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Early Stages of Occupational Therapy in Patients with Arthrogryposis

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Occupational Therapy in Early Stages

Reduce contractures

Maximize antigravity strength

Position the arms to perform everyday functions

Promote mobility



Treatment Begins in Infancy



- Connective tissue is most compliant shortly after birth
- Best opportunity to improve muscle/tendon length and joint mobility
- Early manipulation may provide an opportunity for a typical joint to form

van Bosse HJP. Arthrogyryposis Introduction. J Pediatr Orthop. 2017 Jul/Aug;37 Suppl 1:S1. doi: 10.1097/BPO.0000000000000995. PMID: 28594684.

Family Training

- Importance of early stretching
- Handling techniques
- Return demonstration
- Video record
- Repeated education / reinforcement



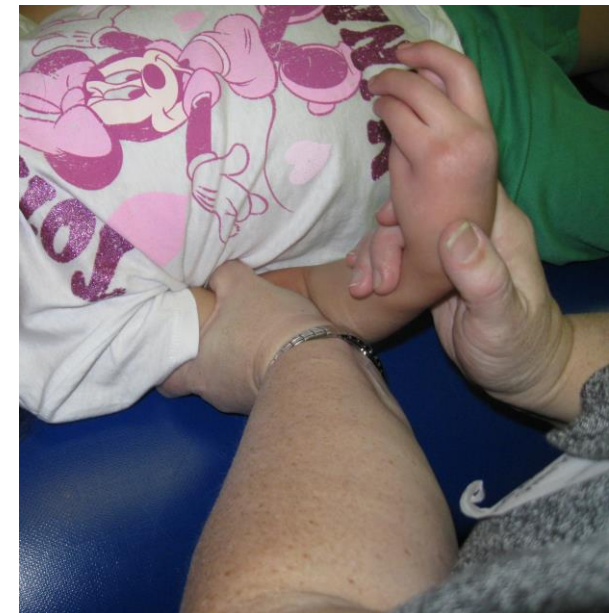
Passive Stretching

- Proximal to distal
- Fewer quality stretches
- Prioritize important movements



Shoulder Mobility a Top Priority

- Depressed and protracted
- Mobilize and stabilize the scapula



Prone on Elbows Weightbearing: Shoulder Flexion, Abduction and External Rotation



Incorporate Shoulder Mobility During Daily Activities

- Carry in prone with arms extended
- Support prone in your lap with arms forward
- Play games like “So Big” stretching both arms overhead / sides



Elbow Mobility

- Elbow extension contractures
- Joint creases can be absent
- Strive for 90 degrees elbow flexion



Weight bearing to promote elbow bending



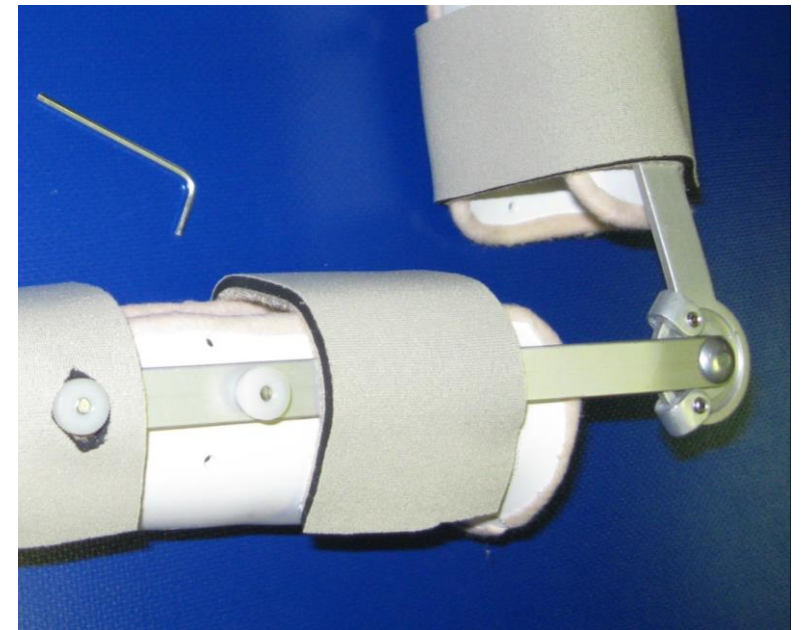
Elbow Flexion Splinting



Hinged Elbow Brace: Rubber Band Traction or Locking Clips



Phoenix Hinge



Serial Casting
if < 90 Degree Bend by Six Months of Age



Serial Casting Results for Elbow Flexion



Splinting: Elbow Flexion Contractures



Wrist Mobility

- Wrist flexion and ulnar deviation tightness
- Support the ulnar side of the hand
- Better stretch with fingers flexed

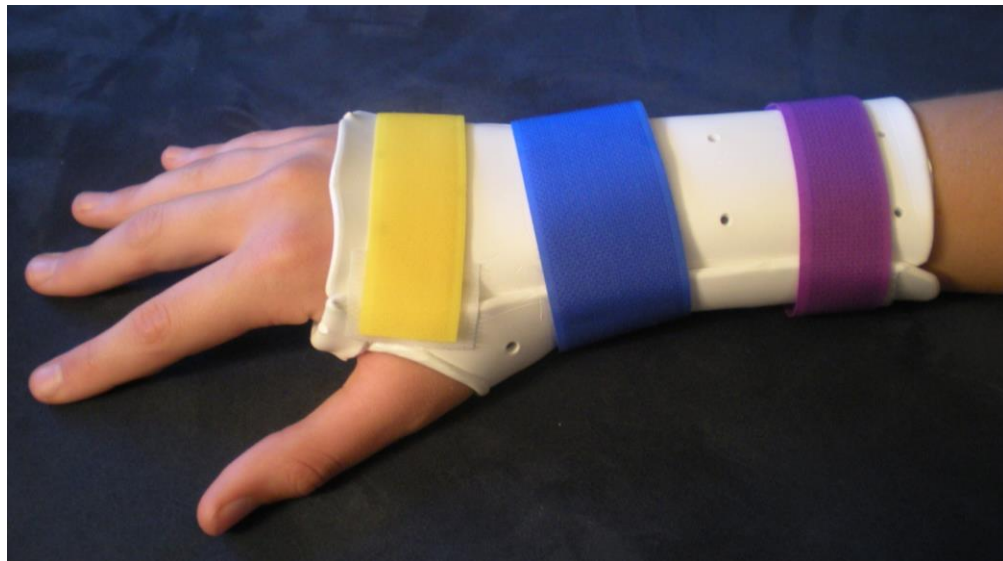


Wrist: Hand Based Weight Bearing Splint

- Encourage neutral or extended wrist position during gross motor skills



Splinting: Wrist Flexion Contractures



Thumb is most often included
High ulnar border
Night splint include the fingers

Serial Casting: Wrist Extension

Highly Recommend!

- Change cast every 3-4 days
- Two persons for optimal position
- Extension/radial deviation/thumb abduction
- Reinforce the thumb into abduction leaving MP joint free
- Fingers free – at night add finger extender
- Want their fingers working actively as much as possible
 - coloring, drawing, toys of different sizes, video games
- Continue casting until they lose finger movement



Serial Casting is Effective with Older Children

11 Year Old Boy: Wrist Flexion Contracture (after 2 casts)



Hand Mobility

- Fingers are most commonly flexed
 - PIP extension tightness
 - Composite flexion tightness
-
- Finger extension and abduction with elastomere
 - Passive stretching



Thumb Mobility

- Thumb in palm can be severe
- PROM support at the base of thumb
- Maximize web space



Thumb Abduction Splints



Promotion of Gross Motor Skills: Upper Extremity Weight Bearing and Strengthening

- Mobility and transitional movements
- Prone on elbows
- Rolling
- Quadruped
- Sitting
- Standing



Rolling for Movement and Mobility Side Lying Over an Abducted Arm with Rotation



Quadruped and Crawling for Mobility



Sitting: A Milestone to Promote Arm Function and Awareness



Wagner LV, Cherry JS, Sawatzky BJ, Fafara A, Elfassy C, Eriksson M, Montpetit K, Bucci T, Donohoe M. Rehabilitation across the lifespan for individuals with arthrogyrosis. *Am J Med Genet C Semin Med Genet.* 2019 Sep;181(3):385-392. doi: 10.1002/ajmg.c.31729. Epub 2019 Aug 8. PMID: 31397084

Standing and Lower Extremity Weight Bearing



Maximize Active Shoulder Movement

- Lots of table play in therapy
- Height adjustable table
- 90 degrees shoulder flexion
- Raise or lower table depending on active abilities



Facilitate Antigravity Strength in all Upper Extremity Movements



Taping to Promote Muscle Balance



Exoskeleton Device for Assisted Movement WREX

www.stratasys.com



Adapt Equipment to Promote Gravity Eliminated Movements Theraband to Support the Arm with Overhead Swings



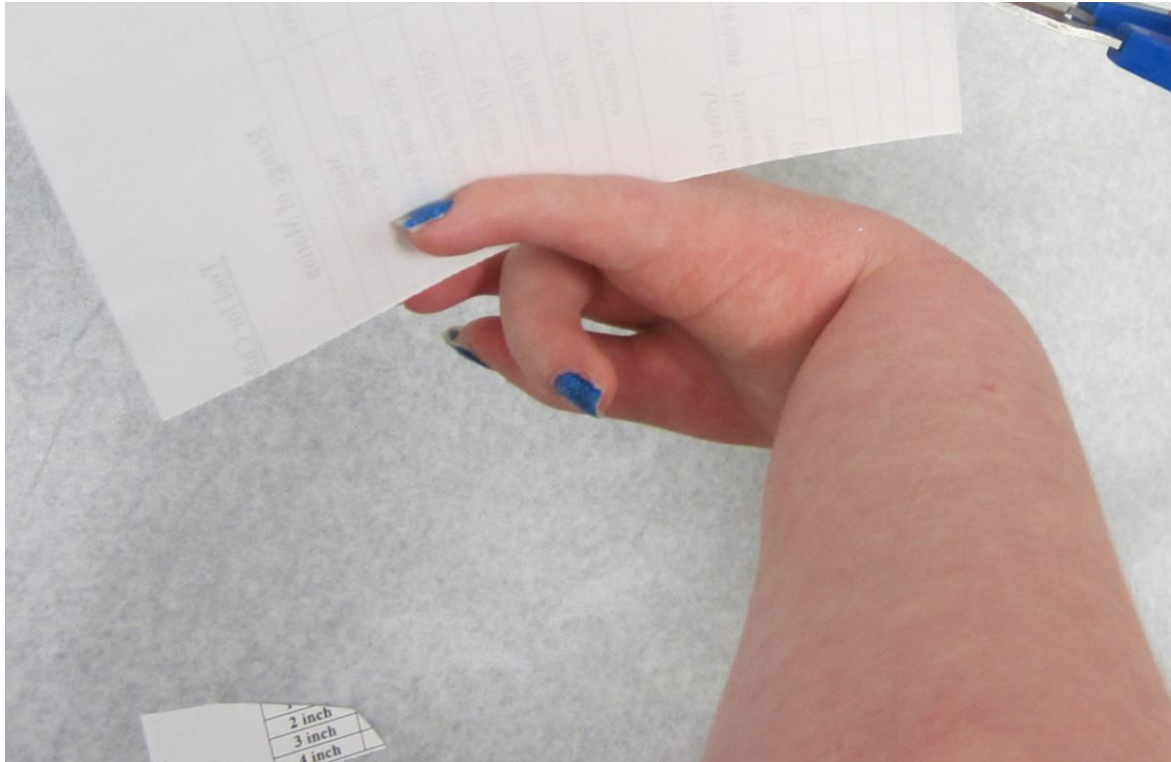
Functional Use of Arms and Hands

- Self-feeding and toileting
- Dressing, grooming, bathing
- School skills: writing, keyboarding, scissor use
- Mobility: ambulation, assistive devices

Determine the need for adaptive devices



Select Activities to Facilitate Development of Hand Grasp



Embrace Compensations for Movement



References

Wagner LV, Cherry JS, Sawatzky BJ, Fafara A, Elfassy C, Eriksson M, Montpetit K, Bucci T, Donohoe M. Rehabilitation across the lifespan for individuals with arthrogryposis. *Am J Med Genet C Semin Med Genet*. 2019 Sep;181(3):385-392. doi: 10.1002/ajmg.c.31729. Epub 2019 Aug 8. PMID: 31397084.

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www.stratasys.com

Interview with Mary Beck OTR/L Paleo Institute in Florida

Palmer PM, MacEwen GD, Bowen JR, Mathews PA. Passive motion therapy for infants with arthrogryposis. *Clin Orthop Relat Res*. 1985 Apr;(194):54-9. PMID: 3978934.

Smith DW, Drennan JC. Arthrogryposis wrist deformities: results of infantile serial casting. *J Pediatr Orthop*. 2002 Jan-Feb;22(1):44-7. PMID: 11744853.

Thank you for your time and attention!





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