



## Exploring Optimal Breathing Techniques in Healthy, At-Risk and Clinical Populations

Presenter: Nicole Juen, SRT

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### Session Abstract

Diaphragmatic breathing and core stability training are the foundation for physical training in healthy individuals. Clinical patients with respiratory disorders have laboured breathing that leads to recruitment of accessory breathing muscles (ABM) when patients are at rest and during physical activity. In normal populations, ABM are activated during intense physical exertion. Studies have shown that hypertonicity in ABM leads to kyphosis, and consequently, the inability to effectively activate the transverse abdominals (TVA). It has been demonstrated that respiratory training can be beneficial to patients with respiratory disease, not only at rest but also during physical activity. These studies however, focused either on respiratory training alone, or respiratory training with a general exercise program. Although labored breathing may be inevitable in some patient populations, it may be possible to mitigate ABM recruitment by approaching respiratory training in a different way. Studies have suggested that the TVA and pelvic floor muscles (PFM) are involved in respiration. Researchers across a variety of disciplines have observed that the diaphragm, TVA and PFM work synergistically to create intra-abdominal pressure (IAP). IAP is essentially the result of bracing these muscles, along with other core muscles, in a neutral spine position. To brace the core in this manner, diaphragmatic breathing must be in place while the TVA and PFM are engaged. Core stability and strength is achieved when this brace is maintained while breathing, and then challenged through movement. It may be posited that recruiting the muscles in this manner may improve respiration, reduce some of the work of ABM, and improve posture and core strength of people with chronic respiratory disease. Future studies, consisting of patients with chronic respiratory disease, should incorporate this method during respiratory training and elucidate its efficacy through functional exercises as opposed to a general exercise program. People at risk of respiratory disease could be used as another experimental group, with a healthy group as the control. Should this approach show validity, it could be used also as a preventative measure in healthy and at-risk populations against ineffective respiratory patterns. Ultimately, the diaphragm can be thought of as being part of a whole unit that affects our structure and movement; poor movement patterns may exacerbate laboured breathing and vice versa.

### Session Objectives

1. To review accessory breathing muscle recruitment in respiratory disorders.
2. To understand the importance of respiratory muscle training in both healthy and clinical populations.
3. To analyze current respiratory training research by evaluating methodology and identifying possible avenues for improvement.
4. To explore future research ideas that are based on a new approach to respiratory training and its implications for improving quality of life.

### Speaker Biography

Nicole recently completed her first year of the Respiratory Therapy program at Fanshawe College, and is currently on the CSRT board of directors as the student perspective. She has an Honours Bachelor's Degree in Psychology. Following her BA, she was part of a research group that combined fMRI and EEG to study the effects of extremely low frequency magnetic field exposure. During this time, she presented posters at conferences in Turkey and Sicily (2010), and presented a talk in Rome (2011). Nicole has been a Certified Personal Trainer since December 2011. Since then, she has taken undergraduate and graduate level health science courses at Western University as part of her continuing education.