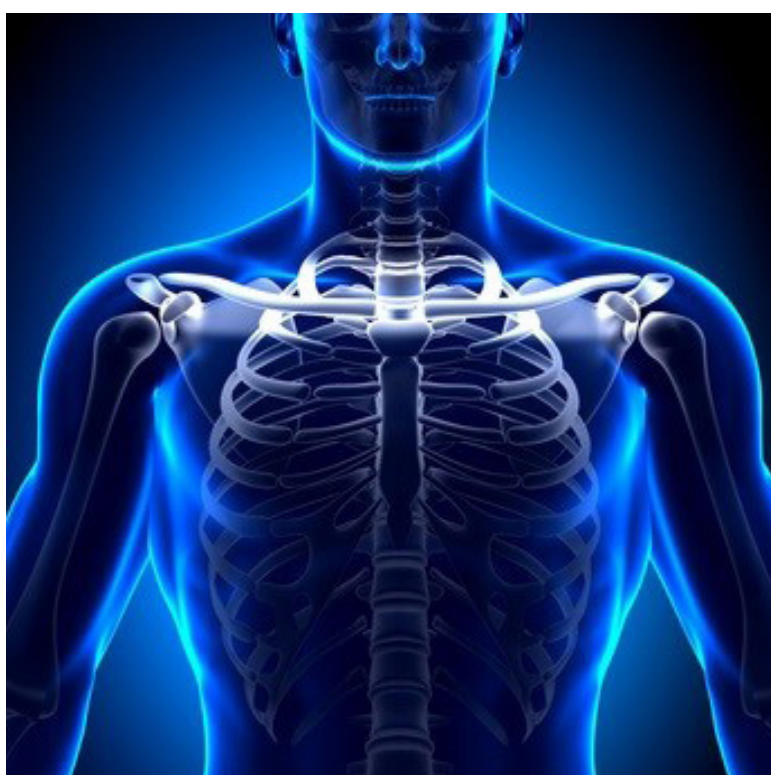




**TWIN CITIES ORTHOPEDICS**

# **CLAVICLE FRACTURE**



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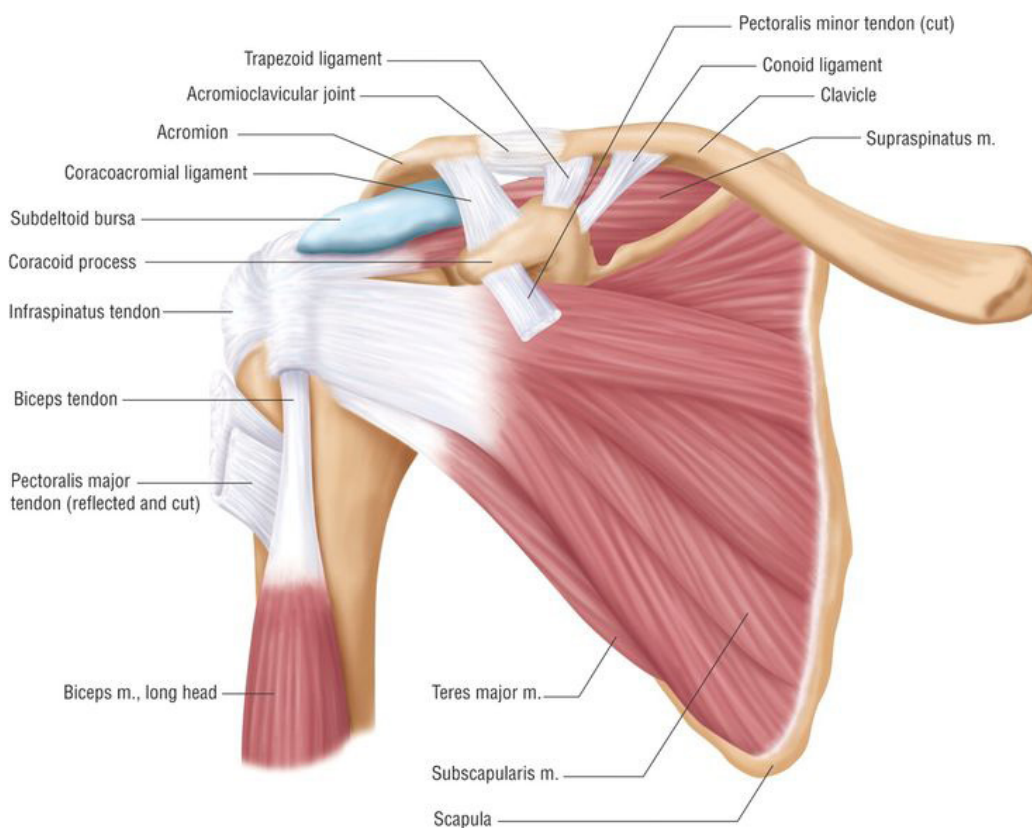
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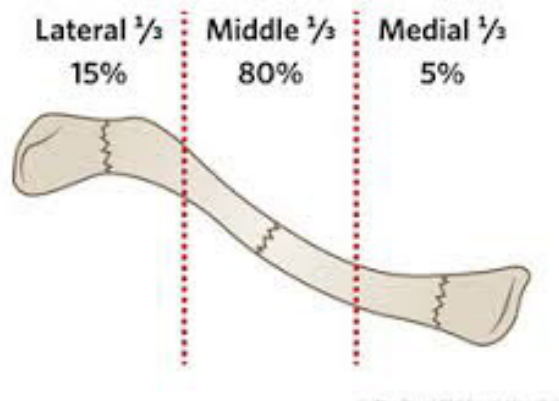
## CLAVARBONE ANATOMY

The clavicle (collarbone) is a long bone located on the upper chest. It is part of the shoulder girdle and acts like the strut of a car, providing stability with arm movements. At the shoulder, the clavicle connects to the acromion a bone off the back of the scapula (shoulder blade) forming the acromioclavicular joint. Over this joint, is a ligament called the acromioclavicular ligament. Ligaments (trapezoid, conoid) connected to the coracoid process secure the clavicle to the front of the scapula. The clavicle connects to the center of the sternum to form the sternoclavicular joint.



## FRACTURE CLASSIFICATION

There are 3 main types of clavicle fractures and are based on location and severity of displacement and disruption of ligament structures.



**Group I:** Fracture of Middle Third

**Group II:** Fracture of the Lateral (Distal) Third

5 subtypes- Involve ligament disruption and will change Dr. Norberg's surgical approach

**Group III:** Fracture of the Medial (Proximal) Third

5 subtypes- typically involve trauma (motorvehicle accident)

### (MIDDLE) TYPE I



### (LATERAL) TYPE II



### (MEDIAL) TYPE III



## WHAT IS IT?

Clavicle fracture is also known as a broken collarbone. It is usually the result of a fall on the shoulder or outstretched hand. It can also result from trauma such as a motorvehicle accident or bicycle accident. The most common place to break your clavicle is in the middle where the force is focused because of the angle of the clavicle. This is also known as a type I/Group I fracture. There are three types of fractures which are depicted in the clavicle fracture classification on the prior page. The second and third group/type are uncommon but can result from similar mechanisms of injury. There are other associated injuries that can occur in combination with a clavicle fracture (such as shoulder injury) and will be assessed at your visit

## WHAT ARE THE SYMPTOMS?

Most commonly you will have pain, swelling, tenderness, and possible visual deformity of the clavicle. There is typically severe pain when trying to move the arm.

## HOW IS IT DIAGNOSED

Clavicle fractures are typically diagnosed using standard xray images. Some fractures are complex and may need CT imaging in order to make the appropriate surgical plan.

## WHEN DO I NEED SURGERY?

There are four main reasons you may need surgical fixation of your fracture. Surgery is determined based on the risk of the fracture not healing (nonunion). Based on clinical evidence we will determine your risk of a nonunion and recommend surgical fixation.

- **Multiple fractures that have displaced fragments**
- **Shortening of the clavicle with overlapping of bone > 1.5cm**
- **Open fracture and fractures that have tenting of the skin**
- **Other associated fractures**
- **Failure to heal**

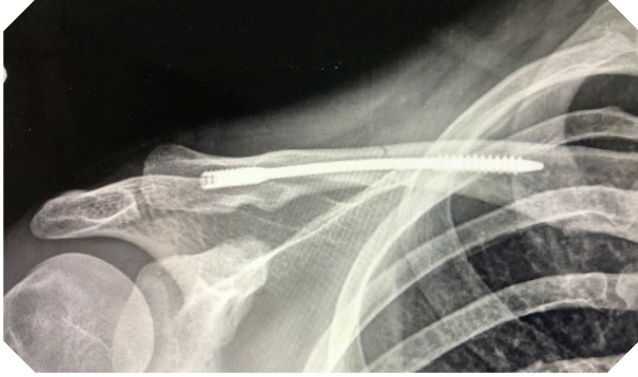
## References & Recommendations:

Ahrens, P.M, Garlick, N. I., Barber, J., & Tims, E. M. (2017). The Clavicle Trial. The Journal of Bone and Joint Surgery, 99(16), 1345-1354. doi:10.2106/jbjs.16.01112

Rockwood C.A. (2009). The shoulder. Philadelphia, PA: Saunders/Elsevier

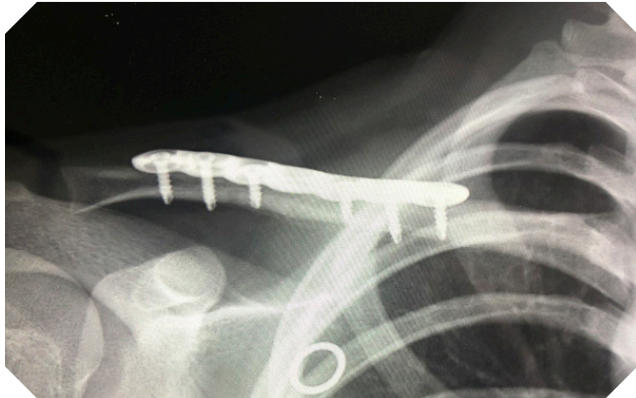


## SURGICAL FIXATION



### INTRAMEDULLARY SCREW

Fixation of fracture using a cannulated screw. The canal is hollowed out like a pipe and fit for the proper size screw. The screw will simultaneously compress the fracture ends together. There are benefits to using the intramedullary screw, however, it can only be used with type I fractures and in a population with adequate bone density. It is also difficult to use in refractures.



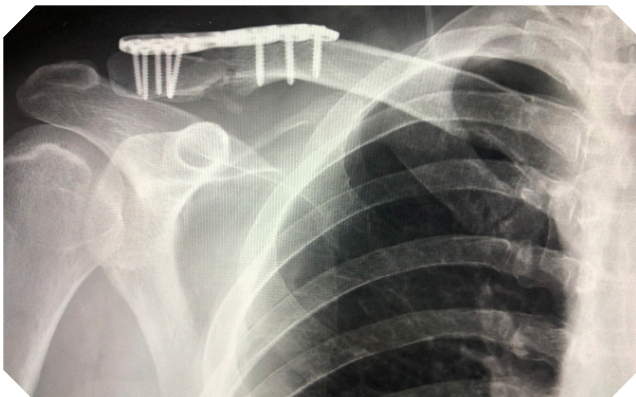
### PLATE

Fixation of the fracture using a plate and screws. This is used in cases where there is inadequate bone density, complex (comminuted fracture), narrow bone canal, or refracture. Plates provide strong fixation however, there will be a larger scar possible need for plate removal.



### ANTERIOR PLATE

Fixation of fracture using a plate that is on the front side of the clavicle. The anterior plate can be used in cases where the fracture pattern does not allow for a plate on the top. Fixation of fracture is similar to the plate above. However, patients typically have less irritation from plate and are less likely to have the plate removed.



### DISTAL PLATE

Fixation of distal clavicle fracture. Similar plate to the plate above however it is designed to specifically fit on the distal end of the clavicle. Not seen in the xray is a coracoclavicular loop using strong suture. The suture is wrapped around the corcoid (see anatomy section) and secured with the plate to provide stability following the disruption of the ligaments holding the clavicle down.

## **RISKS OF SURGERY:**

With any surgery there are potential risks involved. These include but are not limited to infection, continued pain, damage to blood vessels or nerves, decreased motion, failure to heal, and anesthetic complications. Call Dr. Norberg if you have any signs of infection: redness, warmth, fever, discolored drainage.

## **QUITTING SMOKING**

Studies have shown that nonunion rates are increased in people who smoke. Smoking or using any form of nicotine or tobacco products (including cessation products with nicotine), can delay your body's healing process. Smoking makes your blood vessels constrict (become smaller), which reduces the amount of oxygen-rich blood delivered to healing tissues. Smoking can cause your blood to clot faster, which can lead to heart and blood flow problems. If you are going to stop smoking around the time of your surgery, you should not use a nicotine based program or cessation products.

## **BEFORE SURGERY:**

Clavice fixation is typically performed on a same day basis. You will return home several hours after the surgery. You shouldn't take anti-inflammatories (i.e. Ibuprofen or Aleve) or aspirin for 4-7 days prior to surgery. Arrange for a ride to and from the hospital. Let all medical providers know of any allergies you may have and medications you are taking. Please bring a list of current medications.

## **AFTER SURGERY:**

You will be placed in a immobilizer/sling to be worn at all times for 4-6 weeks. You may remove your sling or immobilizer for a shower. You should wear the sling to sleep. You will be given pain medication. You will have 4 followup visits. All visits can be schedule prior to surgery if needed. Your first appointment after surgery is 7 - 10 days after surgery with Kayla Mork, PA-C with Dr. Norberg.

## **INCISION CARE:**

Keep the dressings dry and do not remove until day 2 after surgery. If you any have drainage you may replace with a new bandage. Small tape strips (steri-strips) will be placed over all incisions. Leave in place until they fall off. Usually this is 10-14 days.

Do not poke anything into your dressings.

Do not apply lotion, cream or powder to your incision.

You can shower safely 3 days after surgery, without covering the incision. The incision may get wet, but should not be submerged in water for at least 2 weeks after the surgery.

Do not soak or scrub the incisions until fully healed.

Watch for signs of infection. Increased redness or drainage from the incisions Fever and or chills

Wash twice a day under your affected arm and dry that area well. Do not raise your arm after surgery. Place your hand on a counter and take a small side step away to give access to your underarm without lifting your operative arm.

Put a washcloth under your arm to help with sweating and to keep your skin from getting irritated.

When you get dressed, put your shirt on the arm that had the surgery first.

No sutures will need to be removed at your first post-operative visit. They will dissolve in 2-3 weeks and remain under the skin. .

## RECOVERY TIME:

**Clavicle Fixation:** You will be in an immobilizer for 4-6 weeks depending on the severity/stability of the fracture. It will take about 3 months to heal. Patients can continue to make progress up to 4 months before reaching their end result of the surgery.

## RESTRICTIONS FOLLOWING SURGERY:

Clavicle fixation we recommend all patients take at least 2 weeks off of work to rest and manage pain efficiently. All patients will be released to work with restrictions following the 2 weeks. The restrictions will include no lifting overhead for 2 months. While in immobilizer you will only be able to lift 1-2lbs with elbow at your side. If your job does not require lifting and is mainly office work (keyboard,paperwork,mouse) then it is likely you can return to work. Jobs that require lifting will determine if they have the appropriate accomodations.

## ACTIVITY TIMELINE:

0-6 weeks- Elbow remains at side in sling/immobilizer lifting only 1-2lbs.

1-2 months- Discontinue sling/immobilizer, Start range of motion exercises and work on returning normal shoulder function

3-4 months- Fracture is typically healed. Shoulder range of motion, strength should be close to baseline. There are no restriction if xray shows a healed fracture, no pain or movement with palpation of fracture site, and shoulder function is normal. If Bone is not fully healed patient will be considered for bone stimulator therapy.

## PAIN RELIEF:

Most patients will have a nerve block that will last approximately 12 hours. The block involves an injection of a local anesthetic (Ropivacaine) similar to novocaine. It is injected where the shoulder and neck meet. The block allows the surgery to be preformed using much less anesthetic drugs. The block also provides excellent pain relief after surgery. You may experience a numbness, burning, tingling sensation while block is wearing off up to 18 hours after surgery. This sensation is normal.

You should take some pain medication approximately 8-10 hours after your block is performed, even if you have no pain.

Narcotic medications will be prescribed to help manage your pain after surgery. We only prescribe short acting narcotic medications, typically oxycodone, following surgery. Recent studies have shown poorer outcomes and increase of addiction and death with long acting narcotics. Dr. Norberg recommends taking them as written the first day and then gradually spacing them out and taking them only if needed.

The pain medications will make your pain manageable but will not necessarily take away all of your pain.

Tylenol (acetaminophen) can be taken with Percocet, Norco, and Vicodin. However, these medications also contain Tylenol (acetaminophen). Whether you are taking Percocet (oxycodone), Norco (hydrocodone), or Tylenol (acetaminophen), be careful not to exceed 4,000mg of acetaminophen in a 24 hour period. Dr. Norberg recommends obtaining the 650mg extended release (8-hour), arthritis strength acetaminophen tablets prior to surgery.

Do not take Advil (ibuprofen) or Aleve (naproxen) for the first week after surgery. This may slow bone healing. However, after 1 week (Advil, Aleve) did not show decreased healing are shown to be more effective in managing pain than narcotic medication. Do not take these medications if on blood thinners (warfarin, lovenox) or have hx of reflux disease.

If the pain is still not controlled increase frequency of icing shoulder, squeeze stress ball that comes with sling, and do gentle range of motion exercises of elbow, wrist, hand.

Exceeding the recommended dose or taking medication with alcohol may result in liver damage. If you see that you are running out of pain medication, you must call the office number 952-456-7107 during regular clinic hours (8:30-4:00). Pain medications are not filled after hours or on weekends.

Take pain medication with food. They may also cause cognitive impairment so you are not to drive or operate heavy machinery. Another common side effect is constipation. You may use over the counter stool softeners (i.e. Colace or

Dulcolax) to help with this. See packages for recommended dosages.

For the first several weeks, many patients find it more comfortable to sleep in a recliner or propped with pillows in a semi-sitting position.

Put an ice pack on your shoulder continuously for the first 2-3 days, then three times a day minimum. Use ice as much as you need to control pain and swelling. Don't sleep with ice on your shoulder. Do not put ice packs directly on the skin. Wear a shirt or place a light towel over the incision

### **CALL 952-456-7000 IF:**

Your temperature is 101.5 degrees Fahrenheit or more that does not go down with medication like Tylenol or Advil.

You see a large amount of new bleeding or drainage from the incision area. Some drainage the first day after surgery is expected.

Notice increased or unusual redness, swelling or warmth in the surgery area.

Have a lot of discomfort that doesn't get better with pain medicine, ice and rest.

Notice a big change in color, movement or feeling to the fingers or hand

Have any questions or concerns

### **DIET:**

You will need to eat healthy meals to give your body the energy, vitamins and minerals needed to recover from surgery. Return to your usual diet as soon as you are able. Drink six to eight glasses of water each day. Eat more food that has fiber (fruits, vegetables and whole grains) to avoid constipation from the pain medications. Avoid alcohol while taking prescription pain medicine.

**Start taking Vitamin D 4000-6000 units daily for optimal fracture healing potential.**

### **FREQUENTLY ASKED QUESTION:**

#### **Do I have to go to physical therapy?**

No, not every patient will need physical therapy. Typically if patient has decreased range of motion or has difficulty with exercises physical therapy will be recommended.

#### **How long is recovery time?**

Typically 3-4 months is needed to return to activities and 1 year to see maximum improvement.

#### **Work Status?**

You will be off of work until your follow-up appointment in about 7-14 days and then will adjust your work restrictions accordingly.

#### **Are there possible complications from surgery?**

Yes, but they are very rare. Some include but are not limited to: infection, stiffness, loss of motion, loosening of hardware, and nerve injury



### What are the signs of an infection?

Fever over 101.5 degrees, the incision becomes red or swollen, or any foul drainage. If these symptoms occur, call Dr. Norberg's office right away. (952-456-7107).

### Is swelling and pain normal?

Yes. It is normal to experience some swelling and pain after your surgery. The pain should be manageable with the prescription pain medication given to you after your surgery.

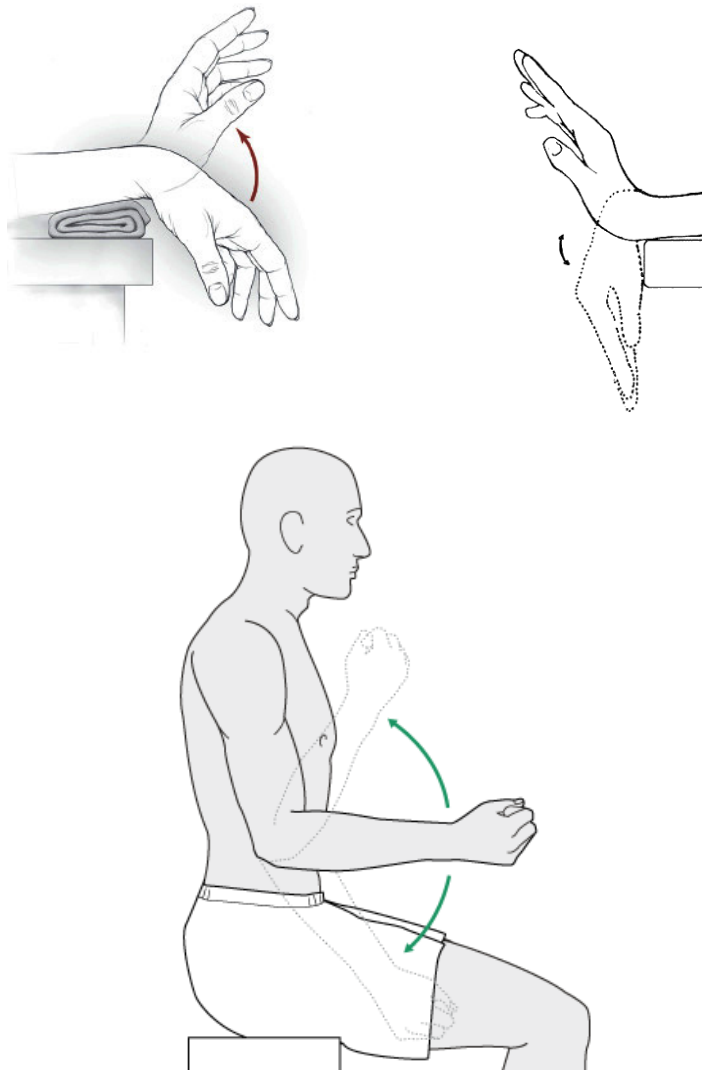
### Can I shower?

Yes. You may shower 3 days after your surgery. Do not scrub your incisions. Do not submerge your incision for 2 weeks..

## IMMEDIATE POST OPERATIVE EXERCISES - START THE DAY AFTER SURGERY

Wrist range of motion. Bend your wrist forward and backwards as far as your can. Repeat 10 times. Do 3 sets for 2-3 times per day.

Elbow range of motion. Gently bring your palm up towards your shoulder and bend your elbow as far as you can. Then straighten your elbow out as far as you can. Repeat 10-15 times for 2-3 times per day.



## START EXERCISES AFTER FIRST POST OPERATIVE VISIT



The starting position for this exercise will be with your hands resting in front of you on a counter top. Put your weight on your legs, not on your hands or upper body. Keep your hands in the same position on the counter top. While moving your feet slowly backwards, bend slightly at your waist, stick your buttocks back past the base of your feet. (see picture above) Once you feel a stretch, hold our position for 5-10 seconds. **DO NOT STRETCH TO THE POINT OF PAIN.** Always walk yourself back up.



Start this exercise in a standing position. You may be more comfortable resting against a wall. Bend your affected arm at the elbow. Place your opposite hand on your wrist and gently rotate your wrist outward while keeping your elbow at your side. If you have trouble keeping your elbow at your side, hold a rolled up sock between your elbow and waist. If the sock falls to the floor, you are not keeping your elbow close enough to your body. While gently rotating your wrist outward, continue until you feel a good stretch Hold for 5-10 seconds. **DO NOT STRETCH TO THE POINT OF PAIN.**

## PAIN MEDICATION AGREEMENT FOR POST-OPERATIVE PAIN TREATMENT

The official policy of our practice is as follows:

1. Patients will not be provided with narcotic pain medication prior to surgery.
2. After surgery, appropriate prescription pain medications will be prescribed for adequate pain control. The amount of medication prescribed will be based on typical pain control needs for the surgery performed. This is at the discretion of Dr. Norberg
3. We will not prescribe pain medications longer than **TWO WEEKS** after surgery.
4. Prescription pain medications do not help with healing after surgery. Take prescription pain medications only if pain cannot be controlled with over the counter medications such as tylenol.
5. If a patient takes prescription pain medication prior to surgery (prescribed by another provider) we will establish a specific pain mediation plan for that patient.
6. Patients should avoid NSAID's (Ibuprofen, naproxen, aspirin, etc.) for at least two weeks after surgery if they have a superior capsular reconstruction, rotator cuff repair, labral repair, biceps tenodesis, or fracture. NSAID's have been associated with decreased healing rates.
7. Taking prescription Opiates/Opoids (such as oxycodone, hydrocodone, morphin, hydromorphone) are well known to cause death and addiction/dependency and should never be taken while driving. Prescription opiates/opioids are the leading cause of prescription related deaths.

Patient Name \_\_\_\_\_

Patient Signature \_\_\_\_\_

Date: \_\_\_\_\_

### References:

Increases in Drug and Opioid-Involved Overdose Deaths- United States, 2010-2015. MMWR Morb Mortal Wkly Rep, 64(50-51), 1378-1382.

Dowell D, Haegerich TM, C.R. (2016). CDC Guideline for Prescribing Opioids for Chronic Pain- United States, 2016. MMWR Morb Mortal Wkly Rep, 65(1), 1-49.

O'Neill. (2014). Less is More: Limiting Narcotic Prescription Quantities for Common Orthopedic Procedures. The Physician and Sportsmedicine, 42(4), 100-105.

Rudd RA, Seth P, David F, S. L. M. M. W. R. 2016;65:1445-1452. D. <http://dx.doi.org/10.15585/mmwr.mm655051e1>. (2016)