



# Tenodesis Thermoplastic Splint Kit

## Indications:

Use as a functional splint for those who have **fair to normal** wrist extensor strength and no hand strength. Ideal for C6 quadriplegic patients.

Use as a training device before a more permanent, wrist-driven tenodesis orthosis is made by an orthotist.

Designed to harness the power of wrist extension to bring the weak fingers into a moderate flexion position for gross grasp/tip pinch. Through reciprocal wrist extension and finger flexion motion (tenodesis action), the patient is able to grasp, hold, and release objects.

## Instructions For Use:



### 1. Mold the thumb immobilization piece

- Heat the thermoplastic precut piece in 150° F (66°C) water until pliable.
- Place the thumb in palmar abduction, with the thumb resting in alignment with the fingertips of the minimally flexed index and long fingers. A position of too much palmar thumb abduction will defeat the purpose of the splint.
- Mold the splint around the dorsal hand, through the web space and along the thumb. Hold the thumb joints stable with the IP joint flexed slightly. Be sure that the dorsal thumb piece is long enough to support the IP joint but not so long that it extends beyond the thumb tip. Leave the pulp of the thumb tip uncovered. (Figure 1) This dorsal thumb piece will help counter balance the pinching force of the fingers. The patient will have a broader pinch surface if the IP joint of the thumb is flexed slightly, allowing the pulp of the thumb to contact the pulp of the index and long fingertips in a three-point pinch pattern.
- Attach Velcro® hook and loop fasteners to the volar wrist area of the splint.
- Push down on the pulp of the thumb tip to assure that the splint can adequately support the thumb during pinch. If this is not the case, remold this portion of the splint.

## Description:

The Tenodesis Thermoplastic Splint Kit includes:

- Precut thermoplastic pieces: (1) dorsal finger component, (1) thumb immobilization component and (1) wrist/forearm component
- (1) Braided string, 18" (46cm)
- (1) Adjustable cord lock for the tenodesis string
- (2) D-ring straps with Velcro® Sticky Back Hook and Loop fasteners for the forearm cuff
- (2) Velcro® Sticky Back Hook pieces
- (1) Velcro® loop piece for the wrist strap
- (1) Velcro® loop piece for the finger straps



### 2. Mold the dorsal finger piece

- Heat the thermoplastic precut piece in 150° F (66°C) water until pliable.
- Mold the dorsal finger piece over the index and long fingers with joints in slight flexion. The fingertips should be positioned so they can touch the tip of the thumb. Be sure that the dorsal finger piece ends in the middle of the nail. This length will help prevent DIP hyperextension and any irritation from the splint along the nail bed cuticle. Curve the side edges of the splint slightly to make the piece stronger. (Figure 2)
- Cut the 1" (2.5cm) Sticky Back Hook piece into two ½" (1.3cm) wide strips and attach them to the dorsal finger piece. Trim as needed.
- Cut the Velcro® Loop piece into two ½" (13mm) wide strips. Attach these straps to the hook fastener around the proximal phalanx and around the middle phalanx. Make a mark about ¼" (6.5mm) distal to the PIP joint and between the index and long fingers. With an awl or punch, make a small hole at this mark. (Figure 3)

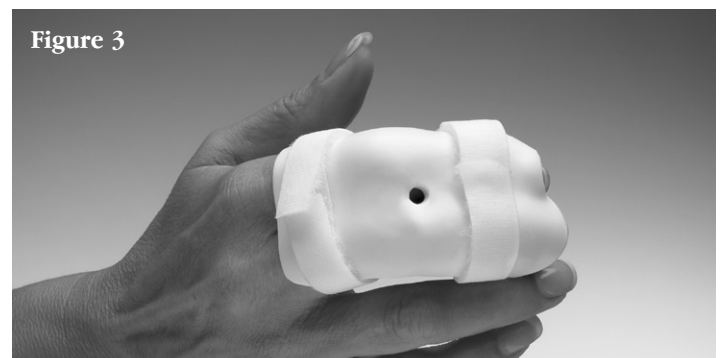




Figure 4

### 3. Mold the forearm piece

- Heat the thermoplastic precut piece in 150° F (66° C) water until pliable.
- Mold the forearm piece circumferentially around the distal forearm with the opening on the ulnar side of the arm. (Figure 4) Be sure that the ulnar styloid is free of pressure. Distal migration of the splint can be minimized somewhat by contouring the splint along the interosseous membrane depression, proximal to the wrist.
- In the proximal area of the forearm piece, punch two small holes directly in line with the index and long fingers when the wrist is in neutral. (Figure 5)
- Apply the two D-ring straps using the Velcro® Sticky Back Hook fastener.

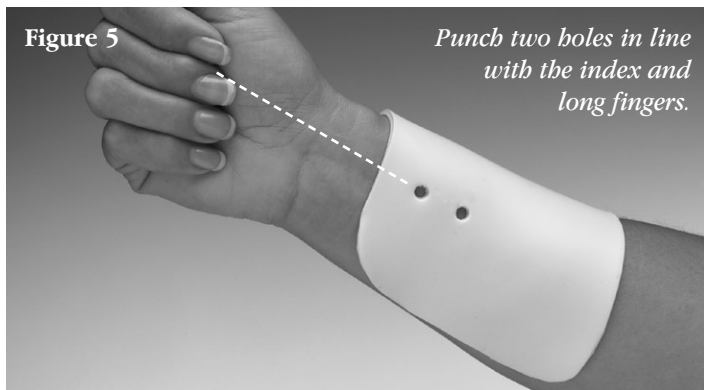


Figure 5

*Punch two holes in line with the index and long fingers.*

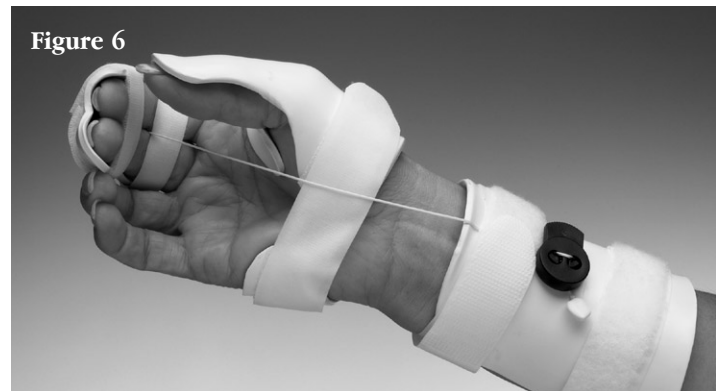


Figure 6

### 4. Attach the string

- Make a knot at the end of the string. To enlarge the knot and help keep it from untying, warm and mold a small piece of the included thermoplastic into a ball around the knot, or place a drop of glue over it.
- Thread the unknotted end through the dorsal finger piece leaving the knot to rest on top of the finger piece.
- Bring the unknotted end over the wrist strap to the proximal forearm piece and weave it through the two holes. The unknotted end of the string will hang out from the most proximal hole in the forearm piece.
- Weave the string's end through the cord lock. Push the cord lock up to the hole, tightening the string. (Figure 6)

### 5. Don the splint (reverse steps to remove)

- Place the thumb piece on the hand.
- Slip on the forearm piece with the opening on the ulnar side. Secure the straps.
- Slip on the finger piece with the wrist flexed. Secure the finger straps.

### 6. Adjust the string for tenodesis action

- Adjust the cord lock so that when the patient extends the wrist, the fingertips are brought to rest on the pulp of the thumb. The cord lock can be moved on the string to allow for a greater opening, permitting the patient to grasp larger objects.
- Attempt various grasps to assure that the splint is adjusted correctly. If the finger and thumb tips do not converge, the thumb immobilization piece or the dorsal finger piece may need to be remolded in a different position.
- Cut off any extra string and tie a knot within 1" (2.5 cm) of the cord lock. To prevent the knot from slipping through the cord lock, warm and mold a small piece of the included thermoplastic around the knot, or place a drop of glue over it.

### Care Instructions

1. Store at room temperature. Avoid exposure to heat as it may soften the material and cause it to change shape.
2. Wash with cool water and mild soap.

### Note

Originally designed at the Rehabilitation Institute of Chicago. See Sabine C. Sammons F, Michela B: Report of development of the RIC plastic tenodesis splint, *Arch Phys Med* 40: 513-515, Dec. 1989

NC22626-1 Small

NC22626-2 Medium

NC22626-3 Large

To be used under the guidance of a qualified medical professional.

