



Editorial

Telerehabilitation: An Effective Strategy in Pulmonary Rehabilitation Programs?☆



Telerrehabilitación, ¿una estrategia eficaz en programas de rehabilitación respiratoria?

 Juan Bautista Gáldiz Iturri,^{a,*} Amaia Gorostiza Manterola,^b Nuria Marina Malanda^c
^a Laboratorio Exploración Funcional, Servicio Neumología, Hospital Universitario Cruces, Biocruces, Ciberes, Barakaldo, Spain

^b Sección Rehabilitación Respiratoria, Hospital Universitario Cruces, Barakaldo, Spain

^c Laboratorio Exploración Funcional, Servicio Neumología, Hospital Universitario Cruces, Barakaldo, Spain

There is evidence of the highest level to show that respiratory rehabilitation (RR) benefits COPD patients. The principal benefits are an increase in exercise tolerance for activities of daily living and an improvement in health-related quality of life.

RR is often criticized because the benefits of these programs are steadily lost after the patient has completed the intensive phase and loses contact with the rehabilitation team. As a result, guidelines insist on the need to implement new strategies that attempt to resolve this limitation.^{1,2}

Telemedicine could, in theory, be a useful way of delivering RR maintenance programs to a larger COPD patient population, provided such an approach can be shown to maintain the benefits obtained from an initial intensive RR program.

Some programs have managed to maintain the initial benefits by prolonging the standard rehabilitation course for 6 months, instead of the usual 8 weeks. In a classic study conducted in outpatients, Troosters et al.³ found that the benefits of a 6-month program persisted over an 18-month follow-up period. After an initial intensive RR program, followed by a low-intensity maintenance program with controls every 3 months, Wilson et al.⁴ found that despite efforts to motivate patients in regular sessions, they were unable to increase physical activity, and the beneficial effects were lost before the first 3-month follow-up.

Numerous studies have demonstrated the difficulties of maintaining benefits after an intensive RR program. Brooks et al.⁵ showed that when patients were evaluated at 18 months, the improvements achieved in the RR program tended to decrease. They attributed this to various factors, such as duration of the program, distance from the reference center, motivation, and personal characteristics of the patients.

In view of these frankly disappointing results, other strategies are being evaluated, including the use of telemedicine-based rehabilitation programs promoted through phone calls, websites, or mobile phones. These strategies have shown promising results in increasing levels of physical activity in COPD patients.⁶

Telemedicine has the potential to improve access to RR for a greater number of patients, and can be used to support long-term maintenance programs that provide rehabilitation interventions to patients in their own homes or in settings other than the reference health centers.

Some non-controlled studies show that the use of telerehabilitation does not present problems with respect to feasibility and patient safety.⁷ However, few studies have evaluated the effects of telerehabilitation in COPD patients, and little information is available on the possible long-term effects. Marquis et al.⁸ found that an 8-week telerehabilitation program consisting of videoconference-supervised cycling with web-based education and self-care conferred significant improvements in exercise tolerance and quality of life. Zanaboni et al.,⁹ in a small 2-year study of 10 patients, with no control group, found that physical performance, lung capacity, and quality of life were maintained during the 2-year follow-up. Tsai et al.¹⁰ recently reported an 8-week study that included 37 patients randomly assigned to receive telerehabilitation at home by videoconference or standard care. They found an improvement in the experimental group compared to the control group in the walk test, but no differences in the quality of life tests.

One limitation of the maintenance programs is that patient compliance rates vary widely, from 15% to 94%, but is generally very poor.

Griffiths et al.¹¹ observed in a classic study that only 25% of 200 patients who had completed 3 months of outpatient rehabilitation attended the follow-up sessions. In a recent multicenter study in Spain that included 143 patients with moderate-severe COPD in maintenance for 3 years with a very strict, bi-weekly follow-up, Guell et al.¹² observed an adherence rate in the intervention group of 66% compared to 17% in the control group.

Telemedicine may potentially help improve adherence in maintenance programs with daily follow-up of patients, although there are few data to confirm this hypothesis. Hoas et al.¹³ used a

☆ Please cite this article as: Gáldiz Iturri JB, Gorostiza Manterola A, Marina Malanda N. Telerrehabilitación, ¿una estrategia eficaz en programas de rehabilitación respiratoria? Arch Bronconeumol. 2018;54:547–548.

* Corresponding author.

E-mail addresses: med00901@hotmail.com, nuria.marinamalanda@osakidetza.eus (J.B. Gáldiz Iturri).

telerehabilitation program with a follow-up of 2 years, and found that adherence to the daily recording of symptoms, which was 39.3% in the second year, dropped to 15.6% in the year after completion of the program.

In contrast to conventional programs, those that include telemedicine-based RR are wider-reaching and more convenient, and can encourage patients to integrate exercise routines more effectively in their daily life in both the intensive and maintenance stages. At present, very few studies have obtained promising results, and most have involved programs with small populations or a short intervention.

These limitations must be addressed with large, long-term studies, some of which are still under development (iTrain,¹⁴ TeleRehab¹⁵), that will be able to demonstrate the usefulness of telerehabilitation and answer the outstanding questions about RR strategies.

References

1. Spruit MA, Singh SJ, Garvey C, ZuWallack R, Nici L, Rochester C, et al. An Official American Thoracic Society/European Respiratory Society statement: key concepts and advances in pulmonary rehabilitation. *Am J Respir Crit Care Med.* 2013;188:e13–64.
2. Rochester CL, Vogiatzis I, Holland AE, Lareau SC, Marciniuk DD, Puhan MA, et al. An Official American Thoracic Society/European Respiratory Society Policy statement: enhancing implementation, use, and delivery of pulmonary rehabilitation. *Am J Respir Crit Care Med.* 2015;192:1373–86.
3. Troosters T, Gosselink R, Decramer M. Short and long-term effects of outpatient rehabilitation in patients with chronic obstructive pulmonary disease: a randomized trial. *Am J Med.* 2000;109:207–12.
4. Wilson AM, Browne P, Olive S, Clark A, Galey P, Dix E, et al. The effects of maintenance schedules following pulmonary rehabilitation in patients with chronic obstructive pulmonary disease: a randomised controlled trial. *BMJ Open.* 2015;5:e005921.
5. Brooks D, Krip B, Mangovski-Alzamora S, Goldstein RS. The effect of postrehabilitation programmes among individuals with chronic obstructive pulmonary disease. *Eur Respir J.* 2002;20:20–9.
6. Lundell S, Holmner Å, Rehn B, Nyberg A, Wadell K. Telehealthcare in COPD: a systematic review and meta-analysis on physical outcomes and dyspnea. *Respir Med.* 2015;109:11–26.
7. Beauchamp MK, Evans R, Janaudis-Ferreira T, Goldstein RS, Brooks D. Systematic review of supervised exercise programs after pulmonary rehabilitation in individuals with COPD. *Chest.* 2013;144:1124–33.
8. Marquis N, Larivée P, Saey D, Dubois MF, Tousignant M. In-home pulmonary telerehabilitation for patients with chronic obstructive pulmonary disease: a pre-experimental study on effectiveness, satisfaction, and adherence. *Telemed J E Health.* 2015;21:870–9.
9. Zanaboni P, Hoas H, Lien LA, Hjalmarson A, Wootton R. Long-term exercise maintenance in COPD via telerehabilitation: a two-year pilot study. *J Telemed Telecare.* 2017;23:74–82.
10. Tsai L, McNamara R, Moddel C, Alison J, McKenzie DK, Mckeough ZJ. Home-based telerehabilitation via real-time videoconferencing improves endurance exercise capacity in patients with COPD: the randomized controlled TeleR Study. *Respirology.* 2017;22:699–707.
11. Griffiths TL, Burr ML, Campbell IA, Lewis-Jenkins V, Mullins J, Shields K, et al. Results at 1 year of outpatient multidisciplinary pulmonary rehabilitation: a randomised controlled trial. *Lancet.* 2000;355:362–8.
12. Guell R, Cejudo P, Ortega F, Puy C, Rodriguez-Trigo G, Pijoan JI, et al. Benefits of long-term pulmonary rehabilitation maintenance program in patients with severe chronic obstructive pulmonary disease. Three-year follow-up. *Am J Respir Crit Care Med.* 2017;195:622–9.
13. Hoas H, Morseth B, Holland A, Zanaboni P. Are physical activity and benefits maintained after long term telerehabilitation in COPD? *Int J Telerehabil.* 2016;8:39–48.
14. Zanaboni P, Dinesen B, Hjalmarson A, Hoas A, Holland A, Carneiro Oliveira C, et al. Long-term integrated telerehabilitation of COPD patients: a multicentre and randomised controlled trial (iTrain). *BMC Pulm Med.* 2016;16:126.
15. TELEMEDICINE, maintenance of a respiratory rehabilitation program in patients with chronic obstructive pulmonary disease. (TELEREHAB); 2017. NCT 03247933.