

# Power Plate® Training Enhances Recovery After ACL Reconstruction

## Power Plate Training Expedites and Improves Recovery of Anterior Cruciate Ligament (ACL) Rupture and Subsequent Arthroscopic Reconstructive Surgery.

This is a summary of a study published in the *German Magazine for Sportsmedicine* - "Deutsche Zeitschrift für Sportmedizin", Vol. 56, No. 7/8 (special abstract issue), p. 228.

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### Study Conclusions:

1. The Power Plate Training group experienced no muscle atrophy or weakness after surgery, while the control group suffered femoral muscular atrophy, weakness and decreased coordination.
2. Twelve weeks after surgery, the Power Plate Training group was more satisfied with the results of the surgery; participants were stronger and felt better.
3. The Power Plate Training group reported less pain than the control group.
4. Research evidence suggests that Power Plate® Training - executed on the "classic" Power Plate machine - is a significant resource for patients wishing to enhance recovery and regain strength in order to return to daily activities of work and sport.

### Introduction:

Weakness and atrophy in the muscles of the quadriceps group is a common challenge for patients recovering from reconstruction of the anterior cruciate ligament. The aim of this study was to examine the effects of Power Plate® Training on the healing process. This study sought to build upon previously published research outcomes and investigate the hypothesis that Power Plate® Training leads to increased co-activation of the extensor and flexor muscles of the lower extremities, causing positive effects on joint stabilization, strength and circulation.

### Method:

Sixteen subjects were divided among two groups. Any contraindications to vibration training were considered. The Power Plate Training group used the Power Plate machine combined with conventional physiotherapy. The control group used conventional physiotherapy only, 2-3 times per week, including performing squats and lunges.

The Power Plate Training group performed a 10-minute Power Plate Training program two times per week for ten weeks, beginning the third week after surgery, in addition to performing conventional physiotherapy. They used the Power Plate machine to warm up with massage exercises for the quadriceps and hamstrings, they then performed squats and lunges, followed by hamstring stretches.

Measurements of leg circumference (10 cm and 20 cm above the knee, 15 cm below the knee) were taken before surgery, and again after surgery at six and 12 weeks (see fig. 2). The objective findings of muscle measurements were supplemented by subjective data evaluating pain perception and wellbeing using a questionnaire.

### Results:

The Power Plate Training group maintained size and strength of leg musculature while the control group suffered atrophy and loss of strength. (see fig. 1).

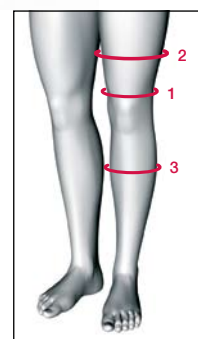


Figure 1

Measurements of the leg circumference:

- 1 - 10 cm above the knee
- 2 - 20 cm above the knee
- 3 - 15 cm below the knee

Figure 2

Figure 2A

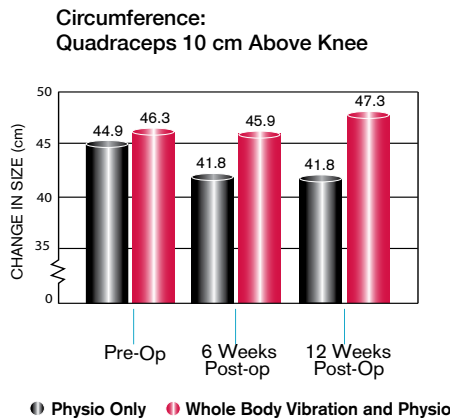


Figure 2B

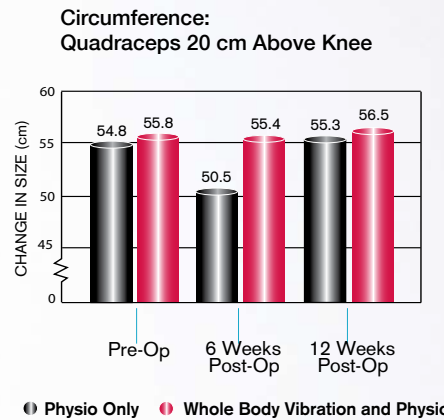
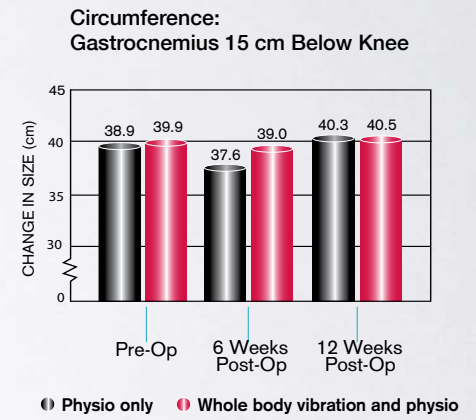


Figure 2C



**Circumference:**

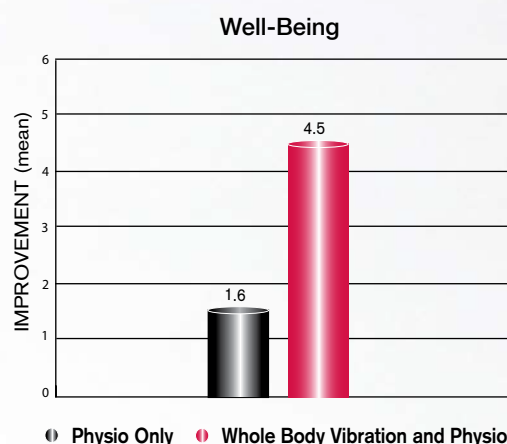
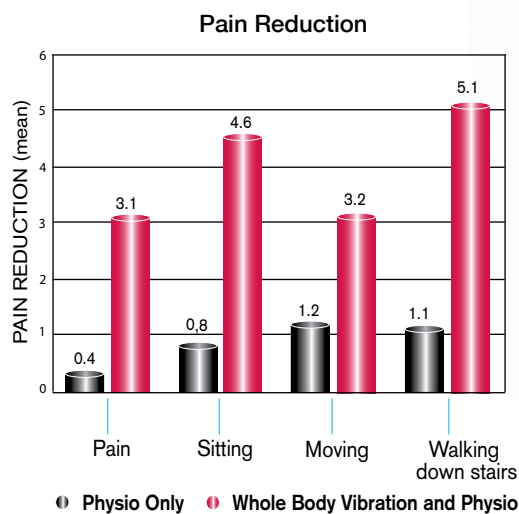
Fig. 2 demonstrates maintenance of muscular size and strength for the Power Plate Training group. The control group participants experienced average muscle atrophy in the quadriceps group, and were not able to regain strength in all muscle groups 12 weeks after surgery. The whole body vibration group experienced no atrophy and no strength loss.

**Questionnaire:**

Several questions were asked before and after the surgery and the rehabilitation program about pain reduction and improvement of general well-being (see fig. 3). The answers clearly indicated that the Power Plate Training group experienced less pain and improved at a faster rate than the control group.

Figure 3: Questionnaire

Effect on pain reduction (left) and well-being (right).



Recovery from a rupture of the ACL generally leads to atrophy of the thigh and calf muscles as well as dysfunction of the knee in terms of coordination, mobility and stability. Power Plate® Training leads to an increase in muscle girth, retention of strength, recovery of coordination, mobility and flexibility. This evidence suggests that Power Plate Training therapy, performed on the Power Plate machine, following surgery aids in stabilizing joints and preventing further trauma. It provides a significant resource for patients wishing to recover quickly from ACL or joint surgery in order to return quickly to life activities, work and sport.