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Editorial

A Patient-Centered Walking Program for COPD

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Abbreviations: chronic obstructive pulmonary disease, **COPD**; pulmonary rehabilitation, **PR**; acute exacerbation of COPD, **AECOPD**; specific-measurable-attainable-realistic-time-oriented, **SMART**

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In this issue, Bender and colleagues[1] report on the effectiveness of a walking program based on patient-centered activity goals, on daily physical activity, weight loss, health-related quality of life, and symptoms such as shortness of breath. The idea is innovative and challenges us to consider 2 aspects of chronic obstructive pulmonary disease (COPD) management. One is the role of treating exercise capacity versus sedentary behavior and the other is the importance of goal setting.

A major focus of pulmonary rehabilitation (PR) is to increase functional exercise capacity. Although there is Grade 1 evidence that this is usually achievable,[2] patients often lose the gains achieved after 1 year,[3] mainly as a result of poor adherence to the exercise prescription. There is also evidence to show that patients who are more sedentary (i.e., spend more time engaged in activities such as lying and sitting) have more frequent acute exacerbations of COPD (AECOPD) as well as more frequent hospitalizations.[4,5] Decreased physical activity and increased sedentary activity is also associated with a higher mortality in people with COPD.[6,7] In fact, physical activity levels measured using a multisensory armband showed that it was the best predictor of 4 year survival, when compared with all other established predictors.[8] Many people with COPD spend relatively small amounts of time standing or walking even when clinically stable.[9] These low levels of physical activity are even more pronounced post AECOPD.[10]

Physical activity is sometimes classified from the daily step count using a simple pedometer. Depew and colleagues suggested that in patients with COPD a step count below 4580 steps per day was associated with severe physical inactivity as measured using a multimodal activity monitor.[11] A number of studies have also reported daily step counts in people with COPD with mean values in the range of 3500 to 4400 per day[1,12-14] which decrease further following an AECOPD.[14] The count increases substantially following a walking program, although the results of the increase are highly variable (988-3080 steps per day).[12,15,16] Accepting the obvious limitations of absolute step count measurements such as the influence of stride length, height, age and disease severity, simple step count monitoring is easy and inexpensive to use for tracking activity and encouraging individuals (rather than groups) to reach a target. Therefore, given the importance of the negative consequences of a sedentary lifestyle, focusing on the sedentary signal might be an important program goal to be accomplished in addition to increasing exercise capacity. Cavalheri and colleagues[17] have recently suggested that we should aim to decrease sedentary time and increase light (as

opposed to moderate or vigorous) intensity activity in people with COPD in order to reduce the risk of adverse health outcomes. For many this may be a more realistic goal. For others it may offer a bridge to more vigorous exercise training. But how do we facilitate behavior change necessary to increase physical activity?

Pedometers will help increase step count, quality of life, and functional capacity.[16] In the Bender study[1] as both groups were given a pedometer and encouraged, using telephone support, to walk more, we can discount these components as independent variables. The intervention of note was the motivational interviewing and personalized goal setting by a wellness coach to assist in overcoming barriers to activity. Personalized care planning using goal setting has been used as part of chronic disease management for a variety of conditions such as diabetes, asthma and heart failure.[18-20] A Cochrane review concluded that personalized care planning was associated with small improvements in physical and psychological health, with greater benefit being realized as the personalized care became more comprehensive.[20] As in all goal setting, the goals need to be specific, measurable, attainable, realistic and time-oriented (SMART) and the interventions should be specific to the desired outcomes.[21] The participants in the Bender study were asked to set a goal of increasing the time spent engaging in an activity they enjoyed. They were coached on how walking could help them achieve their activity goal and they were provided with a step count goal set to be a 15% increase over their last month's activity. The authors note that some participants required coaching assistance to make their goals more specific and more detail on the process of coaching would be welcome. It is unclear whether simply beginning a new activity meant that the goal had been achieved or whether progress and frequency of the activity was tracked. Less than half of the participants achieved even one goal. This is disappointing as the initial goal should be achievable in order for the participant to experience mastery and increase self-efficacy.[22] This low achievement level raises the question as to how realistic the goals were. Another issue is whether the increased step count walking goal is actually related to some of the personal goals, such as starting swimming. Whereas it is possible that individualized step count goals will contribute to an increase in overall activity, participant buy in is likely to be greater if the coaching is closely related to their chosen activity.

For several reasons the cost comparisons cited are of limited value. Contrasting costs with hospital based PR is comparing 2 different treatments likely in different settings. PR is generally outpatient-based and in many instances substantially cheaper than the amount ($2000/patient) quoted. Furthermore, PR includes a broad range of endurance and resistance exercises in addition to modalities such as education, social, nutritional and psychological support. The intervention applied in the Bender study did not influence dyspnea or health-related quality of life, both of which are known to improve with PR. Therefore, it might be best utilized as part of a maintenance strategy after pulmonary rehabilitation.

The communication by Bender is of a 12 week intervention. The next step should be to explore the sustainability of the intervention (how long can biweekly phone calls be maintained?) and the sustainability of the improvement in daily step count as well as the achievement of personal goals. Will it mirror PR with adherence decreasing as the extrinsic motivation is withdrawn? Or will participants learn to set SMART goals, progress their activities independently and maintain or increase their activity level over time?

We know that we can improve exercise capacity with PR but there is growing evidence of the need to separately reduce the sedentary signal. Activity monitoring and goal setting are 2 strategies that can be used to this end but we need to make sure that the goals are SMART and relevant to the participant. Singh[23] has proposed a stratification of interventions to address both exercise capacity and activity levels. Individuals would be assessed and treated based on their baseline exercise capacity as well as their level of physical activity. Therefore, an intervention such as Bender's could be used to target those with low physical activity, alone or in combination with PR. Conversely, PR would be prescribed for those with low exercise capacity and Bender's intervention added only for those with concomitant low activity levels. This would encourage a newer paradigm to improve the health of those with COPD.

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