ORTHOTIC FABRICATION FOR CONGENITAL MALFORMATION

Congenital malformation of upper extremities may affect an individual throughout the course of his or her life. Specific hand anomalies need early expert care to correct and/or prevent deformities, and allow for the development of independent hand function.

Therapists play an important role in evaluation and treatment, before, during and after, any surgical interventions that may be necessary.

Some of the more common congenital hand anomalies are:

- Radial Deficiency / Radial Club hand
- Hypoplastic Thumb
- Congenital Trigger Finger
- Syndactyly
- Camptodactyly
- Clinodactyly
- Brachial Plexus Palsy
- Arthrogryposis
- Juvenile Idiopathic Arthritis
- Cerebral Palsy

A therapist can provide orthotic interventions for these conditions in order to protect limbs, prevent deformity, and/or enhance the child’s upper extremity function and skill development.

The goals of specific orthoses may include:

- Support for specific joints.
- Protection during healing after a surgical intervention.
- Positioning for improved function.
- Assistance to weaker muscles.
- Maintenance of tissue length and joint alignment.
- Prevention of deformity.
Orthoses can be fabricated for the elbow, forearm, wrist, hand, thumb and digits or include multiple joints. Sometimes, an individual with multiple joint involvements may require a variety of orthoses and a creative schedule that allows for wearing each one.

**Orthotic fabrication for a child will be different than for an adult:**

- There is a difference in proportions between the palm and the length of fingers in a growing hand.
- Growing hands need regular orthotic adjustments and new orthoses to accommodate this growth.
- Parents, family members and teachers might be responsible for applying and removing the orthosis. They must understand the importance of the orthosis, wear and care schedule, and possible precautions.
- The orthoses should be geared towards helping the child to develop functional movement patterns.

Examples of orthoses might include a dorsal wrist cock-up for a child with Cerebral Palsy, a web spacer for a child with Thumb Hypoplasia, or a circumferential wrist support for a child with Arthrogryposis.

Orfit Industries has a variety of excellent thermoplastic materials to assist in the orthotic fabrication of an orthosis for the paediatric population.

**When choosing the right material for a child’s orthosis, make sure to incorporate the following elements:**

- **Appealing:** Make sure it has some visually appealing elements, which will ensure a better compliance during a tight wearing schedule.
- **Breathable:** To ensure maximum comfort and skin tolerance during play and other meaningful activities.
- **Lightweight:** In case of children, the more light weighted the orthosis is, the less it will interfere with their daily activities or be perceived as a burden.
Orfit Colors NS sheet material in 1/12” (2.0mm) is available in 9 bright colours, designed to appeal to everyone. Let each child pick their favourite or “team” colour which may help to increase compliance with orthotic wear. Decorate with scraps of other coloured materials.

Orafilight, Orafilight Atomic Blue NS, and Orafilight Black NS sheet materials, which are up to 30% lighter than conventional material, are available in 3 thicknesses, excellent for any body part. These particular materials are ideal for making lightweight orthoses for small infants and toddlers as well as for children with joint inflammation due to Juvenile Rheumatoid Arthritis or after surgeries involving the thumb (Hypoplasia) and fingers (Syndactyly release, Camptodactyly).

Orficast and Orficast More are ideal materials for the fabrication of small and larger orthoses for children. Due to its rapid setting time, a good fitting orthosis can be made in a minimum of time. The breathability of the textile-like structure allows for a good transportation of sweat and moisture, thus preserving skin quality and a worry-free wearing during play and physical activities.

*Tip:* Think about combining different materials in one orthosis. For example, combining the breathability of Orficast for a general circumferential wrist orthosis with a piece of Orfit Colors NS for more local support.

**Follow-up:**

- Make sure to involve the parents and/or the caregivers in the process.
- Write out the instructions for wearing the orthosis and make sure they understand its purpose and significance.
- Arrange for frequent follow-up appointments to ensure that the orthosis fits well and is fulfilling its goals.

- Observe the child in play to see that the orthosis does not totally limit independent function.
- Assess the skin for redness and or pressure areas as young children may not be able to tell you exactly where the orthosis is too tight or uncomfortable.
Some tips to make the fabrication process more enjoyable for the child:

- Choose a quiet corner or space. Minimize distractions and noise.
- Play soft music if possible and speak in a calm manner.
- Create an orthosis for the child’s dolls or soft animals to make the procedure less frightening.
- Decorate the orthosis with beads or stickers, or add eyes to create an animal or puppet friend.

The images where provided by Ann Ovsyannikova
https://www.instagram.com/annovsyannikova/

Written by Debby Schwartz, OTD, OTR/L, CHT

Physical Rehabilitation Product and Educational Specialist at Orfit Industries America.

Debby is a hand therapist with over 33 years of clinical experience. She completed her Doctorate of Occupational Therapy at Rocky Mountain University of Health Professions in 2010.

She is also an adjunct professor at the Occupational Therapy Department of Touro College in NYC and has written many articles for hand therapy journals, including the ASHT Times and the Journal of Hand Therapy.