

# JOINT PROTECTION STRATEGIES & ERGONOMIC EDUCATION








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## Who is at risk for basal joint arthritis?

- 1 in 4 women (Armstrong, Hunter, & Davis, 1994)
  - especially after menopause
  - evidence shows up to 75% of women over 70 have pain and limited motion associated with arthritis in one or more joints of the hand (Kjeken et al. 2005)
- 1 in 12 men
- it's likely that it occurs more often but isn't reported because people deal with it on their own and don't seek medical attention






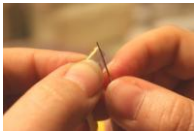


### Joint protection strategies are one of 3 conservative measures aimed at reducing the progression of basal joint arthritis:

- \*Joint protection techniques/ adaptive equipment
- \*Thumb muscle strengthening
- \*Temporary use of a protective orthosis

(Baron, Glickel, & Eaton, 2000; Laffer & Armstrong, 2004; Rognes & Wilder, 2007; Roundtree, 2011; Sillem, Backman, Miller, & Li, 2010; Valdes & Mark, 2009; Wajon & Ada, 2005; Weiss, LaSoye, Mills & Brantley, 2004).




### Thumbs contribute 40%-60% of the use of our hands and allow us to complete both delicate and forceful tasks




### Joint protection strategies help to:

- Decrease pain
- Improve function
- Help to slow the progression of arthritic changes at the basal joint
- Allow continued participation in the activities most important to each patient!



### Potential Causes of Basal Joint Arthritis:

- Cumulative trauma from repetitive tasks
- Injury
- Repeated forceful pinching



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### REDUCTION IN THE NEED FOR OPERATION AFTER CONSERVATIVE TREATMENT OF OSTEOARTHRITIS OF THE FIRST CARPOMETACARPAL JOINT: A SEVEN YEAR PROSPECTIVE STUDY

**Technical accessories;**  
 "bread saw, grabber stick, scissors, potato peeler, tap handle, pen handle, cheese cutter, and book support." (p. 416)

Group	Technical accessories only	Semistable textile splint	Leather Splint	Total
Start	11	11	11	33
7 months	3	4	3	10
7 years	3	5	4	12

Berggren, M., Jost-Davidsson, A., Lindstrand, J., Nylander, G., & Porssen, B. (2001). Reduction in the need for operation after conservative treatment of osteoarthritis of the first carpometacarpal joint: a seven year prospective study. *Scandinavian Journal of Plastic and Reconstructive Surgery and Hand Surgery / Nordisk Handkirurgiskt Forum och Svensk Läkare för Handkirurgi*, 35(4), 414-7. Retrieved from <http://www.jstor.org/stable/4443234>

Marks, M., Muoith, C., Goldhahn, J., Liebmann, A., Schreib, I., Schindele, S. F., Simmen, B. R., et al. (2012). **Packaging-A Problem for Patients with Hand Disorders? A Cross-sectional Study on the Forces Applied to Packaging Tear Tabs.** *Journal of Hand Therapy*, 25(4), 387-96. doi:10.1016/j.jht.2012.04.003

**Objectives:**

- Investigate the forces that patients with hand disorders are able to generate onto different tear tabs
- Compare the results obtained with normative data,
- Identify the difficulties in opening different types of packaging
- Recommend packaging design to the industry

100 consecutive pts w/ different hand disorders;  
 71 female, 29 male patients av age 61 years  
 Hand OA and CTS most common

**FIGURE 4. Frequency of diagnoses of the patient population. (p.328)**

**Main diagnoses of 100 included patients**

Marks, M., Muoith, C., Goldhahn, J., Liebmann, A., Schreib, I., Schindele, S. F., Simmen, B. R., et al. (2012). Packaging-A Problem for Patients with Hand Disorders? A Cross-sectional Study on the Forces Applied to Packaging Tear Tabs. *Journal of Hand Therapy* 25(4), 387-96. doi:10.1016/j.jht.2012.04.003

**FIGURE 6: Number of patients having difficulties in opening different kinds of packaging in daily life. (p.393)**

**Patients indicated 5/8 packages were difficult to open:**

- 82% -jam jars
- 78% -peelable meat/cheese packaging
- 69%- bottles
- 68%-peelable coffee containers
- 62% -peelable cereal packs



Marks, M., Muoith, C., Goldhahn, J., Liebmann, A., Schreib, I., Schindele, S. F., Simmen, B. R., et al. (2012). Packaging-A Problem for Patients with Hand Disorders? A Cross-sectional Study on the Forces Applied to Packaging Tear Tabs. *Journal of Hand Therapy* 25(4), 387-96. doi:10.1016/j.jht.2012.04.003

Educating patients to incorporate joint protection principles into 'all' ADLs and daily occupations will help minimize pain, and help slow the progression of basal joint disease

### Joint Protection Principles

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- Use larger, stronger joints when able:




Use a shoulder bag rather than a clutch purse to avoid pinching motions


### Writing

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- Large diameter pens
- Pen grips
- Felt tip or gel pens

All require less pressure to write






### Choose options to protect your joints when given a choice:



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**Reduced Effort Staplers**



**Traditional Staplers**



Protect your thumbs and the environment!

### THERE ARE MANY ERGONOMIC TOOLS FOR THE KITCHEN AVAILABLE AT STORES THAT SELL KITCHEN SUPPLIES

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**Large diameter handles help decrease force on the thumb**



**These handles allow you to grip with your fingers instead of your thumb**






### THERE ARE MANY NEW TOOLS FOR THE KITCHEN AVAILABLE AT STORES THAT SELL KITCHEN SUPPLIES:




These make it easier to open different size bottles



This breaks the seal on a new jar to open it effortlessly




Electric can openers are helpful

### Ergonomic garden tools minimize force on the thumb

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gardenofedentation.com



gardenofedentation.com




## USE ADAPTIVE EQUIPMENT TO DECREASE FORCE ON YOUR THUMBS

Lever doorknobs are trendy and require much less force than turning a doorknob



Bookstands eliminate the need to hold a book for prolonged period of time



Magnetic jewelry clasps make it easier to apply a necklace



Easy grip toenail clippers require less force and can be squeezed with your fingers instead of your thumb

## Starting your car:

- Use a remote/ keyless car starter
- Or the master key



## Custom formed or pre-fabricated orthoses

To temporarily rest the joint, and help to decrease pain at the cmc joint by immobilizing it.



The goal is to wean out of the orthosis as pain decreases

Prevention strategies such as these are an integral element of the American Occupational Therapy Association's (AOTA) Centennial Vision:

"to promote occupational therapy's practice of enabling people to improve their physical and mental health, secure well-being and enjoy higher quality of life through preventing and overcoming obstacles to participation in the activities they value." (AOTA, 2007a, p. 613).

## Helpful Resources:

- [www. BeAbleToDo.com](http://www.BeAbleToDo.com)
- [www.goldviolin.com](http://www.goldviolin.com)
- American Society of Hand Therapists; [www.ASHT.org](http://www.ASHT.org)
- American Occupational Therapy Association; [www.AOTA.org](http://www.AOTA.org)
- American Physical Therapy Association [www.APTA.org](http://www.APTA.org)
- American Association of Hand Surgeons ; [www.handsurgery.org](http://www.handsurgery.org)
- American Society of Surgery of the Hand; [www.ASSH.org](http://www.ASSH.org)
- Arthritis Association; [www.Arthritis.org](http://www.Arthritis.org)

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ProtectYourThumbs.com

## References

- Albrecht, J. (2004). Caring for the painful thumb. North Mankato, Minn. Jan Albrecht.
- Armstrong, A., Hunter, J., & Davis, T. (1994). The prevalence of degenerative arthritis of the base of the thumb in post-menopausal women. *The Journal of Hand Surgery: Journal of the British Society for Surgery of the Hand*, 19(3), 340-341. doi:10.1016/0266-7681(94)90055-X
- Barron, O. a, Glickel, S. Z., & Eaton, R. G. (2000). Basal joint arthritis of the thumb. *The Journal of the American Academy of Orthopaedic Surgeons*, 8(5), 314-23. Retrieved from [www.ncbi.nlm.nih.gov/pubmed/11029559](http://www.ncbi.nlm.nih.gov/pubmed/11029559)
- Berggren, M., Joost-Davidsson, a, Lindstrand, J., Nylander, G., & Povlsen, B. (2001). Reduction in the need for operation after conservative treatment of osteoarthritis of the first carpometacarpal joint: a seven year prospective study. *Scandinavian Journal of Plastic and Reconstructive Surgery and Hand Surgery / Nordisk Plastiskirurgisk Forening [and] Nordisk Lubb for Handkirurgi*, 33(4), 415-7. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/11878178>
- Cooney, B. Y. W. P., D. M., & Linscheid, R. L. (1981). The Kinesiology of the Thumb Trapeziummetacarpal. *Journal Bone and Joint Surgery*, 63(9), 1371-1381.
- Dickson, R. A., & Morrison, J. D. (1979). The pattern of joint involvement in hands with arthritis at the base of the thumb. *The Hand*, 11(3), 249-55. Retrieved from [www.ncbi.nlm.nih.gov/pubmed/520867](http://www.ncbi.nlm.nih.gov/pubmed/520867)
- Eaton R.G., (1984). Thumb basilar joint classification eaton lither staging. *Journal of Hand Surgery*;94:692. Retrieved from: [eorif.com/thumb-basilar-joint-arthritis-71514](http://eorif.com/thumb-basilar-joint-arthritis-71514)
- Kjeken, I., Dagfinrud, H., Slatkowsky-Christensen, B., Mowinckel, P., Uhlig, T., Kvien, T. K., & Finset, A. (2005). Activity limitations and participation restrictions in women with hand osteoarthritis: Patients' descriptions and associations between dimensions of functioning. *Annals of the Rheumatic Diseases*, 64(11), 1633-8. doi:10.1136/ard.2004.034900
- Koff, M. F., Ugwionali, O. F., Strauch, R. J., Rosenwasser, M. P., Ateshian, G. a, & Mow, V. C. (2003). Sequential wear patterns of the articular cartilage of the thumb carpometacarpal joint in osteoarthritis. *The Journal of Hand Surgery*, 28(4), 597-604. doi:10.1016/S0266-7681(03)00145-X
- Lefler, C., & Armstrong, W.J. (2004). Exercise in the treatment of osteoarthritis of the hands of the elderly. *Clinical Kinesiology*, 58(2), 13-17.

## References continued...

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- Marks, M., Muth, C., Goldshah, J., Liebmann, A., Schreib, I., Schindele, S. F., Simmen, B. R., et al. (2012). Packaging- A Problem for Patients with Hand Disorders? A Cross-sectional Study on the Forces Applied to Packaging Tear Tabs. *Journal of Hand Therapy*, 25(4), 387-96. doi:10.1016/j.jht.2012.04.003
- Moulton, M. J., Parentis, M. A., Kelly, M. J., Jacobs, C., Naidu, S. H., & Pellegrini, V. D. (2001). Influence of metacarpophalangeal joint position on basal joint-loading in the thumb. *The Journal of Bone and Joint Surgery*, 83-A(5), 709-716. Retrieved from www.ncbi.nlm.nih.gov/pubmed/11379740
- Rogers, H. W., & Wilder, F. V. (2007). The effects of strength training among persons with hand osteoarthritis: A two-year follow-up study. *Journal of Hand Therapy*, 20(3), 244-9. doi:10.1197/j.jht.2007.04.005
- Roundtree, L.C. (2010). Making a difference: Hand therapy. *Rehab Management*, April 2011. Retrieved from www.rehabpub.com/issues/articles/2011-04\_01.asp
- Sillem, H., Backman, C. L., Miller, W. C., & Li, L. C. (2010). Comparison of two carpometacarpal stabilizing splints for individuals with thumb osteoarthritis. *Journal of hand therapy*, 24(3), 216-25. Doi:10.1016/j.jht.2010.12.004
- Stamm, T. A., Machold, K. P., Smolen, J. S., Fischer, S., Redlich, K., Graninger, W., Ebner, W., et al. (2002). Joint protection and home hand exercises improve hand function in patients with hand osteoarthritis: A randomized controlled trial. *Arthritis Care & Research*, 8(8), 44-49. doi:10.1002/art.1.10246
- Valdes, K., & Mark, T. (2009). A systematic review of conservative interventions for osteoarthritis of the hand. *Journal of Hand Therapy*, 23(4), 334-50. doi:10.1016/j.jht.2010.05.001
- Wajon, A., & Ada, L. (2005). No difference between two splint and exercise regimens for people with osteoarthritis of the thumb: a randomised controlled trial. *Australian Journal of Physiotherapy*, 51(4), 245-248.
- Weiss, S., LaStayo, P., Mills, A., & Bramlet, D. (2004). Splinting the degenerative basal joint: Custom-made or prefabricated neoprene? *Journal of Hand Therapy*, 17(4), 401-406. doi:10.1197/j.jht.2004.07.002