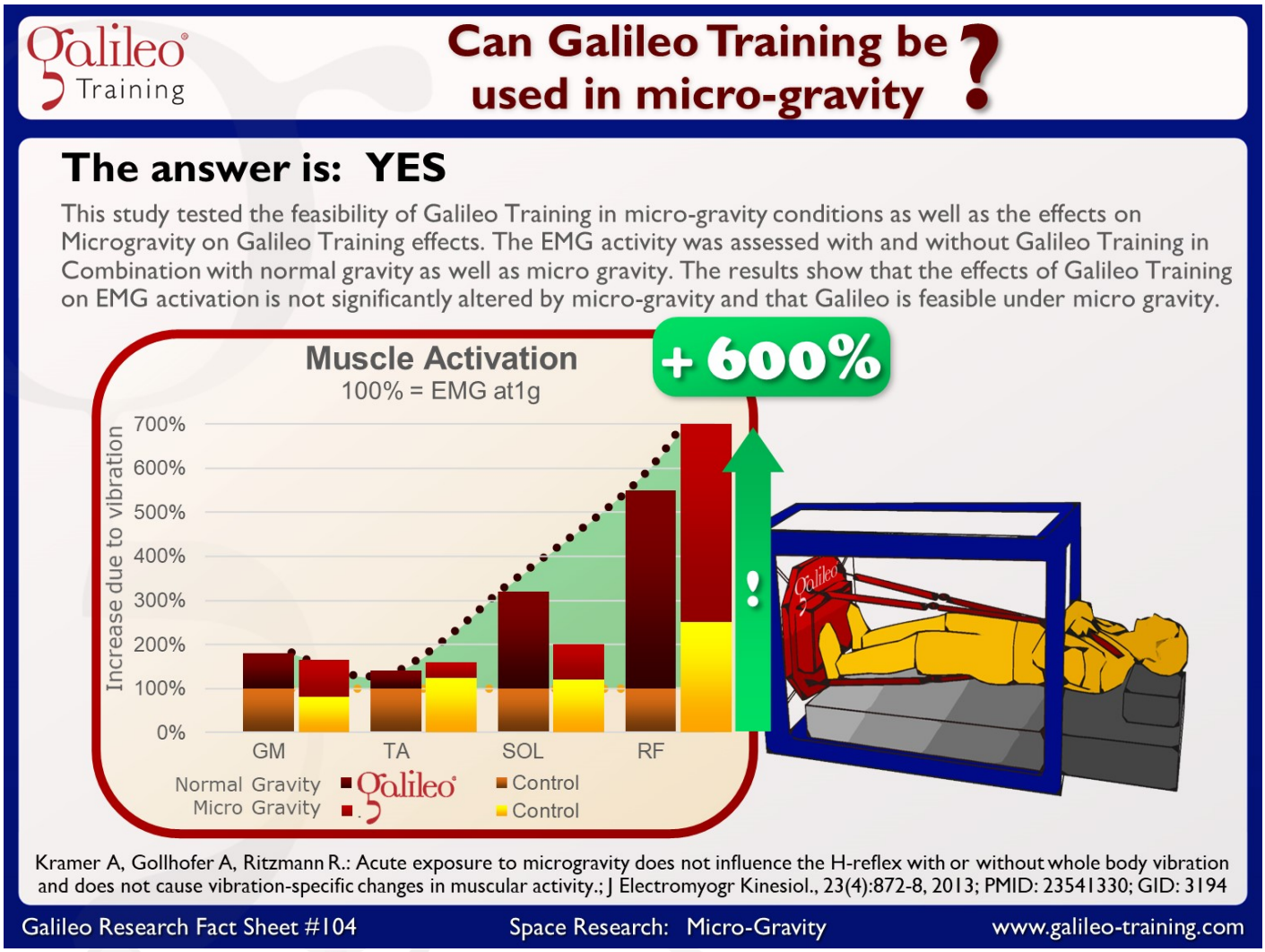

This study examined the effects of micro gravity on Galileo Training and weather Galileo Training is feasible to be applied in micro-gravity.

The study was done during the 14th parabolic flight campaign of the German Space Agency (DLR) in 2009, which was already the second campaign Galileo Training was used in.

During parabolic flight, the airplane (Airbus A300 Zero-G) follows the trajectory of a thrown ball. During this path a 25 second period of micro-gravity is followed a 40 second period of hyper-gravity (1.8 times earth gravity).

This process is repeated about 30 times. During the 25 seconds of micro gravity experiments can be performed under space-like conditions.

In this case individuals were pressed on the Galileo Device using a special spring system which created a force of 100% body weight in lying (as well as in micro-gravity). The force was transferred over the shoulders (25Hz, Pos. 1.5 to 3, slightly bent legs).

The results proved that Galileo Training is not significantly altered by micro-gravity and that it is feasible to apply Galileo Training in micro gravity. This is one step further for Galileo Training to a possible application in space since bedrest studies already showed the effectiveness and efficiency of Galileo Training to compensate negative effects of long-term space missions

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Acute exposure to microgravity does not influence the H-reflex with or without whole body vibration and does not cause vibration-specific changes in muscular activity.

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PURPOSE:

Many potential countermeasures for muscle and bone loss caused by exposure to microgravity require an uncompromised stretch reflex system. This is especially true for whole body vibration (WBV), as the main source of the neuromuscular activity during WBV has been attributed to stretch reflexes. A priori, it cannot be assumed that reflexes and Ia afferent transmission in particular have the same characteristics in microgravity as in normal gravity (NG). Therefore, the purpose of the study was to compare Ia afferent transmission in microgravity and NG and to assess how microgravity affects muscle activity during WBV.

METHODS:

In 14 participants, electromyographic activity of four leg muscles as well as Hoffmann-reflexes were recorded during NG and microgravity induced by parabolic flights.

RESULTS:

The size of the Hoffmann-reflex was reduced during WBV, but did not differ during acute exposure to microgravity compared to NG. The influence of the gravity conditions on the electromyographic activity did not change depending on the vibration condition.

CONCLUSIONS:

As far as the electromyographic activity of the recorded leg muscles is concerned, the effect of WBV is the same in microgravity as in NG. Moreover, Ia afferent transmission does not seem to be affected by acute exposure to microgravity when subjects are loaded with body weight and postural sway is minimized.

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