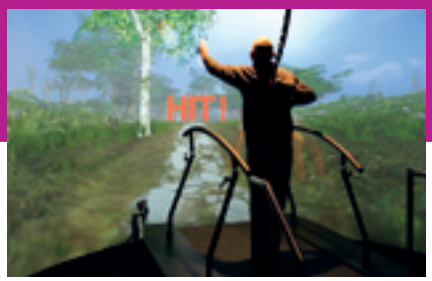
Motek

GRAIL

Gait Real-Time Analysis Interactive Lab

GRAIL
The gait lab of the future

GRAIL is a total package solution for gait analysis and gait training, which employs an instrumented dual-belt treadmill, a motion capture system and Virtual Reality (VR) environments as well as three video cameras. GRAIL empowers user friendly assessments and exercises, in challenging conditions, to improve (pathological) gait patterns. Real-time feedback in GRAIL enable analysis and training during the same session.



The Status Quo

Traditionally, clinical gait analysis is done with force-plates, EMG, video cameras, and a motion capture system. These tools are widely used to collect gait parameters such as walking speed, step size, joint angles, and muscle activation during one single step. In most cases, this conventional approach to gait analysis is done in a large lab which averages 88m^2 (947 ft^2). This method, although scientifically proven to be effective, is time consuming, complex, and expensive, which means it is usually limited to severe Cerebral Palsy and Stroke patients.

How GRAIL works

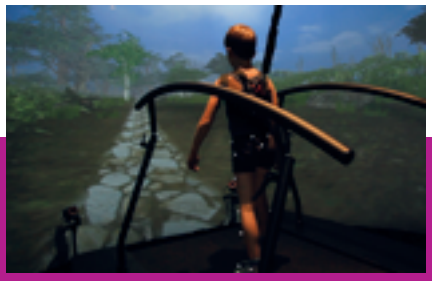
Synchronized VR environments, projected on a semi-cylindrical screen, immerse the patient in virtual worlds and natural walking environments. The treadmill's self-paced mode allows the patient to initiate gait and to walk at a self selected pace, while the treadmill and the VR environment run in perfect synchronization. Simulate walking up- and down hill, combined with visual stimuli, challenge patients while measuring gait behavior, which ultimately provides a 'functional gait analysis'. An added advantage is that once gait analysis has been done, a training session can be initiated which allows the patient to work on gait functionality right away.

The GRAIL Way

Instead of the traditional large lab, GRAIL requires only 25m^2 of space, which is a major advantage. The biggest difference with the common practice of gait analysis is GRAIL's use of a fully instrumented dual-belt treadmill. GRAIL combines the treadmill with a self-paced option, an integrated motion capture system, 3 video cameras, and an EMG system. This unique combination allows for the calculation of all gait parameters in real time (spatio-temporal parameters, kinematics, kinetics, and muscle activation). The Gait Offline Analysis Tool using the real-time musculoskeletal Human Body Model offers intuitive data analysis and facilitates communication with the (medical) specialist as well as between the specialist and the patient.

"With the GRAIL clinical gait analysis and gait training under various conditions can be used to obtain faster and better rehabilitation results"

BERTJO RENZENBRINK, REHABILITATION PHYSICIAN & DIRECTOR AT THE REHABILITATION CENTER ST. MAARTENSKLINIEK, NIJMEGEN, THE NETHERLANDS



GRAIL Features

Instrumented dual-belt treadmill

Measuring 3D ground-reaction forces of the left and right leg independently
Self-paced module
Pitch and sway

Video, motion capture system and EMG

Synchronized data streams
Gait parameter calculations in real-time

- Spatio-temporal parameters, joint kinematics, joint kinetics, EMG
- Averages, standard deviations, variations over time

180° projection and surround sound system

Immersive VR with peripheral vision
Interactive multi-sensory feedback for gait training

Software

Set of clinical applications for amongst others dynamic alignment of prostheses, left-right comparison, cueing, dynamic stability, gait adaptability, cognitive dual-tasks, training of push-off/foot clearance. Musculo-skeletal Human Body Model with real-time visualization of muscle forces

Gait Offline Analysis Tool

User friendly interface

- Synchronized data: videos (3x), 3D data, gait parameters
- Extensive interactive data analysis of multiple gait cycles
- Data reprocessing and export functionality
- Gait report generation

"If you really want to improve your walking, GRAIL is the best tool you can have because it combines all therapies in a functional, challenging environment."

ERIK BRAKERT, STROKE PATIENT AT THE MILITARY REHABILITATION CENTER AARDENBURG, DOORN, THE NETHERLANDS.

Why Choose GRAIL?

It's fast: Full 3D clinical gait analysis of multiple cycles within 30 minutes. Faster and better rehabilitation results using gait training under various conditions.

It's real-time: all gait parameters are available in real-time for monitoring and intervention (spatio-temporal parameters, kinematics, and muscle activation).

It's proven: GRAIL contains scientifically proven clinical protocols which currently exist.

It's efficient: Training options enable a 100% utilization rate.

It saves space: a traditional lab takes up an average of 88m^2 (947ft^2) but GRAIL only requires 25m^2 (269ft^2).

It's communicative: The Gait Offline Analysis Tool offers intuitive data analysis and facilitates communication between specialists and with patients.

It's effective: GRAIL is used with neurological and orthopedic patients, patients with neuromuscular problems, and the elderly. It's useful in the rehabilitation process for analysis and training.

It's challenging: Synchronized VR environments, projected onto a semi-cylindrical screen, immerse the patient in virtual worlds and natural environments and offer interesting rehabilitation games for walking.

Sometimes in our lives a setback in movement and mobility, due to disease, trauma, or aging, adversely affects our quality of life. To regain mobility, restore and improve human performance, Motekforce Link draws on 15 years of experience in rehabilitation technology and virtual reality.

Motek

Motek is a proud partner of

DIH Hocoma

Motekforce Link B.V.
Hogehilweg 18 - C
1101CD Amsterdam
The Netherlands

www.motekforcelink.com
info@motekforcelink.com

Find Out More About Us

FOR 68- NOVEMBER 2016