Clinician's Commentary

The American Thoracic Society and the European Thoracic Society define pulmonary rehabilitation (PR) as an “evidence-based, multidisciplinary, and comprehensive intervention for patients with chronic respiratory disease who are symptomatic and often have decreased daily life activities. Integrated into the individualized treatment of the patient, PR is designed to reduce symptoms, optimize functional status, increase participation, and reduce health care costs through stabilizing or reversing systemic manifestations of the disease.”^{1(p.1391)} Pulmonary rehabilitation requires that patients, family, and health care providers act as a collaborative team to provide integrated care aimed at enhancing programme adherence and optimizing self-management following programme completion. Despite a wide variety of programme configurations and delivery models, PR has

consistently been demonstrated to improve exercise tolerance and health-related quality of life and to reduce dyspnea, fatigue, anxiety, and depression.¹ Exercise is the cornerstone of PR, but programmes include other components such as education, nutritional intervention, smoking cessation, and psychosocial support. Typically, participants attend supervised exercise sessions twice a week for 8–12 weeks, but longer and shorter programmes are also used. Most participants begin PR under the supervision of a health professional in a health care or community facility; however, home-based programmes have also been shown to be effective, and such programmes offer an alternative when directly supervised exercise sessions are unavailable or inconvenient.² Recently, Web-based technologies have also been used to deliver key components of the PR pro-

Figure 1 Key concepts in the theory of planned behaviour

Figure 2 Elements of the social ecological model

gramme. Clinical improvements occur regardless of disease severity^{3–5} and reduce health care costs.⁶ Thus, the state of affairs presented by Johnston and Grimmer-Somers in “Pulmonary Rehabilitation: Overwhelming Evidence but Lost in Translation?” is a tragedy. The authors note that only 1–2% of people suitable for PR in Canada, Australia, and the United Kingdom receive this valuable intervention. How can this be, when politicians are calling for health care cost containment and health professionals are promoting patient-centred care that encourages independent living?

Johnston and Grimmer-Somers provide valuable insights into the reasons for poor participation in PR. They discuss patient-related factors that affect participation, such as support from significant others, patients' belief that PR will improve their lives, and proximity to an available PR programme. But how important is each of these factors? Where do we focus our limited resources? To date, health professionals have not approached these issues in a systematic manner. We can gain guidance from the literature on behaviour change in cardiac rehabilitation (CR), which parallels PR in many important ways. Social scientists researching CR use models to identify theoretical determinants of participation in rehabilitation programmes. This allows them to methodically examine the impact of a change in one or more of the determinants in order to guide future clinical interventions.

One model commonly used to describe the patient-related factors affecting behaviour change is the theory of planned behaviour, proposed by Ajzen,⁷ which links an individual's attitudes and behaviours (see Figure 1). According to this model, the most direct predictor of

behaviour is intention, which is predicted by three variables: (1) behavioural attitude, (2) subjective norms, and (3) perceived behavioural control. Each of the variables reflects a person's underlying beliefs. For example, a person's belief that PR will improve her ability to perform activities of daily living would contribute to *behavioural attitudes*, while the belief that her physician wants her to attend PR would inform *subjective norms*. Distance from PR, bad weather, and health problems affect *perceived behavioural control*. The concept of *self-efficacy*—the conviction that one can successfully perform the behaviour needed to produce an outcome—is the positive embodiment of perceived behavioural control. Recently Blanchard used the theory of planned behaviour to examine exercise behaviour during CR.⁸ He examined the correlation of 22 beliefs, representing all three model variables above, with exercise behaviour at baseline and after 3 months and 6 months of CR. The results demonstrated that behavioural attitude and behavioural control beliefs significantly predicted intention from baseline to 3 months and from 3 to 6 months of CR, while subjective norm beliefs predicted intention only in the first 3 months of rehabilitation. Based on this information, support from significant others should be focused at the beginning of the programme, while it would be important to help participants appreciate the benefits of CR and determine ways of overcoming barriers to participation at later stages of the programme. A similar approach could be used to help us characterize those who participate in PR. It could also help us to systematically assess interventions to improve programme participation.

Johnston and Grimmer-Somers note that patient-related factors affecting participation in PR have been more completely studied than those that affect referral and programme availability. They suggest that a coordinated multilevel approach is needed to address the gaps between evidence, policy, and practice that are responsible for barriers to participation in PR. Again, the use of a model can help us to assess these complex relationships systematically. The social ecological model (see Figure 2) recognizes the interwoven relationships that exist between the person and his or her environment.⁹ The individual and interpersonal factors in this model correspond to the variables in the theory of planned behaviour. The social ecological model further recognizes, however, that circumstances beyond the level of the person may affect that person's behaviour, which may in turn affect, for example, public policy. Levels in the model interact with one another, and each level has an independent effect. We can use this model to examine issues affecting referral to PR. Johnston and Grimmer-Somers note that only 3% of health professionals who responded to a recent US survey reported believing that PR is helpful. This negative behavioural

attitude impedes referral to PR. Lack of knowledge about the referral process, a behavioural control factor, also affects referral. Physicians' intention to refer may be affected by colleagues' beliefs about the value of PR (i.e., these beliefs affect their subjective norms). This is an interpersonal factor in the social ecological model. Physicians and their colleagues influence organizational guidelines on the management of people with COPD, including PR. The organizational guidelines, in turn, set a standard that may influence medical practice. Demand from patients can affect both interpersonal (physicians and health professionals) and organization-level factors. It may also be powerful enough to influence public policy, which in turn can affect beliefs at the individual and interpersonal levels. It is only by appreciating the interconnectedness of all factors in the model that we can understand and effectively address the barriers to participation in PR.

The social ecological model can help physiotherapists to identify ways they can improve participation in PR. Those of us who work in PR should have no doubt about its value. Therefore, we should work to change the subjective norms of other health professionals and physiotherapists working outside cardiorespiratory practice who do not share this belief. Research is needed to understand the behavioural control issues that affect referral patterns so that we can identify and overcome these barriers. For example, the Saskatoon Health Region uses specially designed prescription pads to ensure that physicians, other health professionals, and other appropriate community resources have easy access to information about PR. The pads are an active reminder about the programme and also contain information about programme locations, class times, phone numbers, and e-mail contact information. This strategy has improved referral to PR programmes within this jurisdiction.¹⁰

Johnston and Grimmer-Somers identify low rates of referral to PR as an important barrier to increasing participation. This year, Grace et al. published a review of strategies to improve hospital-based referral to CR.¹¹ They reported that the highest enrolment in CR resulted from a combination of automatic referral linked to hospital discharge and liaison (discussions with allied health-care providers). Liaison ensured that patients knew they had been referred to CR. It also represented an opportunity to increase patients' knowledge about CR and its benefits, as well as to influence their attitudes. Strong endorsement of CR by patients' personal health care providers is known to be an important determinant of programme participation.¹²⁻¹⁴ Thus, it is not surprising that liaison strategies were associated with decreased ambivalence about and increased compliance with CR. Physiotherapists can participate in liaison activities. They can also work at the organizational level to pro-

mote the adoption of automatic referral to PR. Hospital-based automatic referral could facilitate attendance in PR following admissions for treatment of an acute exacerbation of COPD. There is strong evidence that starting PR within a month of an exacerbation improves exercise capacity and quality of life and reduces the odds of hospital readmission and death.¹⁵ Increasing referrals from primary-care physicians and other health professionals where automatic referral strategies are not realistic is more challenging. However, Johnston and Grimmer-Somers refer to a study reporting that physician education increased referral to PR in Denmark.¹⁶ Furthermore, a recent Cochrane review by Forsetlund et al. found that a combination of didactic and interactive educational meetings was more effective than either didactic or interactive education alone in changing professional practice.¹⁷ An interesting strategy would have physiotherapists and respirologists deliver this type of continuing medical education to family physicians to ensure that the exercise component of PR is effectively represented.

Johnston and Grimmer-Somers suggest that even if we were able to implement effective strategies to increase referral to PR, it is unlikely that we currently have the resources to provide PR for the large number of people who need it. Action at the organizational, community, and public-policy levels of the social ecological model is needed to tackle the issue. This raises an interesting dilemma. Very few people, even in health care, know about PR. More people are aware that exercise is recommended for people with cancer than are aware that it is recommended for people with lung disease. How, then, can we create a groundswell of support for PR? Using the models of planned behaviour and social ecology as a contextual framework, we need to learn effective social marketing strategies from the cancer and AIDS movements to create the political will and raise the funds to promote PR and PR research. Lamenting that cancer and AIDS are hot causes compared to COPD is not a legitimate excuse. Instead, we need to understand how these prevalent conditions achieved their status in the realm of social concern. Patients and health professionals will have to spearhead these activities. We must accept our social responsibility to play a role in overcoming the barriers to implementing effective PR for all patients with chronic respiratory disease.

*Gail Dechman, BScPT, PhD
Assistant Professor
School of Physiotherapy
Dalhousie University
Halifax, Nova Scotia*

REFERENCES

1. Nici L, Donner C, Wouters E, Zuwallack R, Ambrosino N, Bourbeau J, et al. American Thoracic Society / European Respiratory Society statement on pulmonary rehabilitation. *Am J Respir Crit Care Med*. 2006;173:1390–413. doi:10.1164/rccm.200508-1211ST
2. Maltais F, Bourbeau J, Shapiro S, Lacasse Y, Perrault H, Baltzan M, et al. Effects of home-based pulmonary rehabilitation in patients with chronic obstructive pulmonary disease: a randomized trial. *Ann Intern Med*. 2008;16:869–78.
3. Berry MJ, Rejeski WJ, Adair NE, Zaccaro D. Exercise rehabilitation and chronic obstructive pulmonary disease stage. *Am J Respir Crit Care Med*. 1999;160:1248–53. doi:10.1097/00008483-200003000-00014
4. Puhan MA, Mador MJ, Held U, Goldstein R, Guyatt GH, Schunemann HJ. Interpretation of treatment changes in 6-minute walk distance in patients with COPD. *Eur Respir J*. 2008;32:637–43. doi:10.1183/09031936.00140507
5. Vogiatzis I, Williamson AF, Miles J, Taylor IK. Physiological response to moderate exercise workloads in a pulmonary rehabilitation program in patients with varying degrees of airflow obstruction. *Chest*. 1999;116:1200–7. doi:10.1378/chest.116.5.1200
6. Griffiths TL, Phillips CJ, Davies S, Burr ML, Campbell IA. Cost effectiveness of an outpatient multidisciplinary pulmonary rehabilitation programme. *Thorax*. 2001;56:779–84. doi:10.1136/thorax.56.10.779
7. Ajzen I. The theory of planned behavior. *Organ Behav Hum Decis Process*. 1991;50:179–211. doi:10.1016/0749-5978(91)90020-T
8. Blanchard C. Understanding exercise behaviour during home-based cardiac rehabilitation: A theory of planned behaviour perspective. *Can J Physiol Pharmacol*. 2008;86(1–2):8–15. doi:10.1139/Y07-117
9. Emmons K. Health behaviors in a social context. In: Berkman LF, Kawachi I, editors. *Social epidemiology*. Oxford: Oxford University Press; 2000. p. 242–66.
10. Litzenberger, Trent (Saskatoon Health Region). Conversation with: Gail Dechman (School of Physiotherapy, Dalhousie University). 2010 May 25.
11. Gravely-Witte S, Leung YW, Nariani R, Tamim H, Oh P, Chan VM, et al. Effects of cardiac rehabilitation referral strategies on referral and enrollment rates. *Nat Rev Cardiol*. 2010;7(2):87–96. doi:10.1038/nrcardio.2009.223
12. Ades PA, Waldmann ML, McCann WJ, Weaver SO. Predictors of cardiac rehabilitation participation in older coronary patients. *Arch Intern Med*. 1992;152:1033–5. doi:10.1038/nrcardio.2009.223
13. Daly J, Sindone AP, Thompson DR, Hancock K, Chang E, Davidson P. Barriers to participation in and adherence to cardiac rehabilitation programs: a critical literature review. *Prog Cardiovasc Nurs*. 2002;17(1):8–17. doi:10.1111/j.0889-7204.2002.00614.x
14. Thomas RJ, King M, Lui K, Oldridge N, Pina IL, Spertus J, et al. AACVPR/ACC/AHA 2007 performance measures on cardiac rehabilitation for referral to and delivery of cardiac rehabilitation/secondary prevention services endorsed by the American College of Chest Physicians, American College of Sports Medicine, American Physical Therapy Association, Canadian Association of Cardiac Rehabilitation, European Association for Cardiovascular Prevention and Rehabilitation, Inter-American Heart Foundation, National Association of Clinical Nurse Specialists, Preventive Cardiovascular Nurses Association, and the Society of Thoracic Surgeons. *J Am Coll Cardiol*. 2007;50:1400–33.
15. Puhan M, Scharplatz M, Troosters T, Walters EH, Steurer J. Pulmonary rehabilitation following exacerbations of chronic obstructive pulmonary disease. *Cochrane Db Syst Rev*;2009:1. doi:10.1002/14651858.CD005305.pub2
16. Lange P, Rasmussen F, Borgeskov H, Dollerup J, Jensen MS, Roslind K, et al. [KVASIMODO Study Group]. The quality of COPD care in general practice in Denmark: the KVASIMODO study. *Prim Care Respir J*. 2007;16(3):174–81. doi:10.3132/pcrj.2007.00030
17. Forsetlund L, Bjorndal A, Rashidian A, Jamtvedt G, O'Brien MA, Wolf F, et al. Continuing education meetings and workshops: effects on professional practice and health care outcomes. *Cochrane Db Syst Rev*;2009:2. doi:10.1002/14651858.CD003030.pub2

DOI:10.3138/physio.62.4.374