THE WRONG PRESCRIPTION FOR AGING:  
COMMENT ON WILLIAMS AND PATE

Dear Editor-in-Chief:

Eight years ago, Williams created a stir with body composition data on about 6000 male runners (5). He surmised that simply maintaining a constant volume of running would lead to gaining weight and getting fatter by middle age. Williams argued that the volume of physical activity and exercise need to be matched with age and recommendations changed to fit his findings.

Williams and Pate (6) in a much larger sample (60,617) of men, contacted at races and by survey in collaboration with Runners World, extended the findings from the earlier study. Running longer distances at any age was associated with a lower body mass index and waist circumference. However, body mass index and waist increased with age. Paralleling their sedentary peers, runners gained weight and body fat in middle age except at the higher volumes of running where gains were diminished. An algorithm showed that the 16 km·wk⁻¹ runner at age 25 would need to be running about 64 km·wk⁻¹ at about age 50 to maintain weight and waist circumference.

Williams and Pate were careful to note the selectivity of their sample and the danger of cohort effects. However, their primary conclusion is the need for amendment of cardiovascular exercise and physical activity recommendations to increase volume with age.

Closely following the recommendations from Williams and Pate without further interpretation may be a case of strict empiricism replacing public health policy, a network of scientific findings, and common sense. Currently, only a small percentage of the population meets minimal physical activity recommendations (30 min·d⁻¹ of moderate activity, (4)). To meet Williams and Pate’s recommendations, 50-yr-old men at the 50th percentile for VO₂max and running at 75% of VO₂max would need to run about 9 h·wk⁻¹ (1) with distance and time increasing each year. Men also would have to overcome the recovery and injury problems associated with high-volume training (1).

Williams and Pate may have ignored the current ACSM guidelines for resistance training and cardiovascular training based on science and practicality (1). The prescriptions from these guidelines do not require high-volume and high-frequency training at any point or at any age to increase and then maintain strength, fitness, or muscle mass.

Gaining weight and getting fatter apparently are associated with some processes of aging (3) and a failure to compensate for those changes by performing resistance training, maintaining cardiovascular training and 30 min·d⁻¹ physical activity, and consuming slightly fewer calories per day; that is, a small correction in the “energy gap” (2). Maintaining body composition, strength, and fitness do not involve a life spent on an endless treadmill just to stay even. Williams and Pate seem to have provided the wrong prescription.

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COMMENT—RESISTANCE TRAINING FOR STRENGTH: EFFECT OF NUMBER OF SETS AND CONTRACTION SPEED

Dear Editor-in-Chief:

Munn and colleagues (3) investigated the effects of the number of sets and movement velocity (contraction speed) for an exercise on strength. Munn et al. randomized 115 previously untrained participants (21 male, 94 female) to a nontreated control group or one of four treatments. The treatment groups trained elbow flexion three times per week for 18 sessions over 6–7 wk. One group trained with 1 set with a 6–8 RM of “slow” repetitions (−3 s concentric, −3 s eccentric) while a second group used the same protocol for 3 sets. A third group trained with 1 set with a 6–8 RM of “fast” repetitions (−1 s concentric, −1 s eccentric) while a fourth group used the same protocol for 3 sets:

Based on the data reported in their Table 1 (p. 1624) and linear regression analyses reported in Table 2 (p. 1625), Munn et al. indicated that compared with the control group, the 1-set slow group increased strength by 25%. The groups training with three sets increased strength by 48%. Munn et al. reported that fast training increased strength by 11% compared with slow training.

The data from Munn et al.’s Figure 2 (p. 1624) suggest more cautious interpretations. Figure 2 showed the distribution of strength change scores in each group. There clearly are outliers; that is, high responders. The data indicated that the 1-set fast group with three outliers, the 3-set slow group with two outliers, and the 3-set fast group with two outliers had more outliers than the 1-set slow group with one outlier. Eliminating the outliers, including one inexplicably in the control group, resulted in the following absolute change in each group compared with the control group: 1-set slow, −1.28 kg; 1-set fast, −1.62 kg; 3-set slow, −1.94 kg; and 3-set fast, −2.15 kg. The percentage changes (change kg/pretraining kg) for each group are 1-set slow, −24%; 1-set fast, −28%; 3-set slow, −34%; and 3-set fast, −38%. Without the outliers, the absolute mean changes, the percentage changes, and the absolute differences between the 1-set slow group and the three other training groups are smaller, albeit with smaller group SDs.

Despite randomization, the 1-set slow group had fewer high responders than the other training groups. Strength increases and muscular hypertrophy with resistance training show considerable variation that is most likely attributable to genetic factors (2).

Munn et al. found that all four training groups showed a small increase in biceps circumference. Referring to a prior study by Hass et al. (1), they noted that an increase in biceps circumference was only found when the study participants trained with 3 sets compared to 1 set. Hass et al. reported that both 1-set and 3-set training groups showed within group changes in body composition with experienced trainees. While the within group patterns were different, there were no significant differences between groups.

Munn et al. concluded that 1 set with slow repetitions produces some favorable outcomes, but 3 sets of slow repetitions or training with fast repetitions produces superior outcomes. Their conclusions concerning 3 sets or fast training have minimal support.

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