Rehabilitation Protocol for Proximal Humeral Fracture Open Reduction Internal Fixation (ORIF)

This protocol is intended to guide clinicians through the post-operative course for Proximal Humeral Fracture Open Reduction Internal Fixation (ORIF). This protocol is time based (dependent on tissue healing) as well as criterion based. Specific intervention should be based on the needs of the individual and should consider exam findings and clinical decision making. The timeframes for expected outcomes contained within this guideline may vary based on surgeon's preference, additional procedures performed, and/or complications. If a clinician requires assistance in the progression of a post-operative patient, they should consult with the referring surgeon.

The interventions included within this protocol are not intended to be an inclusive list. Therapeutic interventions should be included and modified based on the progress of the patient and under the discretion of the clinician.

Considerations for the Post-operative Proximal Humeral Fracture ORIF
Many different factors influence the post-operative rehabilitation outcomes, including pre-operative bone health, blood supply, pre-operative shoulder range of motion (ROM), strength, and function. Other individual considerations include patient age and co-morbidities, such as: increased BMI, smoking, and diabetes. It is recommended that clinicians collaborate closely with the referring physician regarding specific ROM or loading guidelines for each individual case.

Post-operative considerations
If the patient develops a fever, unresolving numbness/tingling, excessive drainage from the incision, uncontrolled pain or any other symptoms you have concerns about you should contact the referring physician.

PHASE I: IMMEDIATE POST-OP: Initial ROM (1-4 WEEKS AFTER SURGERY)

Rehabilitation Goals	• Minimize pain and inflammatory response • Protect fracture and optimize bony healing • Restore shoulder passive range of motion (PROM) • Maintain elbow, wrist and hand function
Sling	• Wear sling for at least 3 weeks. Sling should be taken off at least four times per day to perform exercises and daily activities such as eating, dressing, and bathing
Precautions	• No abduction past 90 degrees • Shoulder ER 0-40 degrees • No lifting greater than 1lb • No driving until adequate ROM, sling is discharged, and no narcotic pain medication is being used • No motions into painful ranges
Interventions	*Pain/Swelling management* • Cryotherapy and Modalities as indicated *Range of motion/Mobility* • Shoulder PROM • Shoulder Pendulums • Elbow, wrist and hand AROM *Strengthening*

	• Ball squeezes • Scapular retraction and mobility exercises
Criteria to Progress	• Wean from sling at 4 weeks • Adequate pain control • Full elbow AROM • Shoulder PROM flexion to 140 degrees, ER to 40 degrees, abduction to 90 degrees

PHASE II: INTERMEDIATE POST-OP: AAROM and AROM (4-8 WEEKS AFTER SURGERY)

Rehabilitation Goals	• Full shoulder PROM • Initiate shoulder active assisted range and active range of motion (AAROM/AROM) • Start active range of motion at 6weeks • Initiate gentle elbow isotonic strengthening • Initiate shoulder isometrics • Minimize compensatory motions of involved upper extremity • Encourage return to normal ADL's within lifting precautions
Precautions	• No lifting greater than 2lbs before 6 weeks • Start shoulder AROM at 6 weeks post-op • No forceful end range over pressure to involved shoulder • No isotonic strengthening of the shoulder
Additional Interventions **Continue with Phase I interventions*	*Range of motion/Mobility* *AAROM* • Lawn chair progression • Table slides, rail slides, wall slides • Pulleys *AROM* • Supine shoulder AROM flexion • Side-lying shoulder ER with towel roll under arm • Side-lying shoulder abduction to 90º • Side-lying shoulder flexion • Low punch *Strengthening* • Shoulder isometric flexion, Shoulder isometric extension, Shoulder isometric IR, Shoulder isometric ER • Biceps curls • Triceps extension • Prone Rows
Criteria to Progress	• Full Shoulder PROM • Full elbow AROM • Adequate pain control • Good tolerance to shoulder isometrics and elbow strengthening

PHASE III: LATE POST-OP: Initial Strengthening (8-12 WEEKS AFTER SURGERY)

Rehabilitation Goals	• Full shoulder AROM • Initiate shoulder strengthening

	• Progress elbow and wrist strengthening • Adequate pain control
Precautions	• No lifting greater than 10lbs • No painful or forceful stretching • No excessive weight bearing on involved extremity
Additional Interventions **Continue with Phase I-II Interventions*	*Range of motion/Mobility* *AAROM* • Standing shoulder flexion with dowel • Standing shoulder abduction with dowel *AROM* • Standing shoulder elevation • Standing shoulder PNF diagonals • Prone I, Prone Y, Prone T *Stretching* • Doorway Stretch • Pec/biceps stretch • Cross body stretch *Strengthening* • Rows • Straight arm pull-down • Resisted shoulder ER, Resisted shoulder IR: neutral shoulder position • Low punch with resistance • Supine shoulder protraction
Criteria to Progress	• Full shoulder AROM with appropriate mechanics • No pain or compensatory strategies with strengthening exercises

PHASE IV: Advanced Strengthening (12 WEEKS AFTER SURGERY)

Rehabilitation Goals	• Progress shoulder strength with heavier resistance and compound movements • Return to normal functional activities • Continue to improve shoulder ROM if needed
Additional Interventions **Continue with Phase II-III interventions*	*Strengthening* • Rhythmic stabilizations • Push up progression: Wall, counter top, knees, high plank • High plank stability progression • Scaption raises • Resisted shoulder diagonals • Resisted shoulder ER @ 90 deg, Resisted shoulder IR @ 90 deg • Quadruped stability progression • Shoulder plyometrics • Interval return to sports training if appropriate
Criteria to Progress	• 80% or > strength of involved upper extremity compared to uninvolved arm with dynamometry testing • No pain with progressive strengthening exercises • Low level to no disability score on patient reported outcome measure (e.g. Quick DASH)

Contact	Please email MGHSportsPhysicalTherapy@partners.org with questions specific to this protocol

References:

Canbora MK, Kose O, Polat A, Konukoglu L, Gorgec M. Relationship between the functional outcomes and radiological results of conservatively treated displaced proximal humerus fractures in the elderly: A prospective study. Int J Shoulder Surg. 2013 Jul;7(3):105-9. doi: 10.4103/0973-6042.118911. PMID: 24167402; PMCID: PMC3807944.

Handoll HH, Ollivere BJ, Rollins KE. Interventions for treating proximal humeral fractures in adults. Cochrane Database Syst Rev. 2012 Dec 12;12:CD000434. doi: 10.1002/14651858.CD000434.pub3. Update in: Cochrane Database Syst Rev. 2015;11:CD000434. PMID: 23235575.