Introduction:

The Mayo Clinic estimates that nearly 110,000 people suffer from hand fractures each year in the United States (Clinic). The complicated anatomy of the hand leads to a difficult and often strenuous rehabilitation process. This document serves as a general guide for the rehabilitation of a broken hand, but will primarily focus on the 5th proximal phalange, known as a boxer’s fracture. The best way to understand the mechanisms that make the hand function is to familiarize yourself with its structure. The two X-Ray images below are intended to reveal the anatomy of a healthy hand compared to one that has sustained serious injury to the 5th proximal phalange. The image on the left gives the location and name of the primary bones in the hand; the image on the right shows a 5th proximal phalange fracture (boxer’s fracture).

This document will give detailed instructions as to how to rehabilitate a boxer’s fracture to the 5th proximal phalange on either the left or right hand. Often, in order to reduce the angle of reduction to the bone, or the displacement of deviation from normal, surgery is required to set the bone manually. This document is specifically relevant to patients who have received surgery to the 5th proximal phalange for fixation of a boxer’s fracture. This rehabilitation guide starts at the first day post operation.
Instructions:

1. Post operation, the surgeon will likely fixate the hand in a cast in order to reduce motion of the affected region. In order to reduce swelling of the hand, keep your arm elevated above the heart at all times.

   Additional Tips: An anti-inflammatory, such as ibuprofen, can be beneficial to patients who are prone to extreme swelling and irritation. Often, pain medication such as Vicodin will also be prescribed to aid in the recovery process.

   Caution: Taking excess amounts of Vicodin can cause serious damage to the liver. Vicodin should only be taken in quantities as directed by your pharmacist.

2. At this point in the recovery process, intake of calcium is crucial. It is recommended to double your daily intake of calcium at this stage in the rehabilitation process to supplement the fractured bone with the nutrients needed in order to heal properly.

   Foods with high levels of calcium: milk, yogurt, almonds, cheese, herring, and sesame seeds.

3. Repeat steps 1 and 2 daily until the cast is removed and the surgical incision is fully healed. The next steps of the rehab process are only valid for patients who are no longer constrained in a cast.

4. Now that your hand is no longer constrained in a cast, you may start to use it as you normally would. Your hand will be very stiff after you get your cast off. The best way to reduce this stiffness is to wash your hand under hot water very gently. Allow hot water to run on your hand for about 10 minutes, and then afterwards attempt to move your fingers and form a fist.

   Note: It is perfectly normal not to be able to make a fist or move your fingers after being fixated in a cast for long periods of time. A positive attitude goes a long way. You must accept that your hand will not be normal right away and that you have to work at it until it feels ready for movement exercises.

   Caution: Skin nerve cells may damaged or altered from prolonged exposure to the cast material. As you may not have normal sensations to heat, exercise caution when placing your hand in a hot water bath to avoid being seriously burned.

5. Repeat step 4 up to three times a day (morning, afternoon, and night) until you feel the stiffness in your hand has reduced by about 50 percent.

   Now that you have slowly started to reduce the stiffness from being in a cast, the next step is to start breaking up some of the scar tissue that will be present near the site of fracture. The body often over compensates for a fracture and builds an excess of tissue in the region that is affected. This build up of tissue can often cause problems with mobility and pain. However, with the proper massage techniques, the excess scar tissue can be eliminated. Transverse massaging of the incision site is the best way to reduce the immediate scar tissue that will be located directly below the cut the surgeon made to reduce the bone.
6. Transverse massaging should be done while allowing hot water to run on the hand, in order to ensure the increase of blood flow to the affected region. With the thumb of your opposite hand, rub the surgical incision in the direction that is perpendicular to the scar itself, as is depicted in figure 3 above.

   Note: Transverse scar massaging can be a very painful process. If you feel your hand becoming numb and tingly, stop immediately and continue on another day.

   Additional Tips: In order to reduce the friction between the skin, try lubing your hand with vitamin E oil before you begin the transverse massaging. This will give you the opportunity to press harder on the incision site, which in turn will allow more scar tissue to be released and broken up.

7. Repeat step 6 two times a day (morning and night) for a duration of 3 weeks until you do not feel immediate pain from transverse massaging.

   Now that you have regained proper blood flow to your hand and eliminated a majority of the scar tissue, you will begin hand exercises in order to regain strength and mobility. For this portion of the rehab process, you will need to purchase a stress ball and a set of resistance bands. Each can be found at your local sporting goods store.

8. In order to regain grip strength in your hand, grab your stress ball and attempt squeezing it as hard as you can. At first, you will not be able to grip the ball with a lot of force, this is normal since you haven’t used your hand in over a month. Try your best to improve your grip strength by increasing the amount of force you use each time you exercise. A photo of the proper gripping form is shown in figure 4, on the next page.
9. Repeat step 8 up to three times a day (morning, afternoon and night). Follow stress ball exercises with elastic band exercises as depicted below, in figure 5. Grip the handles such that your palms are facing downward, then attempt raise both hands to shoulder height.
Note: Shoot for 3 sets of 10 repetitions on both stress ball and elastic band exercises. Do not be discouraged if you are not able to do this right away. Hand rehabilitation is a slow and painful process. Work your way up at your own pace until you feel ready to take on more reps.

Conclusion:

Due to its complicated structure, the hand is one of the hardest regions in the body to rehabilitate post operation. The instruction set above is intended to give users a guide that will aid them in regaining the full use of their hand post surgical operation. As you progress through the steps of the rehabilitation process, you will notice that your hand will slowly begin to regain strength and mobility. After some time, you should be able to recover most of the normal function of your hand and perform normal day activities as you would have pre fracture. If you notice any serious problems with the progression of your mobility and strength while rehabbing, make sure to contact your physician immediately for a follow up appointment, as this may be a sign of a worsening condition.

Bibliography: