

ICAROS

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**ICAROS REVOLUTIONIZES THE WAY
PEOPLE EXERCISE AND PLAY**

JANUARY 2016

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Introduction

PLANK POSITION & CORE ACTIVATION

The ICAROS Pro device is thought for an assisted, global core training, offering a wide range of training modalities keeping safety and effectiveness as main aim.

ICAROS enables users to train core and other body districts at the same time using the „plank position “(also known as „ bridge “) as base which is known to be one of the most important and effective exercises in core conditioning.

Short and long leverage plank, side plank, and some other classical core exercise, like the „bird-dog “, can be performed on ICAROS with several variation possibilities.

The adjustable structure enables the therapist or the trainer to find out the optimal set up for every case and allow the precise repeatability of the exercise.

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Kneeling plank
on ICAROS Pro



Long leverage plank
on ICAROS Pro



Bird dog on ICAROS Pro

PLANK POSITION & CORE ACTIVATION

The difficulty level of the exercise can be selected regulating the range of motion and the reactivity level of the equipment, offering also the possibility to have a high performing unstable surface maintaining a very high safety standard. Enabling even subjects with a low training experience to execute this kind of exercises.

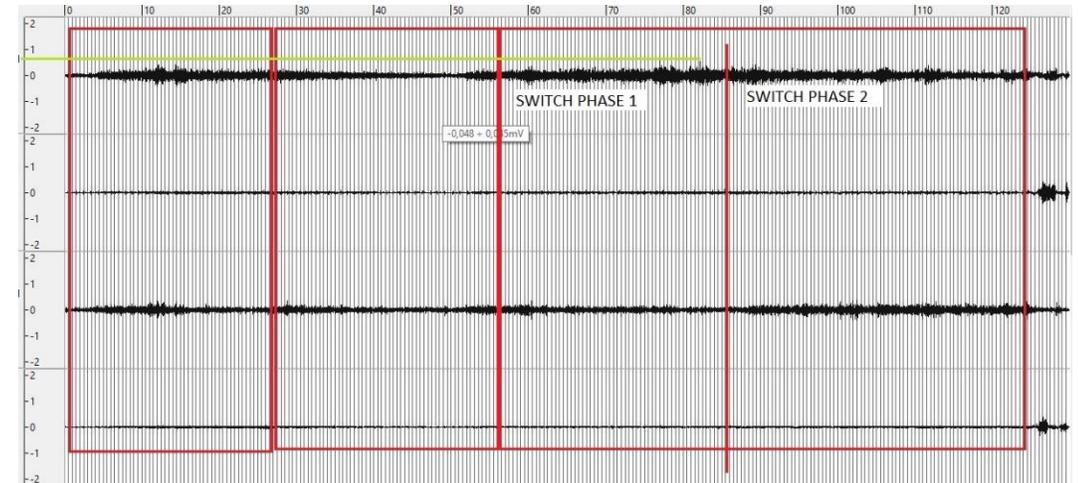
By many trials conducted in order to understand which type of plank is more effective, it was actually demonstrated that planking on an instable surface gives a greater core activation than a stabile plank. Furthermore the evidence shows also that the most effective core activation is given from those exercises where also other distal muscle groups are involved (e.g. shoulder). At our advice it's to note that all the described core activating situation are obtained with exercise that require a good fitness and experience level when performed in the traditional way.

With ICAROS, it is possible to get all these effects in a safe, controlled and measurable way, so that the exercises are suitable also for subjects with conditions (e.g. Low Back Pain syndrome) as therapy (rehab), or in all core instability situations as prevention (prehab).

The machine structure allows to separate the movements on the sagittal and frontal planes as the combined sum of both them, granting a really high quality of the repeatability of the base motions and providing the optimal conditions for the motor learning and core strengthening process.

Many important details as the possibility to switch continually and with flow from a plank position (front) to another (side), or to check and regulate the scapulas position have a fundamental role in developing core stability with efficacy, precision and in global synergy with the whole body.

On ICAROS Pro, as we tested with a sEMG (a 4 channels device from OT BioLab measuring the extensor spinaes and the external obliques)) all these crucial points were confirmed. The maximal core muscle activation was registered during the transition between the front plank (or front bridge) and the side plank (or side bridge) position.



CORE TRAINING EFFECTS

In the last decades the role of the core in injury prevention and rehabilitation was supported by several trials and practice based evidence.

The effects of such a training are not only effective, in the spine and trunk districts, in decreasing pain and increasing active range of motion in patients with chronic low back pain [18], but it promotes and improves the global coordination and joints movement precision, and of course spinestability.

The effects of a three days training on ICAROS was tested internally, using the Corehab platform, a validated medical device on four subjects with different level of training and no injuries (age 27-51).

The global score is given by three different percentage scores:

- Precision (%): ability to reach the target angle at the exact moment.
- Stability (%): ability to maintain balance.
- Accuracy (%): ability to avoid compensations.

The internal pilot trial indicate that every subject improved his global coordination abilities.

Subject	Score Trial1 %	Score Trial2 %	Difference %	Mean %
De l	83	86	+3	
Da l	77	82	+5	
J l	85	93	+8	
J l	72	78	+6	
L l	80	82	+2	
M l	82	89	+7	
			31	5,166

Study I

“The influence of extra Icaros training in rehabilitation aftercare
on the daily limitations and trunk muscles strength
in patients with lumbar spinal problems “

conducted at Technical University of Munich, 2018
Sports Science Faculty

Study I

Question:

“Does additional exercise with the Icaros have a positive effect on the subjective experience of daily limitations or strength parameters of the trunk muscles in patients with lumbar spinal problems?”

Procedure:

- 42 lumbar spinal problems patients in aftercare
- 26 at pre-test
- 12 appointments
- 20 at post test

Test Subjects:

Intervention group (n=9)

Control group (=11)



Study I

Methodology- Test

Oswestry Disability Questionnaire (Osthus et al., 2006)

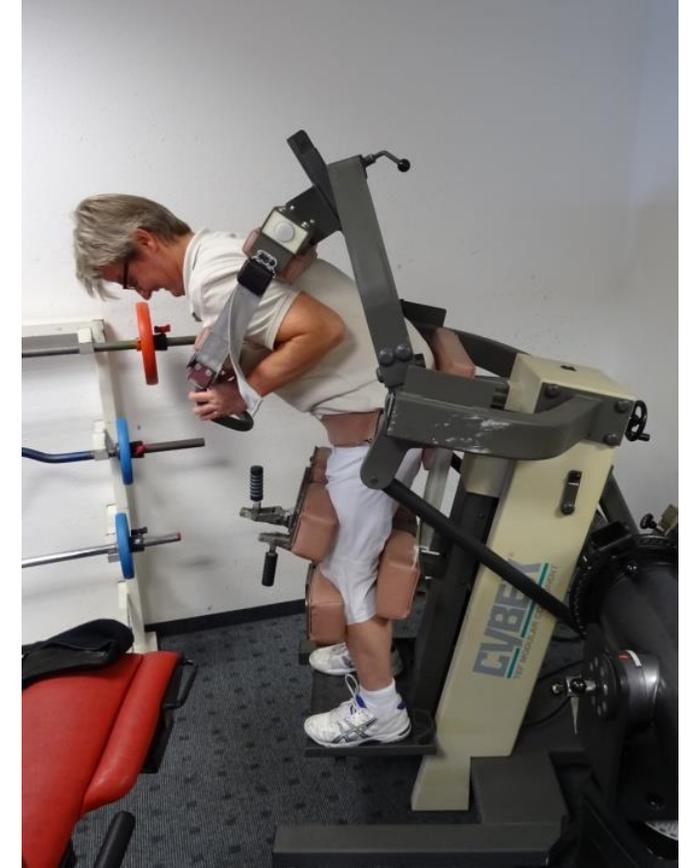
10 minute warm-up on the ergometer

Isokinetic reading:

5 times at 60°/s
15 times at 90°/s

Isometric reading:

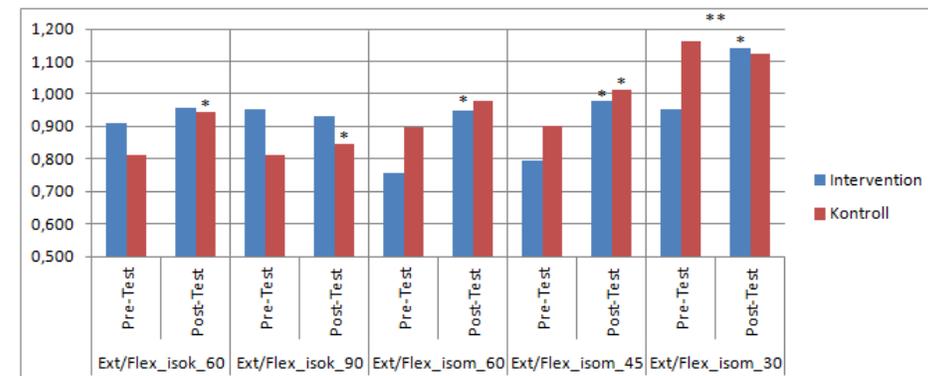
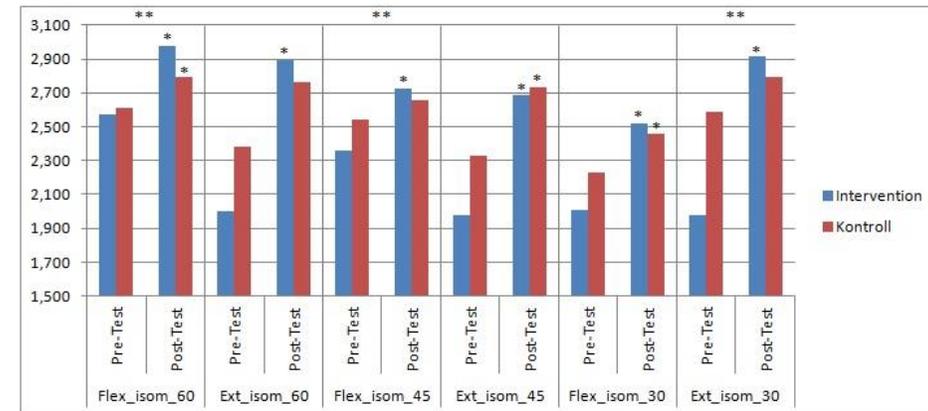
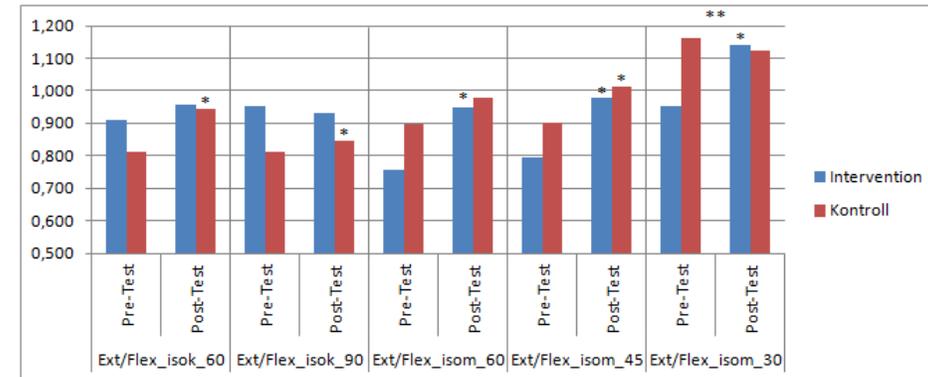
60°, 45°, 30° flexion
Ratio of extensors : flexors



Study I

Results

- Isokinetic strength ratio not significantly improved
Expectation of pain? (Al-Obaidi, 2000)
- **All other parameters improved** more than in the control group
- Isometric flexion at 60° and 45° **significantly more improved** than in the control group
- Isometric extension and strength ratio at 30° flexion **significantly more improved** than in the control group
- The **motivational nature** of ICAROS is positive for the continuation of sports activity after rehabilitation
- Usage also for shoulder problems or neurological disorders?
- Further studies are being conducted



Study II

“Energy consumption and muscle activity
exercising with innovative fitness equipment ICAROS“

conducted at Technical University of Munich, 2017
Sports Science Faculty

Study II

Question 1:

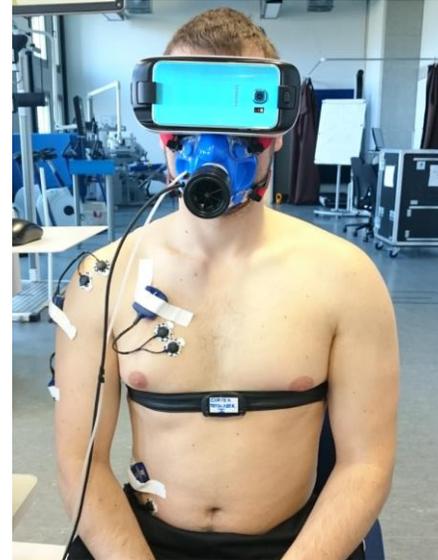
“How high is the calorie consumption during exercising with ICAROS training?”



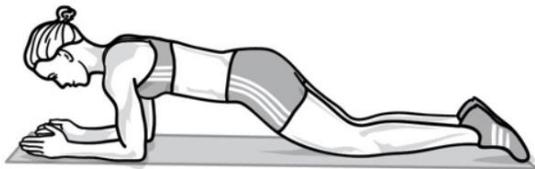
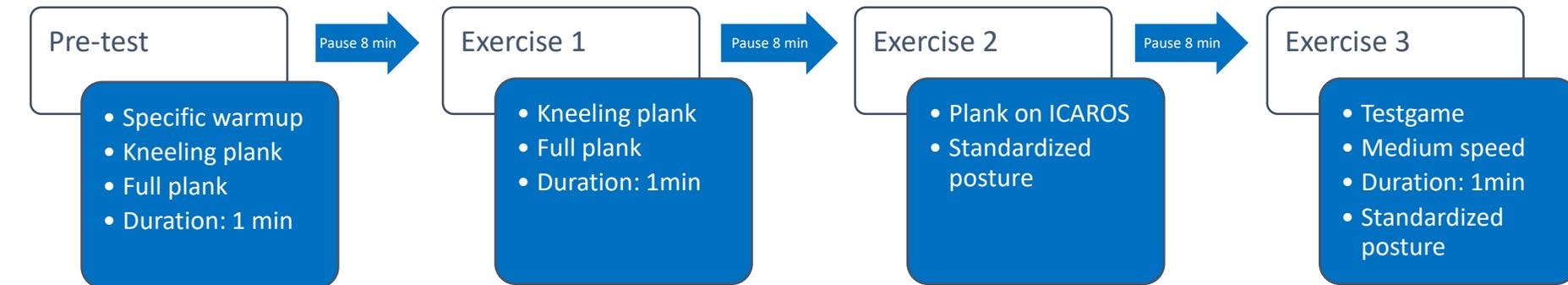
Study II

Question 2:

“How intense is the muscle activation during exercising with ICAROS training equipment?”



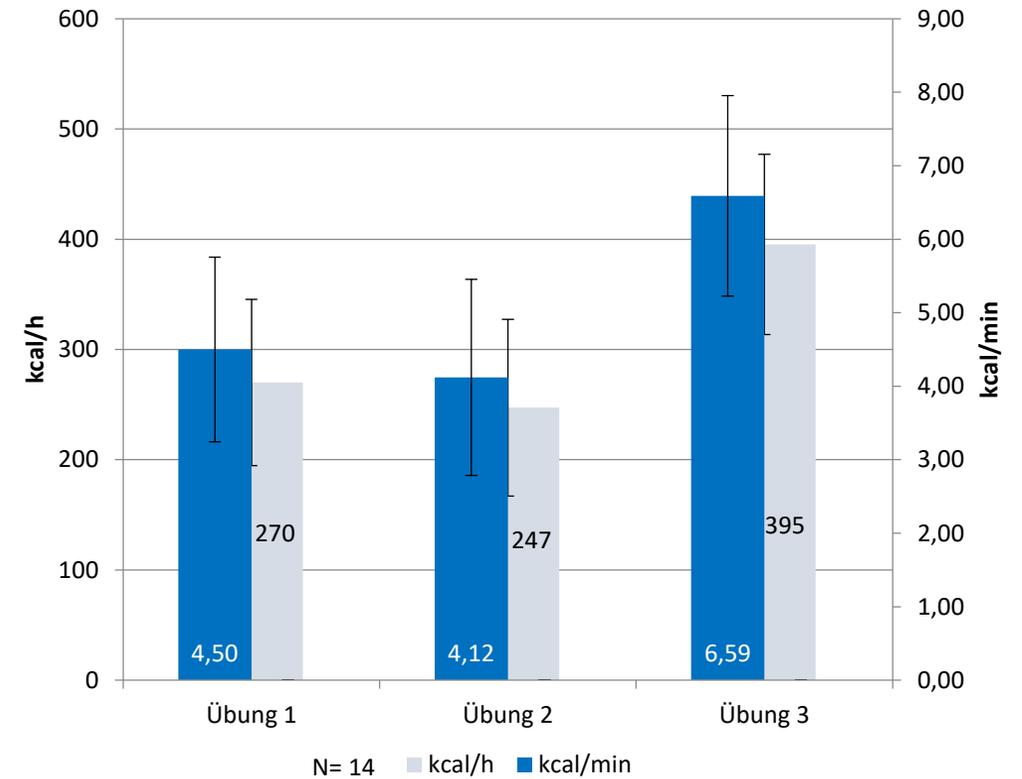
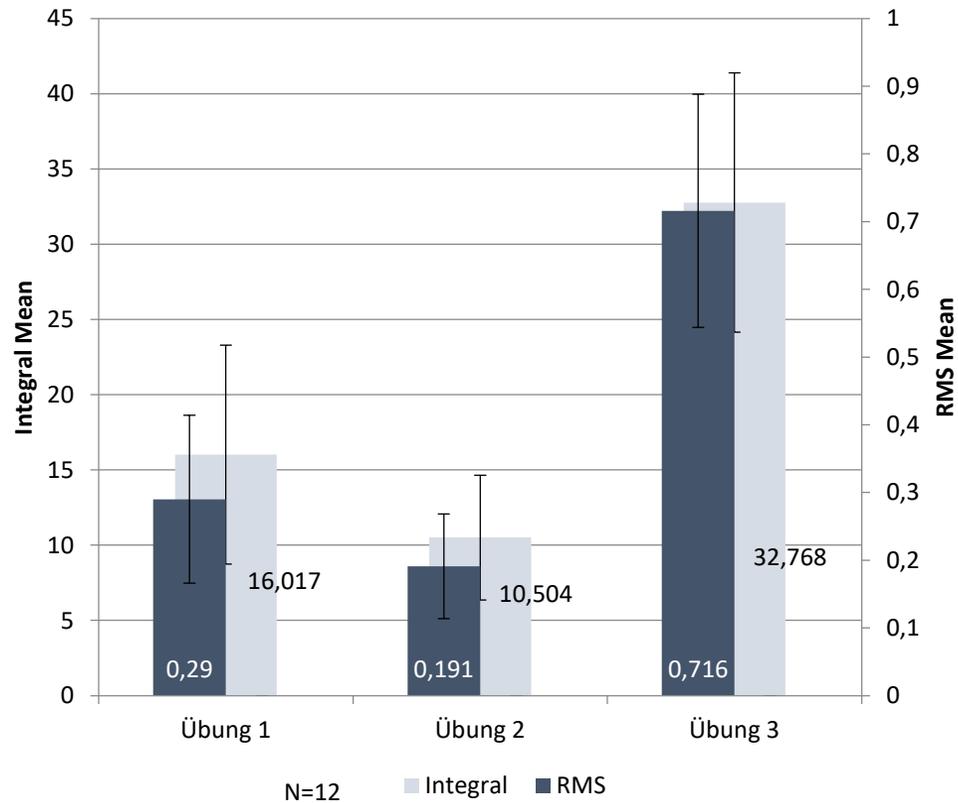
Methodology:



Results

The muscle stimulation **doubled** compared to regular kneeling plank

Calorie consumption **increased by 30%** compared to regular kneeling plank

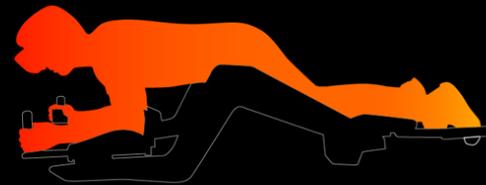
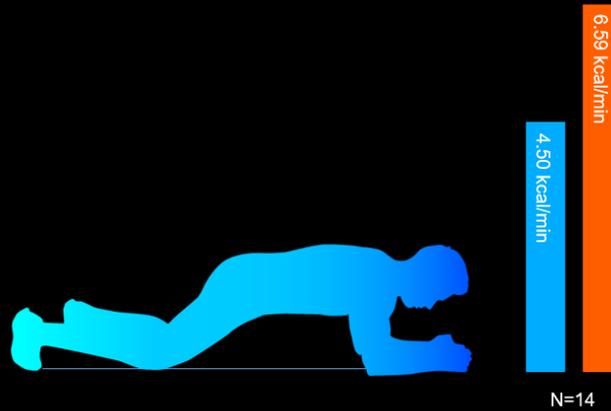


ICAROS Workout Efficacy

Calorie consumption increased by

30%

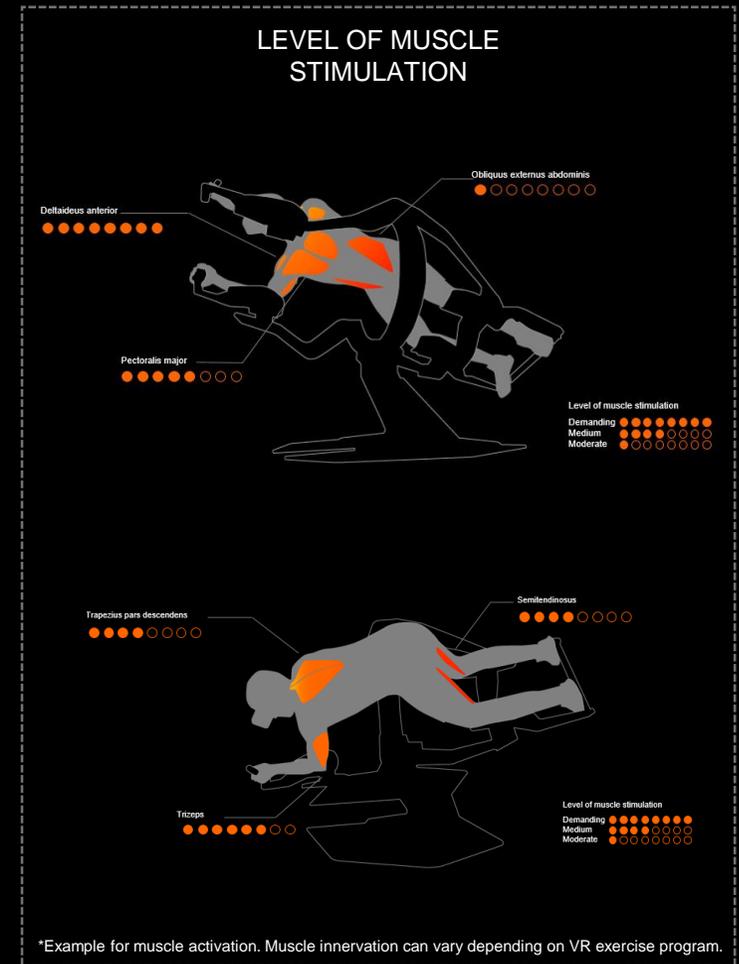
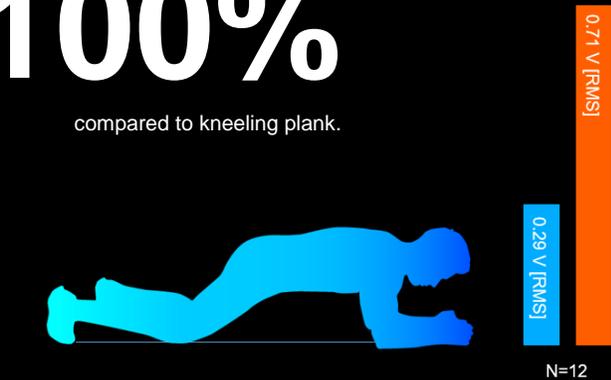
compared to kneeling plank.



Muscle activation increased by

100%

compared to kneeling plank.



Study III

“Training 2.0? Full Body Exergaming in Virtual Reality“

Several studies conducted at German Sports University Cologne, 2016 - 2018

Study III

<https://www.youtube.com/watch?v=ODcs1JU2W9Q>



ICAROS VR - Training and Prevention in Virtual Reality
2.095 Aufrufe

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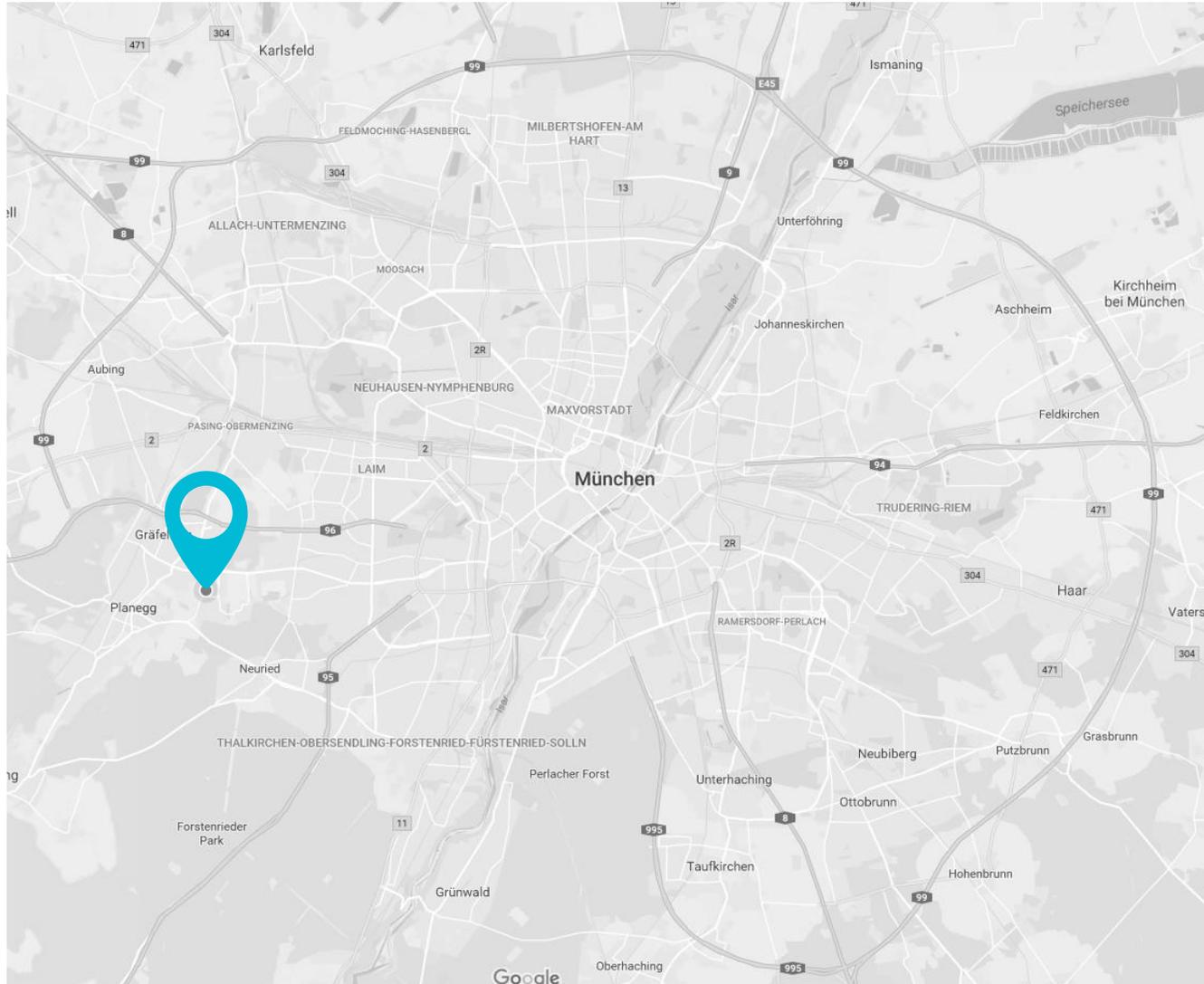


ICAROS VR - Training and Prevention in Virtual Reality
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About ICAROS

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Get in Touch

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ICAROS GmbH

Competencies:

Hard- and Software Development
Design and Engineering
Virtual- and Augmented Reality

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Facts & Figures:

Founded: 2015
Location: Munich
Staff: 20
Our Mission: [ACTIVE VR](#)