

## Survival benefit associated with low-level physical activity



In *The Lancet*, Chi Pang Wen and colleagues<sup>1</sup> report their findings from a very large observational study, showing that a small amount of leisure-time physical activity reduces total mortality, mortality from cardiovascular disease, and mortality from cancer. Although the ability of physical activity in moderate amounts to reduce mortality from all causes has been well documented,<sup>2-4</sup> the public-health recommendation in most countries is to do the equivalent of at least 30 min per day of walking, most days of the week—ie, 150 min per week.<sup>5,6</sup> Wen and colleagues' study shows that half this amount of physical activity (15 min per day for 6 days a week) reduces all-cause mortality by 14%, cancer mortality by 10%, and mortality from cardiovascular disease by 20%. To our knowledge, this is the first observational study of this size to report important and global health benefits at such a low volume of leisure-time physical activity with this degree of precision. The benefits of physical activity follow a dose-response curve (figure), which clearly shows that although a little amount of physical activity is good, more is better. In an ideal world, people would benefit greatly from 300 min of moderate-intensity physical activity per week, but data from most countries show that this amount of physical activity is achieved by only a small proportion of the population.<sup>5,7</sup> The reason for this reality is multifactorial and complex, and individual, psychosocial, and environmental factors all play a part.<sup>8</sup> Repeated, simple advice from a physician—as Wen and colleagues suggest—is one of many interventions that can effectively contribute to increased physical activity.<sup>9</sup> We agree that this advice is very simple and probably easily achievable.

Because of its observational nature, Wen and colleagues' study cannot establish causality, but their results are entirely consistent with the findings of prospective randomised trials in secondary cardiovascular prevention that show a clear mortality benefit from regular exercise.<sup>10,11</sup> As such, the direct health benefits of exercise are irrefutable. Exercise can reduce cardiovascular mortality and, in particular, coronary mortality by many mechanisms, including improvements in endothelial function, autonomic tone, inflammation, and risk-factor control. The final common pathways of cardiovascular risk reduction presumably operate through both improved endothelial function and improved

autonomic regulation of cardiovascular function.<sup>12</sup> Improved endothelial function leads to the prevention and stabilisation of coronary atherosclerosis, thereby reducing the risk of acute coronary syndromes. Improved autonomic function leads to a reduced risk of sudden cardiac death. Cancer, like coronary heart disease, is also to an extent preventable and shares several common risk factors such as poor nutrition, obesity, inflammation, and physical inactivity. Therefore, improvements in some of these risk factors with regular exercise could plausibly explain the cancer mortality benefits recorded by Wen and colleagues. The oncoprotective effects of exercise are certainly an expanding topic of research in cancer.<sup>13</sup>

Finally, noteworthy from a public health perspective, 54% of individuals in the Taiwanese cohort studied were inactive, with another 22% doing low levels of leisure-time physical activity only. Rural-to-urban migration across the Asia-Pacific region through rapid economic growth and industrialisation during the past few decades could explain these low levels of physical activity and the concomitant epidemics of obesity and diabetes that are being witnessed.<sup>14</sup> The knowledge that as little as 15 min per day of exercise on most days of the week can substantially reduce an individual's risk of dying could encourage many more individuals to incorporate a small amount of physical activity into their busy lives. Governments and health professionals both have major roles to play to spread this good news story and convince people of the importance of being at least minimally active.

Published Online  
August 16, 2011  
DOI:10.1016/S0140-6736(11)61029-5

See Online/Articles  
DOI:10.1016/S0140-6736(11)60749-6

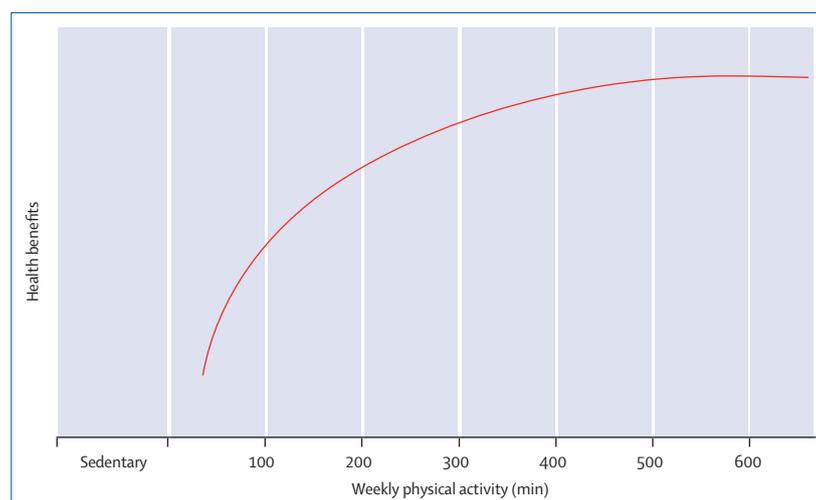


Figure: Relation between health benefits and physical activity

\*Anil Nigam, Martin Juneau

Montreal Heart Institute and Université de Montréal,  
5000 Bélanger Street, Montreal, Quebec H1T 1C8, Canada  
anil.nigam@icm-mhi.org

We declare that we have no conflicts of interest.

- 1 Wen CP, Wai JPM, Tsai MK, et al. Minimum amount of physical activity for reduced mortality and extended life expectancy: a prospective cohort study. *Lancet* 2011; published online Aug 16. DOI:10.1016/S0140-6736(11)60749-6.
- 2 Physical activity guidelines advisory committee. Physical activity guidelines advisory committee report 2008. <http://www.health.gov/paguidelines/committeereport> (accessed May 12, 2009).
- 3 Haskell WL. JB Wolffe Memorial Lecture: health consequences of physical activity—understanding and challenges regarding dose-response. *Med Sci Sports Exerc* 1994; **26**: 649–60.
- 4 US Department of Health and Human Services. Physical activity and health: a report from the Surgeon General. Atlanta, USA: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 1996.
- 5 US Department of Health and Human Services. 2008 physical activity guidelines for Americans. <http://www.health.gov/paguidelines> (accessed May 12, 2009).
- 6 WHO. Global recommendations on physical activity for health. [http://www.who.int/dietphysicalactivity/factsheet\\_recommendations/en](http://www.who.int/dietphysicalactivity/factsheet_recommendations/en) (accessed Oct 10, 2010).
- 7 Bauman A, Schoeppe S, Lewicka M, et al. Review of best practices in interventions to promote physical activity in developing countries: background document for the WHO workshop on physical activity and public health. 2005. <http://www.who.int/dietphysicalactivity/bestpracticePA2008.pdf> (accessed Nov 9, 2010).
- 8 Pan SY, Cameron C, Desmeules M, Morrison H, Craig CL, Jiang X. Individual, social, environmental, and physical environmental correlates with physical activity among Canadians: a cross-sectional study. *BMC Public Health* 2009; **9**: 21.
- 9 Grandes G, Sanchez A, Sanchez-Pinilla RO, et al, for PEPAF Group. Effectiveness of physical activity advice and prescription by physicians in routine primary care: a cluster randomized trial. *Arch Intern Med* 2009; **169**: 694–701.
- 10 Taylor RS, Brown A, Ebrahim S, et al. Exercise-based rehabilitation for patients with coronary heart disease: systematic review and meta-analysis of randomized controlled trials. *Am J Med* 2004; **116**: 682–92.
- 11 Jolliffe JA, Rees K, Taylor RS, Thompson D, Oldridge N, Ebrahim S. Exercise-based rehabilitation for coronary heart disease. *Cochrane Database Syst Rev* 2001; **1**: CD001800.
- 12 Juneau M, Nigam A. Exercise training after an acute coronary syndrome. In: Thérioux P ed. Acute coronary syndrome. A companion to Braunwald's heart disease, 2nd edn. Philadelphia: Saunders Elsevier, 2010.
- 13 Newton RU, Galvao DA. Exercise in prevention and management of cancer. *Curr Treat Options Oncol* 2008; **9**: 135–46.
- 14 Inoue S, Zimmet P. The Asia-Pacific perspective: redefining obesity and its treatment. 2000. <http://www.wpro.who.int/internet/resources.ashx/NUT/Redefining+obesity.pdf> (accessed June 12, 2011).