Treating with Technology

The 5 W's
(What, Why, Who, Where, When)

Vicki Abraham
Managing Director
Occupational Therapist

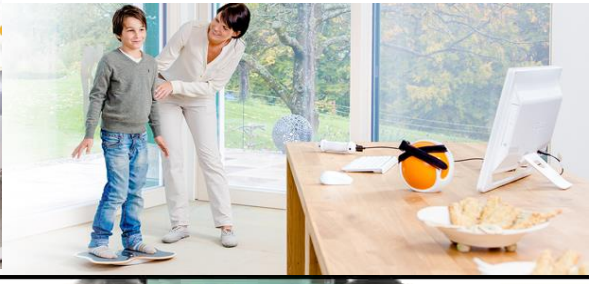
REACH MORE

cbra
Computer Based Rehabilitation Australia

Technology

Technology in Rehab

Technology in Rehab

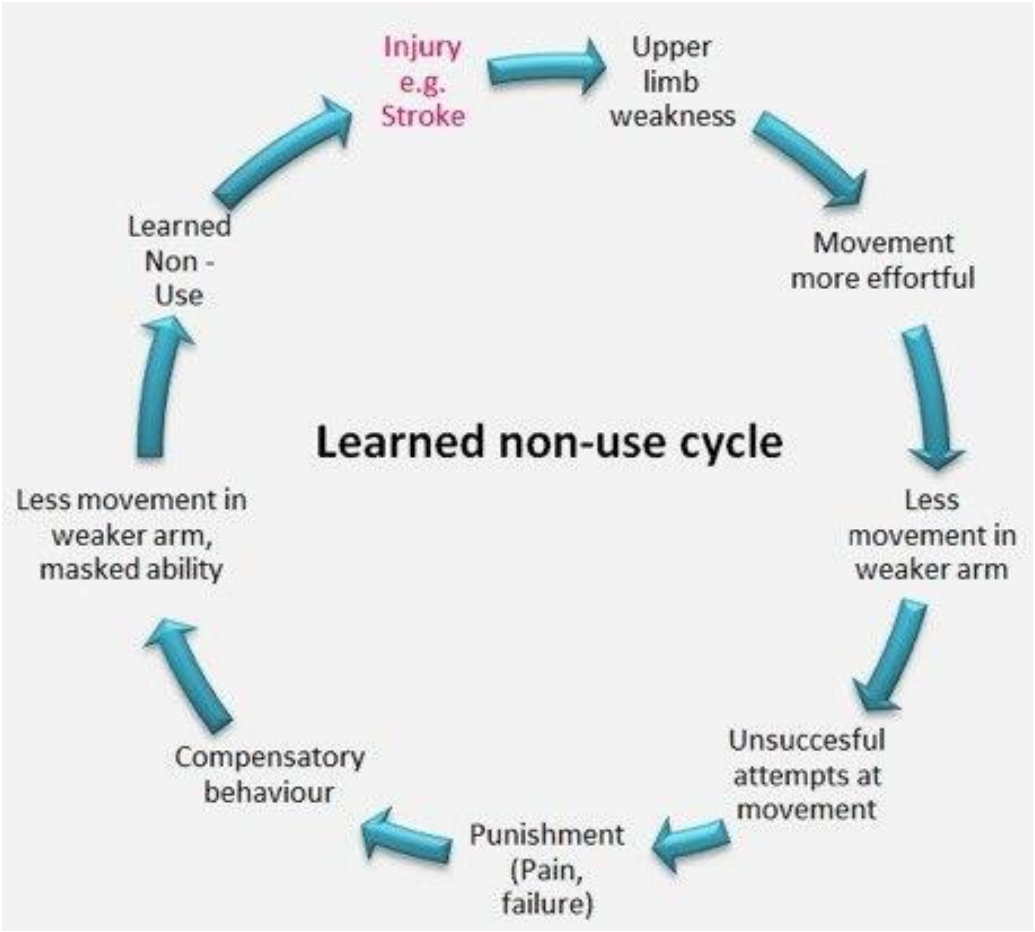


Neuroplasticity

"Neuroplasticity is the ability for the brain to adapt in function and morphology to environmental influences such as new experiences (learning) and compensation after damage"

Barry Willer, 25-28 February 2014, *Level Two Training in Acquired Brain Injury*, Presented by Monash University Department of Occupational Therapy, Victoria, Australia

Learned Non Use



Theory Behind Therapy

There are three factors which have been proven in motor research to be crucial to the learning process and also carry implications for the rehabilitation:

- **1. Focusing of attention of the person learning, which is induced by instructions or by feedback.**
- **2. Self-controlled training in which the learner has the possibility to control certain aspects of the training conditions him/herself.**
- **3. Group training instead of individual training.**

By factoring these points into therapy the effectiveness of the intervention is raised and the recovery of motor skills is accelerated.

Theory Behind Therapy

Core Elements of Motor Learning

- repetition
- shaping
- external focus
- biofeedback
- motivation

Different Therapy Strategies

- passive repetitive movement
- task-oriented training
- bilateral therapy
- cognitive aspects
- and many more

Transfer to Practice

- Motivation
  - external focus
  - goal orientation
  - quantify changes

- Therapists supervising more patients
- Offer patients an opportunity to train independent, intensive, functional, and at home

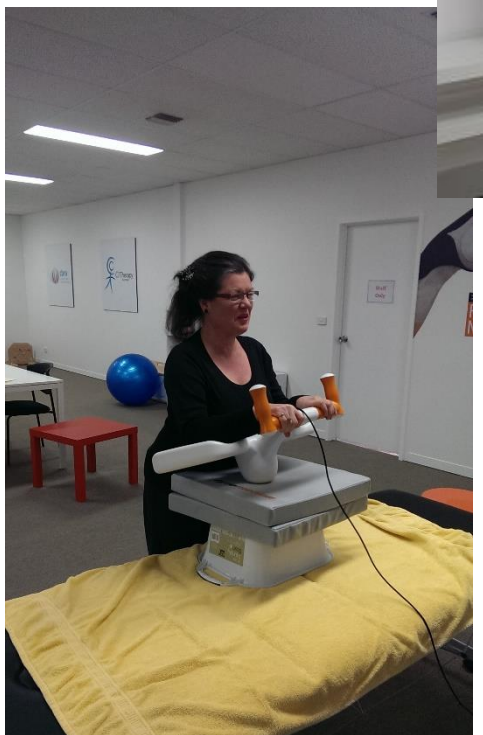
AOTS Clinic

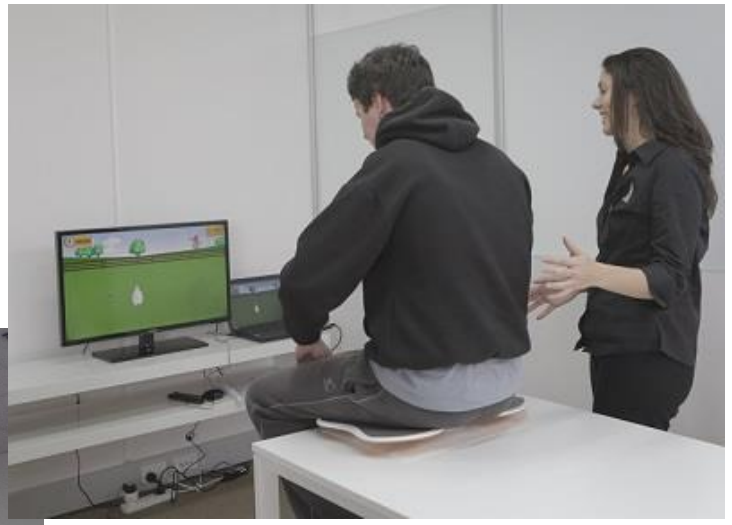
AOTS Clinic specialising in computer/robotic therapy

- was opened January 2014
- Using Tyromotion Devices
- Results being seen has been amazing
- Clients are very satisfied with therapy being provided

Providing Australians with hope that they can work on increasing function of their upper limb

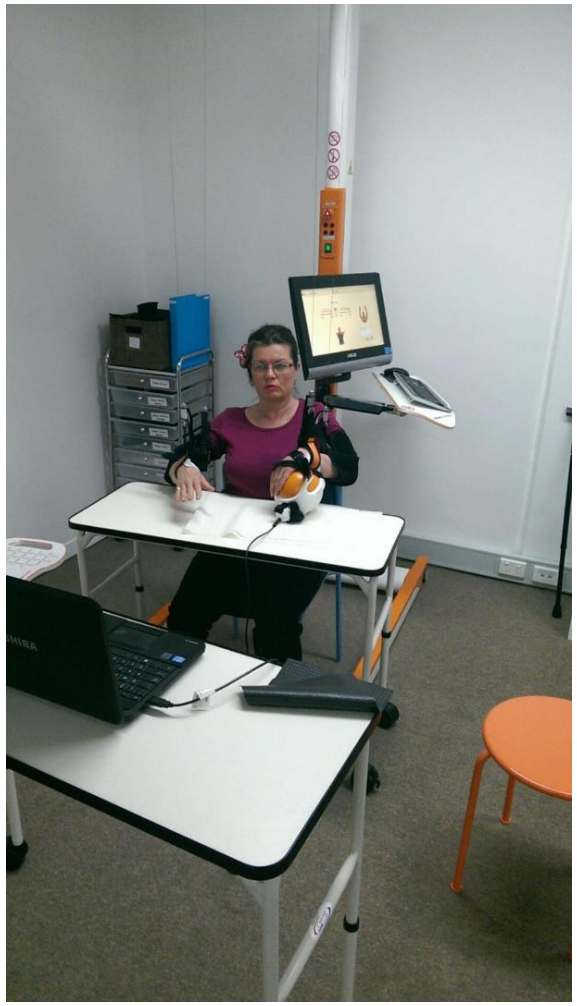
AOTS Clinic

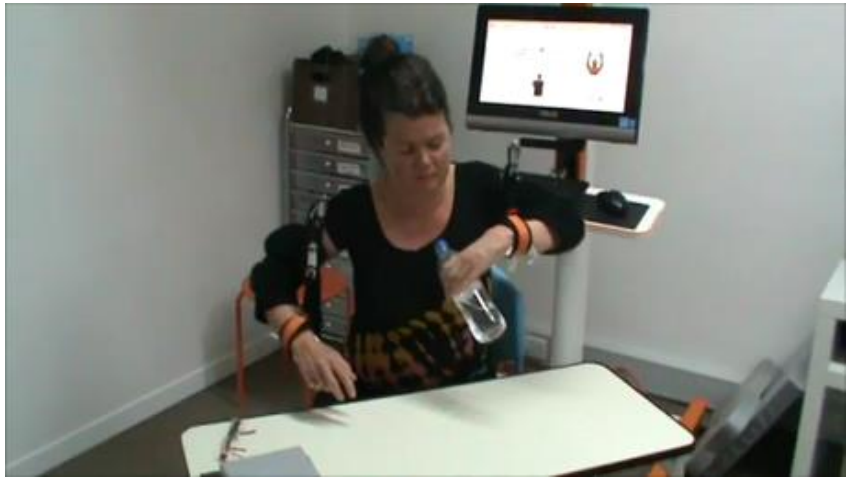




How we use the devices

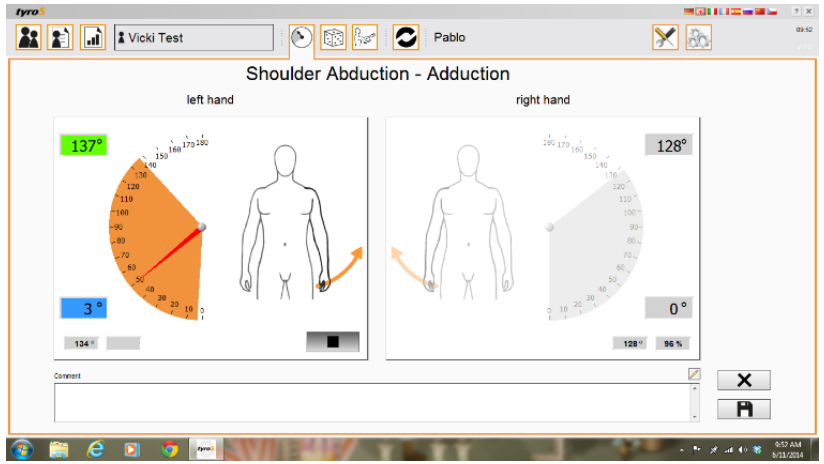
How we use the devices

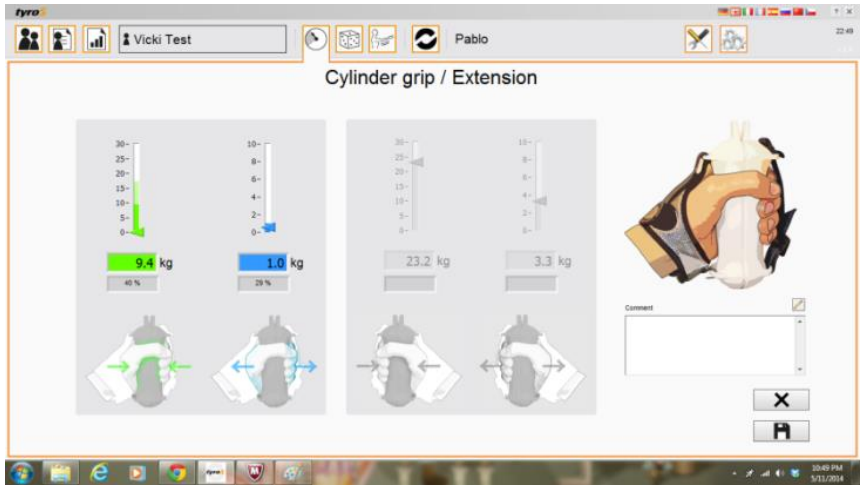


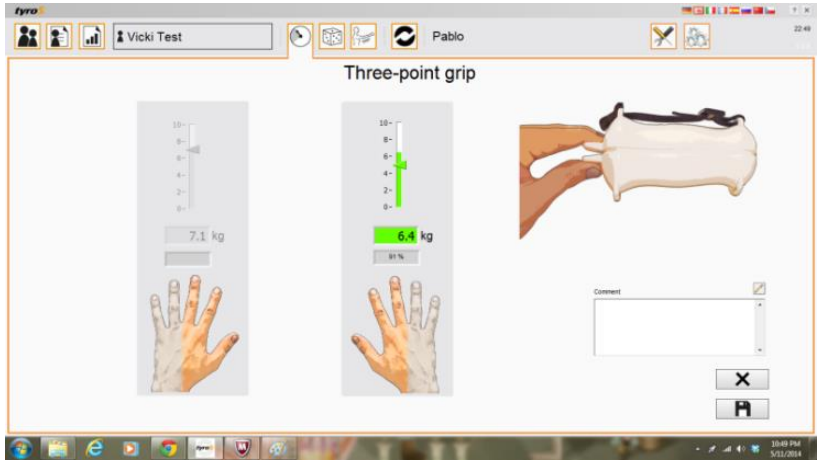


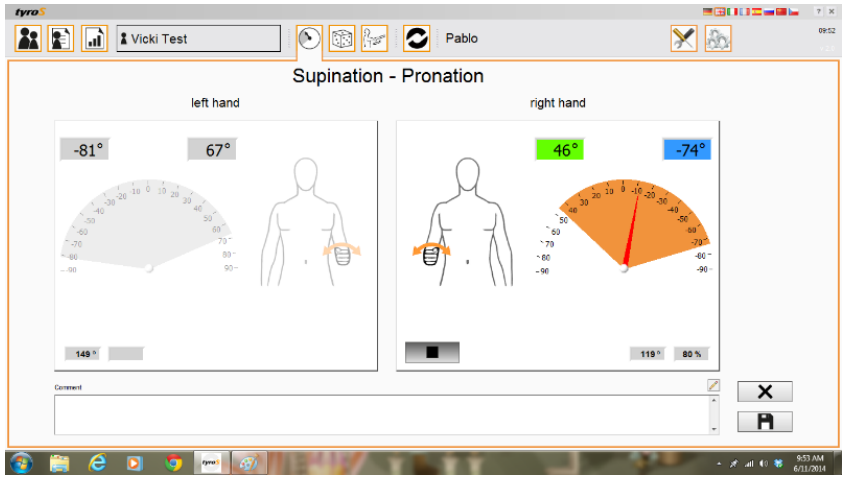
TYROS SOFTWARE

ASSESSMENTS



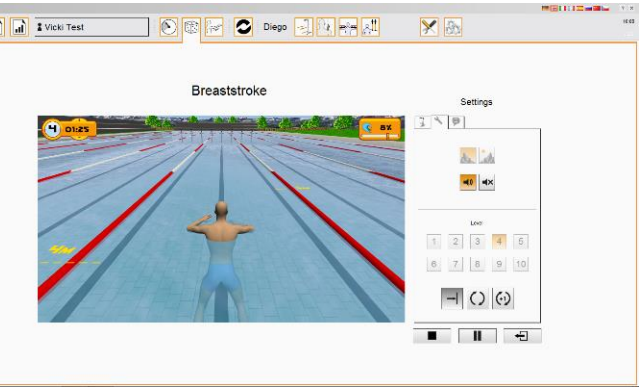


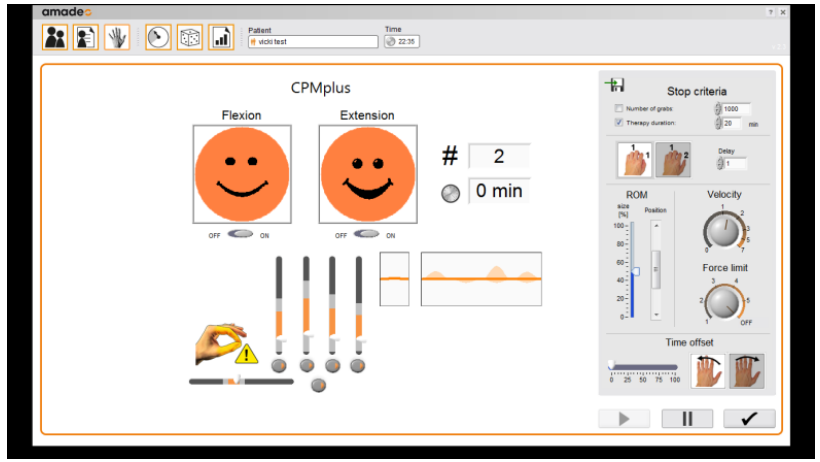


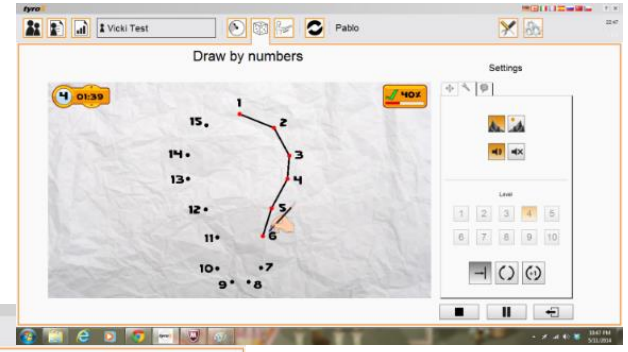


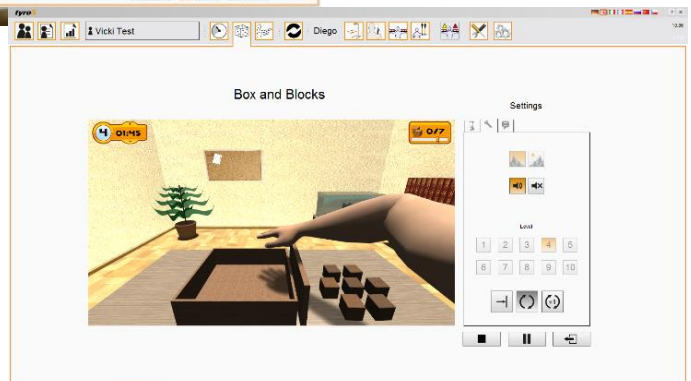
SOFTWARE

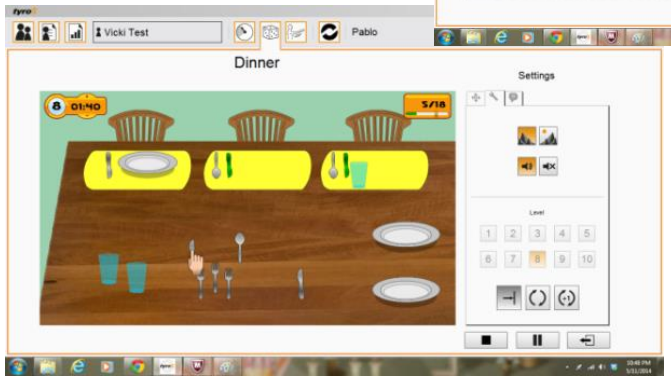
INTERACTIVE THERAPIES





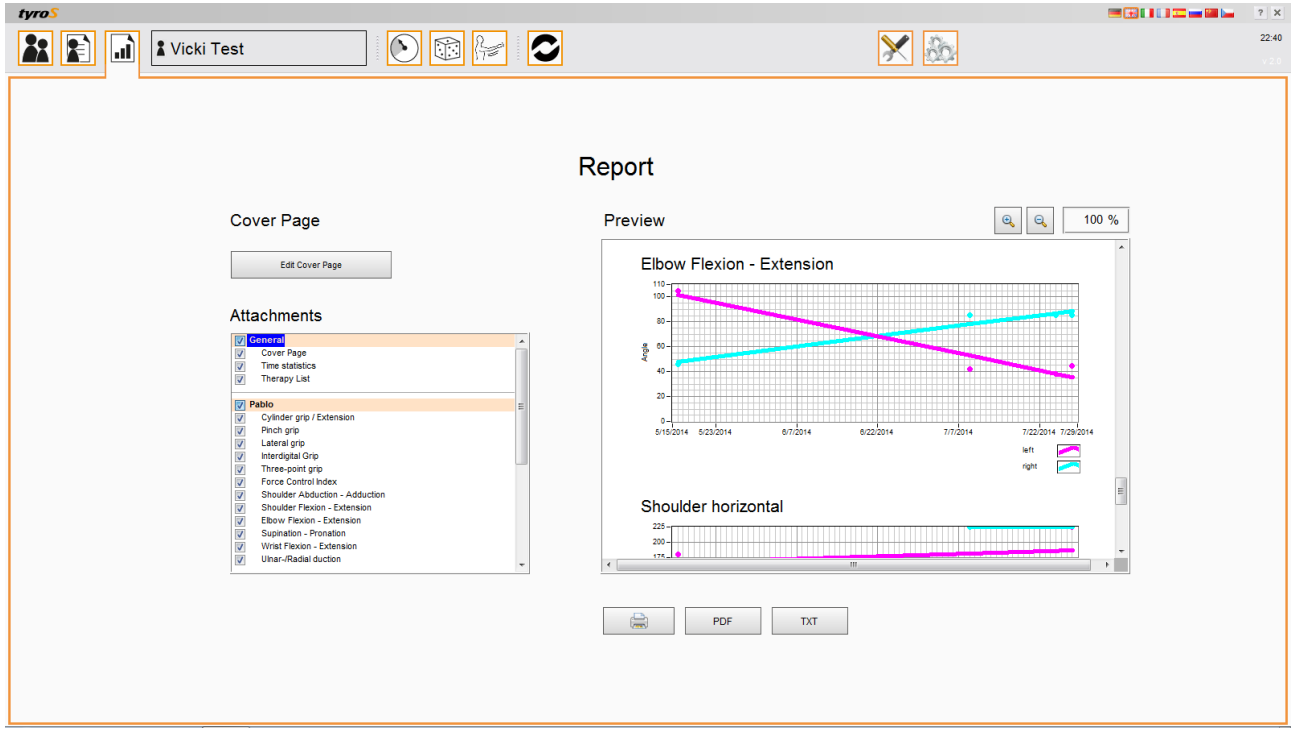






SOFTWARE

DOCUMENTATION & REPORTING



CBR: Advantages

- One complete system for upper limb rehabilitation
- Rehabilitation with evidence, concept based on RCS
- One common software, easy to use for therapists and patients
- Therapy with fun, motivating

for patients

Case Study 1

- 53 years old male
- Glioblastoma Multiforme

Medical Background

- Surgery April 2016
  - Left Hemiparesis
  - Left peripheral vision affected
  - Mobility affected

Case Study 1

Results from initial assessment

- High tone biceps/pecs/flexor tendons
- Left shoulder pain
- Learned non use
- Functional task goals
  - Any use at all
    * Holding a fishing rod
    * Hand shake

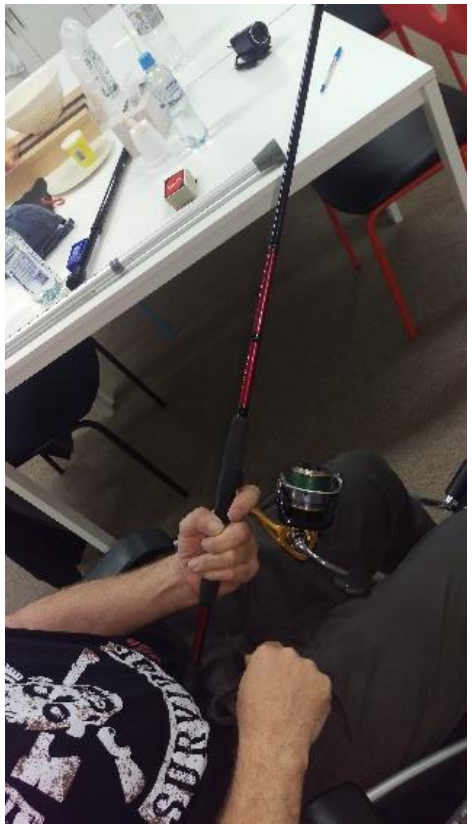
Case Study 1

Treatment strategies using Computer Based Therapy

- Increase movement in arm
  - * Diego *Functional tasks *Home exercise program
- Increasing strength in left fingers
  - Amadeo *Functional Tasks * Home exercise program
- Increase trunk control
  - * Tymo in sitting and standing
  - * Leaning through Tymo with forearms while standing
  - *Functional Tasks * Home exercise program

Case Study 1

Results from reassessment after 2 weeks of therapy



- Actively using left arm whenever possible
- Is able to actively relax arm and fingers
- Has increased movement in all joints of left arm
- Is able to stand much longer than before

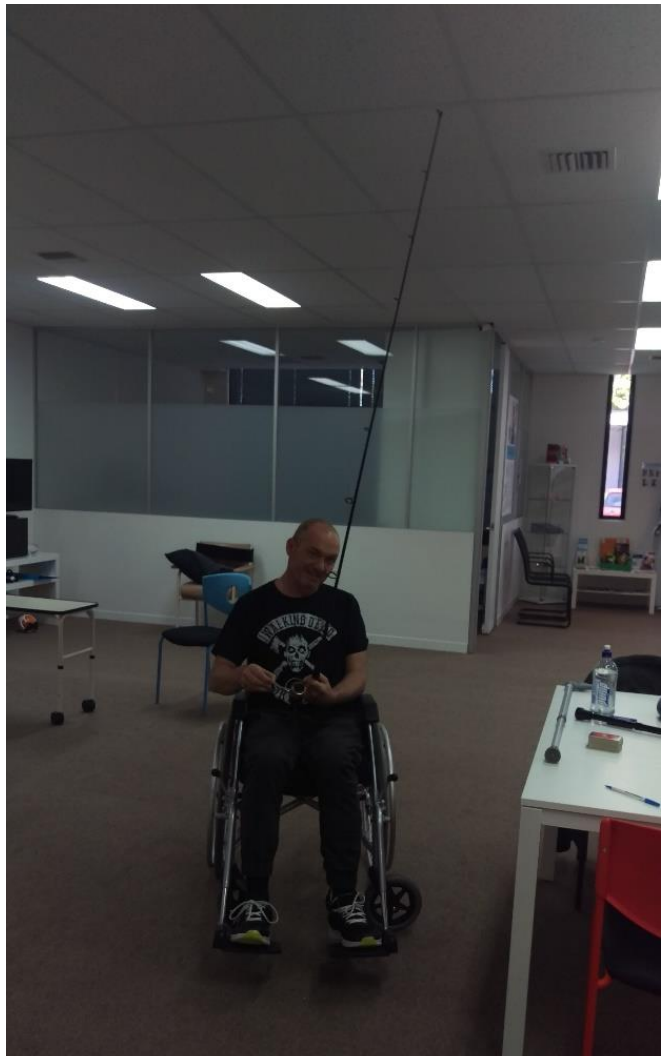
- Functional task

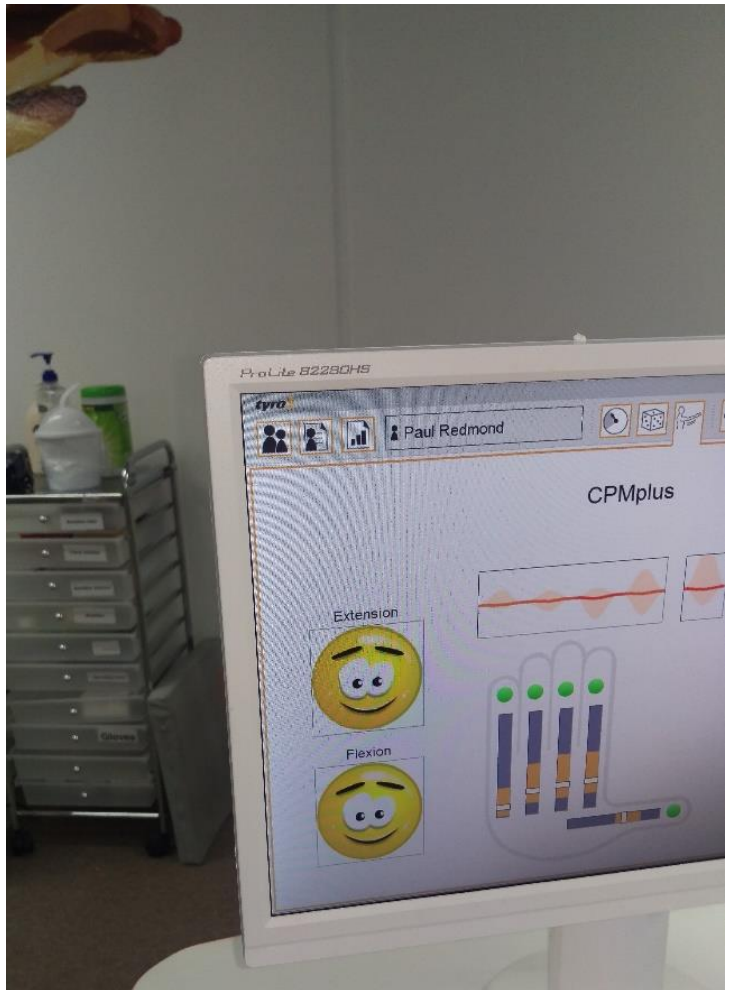
*Automatically uses left hand

* Can hold a fishing rod

*Gave his wife a hug using both arms

Case Study 1





Case Study 2

- 23 years old male
  - ❖ Stroke 2009 affecting left side of body with near full recovery
  - ❖ Stroke 2011 affecting left side of body
    - ❖Right sided hemiparesis (nil functional use of r UL at time of referral)
    - ❖Reduced AROM, near full PROM
    - ❖Able to walk with reduced balance
    - ❖Not able to communicate (global aphasia)

Case Study 2

Treatment strategies using Computer Based Therapy

- Therapy compiled in 1 week intensive blocks – 2 hours per day
- Client has been attending AOTS clinic since Nov 2014 every 3 months
- Therapy has progressed over this time
- Home based program is modified after every intensive block

Case Study 2

Therapy Progress

- 2014 began with continuous passive movement of fingers to ensure intensive repetition and some active movement using Amadeo
  - No response from client during sessions
  - Required both parents to be in therapy sessions

- 2016 now shows interaction during sessions and active involvement
  - Using 2 devices
  - Active and passive movements
  - Functional activities such as self feeding & using Ipad
  - Only one parent attends therapy session
  - Increased attention, concentration, engagement, awareness, mood
  - Increased awareness of right arm

What does this mean?

- New evidence based treatment techniques need to be embraced
- Clients should be provided with information regarding alternatives to their traditional therapy options.
- Technology is a growing industry and a part of everyone's daily life, this needs to be extended to therapy.
- For many clients, even a minimum improvement in movement will lead to greater independence and quality of life.

What does this mean?

- Limited time within a hospital setting to provide intensive therapy required so therapy should be continued when client returns home, not stopped.

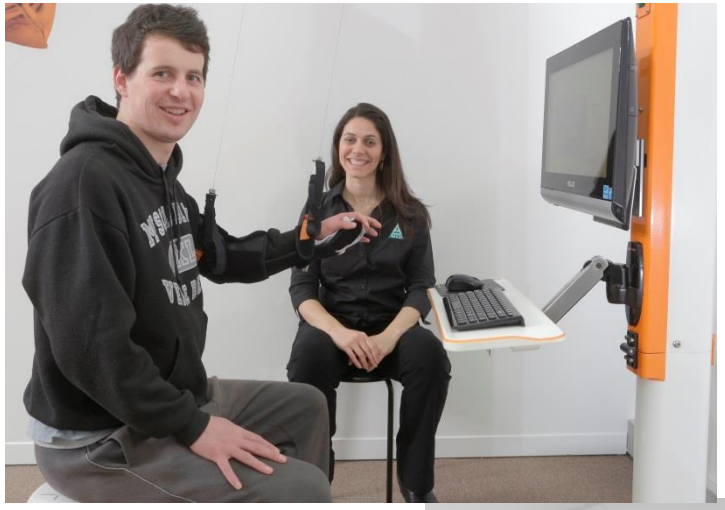
- The Australian NDIS now allows clients to decide whether they would like to use their funding on therapies such as these

WHAT WE HAVE LEARNED

- The brain can keep forming new pathways no matter how long after the incident and no matter the age of the client
- Early intervention is required in order to maximise long term functional outcomes
- Repetition assists with these pathways being formed
- Clients need to be motivated in order to perform the task at hand
- External focus assists with the client performing the required movements
- Technology is the way of the future so it should be embraced as part of therapy

EVERYONE NEEDS HOPE

THANK YOU



AOTS - CBRA

AOTS Clinic

Computer Based Rehabilitation Australia

Unit 16

26-28 Roberna St

Moorabbin, 3189

Ph: (03) 9555 0303

www.aots.com.au

cbra
Computer Based
Rehabilitation Australia