

dr. Mitja Bračič

DR. MITJA BRAČIČ

HITOP IN SPORTS TRAINING AND REHABILITATION



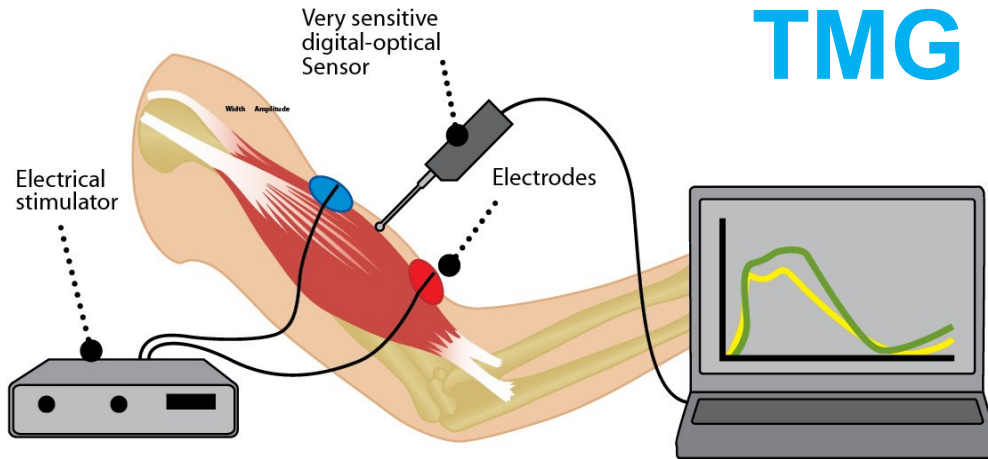
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TMG MEASUREMENTS



Five simple steps:

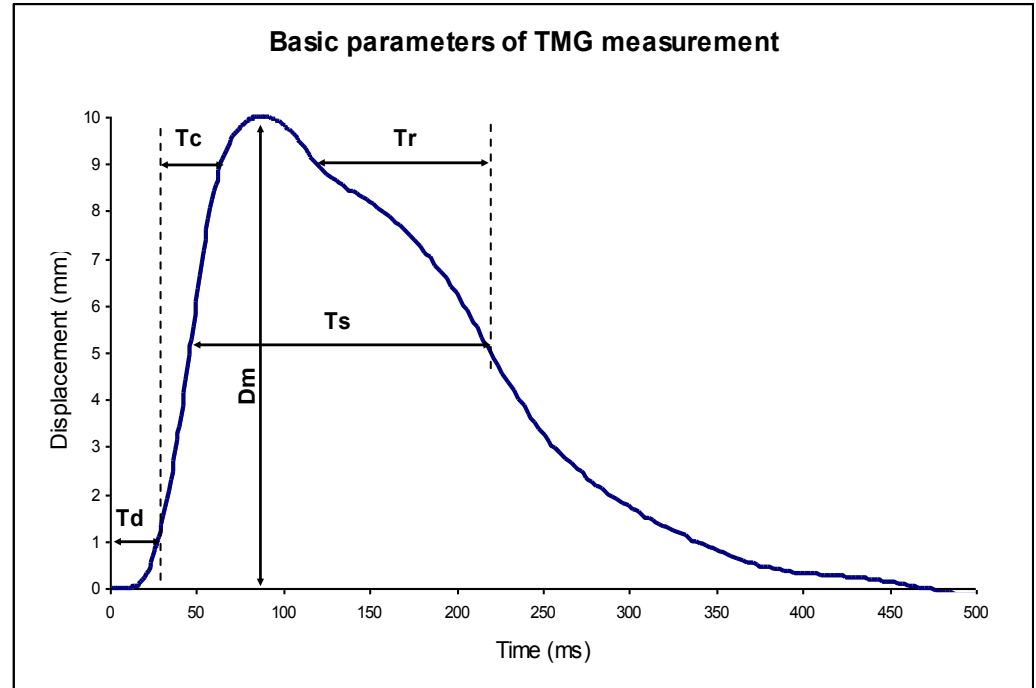
1. Place electrodes on the muscle belly.
2. Place specially-developed sensor on skin above muscle we wish to measure – the sensor is designed to register the muscle contraction.
3. The muscle contraction is induced artificially with an electro stimulator.
4. The contraction of the muscle under isometric conditions results in radial displacement of the muscle belly which displaces sensor tip. Radial displacement is recorded as a function of the elapsed time.
5. The sensor is connected to a computer where a specially designed software plots the radial displacement of the sensor rod against time.



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TMG BASIC PARAMETERS

- Radial displacement (mm)
- Delay time (ms)
- Contraction time (ms)
- Sustain time (ms)
- Relaxation time (ms)



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TMG MEASUREMENTS



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HITOP THERAPIES

1. MAXIMUM STRENGTH TRAINING An individual's physical/muscles strength is determined by two factors; the cross-sectional area of muscle fibers recruited to generate force and the intensity of the recruitment.

2. MUSCLE ATROPHY is defined as a decrease in the mass of the muscle; it can be a partial or complete wasting away of muscle, and is most commonly experienced when persons suffer temporary disabling circumstances such as being restricted in movement and/or confined to bed as when hospitalized. When a muscle atrophies, this leads to muscle weakness, since the ability to exert force is related to mass.



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ECCENTRIC CONTRACTION + HITOP

An **eccentric contraction** is the motion of an active muscle while it is lengthening under load.

One leg – ecc contraction –
electrodes on quadriceps f.
5 sets – 5 reps

Sim X – HTEMS – 40 – 60 herz
100 – 120 deg
5 sec 120 – 160 mA



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Maximum strength training + HITOP

An **eccentric contraction** is the motion of an active muscle while it is lengthening under load.

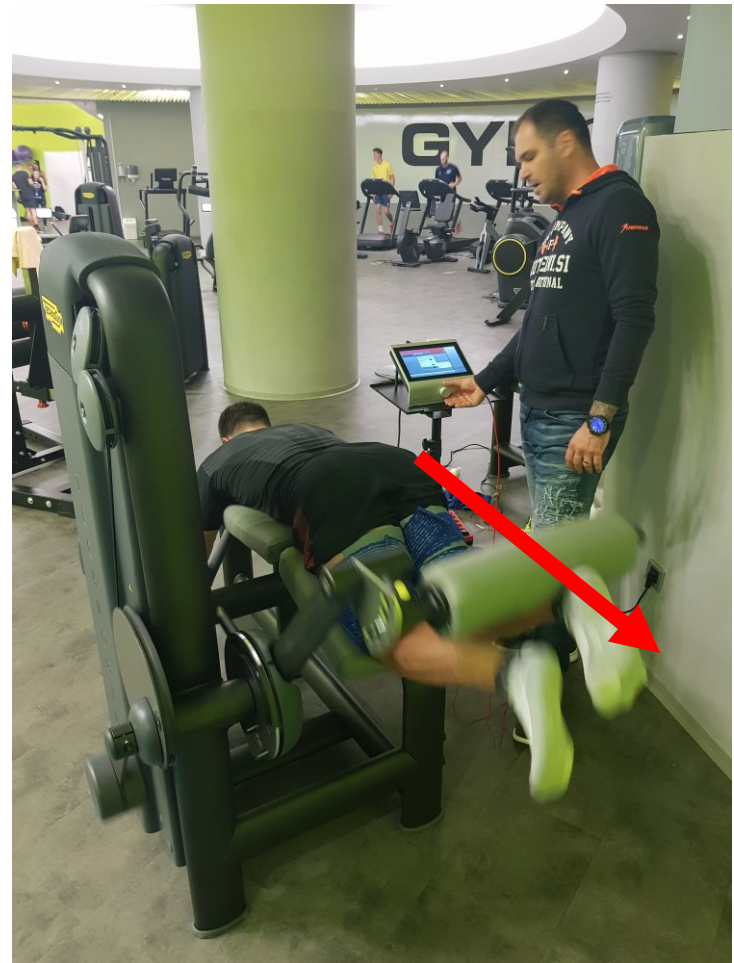
One leg hamstrings curl – ecc contraction – electrodes on hamstrings m.

5 sets – 5 reps

Sim X – HTEMS – 50 - 60 herz

100 – 120 deg

5 sec 120 – 160 mA



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Maximum strength training + HITOP

Squat – ecc contraction –
electrodes on quadriceps m.
5 sets – 5 reps

Sim X – HTEMS – 50 - 60 herz
100 – 120 deg
5 sec 120 – 160 mA

Žan Kranjec – alpine skiing
4th place Olympic Games 2018



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Maximum strength training + HITOP

Squat – concentric + explosive contraction – electrodes on quadriceps m.
5 sets – 5 reps

Sim X – HTEMS – 60 herz
100 – 120 deg
5 sec 160 mA

Robert Kranjec – Skijumping
World champion



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Muscle atrophy + HITOP

One leg squat – ecc contraction
– electrodes on quadriceps m.
5 sets – 5 reps

Sim X – HTEMS – 50 herz
120 deg
5 sec 120 – 160 mA

Basketball player –
microfracture of the knee + ACL



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ACL Rehab + HITOP

One leg squat – ecc contraction
– electrodes on quadriceps m.
5 sets – 5 reps

Sim X – HTEMS – 50 herz
120 deg
5 sec 120 – 160 mA

Soccer player Arthur Yusupov –
FC Zenith Russia – ACL –
rehabilitation in Dubai (UAE)



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ECCENTRIC CONTRACTION + HITOP

Death lift – hamstrings – ecc
contraction – electrodes on
hamstrings m.
5 sets – 5 reps

Sim X – HTEMS – 50 herz
120 deg
5 sec 120 – 160 mA

Marko Vukičević - Alpine skier



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Hamstrings rehab + HITOP

hamstrings – ecc contraction –
electrodes on hamstrings m.
5 sets – 5 reps

Sim X – HTEMS – 50 herz -
100 deg

5 sec 120 – 160 Ma

Hamstrings muscle rupture



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Achilles tendon rehab + HITOP

Calfs m. – ecc contraction –
electrodes on gastrocnemius m.
5 sets – 5 reps

Sim X – HTEMS – 50 herz -
100 deg

5 sec 120 – 160 mA



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SHOULDER REHAB + HITOP

Shoulder abduction –
concentric + isometric
contraction – electrodes on
deltoideus m.

5 sets – 5 reps

Sim X – HTEMS – 50 herz -
100 deg

5 sec 120 – 160 mA



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SHOULDER REHAB + HITOP

Deltoideus posterior m.
– concentric + isometric
contraction – electrodes
on deltoideus post. m.

5 sets – 5 reps

Sim X – HTEMS – 50
herz - 100 deg

5 sec 120 – 160 mA



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SHOULDER REHAB + HITOP

Pectoralis m. –
eccentric contraction –
electrodes on pectoralis
m.

5 sets – 5 reps

Sim X – HTEMS – 50
herz - 100 deg

5 sec 120 – 160 mA

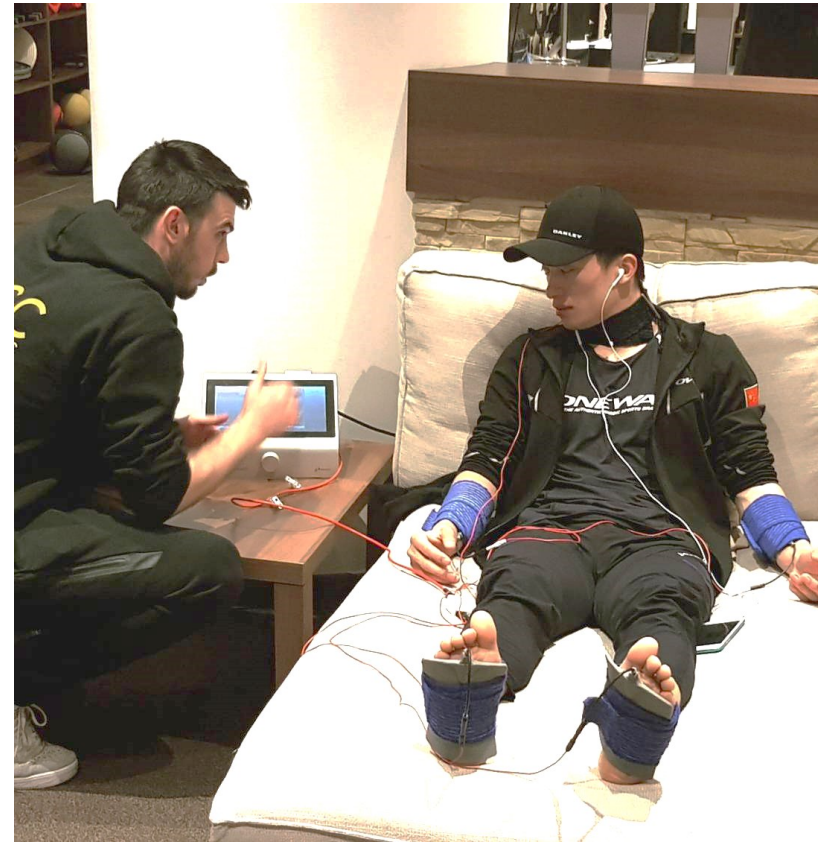


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RECOVERY AFTER TRAINING

Vitalization Hitop 60 MIN + MASSAGE

CHINA SNOWBOAR OLYMPIC TEAM



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HITOP IS THE BEST!

1. FOR STRENGTH TRAINING

- ECCENTRIC CONTRACTION
- CONCENTRIC CONTRACTION
- ISOMETRIC CONTRACTION
- COMBINATION

2. FOR REHABILITATION

- MUCLE ATROPHY
- WEAK MUSCLE
- WEAK MUSCLE ACTIVATION
- TENDONITIS / TENDINOPATHY
- MUSCLE DEFICIT / ASIMETRY

3. FOR RECOVERY AFTER TRAINING OR REHAB PROCESS

- WHOLE BODY VITALIZATION
- MUSCLE MASSAGE
- BIG TAST MASSAGE



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HVALA!

THANK YOU!