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Custom Orthoses in OT: A Review Part II
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Learning objectives

1. Identify the clinical indications for each orthosis
2. Recognize how to increase comfort with pattern and fabrication of each orthosis
3. Explain what to watch for when fabricating orthoses
Splints vs. orthoses

- ASHT definitions
- Splint
- Orthoses
  - Pre fabricated
  - Custom fitted
  - Custom fabricated

The term "splinting" should not be used by therapists who are fabricating or issuing orthoses. The term is used by physician offices for applying a cast (ASHT 2016).
Location, location, location!!!

- Digit based
- Hand based
- Forearm based
- Long arm
- Radial
- Ulnar
- Volar
- Dorsal

Poll

- Part 1: Who has made a custom molded, hand based, thumb spica before?
- Part 2: What do you find most difficult about this particular orthosis?
Thumb spica

- Thumb spica - restricts CMC and MP but wrist and IP joints are relatively mobile (Radomski 2008)
- Common indications: CMC OA, UCL

Thumb Spica Sillem et al 2011 study

- Comparing pre-fab vs. custom molded CMC orthoses
- Assessing difference in hand function, pain, and hand strength in adults with CMC OA.
- Fifty-six participants were randomly assigned for each orthosis in a two-phase, four-week crossover trial.
- Hand function outcome measure: Australian Canadian Hand Osteoarthritis Hand Index.
- Differences between the two orthoses were not statistically significant for effect on hand function, and grip and pinch strength.
- Both orthoses demonstrated modest improvements in hand function.
- Custom molded orthoses – less pain
- However pre-fab was preferred by patients
- CLIENT CENTERED!
Hand based thumb spica

Video

Results (no selections made – assuming no filtering)

6 database entries found.

Refine Search:

Assessment Type
No Preference

Type of training
No Preference

Instruments in PDF format
No Preference

Search Results:

 Disabilities of the Arm, Shoulder, and Hand Questionnaire:
The DASH is designed to evaluate disorders and measure disability of the upper extremities, and monitor change or function over time.

- Length of Test: 6 to 22 minutes
- Training Required: No Training
- Cost: Free
- Population Tested:
  - Adult with wrist, hand, elbow and shoulder disorders
  - Rheumatoid Arthritis
  - Musculoskeletal and Arthritis Disease
  - Atlantoaxial
  - Carpal Tunnel Syndrome
  - Elbow Arthritis
  - Wrist Pain
  - Proximal Humeral Fractures
  - Trauma Disorders
  - Post-Operative Upper Extremity Surgery
  - Multiple Sclerosis
  - Adhesive Capsulitis
  - Non-traumatic neck complaints with Upper Extremity symptoms
  - Shoulder Enyroment

DASH results: Enzyme Review

Note: The change in DASH Score From Preoperative Clinical Evaluations: Mean SD 36% lower of DASH 2.0 mean = Mean DASH scores in 3 months, DASH 1 is mean DASH 1 = Mean DASH 2.0 (3.1.2)

7/ DASH t-test t 0.26 77 CMM symptoms 0.2 1 (2.4.19)
**Step outline**

**Thumb spica**

1. **(1) paper towel template (landmarks)**
   - CMC to IP joint (visualize a circle)
   - Mark 1st and 2nd metacarpal heads and add “bunny ear” in between
   - 5th metacarpal head to base of 5th metacarpal

2. **(2) check template fit to patient’s hand**
   - Make notes re: changes as needed
     - *make sure “bunny ear” is long enough!

3. **(3) trace onto cold material with grease pencil**

4. **(4) place cold material in splint pan (~160 deg.)**
   - Good time to coach patient on positioning
   - Cut hook sided velcro

5. **(5) carefully cut out pattern on the inside of the grease pencil mark**

6. **(6) briefly place back in splint pan**

7. **(7) check temperature of material and form to patient**
   - Roll distal palmar crease
   - Clear metacarpal heads
   - Externally rotating the arm will allow gravity to assist
   - Oppose index and thumb

8. **(8) add strapping (over seam if able)**

9. **(9) have patient move around to check for any needed adjustments**
   - Strapping: 1 skinny or fat, depending

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**Clinical Pearls**

**Thumb spica**

- Visualize a whole circle when making pattern, material needs to cover first dorsal interossei
- Ensure patient understands position “up against a wall” or have them oppose
- Place velcro over the seam if possible
- Instruct patients to “resist the urge to help” especially with thumb spicas
- If the thumb spica is for a specific task, have them bring in the item if possible-e.g. gardening gloves, baseball mitts
- Adjustments for forearm based
Poll

- Part 1: Who has made a custom molded, forearm based, ulnar gutter, intrinsic plus before?
- Part 2: What do you find most difficult about this particular orthosis?

Intrinsic Plus

- Originally described by James in 1962
- To avoid stiffness and contracture following surgery or injury
- Wrist in 0-30° of extension, MCP joints in 70-90° of flexion and IP joints in full extension
- Common indications
Metacarpal neck fractures (boxer's fracture) are common and usually involve the ring and small metacarpals.

“Boxer's fracture” are unusual in professional boxers (Day 2010).

Summertime
Ulnar gutter
intrinsic plus

- Video

Step outline
Intrinsic plus
ulnar gutter

- (1) paper towel template (landmarks)
  - Radial side of digit #4, digit #5
  - 2/3 length of the forearm
  - Fold in half

- (2) check template fit to patient’s hand/forearm
  - Make notes re: changes as needed
  - Watch for excess material

- (3) trace onto cold material with grease pencil

- (4) place cold material in splint pan (~160 deg.)
  - Good time to coach patient on positioning
  - Cut hook sided velcro

- (5) carefully cut out

- (6) briefly place back in splint pan

- (7) check temperature of material and form to patient
  - Roll thenar eminence and possibly 3rd metacarpal head
  - Externally rotating the arm will allow gravity to assist

- (8) add strapping

- (9) have patient move around to check for any needed adjustments

- Strapping: Strapping: 2-3 skinny, 2 fat
Clinical pearls

- Ulnar gutter intrinsic plus might take several tries!
- Watch for excess material with ulnar gutter intrinsic plus
- Straighten out the distal end afterward in the splint pan
- Make a notch in the loop velcro for the thumb or use soft strapping material
- Check with surgeon – buddy taping underneath orthosis can be helpful

Clinical Pearls cont’d

- Remember to keep lid on splint pan
- Aviation shears good for cold material
- Place pillowcase over towel to avoid “towel pattern”
- Watch for ulnar deviation when making templates
- Bigger velcro is better – less likely to come off later
- Round hook side velcro
- Heat velcro before putting on a cold splint
  - Make sure material is dry dry dry!
Questions

References