

# BASIC INTERVENTIONS



## Edema Control

- Elevation, active exercise, and compression have been the mainstays of edema control. Treatment of upper extremity edema has also historically included retrograde massage, string wrapping, compression garments, and modalities such as an intermittent pressure pump.
- a new approach to the treatment of upper extremity edema, called **manual edema mobilization** (Artzberger, 2007), a technique for stimulating the lymphatic system to remove the excess large plasma proteins that cause sustained edema leading to fibrotic tissue and stiffness.





# Manual Edema Mobilization Concepts

- The basic MEM technique consists of **diaphragmatic breathing, light skin-traction massage, exercise, pump point stimulation, and a self-management program.**
- All MEM sessions **begin** with deep, diaphragmatic breathing. This “belly” breathing involves breathing in deeply through the nose, causing the abdomen to expand, and then slowly exhaling through “pursed” lips. Feeling or seeing the rise and fall of the abdomen can help the therapist ensure that the patient is correctly performing the technique.
- Respiration changes tissue pressure, and thus lymphatic absorption is stimulated.



- A light skin-traction massage is a massage so light that no blanching or indentation of the skin occurs yet it is firm enough to move the skin, thereby preventing the hand from sliding on the skin. The light skin-traction massage technique involves a rhythmical massage that forms U shapes on the skin, with the opening of each U in the direction of lymphatic flow proximally to an uninvolved or previously decongested area. The massage technique should remain light and should follow lymphatic pathways.



- Clearing U Massage
- Initially, the therapist performs the MEM massage technique (the U technique) in one segment of the body, starting proximally (or centrally) and moving distally down the segment. This proximal- (or central-) to-distal massage technique is referred to as the “**clearing U s,**” and its purpose is to clear the lymphatic system within that segment. The clearing U s technique consists of performing **five** consecutive U massages in the most proximal (or central) location within that segment, then performing **another five** U massages just distal to the previous five, and continuing in this manner down to the distal portion of that segment. For example, if edema is in the right hand, the clearing U s would start with five U s at the left shoulder region, then five at the left clavicle, five over the sternum, five over the right clavicle, five at the right shoulder region, and so on down the arm until the therapist reached the hand.



- Immediately after performing the clearing U massage technique in each section (trunk, upper arm, elbow, forearm, hand), active and/or passive exercises that move the joints and muscles associated with the recently cleared body segment are performed. In the example given, active and/or passive shoulder flexion, shoulder abduction, elbow flexion/extension, wrist flexion/extension, and fisting exercises would be performed after the clearing U massage.
- Once the clearing U massages have been performed throughout the entire segment and the active and/or passive exercises have been performed, that segment is then considered cleared. The purpose of clearing a segment is to open and clear out the lymphatic pathways to allow the flow of lymph into the central structures.

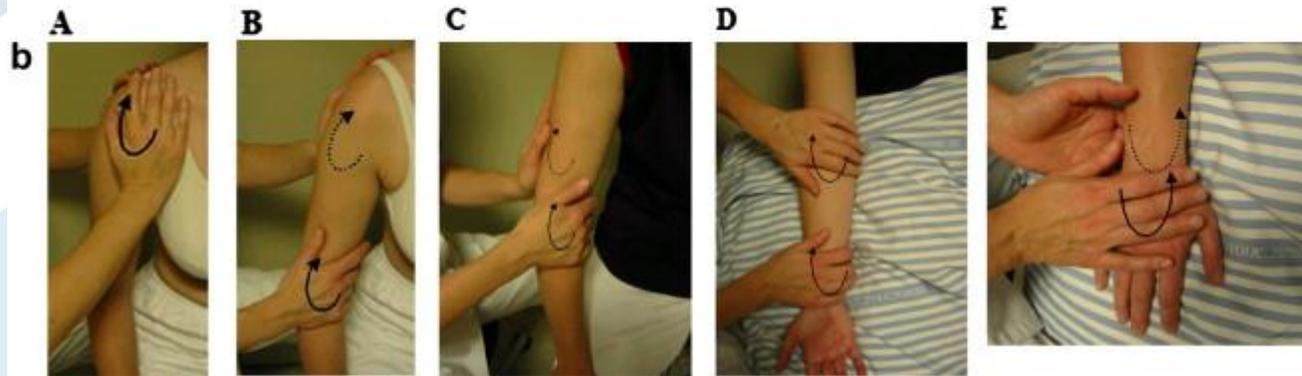
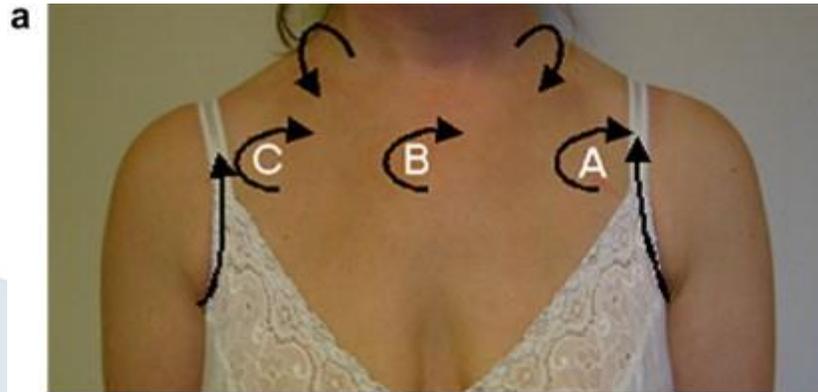


- Flowing U Massage
- After a segment has been cleared, the therapist changes the direction of the massage technique to promote the flow of lymph through the recently cleared segment. During the **flow portion, the U massage is performed distally to proximally** (or centrally) within the newly cleared segment. This distal-to-proximal (or -central) massage technique is referred to as “**flowing U s,**” and it consists of performing one U massage in a distal location within the cleared segment, then performing another U massage just proximal to the previous one, and continuing up to the most proximal portion of the segment. At this point, the sequence is repeated **until five** U massages have “flowed” up the cleared segment.
- In the previous example, after the right arm had been cleared, the therapist would perform one U massage over the dorsum of the right hand, then over the right volar wrist, the right volar forearm, the right cubital tunnel, the right volar upper arm, the right shoulder, the right clavicle, the sternum, the left clavicle, and then finally the left axilla.



- Differences Between Clearing U Massage and Flowing U Massage
- Although the clearing U massage and the flowing U massage are performed in the same segmental area, they differ from each other in two ways. First, the clearing U massage is performed in a proximal- (or central-) to-distal fashion, whereas the flowing U massage is performed in a distal-to-proximal (or -central) fashion. Second, the clearing U massage consists of performing five U massages in each location before moving distally, whereas the flowing U massage consists of performing only one U massage distally within a segment, and then moving sequentially up the segment until the proximal (or central) portion of that segment is reached. The flowing U massage sequence is then repeated a total of five times





# Contraindications

- **When Not to Perform Manual Edema Mobilization (MEM)**
- If **infection** is present because there is the potential to spread the infection
- Over areas of **inflammation** because of the potential of increasing the inflammation and pain (Do MEM proximal to the inflammation to decrease congested fluid.)
- If there is a **blood clot** or hematoma in the area because there is the opportunity to activate (move) the clot
- If there is **active cancer** (A controversial theory notes the potential to spread cancer. Absolutely never do MEM if the cancer is not being medically treated. Always seek a physician's advice.)
- If the patient has **congestive heart failure**, severe cardiac problems, or pulmonary problems because there is the potential to overload the cardiac and pulmonary systems
- In the **inflammation stage of acute wound healing** because theoretically there is the possibility to disrupt the "clean-up" process and the invasion of fibroblasts
- If **renal failure or severe kidney disease** problems exist (This is not a high-protein edema. There is the potential for overloading the renal system and/or moving the fluid elsewhere.)
- If the patient has **primary lymphedema or postmastectomy lymphedema**



# Scar Management

- **Compression** (e.g., Isotoner™ gloves, Tubigrip™, or Coban™ wrap) and **desensitization** are traditionally used to promote scar softening and maturation. Silicone gel applied over the scar helps promote scar maturation, presumably through neutral warmth. Other inserted materials such as padding, otoform, or elastomer can also be used.
- Application of micropore tape over incision scars is gaining popularity. It has been shown to be very effective and is much more affordable than the other options



- Although friction massage has typically been advocated for scar softening, legitimate questions have been raised as to whether this more aggressive technique may in fact cause inflammation, resulting in deposition of even more scar tissue. Manual edema mobilization may be a more effective alternative. Research is needed in this area.



# Differential Digital Tendon Gliding Exercises

- Tendon gliding exercises maximize total gliding and differential gliding of digital flexor tendons at the wrist. Because tendon gliding exercises promote digital and joint motions, they are a mainstay of most home exercise programs.
- **The four positions: straight, hook, straight fist, and full fist.**



# Blocking Exercises

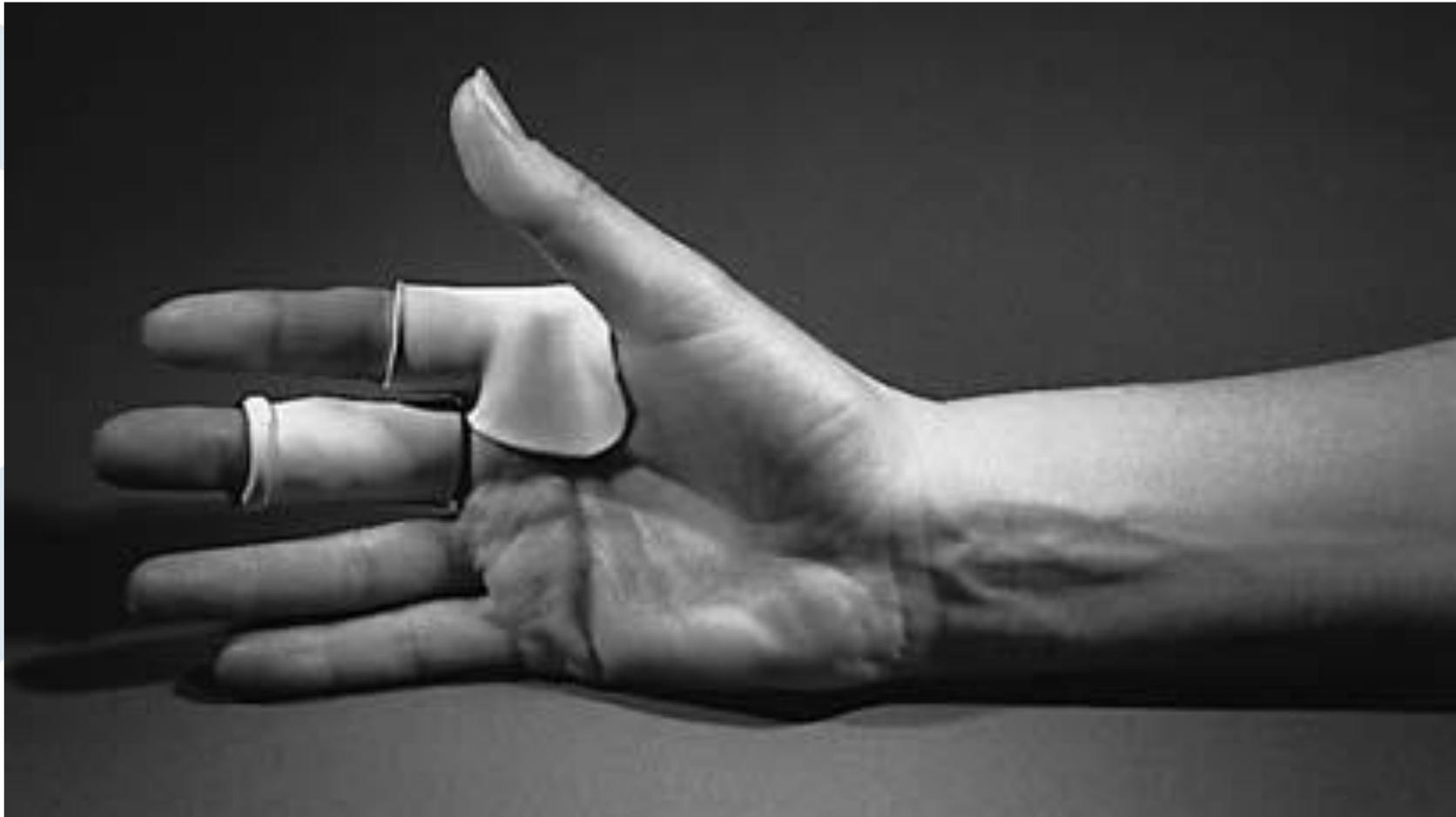
- Digital cylinders blocking the IPs help to isolate and exercise MP flexion and extension. A blocking splint with the MPs extended promotes intrinsic stretch as well as IP flexion. A blocking splint with the MPs flexed promotes extrinsic extensor stretch and recovery of composite fisting [flexion at all finger joints of the hand simultaneously].
- A PIP cylindrical block encourages DIP isolated flexion and flexor digitorum profundus (FDP) excursion at the DIP. A DIP cap facilitates PIP flexion and flexor tendon excursion at the PIP.
- Instruct patients who do blocking exercises to exercise comfortably into the end range to remodel the tissue. Teach them to do the exercises frequently and slowly, holding at the comfortable end range for 3–5 seconds.







Blocking splints. MP splint blocks MP motion, promoting PIP and DIP motion. Digital splint blocks PIP motion, promoting MP, and/or DIP motion.



# Place-and-Hold Exercises

- Place-and-hold exercises are effective for achieving increased ROM when PROM exceeds AROM.
- To perform them, use comfortable PROM to position the hand (e.g., composite fisting). Then release the assisting hand while the patient tries to sustain the position in a pain-free way.
- Place-and-hold exercises can be effective in combination with blocking exercises.



# Mirror Box

- Growing interest in neuroplasticity has provided fascinating additions to the traditional repertoire of hand therapists. The use of a mirror box (also called mirror visual feedback or mirror training) is based on research on neural responses to intentional visual confusion, with stimulation of neurons called mirror neurons. Mirror training is used for pain, sensory, and motor problems and can be used in conjunction with laterality and graded imagery interventions. It has been used with clients who have had a cerebral vascular accident (CVA) and is being used more recently with clients with peripheral and orthopedic problems of the upper extremities



- In mirror therapy (MT), a mirror is used to create a reflective illusion of an affected limb in order to trick the brain into thinking movement has occurred without pain, or to create positive visual feedback of a limb movement.
- This approach exploits the brain's preference to prioritise visual feedback over somatosensory/proprioceptive feedback concerning limb position. In conditions such as phantom limb pain (PLP), stroke, or Complex Regional Pain Syndrome Type 1 (CRPS1) where neuropathic processes cause issues with pain, related or unrelated to movement, this approach is thought to offer potential relief.





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# End Feel and Splinting



- If there is a soft end feel (a favorable spongy quality at end range indicative of potential to remodel), it is reasonable to **try low-load, long-duration dynamic splinting** for a medically cleared patient. Dynamic splint forces must be prolonged and gentle for tissue to remodel. Forceful splinting is contraindicated because it causes pain and injury, hence inflammation and scarring. Follow dynamic orthotic use with activity that challenges and incorporates the limited motion. For a firmer or hard end feel (an unyielding quality at end range), try increasing the time in the orthosis and decreasing the force. **If there is a hard end feel, dynamic splinting may not be effective, and serial casting or static progressive splinting may be more useful.**



# Splints (Orthotics)

- **Functional splints** (or orthotics) can be used in ordinary daily activity to promote mobility of restricted structures. For example, if the index finger PIP joint lacks flexion and the MP joint moves normally, try a hand-based index finger MP blocking splint, used off and on throughout the day. When the splint is in use, the patient achieves PIP flexion exercise while performing normal grasping activities.



- Buddy straps allow one digit to assist a neighboring digit to achieve greater motion. The offset buddy strap accommodates different phalangeal lengths of adjacent digits. Buddy straps are also useful to retrain keyboard users who habitually maintain the small finger MP in hyperextension or repetitively hyperabduction the small finger when keyboarding.
- A dorsal MP flexion blocking orthosis promotes composite flexion incorporating MP flexion and is particularly helpful when there is extrinsic extensor tightness. If the patient has difficulty incorporating MP flexion into composite fisting and instead extends the MPs while flexing the IPs, a dorsal hood maintaining MP flexion promotes recovery of composite fist incorporating MP flexion.



Offset buddy straps. Interdigital strap accommodates different phalangeal lengths of adjacent digits. Used to allow one digit to assist the next in achieving motion and for protection.



**THANK YOU**

