

Hand Therapy Techniques

Splinting

- Braces and splints are used to:
- Support the injured area in a position of comfort
- Rest inflamed areas by reducing friction caused by movement
- Hold the wrist, finger or elbow in a position that reduces stress and optimizes healing
- Protect the injured area from further bumps or re-injury
- Act as a "reminder" to perform activity gently
- Warn others to be careful around an injured area

Modalities to Reduce Pain, Reduce Swelling and Promote Healing

- Hot Packs
 - Increase Circulation and blood flow
 - Increase flexibility and relax muscles
 - Good for chronic pain
 - Good to use prior to exercising
 - Apply pack for 10-20 minutes
 - May cause a little more swelling
 - Use carefully, especially if sensation or circulation is impaired
- Paraffin Dips
 - More intense heat than a hot pack as hot wax coats the joints
 - Good to help soften scars
 - Good for arthritic joints
 - Home units are found easily and cost is now reasonable
 - Use carefully. Avoid use if sensation or circulation is impaired
- Contrast Bath
 - Increases circulation
 - Decreases Swelling
 - Decreases pain
 - Good for acute pain
 - Use two basins of water, one with hot water (about 100 degrees - on the warm side but not burning) and 1 with cold water (cold but not freezing).
 - Place hand in the warm water for 3 minutes followed by cold water for 1 minute.
 - Alternate 4-5 cycles.
- Cold Packs
 - Reduces acute swelling
 - Decreases pain
 - Good for alleviating post-activity or post-exercise soreness
 - Causes a temporary reduction in flexibility
 - Use carefully, especially if sensation and circulation are impaired
 - Apply cold packs in 10-20 minute intervals until the tissues feel cold or numb and the skin is slightly red. Use a thin towel layer between the cold pack and the skin.

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- Because cold decreases flexibility, let the tissues warm up for about 20 minutes before performing exercise or intensive hand activity after using cold
 - An inexpensive way of providing cold is to use a bag of frozen corn (frozen peas work as well, but may become mushy if used frequently). Mark the bag "for therapy" and do not eat the corn once it has been defrosted and refrozen.
 - You can also use a good, leak-proof freezer bag to freeze 3 parts water to 1 part alcohol (any type of alcohol will do). The alcohol prevents the water from freezing completely, making a slush that can be wrapped around the painful area.
- **Ice Massage**
 - More intense than a cold pack
 - Good for small areas of superficial inflammation and tenderness
 - Use carefully. Avoid use if sensation or circulation is impaired.
 - Freeze water in a small dixie-cup or Styrofoam cup (or use an ice-cube).
 - Tear off the lip of the cup until a small portion of the ice is exposed.
 - Massage the painful area with small, circular strokes (never hold the ice still over the area).
 - Initially, the area being massaged will feel very cold, then achy, then almost as if it is burning, then it goes numb.
 - Stop the ice massage once the area is numb.
- **Ultrasound**
 - The use of sound waves created when an electrical current passes through a crystal sound head
 - If the sound wave is pulsed, ultrasound increases circulation, decreases swelling, promotes healing
 - If the sound wave is constant, ultrasound acts as a deep heat and relaxes muscles
 - Helps soften scars
 - May be used to help push an anti-inflammatory medication through sweat pores to a local region (called phonophoresis - studies show controversial results at this time regarding effectiveness)
 - Needs to be prescribed by a physician or chiropractor. Often administered by a therapist
- **Iontophoresis**
 - The use of an electrical stimulator using a direct current to push medication through sweat pores to a localized area of superficial inflammation and tenderness.
 - Reduces localized swelling
 - Reduces pain
 - Needs to be prescribed by a physician or chiropractor. Often administered by a therapist
 - Advise the therapist if you are allergic to any medications
- **Electrical Stimulation**



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- Used to block the way that the brain perceives pain signals
- Can increase circulation and help promote healing
- Needs to be prescribed by a physician or chiropractor

Manual Therapy

- Soft Tissue Mobilization
- Cross-Friction Massage
- Trigger Point Massage
- Myofascial Release
- Scar Management - massage, silicone gel



Manual Therapy
Relaxes.
Relieves.
Restores.
Renews.

Exercises

- Stretching
- Tendon and Nerve Glides
- Strengthening
- Cardiovascular

Education

- Ergonomics
- Joint and Tendon Protection Techniques
- Positioning - elevation, sleeping

Reducing Swelling

- isotoner gloves for a gentle compression
- ace-wrap or coban (disposable elastic bandage) wrap for gentle compression
- cold packs
- retrograde massage - massaging gently but firmly from the finger-tips towards the elbow to assist circulation and movement of the extra-cellular fluid back towards the body's pump (the heart)
- positioning (elevation) - to be properly elevated, the wrist should be higher than the elbow, and the elbow should be higher than the heart with the elbow mostly open. Use pillows when sleeping to support the arm.

Reducing Scarring

- Managing scar tissue is a constant battle in hand therapy. Some body types are naturally good healers and lay down thick scar tissue. Other bodies heal more slowly but scars are naturally soft and supple. The body has an amazing ability to deal with scar tissue.

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- During the initial stages of injury, the body throws down a mass of chaotic scar fibers in an attempt to close the wound.
- The body does not differentiate between the different layers of tissues while healing but binds them together.
- The scar is often thick, raised, red, and stuck to tissues underneath.
- Over time, the body will gradually break down fibers and reform them until the scar is organized into more of a matrix. This is considered to be a mature scar.
- It takes 6 months for scars to naturally soften. Swelling will often go down at this time as well due to the softening scar.
- A mature scar is more supple, flat, white, and less painful and sensitive.

General Timeline for Healing & Scar Tissue Formation

- Weeks 1-2 - The body begins healing and is working to close the wound
- Weeks 3-6 - The body throws down an incredible mass of scar tissue. During this time-frame, you may actually feel stiffer than during the first two weeks. Morning stiffness is common. "Bad days" outnumber the good. Exercising within surgical precautions is critical during this stage, although at times you may not feel as if you are accomplishing much since the scar tightens up quickly again after exercise.
- Week 6-8 - scar tissue formation begins to slow.
- Week 8 - The injured area suddenly begins to feel just a bit better
- Week 12 - Definite improvement noted. Scar begins to soften and become more supple.
- Months 4-6 - Swelling goes down significantly and motion improves
- Month 6+ - The body is now breaking down scar tissue faster than it is laying it down (although scar will continue to form for over a year). You now begin to forget about the injury or surgery except for the infrequent bad day.

Within this time-frame, we can impact the scar to some degree. Some techniques to improve scar tissue formation include:

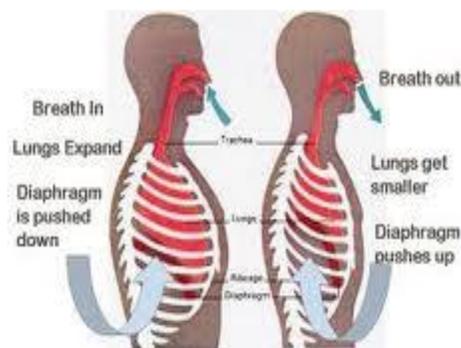
- Massage - place a finger pad directly over the scar and gently massage in circles or push/pull the scar in all directions as if you are stretching the fibers underneath the skin. Do not rub across the scar as if you are trying to erase it. This can create too much friction and may create a water blister along the scar line or rub the scar raw.
- Compression - Ace wraps or compressive bandages or gloves can help lay down a flatter scar. A therapist may make a "scar mold" out of silicone putty.
- Silicone gel- Many band-aid companies are now marketing products to manage scar tissue. Rather than gauze, these band-aids have a layer of gel that may contain either silicone or mineral oil. Clinically, I find that most people respond best to the silicone based gels. These band-aids are an investment but are often worth the cost. Many people notice a significant softness in their scars which can help improve motion, reduce swelling, and reduce sensitivity. Studies report an improved scar matrix with use.
 - Wear at night for 10-12 hours so that the band-aid is not in the way during daily activities.

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- Do not wear over open wounds.
- **Vitamin E, Mederma, , Cocoa Butter, Aloe Vera, antibiotic creams** (bacitracin, neosporin, triple-antibiotic)- Although most hand physicians in my area recommend Vitamin E application to the new scar to improve it's appearance , clients have used all of these substances and reported good results (studies, however, are controversial).
 - The easiest and least expensive way to apply Vitamin E is to purchase the gel vitamins, prick one with a pin, and squeeze out some of the tacky fluid.
 - Do not introduce any of these scar reducing lotions over an open wound except for the anti-biotic creams

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 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.



Positioning

- **Sleeping positions:** Finding a comfortable position while sleeping can be difficult. You will need lots of pillows to support the arms.
- **When sleeping on your back:**
 - Place a small pillow underneath the armpit to "open up" the shoulder;
 - Place a pillow under the knees to help support the lower back.
 - Use pillows as a "ramp" for the arm giving the arm some elevation.

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- Keep your arms out to the sides, or if more comfortable, coming in towards your navel.
- Keep the elbow only slightly bent (you may need a splint or brace to help with this). Avoid the fetal position.
- Keep the wrist neutral (you may need a splint or brace to assist with this).
- Use only a small pillow that supports the neck but does not push the head forward.
- Do not sleep with your arms overhead or placed behind your neck as this places stress on the muscles and nerves.
- **When sleeping on your side:**
 - Place the arm of the side you are sleeping on at about a 45 degree angle in front of your body with a small pillow underneath for support.
 - Place your other arm about 45 degrees in front of your body with larger pillows to support it over the first arm (as if you are hugging a giant beach ball). Do not let your arm just "hang down" at your side.
 - Keep your elbows only slightly bent in a comfortable position (you may need a splint or brace to assist with this). Avoid the fetal position.
 - Keep the wrist neutral (you may need a splint or brace to assist with this).
 - Use only a small pillow that gives the neck support but does not push the head forward.
 - Your legs will be stacked one on top of the other. Use a pillow between the knees for comfort. Place a pillow behind you so you can roll slightly back but still be supported.
- **Sleeping on your stomach:**
 - Train yourself to sleep on your side or your back.
 - Sleeping on your stomach places stress on the nerves for the arms as they branch under the armpit.
 - Avoid sleeping on your stomach if at all possible.

Sleeping Hygiene

- Stay on a regular sleep cycle. Staying up late and sleeping in late one or two days a week can disrupt the sleep cycle.
- Exercise helps promote deeper, healing sleep. Exercise earlier in the day, not right before bed, or it may be difficult to fall asleep.
- Try taking a warm shower before sleep to increase body temperature and relax muscles.
- Alcohol, nicotine, caffeine and sleeping medications alter the quality of sleep. Try to avoid these when healing from an injury so that your body gets the healing rest that it needs.
- Your room should be quiet, comfortable and dark.
- Avoid connecting your bedroom with stressful activity such as paying the bills.

Elevation - I find that people try to follow medical orders and elevate their arm to reduce swelling by bending the elbow and holding the hand close to their shoulder. This can actually impede fluid flow much the same way that bending a garden hose in half crimps off water

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supply. Or people lift the arm high overhead for extended periods of time which makes the shoulder sore. Here are some suggestions for positioning to maximize fluid flow and reduce swelling.

Use lots of pillows for support. Position the pillows so that they act as a "ramp" by positioning the wrist raised above the elbow level and the elbow raised above the heart level. Keep the elbow only slightly bent. You can use this positioning while sitting at a table, while in bed or while reclined on the couch with lots of pillows in your lap as support.

Posture

- Maintain a good, comfortable posture. Move often and fluidly. Return to your posture base when an activity is completed.
- Don't rest your chin in your palm.
- Don't lean on your elbows on the table, on arm rests, or in the car.
- Don't lean the forearms on sharp desk or table edges.
- Don't round the shoulders and let the head fall forward while working