Changing medical culture to promote physical activity in secondary prevention of coronary artery disease

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This editorial refers to ‘Physical activity in patients with stable coronary heart disease: an international perspective’, by R. Stewart et al., on page 3286

Stewart and colleagues analyse reasons why many patients with coronary artery disease (CAD) do not engage in regular physical activity (PA) despite considerable evidence describing its benefit and guidelines promoting it. Their study population was a large (n = 15 486) international (39 countries) cohort of patients with stable CHD participating in a large randomized clinical trial (STABILITY). PA was assessed by the International Physical Activity Questionnaire; subjects estimated the number of hours of ‘mild’, ‘moderate’, and ‘vigorous’ PA in which they engaged during a typical week. Total PA was reported in metabolic equivalent (MET)-hours/week. Subjects indicated whether moderately vigorous PA occurred at work or during leisure time and whether PA levels changed after their first ‘heart problem’. Further, subjects were asked to identify limitations to walking 100 m, climbing one flight of stairs, or walking 1 km.

The investigators found that 46% of subjects reported decreased PA after their first heart problem. A lower level of PA was associated with older age, poorer health, more co-morbidities, depressed mood, greater exercise limitation, lack of cardiac rehabilitation (CR), non-white race, middle vs. higher income country, and less formal education.

Self-reporting of PA is the usual methodology, though objective assessment by motion sensors can provide varying results; self-reporting generally overestimates PA. While the methodology of combining all PA into MET-hours per week is commonly used in epidemiological investigations, it makes it difficult to understand whether subjects are meeting current guidelines. Recommendations in the American Heart Association/American College of Cardiology (AHA/ACC) guidelines and European Society of Cardiology (ESC) Guidelines (Figure 1) are phrased in terms of total recommended minutes of exercise on a specific number of days per week. Taking multiple short walks at work may not be biologically equivalent to running on a treadmill for 30 min even if total energy expenditure is the same.

Levels of PA in CAD patients were not compared with those of a control group or population data in the various study countries. We might also question how accurately subjects recall their PA level prior to their first heart problem after a mean interval of ~ 53 ± 55 months and whether any of the change is just a function of ageing. These caveats and concerns aside, the findings of the study are probably not surprising to most readers. We might explore whether the reasons for inadequate PA are biological or cultural and whether our medical culture is promoting PA sufficiently.

In every society, individuals work to provide the basics of food, water, and security. The nature of this work changed dramatically over the last 150–200 years, and that change continues in the developing world. Early studies by pioneer epidemiologist Jeremy Morris investigating the benefits of PA focused on work, e.g. double-decker bus drivers vs. bus conductors in London, but he soon shifted the focus to leisure time activity as performed by British male civil servants. Homo sapiens has existed for ~ 100 000 years, so the recent transformation of work in human societies is much less relevant to our biology than the activities of pre-technological societies described in anthropological literature. Primitive social groups hunted and gathered as calories were needed, then feasted and rested when they were readily available. From a biological perspective, it is foolish for a hunter—gatherer to waste calories and face exposure to dangers by roaming about when food is available locally. True, children played games that served for socialization and learning, and adolescent males engaged in various type of vigorous activity to demonstrate genetic fitness to adolescent females, but physical games and unnecessary risk-taking were not typical for the mature adult.

A principal driving force behind technological advancement in human culture is the reduction of physical work: farmers have progressed from sharpened sticks for turning the earth to metal...
ploughs pulled by a draft animal, to motorized GPS-guided tractors in use on modern farms today.

Exercise physiologists and proponents of endurance sports such as marathon running have uncovered an endogenous opiate system of endorphins\(^9\) to explain how individual athletes can tolerate and actually enjoy such activities—and in turn how they can become addictive and obligatory. Such rewards do not appear to the vast majority of people across more pedestrian ranges of PA. Improving fitness and losing weight are certainly inherently satisfying experiences, but the investment required to achieve these gains is apparently too large in relation to the rewards to self-motivate many people.

While most health professionals embrace the motto of the American College of Sports Medicine, ‘exercise is good medicine’, it seems that the majority of the public really agrees more with Henry Ford: ‘Exercise is bunk. If you are healthy, you don’t need it; if you are sick, you should not take it’.

Our biology fails to motivate us to engage in leisure time PA, even less so if we have developed a disease that adds to the burden of being physically active. Therefore, we must turn to culture to provide the incentives. This is where we see the findings of the study coming into play: more activity in white, educated residents of high income countries. These individuals have cultural role models—admired athletes or trim, fit celebrities—safe areas to exercise outdoors, facilities for exercise indoors, and financial resources for exercise equipment and classes. They are also less likely to have myocardial damage, residual ischaemia, or exercise impairment compared with those in less developed countries who do not have access to widely available emergency medical systems, emergent revascularization, and rapid hospital discharge. Also they are also more likely to have access to CR. It is noteworthy that 65% of the subjects in this study did not undergo CR. Even in developed nations, however, CR is unfortunately a frequently unavailable and underutilized resource.

This brings us to medical culture. Not only is CR not universally available and utilized, especially in developing nations, but physician training in exercise physiology, nutrition, and behavioural management is limited. Physicians are generally not incentivized to spend time counselling a patient for lifestyle (cultural) change and to follow the patient regularly to ensure continued adherence. Export of new technology into the developing world is often of greater priority than exporting systems of care and low-tech preventive strategies for dealing with CAD.

The World Health Organization rates physical inactivity as the fourth leading cause of death worldwide (behind high blood pressure, smoking, and high blood glucose), with \(\approx 3.3\) million attributable deaths annually, the greatest number of these falling in the middle income countries,\(^10\) and so the continuum of CAD prevention (Figure 2) involves exercise at multiple levels. Since it appears that biology is not driving us to take up vigorous PA in our leisure time, then the change must be cultural, and logically we have to focus our efforts on the medical culture which we create and sustain. Below are some suggestions.

(i) First and foremost, promote CR through articles, guidelines, editorials, seminars, and awards. To this end, we have an ongoing initiative at the Mayo Clinic to promote CR in Latin America through international conferences and mentoring of students that has resulted in new programmes in at least four countries.\(^11\) However, this is just the tip of an iceberg in terms of what is needed. CR does more than provide a medical treatment; it creates a positive and powerful culture that encourages vigorous PA and other healthy behaviours, and reassures...
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References


