

# Stretching on the Power Plate® machine increases flexibility more than stretching alone

This is a summary of a study published in the International Journal of Sports Physiology and Performance (2008).

By William A. Sands, Jeni R. McNeal, Michael H. Stone, G. Gregory Haff, and Ann M. Kinser.  
United States Olympic Committee, USA.

## Study Conclusions:

- Stretching on the Power Plate® machine increases range of motion further than stretching alone.
- It can be an effective way for elite athletes who are already highly flexible, to further increase range of motion.

## Introduction:

For sports such as gymnastics, figure skating and hurdling, the range of motion (ROM) achievable by the athlete determines both performance and safety. Even a minimal increase in range of motion can result in improved performance, and could be the difference between first and second place. The purpose of this study was to determine if the addition of vibration during stretching exercises could result in further increases in flexibility, when compared to stretching exercises performed without vibration.

## Method:

Ten young male elite gymnasts (average age 10.7 years) participated in this study. Each participant performed two exercises for each forward split condition (right and left leg forward split), first with the forward leg on the platform (see figure 1), and then with the rear leg on the platform (see figure 2). The Power Plate machine was set to 30Hz Low, for 45 seconds and the participants performed one forward split condition with and one without vibration. The order of vibration on/off and left or right leg first was determined randomly.

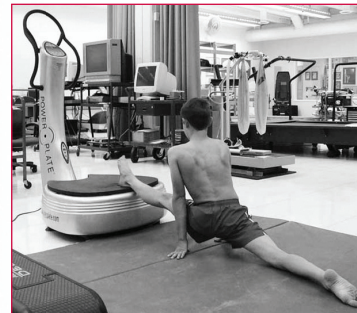


Figure 1



Figure 2

The participants' forward split flexibility (range of motion) was measured by performing a forward split next to a metre stick, to measure height from the floor (see figure 3). The measurements were taken both before and after each specific stretch condition by the same researcher.

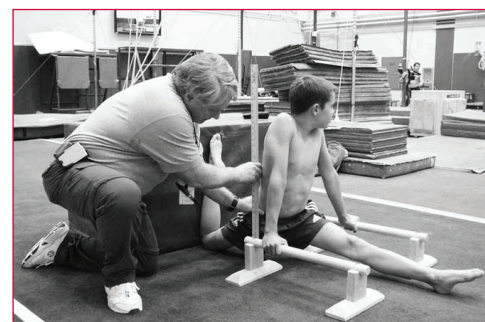
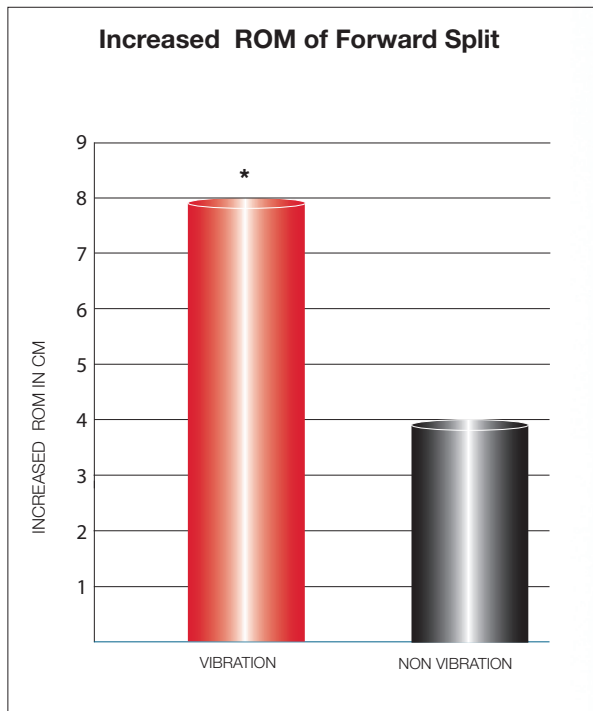


Figure 3



\* Significant difference compared to non vibration intervention

Figure 4

### Results:

As illustrated in figure 4, measurements taken after the exercises performed in the vibration condition showed an increase of 7.9cm in range of motion, while the exercises performed in the no vibration condition only increased range of motion by 3.9cm. The results show that stretching with vibration can significantly increase range of motion, when compared to the Control group.

### References

1. Sands, W.A., J.R. McNeal, M.H. Stone, E.M. Russell, and M. Jemni. Flexibility enhancement with vibration: Acute and long-term. *Medicine & Science in Sports & Exercise*. Vol. 38(4), pp: 720-725. 2006.
2. Sands, W.A., J.R. McNeal, M.H. Stone, W.L. Kimmel, G.G. Haff, and M. Jemni. The effect of vibration on active and passive range of motion in elite female synchronized swimmers. *European Journal of Sport Science*. Vol. 8(4), pp: 217-223. 2008.

### Conclusion:

The results of this study, which show an increase in range of motion when stretches are performed during a vibration condition, are consistent with other similar studies conducted by this research group.

Sands et al. (2006)<sup>1</sup> showed an acute and structural improvement in forward split flexibility, in another study also conducted on ten young male gymnasts. It concluded that vibration could be a promising means of increasing range of motion beyond that obtained with static stretching, for highly trained male gymnasts.

This study also shows that performing a stretching exercise program for 4 weeks (5 times a week) could result in a structural improvement in flexibility and, as a result of that, an improvement in performance.

Another study by Sands et al (2008)<sup>2</sup> was conducted on female synchronized swimmers, who also had excellent flexibility before participating in the study. It also showed significant improvements in passive forward split flexibility, after stretching with vibration.

All these studies indicate that performing stretch exercises on a Power Plate machine will increase flexibility even further, even for those athletes who are already highly flexible.

**The Power Plate machine can help increase flexibility and range of motion, even for those people who already have excellent flexibility.**