

trial – ARCANGEL (assisted rehabilitation care during post stroke management: feasibility assessment) study

Our Experiences

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partnership with our community”*

What is ARCANGEL?

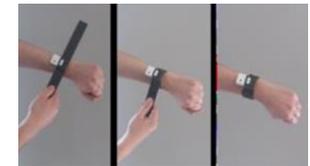
- ARCANGEL - tablet based programme
 - in a patient's home
 - post-acute phase after stroke.
- ARCANGEL can allow therapists
 - to personalise rehab programmes & activities of daily living
 - receive feedback on patients performance remotely from therapist's base.



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What is ARCANGEL?

- The ARC unit involves wearable sensors, a tablet, base-station & therapist tablet.
- Requires 3G or 4G internet connection
- ARC unit has a number of available upper limb & lower limb exercises e.g. stand on one leg, shoulder abduction
- Several activities of daily living e.g. brushing teeth, tying shoe laces, to select to make a tailored patient-centred treatment programme.



Inclusion and exclusion criteria

Inclusion Criteria

- Stroke Diagnosis < 6 months with a stable clinical condition
- Modified Rankin score at discharge lower or equal to 4 or Barthel Index score at discharge greater than 10
 - Age >18
- Able to keep the standing position without or with minimal assistance

Exclusion Criteria

- Significant cognitive impairment and behavioural disorders
 - Poor communication or reading skills
- Orthopaedic limitation (fractures, amputations, advanced osteoarthritis, active rheumatoid arthritis)
 - Head trauma
 - Epilepsy, not pharmacologically controlled
 - Severe Spatial Neglect
- Neurodegenerative and neuromuscular diseases
- Severe spasticity (i.e. Ashworth spasticity index ≥ 3)



The trial

- OTs & PTs in the Northern Trust & in Italy working in stroke rehab took part in this feasibility trial with Camlin.
- The trial ran from October 2018 - September 2019 for new recruits.
- Each client was to be involved for 6 months.
- In the Northern Trust 144 patients were screened & 11 were eligible for the study. 9 patients were recruited – 6 mid-treatment dropped out of trial, 2 completed, 1 ongoing.
- In Italy 70 patients were screened. 32 were eligible & enrolled in the study & 8 declined to participate in the study. Over the course of the trial, 9 of the 32 patients dropped out.
- The reasons for dropping out were similar in both areas - lack of confidence using technology, technical issues, patient changed their mind, carers felt they could not support the patient using ARC.



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Therapists experiences

Positives:

- Great motivator for patients to complete exercises.
- Therapists saw patients gaining confidence & appeared more autonomous in everyday life.
- Simple, easy to put on sensors.
- Good visuals and clear instructions on tablet.
- Easy implementation of rehab programme.
- MDT approach - Exercises ROM specific & included activities of daily living.
- Had the ability to observe therapy from a distance.
- Good relationship with the engineers for problem solving/technical issues.



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Therapists experiences

Negatives:

- Lack of 3g/4g in rural areas and intermittent connection in others.
- Problems initially with the hardware and software, but this improved.
- Time consuming if problems arose e.g. not working and therapists having to visit to address issue.
- Limited activities of daily living selection and exercises.
- Activity section gives limited feedback on degree of effort/success.
- Inconsistency with success in completing exercises, in particular lower limb exercises.
- No immediate contact with provider for trouble shooting.
- Initial training insufficient.



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Patient experiences

Positives

- Easy to use.
- Increased motivation.
- Completed programme when it suited them.
- Enjoyed having feedback when completing programme - “its like having someone in the room with me”, “big brother is watching me”
- Outcomes improved e.g. ROM, reduced pain, reduced inattention.

Negatives

- Technical issues – patient had to repeat exercises if not recognised by system leading to fatigue and frustration and therefore dropping out of trial.
- Time consuming if patient had to repeat exercises due to technical problem.
- If not confident with technology, can feel overwhelming.



Further development

- Technology issues need addressed to ensure system works efficiently.
- The selection of activities/ exercises available need to have input from PT & OT.
- Would like further development in clients wearing sensors for longer & getting an indication of percentage of involvement of impaired limb on a daily basis.
- Need for quicker access to improve problems e.g. being able to facetime Camlin.



Summary

- The concept of ARCANGEL technology shows benefits to both patients & therapists, but the trial demonstrated further fine-tuning required.
- Has the potential to reduce therapist-patient face to face contact therefore more cost effective.
- Has the potential to lessen patient dependence on therapist & allow increased self management.



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