



The
personal fit

Webinar #10 2020

Tips and Tricks for Fabrication of the
Long Opponens Orthosis /
Long Thumb Spica Orthosis

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Learning Objectives

At the conclusion of this session, participants will be able to:

- 1.** Recognize conditions of the wrist and thumb that benefit from orthotic management.
- 2.** Learn tips and tricks for working with low temperature thermoplastic materials that benefit specific orthotic fabrication.
- 3.** Identify the steps of fabrication for 2-3 custom orthoses for the wrist and thumb to address the above conditions.
- 4.** Understand the current levels of evidence to support these orthoses as therapeutic interventions.

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Wrist and Thumb Anatomy

Wrist = Bones, joints, tendons, ligaments, nerves, etc.

Thumb = Bones, joints, tendons, ligaments, nerves, etc.

Consider all of the anatomical structures in the wrist and thumb for each diagnosis.

Pathology can affect one or more structures.

Immobilization periods vary according to diagnosis and clinical condition.

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Orthotic Intervention for the Wrist *and* Thumb

Common clinical conditions include:

- Scaphoid fractures
- Thumb bone fractures
- Arthritis- either Rheumatoid arthritis and /or osteoarthritis
- Thumb and wrist ligament sprains
- Thumb and wrist tendinitis –
 - De Quervain's syndrome. Intersection syndrome
- Extensor pollicis longus (EPL) rupture
- Post-operative tendon transfer for thumb extension
- Post –operative ligament reconstruction
- Post- operative CMC joint arthroplasty



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Goals of the Wrist and Thumb Orthosis

- Decrease pain and inflammation
- Provide support for injured structures
- Decrease tension on irritated tissues
- Immobilize for healing



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Positioning in the Orthosis

- Wrist positioned typically in 20-30° extension
- Thumb CMC joint between radial and palmar abduction*
- MCP joint is flexed slightly*
- IP joint is free *
- 2/3 length of forearm
- ½ circumference of forearm
- Palmar arches are gently supported
- Radial styloid and ulnar head are cleared

***except for EPL ruptures and repairs



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Material Characteristics

Use 1/8" or 1/12" thermoplastics

Select a material that conforms to thumb contours

Lightweight products:

Orfilight, Orfilight Black NS, and Orfilight Atomic Blue NS

Elastic products:

Orfit Natural NS, Orfit NS, Orfit Colors NS

Rigid products:

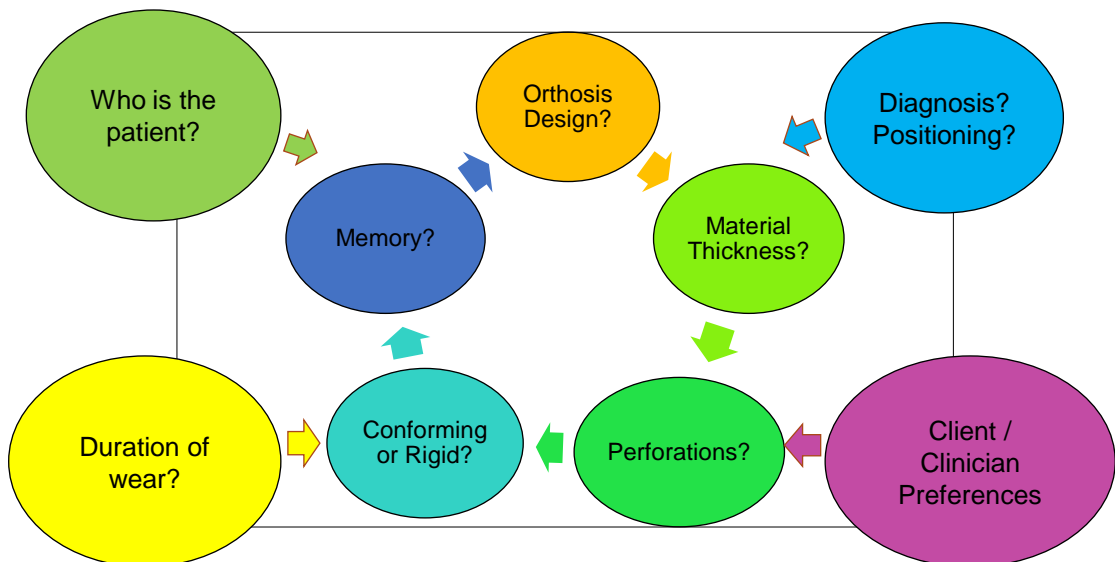
Orfit Eco and Orfit Eco Black NS



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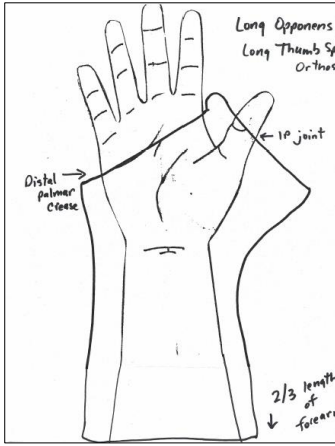
Material Considerations



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Patterns



Volar Design



Radial Design

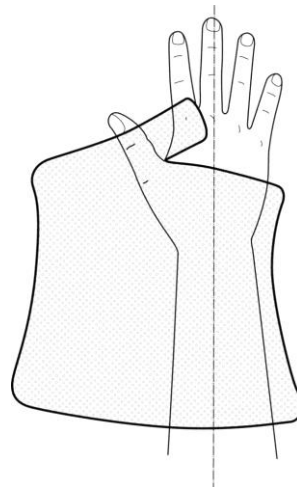
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Patterns



Precut Circumferential Design



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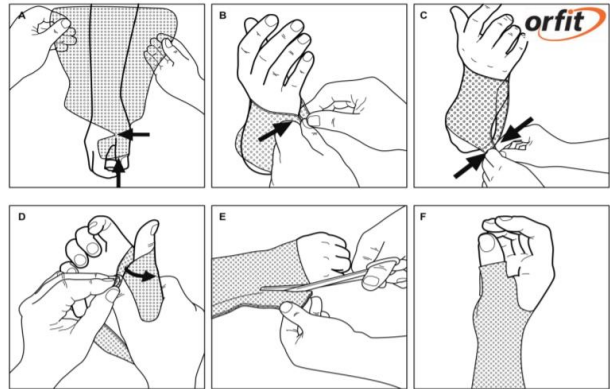
Orfit Precut: Wrist + thumb (thumb spica) orthosis



<https://www.orfit.com/app/uploads/35814-35815-35816-orfit-colors-ns.pdf>

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METHOD OF APPLICATION

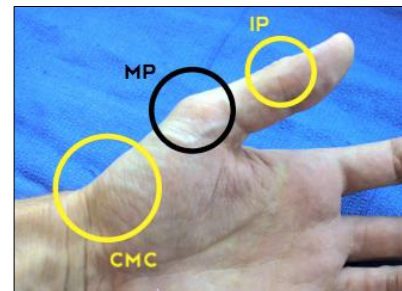


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Tips for Orthotic Fabrication

- Avoid excessive MCP joint flexion.
- Move thumb around to create space if IP joint is large.
- Wrap material around proximal phalange if IP joint is large and the proximal phalange is very thin.
- Have patient do a light pinch between index and thumb.



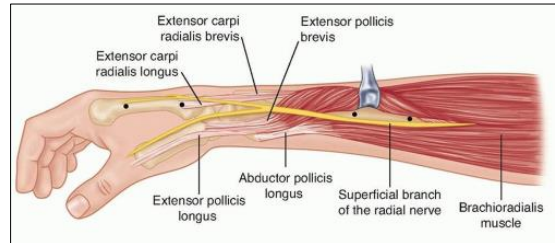
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Tips for Orthotic Fabrication

- Place a silicone gel sheet over the hypersensitive sensory branch of the radial nerve.
- Position should allow for holding a pen (as in writing).
- Create a “trap door” with strap for easy don and doff for patients with arthritis.
- Use strap to hold thumb in place for patients with edema.



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Demonstrations

Volar Design

Orflight Atomic Blue NS 1/8"

Radial Design

Orficast More 6" or
Orfit Colors NS 1/12"

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More Information!

Orfit
Blog

<https://www.orfit.com/blog/splint-in-the-spotlight-the-long-opponens-thumb-spica-orthosis/>

www.
Youtube.com

Circumferential Precut
Orfit Colors NS 1/12"

https://www.youtube.com/watch?v=nGZBeL_LY7g

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De Quervain's Study

A study by Nemati et al (2016) compared the use of a static long opponens orthosis to a dynamic long opponens orthosis in patients with Dequervain's syndrome. The dynamic long opponens orthosis allowed wrist flexion and extension but prevented radial and ulnar deviation. Blocking radial and ulnar deviation prevents increasing tension on the already aggravated tendons of the EPB and APL.

Patients reported increased satisfaction with the orthosis and increased ability to do ADL's.

<https://www.orfit.com/blog/de-quervains-syndrome-and-orthotic-management/>

Nemati, Z., Javanshir, M. A., Saeedi, H., Farmani, F., & Aghajani Fesharaki, S. (2016). The effect of new dynamic splint in pinch strength in De Quervain syndrome: a comparative study. Disability and Rehabilitation: Assistive Technology, 1-5.



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Evidence

Balakatounis, K., Angoules, A. G., Angoules, N. A., & Panagiotopoulou, K. (2017). Synthesis of evidence for the treatment of intersection syndrome. *World journal of orthopedics*, 8(8), 619.

Burt, J., Zwart, M. B., & Roiger, T. C. (2017). Intersection Syndrome in an NCAA Division I Women's Softball Player: A Case Study. *International Journal of Athletic Therapy and Training*, 22(3), 44-51.

Cavaleri, R., Schabrun, S. M., Te, M., & Chipchase, L. S. (2016). Hand therapy versus corticosteroid injections in the treatment of de Quervain's disease: A systematic review and meta-analysis. *Journal of Hand Therapy*, 29(1), 3-11.

Huisstede, B. M., Coert, J. H., Fridén, J., & Hoogvliet, P. (2014). Consensus on a multidisciplinary treatment guideline for de Quervain disease: results from the European HANDGUIDE study. *Physical therapy*, 94(8), 1095.

Kohring, J. M., Curtiss, H. M., & Tyser, A. R. (2016). A scaphoid stress fracture in a female collegiate-level shot-putter and review of the literature. *Case reports in orthopedics*, 2016.

Mardani-Kivi, M., Mobarakeh, M. K., Bahrami, F., Hashemi-Motlagh, K., Saheb-Ekhtiari, K., & Akhoondzadeh, N. (2014). Corticosteroid injection with or without thumb spica cast for de Quervain tenosynovitis. *The Journal of hand surgery*, 39(1), 37-41.

Nemati, Z., Javanshir, M. A., Saeedi, H., Farmani, F., & Aghajani Fesharaki, S. (2016). The effect of new dynamic splint in pinch strength in De Quervain syndrome: a comparative study. *Disability and Rehabilitation: Assistive Technology*, 1-5.

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Tips for Increasing Your Client's Compliance with Orthotic Wear

- Make sure client understand purpose of orthosis
- Make sure client understands wearing schedule
- Make sure client has some say in final design (choice of color of material, straps)
- Have client keep a log of orthotic use
- Assess functional status with and without the orthosis
- ** Measure active and passive range of motion and/or perform a functional assessment prior to orthotic intervention.

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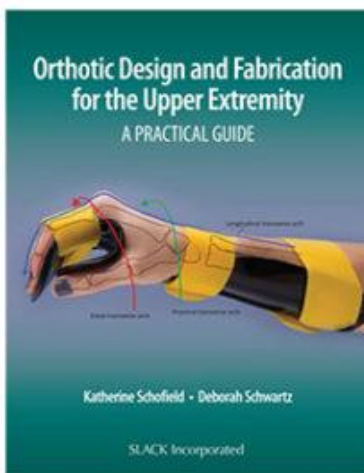
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Excellent Guide to Orthotic Fabrication



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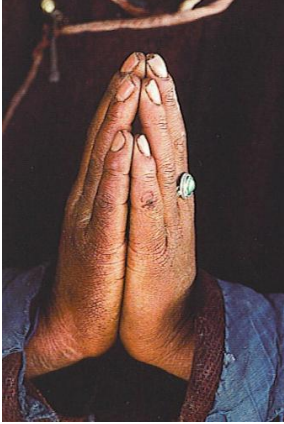
<https://www.orfit.com/physical-rehabilitation/accessories/orthotic-design-and-fabrication-for-the-upper-extremity/>

In the US:

<https://www.healio.com/books/health-professions/occupational-therapy/%7Bd4a80eb1-3ae2-4e62-8fb0-7c56f9ed34b9%7D/orthotic-design-and-fabrication-for-the-upper-extremity-a-practical-guide>

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