Factors Associated With Regular Aerobic Exercise In An Elderly Population

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Abstract: Background: Little is known regarding the characteristics of elderly persons who do not regularly exercise. This lack of knowledge limits the design and marketing of exercise programs to persons who could benefit from regular exercise.

Methods: We compared characteristics of regular exercisers and nonexercisers among 561 randomly selected persons aged 65 years and older who were enrollees of a health maintenance organization. Baseline data were obtained on sociodemographics, health attitudes, and medical conditions.

Results: Of the 561 persons studied, 192 (34 percent) were regular exercisers. Exercisers were slightly younger than nonexercisers and reported more positive health perceptions. Nonexercisers tended to report lower incomes and lower educational levels than did exercisers. Exercisers were less likely to report hypertension, arthritis, or two or more of the following medical conditions: heart disease, hypertension, arthritis, and emphysema (odds ratio 0.49; confidence interval 0.28 to 0.86). Sex differences were present. In logistic regression analysis, higher reported income, better perception of current health, and fewer than two medical conditions were associated with regular exercise status.

Conclusions: Specific characteristics are present in persons who regularly exercise compared with those who do not. These findings may prove useful in understanding the dynamics of exercise behavior in this age group and in designing exercise interventions for this population. (J Am Board Fam Pract 1992; 5:467-74.)

Although more than 50 percent of older adults have no health or medically related restrictions on physical activity,1 fewer than 20 percent regularly exercise at an intensity sufficient to improve cardiovascular fitness.2 Such exercise has been shown to have benefits for younger persons,3-5 and there is promising evidence that suggests benefits for the elderly as well.6-8 Nevertheless, despite the growing interest in health promotion for older adults, and in exercise in particular, little research has been done to characterize elderly persons who perform regular aerobic exercise compared with those who do not. We therefore sought to determine the relation of selected demographic and socioeconomic factors, health attitudes, preventive health practices, and medical conditions with regular aerobic exercise in elderly persons.

Methods

Study Site

Group Health Cooperative (GHC) is a large, closed-panel, not-for-profit health maintenance organization (HMO) with more than 350,000 members including a senior (aged 65 years and older) population of more than 45,000. The Group Health Senior Health Promotion Program, supported by research and demonstration grants from the Centers for Disease Control and the Kellogg Foundation, involves randomly sampled enrollees who are 65 years and older and who receive their care at one of three central Seattle GHC primary care clinics. The research and demonstration project includes a randomized controlled trial to evaluate this senior health promotion program, which consists of a 60- to 90-minute nurse visit in which health risks are discussed and specially designed follow-up inter-


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ventions are undertaken. The goals of the pro-
gram are to reduce the occurrence or progression
of disability among ambulatory older adults and
to integrate health promotion and disease preven-
tion activities for seniors into the primary care
system.

Study Population
The study population consisted of 561 enrollees
aged 65 years and older who responded to a
mailed questionnaire regarding health attitudes,
medical conditions, preventive health behaviors,
socioeconomic status, and demographic information
and who underwent an exercise evaluation as part
of the Senior Health Promotion Program. The
program had initially selected individuals at
random from the computerized enrollment lists
of GHC clinics; 6328 names were selected, or-
ganized by primary care practice, and reviewed by
their primary care physician. The physician iden-
tified subjects who were seriously ill, cognitively
impaired, or otherwise unfit for a health promo-
tion trial; 483 persons (8 percent) were thus ex-
cluded. The remaining 5845 were sent an intro-
ductive letter, followed by a mailed program
description and baseline questionnaire. Eight
hundred twenty-six (13 percent) refused partici-
pation; the most frequent reasons given for refu-
sal were “too busy” or poor health. A random
telephone survey of those refusing indicated that
many of them were very active and functional
and were not likely to be candidates for the
health promotion intervention. An additional 105
(2 percent) were not eligible to participate be-
cause they were institutionalized, seriously ill,
or out of the area. Two thousand two hundred
eighty-nine (39 percent) returned completed
consent forms and questionnaires, while 2625
(45 percent) failed to respond despite repeated
attempts to elicit a mailed response.

Of the 2289 persons who returned question-
naires, 1868 (82 percent) were eligible for the trial
because they were not institutionalized, did not
report difficulties with activities of daily living,
and were planning to remain in the Seattle area.
Six hundred thirty-three persons were randomly
assigned to the program, which included an exer-
cise evaluation performed by a trained health
nurse assessor using published criteria including
those developed by the American College of
Sports Medicine.\textsuperscript{9} Sixty-one persons did not at-
tend this assessment; analysis of age, sex, and the
number of medicines used for chronic diseases
(chronic disease score\textsuperscript{10}) did not reveal significant
differences from those who attended.\textsuperscript{11} One per-
son died before attending the assessment, and
data on the exercise evaluation were missing for
10 persons. The remaining 561 (89 percent of
those randomized) received the physical activity
assessment and were classified as (1) regular aer-
obic exercisers — persons exercising a minimum
of three times a week for at least 15 minutes per
session, in a manner thought to be sufficient to
raise their heart rates to a level for cardiovascular
fitness; or (2) nonaerobic exercisers — persons
exercising fewer than three times a week, exercis-
ing less than 15 minutes per session, or exercising
without attaining a heart rate sufficient to im-
prove cardiovascular fitness. Our intent was not
necessarily to determine which persons were
achieving a full training effect, but rather to de-
termine who were regularly exercising in a man-
ner likely to maintain some level of enhanced
cardiovascular fitness. We later compared this
classification with a version of the Paffenbarger
index,\textsuperscript{5} which was completed during the baseline
questionnaire. The exercisers’ mean index value
was 47 ± 21 kcal/kg/d, and the nonexercisers’
mean index value was 33 ± 15 kcal/kg/d. Using a
cutoff of 2500 kcal/d,\textsuperscript{5} there was 80 percent agree-
ment between the assessors’ classification of
persons as nonexercisers and the Paffenbarger
classification.

Generation of Hypotheses
Based on previous work with the Health Belief
Model\textsuperscript{12} and Multiattribute Utility Theory,\textsuperscript{13} we
hypothesized that regular aerobic exercise would
be associated with higher perceptions of current
health status and a positive outlook on personal
health. Second, exercise could have a strong social
component in older persons, and greater social
participation might be associated with regular ex-
ercise. Third, because regular exercise is a pre-
ventive health behavior, we expected regular exer-
cise to be associated with the practice of other
preventive health behaviors, such as influenza im-
munization, screening fecal occult blood test-
ing, and screening mammography in the past
year, plans for mammography during the next
year, seatbelt use, and performance of monthly
breast self-examination. Fourth, socioeconomic
status was expected to correlate with regular aerobic exercise. We believed that persons with higher socioeconomic status might view exercise more as a leisure activity, whereas those from lower socioeconomic strata might tend to view exercise as work. In addition, high socioeconomic status has been associated previously with the practice of other preventive health behaviors.14-16

Analysis
The dependent variable was regular exercise status as determined from a personal interview by the nurse assessor. Independent variables were drawn from the baseline questionnaire items, including measures of health perceptions developed in the Rand Health Insurance Experiment17,18 and the Perceived Quality of Life Scales designed by Patrick, et al.19 Dichotomous variables were analyzed using the chi-square method. Continuous or ordered variables were examined with t-tests or the Mann-Whitney U test as appropriate. For those variables that demonstrated significant associations (P < 0.05), dichotomous variables were then created using the median values as cutoffs. These variables were then entered into a logistic regression analysis, and odds ratios were calculated using beta coefficients from the regression. SPSS20 and the EGRET21 program for logistic regression were used. Because of the number of missing variables for some items, the number of subjects available for the regression analysis varied.22 Several models were studied with different variables, and the final regression equation was determined based on the largest number of significant variables given the largest number of subjects in the equation.23

Results
Of the 561 persons undergoing the assessment, 192 (34 percent) were regular exercisers and 369 (66 percent) were classified as nonaerobic exercisers.

Demographic and Social Characteristics
Regular exercisers were 1.4 years younger than nonexercisers; only 25 percent of those more than 75 years old were regular aerobic exercisers. Regular aerobic exercisers also reported significantly higher incomes and higher educational levels, and they were more likely to be married than were nonexercisers (Table 1).

### Table 1. Sociodemographic Characteristics of Exercisers and Nonexercisers.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Exercisers</th>
<th>Nonexercisers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &gt; 75 years (%)*</td>
<td>25</td>
<td>34</td>
</tr>
<tr>
<td>Average age (years)*</td>
<td>71.3 ± 4.3</td>
<td>72.8 ± 5.6</td>
</tr>
<tr>
<td>Income &gt; $15,000 (%)*</td>
<td>74</td>
<td>60</td>
</tr>
<tr>
<td>College graduate (%)*</td>
<td>32</td>
<td>23</td>
</tr>
<tr>
<td>Married (%)</td>
<td>66</td>
<td>53</td>
</tr>
<tr>
<td>Women (%)</td>
<td>54</td>
<td>62</td>
</tr>
<tr>
<td>White (%)</td>
<td>97</td>
<td>92</td>
</tr>
</tbody>
</table>

*P < 0.05.

Health Attitudes
Significant differences in health attitudes were present between the two groups. Regular exercisers tended to have more positive perceptions of their health but were no more likely to worry about their health (Table 2).

### Table 2. Health Attitudes and Regular Aerobic Exercise.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio*</th>
<th>Confidence Interval</th>
<th>Coefficient</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current health† (score &gt; 16)</td>
<td>1.8</td>
<td>1.3-2.6</td>
<td>0.6</td>
<td>0.001</td>
</tr>
<tr>
<td>Outlook on health† (score &gt; 15)</td>
<td>1.6</td>
<td>1.2-2.3</td>
<td>0.47</td>
<td>0.01</td>
</tr>
<tr>
<td>Perception of health as excellent or very good†</td>
<td>1.9</td>
<td>1.3-2.7</td>
<td>0.66</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Worry about health† (score &gt; 12)</td>
<td>0.85</td>
<td>0.58-1.3</td>
<td>-0.15</td>
<td>0.44</td>
</tr>
<tr>
<td>Satisfaction with health of body‡ (score &gt; 30)</td>
<td>1.7</td>
<td>1.3-2.8</td>
<td>0.57</td>
<td>0.01</td>
</tr>
</tbody>
</table>

*Unadjusted odds of being a regular exerciser.†Variables from the Rand Health Insurance Experiment.17,18‡Patrick.19

Note: scores are cut at median values.
those reporting two or more of these four conditions were regular aerobic exercisers compared with 40 percent of nonexercisers (Table 3).

Sex Differences
Although not statistically significant, men were more likely to be regular exercisers. When the data were examined separately for men and women, different patterns emerged. In men (Table 4), regular aerobic exercise was associated with better perceptions of current health, more positive health outlook, and more positive self-reported health status. All of these measures were highly intercorrelated, with correlation coefficients of 0.45 or greater. The simple rating of health as excellent, very good, good, fair, or poor was the variable most strongly associated with regular aerobic exercise for men.

Women aerobic exercisers demonstrated a different pattern (Table 5). Like men, they had more positive perceptions of their current health and the health of their bodies; however, they were younger and reported higher incomes, higher educational levels, and fewer medical conditions. They also were more likely to have received screening mammograms in the past year. These four factors were also intercorrelated, correlation coefficients ranging from \( r = 0.3 \) to 0.6.

Logistic Regression Model
Finally, we constructed a logistic regression model for regular aerobic exercise status. The model showed that aerobic exercisers tended to have better perceptions of current health and were almost twice as likely to report incomes greater than $15,000, but they also had one-half the odds of reporting two or more of the medical conditions: hypertension, heart disease, arthritis, or emphysema. Based on multivariate linear regression analysis, the value of \( R^2 \) for the final model was 0.15 (Table 6).

Discussion

Limitations of the Study
Our study group was drawn from an HMO population that has traditionally had a special emphasis on health promotion. Consequently, we cannot rule out an effect of this emphasis on exercise behavior. While we would expect this emphasis to result in higher numbers of persons who regularly exercise, it should not affect our ability to determine important factors for those who were not regularly exercising. In addition, the variables for which we have found significant associations seem unlikely to be affected by enrollment in a health maintenance organization. Nonetheless, this population was interested in health promotion and chose to respond. Thus our population is in this way a select one.

Table 3. Medical Conditions Associated with Exercise Status.

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Odds Ratio*</th>
<th>Confidence Interval</th>
<th>Coefficient</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>0.64</td>
<td>0.41–0.97</td>
<td>-0.45</td>
<td>0.04</td>
</tr>
<tr>
<td>Arthritis</td>
<td>0.7</td>
<td>0.48–1.00</td>
<td>-0.36</td>
<td>0.05</td>
</tr>
<tr>
<td>≥ 2 medical</td>
<td>0.49</td>
<td>0.28–0.86</td>
<td>-0.69</td>
<td>0.01</td>
</tr>
</tbody>
</table>
| conditions
| (hypertension, heart disease, arthritis, emphysema) |

*Unadjusted odds ratios according to likelihood of regular aerobic exercise status.

Table 4. Factors Associated with Regular Aerobic Exercise in Men.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Odds Ratio*</th>
<th>Confidence Interval</th>
<th>Coefficient</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current health† (score &gt; 16)</td>
<td>2.27</td>
<td>1.28–3.9</td>
<td>0.82</td>
<td></td>
</tr>
<tr>
<td>Health outlook† (score &gt; 15)</td>
<td>2.48</td>
<td>1.4–4.4</td>
<td>0.91</td>
<td></td>
</tr>
<tr>
<td>Self-reported health† (excellent/very good)</td>
<td>2.78</td>
<td>1.6–4.9</td>
<td>1.02</td>
<td></td>
</tr>
</tbody>
</table>

*Odds of being a regular aerobic exerciser, adjusted for age.
†From the Rand Health Insurance Experiment.17,18
Note: Score cutoffs taken at median values.

Table 5. Regular Aerobic Exercise in Women.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Odds Ratio*</th>
<th>Confidence Interval</th>
<th>Coefficient</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &gt; 75 years</td>
<td>0.58</td>
<td>0.34–0.98</td>
<td>-0.54</td>
<td></td>
</tr>
<tr>
<td>Income &gt; $15,000</td>
<td>1.8</td>
<td>1.07–3.1</td>
<td>0.59</td>
<td></td>
</tr>
<tr>
<td>College graduate</td>
<td>1.8</td>
<td>1.05–3.0</td>
<td>0.58</td>
<td></td>
</tr>
<tr>
<td>Current health† (score &gt; 16)</td>
<td>1.6</td>
<td>1.1–2.7</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Satisfied with health of body† (score &gt; 30)</td>
<td>1.7</td>
<td>1.1–2.4</td>
<td>0.53</td>
<td></td>
</tr>
<tr>
<td>≥ 2 medical conditions§</td>
<td>0.49</td>
<td>0.34–0.90</td>
<td>0.82</td>
<td></td>
</tr>
<tr>
<td>Screening mammography in past year</td>
<td>1.7</td>
<td>1.1–2.8</td>
<td>0.55</td>
<td></td>
</tr>
</tbody>
</table>

*Unadjusted odds of being a regular aerobic exerciser.
†Rand Health Insurance Experiment.17,18
‡Life Satisfaction Scale.19
§Hypertension, heart disease, emphysema, arthritis.
Note: Cutoffs made at median values.
Table 6. Logistic Regression Model for Regular Aerobic Exercise Status (n = 482).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio*</th>
<th>Coefficient</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &gt; 75 years</td>
<td>0.68</td>
<td>-0.35</td>
<td>0.15</td>
</tr>
<tr>
<td>Income &gt; $15,000</td>
<td>1.7</td>
<td>0.41</td>
<td>0.05</td>
</tr>
<tr>
<td>Current health score &gt; 16 (median)</td>
<td>1.7</td>
<td>0.56</td>
<td>0.009</td>
</tr>
<tr>
<td>≥ 2 medical conditions (hypertension, arthritis, heart disease, emphysema)</td>
<td>0.52</td>
<td>-0.65</td>
<td>0.047</td>
</tr>
</tbody>
</table>

*Odds of being a regular exerciser, ± confidence interval.

Selection bias is especially important in studies of persons aged 65 years and older because this age group has greater heterogeneity in health status and disease burden than in any other. Our study used reliable addresses and contact methods of this HMO population to avoid the more common types of selection bias. Respondent bias has been a concern in every study involving questionnaire data, and it could be a potential source of bias in this study as well. Elderly persons are known to demonstrate lower response rates to questionnaires, although participation rates in clinical studies compare favorably with those of younger persons. The study's nonrespondent rate was high, but compares favorably with previous rates reported in this age group. In contrast to other research in the elderly, information on the study's subgroups was available as part of the study design and is presented in Table 7. There were no significant differences between respondents and nonrespondents with respect to age, sex, and the number of medications taken for major chronic diseases (chronic disease score). The participation rate for the exercise evaluation (89 percent), however, is to our knowledge the highest ever reported in an elderly population.

Potential misclassification of persons as regular or nonregular exercisers is possible, because we did not have direct observational data with which to corroborate their reports. All self-report measurements have this potential source of error, including the Paffenbarger index, which is based on report of exercise activity. Comparison of assessors' classifications with Paffenbarger scores recorded separately on the baseline questionnaire (and not available to our assessors) indicated acceptable levels of agreement. That personal interviews with trained health personnel could be more accurate is speculation in the absence of an independent reference standard.

Because the study population was 95 percent white, the findings might not be generalizable to a more ethnically diverse group. Self-reported income and educational levels were not corroborated with objective data; therefore, the degree of influence of particular levels of income and education cannot be determined. Our questionnaire did not allow us to assess severity of illness with respect to any of the reported medical conditions. We cannot rule out some effect that variability in illness might have had, but other measures of overall disability (e.g., number of days in bed, the degree to which respondents reported limitations in activity in the recent past) were not significantly different between the two groups. Lastly, this data set was not originally formulated to address our specific hypotheses. A questionnaire directed specifically at these areas might be able to provide more in-depth information.

Implications

This study examined the factors associated with regular aerobic exercise behavior in elderly enrollees of an established health maintenance organization. We found that attitudes regarding health, the absence of reported chronic disease, and socioeconomic factors were important in exercise behavior. We cannot imply causation simply from associations with exercise behavior, and the precise interaction of exercise activity with other factors could not be tested with this study.

Table 7. Age, Sex, and Chronic Disease Score (CDS) among Subgroups in the Group Health Senior Health Promotion Project.

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>No.</th>
<th>Mean Age in Years (± SD)</th>
<th>Percent Women</th>
<th>Mean CDS (± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondents</td>
<td>2299</td>
<td>72.4 (5.7)</td>
<td>59.9</td>
<td>2.22 (2.58)</td>
</tr>
<tr>
<td>Nonrespondents</td>
<td>2625</td>
<td>72.9 (6.3)</td>
<td>58.6</td>
<td>2.25 (2.62)</td>
</tr>
<tr>
<td>Physician review</td>
<td>483</td>
<td>77.4 (7.7)</td>
<td>61.3</td>
<td>4.05 (3.29)</td>
</tr>
<tr>
<td>Subject refusal</td>
<td>826</td>
<td>74.8 (6.9)</td>
<td>65.1</td>
<td>2.62 (2.78)</td>
</tr>
<tr>
<td>Ineligible</td>
<td>105</td>
<td>77.2 (8.8)</td>
<td>58.1</td>
<td>3.80 (3.08)</td>
</tr>
<tr>
<td>Study group</td>
<td>561</td>
<td>72.3 (5.3)</td>
<td>59.5</td>
<td>2.12 (2.52)</td>
</tr>
</tbody>
</table>

SD = standard deviation.
When viewed in context with previous research, however, our study has several implications for promotion of exercise in this age group.

Certain groups of persons may not exercise regularly: persons of lower socioeconomic status and those who report more medical conditions. It seems doubtful, however, that financial or educational status as such directly deters patients from exercising, particularly in this HMO population that has essentially equal access to services. More likely, Mechanic and Cleary\textsuperscript{15} and Green\textsuperscript{16} have argued that positive health behaviors are part of a wider life orientation that includes a sense of psychological and physical well-being and a sense of the importance of personal health maintenance that is not as well integrated into these persons' experiences. An understanding of how these factors specifically influence exercise behavior in older age groups is not known, however. We speculate that group activities that are part of other social functions or clubs might serve to lessen misperceptions of many poor elderly that exercise interferes with leisure, or alternatively, they could promote the adoption of exercise into the social culture. These hypotheses deserve further investigation.

We do not know whether exercisers have a more positive outlook because they exercise, or whether they exercise because they have a more positive attitude. Study of nonexercisers has, however, suggested that some improvements in self-image and mood do accrue to previously sedentary persons who take up exercise.\textsuperscript{27,28} In addition, exercise has been shown to improve functional ability as well as perceptions of personal health.\textsuperscript{29-32} Our study raises a different issue: which specific health perceptions are truly important? Longitudinal studies of sufficient rigor are needed to answer this question definitively, but our data suggest that a desire to improve or at least maintain functional ability has an important role.

Previous research in persons with coronary artery disease suggested that medical problems were given as important factors for dropout in cardiac rehabilitation programs but that dropout did not correlate well with objective indicators of severity of illness as determined from hospital and clinic records.\textsuperscript{33} In fact, persons who experienced intercurrent coronary artery bypass or myocardial infarction did not have an increased rate of dropout. This finding supports an important role for health perceptions in exercise behavior. Nonetheless, certain medical conditions, such as arthritis, can adversely affect the type of activities that an elderly person can find enjoyable and easy to perform.\textsuperscript{34,35}

Only mammography screening was related to regular exercise for women for whom, in this HMO setting, financial barriers did not exist. There was no correlation between exercise and other individual preventive health behaviors or in the total number of behaviors in the entire group. Exercise could be a preventive health behavior with determinants different from the more provider-oriented behaviors, such as influenza immunization and fecal occult blood testing, and could require greater personal commitment than seat belt use or breast self-examination.

Our study suggests issues to be addressed when counseling elderly patients who are not regularly exercising. Physicians would do well to address carefully seniors' perceptions of their health and of their need for exercise. Many programs emphasize training or endurance, concepts that might not be attractive or meaningful to seniors.\textsuperscript{36} An alternative would be to place emphasis on the ability of exercise to improve or maintain the functional capacity of the elderly person and to lessen the impact of intercurrent illnesses in everyday activities.\textsuperscript{6} Indeed, the dysfunction involved with all the medical conditions associated with not exercising can be improved in many patients with the appropriate form of exercise (e.g., water aerobics for those with severe arthritis).

Conclusions

In this population of elderly enrollees of an established health maintenance organization, regular aerobic exercise status was associated with higher perceptions of current health and a more positive outlook on personal health; exercisers reported fewer medical conditions, particularly those that might directly influence cardiopulmonary and exercise abilities. Exercisers also reported higher socioeconomic status. We did not find an association between regular exercise and the practice of other preventive health behaviors. We believe this lack of association relates to the different nature of exercise compared with receiving influenza immunizations or mammograms. Sex differences were present. Regular aerobic exercise in
men seemed to be predominantly associated with health perceptions, whereas in women the relative contribution of socioeconomic factors was greater. Finally, the dynamics involved in regular exercise behavior are complex. There is interaction between health attitudes and socioeconomic characteristics, but the manner and the degree to which this interaction operates remain to be elucidated. Further research is needed to formulate a conceptual model for exercise behavior in this age group.

References
30. Fiatarone MA, Marks EC, Ryan ND, Meredith CN, Lipsitz LA, Evans WJ. High intensity strength training in nonagenarians. Effects on skeletal muscle JAMA 1990; 263:3029-34.

ABFP ANNOUNCEMENT

Sports Medicine Certificate of Added Qualification (CAQ)

Applications became available September 1, 1992. All applications must be returned to the Board office by January 15, 1993. A late fee will apply for applications received from January 16, 1993, through February 15, 1993.

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