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## **REHABILITATION PROTOCOL: Clavicle Fracture Open Reduction Internal Fixation (ORIF)**

This protocol is intended to guide clinicians through the post-operative course for Clavicle 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 Clavicle 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.

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

<b>Rehab Goals</b>	<ul style="list-style-type: none"> <li>Minimize pain and inflammatory response</li> <li>Protect fracture and optimize bony healing</li> <li>Restore shoulder passive range of motion (PROM)</li> <li>Maintain elbow, wrist and hand function</li> </ul>
<b>Sling</b>	<ul style="list-style-type: none"> <li>Wear sling during the day and at night for sleeping.</li> <li>Wear sling for at least 3 weeks.</li> <li>Sling should be taken off at least four times per day to perform exercises and daily activities such as eating, dressing, and bathing</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>No active motion of involved shoulder</li> <li>No lifting or carrying objects with involved arm</li> <li>No weight bearing through involved arm</li> <li>No shoulder flexion or abduction beyond 90 degrees</li> </ul>
<b>Interventions</b>	<p>Pain/Swelling management</p> <ul style="list-style-type: none"> <li>Cryotherapy and Modalities as indicated</li> </ul> <p>Range of motion/Mobility</p> <ul style="list-style-type: none"> <li>PROM: ER and IR in the plan of the scapular to tolerance. Flexion/Scaption/abduction <math>\leq 90</math> degrees. Table slides, pendulums</li> <li>AAROM: Shoulder ER c dowel/cane in neutral</li> <li>AROM: Elbow, wrist, hand, and cervical AROM</li> </ul> <p>Strengthening (Week 2)</p> <ul style="list-style-type: none"> <li>Elbow, wrist, hand: resisted wrist extension, resisted wrist flexion, resisted pronation/supination, ball squeezes</li> </ul> <p>Cardio</p> <ul style="list-style-type: none"> <li>Walking with arm in sling</li> <li>Recumbent bike with arm in sling</li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>90 degrees PROM Flexion/Scaption</li> <li>30 degrees shoulder PROM ER</li> <li>IR PROM to belt line</li> <li>&lt; 4/10 pain at rest</li> <li>Full elbow, wrist and hand AROM</li> </ul>

**PHASE II: INTERMEDIATE POST-OP: AAROM and AROM (5-8 WEEKS AFTER SURGERY)**

<b>Rehab Goals</b>	<ul style="list-style-type: none"> <li>Wean from sling</li> <li>Progress shoulder PROM, AA/AROM</li> <li>Improve distal arm strength</li> </ul>
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	<ul style="list-style-type: none"> <li>• Decrease pain</li> </ul>
<b>Sling</b>	<ul style="list-style-type: none"> <li>• Continue to use sling for sleep up until 6 weeks post op</li> <li>• Can wean from sling throughout the day and discharge sling completely at 6 weeks post op</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• <b>No lifting or carrying objects &gt; a coffee cup with involved arm</b></li> <li>• <b>No forceful stretching of involved shoulder or positions that cause pain</b></li> </ul>
<b>Interventions</b> *Continue with Phase I Interventions	<p>Range of motion/Mobility</p> <ul style="list-style-type: none"> <li>• PROM: Full shoulder PROM in all planes of motion per tolerance</li> <li>• AAROM: Supine shoulder flexion with dowel (Lawn Chair progression), standing shoulder flexion with dowel, rail slides, wall slides, pulleys</li> <li>• AROM: Supine shoulder flexion, standing shoulder flexion, seated shoulder ER, side-lying shoulder ER</li> </ul> <p>Strengthening</p> <ul style="list-style-type: none"> <li>• Periscapular: scap retraction, prone scap retraction, low row, mid row, resisted straight arm extension, supine serratus punches</li> <li>• Elbow: biceps curls, triceps extension</li> </ul> <p>Cardio</p> <ul style="list-style-type: none"> <li>• Walking with arm out of sling</li> <li>• Recumbent bike</li> <li>• Stationary bike after 6 weeks, or if cleared by surgeon</li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>• Full shoulder PROM</li> <li>• 120 degrees or greater shoulder AAROM flexion</li> <li>• &gt; 30 degrees shoulder ER AROM</li> <li>• Minimal compensation pattern with shoulder movements</li> <li>• &lt; 4/10 pain with shoulder AROM</li> </ul>

**PHASE III: LATE POST-OP: (9-12 WEEKS AFTER SURGERY)**

<b>Rehab Goals</b>	<ul style="list-style-type: none"> <li>• Maximize shoulder AROM</li> <li>• Initiate shoulder girdle muscle activation</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• No lifting greater than 5lbs</li> </ul>
<b>Additional Interventions</b> *Continue with Phase I-II Interventions	<p>Range of motion/Mobility</p> <ul style="list-style-type: none"> <li>• AROM: Continue to progress shoulder AROM and minimize compensatory patterns</li> <li>• Stretching: Lat stretch, doorway stretch, pec/biceps stretch, posterior capsule stretch, sleeper stretch</li> </ul> <p>Strengthening</p>

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	<ul style="list-style-type: none"> <li>Shoulder: Isometric flexion, Isometric extension, Isometric ER, Isometric IR, resisted IR, resisted ER</li> </ul> <p>Cardo</p> <ul style="list-style-type: none"> <li>Biking</li> <li>Swimming if cleared by surgeon</li> <li>Running if cleared by surgeon</li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>≥ 90% shoulder AROM compared to uninvolved side</li> <li>Appropriate muscle activation with isometric contraction of rotator cuff and periscapular muscles</li> </ul>

**PHASE IV: TRANSITIONAL (12-16 WEEKS AFTER SURGERY)**

<b>Rehab Goals</b>	<ul style="list-style-type: none"> <li>Initiate and progress isotonic shoulder strengthening</li> <li>Return to normal ADLs</li> </ul>
<b>Additional Interventions</b> *Continue with Phase II-III interventions	<p>Range of motion/Mobility</p> <ul style="list-style-type: none"> <li>Continue with ROM and stretching exercises as needed</li> </ul> <p>Strengthening</p> <ul style="list-style-type: none"> <li>Shoulder: wall push-ups, scaption raises, serratus roll ups, chest pulls, rhythmic stabilizations, plantigrade shoulder taps</li> </ul> <p>Cardo</p> <ul style="list-style-type: none"> <li>Swimming, Running, Biking, Elliptical</li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>Good form with strengthening exercise</li> <li>Full shoulder ROM</li> <li>0/10 pain at rest, ≤ 3/10 pain with resisted exercises</li> <li>4/5 shoulder strength or greater</li> <li>No difficulties with ADL and light work-related activities</li> </ul>

**PHASE V: RETURN TO SPORT (4-6 MONTHS AFTER SURGERY)**

<b>Rehab Goals</b>	<ul style="list-style-type: none"> <li>Progressive strengthening and stability of involved shoulder</li> <li>Return to normal sport activities</li> </ul>
<b>Additional Interventions</b> *Continue with Phase II-IV interventions	<p>Strengthening</p> <ul style="list-style-type: none"> <li>Counter push-ups, standard push-ups, resisted IR in abduction, resisted ER in abduction, wall walks, face-pulls, resisted PNF diagonals,</li> <li>Interval return to sport training</li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>90% strength or greater of involved shoulder compared to uninvolved side with dynamometry testing</li> </ul>

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	<ul style="list-style-type: none"><li>• 0% disability on Quick DASH</li><li>• No pain with strength training</li></ul>
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*\*Acknowledgement: This rehab protocol was largely adopted from the protocols at MGH Sports Medicine Physical Therapy, which can be found at <https://www.massgeneral.org/orthopaedics/sports-medicine/physical-therapy/sports-rehab-protocols>*