

ORCID IDs: 0000-0002-3367-9940 (T.N.); 0000-0002-5167-6970 (R.T.S.).

*These authors contributed equally to this work.

†Corresponding author (e-mail: tatyana.novoyatleva@innere.med.uni-giessen.de).

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Patients with Chronic Obstructive Pulmonary Disease Require More Than Pulmonary Rehabilitation to Improve Outcomes

To the Editor:

We read with great interest the publication by Nici and colleagues summarizing the evidence that supports expansion of pulmonary rehabilitation beyond traditional center-based settings, and calling

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for research on new models of delivery to expand the reach of this intervention (1). As the authors highlight, increasing evidence indicates that home- and community-based programs offer improvements in outcomes equivalent to those achieved by center-based programs, and technology-based delivery will further increase the reach of these programs. In looking to the future, they describe several challenges to be addressed through research in developing new models of pulmonary rehabilitation: 1) promoting referrals, 2) increasing patient uptake, 3) tailoring the program type to the severity of the patient's impairment, 4) optimizing cost-effectiveness, 5) optimizing the robustness and fidelity of the intervention, and 6) ensuring that health professionals acquire skills in behavioral-change techniques and new technologies. A challenge not mentioned is the decline in benefits after about 12 months of participating in pulmonary rehabilitation and the need for interventions to sustain improvements. These many challenges emphasize the complexity of developing and delivering new models of pulmonary rehabilitation.

Although technical fixes, such as an opt-out option for automated order-sets to increase referrals and educating physicians about pulmonary rehabilitation, may partially address some of these challenges, they will not address adaptive behaviors that limit patient uptake of pulmonary rehabilitation or other interventions to promote self-management behaviors. Results from qualitative studies of patients and providers may lead to improved interventions and help patients adapt to their chronic conditions by ensuring that their support needs are met (2–4).

Patients with chronic obstructive pulmonary disease (COPD) require ongoing cognitive and behavioral changes tailored to their specific needs and preferences (4), which cannot be accomplished during an 8- to 12-week period of pulmonary rehabilitation and may partly explain the decline in benefits after rehabilitation. Moreover, we are just beginning to understand the factors that affect the adoption and maintenance of new behaviors, such as increasing and sustaining physical activity after pulmonary rehabilitation (3). Further research is needed to identify facilitators of and barriers to self-management behaviors, and to use this information to tailor interventions that will help patients effectively adapt to their chronic illness.

Finally, as described by Nici and colleagues in the American Thoracic Society report on integrated care for patients with COPD, pulmonary rehabilitation alone is insufficient to address all the needs of such patients (5). Moreover, most healthcare systems are not structured to provide optimal care for chronic illnesses, and because of an insufficient workforce pipeline in all professions, there are ongoing gaps in providing chronic-illness care. Expanding the workforce to provide health coaching and other services with community health workers and peer support offers other potential solutions (6). It is evident that these challenges will require comprehensive and complex policy and health system solutions to address the unmet needs of patients with COPD and other chronic illnesses. ■

Author disclosures are available with the text of this letter at www.atsjournals.org.

Valentin Prieto-Centurion, M.D., M.S.*
University of Illinois at Chicago
Chicago, Illinois

Katheryn Artis, M.D., M.P.H.
David B. Coultas, M.D.
Veterans Affairs Portland Healthcare System
Portland, Oregon

and
Oregon Health & Science University
Portland, Oregon

*Corresponding author (e-mail: vprieto@uic.edu).

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Reply to Prieto-Centurion *et al.*

From the Authors:

We would like to thank Drs. Prieto-Centurion, Artis, and Coultas for their interest in our article (1). We wholly agree with the points raised with respect to the need to support the sustained adoption of healthy lifestyle behaviors. The focus of our article was to explore alternative approaches to pulmonary rehabilitation (PR) that would increase its availability and uptake while not diluting its effectiveness. However, as the authors point out, the challenge of maintaining the benefits of rehabilitation, irrespective of the mode of delivery, should not be overlooked.

The benefits of rehabilitation are well described, but outcomes of this intervention are usually assessed shortly after

completion of the program (2). The seminal study by Griffiths and colleagues clearly demonstrated that in the absence of any maintenance strategy, the gains from rehabilitation tend to subside at 12 months (3). Many efforts have been made to identify an effective and acceptable program to support graduates of rehabilitation to maintain benefits. The evidence about the best format to use is inconclusive (4, 5). Maintenance strategies commonly describe the frequency and method of contact (e.g., once-a-month drop-in sessions [6] and regular telephone contact [7]) rather than the content and nature of the behavioral intervention to support effective self-management. A taxonomy of behavior-change techniques, first described by Michie and colleagues in 2013 (8), has the potential to unravel which techniques may be most effective in supporting and sustaining healthy behaviors. The authors identified 93 distinct behavior-change techniques that were clustered into 16 groups. It would not be unreasonable for us to consider using this taxonomy to describe approaches used as part of rehabilitation and maintenance trials.

It might be speculated that home-based programs would have a longer-lasting effect than center-based programs, given that the participants engage in self-directed exercise behaviors in their home environment. The current literature does not entirely support this assumption, as the three noninferiority trials of home- versus center-based PR cited in our review had differing results. The Canadian study (9) demonstrated retention of some improvements in health-related quality of life and cycle endurance training at 12 months for both home- and center-based groups. These improvements were not at the level of the gains seen immediately after completion of the program but were significant when compared within group. In that study, there was some follow-up contact with healthcare professionals, but it was minimal. The Australian and UK studies (10, 11) offered a more independently managed form of rehabilitation; however, the data from these studies are difficult to compare because the follow-up periods were 6 and 12 months, respectively. The longer follow-up in the Australian study (9) yielded data similar to those reported by Griffiths and colleagues (3): by and large, both groups had returned to baseline at 12 months with respect to their 6-minute walking distance and health-related quality of life. The UK-based study reported that at 6 months there was some retention of exercise capacity above baseline levels (on endurance shuttle walking test), but health-related quality of life had reverted to baseline in the home-based group, with some benefits retained in the center-based group. It is worth noting that in the absence of any interventions, on average, the decline in walk distance is in the region of 20 m/yr (12).

We would wholeheartedly agree that packages of PR should be embedded in an integrated system of care to support the maintenance of benefits. The specific details of these packages of care will depend on the healthcare system, the context of the package, and the acceptability of these modes of support to the individual.

Fine-tuning PR to address the above challenges and opportunities is still a work in progress, and these areas are fertile ground for research. ■

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