



## Dr. Myeroff's Clavicle Fracture Information Sheet

### What is a clavicle fracture?

- A fracture is a break in the bone
- The clavicle is commonly referred to as the collar bone (Figure 1).
- It is a long tubular bone that connects your sternum (chest plate) to your scapula (shoulder blade).
  - You can usually feel it above your rib cage.
  - It is the only bony connection between your body and your arm
    - Holds the shoulder up and allows motion and function.
  - When a fracture (break) occurs
    - The shoulder can slump down and rotate forward.
    - The shoulder can shorten (move closer to the chest).
    - The fracture edge or a bump may be noticeable (especially thin patients)
    - In severe cases:
      - There can be a loss of strength or muscle endurance
      - The nerves in the shoulder can be irritated or squished (thoracic outlet syndrome)
- How do clavicle fractures occur?
  - Falls onto the shoulder or arm
  - Severe trauma: Motorvehicle crash, fall from ladders
  - Sports: Especially cycling, snowboarding, hockey, motocross
- Types: based on location (Figure 2)
  - Medial: The clavicle breaks close to the chest plate
  - Midshaft: The clavicle breaks at the mid-portion (most common)
  - Distal: The clavicle breaks close to the shoulder
    - Near a joint called the acromioclavicular (AC) Joint
    - Near several ligaments called the Coroclavicular (CC) ligaments

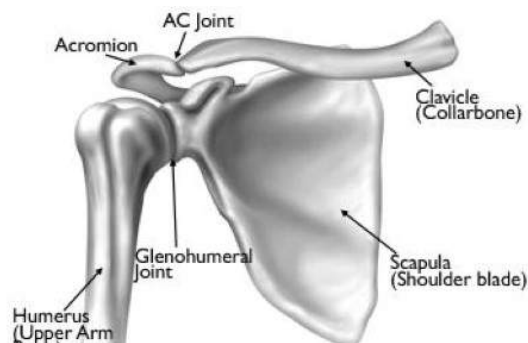


Figure 1 Normal Shoulder Bony Anatomy.  
<https://orthoinfo.aaos.org/en/diseases--conditions/arthritis-of-the-shoulder>

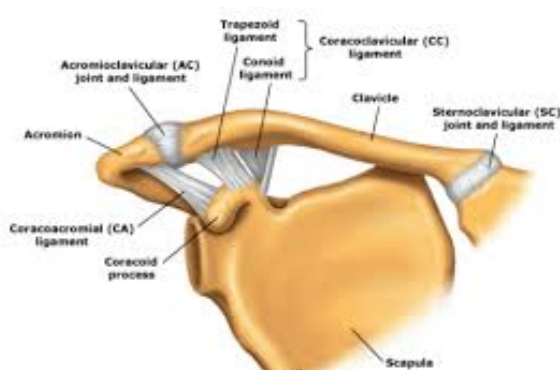


Figure 2 Normal anatomy of the clavicle bone and its joints and ligaments

### How are clavicle fractures diagnosed?

- The first thing I do is listen to your story, which usually includes an injury.
- Exam: I will examine your shoulder carefully. I will mostly be checking your nerves and ruling out additional injuries (especially elbow, wrist and skin issues).
- X-Rays: If you haven't already had them recently, I will obtain X-rays.
  - In clavicle fractures, I will look for the location of the break, and how much the pieces have moved (displacement) (Figure 3a).



Figure 3a Displaced midshaft clavicle fracture



Figure 3b Clavicle fractures fixed with plates and screws (ORIF)

### How will we get you back to function?

- Treatment decision is a shared process between you, myself, and your loved ones if you wish. Factors include your level of activity, your health, your fracture type. Most importantly it is based on your decision after we have a thorough discussion on the risks and benefits of each alternative – a process called informed consent.
- Goal: Regardless of treatment chosen, our goal is to maximize your function with the following steps:
  - Maintain or restore your anatomy
    - Maintain: A period of protection in a sling can support the arm and minimize further bone movement while your body heals the fracture.
    - Restore: Surgery, is the only way to improve the alignment of your bones if alignment is inadequate.
  - Maintain your elbow, wrist and finger function
    - You must come out of your sling 2-3 times per day to work on elbow wrist and finger motion. We don't want to cause stiffness elsewhere just because you are in a sling!
  - Maximize your shoulder motion
    - Work on early passive shoulder range of motion
      - Usually 2-4 weeks after injury (or immediately after surgery).
        - In general, surgery does allow us to begin earlier range of motion.

- What is passive motion? Having an assistant, your other arm, or something else (pulleys) move your shoulder for you while relaxing the muscles in your injured shoulder.
  - Return to function
    - Maintain shoulder posture
    - Shoulder strengthening, and more aggressive motion exercises can be initiated once the fracture is healed but are not routinely needed.
    - Expectations
      - You can expect near normal function if your fracture heals in acceptable alignment
        - Expect at least 6-12 weeks until you return to sport or heavy labor.
          - Timing depends on you, the fracture, and what treatment you choose.
          - You will be clear to do desk work immediately.
          - I recommend discussing work restrictions (and vocational training if needed) with your employer as soon as possible.

### What are your treatment options?

- Treatment is always shared decision making between you, me, and your loved ones.
  - I present all of the information we know and you decide what fits your goals.
    - In rare instances I will make a recommendation, otherwise the decision is yours.
- **Non-operative (conservative) treatment:**
  - The vast majority (85%) of fractures will heal without surgery.
  - While the bones will never heal in “perfect” alignment, it is usually “acceptable”.
  - I recommend this in patients where a surgery would add little to no benefit in your outcome.
    - Minimally displaced fractures where you are satisfied with the shape of your shoulder
    - When surgery is ill-advised for medical reasons
  - Non-operative treatment involves a period of restrictions in a sling, followed by range of motion and an increase in activities once your fracture is stable enough.
  - Benefits
    - Little to no additional medical risk or risks specifically associated with surgery
  - Risks
    - Non-union: There is a chance the bones don’t heal (Figure 4)
      - Risk factors: Multiple pieces, smoking, older age, females.
    - Malunion: There is a chance the fractures heal in the wrong position
      - If displaced enough this can contribute to pain and weakness

- Anatomy – Some degree of malunion is predictable since we have little ability to improve the bony alignment, sometimes it can worsen with time and muscle forces
  - If your bones don't heal or heal in the wrong position, this can be corrected later, if desired, with a surgery.
- Nerve or blood vessel irritation
  - If healing occurs in poor alignment or there is a lot of extra bone formed, the local nerves and vessels can be compressed (thoracic outlet syndrome).
- Stiffness (scar)
  - We can't start shoulder motion (breaking up the scar) until your fracture shows signs of healing.
- There is always the chance we need to perform surgery later.
  - Delayed surgery is slightly more complex.
- Continued pain
- Need for future surgery

Overall Displacement (mm)	Risk (%)			
	Noncomminuted Fracture in Nonsmoker	Comminuted Fracture in Nonsmoker	Noncomminuted Fracture in Smoker	Comminuted Fracture in Smoker
10	2	3	6	10
15	3	6	12	19
20	7	12	23	34
25	14	23	39	52
30	26	39	57	70
40	62	74	86	92

Figure 4 This table can be used to estimate the risk that your clavicle fracture does not heal without surgery. Murray I, Foster C, Eros A, Robinson C. Risk factors for nonunion after nonoperative treatment of displaced midshaft fractures of the clavicle. *J Bone Joint Surg am.* 2013 July;95(13):1153-1158

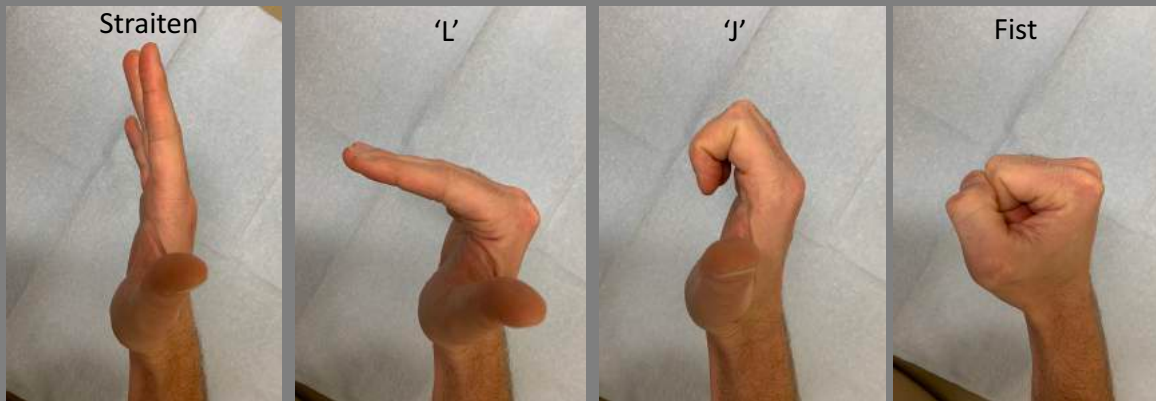
- **Surgery**
  - Usually this injury can be treated with a same day surgery, meaning you will go home that afternoon.
- **Open Reduction and Internal Fixation**
  - Fixing the fracture with internal plates and screws (Figure 3b)
    - This can be offered for displaced fractures or to improve your rehab potential in certain cases.
    - This restores your bony anatomy and the position of your bone and shoulder as close as possible to normal.
      - You will have a similar, but accelerated, protocol compared to those treated without surgery.
  - What is involved?
    - The surgery takes about 1-2 hours.
    - Usually about half of the day is dedicated to getting ready and recovering

- You will either be offered a nerve block by the anesthesiologist, or receive numbing medication in the incision.
  - Risks
    - Symptomatic hardware is relatively common
      - The clavicle is very close to the skin without much padding.
        - It is possible you will feel the implants.
        - This area can be irritated by clothing or backpacks.
      - Studies show about 20% of patients request to have their plate removed in the future
        - Personally, I take great care to minimize the risk of this and do not find the need to remove many.
    - Chest wall numbness
      - It is possible to have a small patch of numbness just below your incision
        - Over time the size of this area will decrease and you will likely stop recognizing it.
    - There is a low 1-3% risk of each of the following:
      - Infection / wound issues
      - Nerve or blood vessel injury
      - Lung injury
      - Shoulder stiffness
      - Medical complications
        - Urinary tract infections, pneumonia, cardiac complications, transfusion, blood clot
      - Hardware failure / bones shifting
      - Nonunion (failure of the bones to heal)
        - Lower with surgery
      - Malunion (bone heal in wrong alignment)
        - Lower with surgery
  - Benefits
    - Reconstruction of your shoulder bones into as normal position as possible
      - Best chance of your fracture healing in a good position
      - **If the 2 ends of your bones are not touching (>100% displaced)**
        - Surgery decreases your chance of the bone not healing, or healing in a position that causes you symptoms from 25% without surgery to around 1% with.
    - Earlier rehabilitation
      - Most fractures will heal appropriately without surgery, but in rare instances highly active patients may elect surgery to speed up their return to work or sport.

- Some patients with multiple injuries may benefit for similar reasons.
    - Higher potential function (restoring your normal anatomy may provide the best chance of regaining full function)
  - What does surgery not do?
    - I do not recommend surgery for acute pain, but rather it would be offered to maximize your long term function and decrease your long term dissatisfaction.
- **Recovery:**
  - The biggest complaint patients have is an insufficient communication of the length of time of restrictions
    - Fortunately, your pain and comfort will improve within several weeks.
  - Bone healing takes about 6-10 weeks.
    - Prior to that, the bone fragments are prone to displacing further.
    - For this period of time you will have restrictions to protect the bones.
  - Driving
    - Studies on total shoulder replacements show you cannot safely drive after a major shoulder surgery for 6 weeks.
  - Top ways YOU can help.
    - **Read this packet!**
      - Set your expectations for return to work / sport appropriately.
        - Make arrangements ahead of time
          - Speak with your employer and come up with a plan.
          - Please fax employer or insurance related paperwork to me as early as possible to 651-254-8127.
    - Stop smoking
      - Smoking doubles your risk of the bones not healing (nonunion), doubles the time it takes to heal, and quadruples your risk of complications.
        - I recommend nicotine alternatives
        - I recommend consulting your primary doctor for consideration of Chantix, a medication that has been shown to improve your chances of quitting.
    - Control your diabetes
      - Poorly controlled blood sugars severely increase your risk of medical and surgical complications especially infection
    - Avoid NSAID antiinflammatories (ie Ibuprofen, Advil, Aleve) for 6 weeks
      - These may prevent bone healing.
    - Bone health
      - I recommend the following medications to help healing and prevent another fracture:
        - Initiating over the counter supplements (I recommend Citrical petite)
          - 1500mg Calcium daily

- 2000 IU Vitamin D daily
- Follow your restrictions with 2 main early goals
  - **Avoid fracture displacement:** Your restrictions are meant to allow safe physical therapy while preventing too much stress on the fracture.
  - **Avoid stiffness:** You should:
    - Move your fingers, wrist and elbow three times per day (Figure 1-2).
    - Most clavicle fractures do not result in stiffness or permanent weakness, routine therapy is not always needed.
      - If you receive rehab protocol. You should view this as a home exercise program. You should do your exercises three times per day.
      - Your initial rehab will focus on regaining shoulder motion (Figure 3).
        - Remember: Therapy is a thing you do, NOT a place you go!
          - Therapy is your homework
          - The therapist is your teacher, designed to keep you on track.
    - Be patient... be A patient!
      - You are probably eager to begin strengthening and get back to your activities, but you have to trust the process.
      - You will get your strength back, it is more important you follow your restrictions, heal your fracture, and regain your motion.

# Finger Range of Motion



Cycle through the above motions with the assistance of your other hand

\*This will prevent stiffness and swelling

Chad Myeroff, MD  
Twincitiesshoulderandelbow.com



Figure 4 Finger range of motion

# Elbow Range of Motion



### Types of Motion

**Passive:** An outside force moves your arm for you entirely

**Active assist:** Using the power of your injured arm with the assistance of your uninjured arm or an outside force

**Active:** Using the power of only your injured arm

\*Tuck your elbow at your side for all exercises

\*Can be done sitting, laying, or standing

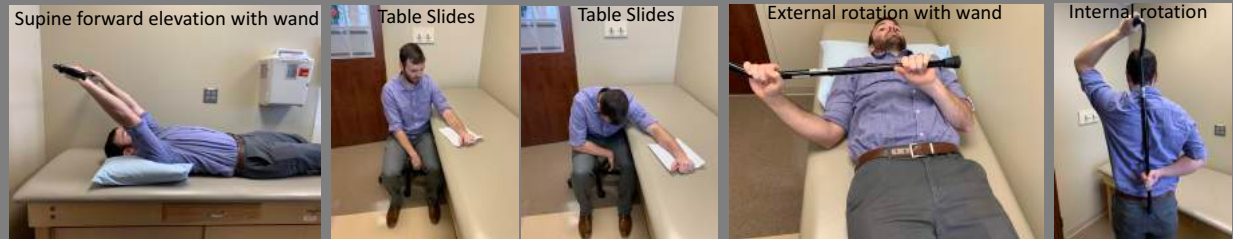
Chad Myeroff, MD  
Twincitiesshoulderandelbow.com



Figure 5 Elbow range of motion



# Shoulder Range of Motion



## Types of Motion

**Passive:** An outside force moves your arm for you entirely  
\*relax the shoulder like a wet noodle

**Active assist:** Using the power of your injured arm with the assistance of your uninjured arm or an outside force

**Active:** Using the power of only your injured arm



Chad Myeroff, MD  
Twincitiesshoulderandelbow.com

Figure 6 Shoulder range of motion

## Want More information?

- Please visit:
  - [twincitiesshoulderandelbow.com](http://twincitiesshoulderandelbow.com)
  - <https://orthoinfo.aaos.org/en/diseases--conditions/clavicle-fracture-broken-collarbone/>
- Regions Hospital / Health Partners Specialty Center
  - Clinical questions: 651-254-8300 option 2
  - To schedule appointments: 651-254-8300 option 1
  - To schedule surgery: 651-254-8399 or 651-254-8338
  - Fax employer or insurance related paperwork ASAP to 651-254-8127.
- TRIA Orthopaedic Center
  - Clinical questions: 952-977-3301
  - To schedule an appointment: 952-831-8742
  - To schedule surgery: 952-977-3414
  - Fax employer or insurance related paperwork ASAP to 952-977-3459.