

Neurological Rehabilitation Research and Innovation Programme

Public Seminar May 2023

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Advanced
Wellbeing
Research Centre

Neurological Rehabilitation Research and Innovation Programme

Delivery Plan

Vision: To integrate research, clinical provision, enterprise and education activities to progress the co-design, co-development and implementation of contemporary and effective technology enabled rehabilitation interventions for people with neurological conditions, or other long-term disabilities, to maximise their life opportunities.

Projects

LABORATORY



INNOVATION



USER ENGAGEMENT



Seminar content

The first part of the seminar will focus on stroke rehabilitation through an exploration of the rehabilitation pathway from the users' perspective. This will lead to an examination of the impact of recumbent cycling for people with acute stroke delivered by Nik Kudiersky.

Part two of the seminar will focus on exercise interventions for people with Multiple Sclerosis, including the challenges and opportunities associated with investigating assistive technologies delivered by Dr. Anouska Carter.

We will conclude by summarizing examples of co-design and user involvement methods which have been implemented at the AWRC to optimize the effectiveness and user-friendliness of rehabilitation solutions.

Current recommendations

Principles of rehabilitation

People with motor recovery goals undergoing rehabilitation after a stroke should receive a minimum of 3 hours of multi-disciplinary therapy a day.

People undergoing rehabilitation after a stroke should be supported to remain active for up to 6 hours a day, for example through the use of open gyms, self-practice, carer-assisted practice, engaging in activities of daily living and activities which promote cardiovascular fitness.

Physical activity

People with stroke should be offered cardiorespiratory training or mixed training regardless of age, time since having stroke, and severity of impairment.

Facilities and equipment to support high-intensity cardiorespiratory fitness training such as bodyweight support treadmills or recumbent cycles should be available.

NATIONAL CLINICAL GUIDELINE FOR STROKE for the United Kingdom and Ireland

2023 edition




www.strokeguideline.org

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Interpretative phenomenological analysis to explore the lived experience of power assisted exercise

Aim: To explore both ambulant and non-ambulant people with stroke' experiences of and perceived effects associated with participation in power assisted exercise in a third sector community stroke centre.



International Journal of Qualitative Studies on Health and Well-being

ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/zqhw20>

Users' experience of community-based power assisted exercise: a transition from NHS to third sector services

Rachel Young, David Broom, Rachel O'Brien, Karen Sage & Christine Smith

Methods and recruitment

Data collection and analysis

Location: Third sector therapy centre



Method: Semi-structured interviews with regular attendees

Analysis: Interpretative phenomenological analysis comprising identification of descriptive, linguistic and conceptual codes to develop emergent and overarching themes.

Emphasis upon the individual context and ideographic narrative.

Participants:

Age	Gender	Time since stroke (months)	Stroke impairment	FAC
53	Male	16	Right hemiparesis	3/5
76	Male	42	Left hemiparesis	0/5
68	Male	48	Right hemiparesis	3/5
52	Male	82	Ataxia	3/5
62	Male	14	Left hemiparesis	2/5
62	Male	18	Left hemiparesis	2/5
42	Female	98	Right hemiparesis	5/5
66	Female	67	Right hemiparesis	5/5

Don't tell me I've plateaued

Hospital was recalled as a safe but sedentary experience. Participants emphasised the importance of discharge home and value of community services. They felt there was nowhere to go after NHS rehabilitation and 50% of the sample heard about the centre incidentally.

They dumped me! I had to listen to it....I was really p***ed off because they said 'you're beginning to plateau.'

Power assisted exercise facilitates the transition into long term recovery

Participants felt that the equipment was easy to access, even by people with very limited mobility. There was an ethos of peer support and encouragement. Participants associated the power assisted exercise with improved strength, mobility, fitness and motor control.

The machines made me stronger...using your strength to push them has helped....it would be good if the console told us how much effort we were putting in.

You've got to re-bond, make new tramlines in your head that allow you to use your limbs.

Reframing the experience of stroke

The equipment was a key incentive for joining the centre and for some participants had legitimized the investment. The participants associated the membership with a renewed identity following stroke.

I've come out of my shell more when I'm here....without it? It would have been a big heartache...stuck at home, stuck in the house

Systematic review and thematic synthesis of qualitative studies

Aim: To organise and summarise the results of contextually rich studies through thematic synthesis to gain an in-depth understanding of venue based exercise from the perspective of people with stroke.



Methods and results

Seven studies included

Participants:

- 76 participants (48M/28F)
- Time since stroke from 6 months to 13 years

Interventions:

- Exercise referral schemes, ARNI or cardiac rehab

Findings:

- Physical ability did not influence reported benefit
- Participants enjoyed a de-medicalised experience
- Venue based exercise facilitated recovery of self-efficacy and return to pre-stroke roles and interests

I returned to work and was able to start where I left off...and if I had not gone through this I would not have had the confidence...it's not the medication which made me better, it is the exercise.

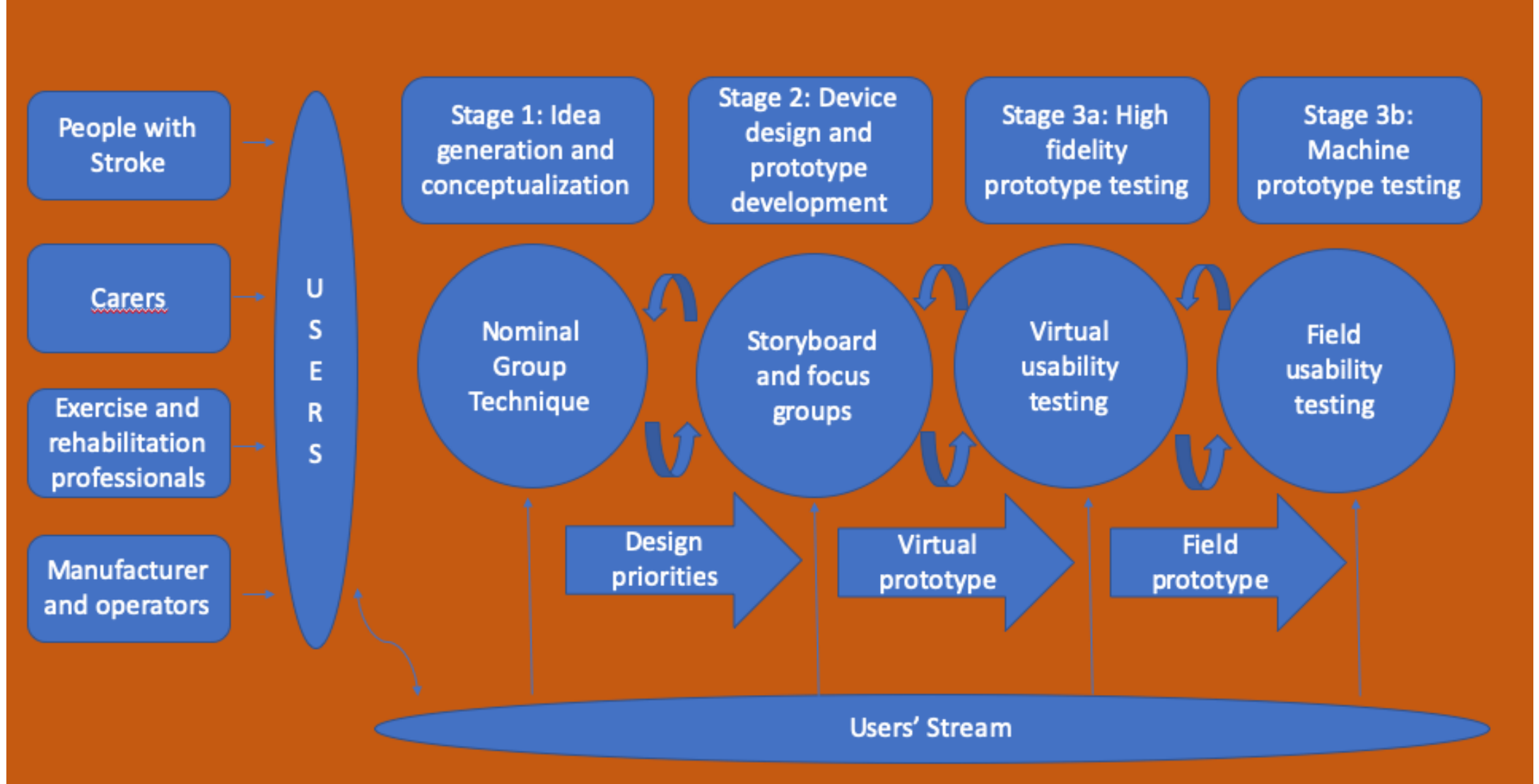
Whatever you do, don't medicalise it. I think one of the key benefits of this is that it's not another bloody appointment. You know it's not the hospital. It's a community facility and it makes other things feel accessible.

Limitations

- Non-completers were not included in data collection
- Limited geographical diversity
- Limited cultural and socio-economic diversity amongst participants
- Researcher bias acknowledged

Conclusion

- Engagement in venue based exercise, including power assisted exercise, is associated with psychosocial wellbeing and continued physical improvement amongst people with stroke.
- Inconsistencies in support during the transition from NHS to third sector services were reported amongst people with stroke.
- Exercise and rehabilitation professionals need to collaborate and connect
- More assistive and accessible equipment is required in community and leisure venues



Application of the Medical Device Technology Framework

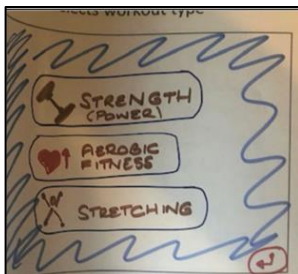
Aim: To co-design and evaluate with professional users and expert users a graphical user interface synchronized with effort detection technology to advance power assisted exercise equipment for use by people with stroke.

Nominal Group Technique

Consensus selection of three priority machines

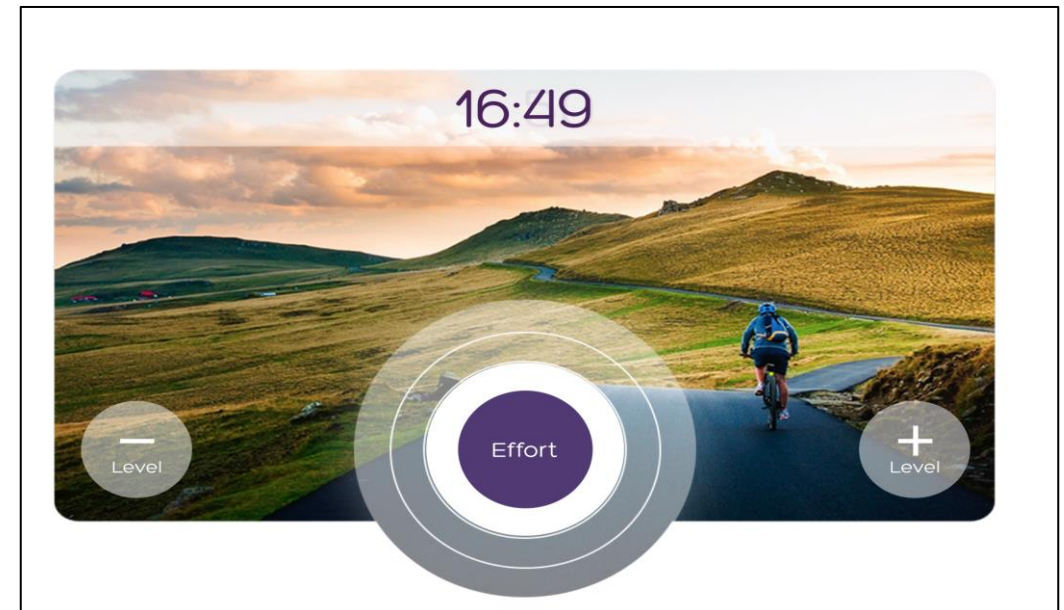


Storyboarding

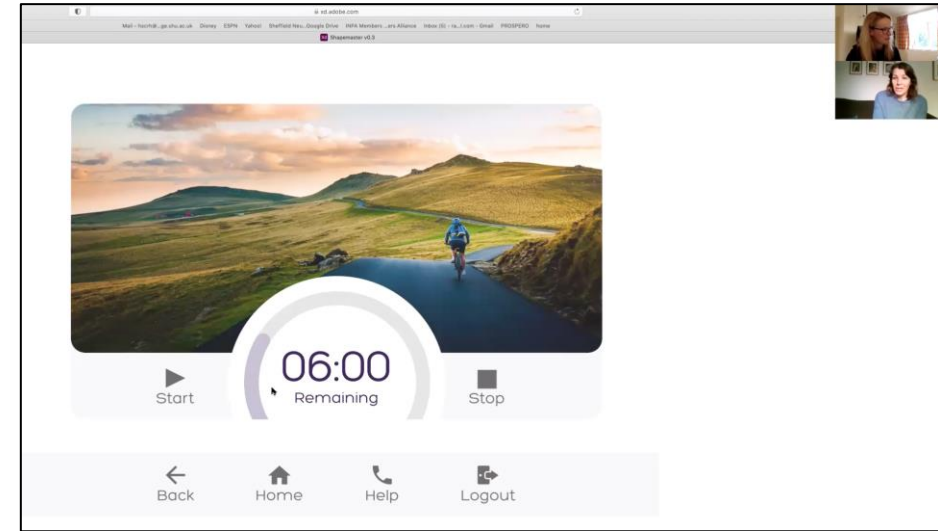
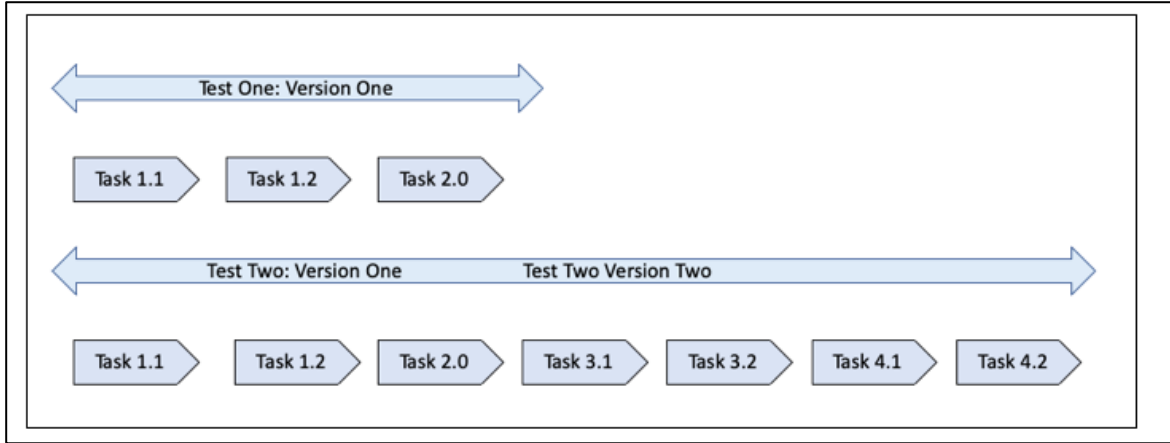


Four themes:

- Aesthetic format
- Functional features
- Programme options
- Engagement & reward



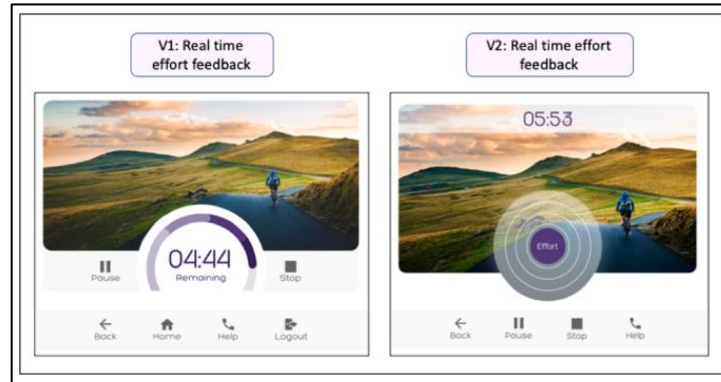
Usability evaluation



Usability problems detected: version 1.0

Category	Number of detected problems
Safety	4
Operational	8
Programme effectiveness	6
User engagement	4

Changes implemented



Summary

The expertise and facilities at the AWRC are optimally positioned to design, implement and evaluate new innovations to enable people with neurological impairment.

Over the next three years we look forward to building upon the foundation developed since the neurological programme was launched in 2020 with a specific focus on rehabilitation technologies.