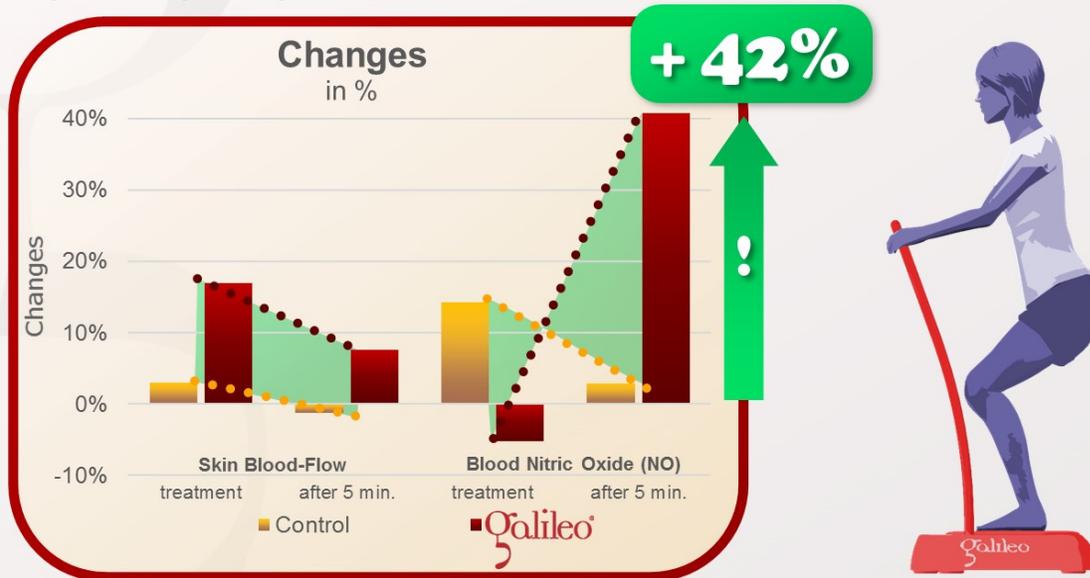


Are exhaustion effects highest during Galileo Training itself ?

The answer is: NO

This study reports short-term effects of Galileo Training on skin blood-flow and blood Nitric Oxide (NO) concentration as an indicator for intense muscle work (10*30 sec., 26Hz, pos. 2, 35° bent knees). The Galileo group showed significant higher effects than the control group. In addition it was observed that skin blood flow was highest during training but NO concentration was increased massively 5 minutes after the training.



Johnson PK, Feland JB, Johnson AW, Mack GW, Mitchell UH: Effect of whole body vibration on skin blood flow and nitric oxide production.; J Diabetes Sci Technol, 8(4):889-94, 2014; PMID: 24876449; GID: 3733

This is another essential study that helps to explain the positive effects of Galileo Training on blood flow (#GRFS21, #GRFS24) but also on endurance (#GRFS11, #GRFS12):

Nitric Oxide (NO) is produced by white blood cells and increases blood flow because it relaxes the muscles of the blood vessels and therefore increases their cross-section. The Control group in this study did the same exercises but without vibration. The example where typical for conventional exercises: During the active exercise skin blood flow as well as blood NO concentration increased and decreased after the exercise. A completely different result in the Galileo group: While the skin blood flow is highest during the training there is no increase in NO during the training but massively 5 minutes after the training. Why? An explanation can be found for example by #GRFS24: While skin blood flow increases during the training, the highest total blood flow (vessel) is actually right after the end of the exercise. How can that be? Galileo training at high frequencies (in this case 26Hz) causes an (almost) maximum co-contraction of the trained muscles which block their own blood flow because they squeeze the internal vessels.

Because of this blood flow inside the muscle cannot increase during the training itself. At the same time this condition is ideal to exhaust the local energy storage of the fast twitch muscle fibers ("sprinter muscles") in the shortest possible time. This causes locally a massive lack of oxygen which causes the body to increase NO in order to increase blood flow by relaxing the muscles of the vessel (an independent thin muscle layer around the vessel itself, which controls the cross-section of the vessel and therefore the blood flow). However, since the muscle is contracted this cannot happen yet. All of this causes an effect anyone will experience when training on Galileo at high frequencies (e.g. 90° squat at 30Hz): During the active training itself there is hardly any change in heart-rate or blood pressure (which is probably one of the reasons why Galileo Training is safe after Lung Transplant and in COPD patients #GRFS31, #GRFS32) - Until the vibration is switched off and one steps off the device: now the muscle relaxes and the relaxed vessels cause an optimal blood flow into the muscle.

This local lack of Oxygen however not only causes the short-term effect of a massive increase in NO and therefore an increased vessel cross-section but if used over a longer period of time it also causes an increase in endurance (#GRFS11, #GRFS12). Occlusion (which blocks blood-flow of arms or legs during the active training by using cuffs) uses exactly this effect - Galileo Training can produce similar effects but is even more effective when combined with Occlusion (#GRFS12, #GRFS33). Over time not only muscles are built-up but also there is a systematic adaptation of the body which is quite similar to high altitude training used in professional sports.



[J Diabetes Sci Technol](#). 2014 Jul;8(4):889-94. doi: 10.1177/1932296814536289. Epub 2014 May 21.

Effect of whole body vibration on skin blood flow and nitric oxide production.

Johnson PK¹, Feland JB², Johnson AW², Mack GW², Mitchell UH².

Abstract

BACKGROUND:

Vascular dysfunction due to hyperglycemia in individuals with diabetes is a factor contributing to distal symmetric polyneuropathy (DSPN). Reactive oxygen species reduce the bioavailability of nitric oxide (NO), a powerful vasodilator, resulting in reduced circulation and nerve ischemia. Increases in blood NO concentrations and circulation have been attributed to whole body vibration (WBV). The purpose of this study was to determine the effects of low-frequency, low-amplitude WBV on whole blood NO concentrations and skin blood flow (SBF) in individuals with symptoms of DSPN.

METHODS:

Ten patients with diabetes and impaired sensory perception in the lower limbs participated in this crossover study. Each submitted to 2 treatment conditions, WBV and sham, with a 1-week washout period between. Blood draws for NO analysis and laser Doppler imager scans of SBF were performed before, immediately after, and following a 5-minute recovery of each of the treatments.

RESULTS:

Low-frequency, low-amplitude WBV significantly increased SBF compared to the sham condition ($F(2,18) = 5.82$, $P = .0115$). Whole blood NO concentrations did not differ between the WBV and sham conditions immediately or 5 minutes after treatment ($F(2,18) = 1.88$, $P = .1813$).

CONCLUSIONS:

These findings demonstrate that patients with diabetes respond to WBV with increased SBF compared to the sham condition. The implication is that WBV is a potential nonpharmacological therapy for neurovascular complications of diabetes.

PMID: 24876449 PMCID: [PMC4764225](#) DOI: [10.1177/1932296814536289](#)