Occupational Therapy: Evaluation and Treatment of Children with Arthrogryposis

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Disclosure Information

There are no disclosures

A-myo-plasia

Occupational Therapy's Primary Goals for Children with Arthrogryposis

- Attain maximum upper body flexibility, strength and function so child can position their arms for optimal use
- Improve a child's ability to accomplish activities that are part of everyday life

What is known about conservative therapy's to improve PROM

Palmar 1985

95 infants with arthrogryposis

Intensive PROM, serial casting, and splinting

Substantially increased patient function

Passive wrist motion increased 50%

Smith 2002

Serial casting 17 wrists (12 classic arthrogryposis, 5 distal)

Average follow up 6 years

Greatest gains after first casting session

Average final correction of 33 degrees - wrist

Distal group responded best – no recurrence

Classic group – high rate of recurrence and less improvement

Therapy to Improve Passive Range of Motion Should be Started In Infancy

PROM Flowsheet

Shriners Hospitals for children

Form 1025B Rev. 11/97

PHYSICAL OR OCCUPATIONAL THERAPY RECORD

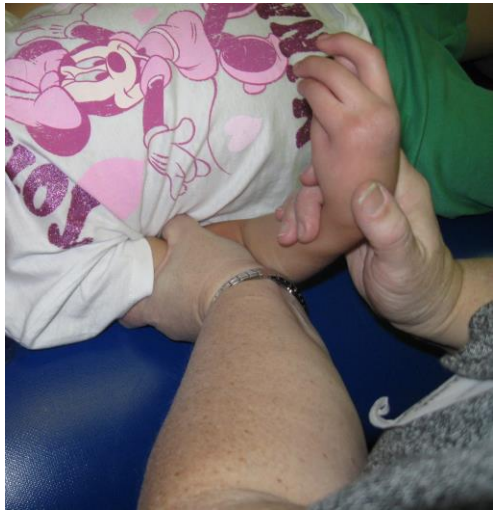
LEFT	UPPER EXTREMITY PASSIVE ROM		RIGHT
	Date		
	Examiner's initials		
	Shoulder: Flexion	0-180°	
	Extension	0-60°	
	Abduction	0-180°	
	Ext. Rotation (shoulder 90°abd)	0-70°	
	Int. Rotation (shoulder 90°abd)	0-70°	
	Elbow: Flexion	0-150°	
	Extension	150-0°	
	Forearm: Supination	0-80°	
	Pronation	0-80°	
	Wrist: Flexion	0-80°	
	Extension	0-70°	
	Ulnar dev	0-30°	
	Radial dev	0-20°	
	Thumb: Abduction	0-70°	
	Fingertip to DPC	cm	

Splint: No Yes Type _____

ADLs:

Family Education is Critical

- Importance of early stretching
- Handling techniques



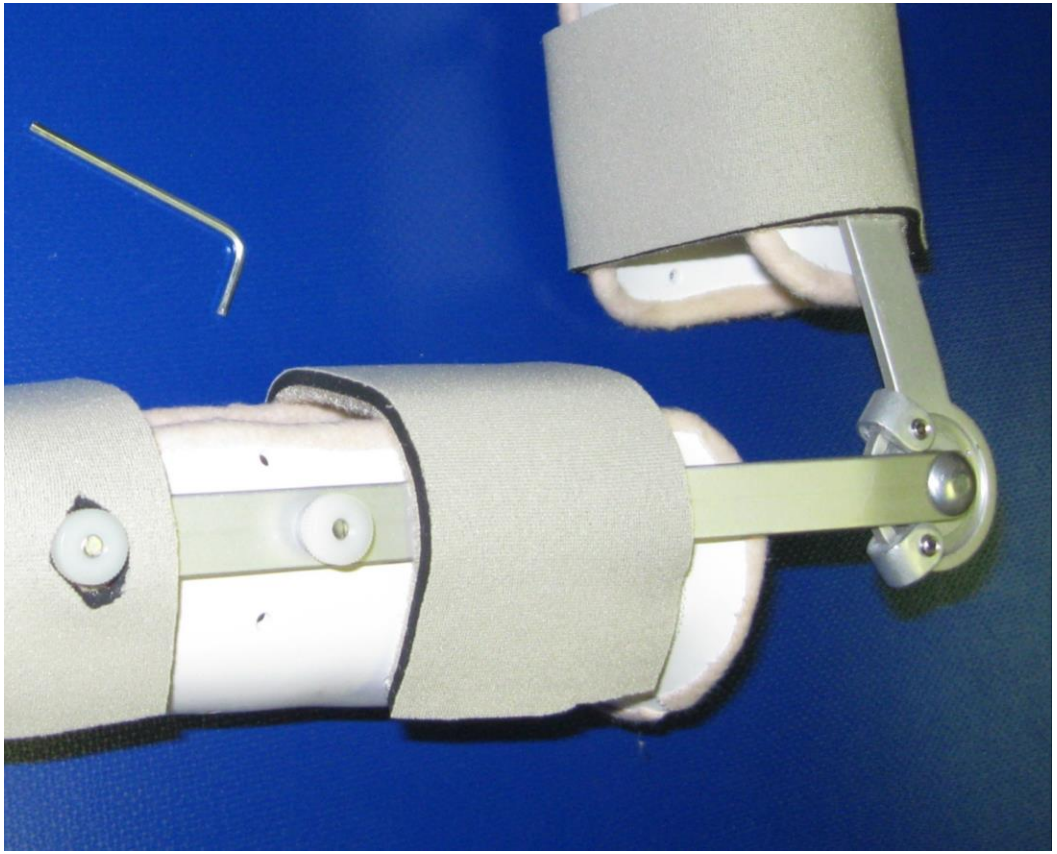
Emphasis on Elbow Flexion and Wrist Extension

- Goal 90 degrees elbow flexion and neutral wrist
- Maintain/improve arm flexibility, especially during a child's growing years

Splinting: Hinged elbow brace with rubber band traction

Elbow Capsular Release Post-op: Hinged Elbow Brace With Locking Clips

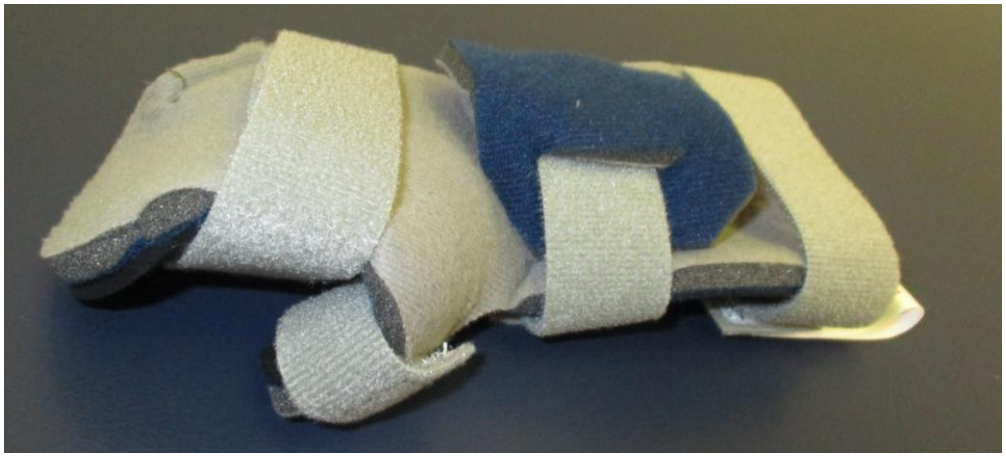
Early PROM and family training in post-op protocol



Splinting: Elbow Flexion Contractures

Splinting: Wrist Flexion Contractures

RCAI wrist thumb support



Wrist hand orthosis (WHO)

Evaluate Upper Extremity Active Strength: Movement Patterns and Compensations

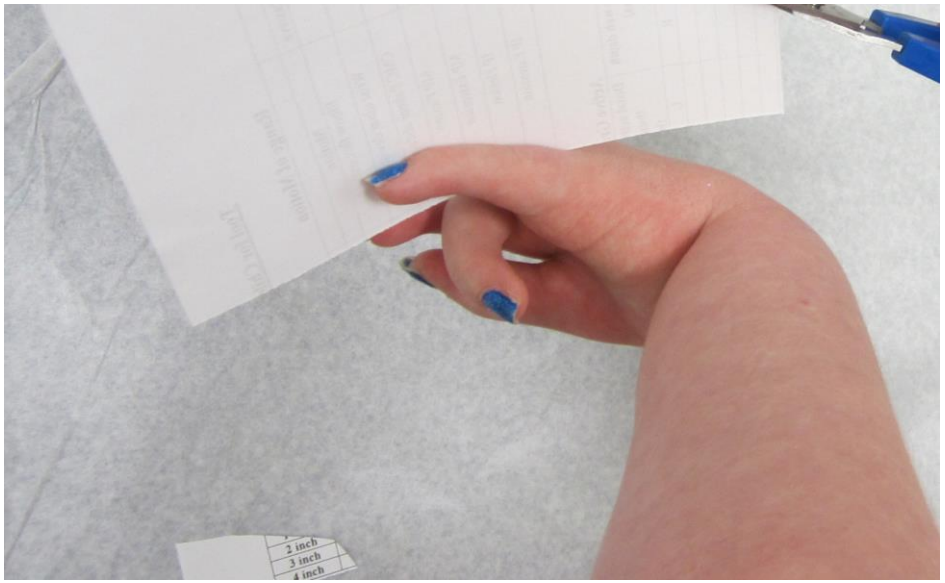
Challenge the Arms and Hands for Strengthening Through Play

Upper Extremity Weight Bearing and Strengthening Through Developmental Positioning

Hand Dexterity

- Evaluate grasp patterns when handling objects of different size and feature
- Built-up grips, universal cuffs for weak grasp

Design Activities Based on Areas of Concern to Facilitate Fine Motor Skills



Standardized Hand Assessments

Standardized Assessments: Grip and Pinch Strength

Hand dynamometer

Pinch Gauge

Mathiowetz – norms – ages 6-19
Lee Valkov – norms – ages 3-5

Standardized Dexterity Testing: Box and Blocks Assessment

Speed of arm/hand movements

Normed for children ages 3 and older

Standardized Dexterity Testing: The Thumb grasp and pinch assessment (T-GAP)

- Measures dexterity based on how the hand formulates grasp and pinch
- Hierarchical scale based on normal and abnormal grasp styles

Table 3. T-GAP Grasp Pattern Hierarchy

0 Points No grasp or pinch	1 Point Palmar Grasp	2 Points Ulnar Scissor Grasp	3 Points Radial Scissor Grasp	4 Points Cylindrical Grasp	5 Points Lateral Key Pinch	6 Points Tip Pinch	7 Points Radial Digital Grasp
							

Kollitz K., Tomhave W., Van Heest A., Moran S. A new direct measure of thumb use in children after index policization for congenital thumb hypoplasia. *J Hand Surg May* 2018

Tomhave W., Kollitz K., Moran S. The thumb grasp and pinch assessment (T-GAP): Inter and Intra rater reliability results. *J Hand Surg* December 2018

T - GAP

- Nine activities that facilitate specific grasp styles and qualities

tip pinch	small grasp	ADL task (shoe or sock)
lateral / key pinch	medium grasp	school task (crayon / writing)
manipulation	large grasp	resistance

- 3 different age groups
  - 18 months – age 4
  - 5 – 7 year olds
  - 8 – 18 year olds

- Final T-GAP score (0-63)
- Preferred grasp style
- Percentage of thumb use

Activities of Daily Living Assessment

- Interview patient and family based on age and function
- Identify areas of concern:
  - Self-feeding and toileting
  - Dressing, grooming, bathing
  - School skills: writing, computer, scissor use
  - Mobility: ambulation, assistive devices

Activities of Daily Living

Most children age 5 and older with amyoplasia were ambulatory and relatively independent in activities of daily living

Ambulatory – 85%

Feeding – 75%

Toileting – 35%

Bathing – 25%

Grooming – 20%

Dressing – 10%

Sells 1996

Self-Feeding

- Functional activity to work on elbow mobility
- 90 degrees passive elbow flexion – reach mouth

Arm push method

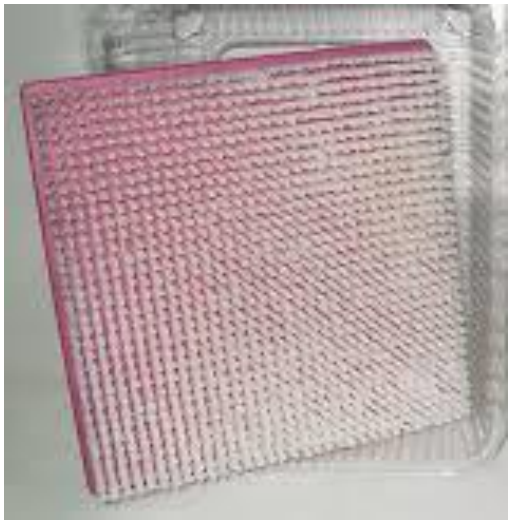
Table push method

Self-Feeding Adaptive Devices

Toileting

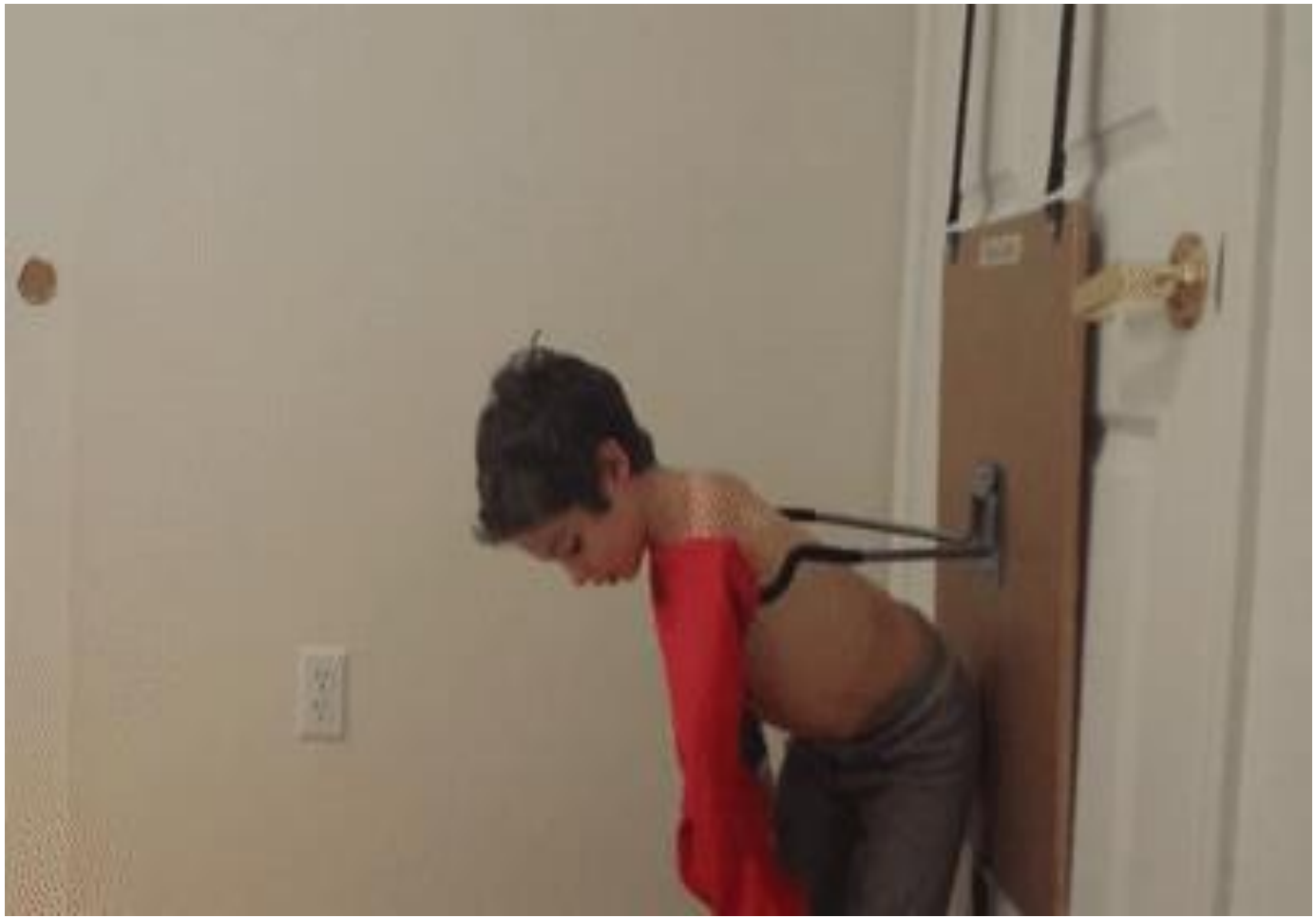
- Difficulties reaching for wiping
- Adaptive techniques (corner technique)
- Extended handle bottom wiper
- Bidet

Difficulties Reaching When Bathing



Extended Handle Devices For Grooming

Self dressing:
Over-The-Door Dressing Tree



Lower extremity dressing: PVC Clothing Support

Difficulties Reaching Feet

School Skills

- Determine if any adaptive devices or adaptations may be needed with academic activities
- Forearm rests, split key boards
- Tilted or lowered work surfaces

Resources to learn more

- You Tube videos of persons with arthrogryposis with clips for inspiration or “what works for me”

  Misha Dream Walker

  Rexi James

  Chris Hartwick

- Arthrogryposis Multiplex Congenital Support Group (AMCSI)

  On-line resources: diagnosis, treatment, adaptive devices

- Facebook group
- Pinterest

Thank You For Your Attention!