

# ACUTE ELBOW INSTABILITY ARISES FROM A TRAMAUTIC INCIDENT, USUALLY A FALL ON AN OUTSTRETCHED ARM


-RIET SHOULDER AND ELBOW 2017

## SIMPLE DISLOCATIONS

“Simple” dislocations only disrupts soft tissue, and have no associated fracture. the majority of these patients can be treated without surgical intervention.

## COMPLEX DISLOCATIONS

“Complex” dislocations have disruption of soft tissue AND a bone fracture. These patients are more likely to need surgical intervention and often have a longer recovery.

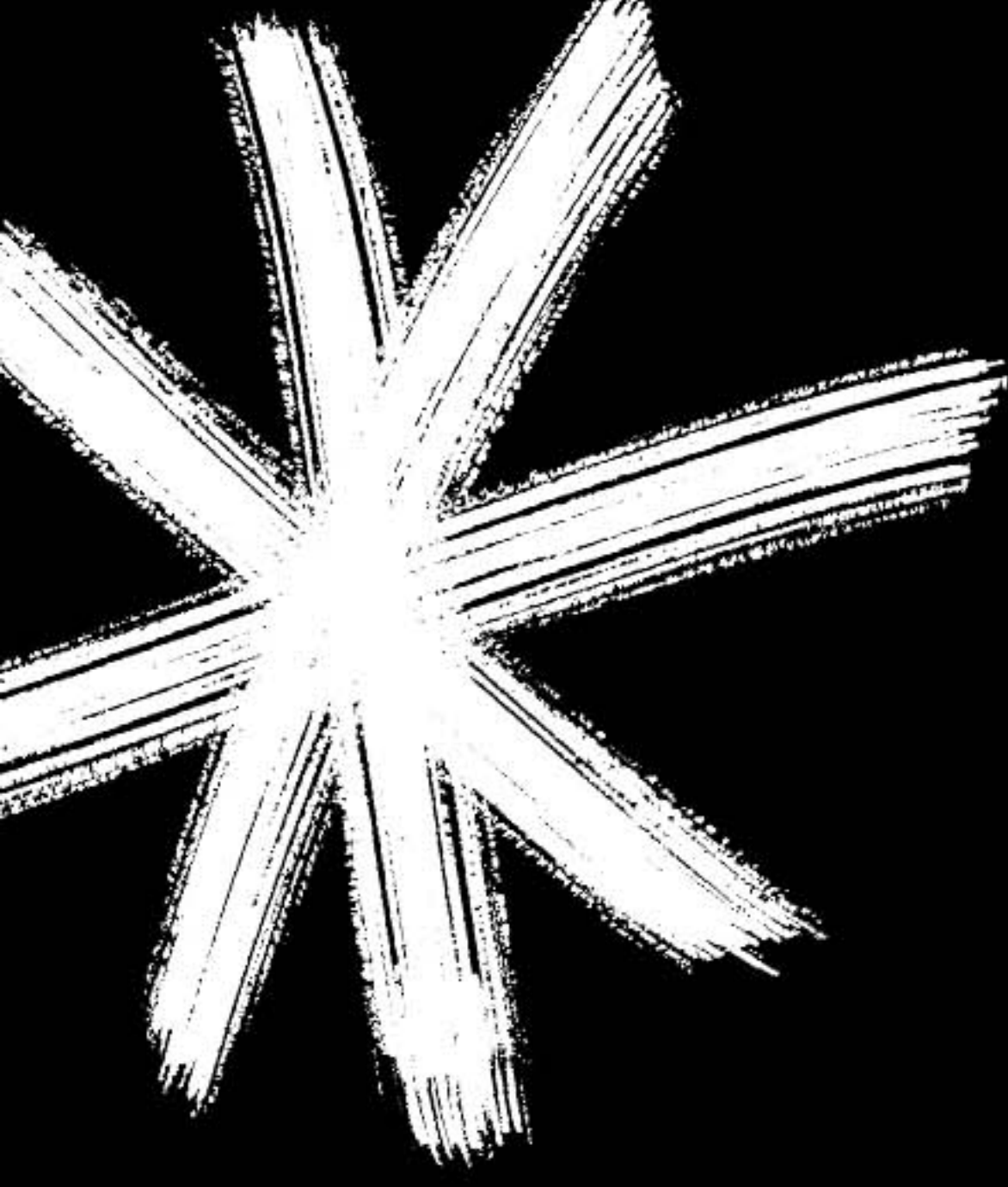


AN ELBOW DISLOCATION HAS A DISRUPTION OF THE SOFT TISSUE, BONE, OR BOTH THAT OFTEN BEGINS ON THE LATERAL SIDE OF THE ELBOW AND PROGRESSES TO THE MEDIAL SIDE.

-O'DRISCOLL ET ALL 2000

CHRONIC INSTABILITY IS RELATIVELY RARE, BUT CAN OCCUR WHEN THE **LIGAMENTS DO NOT HEAL PROPERLY**. SYMPTOMS FROM RECURRENT ELBOW INSTABILITY ARE ASSOCIATED WITH LATERAL ELBOW PAIN, CLICKING OR WEAKNESS.

-RIET 2017



**ELBOW DISLOCATION IS THE MOST COMMON JOINT DISLOCATION IN PEDIATRIC PATIENTS AND THE SECOND MOST COMMON IN ADULT PATIENTS.**

-WAYMACK ET ALL 2020

### PATIENTS WHO MAY BENEFIT FROM ELBOW INSTABILITY SURGERY

High energy injury causing an elbow to be unstable after reduction, can occur from falls from height, motor vehicle accident, or sports injury

Previous failed attempts at reduction or surgical repair of dislocation

Multi directional instability

Complex dislocations with associated fracture



# ELBOW INSTABILITY REPAIR

## PHYSICAL THERAPY PROTOCOL

At UAMS | Health and Train · Recover · Move, our goal is to create an environment that is safe for the healing structures, exciting for the patient, and able to provide an open and transparent line of communication with the therapist and physician. If you ever have any questions or concerns, please feel free to give us a call and we would be more than happy to discuss any concerns or questions you might have.

## OUR PROTOCOL CAN BE DIVIDED INTO FOUR DISTINCT AND SEPARATE PHASES:

<i>PHASE 1</i>	<i>PHASE 2</i>	<i>PHASE 3</i>	<i>PHASE 4</i>
<b>PROTECT</b>	<b>EARLY MOTION</b>	<b>LATE MOTION</b>	<b>STRENGTH</b>
DAY 1 - WEEK 3	WEEK 3 - WEEK 6	WEEK 6 - WEEK 12	WEEK 12+

### BEFORE WE DIVE INTO THE DETAILS OF THE SEPARATE PHASES, WE WOULD LOVE TO ANSWER SOME COMMON QUESTIONS OUR PATIENTS OFTEN ASK WHEN CONSIDERING THIS SURGERY AND REHABILITATION PROCESS:

#### DO I REALLY NEED TO WEAR MY SPLINT/BRACE?

Based on the specifics of the surgery, you will be placed in a non-removable cast for the first 2 weeks following your surgery. The cast will be replaced with a posterior long arm splint by your physician at your follow-up appointment. This posterior long arm splint is to be worn for the next 3-4 weeks depending on the guidelines from your physician.

We recommend you wear the posterior long arm splint at all times. Unwanted movements can place increased stress on healing musculoskeletal tissues that can delay healing times.

You may take your arm out of the splint for exercises (prescribed by your surgeon/physical therapist), for using ice/heat, dressing, and for showering.

#### IS IT NORMAL FOR MY ELBOW TO BE SO STIFF WHEN I AM OUT OF THE SPLINT?

Following a period of bracing/inactivity in a joint, it is normal to have range of motion limitations.

These range of motion limitations can occur due to muscle, joint, tendon, or skin that is placed in a shorted position for an extended period.

One of the earliest goals after surgery is to limit the effects of immobilization. Talk with your surgeon/physical therapist about the importance of early elbow mobility and home exercise compliance.

Early range of motion activities nourish articular cartilage and assist in synthesis, alignment, and organization of collagen tissue (Wilk 2012 Rehab of OH Elbow).

#### WHAT MOVEMENTS DO I NEED TO AVOID EARLY AFTER SURGERY?

Unwanted movements can place increased stress on healing musculoskeletal tissues in the elbow. Avoid movements that place an increased stress on the lateral elbow; including holding a cup of coffee, pushing up from a chair, twisting open a door knob or jar, pushing open a door, etc...

Avoid movements such as reaching up your back or behind your head. If you are at a computer, keep your elbow by your side during the initial six weeks.

Depending on where you are during your phase of rehabilitation, the limitations placed on your elbow will change.

#### WHEN DO I BEGIN PHYSICAL THERAPY?

Physical Therapy will begin depending on your type of elbow instability surgery. Generally, therapy will begin sometime between 3-6 weeks following surgery.

The frequency of how often and when a patient starts physical therapy can be adjusted by your surgeon.

#### HOW OFTEN DO I NEED TO GO TO PHYSICAL THERAPY?

The frequency of physical therapy will typically start at two-three times a week. This frequency can also be adjusted by your surgeon or your physical therapist's recommendations.

Once strength training begins, the patient's frequency can be reduced to one-two times a week depending on goals met, home exercise compliance, and surgeon / therapist recommendations.

## WHEN CAN I START STRENGTHENING?

You will begin early strength / endurance training of the elbow and shoulder during six-twelve weeks after surgery depending on progress made towards goals, home exercise compliance, and surgeon / therapist recommendations.

## IS THERE ANYTHING ELSE I NEED TO AVOID AFTER MY SURGERY?

We encourage any patient who smokes to avoid smoking after surgery for the first twelve weeks. Smoking can correlate with delayed and improper tissue healing.

## I HAVE FRIENDS WHO HAVE HAD AN ELBOW SURGERY... WILL MY EXPERIENCE BE LIKE THEIRS?

There are several factors that are specific to the patient that will affect their recovery. Some of these factors can include the surgical approach, the quality of the tissue, presence of fractures, the mechanism of injury, degree of displacement, and prior level of function.

Your physical therapist will work with you to develop a plan of care based on your specific limitations following the surgery.

# PHASE 1 - PROTECT

DAY 1 - WEEK 3



## GOALS

- Protect surgical repair by avoiding unwanted strain to the involved structures
- Manage post-operative pain/wean off medication
- Address cervical/thoracic posture and mobility

## THINGS TO AVOID

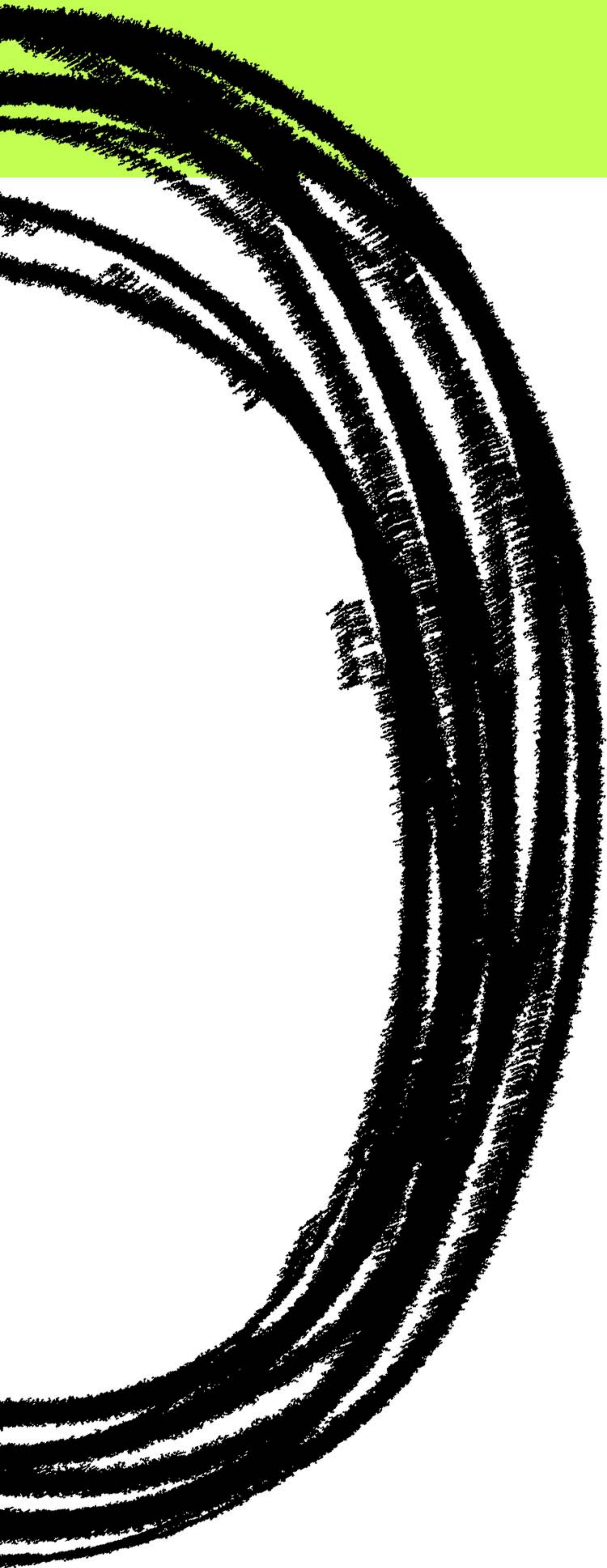
- No lifting, pushing, or pulling anything
- No jogging, running, or active sports participation
- Avoid sleeping on the surgical side to avoid unwanted stresses placed on the elbow

## BOTTOM LINE

- You will be wearing a non-removable surgical cast for these first 2 weeks.
- Your surgeon will remove your cast at your 2 week follow up and place you in a removable posterior splint. This splint is to remain worn at all times until your first physical therapy visit.
- Your elbow **will be stiff** upon removal from the surgical cast. This is normal and expected at this point.

# PHASE 2 - EARLY MOTION

WEEK 3 - WEEK 6



## GOALS



- Discharge from cast into a removable posterior elbow splint
- Protect surgical repair by avoiding unwanted strain to the involved structures
- Begin to restore active and passive mobility in the elbow in protected ranges
- Minimize effects of elbow immobilization and muscle atrophy
- Manage pain and inflammation

## THINGS TO

## AVOID

- No lifting, pushing, or pulling anything
- No jogging, running, or active sports participation
- Avoid positions that place increased stress on lateral elbow (examples: bringing a cup of coffee to your mouth or pulling up your pants)
- No weight bearing through the elbow
- No strengthening of the shoulder, elbow, or wrist

## THINGS TO BE DOING



- Come out of the splint multiple times a day to perform elbow mobility exercises. Elbow flexion range of motion limitations are commonly found in this phase; it is important to begin early recovery of elbow ROM.
- Begin formal physical therapy at 2-3x a week at this time.
- Wear your splint at all times; except when performing home exercises, dressing, or showering.
- We encourage you to tease, touch, and nudge any pain you might experience. Please do not push through or into pain. Do not be aggressive with any mobility exercises that might cause muscle spasms or produce sharp pains in the elbow.
- We recommend active-assistive ROM exercises over passive ROM to recruit the muscles for dynamic stabilization.

# WEEK 3 THERAPY EXPECTATIONS

**BEGIN FORMAL PHYSICAL THERAPY**

**ADDRESS INCISION SITE MOBILITY, DRAINAGE, EXCESSIVE REDNESS, OR DISCOLORATION**

**PATIENT POSITIONED IN SEATED, RECLINE, OR SUPINE**

**BEGIN HOME EXERCISE PROGRAM THAT IS TO BE COMPLETED 2-3 TIMES PER DAY**

**Supine elbow active-assistive ROM exercises for flexion and extension at 90 degrees of shoulder flexion; seated supination and pronation.**

Do not allow the elbow to cross midline or rest in excessive internal rotation to limit varus stresses on the elbow (Wolff 2006).

**Submaximal and pain free isometric contractions**

Elbow: flexion and extension muscles

Wrist: flexion, extension, pronation, supination muscles

Shoulder: flexion, extension, abduction

Avoid external and internal rotation early on to reduce unwanted elbow stresses

**Shoulder active, active-assistive, and passive mobility exercises**

Avoid excessive external and internal rotation of the shoulder to limit fulcrum at the elbow

**Wrist pain free and submaximal isometrics**

**Scapular squeezes, depression, and rolls**

**Ice, tool assisted manual therapy, and modalities as needed**

Kinesiotaping, soft tissue manual edema mobilization, TENS, etc.

# WEEK 4 THERAPY EXPECTATIONS

**CONTINUE TO MONITOR INCISION SITES HEALING PROGRESSIONS**

**ASSESS PATIENT COMPLIANCE AND UNDERSTANDING WITH HOME EXERCISE PROGRAM**

**Patient needs to perform exercises 2-3x a day for best prognosis towards regaining elbow mobility**

**CONTINUE HOME EXERCISE PROGRAM**

**Grade I and II mobilizations for pain management**

**Continue with isometrics; no external resistance**

**Continue with elbow supine active-assistive mobility exercises**

**Address patient specific mobility deficits on adjacent joints**

Grade I-IV mobilizations at the GHJ and RC joints at tolerated. Cervical and thoracic mobilizations as needed and guided by clinical examination and history.

**Continue with ice, tool assisted manual therapy, and modalities as needed**

# WEEK 5 THERAPY EXPECTATIONS

## FINALIZE INCISION HEALING PROGRESSIONS

## ASSESS PATIENT COMPLIANCE AND UNDERSTANDING WITH HOME EXERCISE PROGRAM

Patient needs to perform exercises 2-3x a day for best prognosis towards regaining elbow mobility

## PATIENT MAY BE POSITIONED IN ALL POSITIONS (EXCEPT DIRECTLY ON INVOLVED SIDE) AS TOLERATED DURING INTERVENTIONS

## CONTINUE HOME EXERCISE PROGRAM

Grade I and II mobilizations

Continue with isometrics

Continue with elbow supine active-assistive mobility exercises

### PNF Patterns as tolerated

Contract hold relax, alternating isometrics, rhythmic stabilization for the shoulder.

Continue to avoid excessive external and internal rotation  
Early re-establishment of scapular proprioception and neuromuscular control (Wilk 2012)

Continue to address patient specific mobility deficits

Continue with ice, tool assisted manual therapy, and modalities as needed

# PHASE 3 - LATE MOTION

WEEK 6 - WEEK 12

## GOALS

Discharge from posterior splint

Protect surgical repair until strength and mobility is full

Achieve maximum gains in elbow ROM

Begin gradually restoring upper extremity strength and stability with a progressive program

By 6-8 weeks, any bone fracture should be finished healing and ligament repair in the maturation phase of healing



# THINGS TO AVOID

No lifting, pushing, or pulling anything greater than 1-2 lbs

No upper body weight bearing

No sudden jerking or uncontrolled movements through the elbow

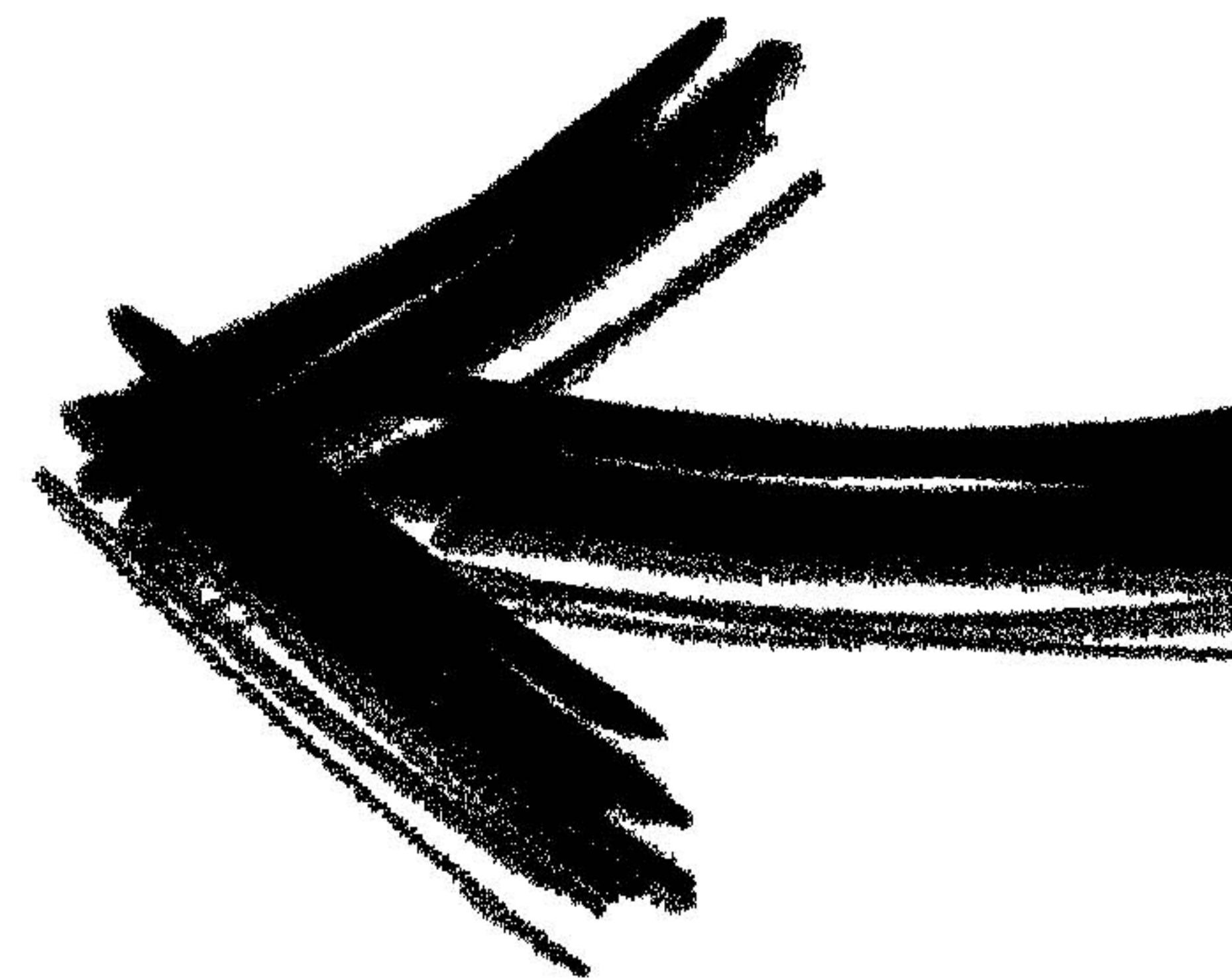
## THINGS TO BE DOING

Return to normal activities of daily living with the affected side.

Progressive strengthening exercises will be added gradually to your home exercise routine; to be performed 1-2x a day.

If elbow mobility deficits persist; continue with home elbow mobility exercises to be performed 4-5x a day with increased aggressiveness to prevent stiffness.

Physical therapy frequency can be reduced to 1-2x a week depending on patient progress and good compliance with home exercise program.



## WEEK 6-12 THERAPY EXPECTATIONS

### JOINT MOBILIZATIONS AND MANUAL THERAPY AS NEEDED TO ADDRESS MOBILITY, PAIN, AND GUARDING DEFICITS

Grades I-IV mobilizations

Instrument assisted soft tissue mobilizations

### ACTIVE AND ACTIVE-ASSISTED ELBOW AND SHOULDER MOBILITY WITHOUT RESTRICTION

ROM exercises can be performed in any plane of motion

Wall / table slides

Ball rolls

Recumbent bike

Gravity assisted elbow extension in sitting

### PASSIVE ELBOW MOBILITY WITHOUT RESTRICTIONS

Doorway elbow extension stretches

Pulleys

### Low load long durational stretching

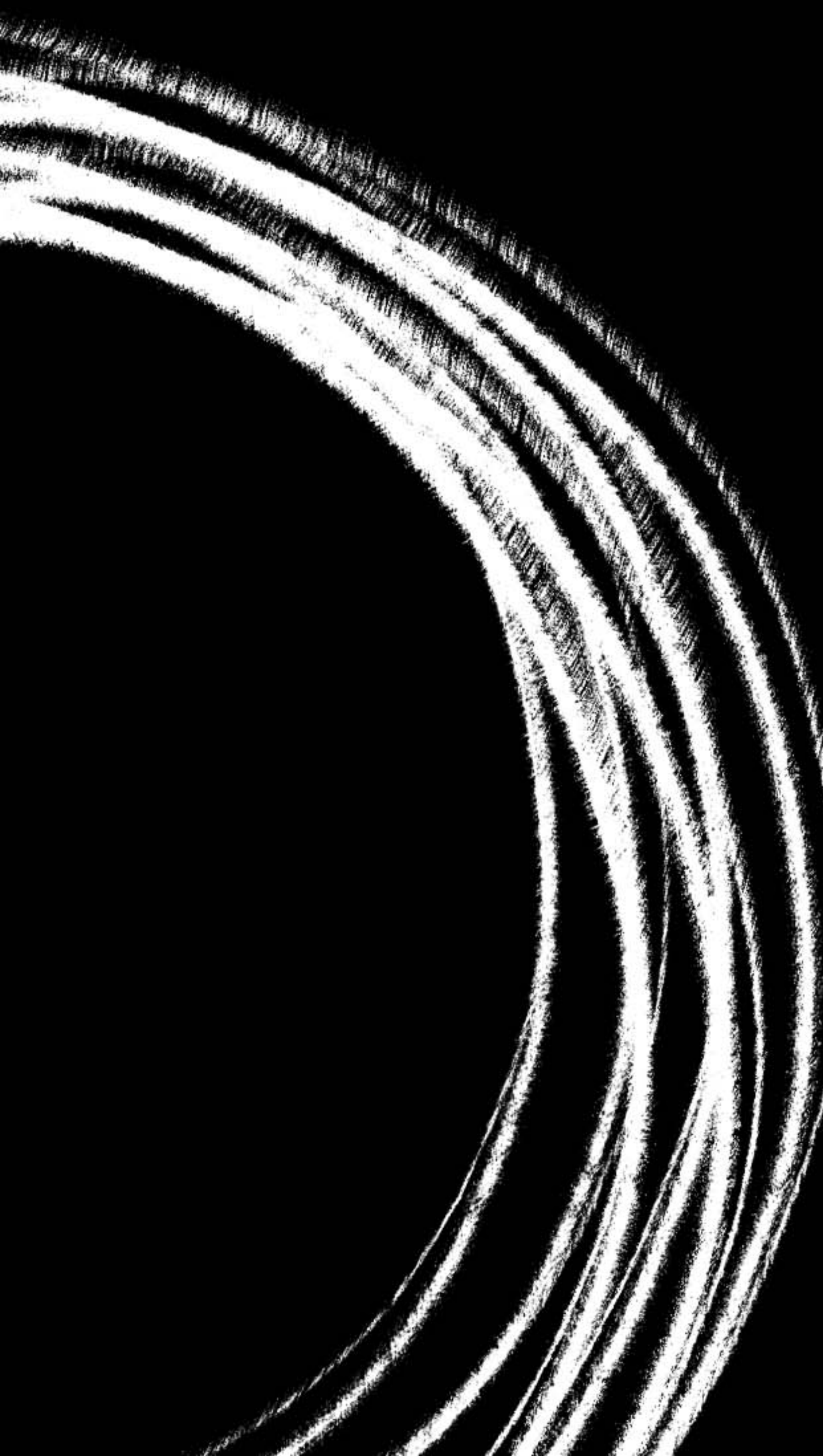
Performed for elbow extension in pronation to isolate and maximize stretch on the elbow joint

Avoid full elbow extension with supination so radial head is not placed at risk for instability

Consider sports specific requirements into stretching

Banded step ups

Banded kettlebell drags



## PROGRESSIVE STRENGTHENING EXERCISES FOR THE SHOULDER, ELBOW, AND WRIST

**Begin progressing isometric exercises towards isotonic contractions; beginning with concentric and progressing towards eccentric**

Begin wrist and shoulder progressions at week 6

Begin elbow progressions at week 8 (based on musculoskeletal tissue healing recommendations)

**Low intensity and high repetition recommended early on**

**Thrower's Ten Program**

## NEUROMUSCULAR CONTROL

### PNF Patterns

Rhythmic stabilization and D1 / D2 in multiple planes of movement  
Standing, lunge, supine, etc.

Manual resistance for elbow / wrist flexion and extension drills

Avoid excessive stressing of the shoulder rotators

## SCAPULAR STABILITY/STRENGTHENING PROGRESSIONS

**Three-way rowing**

**Serratus wall slides**

**Bilateral shoulder external rotation**

**Prone I's Y's T's**

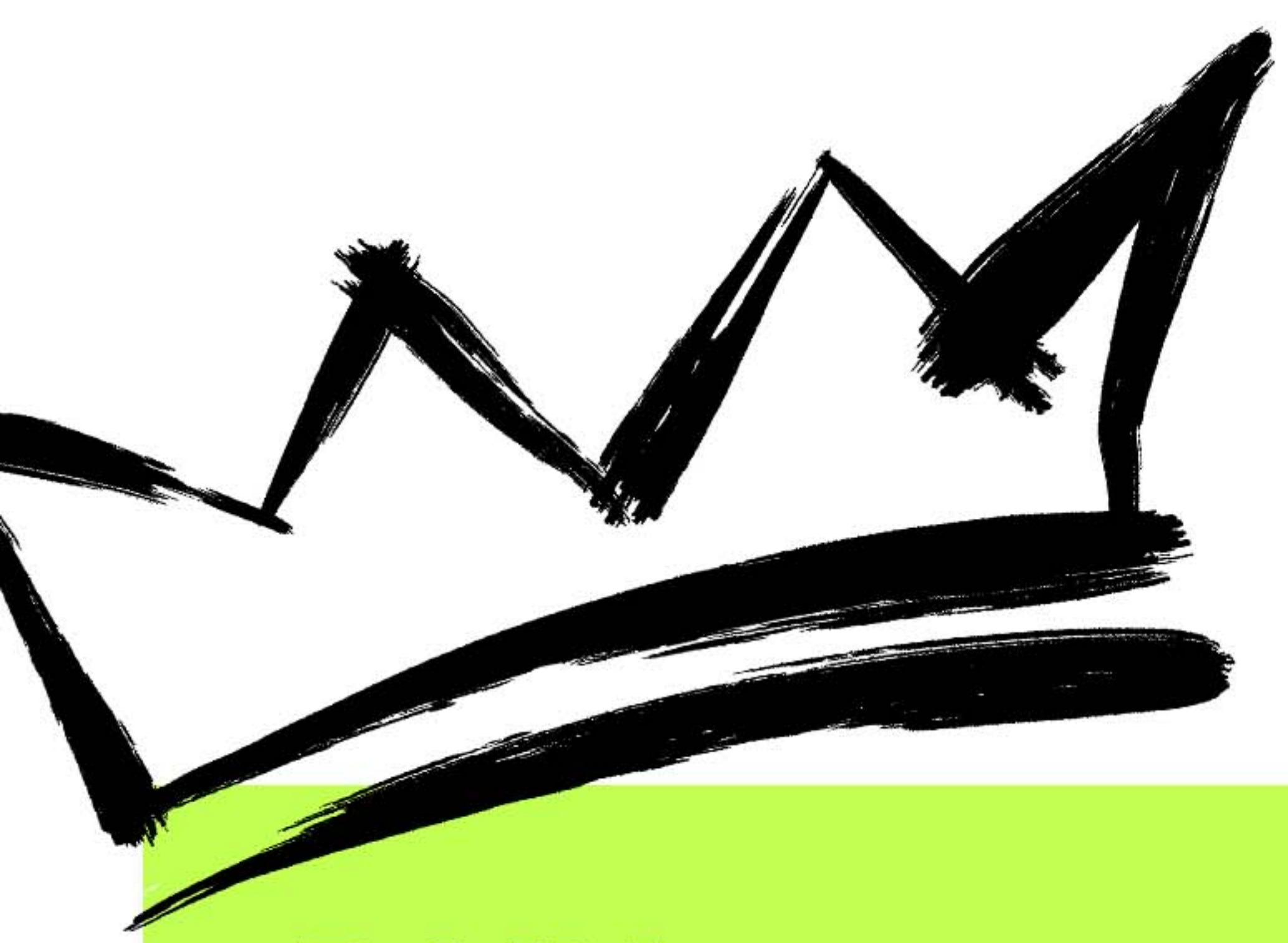
**Wall push ups**

## REGIONAL INTERDEPENDENCE

**Progressive lower extremity cardiovascular endurance**

**Progressing back into jogging / running**

**Sports specific lower extremity requirements**



**IF ROM DEFICITS LAG STAGED ROM GOALS, THE CLINICIAN NEEDS TO DETERMINE IF PAIN OR STIFFNESS IS THE PRIMARY BARRIER AND MODIFY INTERVENTIONS ACCORDINGLY**

### PAIN PREDOMINATES

NOTIFY THE MD

REVIEW EARLY EDUCATIONAL TOPICS

ASSESS ANY PATIENT REPORTED SENSATIONS OF "INSTABILITY" OR EMPTY END FEELS

PAIN CONTROL MODALITIES AND INTERVENTIONS  
GRADES I AND II JOINT MOBILIZATIONS  
PAIN FREE ELBOW ACTIVE-ASSISTED ROM EXERCISES  
CERVICAL / THORACIC / GHJ MANUAL THERAPY AS INDICATED BY PATIENT SPECIFIC FINDINGS



### STIFFNESS PREDOMINATES

INCREASE FREQUENCY / DURATION OF HOME EXERCISE STRETCHES

ADD LOW LOAD LONG DURATIONAL STRETCHING AT HOME  
RECOMMENDED 15 MINUTE STRETCH, 4 TIMES PER DAY

GHJ / RC JOINT MOBILIZATIONS

INCREASE LENGTH OF STRETCHES BY 15-30 SEC / REPETITION

THERAPY APPOINTMENTS 2-3X / WEEK

CONTINUE UNTIL ROM GOALS HAVE BEEN MET

IF PATIENT DOES NOT HAVE ANY ROM PROGRESSIONS ON WEEKLY BASIS...  
REACH OUT TO PHYSICIAN REGARDING EXTENSION BRACE



# PHASE 4 - STRENGTHENING

WEEK 12+



## GOALS

PROTECT SURGICAL REPAIR UNTIL STRENGTH AND MOBILITY IS FULL

CONTINUE TO GRADUALLY RESTORE MOBILITY, STRENGTH, POWER, ENDURANCE, AND NEUROMUSCULAR CONTROL OF THE UPPER EXTREMITY

BEGIN FUNCTIONAL OUTCOME MEASURE TESTING TO ADDRESS PATIENT SPECIFIC LIMITATIONS IN OPEN VS CLOSED KINETIC CHAIN

FOCUS ON RETURN TO SPORT REQUIREMENTS FOR ATHLETES

## THINGS TO AVOID

NO SUDDEN JERKING OR UNCONTROLLED JERKING MOVEMENTS THROUGH THE ELBOW

## THINGS TO BE DOING

Continue to normal activities of daily living with the affected side

Progress gradually into upper extremity weight bearing positions and exercises

Physical therapy frequency can be reduced to 1-2x / week depending on patient progress and good compliance with home exercise program.

Progressive strengthening exercises will be gradually added to your home exercise routine

Home exercise resistance equipment may include Thera bands, free weights, and self-body weight

Discuss return to sports participation plan with your surgeon and physical therapist.

## WEEK 12+ THERAPY EXPECTATIONS

### GRADUAL PROGRESSION OF ELBOW FLEXION AND EXTENSION ISOTONIC EXERCISES

Higher resistance of weights / bands, eccentric contractions, varying speeds of contraction

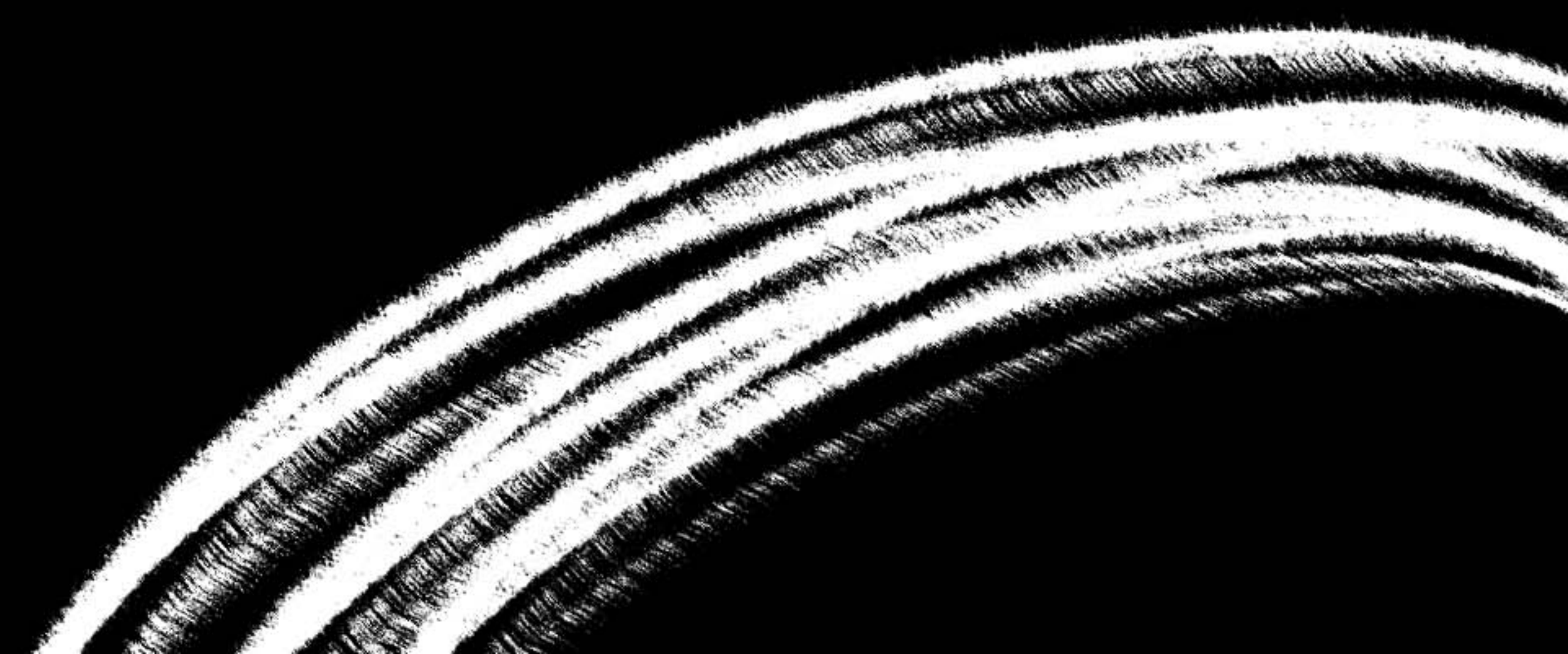
### GRADUAL PROGRESSION OF SCAPULAR STRENGTHENING / STABILITY EXERCISES

#### Closed kinetic chain upper extremity progressions

Begin quadruped and progress towards push up position  
Scapular protraction / retraction

#### Advanced Thrower's Ten Program

Prone / gravity maximized scapular strengthening



## **NEUROMUSCULAR CONTROL**

### **PNF Patterns**

Rhythmic stabilization and D1 / D2 in multiple planes of movement  
Standing, lunge, supine, etc.

Manual resistance for elbow / wrist flexion and extension drills

## **REGIONAL INTERDEPENDENCE**

**Progressive lower extremity cardiovascular endurance**

**Sports specific lower extremity requirement drills**

## **PLYOMETRIC EXERCISES (LATE STAGE: RECOMMENDED AT WEEK 18+)**

### **Start with 2 hand and light weighted medicine ball**

Chest passes  
Side to side throws  
Overhead soccer throws

### **Progress gradually towards 90/90 single arm**

Single arm throws with rhythmic stabilization  
Wall dribbles  
Lateral throws

**Goal: teach patient to control valgus / varus stresses placed on the elbow produced by the ball**

**IF THIS PATIENT IS AN OVERHEAD OR THROWING ATHLETE AND YOU WISH TO CONTACT US ABOUT OUR THROWING OR GOLF PROGRESSIONS AFTER THE PHYSICAL THERAPY PROTOCOL, PLEASE FEEL FREE TO CONTACT US.**

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**ATTN: BLAKELEY KNOX**

**TRM**  
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