

# Power Plate® Training Useful After Anterior Cruciate Ligament Reconstruction

Power Plate Training Improves Proprioception and Balance More Than Conventional Training in Athletes Who Have Undergone ACL Reconstruction.

This is a summary of a study published in the *British Journal of Sports and Medicine*, online Jan. 2008.

By Azar Moezy, Gholamreza Olyaei, Mohammadreza Hadian, Mohammad Razi and Soghra Faghizadeh  
Tehran University of Medical Sciences, Iran.

### Study Conclusions:

The improvement of postural stability in the Power Plate training group, performed on a Power Plate Next Generation (2004), was significantly greater than that of the conventional training group. There was a significant improvement in all knee reposition tests of the Power Plate training group in both knees, except in one condition. The issue most patients have trouble with after ACL reconstruction is the decreased anterior-posterior stability. The Power Plate group showed a great improvement in anterior-posterior stability, causing the researchers to conclude that Power Plate training may be a very useful tool to expedite rehabilitation after ACL reconstruction.

Proprioception is the conscious perception of limb position in space. There are many proprioceptors (sensory nerve receptors) located in the anterior cruciate ligament (ACL). ACL injuries reduce proprioceptive ability and postural stability. The aim of this study was to compare the effects of a Power Plate training program and that of conventional therapy treatments on knee proprioception and postural stability in ACL reconstructed subjects.

### Method:

A total of 20 male athletes who underwent ACL reconstruction surgery participated in this study. The participants were randomly allocated to a Power Plate group (10 subjects) or a conventional therapy group (10 subjects). Both groups participated in 12 training sessions within one month (3 times a week). The Power Plate group performed Acceleration Training™ exercises (see fig. 2+3), and the conventional therapy group performed conventional strength exercises (hip abductors, adductors, flexors, extensors, leg press, leg curl and squat). Both groups performed a progressive schedule.

Figure 1

Improvement of anterior-posterior stability index in Power Plate and Conventional Therapy group with eyes open or closed.

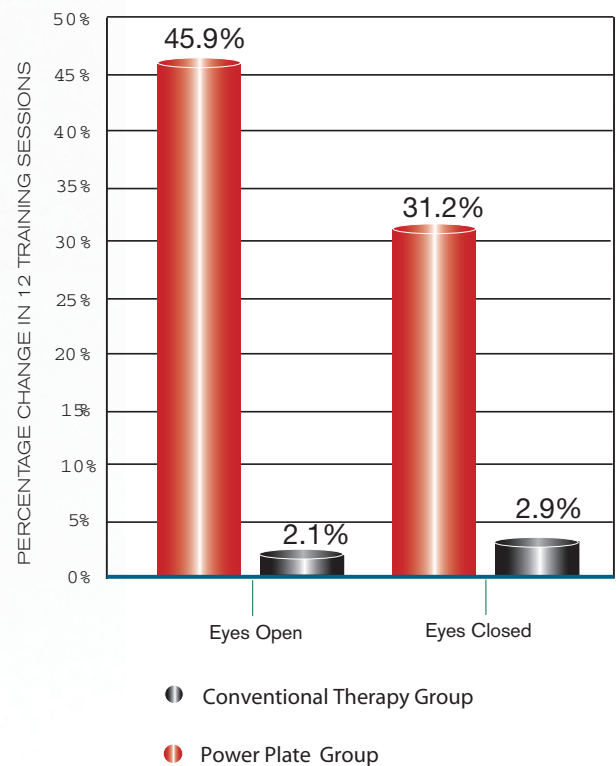


Figure 2

Overview of the Power Plate Program

| Session | Duration set (sec.) | Frequency (Hz) | Amplitude | Rest (sec.) | Modalities       | Duration (min. without rest) | Number of Sets |
|---------|---------------------|----------------|-----------|-------------|------------------|------------------------------|----------------|
| 1       | 30                  | 30             | Low       | 60          | Static           | 4                            | 8              |
| 2       | 30                  | 30             | Low       | 60          | Static           | 5.5                          | 11             |
| 3       | 30                  | 30             | Low       | 60          | Static & Dynamic | 6.5                          | 13             |
| 4       | 30                  | 35             | Low       | 50          | Static & Dynamic | 8                            | 16             |
| 5       | 45                  | 35             | Low       | 50          | Static & Dynamic | 12                           | 16             |
| 6       | 45                  | 35             | Low       | 50          | Static & Dynamic | 12                           | 16             |
| 7       | 45                  | 40             | High      | 40          | Static & Dynamic | 13.5                         | 18             |
| 8       | 45                  | 40             | High      | 40          | Static & Dynamic | 15                           | 20             |
| 9       | 45                  | 40             | High      | 40          | Static & Dynamic | 15                           | 20             |
| 10      | 60                  | 40             | High      | 30          | Static & Dynamic | 16                           | 16             |
| 11      | 60                  | 50             | High      | 30          | Static & Dynamic | 16                           | 16             |
| 12      | 60                  | 50             | High      | 30          | Static & Dynamic | 16                           | 16             |

**Results:**

Both groups were tested pre- and post-intervention. The subjects performed postural stability tests (with eyes open and closed) and a knee joint reposition test. These are standard tests, used to measure postural control and balance. The improvements found were significantly greater in the Power Plate group than in the conventional therapy group.

Most patients suffer from anterior-posterior instability after ACL reconstruction. The Power Plate group shows a 22 times greater improvement in this anterior-posterior stability than the conventional group (see fig. 1). This means that Power Plate training may be a valuable contribution to the rehabilitation of the anterior-posterior stability, which is very important for the recovery of the patient.

**Social Relevance:**

With Power Plate training, better results are obtained in a much shorter time (24 min. vs ±60 min.), which greatly enhances compliance and ensures subjects enjoy the sessions more.

This study shows that Power Plate training resulted in a greater improvement of joint stability and balance than conventional strength training. Power Plate training also has the advantage of shorter training time. It should therefore be considered a useful addition to rehabilitation interventions after ACL reconstruction.

Figure 3

The Power Plate group performed the following exercises plus the deep squat. For progression, subjects were eventually asked to perform the exercises on one leg.

