting ▪ No holding onto plates, barbell or dumbbells	*ROM* ▪ Full AROM/PROM ▪ Joint mobilizations at end range with distraction PRN ▪ Obtain shoulder ROM within non-dominant arm (see appendix)- DO NOT terminally stretch ER at 90° abd *Strengthening* ▪ Elbow isotonic PREs ▪ Sidelying ER isotonic in neutral/scapular plane (wrist weight or manual resistance) ▪ Shoulder isotonic t-band (IR, ER, horiz abd with palm down; avoid med elbow valgus stress) ▪ Prone scapular stabilization Isotonic (rows, horizontal abd with palm down, flexion at 105° thumb-up position and resistance above elbow) *Neuromuscular Reeducation:* ▪ Rhythmic stabilization- PNF D2 multiple alt ISOM positions (resistance above elbow) *Conditioning* ▪ Initiate a walk to jog progression program (with physician clearance; <u>avoid</u> if gracilis autograft)	*Strengthening* ▪ Seated rows isotonic PREs ▪ Lat pulldowns PREs (hand in front of body) ▪ Prone row with shoulder ER ▪ Shoulder ER & IR isotonic at neutral & 90° abd (avoid valgus stress to elbow) ▪ Begin open chain hamstring strengthening (for gracilis autograft) *Reactive Neuromuscular Reeducation:* ▪ Continue previous ▪ Prone ball drops (flexion, horiz abd with palm down) ▪ Sidelying ER ball drops

MILESTONES TO PROGRESS TO PHASE 3:

1. Full elbow AROM (acceptable level for overhead athlete) and shoulder ROM within non-dominant arm (see appendix)
2. Muscular strength 70-80% bilateral comparison for rotator cuff, scapular stabilizers, and LE (with HHD or 4+/5 MMT)
3. Involved extremity ER to IR ratio > 66% (neutral/scapular plane with HHD)
4. Lower extremity flexibility normalized (hamstring, PF, hip rotation WNL and symmetrical)
5. Seated Thoracic spine rotation AROM 50 degrees bilaterally

Phase 3: Advanced Strengthening (9-16 weeks)

GOALS:

- Maintain full elbow range of motion
- Progression of UE muscular strength, endurance, & power without provocation
- Muscular control without compensation
- General athletic conditioning progression as tolerated

PRECAUTIONS:

- Avoid valgus stress to medial elbow in early stage

Post-Operative weeks 9 to 10	***Weeks 11 to 13***	***Weeks 14 to 16***
ROM ▪ If needed, facilitate elbow extension with humeral ER/supination of wrist (avoid elbow valgus stress- do NOT press at wrist) *Strengthening* ▪ Advance wrist/forearm, elbow, shoulder & scapular stabilization isotonics ▪ Manual resistance PNF D2 pattern (applied proximal to elbow) *Core Strengthening & Conditioning* ▪ For gracilis autograft may begin walk to jog program ▪ Continue LE strengthening *Reactive Neuromuscular Reeducation* ▪ Body blade -<u>Week 9</u> ER & IR at neutral -<u>Week 10</u>: ER & IR at 90° abd & through pitch cycle ▪ Impulse (IR & ER at neutral abd, horizontal abd) ▪ <u>Week 10</u>: Initiate double-arm plyometrics (chest height 2-handed drills)	*Strengthening & Reactive Neuromuscular Reeducation* ▪ Continue previous PREs <u>Week 11</u> ▪ Continue double-arm plyometrics - Add cross-body chops -Add overhead soccer throw ▪ Single-arm overhead wall taps/dribbles (semi-circle) ▪ Initiate single-arm plyometrics -Kneeling free-throws <u>Week 12</u> ▪ Single-arm plyometrics -Supine single-arm catch & toss -Wrist flicks (wrist flex & ext) ▪ Over the shoulder deceleration (1 kg ball to start) ▪ Begin UE CKC stability exercises (fixed distal segment, no elbow flex) <u>Week 13</u> ▪ Continue single-arm plyometrics -Add wall dribbles/ IR at 90° abd	*Strengthening* ▪ Continue previous PREs *Reactive Neuromuscular Reeducation* ▪ Continue single-arm plyometrics ▪ Add UE pitch cycle towel slaps (half-kneel, standing) -Under control -With proper biomechanics *Functional Exercise* ▪ 15 feet baseball throws into rebounder -Address proper UE & LE mechanics If desired UE isokinetic testing can be conducted at week 16

MILESTONES TO INITIATE INTERVAL PROGRESSION PROGRAMS (e.g. throwing)

1. Clearance from physician
2. Muscular strength 80-90% bilateral comparison for rotator cuff, scapular stabilizers, and LE (with HHD or 5/5 MMT)
3. Involved extremity ER to IR ratio $\geq$75% (isokinetic or handheld dynamometry testing)
4. Involved extremity elbow ext to flex ratio > 76% (handheld dynamometry)
5. Able to complete an UE plyometric progression program with proper pitch cycle biomechanics

Phase 4: Return to Activity (weeks 18+)

GOALS:

- Continuation of strengthening program
- Initiation of overhead activity through an interval progression program (e.g. throwing)
- Gradually increase tissue exposure to velocity dependent functional activity
- Full UE ROM maintained

PRECAUTIONS:

- Follow interval sport progression program for intensity (% of effort/distance for throw) and frequency
- Follows soreness rules for progression in the interval progression program
- If pain/numbness/tingling present immediately stop and report to medical staff
- Perform UE & LE dynamic warm-ups prior to throwing & strengthening after throwing

Post-Operative weeks 18+

Functional Activity/Interval Throwing Program

Week 18: If criteria is met may begin interval sport progression program (e.g. throwing)

- Mechanics must be monitored to avoid undue valgus stress to medial elbow
- Program must start on flat ground
- Follow soreness rules for progression
- Do not throw beyond 120 feet

9 months (36 weeks): Initiate throwing from pitching mound

- Continue to monitor for proper mechanics & follow soreness rules for progression
- Fastballs only and no simulated batting practice

45 weeks: Continue throwing from pitching mound

- Add off-speed pitches
- Continue to monitor for proper mechanics & follow soreness rules for progression
- No simulated throwing against batter

46 to 50 weeks: Simulated innings/Bullpen

- No throwing against live batter
- Start with 1 inning then progress 1 addition inning per week

50 to 52 weeks:

- Simulated games based on position of starter, reliever, or closer
- No throwing against live batters

12 + Months:

- Progress to live batters

MILESTONES TO RETURN TO SPORT

1. Maintenance of previous strength (>90 % bilateral comparison, unilateral ER to IR ratio $\geq$75%, unilateral elbow ext to flex >76%)
2. Maintenance of previous ROM
3. Completion of throwing progression program

Appendix:

The Overhead Athlete:	**Side to side differences (throwing arm vs non-dominant arm)**
Total rotational ROM at 90° abd (ER plus IR)	< 5 degrees
Shoulder flexion	≤ 5 degrees
Shoulder ER	5 degrees more
Horizontal Adduction	<15 degrees
Elbow extension	Sometimes a lack of 5-10 degrees may be present & functional for the baseball athlete (do not force if pinch or firm end feel present)

References:

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