Published in final edited form as:

JAMA. 2011 May 4; 305(17): 1808–1809. doi:10.1001/jama.2011.572.

Consideration of insurance reimbursement for physical activity and exercise programs for patients with diabetes

Marco Pahor, MD

Department of Aging and Geriatric Research, Institute on Aging, University of Florida, 1329 SW 16th Street, Room 5161, Gainesville, FL 32608, PO Box 100107, zip 32610-0107, Phone (352) 265-7227, Fax (352) 265-7228

Marco Pahor: mpahor@ufl.edu

A recent joint statement from the American Diabetes Association (ADA) and the American College of Sports Medicine (ACSM) underscore the importance of physical exercise to prevent and manage insulin resistance, type 2 diabetes mellitus, gestational diabetes mellitus, and the complications of diabetes.¹ While some clinical trial evidence suggests that aerobic and resistance training can each improve glucose control in patients with type 2 diabetes mellitus, not all clinical trials are consistent with regard to this finding. Differences in results of clinical trials regarding the ability of aerobic exercise and resistance training to improve glucose control are primarily due to differences in trial design, including modality, intensity, and duration of the exercise programs, adherence to the programs, sample size, and patient populations.

In addition, the joint statement from the ADA and ACSM used the term “physical activity” (interchangeably with “exercise.” “Physical activity” was defined as “bodily movement produced by the contraction of skeletal muscle that substantially increases energy expenditure” and “exercise” was defined as “a subset of physical activity done with the intention of developing physical fitness (i.e., cardiovascular, strength, and flexibility training).” If prior clinical trials used “physical activity” interchangeably with “exercise”, this may also have added to the apparent discrepancy in findings among clinical trials regarding the ability of individual exercise programs to improve glucose control.

In this issue of JAMA, the systematic review and meta-analysis by Umpierre et al. provides new evidence regarding the benefits of structured exercise and physical activity on glucose control in patients with type 2 diabetes.² The authors reviewed 47 randomized controlled trials of structured exercise interventions (aerobic exercise, resistance training, or a combination), and physical activity involving 8,538 patients. Results showed that structured programs of aerobic exercise, resistance exercise, or a combination of aerobic and resistance exercise in patients with type 2 diabetes was associated with statistically and clinically significant reductions in HbA1c ranging from –0.51% to –0.73% as compared to non-exercising control groups. In addition, structured exercise training of >150 min/week was associated with greater reductions in HbA1c compared to structured exercise training of

150 min/week. Importantly, physical activity advice was associated with significant reduction in HbA1c levels only when it was combined with dietary advice, but not when it was administered alone. The latter finding is particularly relevant given the difficulty of achieving dietary adherence.

Meta-analyses have limitations. Specifically, meta-analyses only partially predict the results of subsequent large randomized controlled trials that address a similar research question.³ The results of a meta-analysis reflect the quality of the included trials. Although the overall quality of the trials included in the meta-analysis by Umpierre et al. was relatively low and there was significant heterogeneity among the studies, the results were largely consistent with regard to the benefits of exercise and physical activity, which suggests that the findings of the meta-analysis merit confidence.³

Umpierre et al. provide important information for patients and physicians. Because not all patients are able or willing to engage in structured aerobic exercise, resistance exercise represents an efficacious alternative for controlling blood glucose. Patients who are willing and able to engage in both forms of exercise are likely to attain the greatest benefit. The study also provides important information for public health policy makers for planning public health interventions, by showing that structured exercise programs may be more efficacious than physical activity advice outside of a structured exercise program. The study by Umpierre et al. expands on the accumulating evidence regarding the global health benefits of structured physical exercise and physical activity, including favorable effects on lipids, blood pressure, cardiovascular events, mortality, cognition, quality of life and physical performance.^{1, 4, 5}

Some Health Maintenance Organization and Preferred Provider Organization plans include a fitness benefit. Members of these plans can take advantage of monthly membership at participating fitness centers at reduced or no extra cost. Services such as access to a personal trainer or exercise classes may also be offered at a reduced cost to participating plan members. Cost analyses have shown that use of a health plan-sponsored health club benefit by the general older population and by older adults with diabetes was associated with slower increases in total health care costs over two years.^{6, 7} Older adults who visited a health club two or more times per week over two years incurred \$1,252 (95% confidence interval, –\$1,937 to \$567; $P < .001$) less in health care costs in the second year than those who visited a health club less than once per week.⁶ Another cost-effectiveness analysis of seven interventions for the public health promotion of physical activity and structured physical exercise in adults found that, compared to no intervention, six interventions were cost-effective and had the potential to achieve gains in survival and health-related quality of life.⁸ The cost-per-quality adjusted life year (QALY) for six of the seven interventions ranged from \$14,000 to \$47,000 and for the seventh intervention it was \$69,000.⁸ Compared with other broadly accepted preventive strategies, such interventions may offer good value for money. For example, it has been estimated that the cost per QALY gained of the well accepted Diabetes Self Management Education (DSME) in the community was \$40,000,⁹ which is below the \$50,000 per QALY gained conventionally used as a threshold for assessing the cost-effectiveness of an intervention.¹⁰

For patients with type 2 diabetes mellitus, Medicare reimburses DSME when provided by a program that meets national standards and is approved by the ADA or other organizations.¹¹ Medicare also reimburses Medical Nutrition Therapy Services that are provided by a registered dietician according to approved guidelines.¹¹ However, under the original Medicare plan, no specific reimbursement is provided for any type of physical activity or physical exercise program. Given the health benefits of physical exercise for diabetes prevention, the management of patients with type 2 diabetes, and more broadly for improving the health of the general adult and older population, it may be time to consider insurance reimbursement for structured physical exercise programs. However, the type of supported program and the target population eligible ought to be carefully assessed. For example, it has been calculated that from the insurance perspective, compared to no intervention, the expected 30-year cost per QALY of the Diabetes Prevention Program lifestyle intervention would be \$143,000.¹² From a societal perspective, the cost per QALY of the lifestyle intervention would be approximately \$63,000. Delaying the lifestyle intervention until after the onset of diabetes would be more cost-effective, costing \$24,500 per QALY gained.

Additional information regarding the potential benefits of structured exercise is needed, including data from rigorously conducted clinical trials to provide information concerning the efficacy and cost-effectiveness of a structured physical exercise program across a broad spectrum of important health outcomes.⁹

In summary, the meta-analysis by Umpierre et al. in this issue of JAMA and cumulative evidence from a large number of randomized controlled trials conducted over the past few decades in the area of physical activity and exercise provide solid evidence for public policy makers to consider structured exercise and physical activity programs as worthy of insurance reimbursement to promote health, especially in high risk populations.

Acknowledgments

Dr. Pahor is supported by grants of the National Institutes of Health P30AG028740, U01AG022376, C06RR029852, U54RR025208, R01AG024526, R01AG027529 and R01AG026556.

Reference List

1. Exercise and type 2 diabetes: American College of Sports Medicine and the American Diabetes Association: joint position statement. Exercise and type 2 diabetes. *Med Sci Sports Exerc.* 2010; 42(12):2282–2303. [PubMed: 21084931]
2. Umpierre D, Ribeiro PAB, Kramer CK, Leitao CB, Zucatti ATN, Azevedo MJ, Gross JL, Ribeiro JP, Schaan BD. Physical activity advice only or structured exercise training and association with HbA1c levels in patients with type 2 diabetes: a systematic review and meta-analysis. *JAMA.* 2011 in press.
3. LeLorier J, Gregoire G, Benhaddad A, Lapierre J, Derderian F. Discrepancies between meta-analyses and subsequent large randomized, controlled trials. *N Engl J Med.* 1997; 337(8):536–542. [PubMed: 9262498]
4. Pahor M, Blair SN, Espeland M, Fielding RA, Gill TM, Guralnik JM, Hadley EC, King AC, Kritchevsky SB, Maraldi C, Miller ME, Newman AB, Rejeski WJ, Romashkan S, Studenski S. LIFE investigators. Effects of a Physical Activity Intervention on Measures of Physical Performance: Results of the Lifestyle Interventions and Independence for Elders Pilot (LIFE-P) Study. *J Gerontol A Biol Sci Med Sci.* 2006; 61(11):1157–1165. [PubMed: 17167156]

5. Barnes DE, Yaffe K, Satariano WA, Tager IB. A longitudinal study of cardiorespiratory fitness and cognitive function in healthy older adults. *J Am Geriatr Soc.* 2003; 51(4):459–465. [PubMed: 12657064]
6. Nguyen HQ, Ackermann RT, Maciejewski M, Berke E, Patrick M, Williams B, LoGerfo JP. Managed-Medicare health club benefit and reduced health care costs among older adults. *Prev Chronic Dis.* 2008; 5(1):A14. [PubMed: 18082003]
7. Nguyen HQ, Maciejewski ML, Gao S, Lin E, Williams B, LoGerfo JP. Health care use and costs associated with use of a health club membership benefit in older adults with diabetes. *Diabetes Care.* 2008; 31(8):1562–1567. [PubMed: 18458143]
8. Roux L, Pratt M, Tengs TO, Yore MM, Yanagawa TL, Van Den BJ, Rutt C, Brownson RC, Powell KE, Heath G, Kohl HW III, Teutsch S, Cawley J, Lee IM, West L, Buchner DM. Cost effectiveness of community-based physical activity interventions. *Am J Prev Med.* 2008; 35(6):578–588. [PubMed: 19000846]
9. Brownson CA, Hoerger TJ, Fisher EB, Kilpatrick KE. Cost-effectiveness of diabetes self-management programs in community primary care settings. *Diabetes Educ.* 2009; 35(5):761–769. [PubMed: 19622716]
10. Grosse SD. Assessing cost-effectiveness in healthcare: history of the \$50,000 per QALY threshold. *Expert Rev Pharmacoecon Outcomes Res.* 2008; 8(2):165–178. [PubMed: 20528406]
11. Standards of medical care in diabetes--2011. *Diabetes Care.* 2011; 34 (Suppl 1):S11–S61. [PubMed: 21193625]
12. Eddy DM, Schlessinger L, Kahn R. Clinical outcomes and cost-effectiveness of strategies for managing people at high risk for diabetes. *Ann Intern Med.* 2005; 143(4):251–264. [PubMed: 16103469]