

“BRAKING BAD” ECCENTRIC CONTROL FROM TALKING TO WALKING

Instructors

**Mary Massery, PT, DPT, DSc
Nechama Karman, PT, MS, PCS**

Sponsored by

(7.0 Contact Hours)

DESCRIPTION:

Eccentric muscle contractions are the brakes of the human movement system. Although there is yet little direct research on voicing eccentrics, preliminary data shows that glottal control is integral to upright postural control. Modulation of glottal constriction such as during voicing regulates intra-thoracic pressure, and by extension, intra-abdominal pressure, both of which are necessary for finely tuned postural control. The speakers will present novel ideas on the role of eccentrics in trunk control from talking to walking. In the normal gait pattern, the majority of muscle contractions are eccentric, yielding remarkable efficiency: harnessing momentum and ground reaction forces to minimize the energy cost of walking. In individuals with neurological injuries, movement impairments impede the ability to generate eccentric contractions or to time muscle contractions correctly, yielding co-contraction and inefficiency. The speakers will identify how these impairments impede postural control and gait ability and how to specifically address them using voicing as a mechanism to promote eccentric muscle contractions in intervention programs to minimize negative effects on gait and maximize walking performance. Interactive laboratory experiences will allow participants to practice application of these methods across a variety of functional tasks.

OBJECTIVES

Upon completion of this course, you will be able to:

1. State how the mechanics of breathing, talking, and postural control are inter-active and inter-dependent components of normal movement strategies using a soda-pop can as a conceptual model.
2. Discuss the potential benefits of utilizing voicing strategies to treat postural control deficits in multi-task activities like talking while walking and reaching.
3. Identify elements of a biomechanically-efficient gait pattern that are not present in specific gait patterns demonstrated by individuals with neurological impairments.
4. Select and perform intervention strategies and/or techniques to elicit eccentric muscle contractions and address timing and alignment deficits that adversely affect reach, gait, transfers, sustained phonations, and voice volume in a wide range of patients across the lifespan.

TOPICS

Lecture MM	Introduction to topic: eccentrics!
Lecture MM	Biomechanical and neuromuscular links between respiration, posture and movement
Lab MM/NK	Pairing breath control from walking and talking to chewing gum (ventilatory strategies)
Lecture NK	Elements of and impediments to achieving an energy-efficient gait pattern (importance of eccentric control)
Lab NK/MM	Introduction to PNF Agonistic Reversal technique: eccentric resistance training and re-education
Lab & discussion NK/MM	Case studies, problem solving, and treatment techniques: Using neuromotor retraining to optimize eccentric control with breath control in upright: stance, weight-shift, gait
Lab/discussion NK/MM	Lab continued: transfers, position changes, talking and moving at the same time, increasing sustained phonation and volume
Discussion	Tests and measures: Did your interventions work?

SPEAKERS' BIOGRAPHIES

Mary Massery, PT, DPT, DSc

Dr. Massery received her BS in Physical Therapy from Northwestern University in 1977, her DPT from the University of the Pacific in 2004 and her DSc from Rocky Mountain University in 2011. Her publications and interests focus on linking motor behaviors to breathing and/or postural mechanics in both pediatric and adult patient populations. Dr. Massery has been invited to give over 900 professional presentations in all 50 US states and in 18 countries worldwide, including more than 100 presentations for the *American Physical Therapy Association*.



Mary's research pioneered the concept of managing trunk pressures as a new way to visualize core stabilization. She has delivered keynote and major addresses on topics such as cystic fibrosis and posture, pectus excavatum (chest deformities), connections between posture & breathing, and PNF (proprioceptive neuromuscular facilitation).

Mary has received national awards from the APTA, including its highest clinical award, *The Florence Kendall Practice Award*, honoring "one's outstanding and enduring contributions to the practice of physical therapy." She has been honored as *Outstanding Alumnus of the Year* by each of her 3 universities. She was also awarded *Northwestern University's Alumnae Research Achievement Award*. Mary continues to maintain a private practice in Chicago, specializing in breathing and postural dysfunction.

Nechama Karman, PT, MS, PCS

Nechama is obsessed with eccentric control and its link to functional balance and gait! Nechama was the driving force behind the development of this course.

Nechama Karman received her MSPT from Columbia University in 1994, her Advanced MS in orthopedic PT from Touro College in 1998 and has completed her Health Sciences PhD coursework at Seton Hall University. She has held academic appointments at both Hunter College and NYIT and is also an APTA board-certified pediatric clinical specialist.



Nechama is chief clinical educator at Mobility Research, providing pediatric and adult trainings, introductory and advanced seminars, webinars, and clinical support for LiteGait in the USA and internationally. She is a primary instructor in LiteGait's "train the trainer" program. In addition, after a 2-year invited apprenticeship in 2016, Nechama became Mary Massery's first certified faculty member to teach her national course: "If you can't breathe, you can't function." In 2019, she was certified to teach Mary's musculoskeletal course as well. Nechama owns a private practice in New York City focusing on treating patients with complex neurological conditions and/or complex pelvic conditions.