

## Characteristics of Inactive Primary Care Patients: Baseline Data from the Activity Counseling Trial

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**Background.** Although many primary care patients are inactive, being able to classify even small amounts and intensities of activity and factors associated with these activity levels could be helpful for physicians who are trying to motivate their patients to become more physically active.

**Methods.** Sociodemographics, physical activity, fitness, other cardiovascular risk factors, and psychosocial measures were measured at baseline in the 874 patients in the Activity Counseling Trial. Patients were categorized into three groups: (1) no moderate-to-vigorous physical activity (MVPA), (2) some moderate but no vigorous activity, and (3) some vigorous activity. Multiple logistic regression was used to determine factors cross-sectionally associated with activity intensity.

**Results.** One or more cardiovascular risk factors in addition to physical inactivity were present in 84% of participants. Maximal oxygen uptake averaged 25.2 ml/kg/min; 85% had poor to fair aerobic fitness. Physical activity averaged 32.7 kcal/kg/day, with 13.5 min of MVPA/day; 26% engaged in some vigorous activity, 11% engaged in no MVPA. In unadjusted analyses, gender, age, race, education, income, employment, smoking, alcohol use, and exercise self-efficacy were associated

with activity intensity ( $P = 0.05-0.001$ ). A greater percentage engaged in moderate than in vigorous activity in all subgroups. In multiple logistic regression analyses, odds ratios (95% confidence intervals) for engaging in vigorous activity were 0.39 (0.28, 0.56) for women, 0.38 (0.19, 0.75) for 65+ compared with 35- to 44-year-olds, and 1.14 (1.06, 1.22) for 10-unit increases in performance self-efficacy score.

**Conclusions.** Most primary care patients who are physically inactive have additional cardiovascular risk factors, particularly overweight and obesity. All subgroups pursue moderate-intensity activity more often than vigorous activity. Women, older persons, and those with lower exercise self-efficacy are less likely to engage in vigorous activity. © 2000 American Health Foundation and Academic Press

**Key Words:** physical activity; exercise; patient education; health behavior.

### INTRODUCTION

Physical inactivity is an independent risk factor for cardiovascular disease. Health care providers can play an important role in delivering advice, education, and counseling to increase physical activity among their patients. Descriptions of physically inactive patient populations, including intensities of activities being performed and factors associated with activity patterns, may help in planning patient counseling. Advice and counseling is recommended by the American Heart Association [1,2], the National Heart, Lung, and Blood Institute [3–5], the U.S. Preventive Services Task Force [6], and “Healthy People 2000” [7]. Americans average about three physician office visits per year [8], patients want information about physical activity from their

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physicians [9], and physicians' advice to exercise is associated with patients' physical activity levels [10]. Many health care providers, however, do not routinely counsel patients about physical activity [11–16], due to barriers that include lack of time, reimbursement, standardized protocols, counseling skills, and confidence in the effectiveness of counseling [11,13–16]. Interventions in health care settings can achieve significant effects on physical activity and cardiorespiratory fitness, especially using follow-up visits, behavioral approaches, and monitoring, but few studies have been in primary care settings [17]. A focus on primary care for this important preventive health behavior is needed.

This paper reports baseline cross-sectional analyses from participants in the Activity Counseling Trial (ACT) [18–20] who were physically inactive primary care patients without evidence of cardiovascular disease or other serious conditions and had a planned physician appointment. Factors associated with engaging in different intensities of physical activity are examined.

## METHODS

ACT was a 5-year multicenter, randomized controlled trial involving clinical centers at Stanford University in Palo Alto, California; the University of Tennessee at Memphis, Tennessee; and the Cooper Institute for Aerobics Research with the University of Texas Southwestern Medical Center in Dallas, Texas; a coordinating center at Wake Forest University School of Medicine in Winston-Salem, North Carolina; and a project office at the NHLBI in Bethesda, Maryland. ACT was designed to evaluate the effectiveness of two patient education and counseling interventions to increase physical activity and cardiorespiratory fitness among inactive adult patients in the primary health care setting [19]. Baseline data collected prior to randomization are presented in this paper.

### *Setting and Participants*

The ACT clinical centers enlisted eight primary care facilities, including hospital-associated community outpatient clinics, large multispecialty group practices, and primary care internal medicine and family practice clinics, for a total of 51 physicians, 4 physician assistants, and 1 nurse practitioner. ACT participants were community-dwelling adults, 35–75 years of age, without a history or evidence of coronary heart disease, who were patients of an ACT primary care provider and physically inactive. ACT was designed to test interventions that could be incorporated into usual clinical practice, so participants must have been scheduled or planning to see a study physician during the recruitment period of the study.

Physical inactivity was defined as expenditure of 35

kcal/kg/day or less measured by the 7-day physical activity recall (PAR) [21,22]. A value of 32 kcal/kg/day is obtained with 8 hours of sleeping and sitting or light activity the remainder of the day, with no moderate-to-vigorous activity. (Moderate-intensity activity is equivalent to brisk walking, whereas vigorous activity is equivalent to jogging or running.) Participants must have been in stable health and if on medication for a chronic condition, on a stable dose for 3 months. Participants must have been willing to participate, independent in activities of daily living, and able to increase physical activity and must have given informed consent. More details on inclusion and exclusion criteria are reported elsewhere [19]. The study protocol was approved by the Human Subjects Committees of participating institutions and by an NHLBI-appointed Data and Safety Monitoring Board.

Recruitment took place over 18 months and is described in detail elsewhere [23]. Methods to identify potential participants included computerized databases, appointment logs, medical record review, patient questionnaires, and responses to a mailed letter. Three screening visits were conducted to determine final eligibility. Data are from the 874 participants who provided consent, passed the screening examinations, and were randomized.

### *Measurement and Definition of Variables*

Demographic and socioeconomic measures obtained by self-report included gender, age, race/ethnicity, education level, household income, employment status, and marital status. Race/ethnicity categories were white, black, and other (Hispanic/Latino, American Indian/Native Alaskan/Aleutian, Asian, and other). Because relationships may not be linear, continuous demographic variables were categorized for analyses. Age was categorized as 35–44 years, 45–54 years, 55–64 years, and 65+ years. Education categories were less than high school graduation, high school graduate, some college, college graduate, and some postgraduate education; the first two categories were combined for some analyses due to small percentages. Household income categories were <\$20,000, \$20,000–29,000, \$30,000–49,000, \$50,000–75,000, and \$75,000+. Employment status was characterized as homemaker, employed, retired, or unemployed; the latter category included unemployed, disabled, student, or medically disabled. Marital status was previously married (divorced, separated, or widowed), currently married or cohabiting, or never married. Alcohol use was measured by self-report questionnaire, and participants were categorized as alcohol users or nonusers.

Cardiovascular risk factors were measured by standard methods. Resting blood pressure (BP) was obtained by three seated readings 1 min apart using a

standard sphygmomanometer and the results were averaged. Hypertension was defined as  $\geq 140$  mm Hg systolic BP or  $\geq 90$  mm Hg diastolic BP or on antihypertensive medication [4]. Plasma lipids and lipoproteins were analyzed on fasting blood by a central laboratory, with LDL-C calculated [24]. High blood cholesterol was defined as LDL-cholesterol  $\geq 160$  mg/dl or on lipid-lowering medication [3]. Body mass index (BMI) was calculated as weight over height squared ( $\text{kg}/\text{m}^2$ ); BMI 25 to less than 30 defined overweight and 30 or higher defined obesity [25]. History of diabetes and smoking were assessed by self-report questionnaire; smoking was categorized as current, past, or never being a smoker.

Psychosocial and behavioral variables that are hypothesized determinants of physical activity were selected for analysis. Perceived level of stress was measured by the Cohen Perceived Stress Scale, a 14-item scale that is a global measure of chronic stress including anxiety, lack of control over life situations, and coping with stress [26,27]; the mean (SD) from community samples is approximately 19 (8.6) [28]. Depressed affect was measured by the Beck Depression Inventory, a standard instrument of 21 items [29,30]; a score of 18–22.9 indicates moderate depression and a score of  $\geq 23$  indicates severe depression [31]. Confidence in one's ability to exercise, termed exercise self-efficacy, was measured by two scales. The first scale measured self-efficacy for overcoming barriers (barriers self-efficacy); this scale was adopted from a previous study [32] and consists of 14 items assessing the participant's perceived ability to be physically active when faced with various barriers. The second scale, called performance self-efficacy and developed for ACT based on the self-efficacy construct [33], consisted of 5 items asking about confidence in ability to walk briskly for different durations of time.

Physical activity was assessed by the 7-day PAR [21, 22], which is a structured interview in which the participant estimates the amount of time spent each day during the past 7 days in four intensity categories of activity: sleep and moderate, hard, and very hard physical activity. Time in light activity is obtained by subtraction. The type of specific activities is not recorded. Moderate activity is defined for the participant as equivalent to brisk walking and very hard activity as equivalent to running, with hard activity between the two. The amount of time spent in each category is multiplied by that category's average metabolic equivalent (MET) and the results are summed to obtain an estimate of energy expenditure in kcal/kg/day. Minutes spent in moderate and vigorous (hard plus very hard) activities were calculated. The PAR was administered twice, at least 7 days apart, and the results were averaged.

Cardiorespiratory fitness was assessed by measuring maximal oxygen uptake ( $\text{VO}_2\text{max}$  in ml/kg/min by gas

exchange) and maximal METs using a graded maximal treadmill test; the test was halted at volitional fatigue or standard stopping criteria [34]. Age-specific norms from the American College of Sports Medicine were used to categorize fitness levels as excellent, good, average, fair, or poor [34].

Measurement quality control was maintained by central study training and oversight, standardized procedures and forms, standardized equipment with regular calibration, completeness checks of self-report instruments, electronic transfer of data, and audiotapes for quality control of a sample of PAR interviews [19].

### Analyses

Characteristics analyzed for descriptive purposes include demographics, socioeconomic measures, physical activity and cardiorespiratory fitness, and other cardiovascular risk factors. Mean (SD) or proportion was determined overall and by gender, with no statistical testing.

Data from the 7-day PAR were used to determine whether participants engaged in any moderate or vigorous (hard plus very hard) activity, and participants were categorized into three activity groups: (1) no moderate or vigorous physical activity, (2) some moderate intensity but no vigorous intensity activity, and (3) some vigorous activity. Demographic, socioeconomic, and psychosocial factors and other behaviors (smoking and alcohol use) were examined to determine factors associated with activity category. Statistical comparisons were conducted by  $\chi^2$  tests for categorical variables and analysis of variance for continuous variables. Nonparametric analyses (Kruskal–Wallis tests) also were conducted for the psychosocial variables, since these tended to have skewed distributions [35].

Because individuals who engage in vigorous activity may be different from those who don't, the "no MVPA" and the "some moderate" physical activity categories were combined for a multiple logistic regression analysis to examine factors associated with engaging in some vigorous activity versus no vigorous activity. Backward selection was used to determine a final model of significant independent variables, with significance level for remaining in the model set at  $P < 0.05$ . Site was forced to remain in the model to ensure control for that variable. Collinearity between independent variables was examined using linear regression analyses, with eigenvalues of 30–100 considered moderate to strong collinearity [36]. The largest eigenvalue was 21.52, indicating that collinearity between independent variables was not a problem.

## RESULTS

About 90% of the participants were under 65 years of age, with similar distributions for both men and women

(Table 1). One-third were minorities, with a greater proportion among women than among men. Over three-quarters of the participants had some college education, and men had higher education levels than women. Over 40% of participants had household incomes \$75,000 or more per year and nearly 25% made  $\leq$ \$30,000; men had higher incomes than women. Almost 80% of participants were employed, with more homemakers and unemployed among women than men. Over 90% were, or had been, married, with a greater proportion of men currently married than women. Less than half of women and two-thirds of men used alcohol.

Mean BP level was 120/78 mm Hg, which is at the cutpoint for the optimal recommended BP level [4] (Table 2). Hypertensive patients comprised over one-third of the participants and had a mean BP of 130/83 mm Hg, with 43% (133/312) uncontrolled at  $\geq$ 140/90 mm

Hg [4]. Mean LDL-C was 129 mg/dl, which is at the recommended level [3]. Hypercholesterolemic patients comprised a quarter of the participants and had a mean LDL-C of 165 mg/dl with 72% (143/200) uncontrolled at LDL-C  $\geq$ 160 mg/dl [3]. Less than 10% had a self-reported history of diabetes mellitus. Three-quarters were overweight or obese, with a mean BMI at the cutpoint for defining obesity [25]. Over 90% were non-smokers, with a somewhat higher proportion of past smokers among men. About 85% had one or more CVD risk factors in addition to physical inactivity, i.e., hypertension, high LDL-C, diabetes, overweight/obesity, or smoking.

The mean energy expenditure from the 7-day PAR was 32.7 kcal/kg/day, with slightly lower values among women than among men (Table 3). On average, the participants spent 11.5 min/day in moderate-intensity activity and 2.0 min/day in vigorous activity (hard or very hard), for a total of 13.5 min/day of moderate-to-vigorous physical activity (MVPA). Maximal oxygen uptake ( $VO_{2max}$ ) and maximal METs were higher among men than among women. (For comparison, maximal oxygen uptake for average aerobic fitness from age 40 to 59 for men is 32.5–40.0 and for women is 26.0–32.5, and maximal METs for 40- to 64-year-olds and for 65- to 79-year-olds are estimated to be 10 and 8, respectively [37]. Less than 5% had good to excellent cardiorespiratory fitness, whereas almost 85% had poor to fair fitness.

Participation in moderate-intensity but no vigorous activity was reported among 539 (62%) participants. They reported participation in moderate-intensity activity on average 1.7 days/week and averaged 12.6 min/day over all days of the week (averaging about 52 min on the days of activity). Participation in vigorous activity was reported by 238 (27%) participants. They reported participating in vigorous activity on average 1 day/week and averaged 7 min/day over all days of the week (averaging 49 min on the days of vigorous activity). In addition they reported participating in moderate-intensity activity on average 1.8 days/week and averaged 13 min/day over all days of the week (averaging 51 min on the days of moderate-intensity activity).

Unadjusted relationships of demographic, socioeconomic, and other behaviors (smoking and alcohol use) to the three physical activity categories were significant at  $P < 0.05$  (except that menopausal status for women was not significant), with no adjustments for multiple comparisons (Table 4). Participants overall, and for each subgroup defined by the characteristics, were more likely to engage in some moderate rather than some vigorous activity. Men were more likely to engage in vigorous activity than women. Participants 65+ years of age were less likely to engage in vigorous activity, though more likely to engage in moderate activity, than younger participants. The percentage engaging in some

**TABLE 1**

Characteristics of ACT Participants at Baseline by Gender;  
Number (Percentage within Gender)

Characteristic	Men (n=479)	Women (n=395)	Total (n=874)
Age			
35–44	135 (28)	101 (26)	236 (27)
45–54	185 (39)	168 (43)	353 (40)
55–64	103 (22)	79 (20)	182 (21)
65+	56 (12)	47 (12)	103 (12)
Race Ethnicity			
White	338 (71)	248 (63)	586 (67)
Black	95 (20)	120 (30)	215 (25)
Hispanic/Asian/other	46 (10)	27 (7)	73 (8)
Highest school grade			
<High school graduate	14 (3)	33 (8)	47 (5)
High school graduate	30 (6)	61 (15)	91 (10)
Some college	87 (18)	158 (40)	245 (28)
College graduate	155 (32)	76 (19)	231 (26)
Postgraduate	193 (40)	67 (17)	260 (30)
Household income <sup>a</sup>			
<\$20,000	40 (8)	80 (21)	120 (14)
\$20,000 to <\$30,000	16 (3)	55 (15)	71 (8)
\$30,000 to <\$50,000	61 (13)	91 (24)	152 (18)
\$50,000 to <\$75,000	97 (21)	63 (17)	160 (19)
\$75,000+	257 (55)	90 (24)	347 (41)
Employment status <sup>a</sup>			
Homemaker	1 (0)	46 (12)	47 (5)
Employed	409 (85)	275 (70)	684 (78)
Retired	46 (10)	43 (11)	89 (10)
Unemployed	23 (5)	30 (8)	53 (6)
Marital status <sup>a</sup>			
Previously married	53 (11)	129 (33)	182 (21)
Married/cohabiting	388 (81)	224 (57)	612 (70)
Never married	37 (8)	42 (11)	79 (9)
Alcohol use			
Nonuser	153 (32)	232 (59)	385 (44)
User	326 (68)	163 (41)	489 (56)

<sup>a</sup> Household income not available on 24 participants; employment and marital status not available on 1 participant each; denominators are those for whom data are available.

**TABLE 2**

Cardiovascular Disease Risk Factors of ACT Participants at Baseline (Percentage within Gender)

Risk factor	Men ( <i>n</i> = 479)	Women ( <i>n</i> = 395)	Total ( <i>n</i> = 874)
Hypertension, <i>n</i> (%)	169 (35)	143 (36)	312(36)
No hypertension, <i>n</i> (%)	310 (65)	252 (64)	562 (64)
Blood pressure, mm Hg, mean (SD)	121/80 (13/8)	118/75 (15/9)	120/78 (14/9)
High LDL-cholesterol, <i>n</i> (%) <sup>a</sup>	120 (26)	80 (21)	200 (24)
Borderline to normal LDL-C, <i>n</i> (%)	345 (74)	297 (79)	642 (76)
LDL-C, mg/dL, mean (SD)	131 (33)	126 (34)	129 (33)
History of diabetes mellitus, <i>n</i> (%)	38 (8)	30 (8)	68 (8)
No history of diabetes mellitus, <i>n</i> (%)	441 (92)	365 (92)	806 (92)
Obese <sup>a</sup> , <i>n</i> (%)	158 (34)	182 (47)	340 (40)
Overweight, <i>n</i> (%)	206 (44)	97 (25)	303 (35)
Not overweight or obese, <i>n</i> (%)	105 (22)	107 (28)	212 (25)
BMI, kg/m <sup>2</sup> , mean (SD)	28 (7)	30 (3)	29 (6)
Current smoker <sup>a</sup> , <i>n</i> (%)	38 (8)	40 (10)	78 (9)
Past smoker, <i>n</i> (%)	180 (38)	118 (30)	298 (34)
Never smoker, <i>n</i> (%)	258 (54)	235 (60)	493 (57)
≥One CVD risk factor <sup>a</sup> , <i>n</i> (%)	412 (87)	319 (82)	731 (85)
No CVD risk factors, <i>n</i> (%)	61 (13)	69 (18)	130 (15)

<sup>a</sup> Cholesterol not available on 32 participants; BMI not available on 19 participants; smoking not available on 5 participants; total CVD risk factors not available on 13 participants; percentages are for those for whom data are available.

vigorous activity was highest for whites and lowest for blacks; the percentage engaging in no MVPA was somewhat higher among blacks than among the other two race/ethnicity groups. The higher the education level, the greater the participation in some vigorous activity, and those with higher income levels were more likely to engage in vigorous activity than those with lower income levels. Homemakers and retired persons were

less likely to engage in vigorous activity, but more likely to engage in moderate activity, than employed persons. Smokers were less likely to engage in vigorous activity, and never smokers were more likely to engage in some MVPA. Alcohol users were more likely to engage in some vigorous activity than nonusers.

Regarding psychosocial factors, perceived stress was not related to physical activity (Table 5). Depressive

**TABLE 3**

Physical Activity and Cardiorespiratory Fitness Measures of ACT Participants at Baseline

Activity or fitness measure	Men ( <i>n</i> = 479) Mean (SD)	Women ( <i>n</i> = 395) Mean (SD)	Total ( <i>n</i> = 874) Mean (SD)
Total daily physical activity (kcal/kg/day)	32.9 (1.0)	32.4 (0.9)	32.7 (1.0)
Moderate activity (min/day)	12.3 (12.8)	10.5 (11.7)	11.5 (12.4)
Hard activity (min/day)	2.3 (6.7)	0.8 (3.5)	1.6 (5.5)
Very hard activity (min/day)	0.5 (2.1)	0.2 (1.3)	0.4 (1.8)
Moderate, hard, or very hard activity (min/day)	15.1 (15.3)	11.5 (12.3)	13.5 (14.1)
Maximal oxygen uptake (VO <sub>2</sub> max) (ml/kg/min)	28.8 (6.5)	20.7 (5.4)	25.2 (7.2)
Maximal METS	8.2 (1.9)	5.9 (1.5)	7.2 (2.1)
Aerobic age standards	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Excellent	11 (2)	3 (1)	14 (2)
Good	13 (3)	11 (3)	24 (3)
Average	72 (15)	22 (6)	94 (11)
Fair	112 (23)	57 (14)	169 (20)
Poor	270 (56)	302 (76)	565 (65)

**TABLE 4**

Relationship of Hypothesized Determinants of Physical Activity to Three Physical Activity Patterns: Unadjusted Analyses, Number (Percentage within Characteristic)

Characteristic	No moderate or vigorous activity	Some moderate, no vigorous activity	Some vigorous activity	<i>P</i> value
Overall	97 (11)	539 (62)	238 (27)	—
Male	46 (10)	255 (53)	178 (37)	0.001
Female	51 (13)	284 (72)	60 (15)	
35–44 years of age	24 (10)	140 (59)	72 (30)	0.05
45–54 years of age	42 (12)	210 (60)	101 (29)	
55–64 years of age	20 (11)	111 (61)	51 (28)	
65 years of age	11 (11)	78 (76)	14 (14)	
White	61 (10)	345 (59)	180 (31)	0.02
Black	29 (14)	144 (67)	42 (20)	
Hispanic/Asian/other	7 (10)	50 (69)	16 (22)	
High school graduate	6 (13)	35 (75)	6 (13)	0.009
High school graduate	12 (13)	64 (70)	15 (17)	
Some college	31 (13)	157 (64)	57 (23)	
College graduate	25 (11)	134 (58)	72 (31)	
Postgraduate	23 (9)	149 (57)	88 (34)	
<\$20,000/year	12 (10)	86 (72)	22 (18)	0.001
\$20,000 to <\$30,000/year	10 (14)	54 (76)	7 (10)	
\$30,000 to <\$50,000/year	23 (15)	96 (63)	33 (22)	
\$50,000 to <\$75,000/year	19 (12)	94 (59)	47 (29)	
\$75,000/year	29 (8)	193 (56)	125 (26)	
Homemaker	5 (11)	37 (79)	5 (11)	0.002
Employed	77 (11)	399 (58)	208 (30)	
Retired	9 (10)	68 (76)	12 (14)	
Unemployed	5 (9)	35 (66)	13 (25)	
Current smoker	14 (18)	51 (65)	13 (17)	0.05
Past smoker	33 (11)	189 (63)	76 (26)	
Never smoker	49 (10)	296 (60)	148 (30)	
Alcohol user	47 (10)	279 (57)	163 (33)	0.001
Non-alcohol user	50 (13)	260 (68)	75 (20)	

symptoms score was of borderline significance ( $P = 0.06$ ), with lower scores among those who did some vigorous activity. The two self-efficacy scales were statistically significant (both  $P < 0.001$ ) and showed a graded relationship, with greater self-efficacy for those who engaged in some moderate activity compared with no MVPA and some vigorous activity compared with some moderate activity.

Upon adjustment for multiple factors by logistic regression, race/ethnicity, education level, income, employment status, smoking, alcohol use, and barriers to self-efficacy were not statistically significant and were not retained in the final model (Table 6). The following groups were significantly less likely to engage in some vigorous activity: women compared with men, patients 65 years or older compared with patients 35–44 years

**TABLE 5**

Relationship of Psychosocial Factors to Three Physical Activity Patterns: Unadjusted Analyses, Mean Scores (SD)

Psychosocial measure	No moderate or vigorous activity	Some moderate, no vigorous activity	Some vigorous activity	<i>P</i> value
Cohen perceived stress score ( $n = 845$ )	23.3 (9.4)	23.3 (9.6)	23.0 (8.8)	0.90
Beck depression score ( $n = 848$ )	6.4 (6.4)	6.4 (5.5)	5.4 (4.0)	0.06
Barriers self-efficacy score ( $n = 844$ )	55.4 (20.4)	60.9 (18.7)	64.0 (17.3)	0.0006
Performance self-efficacy score ( $n = 827$ )	57.6 (28.2)	64.2 (25.9)	74.0 (22.2)	0.0001

of age, and patients with lower scores on the performance self-efficacy measure.

## DISCUSSION

Participants were physically inactive primary care patients who volunteered to be in the ACT study of physical activity counseling. The demographic characteristics included a broad range of ages, both genders, and a relatively large percentage of minorities. Although a wide range of ages and income groups were represented, the education and income levels indicated a higher socioeconomic status than would be representative of a general clinical population. This difference may be a reflection of patient interest in participating in a research study, selective patient motivation to increase physical activity, and/or selection of the particular primary care sites.

Eligibility criteria required no history or evidence of coronary heart disease. Almost 85% of the participants had at least one CVD risk factor in addition to being physically inactive: hypertension, hypercholesterolemia, diabetes, overweight/obesity, or smoking. Physical activity is recommended for prevention and treatment of these conditions [1–4,25], so the ACT sample represents an important patient population for physical activity education and counseling. About a third were hypertensive and about a quarter were hypercholesterolemic; 43% of the hypertensive patients and 72% of the hypercholesterolemic patients did not have these risk factors controlled at current recommended levels [3,4]. Three-quarters of the participants were overweight or obese, the most prevalent CVD risk factor, for which physical activity is an important treatment modality [25].

The physical activity and cardiorespiratory fitness levels indicate that the ACT sample was a physically inactive, unfit, patient population. Average maximal oxygen uptake and maximal METs in ACT participants were lower than levels considered average in the general population, and the large majority of participants had poor to fair aerobic fitness. Participants engaged

on average in only about 14 min a day of MVPA. The 7-day PAR counts activities that last 10 min or longer in duration, so even a 10-min walk to the bus stop, for example, counts in these average minutes.

About 11% of the participants engaged in no MVPA at all, whereas almost two-thirds engaged in some moderate-intensity, but no vigorous, activity. Within each category of demographics and socioeconomic level, a greater proportion engaged in some moderate-intensity activity than in some vigorous activity. This preference for moderate-intensity activity has been seen elsewhere [37]. Over one-quarter of the participants engaged in some vigorous activity, averaging 7 min/day in vigorous and 13.5 min in moderate-intensity activity, for a total average of about 20 min a day of MVPA, which approaches the current recommendation of 30 min a day [38]. The 89% of participants who engaged in moderate-intensity or vigorous activity tended to engage in longer durations of activity in fewer days per week than the current recommendations of regular, daily activity of 30 min duration. We do not know whether the moderate-intensity activity consisted primarily of housework/yardwork or of time set aside specifically to be active, such as walking, because we lack data on specific types of activities, which are not collected in the 7-day PAR.

In unadjusted analyses, the following demographic, socioeconomic, and psychosocial factors and other behaviors (smoking and alcohol use) significantly associated with physical activity pattern were expected, having been observed in national surveys of physical activity [37]: gender, age, race/ethnicity, SES (by education, income, and employment status), and smoking. We also found, in unadjusted analyses, that alcohol use was associated with physical activity, a finding seen in some other studies [39,40]. The relationship between psychosocial factors and activity level revealed an inverse association with depressive symptoms and a direct association with self-efficacy. These findings were expected based on other studies and on hypotheses about determinants of physical activity [41,42] and on the relationship between physical activity and mental health [43].

When factors from multiple domains, i.e., demographics, socioeconomic variables, other health behaviors, and psychosocial measures, were examined simultaneously in a multiple logistic regression analysis, gender, age, and performance self-efficacy remained significantly associated with engaging in some vigorous activity. That women are less likely than men, and that older people are less likely than middle aged, to engage in vigorous physical activity has been seen in other studies and in population samples [37]. We found an association between self-efficacy and physical activity in this cross-sectional analysis; self-efficacy is associated with physical activity level in other studies and is

**TABLE 6**

Final Multiple Logistic Regression Model of Factors Associated with Some Vigorous Activity, Adjusted for Site

Characteristic	Odds ratio	(95% CI)	P value
Female (vs male)	0.39	(0.28, 0.56)	0.0001
Age (vs 35–44 years)			0.01 overall
45–54 years	1.01	(0.69, 1.50)	0.95
55–64 years	1.08	(0.68, 1.72)	0.74
65+ years	0.38	(0.19, 0.75)	0.005
Performance self-efficacy score (per 10 unit increase)	1.14	(1.06, 1.22)	0.0004

hypothesized to be a determinant, as well as a result, of higher physical activity [44–46].

The results indicate that even in a population selected to be physically inactive, there is still some participation in vigorous activity. Although there is a preference for moderate-intensity over vigorous-intensity activity, men and younger patients were more likely to engage in vigorous activity, implying that these groups may be more amenable to interventions that promote vigorous activity. In addition, self-efficacy appears to be an important correlate of physical activity, and physician advice that helps to build confidence remains an important counseling strategy. Furthermore, physicians can advise women and older patients, who seem to prefer moderate-intensity activity, that increasing the amount of physical activity can confer important health benefits [47].

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