Orthotics

hOT Topics provide occupational therapists and occupational therapy students with a list of references in an area identified as emerging and/or topical by CAOT members. CAOT invites you to contribute to the ongoing development of this document.

CAOT would like to thank Pat McKee, Associate Professor, Department of Occupational Science and Occupational Therapy, University of Toronto, who developed this hOT Topic.

The following excerpts are from:

“An orthosis (splint) is a custom-made or prefabricated device applied to biological structures – impaired by acute injury, cumulative trauma, disease, surgical intervention, congenital anomaly or degenerative changes - to relieve pain, stabilize body joints or tendons, protect against (re) injury, promote healing, prevent or correct deformity - to ultimately promote current or future occupational performance and participation in roles important to the individual.” (p. 1569)

“Although it is common practice for therapists to use the term splint in verbal and written communication, the term is likely to conjure up an image of two pieces of wood lashed to an injured leg by an untrained person on a ski slope. Furthermore, it in no way suggests enabling occupation.1 The International Organization for Standardization (ISO, an international standard-setting body, founded in 1947 with headquarters in Geneva Switzerland) (1998) recommended that the term orthosis be used to describe all such devices. The ISO defined orthoses as “externally applied devices used to modify the structural and functional characteristics of the neuro-muscular and skeletal systems by applying forces to the body”2 (p. 1567)

“In 2000, the United States Centers for Medicare and Medicaid Services (CMS) introduced L-codes, which therapists must now use for reimbursement for custom-made orthotic devices. What is noteworthy is that each device is called an orthosis.” (p. 1567)

“The therapist who provides orthotic intervention requires sound knowledge of anatomy and physiology, bio-mechanics, human occupation, orthotic materials and mechanical principles of orthotic fabrication. Also required are skills in activity analysis, client assessment and education and fabrication techniques.2 Unlike most other interventions in occupational therapy, orthotic intervention results in an individualized device, that the client wears outside the clinic, that meets specific biological and occupational needs. Optimal benefit from orthotic intervention is achieved through an individualized client-centered, bio-occupational approach that addresses clients' biological (anatomical and physiological) needs as well as their occupational performance issues, within their unique social and physical environmental contexts.” (p. 1566)

“A client-centred approach challenges us to modify our language and terminology, as discussed earlier, and advocates for the careful selection of assessment tools and outcome measures.4 Routine use of function-based, client-centered evaluations promotes optimal
collaboration with the client and a focus on occupational rather than on biological outcomes. Examples include the Canadian Occupational Performance Measure\(^4,5,6\), the Disabilities of the Arm Shoulder and Hand (DASH)\(^7\), and the Patient-Specific Functional Scale.\(^8\) These measures have the added benefit of providing evidence of orthotic efficacy.\(^4,8\) (p. 1569)

McKee and Rivard\(^9\) have developed the following guiding principles for a bio-occupational approach to orthotic intervention:
1. Use a client-centred approach
2. Consider psychosocial factors
3. Consider environmental factors
4. Optimize body structure and function
5. Enable activity and participation
6. Well engineered
7. Optimize usability
8. Provide choice
9. Optimize comfort
10. Minimize harm
11. Optimize cosmesis
12. Optimize convenience
13. Use a less is more (minimalistic) approach
14. Provide comprehensive client/caregiver education
15. Monitor and modify
16. Evaluate outcomes

References

From introduction
The following articles and textbooks listed within this hOT topic represent only a portion of the existing literature on orthotics. The particular journals/textbooks listed have been included for one of the following reasons: 1) they provide an overview of orthotics including theory and therapy techniques, 2) synthesize available evidence on the effectiveness of specific orthotics or 3) illustrate how orthotics can be used to enable occupation. The assessment tools listed are supported by good psychometrics and provide justification for clinicians’ clinical reasoning for occupational therapy interventions. The associations listed can provide good networking opportunities for clinicians, further education courses, and resources for practice.

**General Textbooks**


**Upper Extremities Textbooks**


**Lower Extremities Textbooks**


**History of Splinting**


**Evidence Supporting the Use of Orthotics**


Enabling Occupation with Orthoses


**Assessment/Outcome Tools**

**Component Based Assessments**

**Dynamometer**

**Goniometry**

**Manual Muscle Testing**

**McGill Pain Questionnaire**

**Minnesota Dexterity Test**

**Nine Hole Peg Test**

**Oswestry Disability Questionnaire**

**Semmes-Weinstein Monofilaments**

**Functional Assessments**

**Canadian Occupational Performance Measure**

**DASH Questionnaire**

**Jebsen Test of Hand Function**

**Orthotics and Prosthetics User Survey**
Heinemann, A.W., Gershon, R., Fisher, W., Development and application of the orthotics and prosthetics survey: Applications and opportunities for Health care quality improvement. *Journal of Prosthetics and Orthotics, 18*(6) 80-85.

**Patient-specific Functional Scale**
Valpar Work Sample Series

Additional Information

Associations

American Society of Hand Therapists
www.asht.org

American Academy of Orthotists & Prosthetists
www.oandp.org

British Hand Therapy Association
www.hand-therapy.co.uk

Canadian Society of Hand Therapists
www.csht.org

Canadian Association of Prosthetics and Orthotics
www.pando.ca

Hand Therapy Canada
www.handtherapy.ca

International Federation of Societies of Hand Therapists
www.ihsft.org/front.php

International Society of Prosthetics and Orthotics, Canada
www.ispo.ca

West Coast Hand Therapy Association
www.westcoasthandtherapy.com

Several Universities with Occupational therapy programs also have groups:

MacHANd Group
http://www.machand.ca/

The Hand and Upper Limb Centre
http://www.uwo.ca/surgery/plastics/HULC/

University of Toronto Hand Program
http://www.toronto-hand.com/

Resource Contacts

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Questions for Reflection

Who could you connect with for mentorship and practice guidance within your area?

How could you apply some of the evidence provided in this document into your practice context?

How has the information from this document prepared you for working in orthotics?

What more do you need to learn to prepare to work in the area of orthotics?

What issues or dilemmas have you encountered within your practice related to orthotics?