

# Physical Activity Promotion in the Health Care System

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## Abstract

Physical activity (PA) and exercise training (ET) have great potential in the prevention, management, and rehabilitation of a variety of diseases, but this potential has not been fully realized in clinical practice. The health care system (HCS) could do much more to support patients in increasing their PA and ET. However, counseling on ET is not used widely by the HCS owing partly to attitudes but mainly to practical obstacles. Extensive searches of MEDLINE, the Cochrane Library, the Database of Abstracts of Reviews of Effects, and ScienceDirect for literature published between January 1, 2000, and January 31, 2013, provided data to assess the critical characteristics of ET counseling. The evidence reveals that especially brief ET counseling is an efficient, effective, and cost-effective means to increase PA and ET and to bring considerable clinical benefits to various patient groups. Furthermore, it can be practiced as part of the routine work of the HCS. However, there is a need and feasible means to increase the use and improve the quality of ET counseling. To include PA and ET promotion as important means of comprehensive health care and disease management, a fundamental change is needed. Because exercise is medicine, it should be seen and dealt with in the same ways as pharmaceuticals and other medical interventions regarding the basic and continuing education and training of health care personnel and processes to assess its needs and to prescribe and deliver it, to reimburse the services related to it, and to fund research on its efficacy, effectiveness, feasibility, and interactions and comparability with other preventive, therapeutic, and rehabilitative modalities. This change requires credible, strong, and skillful advocacy inside the medical community and the HCS.

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Physical activity (PA) is an essential biological stimulus for the development and maintenance of healthy structures and functions of the human body. Long-standing lack of sufficient PA leads to weaknesses and degeneration of structures and aberrations in metabolism that lead to and appear as functional deficiencies and diseases in a variety of organ systems.<sup>1,2</sup> Research has gradually provided data on the amount of PA, and particularly the energy expenditure (EE) caused by it, that is necessary to prevent the development of various diseases,<sup>3,4</sup> including cardiovascular disease (CVD) (Figure 1).<sup>5</sup> Owing to the steep decline during the past decades in the need to use muscular effort in occupational (Figure 2, A)<sup>6</sup> and domestic (Figure 2, B)<sup>7</sup> activities and in transportation and to the only partial compensation of it by increasing leisure time PA, the amount of PA has become insufficient for health in most populations in the world.<sup>8,9</sup>

Currently, insufficient PA ranks high among 67 risk factors for burden of disease and injuries

(sum of deaths and disability-adjusted life years) in all parts of the world: fifth in Western Europe and Australasia; sixth in high-income North America, Central Europe, and Central Latin America; seventh in Eastern Europe and Southern Latin America; and eighth in Tropical and Andean Latin America and Southeast Asia.<sup>10</sup> The population-attributable fractions for some major noncommunicable diseases associated with physical inactivity (PIA) are also high (eg, in Europe, North America, and Latin America, respectively, the population-attributable fractions for coronary heart disease are 5.5%, 8.2%, and 7.1%; for type 2 diabetes mellitus are 6.8%, 7.6%, and 8.7%; for breast cancer are 9.3%, 10.8%, and 12.5%; for colon cancer are 9.9%, 11.0%, and 12.6%; and for all-cause mortality are 8.8%, 9.9%, and 11.4%). The cited estimates of the burden of PIA are conservative for methodological reasons.<sup>9</sup> Physical activity is important for public health, but it is also a valuable component in the clinical management of a variety of diseases,<sup>3,11</sup> and it is recommended for

these purposes in numerous evidence-based clinical guidelines (eg, Weiler et al<sup>12</sup> listed 39 British national guidelines that included promotion of PA, and in a Finnish Web-based tool for physicians, the rationale and evidence-based advice for PA and exercise training [ET] are given for 35 health-related indications<sup>13</sup>).

The following example reveals the comparative effectiveness of PA when used for disease prevention and management.<sup>14</sup> The authors calculated the number of deaths caused by CVD that could be prevented or postponed (DPPs) if perfect care (PC) for the prevention and treatment of this disease were achieved in a hypothetical population resembling US adults aged 30 to 84 years. Direct comparison of CVD prevention and treatment strategies in patients receiving PC revealed that PC before the first CVD event would prevent or postpone 33% of all deaths, PC between acute events would prevent or postpone 23% of all deaths, and PC during acute events would prevent or postpone 8% of all deaths. In comparing the potential impact of the interventions found to be associated with lower risk of death or known to reduce death from CVD, the largest increase in DPPs would accrue from increasing population levels of adequate PA (44% of all DPPs in this subpopulation). Likewise, comparing the interventions of known efficacy in individuals who have CVD without symptomatic left ventricular dilation, the largest potential to prevent or delay death was associated with increasing the percentage of individuals who remain with high PA (45% of all DPPs). In interventions of known effectiveness in patients with CVD complicated by left ventricular dilation, the largest increase in DPPs would accrue from increasing the percentage of individuals who have high PA (50% of all DPPs). The total calculated number of DPPs by increasing or maintaining PA was 334 in a population of 100,000 adults. In comparison, the corresponding number of DPPs attainable by abstaining from smoking was 139. In addition to the prevented or delayed deaths caused by CVD, the practice of PA and ET would bring numerous other individual and population-wide benefits. One of the most traditional uses of ET in medicine is to include it as part of secondary prevention or rehabilitation programs for CVD (Table).<sup>15</sup>

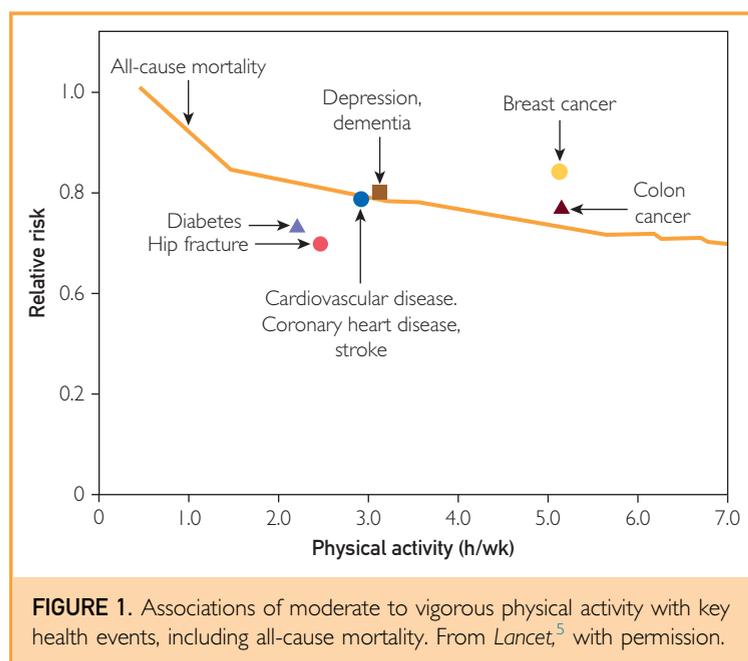
The pandemic of PIA that has arisen is increasing in depth and area. It has to be

#### ARTICLE HIGHLIGHTS

- Physical activity (PA) is essential for the development, maintenance, and recovery of health and functional capacity, but it is seriously neglected by people, health professionals, and politicians.
- The health care system (HCS) has an obligation, as well as an effective, cost-effective, and feasible means, to increase the use of PA and exercise training (ET) for the prevention, management, and rehabilitation of diseases.
- A variety of attitudes and practical obstacles in the HCS are reported to hinder efforts to increase the use of PA/ET for health.
- A large common factor leading to the obstacles to PA interventions is the low priority given to PA/ET in the whole HCS, from basic education to clinical services. If the priority is sufficient, then changes that are needed to increase and improve especially the most feasible measure—PA/ET advising—can be implemented, especially in small units without major organizational or financial resources.
- Encouraging patients to be more active can be done simply by emphasizing the basic messages of current PA guidelines: “more activity is better than none” and “more is better than less, at least up to a point”; and walking is the most common and feasible PA for most individuals.
- However, to make wide and sustainable applications in the HCS, effective distribution of knowledge and strong advocacy related to PA/ET should be undertaken by influential organizations and leaders to change the perception and understanding of PA/ET from discretionary leisure time pursuits to an evidence-based medical measure comparable with pharmaceutical agents and other established modalities.

addressed by multiple approaches. Significant progress has been achieved in creating awareness of this issue at a high political level,<sup>16,17</sup> and the development and implementation of policies by a variety of scientific and professional organizations is under way.<sup>18,19</sup>

Population-wide measures and environmental changes based on multiple policies and cross-sectorial collaboration are likely to be the most effective and sustainable means in counteracting PIA and increasing PA.<sup>19</sup> However, the health care system (HCS) and the medical profession as its leader also have



an important role in PA promotion for several reasons. Physical activity belongs to the mandate and obligations of the HCS as one domain of health promotion,<sup>20</sup> and PA/ET has great potential to further the preventive and clinical goals and obligations of the HCS. The leaders in health care are respected experts and authorities in matters related to health at national, regional, and local levels. The attitudes and opinions of health care personnel, especially of physicians, have considerable influence when the importance and positioning of various health-related issues are debated and discussed. In most of the population, the HCS is considered a reliable and appropriate institution for providing advice on PA.<sup>21-27</sup> Advice on PA from physicians can be a strong cue to begin ET.<sup>24,28-30</sup> Furthermore, primary health care (PHC) has frequent contacts with a large part of the population, especially with less healthy, less well-off, less educated, and elderly people,<sup>21,30-35</sup> who are in greatest need of health-related advice.

The most feasible means of PA promotion in the HCS and other clinical settings is brief counseling or advising of individual patients on PA or ET during 1 or more visits, or referring them to third-party services (ET referral [ETR]). In a questionnaire survey of a nationally representative sample of US PHC physicians, 30% of them reported “always” and 56%

“often” providing specific guidance on PA for patients without chronic disease. The corresponding figures for patients with chronic disease were 49% and 45%.<sup>29</sup> In Canada, 70% of PHC physicians reported using verbal counseling to promote PA, and 16% reported using written prescriptions.<sup>36</sup> Among Catalan primary care physicians, 84% reported promoting PA at least infrequently.<sup>37</sup> In Scotland, 62% of general practitioners reported that they were very likely or likely to recommend that all apparently healthy adult patients undertake moderate ET.<sup>38</sup> In Denmark, PA/ET advising is systematically implemented in PHC, and in 2 such areas more than 95% of general practitioners reported providing this service at least weekly.<sup>34</sup> In most countries, PA/ET advising is not used systematically but rather is largely based on individual preferences.<sup>39-44</sup>

The proportion of patients receiving advice on PA varies widely. Nationally representative data from the United States show that currently approximately 1 in 3 adults who have seen a physician or other health professionals in the past year (approximately 8 in 10 adults) have been advised to begin or continue ET or PA.<sup>45</sup> The prevalence of advising has increased from 23% in 2000 to 32% in 2010, and this trend is seen universally across population subgroups. Advising was highest and had increased especially for overweight and obese patients (Figure 3, A) and for those with health conditions, in whom research has found that PA and ET are associated with substantial health benefits (Figure 3, B).

Corresponding findings have been reported in the studies of PA advising by PHC physicians. In Nova Scotia, Canada, 42% of patients of PHC receive frequent advice on ET<sup>42</sup>; in Germany, one-third of older patients managed in PHC had received advice on PA from their general practitioner during the preceding 12 months.<sup>35</sup> In Queensland, Australia, the corresponding proportion was 18%,<sup>26</sup> and in New Zealand 13%.<sup>41</sup> Especially high figures for ET counseling are seen in settings where it is in systematic use, eg, in some parts of Denmark.<sup>34</sup>

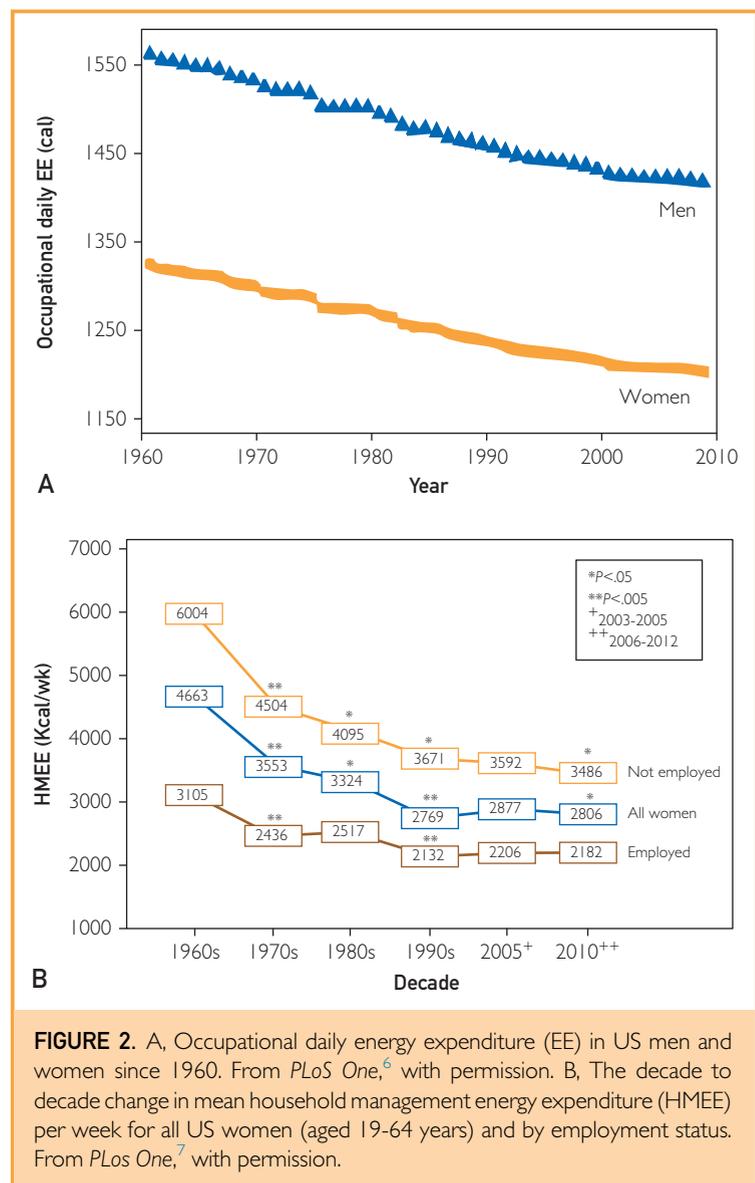
Taken together, the cited data indicate that there is a substantial mismatch between the need to advise patients in PHC on PA and ET and the prevalence of this practice. This discrepancy has lately led to strong statements and demands for change.<sup>12,46-50</sup> To achieve

substantial and sustainable increases in the provision of advising on PA and ET in the HCS, the reasons for the current situation have to be known. The attitudes and perceptions of the health care personnel; the efficacy, effectiveness, and cost-effectiveness of PA/ET advising; and the feasibility of its application are key issues for practitioners and for administrators in the HCS in making decisions on its acceptability for routine use.

The aim of this review was to present the evidence for the previously mentioned characteristics of PA/ET advising and to suggest means to increase its use and improve its quality. The presented evidence is based on critical evaluation of recent systematic and other reviews, meta-analyses, and major primary studies. An extensive search was conducted of the MEDLINE, Cochrane Library, Database of Abstracts of Reviews of Effects, and ScienceDirect electronic databases for literature published between January 1, 2000, and January 31, 2013, and the references of relevant publications were searched by hand. The search strategy included terms for *physical activity, exercise, exercise training, health care, health care system, primary health care, promotion, intervention, counseling, behavior change, effectiveness, efficacy, cost-effectiveness, and feasibility*. The searches were limited to studies of adults and to publications in the English, German, and Swedish languages. Publications that included data of outcomes related to the effectiveness, efficacy, cost-effectiveness, and feasibility of various interventions to increase PA in patients in the HCS were included, but the final selection included only publications in which 1 or more of these issues could be related solely to PA/ET advising or referral.

### FACTORS THAT FAVOR AND HINDER ADVISING ON PA/ET IN THE HCS

Practitioners, especially in PHC, have mainly positive attitudes toward PA, and they consider advising on PA and ET important and believe that they have a role in its provision,<sup>51</sup> although contrary views have also been expressed.<sup>52</sup> The attitudes and perceptions of clinicians related to PA and ET advising seem to have become more positive with time.<sup>53,54</sup> However, a large proportion of clinicians are uncertain about the effectiveness of their counseling and feel uncomfortable in providing detailed advice.



**FIGURE 2.** A, Occupational daily energy expenditure (EE) in US men and women since 1960. From *PLoS One*,<sup>6</sup> with permission. B, The decade to decade change in mean household management energy expenditure (HME) per week for all US women (aged 19-64 years) and by employment status. From *PLoS One*,<sup>7</sup> with permission.

The attitudes and perceptions of nurses and physiotherapists are more positive.<sup>38,51</sup> Some evidence suggests that the advising provided by allied health care professionals alone or in conjunction with physicians produces better long-term effects than that provided by physicians alone.<sup>55</sup>

Several barriers to PA/ET advising are frequently reported: lack of time, knowledge, training, materials for learning, education and information, protocols for delivery of the service, system support, resources, and incentives and reimbursement; the perception of PA/ET advising as a secondary task; and the fact that patients often ignore the advice.<sup>34,44,51,56-60</sup>

**TABLE. Benefits of Formal Cardiac Rehabilitation and Exercise Training Programs**

Improvements in exercise capacity
Estimated METs, +35%
Peak VO <sub>2</sub> , +15%
Peak anaerobic threshold, +11%
Improvement in lipid profiles
Total cholesterol, -5%
Triglycerides, -15%
HDL-C, +6% (higher in patients with low baseline)
LDL-C, -2%
LDL-C/HDL-C, -5% (higher in certain subgroups)
Reduction in inflammation (hs-CRP, -40%)
Reductions in indices of obesity
BMI, -1.5%
% Fat, -5%
Metabolic syndrome, -37%
Improvements in behavioral characteristics
Depression
Anxiety
Hostility
Somatization
Overall psychological distress
Improvements in quality of life and components
Improvements in autonomic tone
Increased heart rate recovery
Increased heart rate variability
Reduced resting pulse
Improvements in blood rheology
Reduction in hospitalization costs
Reduction in major morbidity and mortality

BMI = body mass index; hs-CRP = high-sensitivity C-reactive protein; HDL-C = high-density lipoprotein cholesterol; LDL-C = low-density lipoprotein cholesterol; MET = metabolic equivalent; VO<sub>2</sub> = oxygen uptake.  
From *Circ J*.<sup>15</sup> with permission.

Factors favoring or predicting PA and ET advising include the provider's own living habits, particularly personal PA and ET<sup>40,51,58,61</sup>; having training on PA/ET counseling and support by colleagues; knowing patients well; and patients having risk factors or symptoms of CVD.<sup>34,35,51,58,59</sup> A recent article reported that physicians in the United States are more likely than the general public to be meeting PA guidelines, so it should be feasible for physicians who are active to encourage their patients to meet the same standards.<sup>62</sup>

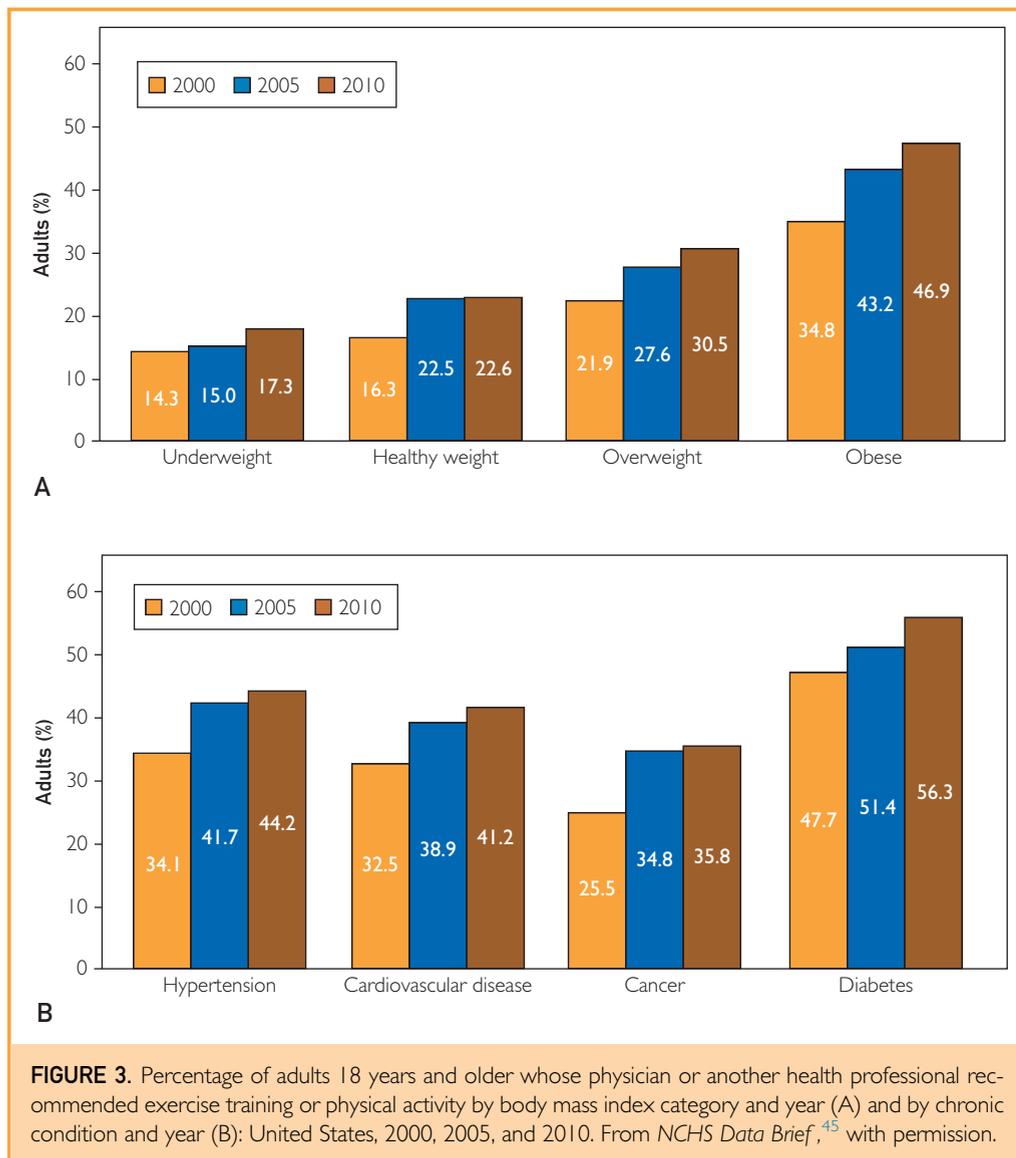
#### EFFICACY OF PA/ET ADVISING

A systematic review of 15 randomized controlled trials of 8745 sedentary adults supports the efficacy of PA/ET advising in the PHC setting.<sup>63</sup> In 11 studies, the intervention was

delivered in PHC, and most interventions included written materials and 2 or more sessions of advice or counseling that was delivered face-to-face by a combination of 2 professionals from different disciplines. Eleven studies reported positive intervention effects on self-reported PA at 12 months. The effects were significant in 6 studies and approached significance in the remaining studies. Pooled analysis of 13 studies found small to medium effects for dichotomous data (odds ratio, 1.42; 95% CI, 1.17-1.73) (Figure 4, A) and continuous data (standardized mean difference, 0.25; 95% CI, 0.11-0.38) (Figure 4, B).

Twelve (95% CI, 7-33) sedentary adults had to be treated with a PA promotion intervention, compared with any control, for 1 additional person to report meeting recommended levels of PA at 12 months. In comparison, for smoking cessation advice, the estimated number needed to treat to get 1 person to stop smoking varies between 50 and 120. Findings from additional analyses suggested that brief counseling interventions might be as effective as more intensive interventions.

Another systematic review and meta-analysis of 21 randomized controlled trials assessed the long-term ( $\geq 12$  months) effect on PA of healthy or "at risk" individuals aged 55 to 70 years ( $n=10,519$ ).<sup>64</sup> Sixteen interventions were delivered by health professionals (in 15 interventions, 1 format of delivery was face-to-face), and 10 interventions were delivered on health care premises. All the interventions were tailored to some degree. Thus, the results reflect quite well the efficacy of PA/ET advising in the HCS. The interventions increased self-reported PA duration at 12 months (standardized mean difference, 0.19; 95% CI, 0.10-0.28) but not beyond 12 months, although 10 of 11 trials reported significant positive intervention effects. Also, objectively measured step count increased significantly in the intervention group compared with the control group (standardized mean difference, 1.08; 95% CI, 0.16-1.99). In agreement with previous research, there was no evidence that the mode of delivery of the intervention is necessarily important for effectiveness<sup>65</sup> or that more contacts lead to more favorable intervention effects.<sup>64,65</sup> However, in line with other studies, tailoring the intervention to participants with, eg, personalized step-count goals or information about local



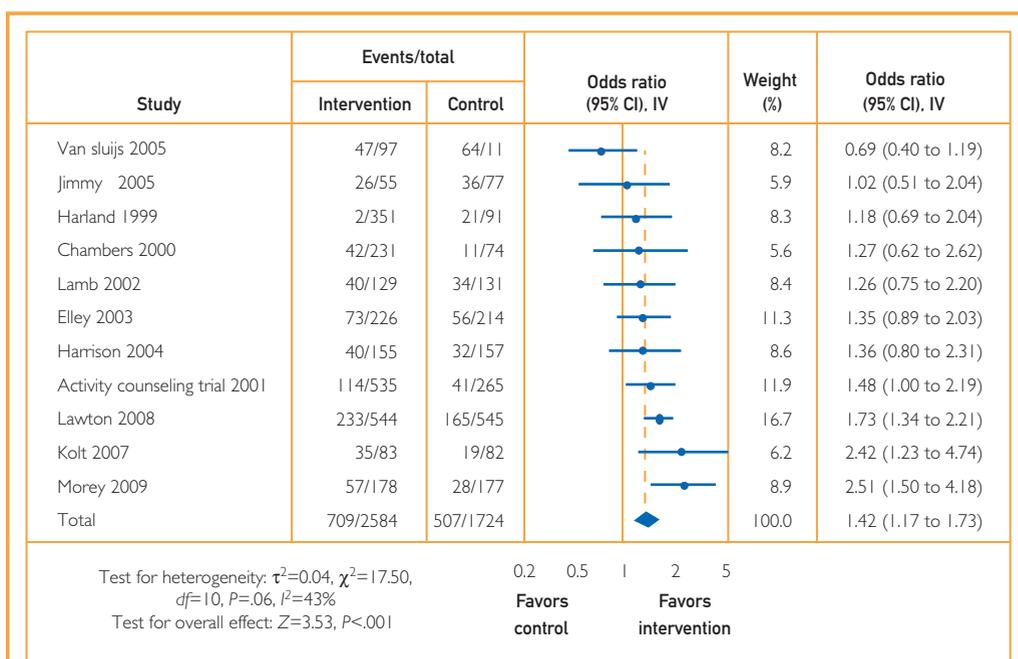
opportunities for PA in the environment,<sup>30,66-69</sup> may be important.

Advising on PA/ET provided by the PHC system has been shown to increase PA/ET in a small to moderate degree in various population subgroups, including women,<sup>70</sup> older people,<sup>71-74</sup> and chronically ill adults.<sup>75</sup> Counseling on PA/ET has led to other positive although mainly modest effects, such as improved physical functioning and mental health in middle-aged and older women,<sup>70</sup> increased aerobic fitness<sup>76</sup> and mobility<sup>73</sup> in older adults, and improved CVD and metabolic risk factors in persons with high baseline levels.<sup>77-80</sup> The interventions in the referred studies have most

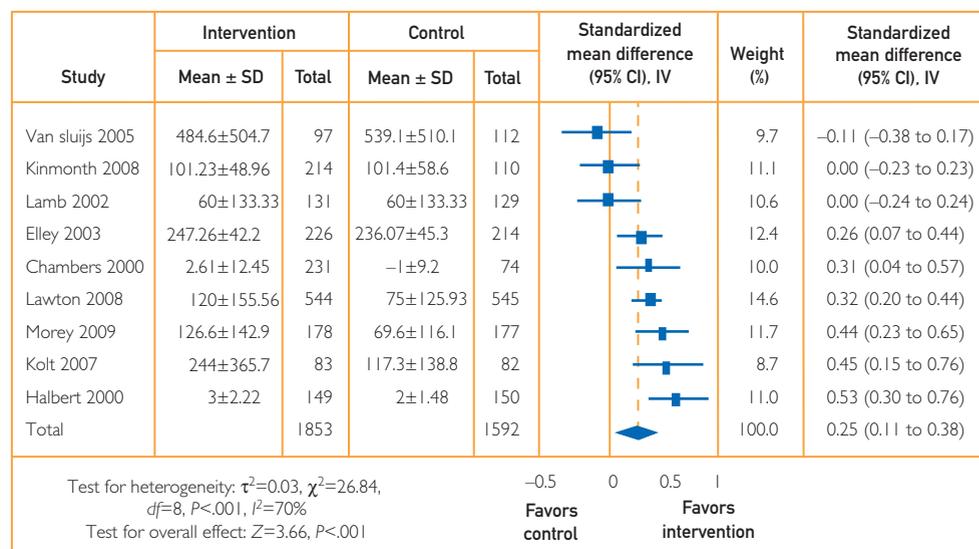
commonly included 1 or more face-to-face sessions delivered by various health professionals and tailored prescriptions for ET. Owing to the only modest effects on CVD risk factors, the US Preventive Services Task Force recommends that behavioral counseling on PA for CVD prevention also should be used selectively for patients with other risk factors and factors favoring positive results of ET counseling.<sup>81</sup>

#### FEASIBILITY AND EFFECTIVENESS OF ADVISING ON PA/ET

The feasibility and effectiveness of advising on PA/ET can be evaluated on the basis of studies conducted in “real-life” conditions. Several



A



B

**FIGURE 4.** Individual study and pooled effects of physical activity promotion on self-reported physical activity at 12 months: dichotomous data (A) and continuous data (B). The random effects model was used. IV = inverse variance. From *BMJ*,<sup>63</sup> with permission.

studies support the notion that PA/ET advising can be successfully implemented in the routine practice of PHC.<sup>34,82-88</sup>

Also, the effectiveness of PA/ET advising delivered in routine PHC is supported by

research evidence. In a large pragmatic randomized trial, patients counseled on PA/ET by family physicians increased their PA by 18 min/wk (95% CI, 6-31 min/wk) more than control patients at 6-month follow-up. Patients achieving

the recommended level of PA was 3.9% (95% CI, 1.2%-6.9%; number needed to treat = 26) higher in the intervention group.<sup>88</sup> During follow-up at 12 and 24 months, however, the intervention effect observed at 6 months had declined, suggesting that maintenance intervention is needed. Accordingly, in the subgroup of intervention patients who received repeated PA prescriptions, there were 10.2% more than in the control group who achieved the minimum recommended level of PA at 24 months.<sup>89</sup>

Several factors, most of which can be incorporated into PA/ET advising in routine clinical work, have been found to be related to improved effectiveness:

- Advising persons with an increased risk of chronic diseases.<sup>32,63,81,90</sup>
- Individual assessment of the needs, motivation, current habits, preferences, and barriers of the patient and individual ET advice based on that information.<sup>91-94</sup> Experience from diet counseling and recommendations indicate that the message should be simple, clear, specific, and realistic<sup>95</sup>; use valid behavior change methods,<sup>65</sup> including emphasizing behavioral and cognitive approaches,<sup>75,96</sup> setting clear and proximal instead of distal goals, emphasizing internal instead of external motivating factors, and improving self-efficacy; and use self-monitoring, social support, and follow-up prompts.<sup>72,93,97-104</sup>
- Until now, face-to-face delivery has been most effective,<sup>96,100</sup> although various mediated modes show promising results.<sup>96,100,105-109</sup>

### EFFICACY AND EFFECTIVENESS OF ETR

In ETR, a PHC professional refers a person having usually 1 or more chronic disease risk factors to a third-party service provider, such as a facility to improve cardiorespiratory fitness and musculoskeletal fitness using individualized ET programs.

A systematic review and meta-analysis of 8 randomized controlled trials (5190 participants, 6-12 months of follow-up) found weak evidence supporting the efficacy of ETR programs to increase PA. The authors concluded that considerable uncertainty remains as to the effectiveness of ETRs and whether they are an efficient use of resources when offered for sedentary people with or without medical diagnoses.<sup>110</sup> In another systematic review

and meta-analysis of 7 randomized controlled trials, the same authors found no consistent evidence of increased PA or favorable changes in, eg, cardiorespiratory fitness, serum lipid levels, or quality of life as a result of ETR.<sup>111</sup> The results of the Wales version of the ETR were slightly more positive, revealing an increase in PA at 12 months in the referred patients (odds ratio, 1.19; 95% CI, 0.99-1.43) and in those referred for CVD risk (odds ratio, 1.29; 95% CI, 1.04-1.60) compared with usual care patients.<sup>112</sup> The Swedish version of ETR, somewhat less intensive and more flexible than the English one, has been shown to be efficacious in substantially increasing the PA level and improving body composition and cardiometabolic risk factors in overweight/obese elderly individuals.<sup>113</sup>

The feasibility of ETRs can be estimated on the basis of the extent of their use by PHC personnel and by the uptake and adherence to them by patients. Findings from a systematic review suggest at least reasonable feasibility.<sup>96</sup> The wide implementation and positive experiences of the use of ETR in the Swedish<sup>82,85</sup> and Danish<sup>34,114</sup> PHC systems support the feasibility of the programs used in those countries. In a systematic review,<sup>115</sup> the pooled level of uptake of ETR in 14 observational studies was 66% (95% CI, 57%-75%), and adherence was 49% (95% CI, 40%-59%). The corresponding figures for the 6 randomized trials included in the review were higher for uptake (81%) and lower for adherence (43%).

The effectiveness of ETR in routine PHC services has been studied, eg, in the widely implemented practice in Sweden. In one region, 6300 PA prescriptions with referral to a third-party organization were issued in 2 years. Twelve months after the ETR, 51% of the patients who were contacted reported an increase in self-assessed PA. The proportion of inactive patients decreased from 33% at baseline to 20% at 12 months, and the proportion of regularly active individuals increased from 22% at baseline to 32% at 12 months, corresponding to medication adherence in developed countries.<sup>116</sup> The adherence of patients to the prescribed program was, on average, 50% at 12 months.<sup>91</sup> Another Swedish study found that 65% of insufficiently PA patients adhered to the ET prescription at 6 months. This level of adherence is as good as or better than that for other treatments of chronic diseases.<sup>117</sup> In the Danish ETR program, 1 in 3 to 1 in 6 participants with elevated risk of

cardiometabolic disease increased their PA level until the 16-month follow-up assessment.<sup>114</sup>

### **COST-EFFECTIVENESS OF PA PROMOTION IN PHC**

A systematic review of 13 randomized controlled trials found that most interventions based in PHC or community settings, such as ET prescription, were cost-effective, especially if direct supervision of ET was not required. Many PA interventions had similar cost-utility estimates as funded pharmaceutical interventions. The cost to move one person to the “active” category at 12 months was estimated for 4 interventions and ranged from €331 (\$448) to €3673 (\$4972). The cost-utility was estimated in 9 studies and varied substantially between the studies from €348 to €86,877 (\$470 to \$117,597) per quality-adjusted life year (QALY).<sup>118</sup> Another systematic review of 8 studies of healthy adults found that behavioral interventions delivered by PHC increased the PA of healthy individuals to the recommended level at reasonable costs, eg, for approximately €800 (\$1083) per year.<sup>119</sup>

Estimation of the cost-effectiveness of ETR using a modeling approach in individuals with a medical condition revealed that a program was cost-effective at £20,000 (\$31,974) per QALY at 51% probability and that a program was cost-effective at £30,000 (\$47,860) per QALY at 88% probability. In subgroup analyses, the cost per QALY for an ETR scheme in sedentary obese individuals was £14,618 (\$23,370), in sedentary hypertensive patients was £12,834 (\$20,517), and in sedentary persons with depression was £8414 (\$13,450). These cost-effectiveness estimates are subject to significant uncertainty because ETR programs are associated with only modest increases in lifetime costs and benefits.<sup>120</sup>

The estimation of cost-effectiveness of the Wales ETR scheme for persons with coronary heart disease risk or mild to moderate depression, anxiety, or stress found that the base-case incremental cost-effectiveness ratio was £12,114 (\$19,366) per QALY. Thus, this version of ETR for patients with CVD is likely to be cost-effective with respect to prevailing payer thresholds.<sup>112</sup>

### **POSSIBILITIES TO INCREASE AND IMPROVE PA/ET ADVISING IN THE HCS**

Basic advising on PA and ET, especially for preventive purposes and for cardiorespiratory

and musculoskeletal fitness but also to support the management of several chronic conditions, is possible for every properly trained physician who follows the established steps of clinical work-up<sup>121</sup> and uses current information readily available, eg, from recommendations and clinical guidelines. However, as mentioned earlier, there are numerous factors that hinder<sup>34,49,51,56,60</sup> or facilitate<sup>32,34,35,40,51,59,60</sup> skillful and effective PA/ET advising for diverse indications and its provision in a systematic way in the HCS. Many of the facilitating factors are “mirror images” of the hindering factors. Most of both kinds of factors belong in 2 groups. The first group includes factors related to the amount and quality of education and training of the practitioners on the principles and practice of counseling on living habits and their change, particularly PA and ET. Provision of opportunities for the needed education and training and requirements to use these opportunities are, in large part, on the mandate of the HCS and its functional units.

The other group of factors hindering and facilitating PA/ET advising is related to the organization of the HCS and its units. They have to offer opportunities, materials, fiscal and organizational resources, and incentives for systematically and professionally providing services that they have decided to provide, and they must require that the staff delivers these services.

Decisions of policy makers, administrators, and superiors of the clinical staff on delivering certain services and on providing prerequisites such as education and training for it depends on the priority they give to those services. The lack of adequate education and training of health professionals on PA/ET advising and the lack of opportunities, responsibility, resources, and incentives for providing this service are results or reflections of the low priority of PA/ET advising in the HCS and in most of its functional units. If the priority of PA/ET counseling and PA promotion in general would increase, there would develop corresponding conditions for providing these services as there are for a variety of established clinical procedures and preventive services that have higher priority.<sup>122</sup> These conditions include knowledge of the benefit of the service by practitioners and patients, skills for its provision, organization allowing and supporting

the delivery of the service, adequate financial return of providing it, perceived demand for the service by a substantial proportion of patients, perceived effectiveness of the service by practitioners and patients, perceived legitimacy of providing the service, confidence in its effectiveness, and a commitment to providing it following rules and guidelines.

In examining possibilities for systematically increasing and improving PA/ET advising in the HCS, the conceptual framework developed to improve medical practice<sup>123</sup> is useful (Figure 5).

Presently, the key part of the framework is the priority for several reasons. Because the priority of PA/ET advising is low in ranking among the functions of the HCS in general and in most of its functional units, the perceived need in the system for organizational changes and changes in the content of the advising service is weak. Second, the changes needed to deliver PA/ET advising systematically, especially in small units, and the changes in the content of this service are not great and do not require extensive organizational, fiscal, or other resources. The needed resources can often be made available and put into use when the priority of PA/ET advising is sufficiently high.

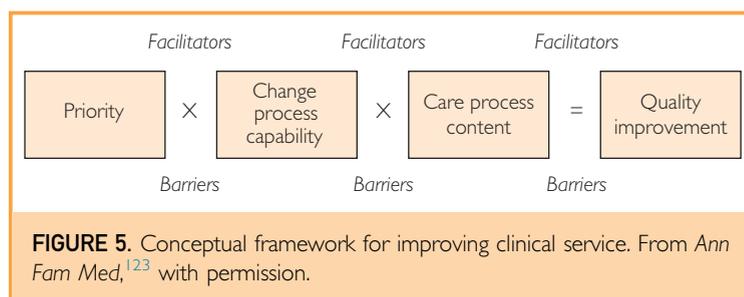
One possibility to increase the priority of PA/ET advising and PA promotion in the HCS would be to make attempts to change the connotation of the words *PA* and *ET* away from recreation and sports and closer to medically useful terminology. Because the effects and potential use of PA and ET can be compared with those produced by pharmaceutical drugs, PA and ET should be seen and dealt with in the same ways as pharmaceutical agents and other medical interventions in the HCS. Logical consequences would be that PA and ET would be included as an essential part in the basic and continuing education and training of physicians, physician assistants, nurse practitioners, nurses, etc; there would be established rules and processes to assess the PA needs of individual patients, to prescribe it, to deliver it, to follow up, and to reimburse the services related to it; and there would be funding and opportunities to conduct clinical research on its efficacy, effectiveness, feasibility, interactions, and comparability with other means, its risks, etc, and to conduct applied

behavioral research. This approach is included in the global Exercise is Medicine initiative.<sup>124</sup> Using the slogan “exercise is medicine” may also be useful in marketing PA/ET to the public to improve its status and increase the demand for PA/ET advising.

Another approach to raise the priority of PA/ET advising and possibly other PA promotion services in the HCS would be to make them accepted as performance measures and in the United States as Healthcare Effectiveness Data and Information Set measures in appropriate connections. The consequence would be the same development as outlined previously herein.

A third approach to increase the priority of PA and ET would be to make the potential of PA/ET and the ways and means to use this potential better known to health professionals, especially to physicians, by publishing original research and thorough reviews on various aspects of PA and ET and their use for health in respected scientific and professional journals with large medical readership. Until now, most reports of research related to the health-enhancing potential of PA/ET and its use have been published in journals that are read by only a small number of health professionals, particularly clinicians. The result is the frequently reported “lack of knowledge.” The knowledge is there, but not easily at hand. Good examples of articles generating great interest and impact in the medical community are the highly cited reports on primary prevention of type 2 diabetes mellitus in the *New England Journal of Medicine*<sup>125,126</sup> and the series of articles in the *Lancet* in connection with the London Olympic Games.<sup>127</sup> What is said herein applies also to conference presentations.

One essential condition for increasing the priority of PA and ET and services related to them in the HCS is that they will be accepted by the leading medical and public health



experts and by the leading scientific and professional organizations as a means to further their goals and to be included in their interests and activities. Furthermore, this acceptance is a key condition to getting the change process in [Figure 5](#) initiated and performed effectively and leading to sustainable changes. The real breakthrough of PA/ET as medicine has to take place in the medical community and medical practices, and it has to be supported and performed by their members. There is great need for credible, strong, and skillful advocacy to convince the right people and the right organizations inside the medical community to work for this change.

In the meantime, much can be done. When willingness to increase and improve PA/ET-related services is sufficient, the change process can be accomplished, especially in small clinical units, by paying attention to the realization of the following factors: strong effective leadership, a commonly understood framework and infrastructure for managing the process, people at all levels who have change management skills, adequate time and resources allocated to the process, an appropriate clinical information system, good communication and management skills, a high degree of team work, individual accountability, and a high degree of involvement and engagement of personnel at all levels.<sup>123</sup>

An important goal of the change process is to rationalize the work of the clinicians and, thus, improve their motivation and to increase the amount and improve the quality of the provided service. One means to this end is to decrease the time and other resources needed to deliver the advising. Although it would be desirable to provide this service by using thorough behavior change processes, the competing interests and pressure on resources in the HCS do not typically allow this practice. Considerable evidence suggests that in terms of using the resources and the effectiveness of the intervention, brief counseling sessions are the most appropriate means to promote ET in the health care units.<sup>63,72,88,113,116,119</sup> The tasks of physicians and other clinicians and paramedical staff could be limited mainly to this stage, and the next steps can be successfully conducted by other health and exercise professionals.<sup>24,30,38,51,55,86,87</sup> Especially, methods including more than brief advising on ET are recommended to be used selectively on patients with increased risk of

diseases and having factors favoring considerable potential to gain from the measures.<sup>81</sup>

Another means to increase the willingness of health care personnel to offer PA/ET advising and to improve its applicability and effectiveness is to develop structured but feasible protocols tailored to local conditions. The protocols should include the whole chain of measures: recording patients' PA as a vital sign; assessing patients' needs, risks, and resources for ET; individualized ET prescriptions; rules and processes of ETR; necessary materials; tools for monitoring and self-monitoring ET; and providing information about sites and services for PA and ET until following up adherence to the program and assessing its effects.<sup>30,32,46,86,116,128</sup> A simple, widely used, and valid protocol in behavioral counseling is the 5As (ask, advise, assess, assist, arrange).<sup>129</sup>

The advising would be faster and its quality would be better if practitioners would have valid and readily available tools to review the background and rationale for PA/ET for specified indications and modifiable model advice to be given to their patients. On this basis, a Web-based tool, Exercise Medicine (Liikuntaa Lääkkeeksi in Finnish), was developed by one of us (I.M.V.). The tool consists of a complete, but concise, package of reliable information to support prescribing PA for 35 indications. The information includes the following indication-specific sections, each to be viewed on one screen page: connection of PA to the indication giving the rationale for PA; clinically relevant and patient-centered benefits of PA in prevention, treatment, and secondary prevention/rehabilitation as appropriate; risks and potential adverse effects of PA; advisability and limitations of PA; rationale/basis for planning an appropriate PA regimen; and ready-written 1-page advice (recommendation, prescription) for appropriate PA for the person and for the given indication to be printed or e-mailed as needed. The prescriber can make changes to the advice. The tool is readily available free of charge for medical professionals on the website of the Finnish Medical Association, and for the public by using a link in the Web journal for patients of the Finnish Medical Journal.<sup>13</sup> Within 1 month of offering this possibility, the tool was viewed approximately 11,000 times.

The frequently mentioned barriers to PA/ET advising included a variety of items related to lack of adequate education and training of physicians and other health care professionals on the health-related aspects of PA and ET, the characteristics of the PA or ET needed for different indications, and the principles and methods of counseling. This education and training would not only increase knowledge but would also influence positively some other barriers, such as attitudes toward and perceptions of counseling, and improve the quality of the counseling services. Substantial improvement can be gained by providing educational materials, emphasizing use of the numerous clinical guidelines and recommendations on the use of ET as medicine,<sup>12,31,82</sup> and attending short courses. It is important to communicate to physicians and other health care professionals, especially PHC physicians, that encouraging patients to be more active does not require a lot of detailed information. Current PA guidelines in many countries emphasize that “more activity is better than none” and “more is better than less, at least up to a point.” Walking is the most common PA in most individuals. The physician’s advice can be simply “sit less and try to walk more each day.” The current guidelines establish a target of 150 min/wk of moderate-intensity PA, such as walking, and this dose will produce important changes in health outcomes. An example of the benefit of even less PA in sedentary populations is the Dose-Response to Exercise in Postmenopausal Women study, which was a large randomized trial in sedentary postmenopausal women. In this study, important benefits were observed in the low-dose ET group, which was engaging in 72 minutes of moderate-intensity PA per week.<sup>130,131</sup> However, a more sustainable and thorough solution would be to include PA and ET medicine in the core curriculum of medical schools and residency/fellowship programs.<sup>12,47,128</sup>

An obvious need in the efforts to increase PA/ET counseling in the HCS based on consultation fees paid by individual patients is to make it a reimbursable item. Realization of this condition is supported by continuously improving the service, by producing further evidence of its effectiveness and cost-effectiveness, and by using this evidence persistently and skillfully in high-level advocacy.

## ALARMING TRENDS IN DAILY LIFE

In terms of daily EE, modern society has changed enormously during the past several decades. We have dramatically reduced EE in many aspects of life in highly developed countries. It has recently been reported that during the past 50 years, occupational PA has substantially declined in the United States (Figure 2, A),<sup>6</sup> and during the past 45 years there have been very marked reductions in household management EE (HMEE) in women (Figure 2, B).<sup>7</sup> These reductions in HMEE amount to greater than 1800 calories per week. During this period, the amount of time in screen-based media exposure has also increased, and although leisure time PA has slightly increased, this does not nearly make up for the very marked reductions in EE from reductions in HMEE. These data have very serious implications regarding the risk of obesity and other chronic diseases, particularly CVD, not to mention the potential downstream effect on the next generation. National guidelines in several countries call for 150 min/wk of moderate PA or 75 min/wk of vigorous PA,<sup>3</sup> and the US Institute of Medicine has suggested that all individuals should do 60 min/d of total PA.<sup>132</sup> Although currently very few are meeting these guidelines, even if these guidelines were met, it would not make up for the very marked reductions in HMEE and occupational PA.

## CONCLUSION

We must continue to encourage increases in PA, which would lead to EE and improvements in physical fitness (cardiorespiratory and musculoskeletal fitness) and likely reductions in chronic diseases, especially CVD. The HCS and, particularly, physicians have important roles to play: to give an important signal and example of the necessity of PA/ET for health to the policy and decision makers and to the people and to use their means to encourage patients to increase their PA/ET. There is much potential to increase and improve PA promotion activities in the HCS by systematically exploring and applying the information available in the basic and applied behavioral and interventional research and by experimenting and applying new ways of organizing and performing the practical work.

**Abbreviations and Acronyms:** CVD = cardiovascular disease; DPP = death prevented or postponed; EE = energy expenditure; ET = exercise training; ETR = exercise training referral; HCS = health care system; HMEE = household management energy expenditure; PA = physical activity; PC = perfect care; PHC = primary health care; PIA = physical inactivity; QALY = quality-adjusted life year

**Data Previously Presented:** A shorter version on the same topic, based on an invited lecture presented by Ilkka Vuori in the DSPG—100 Jahre—Deutsche Sportmedizin, Internationaler Jubiläumskongress, October 4-6 2012, Berlin, has been published on invitation in the Special Issue for *Exercise is Medicine of the Deutsche Zeitschrift für Sportmedizin/ German Journal of Sports Medicine*.<sup>133</sup>

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