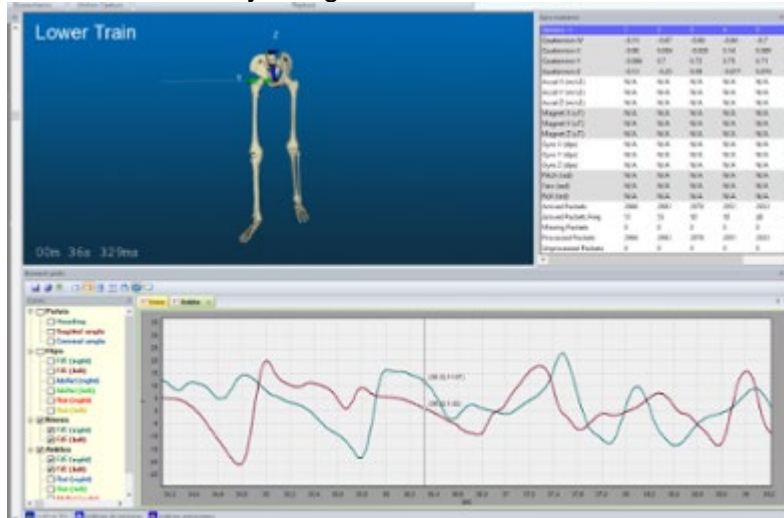


Descriptions of Key Strength & Physical Function Core Services

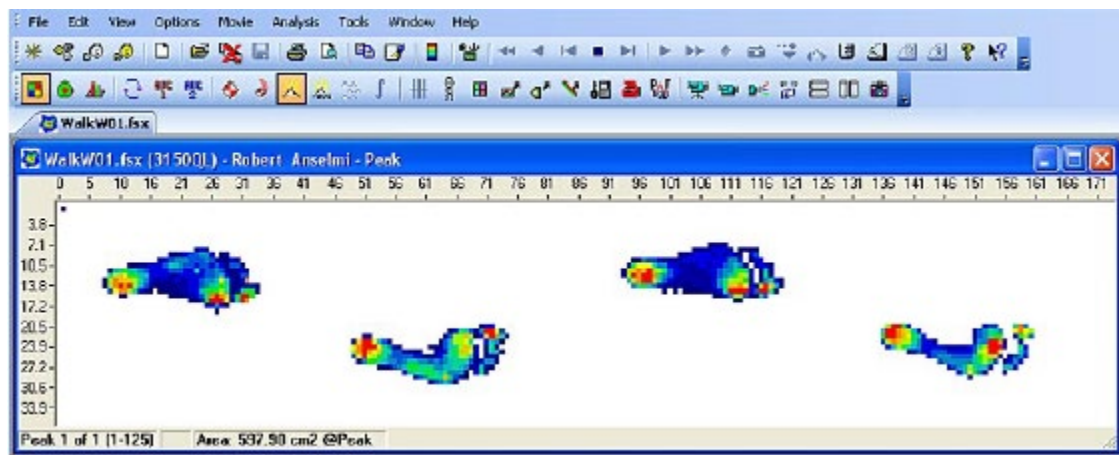
1. Motion Capture and Electromyography (EMG) Recording System

The motion capture system uses inertial measurement unit (IMU) sensors to provide real-time joint kinematics information including orientations (angles) as well as angular velocities and accelerations. The wireless surface electromyography (EMG) sensors will provide high-quality recording of muscle activation. The IMU and/or EMG measurement is available for single limb, upper limb, lower limb and whole body measurement, according to the individualized study design.



2. Gait Mat System (Tekscan Walkway System)

The Gait Mat system provides basic temporal and spatial measures of gait including cadence, gait velocity, step/stride time, step/stride length, step/stride velocity, maximum force, foot angle, duration of each stage of the gait cycle, etc. It can be combined with Motion capture and EMG system to provide a full range of biomechanical gait information.



3. Transcranial Magnetic Stimulation (TMS)

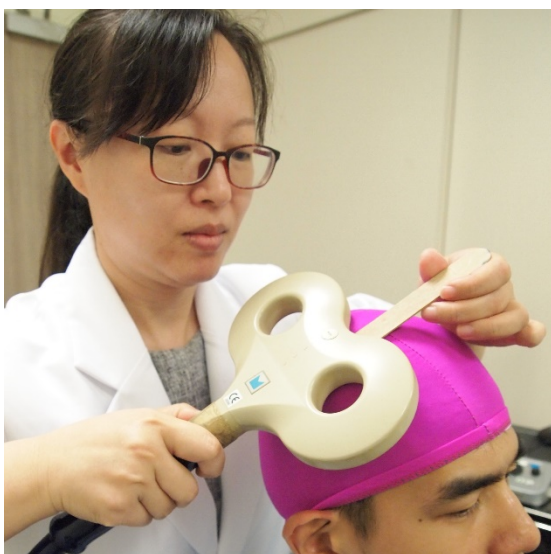
TMS is a noninvasive technique that uses magnetic fields to induce electrical currents in focal areas of the brain's cerebral cortex. By transiently activating or inhibiting these focal areas in the brain, the currents can influence behavior. TMS is used to assess and treat a wide variety of neurologic and psychiatric conditions. The different TMS procedures that are used for assessment and treatment are discussed below.



a. TMS for assessment of cortical excitability and intracortical facilitation/inhibition

Typically, single-pulse TMS is used to assess the excitability and inhibitory characteristics of the cortex. A TMS pulse of sufficient intensity (suprathreshold TMS) will generate a response in the peripheral muscle called a motor evoked response (MEP). The lowest-intensity stimulus needed to elicit a MEP response with an amplitude of at least 50 μV in at least 4 out of 8 successive trials is defined as the resting motor threshold (RMT). RMT could be used as a prognosis indicator for motor recovery.

Paired-pulse TMS stimulation is used to assess intracortical inhibition/facilitation, a first subthreshold conditioning stimulus (80% of RMT) will be applied, followed by a second suprathreshold testing stimulus (120% of RMT). Between these two stimuli, the interstimulus interval (ISI) is varied as follows: 2, 3, 6, 10, and 15 ms. ISIs of 2 ms and 3ms typically induce intracortical inhibition while ISIs of 10 and 15 ms reflect intracortical facilitation. Intracortical inhibition/facilitation is calculated by normalizing the average amplitude of paired-pulse MEPs to the average amplitude of testing stimulus MEPs, and is reported as a decimal fraction of testing stimulus MEP.



b. TMS for treatment of neurologic and psychiatric conditions

Another type of TMS, repetitive TMS (rTMS), can be used to treat patients with conditions such as stroke. rTMS has been shown to improve functions such as motor function, aphasia, attention deficiencies and spatial neglect in stroke patients, as well as to enhance the effectiveness of stroke rehabilitation. This treatment has also been used in psychiatric conditions such as major depression and auditory-verbal hallucinations in schizophrenia. rTMS involves administering trains of repeated pulses, interspersed by intervals (see Figure). A high-frequency (eg, 10 Hz) repetitive pulse can be used to excite cortical regions. Conversely, a low-frequency (eg, 1 Hz) repetitive pulse is used to inhibit cortical regions.

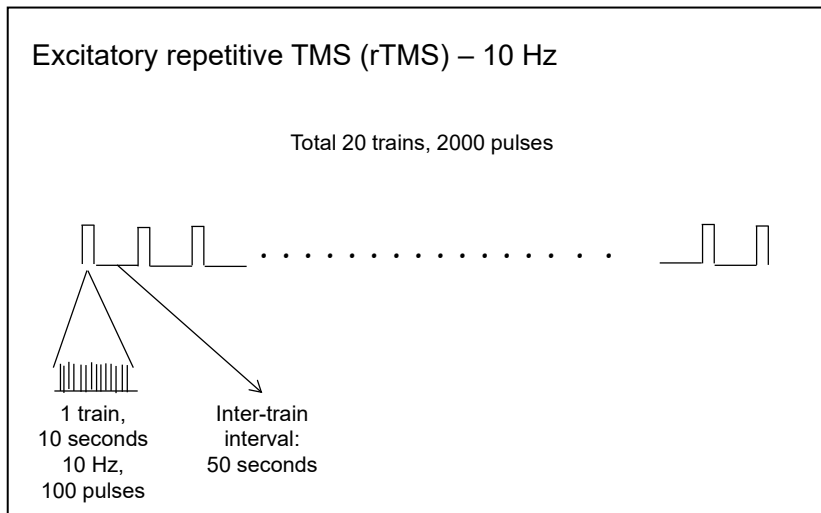


Figure. Example protocol for repetitive TMS