

A Systematic Literature Review of the Evidence for Occupational Therapist's use of CO-OP in Adult Stroke Rehabilitation

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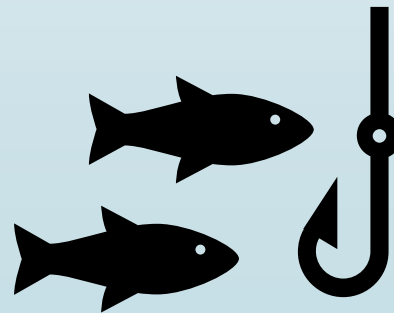
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What is CO-OP?

► Cognitive Orientation to Occupational Performance

GIVE a man a fish, you feed him for a day.
TEACH a man to fish, you feed him for a lifetime.

Proverb - Anon.



Cognitive Orientation to Occupational Performance

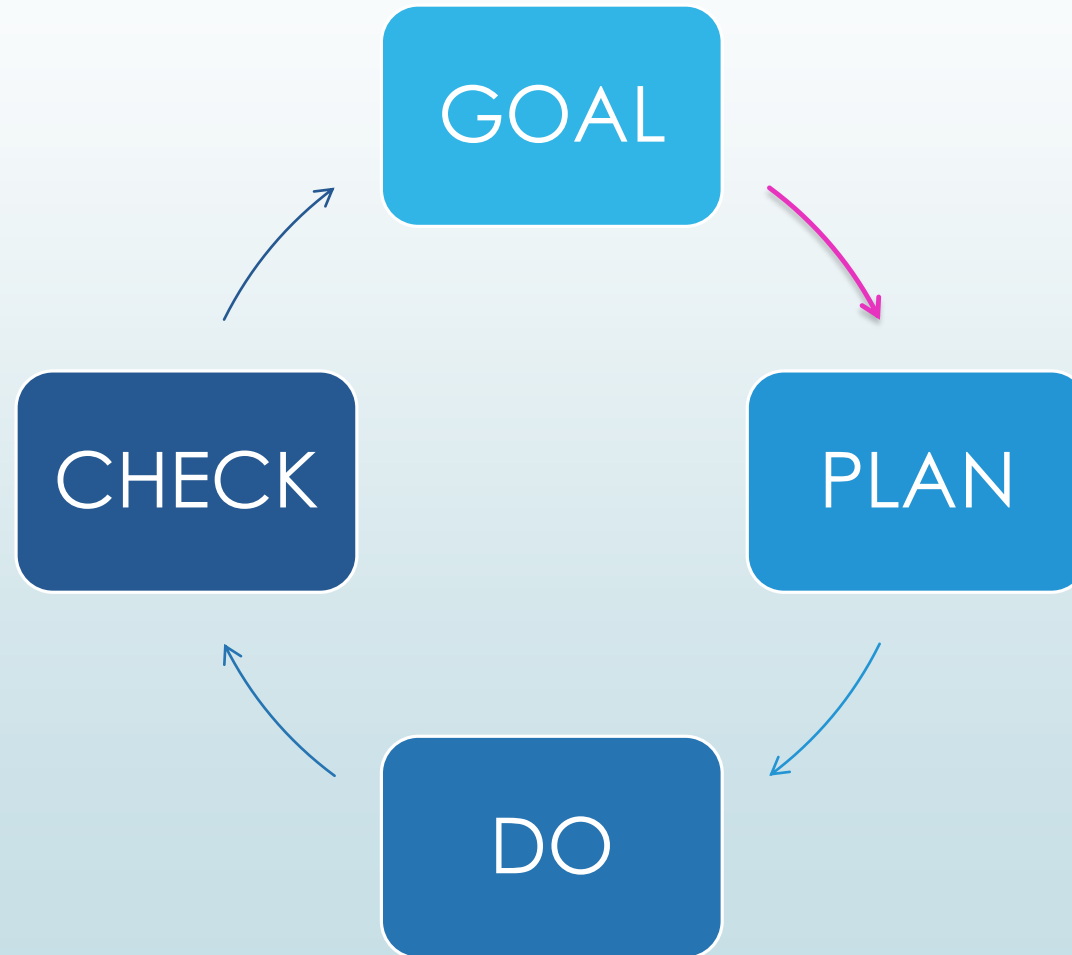
“CO-OP is a client-centred, performance-based, problem solving, approach that enables skill acquisition through a process of strategy use and guided discovery.”



(Polatajko & Mandich, 2004, p. 2)

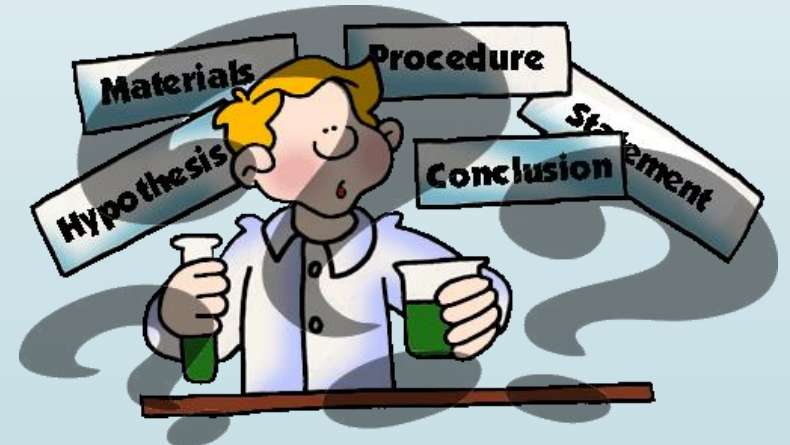
► Source: <http://co-opacademy.ca/>

How Does CO-OP Work?



Objectives of Systematic Review

- Quality of evidence for CO-OP in Stroke Rehab?
- Is CO-OP effective as an Occupational Therapy intervention in stroke rehab?
- Is CO-OP better than traditional OT interventions?

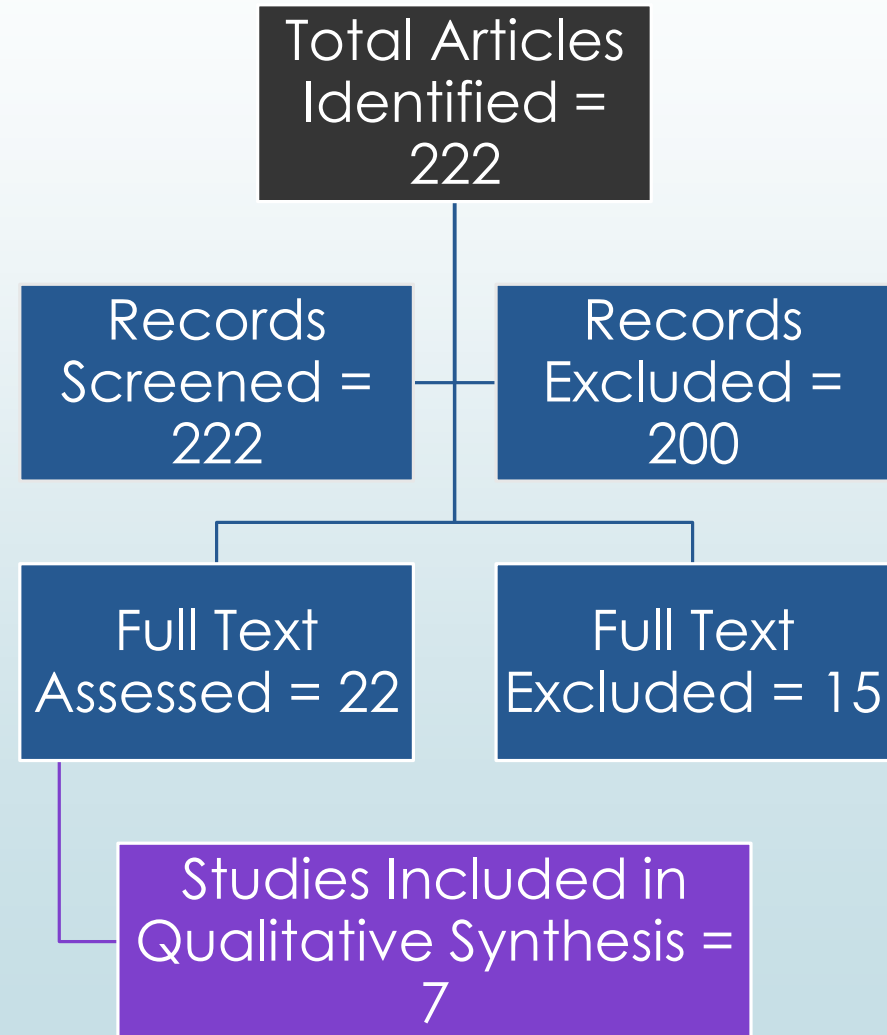




Methods

- Search of: PubMed, SCOPUS, OT Seeker, Pedro, Ovid Medline and CINAHL
- MeSH Terms used to create search criteria
- Search terms include: Stroke; Rehabilitation; Psychomotor Performance; “Cognitive and Motor”; “Cognitive Orientation to Occupational Performance”; and Metacognitive Strategies
- Additional hand searching of citation in reference lists
- In brief the inclusion criteria for the review were:
 - Participants adults aged 18 years+
 - Stroke even (acute or chronic), no mixed aetiologies
 - Receiving CO-OP intervention in rehab to address motor deficits
 - Use of standardised outcome measures
- 2 Assessors for Quality Analysis – initially blinded to ratings

Search & Results



CO-OP Research Articles Included

Title	Citation	Participants	Design	Intervention
Combined Cognitive-Strategy & Task-Specific Training Affects Cognition & Upper Extremity Function in Subacute Stroke: An Exploratory RCT	RCT#1 -(Wolf et al., 2016)	1 st analysis = 26 2 nd Analysis = 22 Mean age: 54.4 yrs (SD = 14 years)	RCT	CO-OP versus usual OT intervention.
Combined Cognitive-Strategy and Task-Specific Training to Improve Transfer to Untrained Activities in Subacute Stroke : An Exploratory RCT	RCT#2 -(S. McEwen et al., 2014b)	1 st analysis = 26 2 nd Analysis = 22 Mean age: 54.4 yrs	RCT	CO-OP versus usual OT intervention.
Pilot Randomised Controlled Trial Investigating Cognitive Strategy Use to Improve Goal Performance After Stroke	RCT#3 -(Helene J. Polatajko, McEwen, Ryan, & Baum, 2012)	8 participants	RCT	CO-OP versus usual OT intervention, in community setting, 6 mths post-acute.
Cognitive Approach to Improving Participation After Stroke: Two Case Studies	CS#1 -(E. Henshaw, H. Polatajko, S. McEwen, J. D. Ryan, & C. M. Baum, 2011)	2 participants 75 yo & 65yo	Case Study	CO-OP approach.
The Feasibility of Meta-Cognitive Strategy Training in Acute Inpatient Stroke Rehabilitation: Case Report	CS#2 -(Skidmore et al., 2011)	1 participant 31 yo	Case Study	CO-OP approach.
Inter-task Transfer of Meaningful, Functional Skills Following a Cognitive-Based Treatment : Results of Three Multiple Baseline Design Experiments in Adults with Chronic Stroke	CS#3 -(Sara E. McEwen, Polatajko, Huijbregts, & Ryan, 2010)	3 participants 54 yo, 37 yo 47 yo	Case Study	CO-OP approach applied to 3 goals, & review 4th goal not targeted.
Exploring a Cognitive-Based Treatment Approach to Improve Motor-Based Skill Performance in Chronic Stroke: Results of Three Single Case Experiments	CS#4 -(S. E. McEwen, Polatajko, Huijbregts, & Ryan, 2009)	3 participants 42 yo; 56yo, 52 yo	Case Study	CO-OP approach.

Quality of CO-OP Studies

RCT Study	PEDRO Score (out of possible 11 points)	Percentage of Criteria Met
Wolf et al (2016)	8	73%
McEwen et. al. (2014)	9	82%
Polatajko et al (2012)	6	55%

Case Studies	SCED Scale (out of possible 11 points)	Percentage of Criteria Met
Henshaw et al (2011)	8	73%
Skidmore et al (2011)	8	73%
McEwen et al (2010)	10	91%
McEwen et al (2009)	9	82%

Effectiveness: PQRS Results - RCT's

CO-OP Groups	Pre Intervention (Mean Score)	Post Intervention (Mean Score)	Change / Difference (Mean)
CO-OP Intervention Group - RCT 2 - McEwen et al. 2014	4.3	7.1	2.9
CO-OP Intervention Group - RCT 3 - Polatajko et al. 2012	1.6	6	4.3

Control Groups	Pre Intervention (Mean Score)	Post Intervention (Mean Score)	Change / Difference (Mean)
Usual Care Group - RCT 2 - McEwen et al. 2014	5.7	7.5	1.8
Standard OT Intervention Group - RCT 3 - Polatajko et al. 2012	3.2	6.3	1.3

Effectiveness: COPM Results - RCT's

CO-OP Intervention Groups	Performance Change (Mean)	Satisfaction Change (Mean)	Significant Change as per COPM?
RCT #2 - McEwen et al. 2014	1.5	1.9	No
RCT #3 Polatajko et al. 2012	4.3	4.4	Yes

Control Intervention Groups	Performance Change (Mean)	Satisfaction Change (Mean)	Significant Change as per COPM?
RCT #2 - McEwen et al. 2014	2.3	1.8	Yes - Performance Only
RCT #3 Polatajko et al. 2012	1.3	3.2	Yes - Satisfaction Only

Effectiveness: PQRS Results - Case Studies

Research Paper	Study & Participant	Pre Intervention (Combined Total)	Post Intervention (Combined Total)	Change / Difference
Case Study #1	Henshaw et al. 2011 - Participant - Mrs A	13	29	16
	Henshaw et al. 2011 - Participant - Mrs B	13	24	11
Case Study #2	Skidmore et al. 2011 - Participant 1	3.2	4.9	1.7
Case Study #3	McEwen et al. 2010 - Participant - P5	12.35	17.6	5.25
	McEwen et al. 2010 - Participant - P7	12.7	28.7	16
	McEwen et al. 2010 - Participant - P8	9.5	18.3	8.8
Case Study #4	McEwen et al. 2009 - Participant - P1	9.6	14.6	5
	McEwen et al. 2009 - Participant - P2	6.8	13.9	7.1
	McEwen et al. 2009 - Participant - P3	10.7	16.6	5.9

Effectiveness: COPM Results – Case Studies

Research Paper	Study & Participant	Performance Change (Mean)	Significant Change as per COPM?	Satisfaction Change (Mean)	Significant Change as per COPM?
Case Study #1	Henshaw et al. 2011 - Participant Mrs A	3.3	Yes	2.6	Yes
	Henshaw et al. 2011 - Participant Mrs B	2	Yes	2.3	Yes
Case Study #3	McEwen et al. 2010 - Participant - P5	2.3	Yes	4	Yes
	McEwen et al. 2010 - Participant - P7	6.5	Yes	7.4	Yes
	McEwen et al. 2010 - Participant - P8	6.4	Yes	7.3	Yes
Case Study #4	McEwen et al. 2009 - Participant - P1	0.6	No	6.7	Yes
	McEwen et al. 2009 - Participant - P2	0	No	1.7	No
	McEwen et al. 2009 - Participant - P3	4.7	Yes	6	Yes

Summary of Findings

- ▶ Is CO-OP effective in stroke rehab?
 - ▶ Yes in PQRS Results
 - ▶ Mostly in COPM Results
- ▶ Is CO-OP better than traditional OT interventions?
 - ▶ Mixed results
- ▶ Other: Is there a carry-over effect for CO-OP?
 - ▶ Potentially?

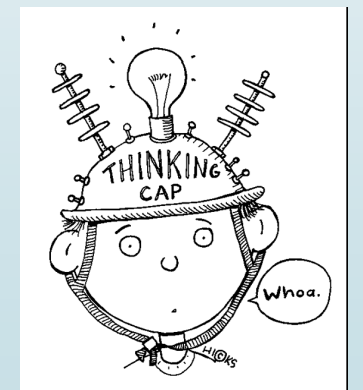


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Discussion



- Increased evidence since last review in 2009
- More research into required – Is CO-OP better than Traditional OT intervention approaches
- Future Considerations to explore CO-OP in Stroke Rehabilitation
 - Improvements after 10 sessions
 - Limited cost re: resources & therapy space
 - Potential for carry-over to untrained tasks
 - Any setting – inpatient, outpatient, community



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References

- ▶ Australian Institute of Health and Welfare. (2013). *Stroke and its management in Australia: an update*. Retrieved from <http://www.aihw.gov.au/publication-detail/?id=60129543613&tab=2>:
<http://www.aihw.gov.au/publication-detail/?id=60129543613&tab=2>
- ▶ Cadilhac, D. A., Carter, R., Thrift, A. G., & Dewey, H. M. (2009). Estimating the Long-Term Costs Of Ischemic and Hemorrhagic Stroke for Australia New Evidence Derived From the North East Melbourne Stroke Incidence Study (NEMESIS). *Stroke*, 40(3), 915-921.
- ▶ Chan, D. Y., Chan, C. C., & Au, D. K. (2006). Motor relearning programme for stroke patients: a randomized controlled trial. *Clinical Rehabilitation*, 20(3), 191-200. doi:10.1191/0269215506cr930oa
- ▶ Dawson, D. R., A. Binns, M., Hunt, A., Lemsky, C., & Polatajko, H. J. (2013). Occupation-Based Strategy Training for Adults With Traumatic Brain Injury: A Pilot Study. *Archives of Physical Medicine and Rehabilitation*, 94(10), 1959-1963. doi:<http://dx.doi.org/10.1016/j.apmr.2013.05.021>
- ▶ Dawson, D. R., Gaya, A., Hunt, A., Levine, B., Lemsky, C., & Polatajko, H. J. (2009). Using the Cognitive Orientation to Occupational Performance (CO-OP) with Adults with Executive Dysfunction following Traumatic Brain Injury. *Canadian Journal of Occupational Therapy*, 76(2), 115-127. doi:10.1177/000841740907600209
- ▶ Foley, N., McClure, J. A., Meyer, M., Salter, K., Bureau, Y., & Teasell, R. (2012). Inpatient rehabilitation following stroke: amount of therapy received and associations with functional recovery. *Disability and Rehabilitation*, 34(25), 2132-2138. doi:10.3109/09638288.2012.676145
- ▶ Harris, J. E., & Eng, J. J. (2007). Paretic upper-limb strength best explains arm activity in people with stroke. *Physical therapy*, 87(1), 88-97.
- ▶ Harris, K. R., Alexander, P., & Graham, S. (2008). Michael Pressley's contributions to the history and future of strategies research. *Educational Psychologist*, 43(2), 86-96.
- ▶ Henshaw, E., Polatajko, H., McEwen, S., Ryan, J. D., & Baum, C. M. (2011). Cognitive Approach to Improving Participation After Stroke: Two Case Studies. *American Journal of Occupational Therapy*, 65(1), 55-63. doi:10.5014/ajot.2011.09010

References (cont.)

- Heugten, C. M. V., Dekker, J., Deelman, B. G., Stehmann-Saris, J. C., & Kinebanian, A. (2000). Rehabilitation of stroke patients with apraxia: the role of additional cognitive and motor impairments. *Disability and Rehabilitation*, 22(12), 547-554. doi:10.1080/096382800416797
- Imms, C., & Nott, M. (2012). Single subject experimental design study demonstrated Cognitive Orientation to daily Occupational Performance (CO-OP) improved performance of self-selected goals in adults with chronic stroke. *Australian Occupational Therapy Journal*, 59(6), 467-468. doi:10.1111/1440-1630.12013
- Kenneth N. K. Fong, C. C. H. C. D. K. S. A. (2001). Relationship of motor and cognitive abilities to functional performance in stroke rehabilitation. *Brain Injury*, 15(5), 443-453. doi:10.1080/02699050118772
- L Tate, R., McDonald, S., Perdices, M., Togher, L., Schultz, R., & Savage, S. (2008). Rating the methodological quality of single-subject designs and n-of-1 trials: Introducing the Single-Case Experimental Design (SCED) Scale. *Neuropsychological Rehabilitation*, 18(4), 385-401. doi:10.1080/09602010802009201
- Law, M., Baptiste, S., McColl, M., Opzoomer, A., Polatajko, H., & Pollock, N. (1990). The Canadian Occupational Performance Measure: An Outcome Measure for Occupational Therapy. *Canadian Journal of Occupational Therapy*, 57(2), 82-87. doi:10.1177/000841749005700207
- McEwen, S., Polatajko, H., Baum, C., Rios, J., Cirone, D., Doherty, M., & Wolf, T. (2014a). Combined Cognitive-Strategy and Task-Specific Training Improve Transfer to Untrained Activities in Subacute Stroke An Exploratory Randomized Controlled Trial. *Neurorehabilitation and Neural Repair*, 1545968314558602.
- McEwen, S., Polatajko, H., Baum, C., Rios, J., Cirone, D., Doherty, M., & Wolf, T. (2014b). Combined Cognitive-Strategy and Task-Specific Training Improve Transfer to Untrained Activities in Subacute Stroke: An Exploratory Randomized Controlled Trial. *Neurorehabilitation and Neural Repair*. doi:10.1177/1545968314558602
- McEwen, S. E., Huijbregts, M. P. J., Ryan, J. D., & Polatajko, H. J. (2009). Cognitive strategy use to enhance motor skill acquisition post-stroke: A critical review. *Brain Injury*, 23(4), 263-277. doi:10.1080/02699050902788493
- McEwen, S. E., Polatajko, H. J., Davis, J. A., Huijbregts, M., & Ryan, J. D. (2010). 'There's a real plan here, and I am responsible for that plan': participant experiences with a novel cognitive-based treatment approach for adults living with chronic stroke. *Disability and Rehabilitation*, 32(7), 541-550. doi:10.3109/09638280903180189
- McEwen, S. E., Polatajko, H. J., Huijbregts, M. P. J., & Ryan, J. D. (2009). Exploring a cognitive-based treatment approach to improve motor-based skill performance in chronic stroke: Results of three single case experiments. *Brain Injury*, 23(13-14), 1041-1053. doi:doi:10.3109/02699050903421107

References (cont.)

- McEwen, S. E., Polatajko, H. J., Huijbregts, M. P. J., & Ryan, J. D. (2010). Inter-task transfer of meaningful, functional skills following a cognitive-based treatment: Results of three multiple baseline design experiments in adults with chronic stroke. *Neuropsychological Rehabilitation, 20*(4), 541-561. doi:10.1080/09602011003638194
- Missiuna, C., Mandich, A. D., Polatajko, H. J., & Malloy-Miller, T. (2001). Cognitive Orientation to Daily Occupational Performance (CO-OP): Part 1 Theoretical Foundations. *Physical & Occupational Therapy In Pediatrics, 20*(2-3), 69-81. doi:10.1080/J006v20n02_05
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). PRISMA 2009 Checklist. Retrieved from <http://prisma-statement.org/Default.aspx>
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *British Medical Journal, 339*. doi:10.1136/bmj.b2535
- National Stroke Foundation. (2010). *Clinical guidelines for stroke management 2010*. Retrieved from Melbourne, Australia:
- National Stroke Foundation. (2014a). *Facing up to the Australian stroke challenge 2014-2050*. Retrieved from http://strokefoundation.com.au/site/media/NSF1033_FacingChallenge_web1.pdf
- National Stroke Foundation. (2014b). *National Stroke Audit - Rehabilitation Services Report 2014*. Retrieved from Melbourne, Australia: <http://strokefoundation.com.au/health-professionals/tools-and-resources/national-stroke-audit-reports/>
- OTseeker. (2013). Rating of Randomised Controlled Trials in OTseeker. Retrieved from <http://www.otseeker.com/Info/CriticalAppraisal.aspx>
- Pohl, P. S., McDowd, J. M., Filion, D., Richards, L. G., & Stiers, W. (2006). Implicit learning of a motor skill after mild and moderate stroke. *Clinical Rehabilitation, 20*(3), 246-253. doi:10.1191/0269215506cr916oa
- Polatajko, H. J. (2010). The CO-OP Twist. *Physical & Occupational Therapy In Pediatrics, 30*(4), 277-279. doi:10.3109/01942638.2010.510381
- Polatajko, H. J., Mandich, A., & Martini, R. (2000). Dynamic performance analysis: A framework for understanding occupational performance. *American Journal of Occupational Therapy, 54*(1), 65-72.
- Polatajko, H. J., Mandich, A. D., Miller, L. T., & Macnab, J. J. (2001). Cognitive Orientation to Daily Occupational Performance (CO-OP): Part 2 The Evidence. *Physical & Occupational Therapy In Pediatrics, 20*(2-3), 83-106. doi:10.1080/J006v20n02_06
- Polatajko, H. J., Mandich, A. D., Missiuna, C., Miller, L. T., Macnab, J. J., Malloy-Miller, T., & Kinsella, E. A. (2001). Cognitive Orientation to Daily Occupational Performance (CO-OP): Part 3 The Protocol in Brief. *Physical & Occupational Therapy In Pediatrics, 20*(2-3), 107-123.

References (cont.)

- ▶ Polatajko, H. J., Mandich, A. D., Missiuna, C., Miller, L. T., Macnab, J. J., Malloy-Miller, T., & Kinsella, E. A. (2001). Cognitive Orientation to Daily Occupational Performance (CO-OP): Part 3 The Protocol in Brief. *Physical & Occupational Therapy In Pediatrics, 20*(2-3), 107-123.
- ▶ Polatajko, H. J., McEwen, S. E., Ryan, J. D., & Baum, C. M. (2012). Pilot Randomized Controlled Trial Investigating Cognitive Strategy Use to Improve Goal Performance After Stroke. *American Journal of Occupational Therapy, 66*(1), 104-109. doi:10.5014/ajot.2012.001784
- ▶ Senes, S. (2006). *How we manage stroke in Australia*: Australian Institute of Health and Welfare.
- ▶ Skidmore, E. R., Holm, M. B., Whyte, E. M., Dew, M. A., Dawson, D., & Becker, J. T. (2011). The feasibility of meta-cognitive strategy training in acute inpatient stroke rehabilitation: Case report. *Neuropsychological Rehabilitation, 21*(2), 208-223. doi:10.1080/09602011.2011.552559
- ▶ Subramanian, S. K., Massie, C. L., Malcolm, M. P., & Levin, M. F. (2010). Does provision of extrinsic feedback result in improved motor learning in the upper limb poststroke? A systematic review of the evidence. *Neurorehabilitation and Neural Repair, 24*(2), 113-124.
- ▶ Togli, J. P., Rodger, S. A., & Polatajko, H. (2012). Anatomy of cognitive strategies: A therapist's primer for enabling occupational performance. *Canadian Journal of Occupational Therapy, 79*(4), 225-236.
- ▶ Wolf, T. J., Polatajko, H., Baum, C., Rios, J., Cirone, D., Doherty, M., & McEwen, S. (2016). Combined Cognitive-Strategy and Task-Specific Training Affects Cognition and Upper-Extremity Function in Subacute Stroke: An Exploratory Randomized Controlled Trial. *American Journal of Occupational Therapy, 70*(2), 7002290010p7002290011-7002290010p7002290010. doi:10.5014/ajot.2016.017293