Clinical Management of Acute Exacerbations of COPD

The World Health Organization (WHO) (2017), classified chronic obstructive pulmonary disease (COPD) as the third leading cause of death and disability. COPD is defined as any restriction of the bronchial lumen that can restrict expiratory airflow (Hillgrass, 2017). Exacerbations in acutely ill patients result from a patient’s inability to mobilize thick secretions caused by an incapacitated mucociliary transport system or an ineffective cough (Zadai, 2016). Other manifestations of COPD are often associated with bronchoconstriction, or other inflammation of the bronchial lining that contributes to conditions such as asthma or bronchitis (Hillgrass, 2017).

The physiological impact of pulmonary hyperinflation results in the formation of the hallmark “barrel chest.” This is defined by the flaring of the ribcage and the loss of costal elasticity, which prevents recoil into a standard resting position (Hillgrass, 2017). As a result, the diaphragm begins to flatten over time contributing to a decrease in the ability the chest wall to passively deflate (Hillgrass, 2017). Progressive deterioration of the bucket handle mechanism results in an increase in the demand for forced expiration. Increased forced expiration over time has also been correlated with pelvic floor stresses that can eventually lead to incontinence in patients with COPD (Hillgrass, 2017).

Camp et al. (2015) suggested that most patients with COPD suffer from at least one exacerbation per year which can result in hospitalization. The most common causes of hospitalization are associated with deconditioning resulting from a progressive decline in physical activity (Camp et al., 2015). As patients with COPD progress through the disease process, a reduction in aerobic metabolism results in a decrease in muscle fiber density leading to diminished exercise capacity (Hillgrass, 2017). Secondary deficits associated with the loss of muscle function includes a reduction in gait velocity and an increase in the frequency of falls (Ja come, Cruz, Olivera & Marques, 2016). Chronic hypoxemia related COPD hypoventilation can also contribute to chronic cognitive impairments including memory loss, attention deficits, and a decrease in cognitive flexibility similar to deficits found in patients with mild anoxic brain injuries.

Following an acute exacerbation of COPD, research has been shown that pulmonary rehabilitation can effectively increase exercise capacity, improve patient perceptions regarding quality of life and reduce the risk associated with hospital readmissions (Camp, 2015; Camp, 2000; Langer et al., 2015, Roig et al., 2016). Clinical literature suggests that best practice for managing acute exacerbations suggests that therapist establish a preliminary baseline assessments with the use of valid and reliable clinical measure to determine the patient’s disease progression.

Clinical Considerations

An optimal goal for managing patients with COPD requires consideration for optimizing functional mobility and ADL’s with a keen focus on energy conservation. Patients, who experience progressive loss of gait tolerance with distances less than 300 feet, may be appropriate for equipment that can extend patients functional gait range. Devices like power wheelchairs and scooters can significantly improve a patient’s ability return to a functional community level of mobility. The use of walkers with seats, bags or trays, can assist with providing patients with energy conservation techniques that can decrease muscle demand and reduce the risk for falls. Patient education and training can help to provide resources to help patients schedule their days to optimize energy conservation and contribute to mitigating any short-term memory and cognitive issues.

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Table 1: COPD Impairment and Clinical Considerations

- Motor strength: Establish baseline motor strength. Assess risk for de-conditioning.
- Aerobic endurance: Measure the patient’s baseline endurance capacity.
- Balance: Risk for falls associated with strength and motor spatial related deficits.
- Cognition: Consider the use of a cognitive measure to rule out underlying anoxic related cognitive deficits.