



Get a move on: physical (in)activity in people with obstructive airway disease

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A study extended the “can do, do do” concept in people with obstructive airways disease to demonstrate different clinical and movement behaviour characteristics based on quadrant classification, and proposed a treatable traits approach to management <https://bit.ly/4cOGIN5>

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Our understanding of the relationship of physical activity with health outcomes in people with chronic respiratory disease continues to evolve [1, 2] in COPD and other obstructive airway diseases [3–5]. Recent years have seen the development of a framework based on what people can or cannot do (physical capacity) relative to what they do and do not do (physical activity) with the premise of guiding the selection of appropriate interventions in clinical practice [6]. Analyses to date have used step count (steps per day) to reflect the amount of daily physical activity [6–8] rather than duration and intensity of physical activity undertaken as per guidelines [9].

The study by URROZ GUERRERO *et al.* [10] in this issue of *ERJ Open Research* sought to address this gap in their secondary analysis of physical activity data from studies including participants with COPD, bronchiectasis and severe asthma. By identifying time spent in Actigraph-assessed moderate- to vigorous-intensity physical activity (MVPA), a key finding was a higher proportion of participants with COPD classified as “can’t do, don’t do” (59% relative to 22% and 34% in earlier work [6, 8]), which may reflect better discrimination using classification according to duration and intensity rather than step count [11] or the long-standing challenge of applying absolute threshold values in the context of a patient group with compromised (and variable) physiological capacity [12]. The proportions of people with severe asthma and bronchiectasis in this group were similar and lower (25% and 30% respectively) but still over-represented relative to the control group (5%), a finding consistent with previous work [13].

Regardless of participation in physical activity, a far higher proportion of participants with COPD were classified as “can’t do”. A treatable traits approach to management would identify the appropriate treatment to address the assessed trait; in this case, pulmonary rehabilitation would be the evidence-based recommendation with evidence for improved functional capacity [14]. Whether this intervention will result in a change in “don’t do” is unclear [15]. However, it has been suggested that people with COPD with better baseline 6-min walk distance (“can do”) were more likely to increase step count post-pulmonary rehabilitation (“do do”) [16] but prospective work has yet to demonstrate maintained improvements in physical activity following pulmonary rehabilitation.

Historically less well-examined in people with severe asthma and bronchiectasis, there is evidence that physical activity is associated with exercise capacity, dyspnoea, health-related quality of life and lung function, with far less scrutiny of sedentary behaviours [13, 17]. With evidence for improvements in exercise capacity in people with bronchiectasis [18] and severe asthma [19], interventions that incorporate exercise training are indicated in order to shift people from “can’t do” to “can do”.

The “don’t do” population continues to prove a significant challenge to researchers and clinicians. The development of strategies that are able to achieve meaningful and maintained improvements in physical



activity needs to incorporate the multifaceted interplay of disease and non-disease factors. Work in people with COPD [20], bronchiectasis [21] and severe asthma [22] has identified barriers to exercise and physical activity, including embarrassment related to symptoms and fear of exacerbating symptoms, which tell us that in order to improve engagement with physical activity, we will need to accommodate the needs of individuals.

The authors also explored light-intensity physical activity profiles according to quadrants, revealing that people with obstructive airway diseases who demonstrated reduced time in MVPA also had reduced time in light-intensity physical activity, a pattern not observed in the control group. The concept of shifting time from sedentary behaviour to light-intensity activities is likely to be associated with health benefits [23] and may be more accessible for people with obstructive airway diseases, but does pose a (so far) treatment-resistant target behaviour [24].

There is hope with some evidence for health benefits including reductions in severe exacerbations and mortality following initiation of regular MVPA in people following diagnosis of COPD [25] but the magic personalised formula to facilitate the behaviour change necessary to improve and maintain physical activity remains elusive. Applying the treatable traits lens to quadrant allocation identifies other traits, including airflow limitation, dyspnoea and comorbidities, that will likely need tailored interventions in order to facilitate quadrant shift, and may provide some directions on the path to improved physical activity and the associated benefits for our patients with obstructive airway disease.

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References

- 1 Garcia-Aymerich J, Farrero E, Felez M, *et al.* Risk factors of readmission to hospital for a COPD exacerbation: a prospective study. *Thorax* 2003; 58: 100–105.
- 2 Buttery S, Williams P, Alghamdi S, *et al.* Investigating the prognostic value of digital mobility outcomes in patients with chronic obstructive pulmonary disease: a systematic literature review and meta-analysis. *Eur Respir Rev* 2023; 32: 230134.
- 3 Alcaraz-Serrano V, Arbillaga-Etxarri A, Oscanoa P, *et al.* Exacerbations and changes in physical activity and sedentary behaviour in patients with bronchiectasis after 1 year. *J Clin Med* 2021; 10: 1190.
- 4 Alcaraz-Serrano V, Gimeno-Santos E, Scioscia G, *et al.* Association between physical activity and risk of hospitalisation in bronchiectasis. *Eur Respir J* 2020; 55: 1902138.
- 5 Kuder M, Clark M, Cooley C, *et al.* A systematic review of the effect of physical activity on asthma outcomes. *J Allergy Clin Immunol Pract* 2021; 9: 3407–3421.
- 6 Koolen E, van Hees H, van Lummel R, *et al.* “Can do” versus “can’t do”: a novel concept to better understand physical functioning in patients with chronic obstructive pulmonary disease. *J Clin Med* 2019; 8: 340.
- 7 Janssen S, Spruit M, Antons J, *et al.* “Can do” versus “do do” in patients with asthma at first referral to a pulmonologist. *J Allergy Clin Immunol Pract* 2021; 9: 1278–1284.
- 8 Vaes A, Spruit M, Koolen E, *et al.* “Can do, do do” quadrants and 6-year all-cause mortality in patients with COPD. *Chest* 2022; 161: 1494–1504.
- 9 Bull F, Al-Ansari S, Biddle S, *et al.* World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *Br J Sports Med* 2020; 54: 1451–1462.
- 10 Uroz Guerrero P, Lewthwaite H, Gibson PG, *et al.* Physical capacity and inactivity in obstructive airway diseases: a “can do, do do” analysis. *ERJ Open Res* 2024; 10: 00108-2024.
- 11 Adams M, Carrascosa L, Jansen C, *et al.* “Can do” vs. “do do” in older adults: a cross-sectional analysis of sensor-derived physical activity patterns. *Sensors* 2023; 23: 1879.
- 12 Demeyer H, Mohan D, Burtin C, *et al.* Objectively measured physical activity in patients with COPD: recommendations from an international task force on physical activity. *COPD* 2021; 8: 528–550.
- 13 Emirza C, Tiryaki P, Kaya B, *et al.* Physical activity level and sedentary behavior in patients with bronchiectasis: a systematic review of outcome measures and determinants. *Respir Med Res* 2023; 84: 101020.
- 14 McCarthy B, Casey D, Devane D, *et al.* Pulmonary rehabilitation for chronic obstructive pulmonary disease. *Cochrane Database Syst Rev* 2015; 2: CD003793.
- 15 Burge A, Cox N, Abramson M, *et al.* Interventions for promoting physical activity in people with chronic obstructive pulmonary disease (COPD). *Cochrane Database Syst Rev* 2020; 4: CD012626.
- 16 Osadnik C, Loecx M, Louvaris Z, *et al.* The likelihood of improving physical activity after pulmonary rehabilitation is increased in patients with COPD who have better exercise tolerance. *Int J COPD* 2018; 13: 3515–3527.

- 17 Cordova-Rivera L, Gibson P, Gardiner P, *et al.* A systematic review of associations of physical activity and sedentary time with asthma outcomes. *J Allergy Clin Immunol Pract* 2018; 6: 1968–1981.
- 18 Lee AL, Gordon CS, Osadnik CR, *et al.* Exercise training for bronchiectasis. *Cochrane Database Syst Rev* 2021; 4: CD013110.
- 19 Osadnik CR, Gleeson C, McDonald VM, *et al.* Pulmonary rehabilitation versus usual care for adults with asthma. *Cochrane Database Syst Rev* 2022; 8: CD013485.
- 20 Robinson H, Williams V, Curtis F, *et al.* Facilitators and barriers to physical activity following pulmonary rehabilitation in COPD: a systematic review of qualitative studies. *NPJ Prim Care Respir Med* 2018; 28: 19.
- 21 Royle H, Kelly C. “The likes of me running and walking? No chance”: exploring the perceptions of adult patients with bronchiectasis towards exercise. *Chronic Illn* 2023; 19: 157–171.
- 22 Apps L, Chantrell S, Majd S, *et al.* Enabling adults with severe asthma to exercise: a qualitative examination of the challenges for patients and health care professionals. *J Allergy Clin Immunol Pract* 2023; 11: 3435–3444.
- 23 Dogra S, Copeland J, Altenburg T, *et al.* Start with reducing sedentary behavior: a stepwise approach to physical activity counseling in clinical practice. *Patient Educ Couns* 2022; 105: 1351–1361.
- 24 Cheng S, Alison J, Stamatakis E, *et al.* Six-week behaviour change intervention to reduce sedentary behaviour in people with chronic obstructive pulmonary disease: a randomised controlled trial. *Thorax* 2022; 77: 231–238.
- 25 Kim T, Kim H, Kong S, *et al.* Association between regular moderate to vigorous physical activity initiation following COPD diagnosis and mortality: an emulated target trial using nationwide cohort data. *Chest* 2024; 165: 84–94.