

# The Effect of Power Plate® Training on Cardiorespiratory Fitness and Muscle Strength in the Elderly

This is a summary of a study published in the international scientific journal *Age and Ageing* (May 2009).

By An Bogaerts, Christophe Delecluse, Albrecht Claessens, Thierry Troosters, Steven Boonen, and Sabine Verschueren  
Katholieke Universiteit, Leuven, Belgium

## Study Conclusions:

1. Power Plate training can significantly increase heart rate in men and women between 60 and 80 years of age.
2. One year of Power Plate training in older individuals leads to significant enhancements in cardiorespiratory fitness and muscle strength.
3. The results observed in the Power Plate training group were comparable with the increases noted in those who followed an equal number of traditional fitness training sessions. However Power Plate training was much more time efficient (average 25 min vs. 75 min).

## Introduction:

Increased age is associated with a decline in cardiorespiratory fitness and muscular performance. However, for elderly people to continue to function independently and perform daily activities, it is essential they maintain sufficient muscle strength and cardiorespiratory fitness. To do so, they should perform progressive resistance and aerobic training. However, a significant proportion of elderly people are unable or unwilling to undertake two training regimens. Exercise on a Power Plate machine could offer a viable alternative, as it may be an efficient combination of both training methods.

## Method:

In this study 220 participants (180 of whom completed the study) were randomly divided into three groups. The first group (PP group) performed basic Power Plate exercises only (see figure 1). The training intensity and time were gradually progressed, to a maximum duration of 40 minutes for one session (including warming up, cooling down and rest between exercises).

The second group (FIT group) performed a fitness program consisting of cardiovascular, resistance, balance and flexibility exercises. The maximum duration of one session was 90 minutes.

Figure 1



Squat

Wide Stance



Calves

Lunge

Both groups performed three sessions of exercise each week over the course of one year.

The third group (CON group) was asked to not change their lifestyle or physical activity during the study.

### Results:

To gauge the effectiveness of the different workouts, measurements were taken at the start of the study and after one year, including peak oxygen uptake (maximum amount of oxygen uptake), time-to-peak exercise (the time from the start of the cycle ergometer test to exhaustion), isometric muscle strength (static muscle strength), and participants' heart rate.

As illustrated in Figure 2 (A, B and C) Power Plate training resulted in an increase in peak oxygen uptake (a), time-to-peak exercise (B) and isometric muscle strength (C). The increases are almost equal to the changes noted in the FIT group, except for time-to-peak exercise, for which there are two possible reasons. First, one of the main components of the FIT group's training program was cardiorespiratory training, while the PP group's training regime did not include this element. Also, the FIT group performed better in the cycle ergometer test because their training program included specific bicycle training.

### Practical Applications:

Maintaining sufficient muscle strength and cardiorespiratory fitness can help elderly people continue to function independently and perform daily activities. These results indicate training on a Power Plate machine is a good intervention to improve cardiorespiratory fitness (VO<sub>2</sub> peak and time-to-peak exercise), which in turn can help to improve quality of life for the elderly. Significantly, the participants in the Power Plate group did not perceive the training sessions as a hard or strenuous workout, in contrast to the FIT group. As the duration of the Power Plate training sessions (maximum of 40 minutes) was also much shorter than the FIT sessions (maximum of 90 minutes), it is a more time-efficient way to achieve similar results.

Exercising on a Power Plate machine can be used as a safe, efficient and non-exhausting alternative to a traditional fitness training program to enhance muscle strength but also cardiorespiratory fitness in older individuals.

Figure 2A

### Peak Oxygen Uptake

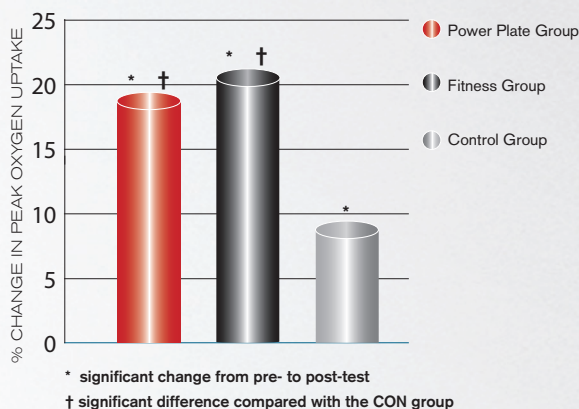


Figure 2B

### Time-to-Peak Exercise

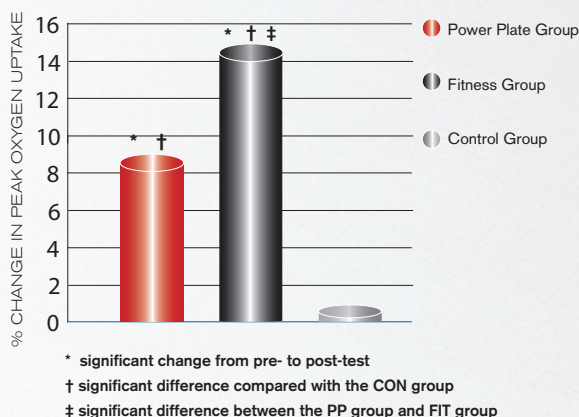


Figure 2C

### Isometric Muscle Strength

