Evidence for Orthotic Management of the Upper Extremity in Rheumatic Populations

Renee' Andersen, OTR/L, CHT
November 6, 2015
Disclosures

Relevant Financial Relationships
None

Off-Label/Investigational Uses
None
Learning Objectives

• Identify three benefits of orthotic use for patients with UE arthritis

• Describe causes of pain, deformity, and diminished hand function for patients with UE arthritis

• Have an awareness of the evidence supporting orthotic use for patients with UE arthritis
What is a rheumatic condition?

- There are more than 100 different rheumatic conditions including but not limited to:
  - Rheumatoid arthritis
  - Osteoarthritis
  - Osteoporosis
  - Systemic lupus erythematosus
  - Scleroderma
  - Gout
  - Fibromyalgia
- Most rheumatic diseases are chronic and are unlikely to resolve.
Why use Orthotics?

- To provide pain relief
- To reduce inflammation and swelling
- To improve function

http://www.healthline.com/health-slideshow/early-signs-rheumatoid-arthritis

http://handtoelbow.com/synovitis/

http://handtoelbow.com/pip-joint-deformity/
Causes of pain, joint deformity, & diminished function

- Synovitis / Tenosynovitis
- Periarticular and articular destruction
- Imbalance of forces acting on the joint
- Intrinsic / extrinsic tightness
Orthotics Relieve Pain by:

- reducing or preventing joint motion
- supporting joints in positions of comfort

Air Soft™ Resting Hand Splint
Orthotics Reduce Inflammation & Swelling by:

- Reducing joint motion
- Reducing tendon excursion
- Alleviating external forces

TheraPlus Universal Hand Orthosis
http://www.pattersonmedical.com/
Orthotics Improve Function by:

- Realigning and repositioning joints
- Stretching to relieve soft tissue tightness

http://www.silverringsplint.com/consumer/view-current-catalog/
Orthotics described in the ACR OT Competencies in Rheumatology Practice Guidelines

- Resting hand
- Wrist cock-up
- Finger and Thumb
- Ulnar deviation
- Elbow extension
- Dynamic outrigger
Is there evidence supporting the use of orthotics?

Yes ?
No ?
Maybe ?
Resting Hand Orthotics

- Decrease pain & inflammation
- Decrease stress on joints
- Reduce ulnar drift
- Maintain intrinsic length
For Periods of Acute Inflammation

Provide neutral rest of the tendons and joints for at least a portion of each day

- Trying to relieve the pain and swelling of tenosynovitis and synovitis.
For Long Term Conservative Management

Provide neutral rest of the joints for at least a portion of each day, typically at night

• Trying to prevent episodes of acute inflammation and swelling


http://www.usmedicalsupplies.com
Evidence for Resting Hand Orthotics

• Steultjens, et al. 2002
  • suggests splints are effective in reducing pain

• Silva, et al. – 2008
  • Night time splinting resulted in significant reduction in hand pain, improvements in grip and pinch strength, and UE function
Evidence for resting hand splints

• Adams, et al. – 2008
  • resting splints provided no significant benefit

• Cochrane review 2010 – Egan et al.
  • Looked at studies up to August 2001
  • resting splints don’t help with pain, pinch or grip but patients prefer wearing them to not
Wrist cock-up orthotics

• Pain Relief
• Provide support for increased function
• Assist with joint stability
• Limit wrist circumduction
• Reduce torque
Volar wrist orthosis

Össur Exoform Wrist Brace

http://www.exosmedical.com/
Evidence for Wrist Working Orthotics

• Cochrane Review 2010 – Egan et al
  • No clear indication working splints help with pain reduction during activity.

• Veehof, et al, 2008
  • significant pain relief in as little as 4 weeks
Muenster style orthosis

Wrist pain may also be the result of arthritis of the DRUJ. Murray, 2011
Thumb CMC Orthotics

- Decrease pain
- Improve function
- Improve grip strength
- Maintain thumb web space
Evidence for Thumb CMC orthotics

• Valdes & Marik – 2010
  • High evidence that immobilization of the CMC of the thumb improved hand function and decreased pain of osteoarthritis
  • Moderate evidence to support use of CMC orthotics to increase grip strength

• Egan/Brosseau – 2007
  • Fair evidence for effectiveness of splinting to relieve pain and improve function
Gomes Carreira et al. - 2010

Functional splinting during activity for patients with trapeziometacarpal osteoarthritis reduced pain but did not alter function, grip or pinch strength, or dexterity.
Rannou, et al. – 2009

Night CMC orthotics were found to decrease pain and disability after 12 months of wear and reduced need/desire for surgery after 7 months of wear
Hand Based Thumb Orthosis

Ottobock Thumboform Short
Functional MCP and Ulnar Deviation Orthotics

- Decrease pain
- Reduce flexion force during grip
- Realign the fingers to improve pinch
- Prevent intrinsic-plus position
Evidence for functional MCP and Ulnar deviation orthotics

1996 study by Rennie

- no improvement in pain, function and grip strength, pinch did improve
Evidence for functional MCP and Ulnar deviation orthotics

2008 Formsma & Dijkstra

- improvement in pain and dexterity when splinting and exercise program are used
Finger Orthotics
Swan Neck Splints

3 Point Products: Oval-8® Splint

SIRIS™ Ring Splints (Silver Ring Splints)

Swan Neck Splint
Boutonniere Splints

Stack Boutonniere Splint

SIRIS™ Ring Splints (Silver Ring Splints)
Boutonniere Splint
Mallet Splints

3 Point Products: Oval-8® Splint
IP Joint Lateralization Splints

- Norco™ Lateral PIP Hinge Splint
- SIRIS™ Ring Splints (Silver Ring Splints)
- 3 Point Products: Oval-8® Splint
Elbow extension

- To reduce flexion contractures

Elbow Turn Buckle Splint

Custom anterior elbow splint


Custom posterior elbow splint

comfysplints.com
Dynamic Outrigger

- after joint replacement
Evidence for Other Therapeutic Interventions

- Moderate evidence for joint protection education
- Moderate evidence for use of adaptive equipment
- Anecdotal/weak evidence for heat modalities
- Favorable outcomes for exercise with patient education
So…Is there evidence supporting the use of orthotics?

Yes
No
Maybe
Yes….

1. Splinting the thumb carpo-metacarpal joint for pain relief and improved function has strong evidence
2. Splinting to correct swan neck deformities has good evidence

No….

1. Splinting for arthritis of the elbow has no evidence
2. No evidence has been created to support splinting to correct lateral deviation of the IP joints
Maybe…..

There is evidence that varies in strength from weak to moderate for:

1. Splinting the wrist with a working wrist splint
2. Splinting the hand at night with a resting hand splint
3. Splinting the MP joints for correction of ulnar drift
“The potential of orthotics to provide pain relief for varying periods of time in certain patients, and at a relatively low cost, tends to support the current practice of recommending that patients try out various splints / orthoses in different activities in order to determine whether these splints are helpful to them”

Splints and Orthosis for treating rheumatoid arthritis (Cochrane Review 2010)

Egan, Brosseau, Farmer, Ouimet, Rees, Tugwell, Wells


