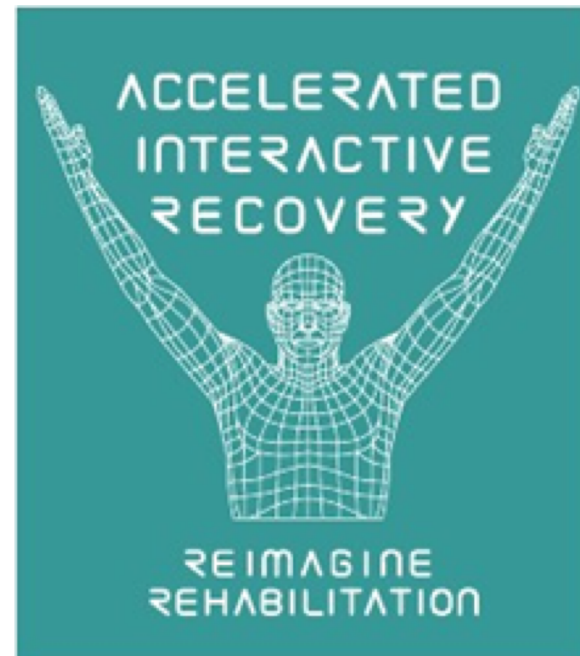


BASIC & Virtual Reality Technology

Sylvia Moss Neuro physiotherapist



AIR Project

CAREN (Computer Assisted
Rehabilitation
ENvironment)

DynSTABLE (Dynamic
STability and Balance
Learning Environment)

C-Mill(Retrainer for Gait)



CAREN System

Multi-movement platform base

Dual-belt treadmill

Force plate

10 motion capture cameras

3 high resolution video cameras

180 degrees screen

4 image projectors

Operated from computer desk

Full body harness for users



CAREN System

Multi-sensory virtual reality system

System mimics the virtual environment

Variety of applications that combine both physical and cognitive elements

Real-time instant feedback for therapists

New environments can be developed

Comprehensive full body gait analysis can be completed



DynSTABLE

Moveable platform base

Force plate

4 motion capture cameras

Virtual screen

3 image projectors

Operated from touchscreen
computer panel

Full body harness for users



C-Mill

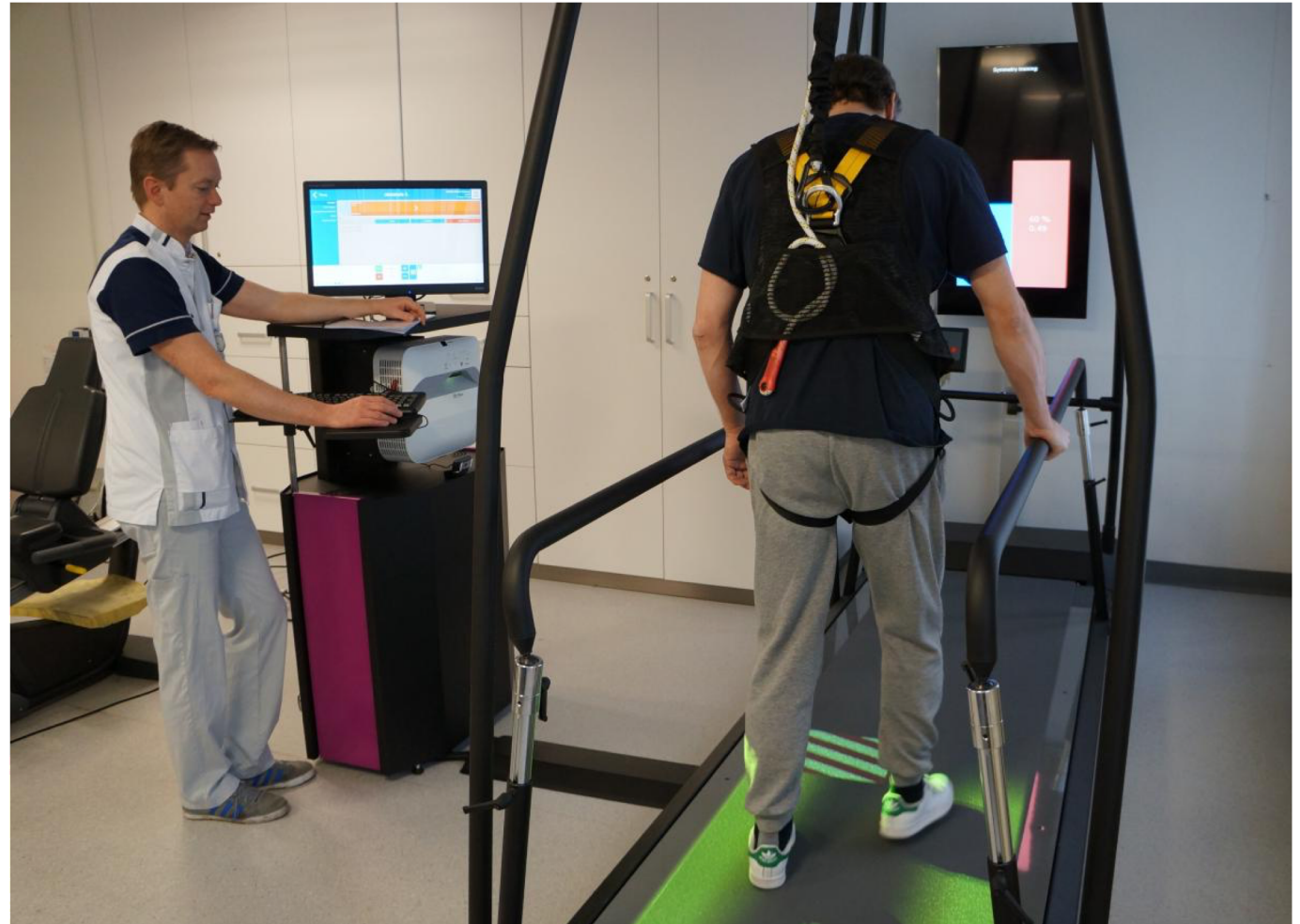
A dynamic learning environment to improve walking patterns using an interactive treadmill.

Uses Augmented reality
and

Virtual reality

Operated from touchscreen
computer panel

Full body harness for users



Case Study 1. JH

- **31 year old, married has 8 month old daughter. Wife owns Equestrian centre, parents live close by**
- **Previous veteran –Iraq 2007-2011**
- **Maritime security on discharge from forces 2012-2017**
- **Last 4 months prior to injury working at home, building horse boxes**

J H

24/8/17 Collapsed whilst working at home

Blue light to PRI, diagnosed AVM, induced coma

Craniotomy-glued AVM

Following surgery significant weakness of left side, peripheral visual field loss on left. Hypersensitivity on left

Unable to mobilise/ sitting/standing balance compromised



Initial Assessment at BASIC

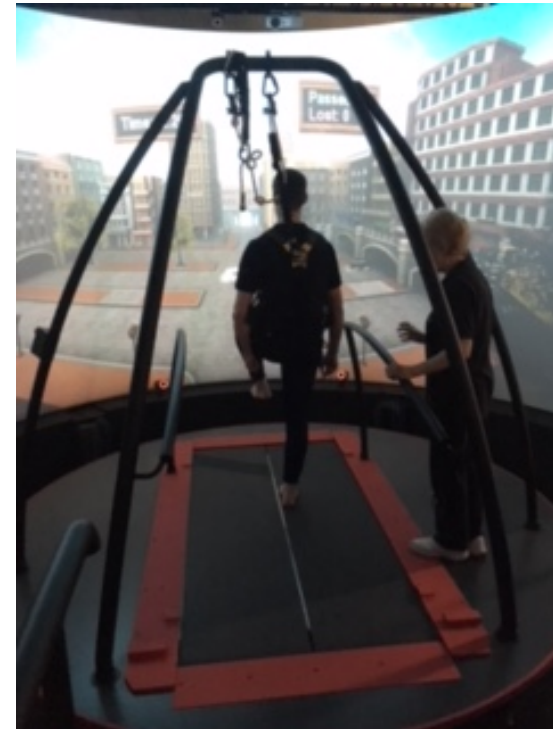
14th October 2017 discharged from hospital, attended 1st appointment at BASIC on 19/10/17

- Independent with mobility, stepping over obstacles reduced, and looking up when walking
- 6 metre walk -4.78secs
- HADS: Anxiety 11 Depression 9: Attention/distraction moderate problem, talking incessantly
- NEADL: 41/88
- Goals: reduce hypersensitivity of left arm
- To return to his work/ to be able to run

Intervention

- Hands-on therapy prior to sessions on CAREN/C-Mill
- 18 sessions, attended twice a week
- Applications for balance eg Kite flyer, Maze, City Ride, Boat, Traffic Jam
- Gait training eg Magician Apprentice, Microbes, Rope Bridge
- HEP including squats, jumps
- Advice:- awareness of sensation, cramps, self pacing
- Support for family –Forces Covenant

Balance --CAREN



Comparison 19/10/17-----21/12/17

Gait-unable to step over obstacles safely

6 metre walk: 4.78secs

NEADL: 41/88

Limited participation –less than 25% with leisure/social

Unable to help with work at the Equestrian centre

Hypersensitivity of left arm

Left peripheral visual field loss

Fatigue ++

- Gait-steps safely over obstacles
- 6 metre walk: 3.72secs
- 6 metre run: 2.15secs
- NEADL: 69/88
- Greater participation in social/leisure
- Now helps out
- Still has sensory issues but deals with them better
- Slight improvement with vision
- Improved in fatigue, better management

Client quotes

- Felt without the support of BASIC and use of CAREN would not be were he is today –the NHS no longer inputting in his rehabilitation
- Achieved his main goal of running again
- August 2018 applying to compete in the Para-Olympic Games-dressage

Cast study 2. R C

- Age 41 years old
- November 1999 RTA affecting right side, speech/behaviour: fully dependent for all cares
- Spent 5 years in specialist unit for ABI –seen daily
- 2005-2006 residential care-behavioural unit
- Last 5 years lives at home with parents with adaptations-initial hoist for transfers.
- Private physiotherapist / PA daily

Initial assessment-13/6/2018

- Wheelchair dependent-independent sitting compromised
- Poor postural control-Sit-std assist. Of 2
- Left side-UL/LL Grade 4
- Right UL prox Grade 2-0 distal contractures elbow
- Right LL Grade 2+ prox-Grade 1 distal
- NEADL 28/88

- Commence CAREN 2/7/2018

CAREN



CAREN



RC



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