

Exercise, fitness, and health

People need to be more active more often

Increasing physical activity is one of the targets of *The Health of the Nation*.¹ The impetus for including it came from Allied Dunbar's national survey of fitness among adults,^{2,3} which showed the low levels of activity, aerobic fitness, and, in older people, muscle strength in England. A similar picture has emerged from other surveys.^{4,7} Despite continuing debate about the best type of exercise there is no dispute that exercise is beneficial.

Physical inactivity is a substantial risk factor for cardiovascular disease.⁸⁻¹¹ Exercise probably works by increasing physical fitness^{10,12} and by modifying other risk factors.^{2,6} Among other benefits it lessens the risk of stroke¹³ and osteoporosis¹⁴ and is associated with a lower all cause mortality.^{9,11,12} Moreover, it has psychological effects that are surely underexploited.^{15,16} A pervasive benefit is the gain in everyday reserve capacity⁷—that is, the ability to do more without fatigue.

Nevertheless, there is much debate about how intense the exercise should be. Some studies show a dose-response relation between activity and reduction of risk,^{8,9} with a threshold of effect⁹; some suggest that vigorous aerobic activity is needed⁹ and others that frequent moderate exercise is adequate^{10,11}—and indeed safer if ischaemic heart disease might be present.¹⁰ A few surveys have found a slightly increased risk of heart attack with extreme activity,^{10,11} though further analysis in one study suggested this applied only to men with hypertension.¹⁰ Different surveys, however, have defined vigorous activity differently, and there is confusion about whether quantity alone or intensity is important: is total energy expenditure critical or must the activity be vigorous for the individual?

Despite this controversy a commonly recommended minimum regimen for cardiovascular benefit is thrice weekly exercise for 20 minutes, brisk enough to produce sweating or hard breathing (or a heart rate 60-80% of maximum). Indeed, this is what the report on the national fitness survey itself recommends.² It conveys a simple popular message of broad minimum targets for different age groups expressed in terms of activities of different intensity. The aim is to produce a training effect through exercise beyond what is customary for an individual.

The main reason why people fail to take exercise is lack of time.² Thus an important message is that exercise can be part of the daily routine—walking or cycling to work or the shops, for instance. Relatively few people in the national fitness survey had walked continuously for even 1.25 km in the

previous month (11-30% depending on age and sex), and other surveys have also found little walking.¹⁰ But it is easy to walk further, faster, and more often, and fast walking has important benefits,¹⁷ reducing the risk of heart attacks.^{9,11} Cycling, though it probably does not protect against osteoporosis, is also beneficial.^{7,9,18} Many, however, are put off cycling to work by the danger. Certainly more cycle routes are needed, but even now life years lost through accidents are outweighed by the estimated life years gained through better health.¹⁸

Employers could encourage people to make exercise part of the working day by providing showers and changing rooms, flexible working hours, individual counselling by occupational health or personnel staff, and sometimes exercise facilities—or at least encouragement for exercise groups. In addition, stairs should be more conspicuous than lifts in new buildings.

In the promotion of exercise children, women, middle aged men, and older people need special thought.² Lifelong exercise is most likely to be started in childhood,² but children may have little vigorous exercise.¹⁹ The national curriculum includes varied exercise activities that could be enjoyed in later life and an emphasis on understanding the health benefits. But inactive families could undermine this influence.

Women tend to be much less active than men and are less fit at all ages.² The proportion judged on a treadmill test to be unable to keep walking at 5 km/h up a slight slope rose with age from 34% to 92%—and over half of those aged over 54 would not be able to do so even on the level. Women have particular constraints: young children may prevent even brisk walking. Thus they need sensitive help from health professionals and women's and children's groups as well as the media.

A high proportion of men aged 45-54, who have a high risk of coronary heart disease, were not considered active enough for their health. Promotion of exercise and individual counselling at work could help. Forty per cent of 65-74 year olds had done no "moderate" activity for even 20 minutes in a month. Yet older people especially need exercise to help them make the most of their reduced physical capacity and counteract the natural deterioration of age.^{6,16,20} They respond to endurance training much the same as do younger people.²⁰ Doctors particularly should take this challenge more seriously.

People need to be better informed, and much can be done through the media. For instance, many in the survey were mistaken in thinking that they were active and fit. Moreover,

many gave "not enough energy" and "too old" as reasons for not exercising. Precautions also need publicity—for example, warming up and cooling down gradually, avoiding vigorous exercise during infections, and (for older people) having a medical check before starting vigorous activity. Doctors are in a key position. Some general practitioners have diplomas in sports medicine, and a few are setting up exercise programmes. As the Royal College of Physicians says, however, all doctors should ask about exercise when they see patients, especially during routine health checks, and advise on suitable exercise and local facilities.⁶ Their frequent contact with women and children provides a valuable opportunity. Excluding ischaemic heart disease and also checking blood pressure before vigorous activity is started are important precautions. But above all doctors could help to create a cultural change whereby the habit of exercise becomes integral to daily life.

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Epilepsy and stress

Time for proper studies of the association

Epilepsy was once regarded as a mental illness and was classified among the neuroses. In the last century the organic component of epilepsy was more clearly recognised, and interest in its psychological component waned.¹ Thus epilepsy came to be attributed to a physical disorder in the brain (whether determined by genetic constitution, structural damage, or new or aberrant growth), which caused characteristic changes in neurotransmitters, leading to seizures. According to this view, epilepsy originates in the brain and is therefore a medical condition, rightly treated by neurologists or other doctors.

This, however, is too narrow a view and leads to medical care becoming a futile exercise in counting pills and seizures and maintaining prohibitions. The result: an overtreated, unhappy patient. Although epilepsy may take place in the brain, it may profoundly influence the morale, wellbeing, self image, and lifestyle of its sufferers.² Epilepsy may briefly change the way a person thinks, feels, and acts—but how someone thinks, feels, and acts may also change his or her epilepsy. Epilepsy takes place in a brain that also contains a mind, which is subject to other influences, both internal and external, and to differing states of arousal and emotion. These may have their own influences on the epilepsy.

Many people with epilepsy (if they are asked³) will tell their doctor that their emotions, states of arousal, and internal and external stresses may profoundly influence the frequency of their seizures: for some people with epilepsy paying attention to states of mind and relieving stress may have a therapeutic effect. There are many anecdotal reports that stress increases the frequency of seizures.²⁻⁴

But is there any scientific evidence that stress may influence the activation of seizures? Although this is an underresearched topic, some evidence exists. Substantial numbers of patients report that the frequency of their seizures increases if they are exposed to stress (that is, an increase in excitement, tension, sadness, or other emotions caused by change in the patient's

internal or external circumstances).³⁻⁵ Detailed studies of groups of patients, either with careful charting of life events and emotional states⁵⁻⁷ or in the laboratory with electroencephalography,^{4,8} show a definite relation between stress, emotional arousal, and frequency of seizures in some patients. For most patients more stress leads to more seizures, although in a few the opposite is the case.^{2,3}

Changes in arousal in the brain lead to changes in excitability,³ which may affect neuronal firing, particularly of those neurones that surround an epileptic focus and may affect further propagation of seizure discharge.^{3,9} Other factors related to stress may be important—such as lack of sleep, consumption of alcohol, omitting drugs (deliberately or otherwise), and, most importantly, involuntary hyperventilation.⁴ Some doctors have the clinical impression that epileptic seizures may start during periods of personal stress²; if the stress is not resolved this may help to continue the epilepsy. Epilepsy itself is stressful, and many patients become afraid of their seizures, so that a vicious circle of fear begetting seizures and seizures begetting fear is set up.^{2,3}

If stress has a role in precipitating seizures then psychological treatment might help to prevent, control, or abort seizures. Much anecdotal, though little scientific, evidence supports this.^{3,10} Many studies of the psychological treatment of epilepsy have been of single patients, often with unusual seizures. Treatment strategies used in published reports have often had a general relaxation element so that the specific effect of the treatment has been hard to determine or it has been difficult to separate treatment from placebo effects. Nevertheless, placebo effects themselves are also psychological and worthy of investigation: how does a placebo effect actually reduce the frequency of seizures? In some of these reports non-epileptic attacks may have been treated.^{11,12} Carefully conducted trials are badly needed to delineate the relation between stress and seizures and to determine the effectiveness of psychological therapy. In these days of