

General Information - Exercise

To maximize the potential for prevention and recovery, it is important to make a commitment to daily stretching and cardiovascular exercise and to perform strengthening exercises 3-4 times per week depending upon your schedule and your symptoms

Begin with postural and core strengthening, especially If you are painful or if the injury is acute. Progress into strengthening for the hand, wrist and elbow as symptoms and pain tolerance allows.

Exercise sessions do not need to be long. Taking 2-3 minutes for stretching every hour while working will improve your comfort. Studies show that these mini rest-breaks actually increase your productivity by the end of the day!

- **Stretching** tight muscles daily
 - increases flexibility
 - reduces muscle tension
 - allows muscles to work more effectively
 - promotes faster recovery of daily wear-and-tear
 - helps remove waste products from strained muscles
- **Strengthening** weak muscles 3-4 times a week
 - increases muscle tone
 - restores balance to muscle groups
 - improves muscular endurance
- **Cardiovascular** activity - performing 15-20 minutes daily
 - increases circulation
 - improves oxygen and nutrient flow

Tendon Gliding Exercises

Nine tendons pass through the carpal tunnel. Four of the nine tendons bend the tips of the fingers; another four of the nine tendons bend the middle joints of the finger, and the ninth tendon bends the thumb tip. The purpose of these exercises is to glide the tendons gently through the carpal tunnel to minimize microscopic adhesions, reduce congestion, and improve lubrication in the tendons. These are *not* strength exercises. Perform the exercises gently or they may cause a pain flare-up.

- **Hook fist** - touch your fingers to the top of your palm. The large knuckles should be pulled back as much as possible.

- **Full fist**- touch your fingers to the middle of your palm. All three finger joints should be bent.
- **Straight fist** - touch your fingers to the bottom of your palm. The tips of the fingers should be straight.
- **Thumb flexion** - Start with your thumb pulled back from your palm as if you are hitch-hiking, then move your thumb across your palm and try to touch the tip of the thumb to the bottom of the small finger.

Nerve Gliding Exercises

The three nerves that supply power and sensation to the hand begin at the spinal cord in the neck. They have some elasticity, like a rubber-band, and lengthen and shorten as we move our arms. With repetitive trauma, microscopic adhesions can bind the nerve. Then, when the nerve over-stretches, we experience sensations such as pain, numbness, tingling, or coldness in the fingers.

If you are experiencing nerve symptoms, these exercises to glide (or slide, or pump) the nerves are critical. In fact, in one study, the chances of avoiding surgery improved dramatically when nerve glides were added to the therapy program.

It is very important not to over-stretch the nerve while exercising or you will *create* symptoms. Perform these exercises at a quiet time when you can pay close attention to the signals from your body. Feeling some tension is good but do not stretch to the point that you feel pain or numbness. You may feel tension anywhere along the nerve pathway, sometimes at quite a distance from the site of pain. I've had clients feel tension in their arms, shoulders, neck, even chest and back!

I teach clients to gently "pump" the nerve so that it is carefully teased out of adhesions. Some therapists instruct their clients in a sustained hold of 10 seconds. Try it both ways and see which feels better for you.

- **Median Nerve Glide** (the carpal tunnel nerve)
 - Sweep your arm out to the side until it is slightly behind you, palm facing forward, elbow gently straight
 - Pull your wrist back until you feel a gently tension somewhere in the arm
 - Relax the wrist forward until tension is relieved
 - Repeat 10 times
 - Ease the tension on the wrist to about half
 - Holding this position, gently raise your arm until you feel tension (stay below shoulder height)
 - Lower the arm until tension is relieved
 - Repeat 10 times
 - Ease the tension on the arm to about half

- Tilt your head (bring opposite ear towards opposite shoulder) until you feel tension
- Straighten the neck until tension is relieved
- Repeat 10 times

Ulnar Nerve Glide (the funny bone nerve)

- Place your arm out to your side with the wrist pulled back as if you are saying "stop"
- Bring your fingers toward your ear as if to cup the ear with the palm, fingers pointing to the shoulder. Stop when you feel a gentle tension.
- Bring your hand back out to the side until tension is relieved
- Repeat 10 times.



As an alternative:

- Hold your arm out to the side, elbow straight, fingers gently curved but not in a fist
- Rotate your arm fully until the palm is up.
- Gently tilt your head (bring opposite ear towards opposite shoulder) until you feel tension
- Straighten the neck until tension is relieved
- Repeat 10 times

Radial Nerve Glide (the back of the hand nerve)

- Place your hand at your side with the back of the hand facing forward
- Push your shoulder down towards the floor (the movement comes from the shoulder, do not lean)
- Bend your wrist toward the palm until you are in the "waiter's tip" position (as if you are a waiter unobtrusively taking a tip)
- Move your arm back behind you and up at a slight angle to the side until you feel tension
- If you feel as if you need more stretch, gently tilt your head (bring opposite ear towards opposite shoulder) until you feel tension
- Straight the head or move the arm back down until tension is relieved
- Repeat 10 times

These nerve glides deserve a repeat of the previous cautions. Stretch only until you feel a gentle tension. Avoid pain. Perform in a quiet environment and listen carefully to your body's feedback while performing.

Finger & Thumb Stretches

- **Finger abduction and adduction** (Spread the fingers apart widely then bring them back together)- This is an exercise that just feels good and can help reduce swelling in the fingers. It also stretches the hand out of the position it is held in for most of the day.



Thumb stretch - Using your other hand, pull the thumb back into the hitch-hike position. You should feel a nice stretch in the muscles at the base of the thumb. Push from the base of the thumb where it meets the palm. Do not pull from the thumb tip. This can hyper-extend the tip or the middle thumb joint. This is an important stretch to perform if you use a blackberry or text-message frequently.

Wrist stretches & Forearm Muscle Stretches

These are great stretches for elbow pain or forearm tightness. Make sure to keep your shoulders relaxed. The muscles of the arm being stretched should be relaxed - do not activate the muscles. The other hand is doing all the work to provide the stretch. If necessary, start the stretch with the elbow tucked in to your side and then gradually straighten the elbow while you maintain the stretch with the other hand until you feel a good stretch. Do not hyperextend your elbow. If performing these stretches with your arm held at shoulder height is uncomfortable, you can relax the shoulder and arm so that it is half-way between the shoulder and the side of your body. These stretches should not hurt; however, it is okay to feel a gentle "good pain". Hold for 30-40 seconds. Perform 2-3 stretches before and after strenuous activity and every 1-2 hours or so during non-strenuous activity.

- **Forearm Extensor Stretch:** Place your hand in front of your body with the elbow straight and the palm down. Let gravity bend the wrist forward. With your other hand, gently push the wrist further until you feel a good stretch. Hold for 30-40 seconds. Close your fingers gently to increase the stretching sensation.



Forearm Stretch-Fingers Relaxed Forearm Stretch-Fingers Bent Forearm Stretch-Arm Relaxed

- **Forearm Extensor Stretch with Full Pronation:** Same as above but rotate the palm outwards as if you are swinging the small finger up towards the ceiling. Hold for another 30-40 seconds. Close your fingers gently to increase the stretching sensation.



- **Forearm Flexor Stretch with Pronation:** Place your hand in front of your body with the elbow straight as if you are saying "stop". Support the hand being stretched with the other hand. Relax the muscles of the arm being stretched so they are not activated. Gently push the wrist further with the other hand until you feel a good stretch. Hold for 30-40 seconds.



- **Forearm Flexor Stretch with Supination:** Begin from the "stop" position with the fingers pointing up towards the ceiling. Swing your fingers out and rotate your arm until the fingers are now pointing to the floor. Make sure the muscles are relaxed and not pulling the wrist back actively. Gently push the wrist further with the other hand until you feel a good stretch. Hold for 30-40 seconds. This forearm stretch is often the most uncomfortable for people to perform. If necessary, bend the elbow to make this stretch more comfortable.



Forearm Stretch-Elbow Straight



Forearm Stretch-Elbow Bent

Computer stretches

It is important to stretch frequently throughout the day. Every 30-60 minutes or so, take 30 seconds to stretch out of the position you have been in. For example, if seated at a computer,

stand up, stretch your back, pull your shoulder blades together, open your arms, turn your palms up, straighten your elbows, look up at the ceiling. Then choose 2 or 3 of the following. Alternate these throughout the day, so that by the end of the day, you will have performed 2-3 repetitions of all.

- Stretches should feel good, not painful.
 - Occasionally you may feel a "good pain". This is okay.
 - Perform stretches smoothly and slowly.
 - Hold the stretch gently. Do not bounce.
 - Breathe slowly, deeply and naturally.
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- supination
 - triceps- overhead
 - triceps - across shoulder
 - biceps - behind back
 - shoulder circles - emphasize scalp retraction, depression
 - hands behind head
 - neck side-bend- neutral, up, down
 - neck rotation- neutral, up, down
 - neck retraction- neutral, flexion

Wrist strengthening

Flexion - (wrist curl)

- Place the back of your forearm on a padded chair arm with the palm facing up.
- Keep your shoulders relaxed. Your elbow, shoulder and ear should all line up.
- Holding a comfortable amount of weight (a juice can, soup can, water bottle, small weight, 1-5 pounds depending up your conditioning and symptoms) bend the wrist forward for a count of 4, pause briefly, and then release for a count of 4.
- Do not snap the wrist forward.
- Control the release. I
- f you have an injury, do not start the movement from an extreme position of wrist extension and do not let the weight roll out to the tips of the fingers.

Extension - (reverse wrist curl)

- place your forearm on a padded arm chair with the palm facing down.
- Keep your shoulders relaxed. Your elbow, shoulder and ear should all line up.
- Holding a comfortable amount of weight (a juice can, soup can, water bottle, small weight , 1-5 pounds depending up your conditioning and symptoms). pull the wrist back for a count of 4, pause briefly, then release for a count of 4.
- Do not snap the wrist back.
- Control the release.
- If you have an injury, do not start the movement from an extreme position of wrist bend.

Radial deviation (hammer curl)

- Place the small finger edge of the forearm on a padded chair arm with the thumb side of the hand up.
- Keep your shoulders relaxed. Your elbow, shoulder and ear should all line up.
- Holding a comfortable amount of weight (a juice can, soup can, water bottle, small weight , 1-5 pounds depending up your conditioning and symptoms) gently bend the wrist up towards the thumb then down towards the small finger as if you are slowly using a hammer.
- Do not snap the wrist.
- Control the release.

Supination & pronation - (forearm rotation)

- Tuck your elbow gently in at your side.
- Keep your shoulders relaxed. Your elbow, shoulder and ear should all line up.
- Holding a comfortable amount of weight (a juice can, soup can, water bottle, small weight, 1-5 pounds depending up your conditioning and symptoms) slowly rotate your palm up for a count of 4, then rotate your palm down for a count of four.
- All the movement should come from the forearm. Do not let the elbow move in towards the body or out away from the body.

Hand Strengthening

A Word about Grippers, Squeezers & Tennis Balls

Use grippers cautiously. I have found that weakness in repetitive strain injuries is caused by pain, not by lack of use. In fact, the majority of activity that we perform during the day (lifting, gripping, pinching, holding) works the flexors, the muscles that bend the fingers. Squeezing tennis balls or stress balls or using commercial hand strengtheners may only fatigue and stress already over-worked muscles. It is more important, especially when an injury is painful or acute, to create muscle balance by working the extensors, the muscles that open the hand.

- ✓ **Rubber band ext** - Rubber bands found in the produce section (binding asparagus stalks or broccoli) work well for this exercise

- ✓ **Putty exercises** - putty is available on-line, through some pharmacies or medical supply stores or in sports stores. Make sure that you purchase a soft, medium soft putty, or medium putty. Often, the sports stores carry firmer putty designed for the athlete. This putty is too hard for the exercises described below or for those with hand injuries.



Upper- Body Strengthening

Frequently in our clinic we work on strengthening activity. Occasionally, when grip strength does not improve with hand strengthening exercises alone, we will see a gain in strength when we add general upper body strengthening activity. With repetitive strain injuries, it is common that the "mirror" muscles (the ones you see when looking in a mirror, such as the pectorals) become tight, and the non-mirror (or back) muscles become weak. The strengthening exercises below target the non-mirror muscles, helping to re-create postural balance.

These are a few samples of the many different techniques used for strengthening these muscles.

- ✓ Hold weights lightly (do not squeeze).
- ✓ If holding a weight aggravates symptoms, try using an ankle or cuff weight placed on the lower end of the forearm.
 - rows
 - abduction
 - extension
 - lat pulls
 - external rotation

Core Strengthening

All movement begins from our core: the abdominals, back, trunk and hip muscles. These core muscles stabilize our body. When the core is strong, the power, efficiency and endurance of all muscles are improved.

Improving core strength reduces risk of injuries:

- Improves body stability and flexibility
- Allows the body to move properly
- Supports the movement of our arms
- Increases the efficiency and power of all muscle groups

Diaphragmatic Breathing

Most people tend to breathe using the muscles of the neck and shoulders rather than the diaphragm. Work activity, sedentary activity, and stress increase this tendency. With time, this type of shallow breathing can affect blood flow and nerve and muscle function. Diaphragmatic breathing relaxes the muscles of the neck and shoulders.

Practicing diaphragmatic breathing daily will improve the strength of the diaphragm and improve the quality of our breathing.

- Improves oxygen flow to the body's tissues
- Reduces stress

- Relaxes the muscles of the neck and shoulders
- Lowers blood pressure and heart rate
- Retrains the body to breathe correctly
 - Place a hand on your upper abdomen.
 - Inhale deeply through the nose. You will feel your hand rise as the diaphragm expands.
 - Exhale slowly through the lips and gently push in with the hand that is on the diaphragm.
 - While exhaling, relax your neck, shoulders and chest.
 - Repeat slowly for 5 minutes.