

# Promotion of Exercise Prescriptions in General Practice for Older Populations

Boyd Swinburn, MB, ChB, FRACP, MD, Professor, Centre for Physical Activity and Nutrition, Deakin University, Melbourne, Victoria, Australia.

Richard Sager, BHLthSc (N&D), APD, Public Health Research Fellow, Greater Green Triangle University, Department of Rural Health, Deakin University, Warrnambool, Victoria, Australia.

*Regular physical activity in older populations reduces the risks of cardiovascular diseases, diabetes, osteoporosis and falls and also improves mental health. Some programs of written exercise prescriptions by general practitioners have been shown to significantly increase physical activity levels over the medium-term (six to 12 months). Increasing the confidence and skills of general practitioners to prescribe and monitor exercise programs is important. However, the more challenging barriers to the widespread uptake of exercise prescription programs are the structural and economic constraints within general practice, as well as the competing promotion of prescribing pharmaceutical products. Implementation research on overcoming these barriers is urgently needed.*

**Key words:** exercise prescriptions, general practitioner, health gains, training, barriers, health promotion.

The rationale for promoting regular physical activity in older populations is relatively straightforward. What is less clear from the literature is the mix of strategies needed to achieve sustainable increases in physical activity levels in older people and the health impacts (both positive and negative) of such programs. Of particular interest to primary care is the concept of written exercise prescriptions by general practitioners (GPs).

## Benefits of Physical Activity

Regular physical activity has consistently been shown to improve physical, social and mental health in people of all ages.<sup>1,2</sup> Many of the conditions with high prevalence in older populations, such as coronary heart disease, diabetes, hip fractures and some cancers, have been associated with low levels of physical activity in epidemiological studies.<sup>1,2</sup> The intermediate risk factors for many of these diseases, such as blood lipids, blood pressure, insulin resistance, obesity and bone mineral density, have shown improvement with physical activity in clinical trials.<sup>1,3</sup> Other common conditions among older

people, such as chronic obstructive airway disease and chronic heart failure, have shown improvement with regular exercise within the limits of the disease.<sup>4,5</sup> Other potential benefits, including preventing declines in mental health, reducing falls and improving overall functionality in daily living contribute to the rationale for promoting physical activity.<sup>2,6-8</sup>

A further reason for promoting physical activity in older people is that their absolute risks of morbid or mortal events are higher than in younger people, such that the absolute benefits, in terms of event reduction, of any intervention will also be higher. In other words, the numbers needed to treat to reduce clinical events such as myocardial infarctions and hospitalizations are relatively low among older patients.

## Potential Risks of Physical Activity

The potential risks of increased physical activity in older people include sudden cardiac death, injury and exacerbation of osteoarthritis.<sup>2</sup> While the relative risks of

sudden death are increased two- to six-fold during vigorous exercise, the absolute risks are very low (about one death per 1.5 million episodes of vigorous exercise) and are mainly confined to people who were previously not regular exercisers.<sup>2</sup> To minimize these risks, sedentary people should progress gradually from light to moderate exercise and should avoid unaccustomed heavy exertion.<sup>1</sup> Such advice is also prudent for minimizing the risk of injury and preventing exacerbations of osteoarthritis.

## The Role of GPs as Exercise Prescribers

In most countries, the GP holds a unique position at the hub of health care delivery. In Australia, for example, approximately 83% of the population visit their GP each year,<sup>9</sup> and among older people, the proportion is even higher. GPs are seen as a credible source of information and both GPs and their patients expect health promotion to be part of their role.<sup>10,11</sup> This places GPs in an ideal position to promote and monitor physical activity in older patients. Other health professionals within the primary health care system also could potentially be exercise prescribers, although practice nurses and health visitors may not be able to achieve the impact of GPs, and exercise specialists, while effective, are not widely available in primary care.<sup>12,13</sup>

## GP-based Exercise Prescription Programs

Several models of GP-based exercise prescription exist. In the U.K., the schemes generally involve a GP referral to a recreation centre where an exercise prescription involves a free or subsidized attendance to the facility over a period of weeks or months.<sup>10,14</sup> Low adherence rates seem to be the major drawback of this system, with a large proportion of patients not completing the two to three month, gym-based

Table 1

## Application of "Stages of Change" Model

| Stage of Change          | Intention/action                                                                                                                   | Appropriate Support                                                                                                   |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Pre-contemplation</b> | Lack of awareness: "I currently do not exercise, and I do not intend to start in the next six months."                             | Raise awareness of the specific links between physical activity and health.                                           |
| <b>Contemplation</b>     | Acknowledgment that problem exists: "I currently do not exercise, but I am thinking about starting within the next six months."    | Encouragement and provision of "how to" information.                                                                  |
| <b>Preparation</b>       | A commitment for change is made: "I currently exercise some but not regularly."                                                    | Encouragement and specific goal setting (exercise prescription).                                                      |
| <b>Action</b>            | Implemented change, not yet sustainable: "I currently exercise regularly but have only begun doing so within the past six months." | Monitoring, encouragement, and updating goals to promote sustainability (exercise prescription).                      |
| <b>Maintenance</b>       | Sustained behaviour: "I currently exercise regularly and have done so for longer than six months."                                 | Monitoring and encouragement.                                                                                         |
| <b>Relapse</b>           | Returned to a previous stage: "I used to exercise regularly, but currently I do not."                                              | Reassurance that this is common; explore reasons for relapse; consider exercise prescription; reduce relapse anxiety. |

Modified from Buxton, *et al.*, 1996.

exercise program. In New Zealand, the Green Prescription program is a short assessment and an exercise prescription written by the GP within the context of a normal appointment, often with a referral to a community sports trust for follow-up and linkages to community programs.<sup>11,15,16</sup> The Active Script program in Australia is based on a similar concept, although the community linkages have not been as well developed.<sup>17</sup> Walking is the most commonly prescribed activity in these programs, and improvements in physical activity are sustained over the medium-term (six to 12 months) in the Green Prescription program.<sup>15,16,18</sup> In the U.S., the PACE model (Physician-based Assessment and Counseling for Exercise) involves a self-completed questionnaire to assess various social and individual factors related to physical activity.<sup>19</sup> Specific exercise goals are then developed with the help of the nurse or receptionist and are checked by the physician. Efficacy studies show increases in exercise (mainly walking) over four to six weeks.<sup>19</sup>

### Type of Exercise Prescription

The activity of overwhelming choice in most exercise prescription programs is walking—it is simple, cheap and available. However, there are many opportunities to further tailor advice to the needs of the patient, which is particularly important for older patients. The Trans-theoretical Model<sup>20</sup> of "stages of change" is helpful to determine the nature of advice to give<sup>21</sup> (Table 1), although it is important to note that people do not generally progress through each stage in a linear fashion. People in the early, "pre-contemplation" stage of change have not thought about increasing exercise and, for them, raising awareness about the relationships between physical activity and their health conditions is most appropriate. For people in "contemplation" and "preparation" stages, providing how-to and where-to information and specific exercise advice, as well as setting goals is more relevant. For those in the "action" stage, regular monitoring and encouragement helps to maintain the person's motivation until regular physical activity becomes an established

habit. It should be recognized that the "relapse" stage is very common, and indeed is part of the human condition, during which people should be encouraged to re-enter the cycle again. Just as with quitting smoking, even motivated people usually require several attempts to permanently change behaviours.

Different exercise options may also be important for different conditions. Adding strength training to an exercise program may help glycemic control and bone mineral density, while weight-supported exercise (such as water-based activities) may be more appropriate for those with arthritis. Moderate impact exercise (e.g., aerobics) may further strengthen bone mineral density, and longer duration, moderate intensity aerobic exercise (e.g., long walks) may be more beneficial for weight loss.

Further research is needed to test the impact of exercise prescriptions within these and other patient groups, using different systems (e.g., involving practice nurses, community organizations and telephone follow-up) and in particular settings (e.g., rural areas and different eth-

nic communities). This type of research will allow exercise prescriptions to be better targeted in their implementation and better quantified in their impact.

While it is unrealistic to expect demonstrable effects of such programs on morbidity or mortality, measuring changes in intermediate variables (e.g., HbA1C, blood pressure, lipids, quality of life, functionality, medication use) is quite feasible in the primary care setting over the medium- and long-term,<sup>16</sup> and more studies are needed. Measuring the cost-effectiveness of exercise prescriptions is also important for the justification of long-term funding and wide promotion of the schemes in general practice.

### Barriers to Widespread Exercise Prescription

There is currently a strong rationale and enough supportive efficacy data from at least three different models to warrant the wider promotion of exercise prescription programs and to evaluate their uptake and effectiveness in the real world of general practice. However, this is not a trivial task, for several reasons (Table 2).

Firstly, the promotion of increased physical activity should ideally come from several sources. The GP is well placed to initiate, monitor and encourage exercise goals

for older patients. However, sustaining behavioural change often requires the promotion of the same message from a number of sources, as well as improved access to safe and supportive environments, especially for recreation and transport.

Secondly, it is important to increase the knowledge and skills of GPs about the assessment and prescribing of physical activity, as well as to provide them with the tools to do so. Only about 19% of U.S. physicians reported counselling patients about physical activity.<sup>21</sup> Time pressure is the most frequently cited reason for not assessing and prescribing exercise more often, although insufficient knowledge and confidence are also acknowledged reasons.<sup>11,22</sup> There also may be a reluctance to prescribe a program of physical activity for high-risk patients, such as those with coronary heart disease or heart failure, despite evidence of net benefits. The concept of promoting gradual increases in physical activity within the patient's capacity not only minimizes the risks of exercise but also makes the changes more achievable compared to promoting large increases in activity and/or promoting vigorous exercise. Duration of activity is probably more important than intensity. Indeed, beneficial levels of physical activity could be

derived from increasing incidental activity such as housework.<sup>23</sup> Moving older people up from the lowest fitness category appears to give the greatest increase in health gains,<sup>13</sup> and such people will usually only be able to make small incremental increases in activity anyway.

Behavioural interventions are still not widely understood or delivered by GPs.<sup>24</sup> Training programs for GPs, which are becoming ever more ubiquitous and sophisticated, and the use of "exercise prescription reps" (analogous to drug reps) to promote the exercise prescription program and tools to individual GPs are valuable options to counter apparent shortfalls in GP knowledge and skills.<sup>18</sup>

The third and most substantial set of barriers to the widespread adoption of exercise prescription, however, is systemic. Most primary care and general practice systems (funding structures, policies and prevailing attitudes) are not well suited to the "behaviour coaching" style of program. The usual 10–15 minute consultation slot per patient is determined largely by the remuneration structures and it is often too short to incorporate a five-minute assessment and prescription of exercise goals on top of dealing with the patient's presenting problems (which, among older patients, are often multiple).<sup>11</sup>

Table 2

### Barriers to Widespread Adoption of Exercise Prescription Programs in General Practice, and Appropriate Actions

| Barriers                                                                                                                                           | Appropriate Action Needed                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>For older patients:</b><br>The lack of consistent messages and supportive environments for exercise.                                            | <ul style="list-style-type: none"> <li>– Social marketing of consistent physical activity messages.</li> <li>– Provision of safe environments that support recreational activity, active transport (walking, cycling, public transport) and incidental activity (such as use of stairs).</li> </ul> |
| <b>For general practitioners:</b><br>The lack of knowledge, skills, confidence and available tools for prescribing exercise.                       | <ul style="list-style-type: none"> <li>– A comprehensive program which includes GP training.</li> <li>– Development and promotion of an exercise prescription program.</li> <li>– Linkages to community organizations.</li> <li>– Ongoing evaluations of effectiveness.</li> </ul>                  |
| <b>For general practice:</b><br>A system of patient interaction and funding structures that do not readily support exercise prescription programs. | <ul style="list-style-type: none"> <li>– Policies and remuneration schedules that encourage the uptake and implementation of effective "behaviour coaching" programs.</li> </ul>                                                                                                                    |

An important competitor to the promotion of exercise prescriptions within general practice is the heavy promotion of prescribing drugs.<sup>24</sup> The pharmaceutical industry is a major driver of GP and specialist prescribing practices and this overwhelms attempts to promote other, more cost-effective “lifestyle” prescriptions.

## Conclusions

Exercise prescriptions have been well demonstrated to improve physical activity levels and could reasonably be expected to improve health outcomes. Further research studies are required to help tailor the exercise prescription to the needs of the older patient. However, the overwhelming research question is one of implementation—how can we achieve a high use of exercise prescriptions by GPs across the board? ♦

No competing financial interests declared.

## References

1. U.S. Department of Health and Human Services. Physical activity and health—A report of the Surgeon General. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 1996.
2. World Health Organisation. Weight control and physical activity. In: Vainio H, Bianchini F, editors. IARC handbooks of cancer prevention. Lyon, France: IARC Press, 2002.
3. Bauman A, Bellew B, Vita P, et al. Getting Australia Active: towards better practice for the promotion of physical activity. Melbourne: National Public Health Partnership; 2002.
4. Oka RK, De Marco T, Haskell WL, et al. Impact of a home-based walking and resistance training program on quality of life in patients with heart failure. *Am J Cardiol* 2000;85:365-9.
5. Stulbarg MS, Carrieri-Kohlman V, Demir-Deviren S, et al. Exercise training improves outcomes of a dyspnea self-management program. *J Cardiopulm Rehabil* 2002;22:109-21.
6. Pignatti F, Rozzini R, Trabucchi M. Physical activity and cognitive decline in elderly persons. *Arch Intern Med* 2002;162:361-2.
7. Gill TM, Baker DL, Gottschalk M, et al. A program to prevent functional decline in physically frail, elderly persons who live at home. *N Engl J Med* 2002;347:1068-74.
8. Feskanich D, Willett W, Colditz G. Walking and leisure-time activity and risk of hip fracture in postmenopausal women. *JAMA* 2002;288:2300-6.
9. Bridges-Webb C. Assessing health status in general practice. *Med J Aust* 1992;157:321-5.
10. Martin C, Woolf-May K. The retrospective evaluation of a general practitioner exercise prescription programme. *J Human Nutr Diet* 1999;12(suppl 1):32-42.
11. Swinburn BA, Walter LG, Arroll B, et al. Green prescriptions: attitudes and perceptions of general practitioners towards prescribing exercise. *Br J Gen Pract* 1997;47:567-9.
12. Sims J, Smith F, Duffy A, et al. The vagaries of self-reports of physical activity: a problem revisited and addressed in a study of exercise promotion in the over 65s in general practice. *Fam Pract* 1999;16:152-7.
13. Halbert JA, Silagy CA, Finucane PM, et al. Physical activity and cardiovascular risk factors: effect of advice from an exercise specialist in Australian general practice. *Med J Aust* 2000;173:84-7.
14. Taylor AH. Evaluating GP exercise referral schemes: Findings from a randomised controlled study. Chelsea: Chelsea School Research Centre, 1996.
15. Swinburn BA, Walter LG, Arroll B, et al. The green prescription study: a randomized controlled trial of written exercise advice provided by general practitioners. *Am J Public Health* 1998;88:288-91.
16. Elley CR, Kerse N, Arroll B, et al. Effectiveness of counseling patients on physical activity in general practice: cluster randomised controlled trial. *BMJ* 2003;326:793.
17. Huang N, Naccarella L. The Victorian Active Script Program: Promising signs for GPs, population health and the promotion of physical activity. *Br J Sports Med* 2003. In press.
18. Swinburn B, Gerrard D, O'Neill D. Green Prescriptions doing well. *N Z Med J* 2000;113:525.
19. Calfas KJ, Long BJ, Sallis JF, et al. A controlled trial of physician counselling to promote the adoption of physical activity. *Prev Med* 1996;25:225-33.
20. Prochaska JO, Markus BH. The Transtheoretical Model: Applications to exercise. In: Dishman RK, editor. *Advances in exercise adherence*. Champaign, IL: Human Kinetics, 1994:161-80.
21. Buxton K, Wyse J, Mercer T. How applicable is the stages of change model to exercise behaviour. A review. *Health Ed J* 1996;55:239-57.
22. Centers for Disease Control and Prevention. Missed opportunities in preventive counseling for cardiovascular disease—United States. *MMWR* 1998;47:91-5.
23. Ritchie CS, Stetson BA, Bass PF, 3rd, et al. Talking to patients about aerobic exercise for disease prevention: an educational exercise for medical students. *Nutr Clin Care* 2002;5:103-14.
24. Lawlor DA, Taylor M, Bedford C, et al. Is housework good for health? Levels of physical activity and factors associated with activity in elderly women. Results from the British Women's Heart and Health Study. *J Epidemiol Community Health* 2002;56:473-8.
25. Cassel CK. Use it or lose it: activity may be the best treatment for aging. *JAMA* 2002;288:2333-5.