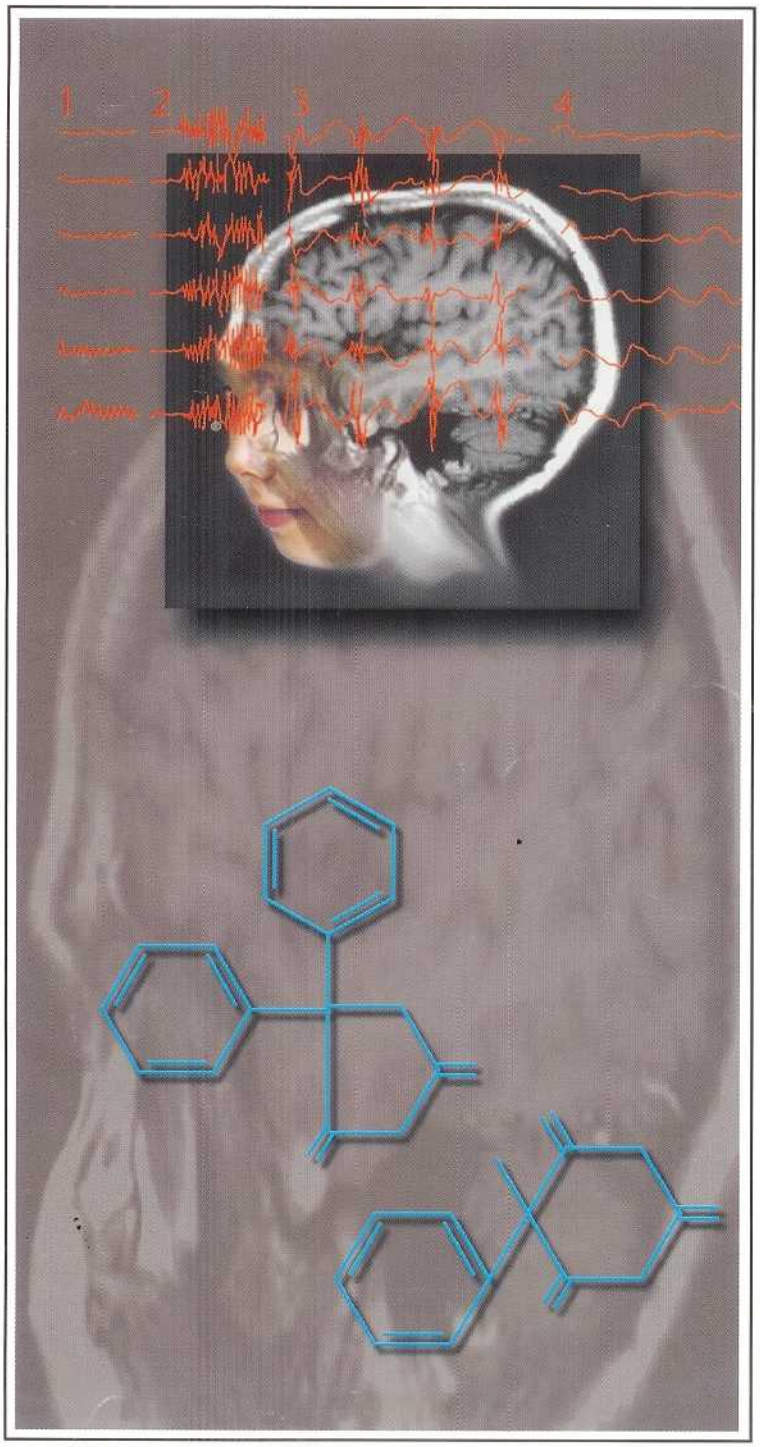
ISSN 0377-9963

MEDICAL PROGRESS



OCTOBER1996 VOL. 23 NO. 10

GUEST EDITORIAL

Lifestyle Activity

Current Recommendations

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New guidelines recommend that every adult should accumulate at least 30 minutes of moderate-intensity physicial activity on most days of the week

An accumulation of international scientific evidence indicates that physical inactivity is detrimental to health and that moderate levels of physical activity confer significant health benefits. Data from several countries in which national level physical activity surveys have been conducted[1-3] indicate that only about 15% of the adult population engage in vigorous physical exercise according to American College of Sports Medicine (ACSM) guidelines[4] with the percentage of adults who are sedentary ranging from 15 to 40%.[1-3,5]

The Centers for Disease Control and Prevention (CDC) and the ACSM recently issued guidelines and recommendations on the amount and frequency of moderate levels of physical activity necessary to elicit health benefits in predominantly sedentary adults. This article briefly reviews the rationale behind these guidelines and, in view of the historical association of exercise training and fitness to health, highlights some challenges and potential problems in applying these new guidelines to the general population.

Lifestyle Activity Recommendations for Adults

In February 1995, an expert panel coordinated by the CDC and the ACSM published the following recommendation: 'Every US adult should accumulate 30 minutes or more of moderate-intensity physical activity on most, preferably all, days of the week.'[6] The new recommendations differ from those previously published[4,7] which were based on an 'exercise training-fitness' model and advocated vigorous physical exercise.[6] The CDC/ACSM recommendations embrace a 'physical activity-health' paradigm,[6] which uniquely incorporates moderate intensity and intermittent physical activity (table I). Similar recommendations for moderate level physical activity have also recently been published in the UK.[3]

The fact that moderate activity confers health benefits is based upon considerable epidemiological evidence. Studies have reported reduced coronary heart disease (CHD) mortality and all-cause mortality rates among individuals who regularly engage in moderate physical activity.[8-12] Most of the beneficial activities reported approximated an intensity of 4 to 7 kcal/min and included activities such as brisk walking, house cleaning, and lawn/garden care. Studies also suggest that health benefits derived from physical activity may be linked to exercise volume as well as exercise intensity.[13-15] An additional 'bonus' for sedentary persons is that the greatest health benefits from increased activity appear to accrue when the least active become moderately active (fig. 1).[16]

The other unique component of the new recommendations is the concept that health benefits may be gained from multiple daily sessions of physical activity, as well as from one con-

tinuous daily session. Epidemiological research[10,12] has identified activities associated with health benefits such as gardening, raking leaves and home repair. It is likely that many of these activities are performed in a discontinuous, rather than continuous manner.

Interpretation of Recommendations

The new US guidelines serve as more realistic goals for the sedentary adult who wishes to adopt health-related lifestyle activities. There may be unique challenges, however, for those involved with the effective dissemination and interpretation of the guidelines. Such challenges include overcoming the inertia of an exercise history generated by more than 2 decades of 'conventional wisdom' which emphasised only the exercise training-fitness model.

The definition of 'moderate activity' must be clarified, since this is of paramount importance in the setting and achieving of goals. While higher-intensity activities are often relatively easy to recognise, 'moderate intensity' activity is typically more difficult to identify, particularly given the influences of individual differences in perception of work effort (table II).[17]

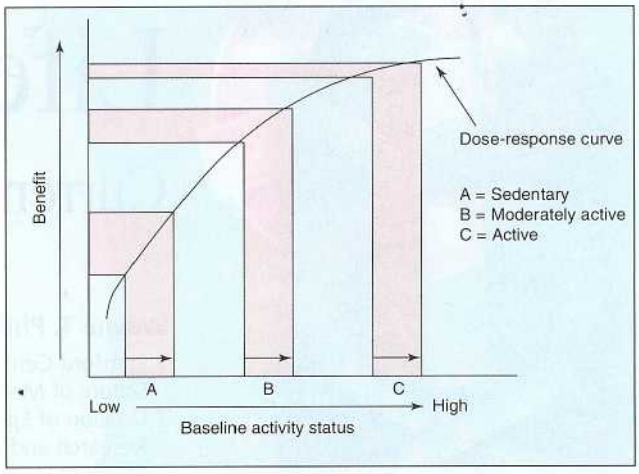

Fig. 1. Theoretical dose-response curve demonstrating that the magnitude of increased benefit for any given increase in activity is greater for less active persons (from Haskell, [16] with permission). N.B. Persons exercising vigorously who increase their level of activity (level C) accrue only small increases in health benefit. However, they elicit the greatest absolute health benefits compared with those performing lower intensity activity (levels A and B).

Practical Applications

What do these new recommendations mean in practical terms for the sedentary adult who wishes to become more active? In general, he or she need not embark on a vigorous exercise programme to realise health benefits. Suggested physical activity scenarios include: (i) a brisk 10-minute walk in the morning, at lunchtime and after work; (ii) a brisk walk to the mail box, raking leaves, and stationary cycling while reading or watching television; or (iii) general house-cleaning, actively playing with children and home gardening. The accumulated duration of these activities should be gradually

Table I.
A comparison of American College of Sports Medicine (ACSM) exercise recommendations with Centers for Disease Control and Prevention (CDC) and ACSM physical activity recommendations[a]

Activity characteristics	ACSM exercise recommendations for cardiorespiratory fitness in healthy adults (1990) [exercise training-fitness model][4]	CDC/ACSM physical activity recommendations (1995)[6]
Frequency	3 to 5 days per week	6 to 7 days per week
Intensity	60-90% of maximum heart rate or 50- 85% maximum aerobic capacity	Moderate (3 to 6 METs[b] or 4 to 7 kcal/min)
Duration	20 to 60 minutes of continuous aerobic activity	Accumulation of >30 minutes of activity; intermittent activity is appropriate
Type	Any activity that uses large muscle groups, can be maintained continuously and is aerobic in nature, e.g., walking, running, cycling, swimming	Any activity which can be performed at an intensity similar to that of brisk walking

a Earlier recommendations were primarily designed to improve functional capacity. Current recommendations focus on the activity requirements important for reduced risk of chronic disease.

b MET values are multiples of the resting rate of oxygen consumption during physical activity. One MET represents the approximate rate of oxygen consumption of a seated adult at rest, or about 3.5 ml/min/kg. The equivalent energy cost of 1 MET in kcals/min is about 1.2 for a 70kg person or approximately 1 kcal/kg/h.

Table II.
Examples of common physical activities for healthy US adults illustrating how the intensity level (in METs)[a] of similar activities may vary as a consequence of individual differences in perception of work effort (from Ainsworth et al.[17] with permission)

Light (<3 METs or <4 kcal/min)	Moderate (3-6 METs or 4-7 kcal/min)	Hard/vigorous (>6 METs or >7 kcal/min)
Walking: slowly, strolling	Walking: briskly	Walking: briskly uphill, or with load
Cycling: stationary, very light effort	Cycling: recreational or transportation	Cycling: fast or racing
Home activities: carpet sweeping, vacuuming	Home activities: cleaning, general	Home activities: moving furniture
	Home activities: standing packing or unpacking occasional lifting of household items (light-moderate effort)	Home activities: moving household items, carrying boxes
Child care: sitting/standing playing with child	Childcare: sit/stand feeding or grooming child	
	Childcare: walk/run playing with children (moderate effort)	
Swimming: slow treading	Swimming: moderate effort	Swimming: fast-treading or crawl
Shopping: walking (non-grocery shopping)	Shopping: walking (with grocery cart)	
Home repair: carpentry	Home repair: painting	
Mowing lawn: riding power mower	Mowing lawn: walking with power mower	Mowing lawn: walking with hand mower
Gardening: walking, applying fertiliser, seeding lawn	Gardening: planting seedlings, weeding	

a MET values are multiples of the resting rate of oxygen consumption during physical activity. One METrepresents the approximate rate of oxygen consumption of a seated adult at rest, or about 3.5ml/min/kg. The equivalent energy cost of 1 MET in kcals/min is about 1.2 for a 70kg person or approximately 1 kcal/kg/h.

Table III.
Examples of physical activity programmes by level of intervention, channel, target and strategy[21]

Level of intervention	Channel	Target	Strategy
Personal	*Face-to-face:* Physician's office, health clinics, health spas and clubs	Patients, clients	Information on risk, health benefits, counsellor support, personal monitoring and feedback, problem solving (relapse prevention)
Personal	*Mediated/not face to face:* telephone, mail (feedback correspondence courses, self-help kits and booklets)	Patients, clients	Same as above
Interpersonal	Classes, telephone/mail systems, health spas and clubs, peer-led groups	Patients, healthy individuals, families, peers	Information, peer, family and counsellor support, group affiliation, personal or public monitoring and feedback, group problem solving
Organisational and/or environmental	Schools, worksite, neighbourhoods, community facilities (e.g. par course, walk/bike paths), churches, community organisations, sites for activities of daily living (public stairs, shopping malls, parking lots)	Student body, all employees, local residents, social norms or milieu	Curricula, point-of-choice education and prompts, organisational support, public feedback, incentives
Institutional/legislative	Policies, laws, regulations	Broad spectrum of the community or population	Standardisation of exercise-related curricula, insurance incentives for regular exercisers, flexible work time to permit exercise, monetary incentives for the development of adequate public facilities for exercise, Surgeon General's report on physical activity and health

Table IV.
Features and examples of physical activity programmes for several major developmental milestones

Milestone (critical period)	Specific features	Goals/strategies
Adolescence	Rapid physical and emotional changes Increased concern with appearance and weight Need for independence Short term perspective Increased peer influence	Exercise as part of a programme of healthy weight regulation (both sexes) Noncompetitive activities that are fun, varied Emphasis on independence, choice Focus on proximal outcomes (e.g. body image, stress management) Peer involvement, support
Initial work entry	Increased time and scheduling constraints Short term perspective Employer demands	Choice of activities that are convenient, enjoyable Focus on proximal outcomes Involvement of worksite (environmental prompts, incentives) Realistic goal-setting/injury prevention Coeducational noncompetitive activities
Parenting	Increased family demands and time constraints Family-directed focus Postpartum effects on weight/mood	Emphasis on benefits to self and family, e.g. stress management, weight control, well-being Activities appropriate with children, e.g. walking Flexible, convenient, personalised regimen Inclusion of activities of daily living Neighbourhood involvement/focus Family-based public monitoring, goal-setting Availability of child-related services (childcare)
Retirement age	Increased time availability and flexibility Longer term perspective on health Increased health concerns, 'readiness' Caregiving duties, responsibilities (parent, spouse, children or grandchildren)	Identification of current and previously enjoyable activities Matching of activities to current health status Emphasis on mild and moderate intensity activities, including activities of daily living Use of 'life path point' information and prompts Emphasis on activities engendering independence Gamering support of family members, peers Availability of necessary services (e.g. caretaking services for significant others)

increased towards 30 minutes per day. The key to effect positive health results will be to perform these activities at an intensity which at least approximates brisk walking.

Since health benefits accrue in a dose-response fashion (fig. 1), adults who currently engage in vigorous activity for 20 to 30 minutes or longer should continue to do so. Furthermore, the importance of muscular strength and flexibility should also not be overlooked. A growing body of data[18-20] indicates that maintenance and/or improvement of these two components of fitness is associated with improved daily functioning and is thus critical to a healthy aging process.

Implementation of Recommendations

The authors of the CDC/ACSM guidelines have issued a 'call to action' aimed at increasing the joint cooperation and involvement of public health agencies, corporations, schools, communities and health professionals, as well as individuals and families. Examples of the types of physical activity programmes that could be delivered across 4 hierarchical levels of intervention are illustrated in table III.[21] Within these levels, the utility of a developmental or life-span strategy should also be stressed, i.e. one which takes account of life periods and transitions which may markedly affect physical activity behaviours (table IV).[21]

Copies of a more comprehensive article or the list of references are available on request from the Editor.

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