

Physical therapy in acute and chronic respiratory conditions : the 'extra-pulmonary' challenges

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Over the last 10 years the body of knowledge and evidence in the area of physical therapy for patients with acute and chronic respiratory conditions. The case for an evidence based treatment is best illustrated in patients with COPD. The contribution of physiotherapy in the treatment has grown tremendously. Recent literature has given more details on the relative contribution of the components of a multidisciplinary rehabilitation program and selection of patients for specific components of a rehabilitation program. The Royal Dutch Society for Physical Therapy (KNGF) *Guideline for Physical therapy in patients with COPD* provides a guide for physical therapists in the treatment of patients with COPD. Physical therapy consists of assessment (exercise testing, limb and respiratory muscle testing, physical activity monitoring, clinical evaluation, symptoms) and various treatment modalities (exercise training, peripheral and respiratory muscle training, breathing exercises) that are considered cornerstones of the rehabilitation program. In addition, much more emphasis is now placed on the assessment and treatment of physical inactivity in daily life. Physical inactivity in daily life is not only a prominent feature in advanced disease stages, especially after acute exacerbations of the disease, but has also been identified early in the disease process. Furthermore, it has become clear that changing a patient's lifestyle (inac-

tivity in daily life, smoking) requires behavioral change strategies in the early stages of the disease, to improve long-term outcome in terms of health status.

Physical therapists are also involved in the management of patients with acute critical illness. In the *Recommendations of the European Respiratory Society and European Society of Intensive Care Medicine Task Force on Physiotherapy for critically ill patients* special attention was given to the assessment and treatment of physical deconditioning (muscle weakness, joint stiffness, impaired functional exercise capacity, physical inactivity) in critically ill patients. In addition to the treatment of respiratory conditions (retained airway secretions, atelectasis and respiratory muscle weakness), *early* physical activity and mobility are key in the prevention, attenuation or reversal of physical deconditioning related to critical illness. A variety of modalities for exercise training and early mobility are evidence based and are implemented depending on the stage of critical illness, comorbid conditions and level of cooperation of the patient. The physical therapist should be responsible for implementing mobilization plans and exercise prescription and make recommendation for progression of these jointly with medical and nursing staff.

Assessment and Physical Therapy for Balance Disorders

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Balance problems are one of the most common reasons patients are referred to physical therapy and the most common reason for falls and decreased quality of life in the elderly and in people with neurological disorders. However, balance control is based on many underlying neurological systems that can be affected by disease and injury. It is important for physical therapists to evaluate the specific balance systems affected in each patient in order to focus on the most effective treatment. Most balance assessments do not differentiate different types of balance problems. The purpose of this presentation is to understand how to use a systems approach to differentiate types of balance impairments and to be exposed to new technology that enables objective measures of balance and gait for physical therapy.

Dr. Horak developed the Balance Evaluation Systems Test (BESTest) and a short version (the MiniBESTest) for physical therapists to differentiate systems that constrain balance: Biomechanical, Stability Limits, Postural Responses, Anticipatory Postural Adjustments, Sensory Orientation, and Dynamic Balance during Gait and Cognitive Effects (Horak, et al., 2009; Franchignoni, et al., 2010; King, et al., 2012). The MiniBESTest now one of the most popular balance assessment tools in physical therapy and has been translated into over 10 languages (www.BESTest.us) The BESTest and miniBESTests are unique evaluation tools appropriate for any age of ambulatory patients with Parkinson's Disease, Cerebellar Ataxia, Vestibular Disorders, Neuroopa-

thy, Head Injury, Multiple Sclerosis, Stroke, Cerebral Palsy, Cognitive Deficits, and others.

Dr. Horak also developed a novel technology called the 'Mobility Lab' system using body-worn, inertial sensors (Opals) to provide objective measures of balance and gait impairments (Horak, et al., 2015; Mancini, et al., 2013). Dr. Horak is on the Board of Directors of the company that commercialized Mobility Lab, APDM, Inc. She will summarize her research showing that body-worn sensor provide accurate, valid balance and gait measures sensitive to subtle deficits and changes with therapy (King, et al., 2013). She is currently using Opals to characterize the quality of walking and turning all day in the home and community and will show how continuous monitoring of mobility may be more sensitive than prescribed balance or gait tasks in the clinic.

Participants will:

1. Learn about research that shows how impairments in different balance systems result in a variety of balance and gait problems.
2. Discover the newest types of technology that allow therapists to measure balance and gait impairments with objective measures.
3. Consider how to customize exercise programs for balance and gait disorders based on a system approach to balance and gait impairments.