

Rhythmic Auditory Stimulation in gait rehabilitation for children and young people following severe acquired brain injury

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Introduction

- Rhythmic Auditory Stimulation (RAS) uses simple regular rhythms (via metronome or live instruments) to support physical control and improve walking patterns (Thaut & Rice, 2014).
- RAS can improve gait in adults who have had strokes, (Nascimento et al., 2015) and children with Cerebral Palsy (Thaut & Abiru, 2010).
- No previous studies have investigated use of RAS with children and young people (CYP) with acquired brain injury (ABI).

Aim of Study

To investigate whether the addition of RAS to standard physiotherapy improved the walking speed and pattern of CYP with ABI.

Methods

- Ethical approval gained from South Central Hampshire A Health Research Authority Research Ethics Committee, REC reference: 17/SC/0052, IRAS project ID: 188173.
- Non-concurrent multiple base line single case experimental design (SCED) methodology (AB design, with additional 'A phase' where placement length allowed).
- Baseline length was randomised. During baseline (A) phase CYP accessed standard rehabilitation (10 physiotherapy sessions per week).
- Intervention (B) phase, 2/10 standard physiotherapy sessions were replaced with RAS for 4 weeks. 10m walk test and Edinburgh Visual Gait Scale were completed pre and post sessions biweekly.
- Visual analysis of level, slope and trend of the data and statistical analysis via randomisation test (one-tailed) undertaken.

Patients

CYP	Gender	Age at injury (years)	Type of injury	Location of injury	Time since injury (weeks)	Physical presentation
1	Female	12	Stroke	Right hemisphere	18	Left hemiplegia
2	Female	12	Traumatic Brain Injury	Diffuse	8	Four limb motor disorder, left side worse than right.
3	Male	10	Hemispherectomy	Left hemisphere	23	Right hemiplegia
4	Male	10	Stroke	Left hemisphere	8	Right hemiplegia

- All children able to walk 10m without physical assistance (+/- aids and/or orthotics), follow simple commands and have walking based goals.

Figure 1: 10mWT scores for the four children taken at the beginning of sessions throughout the study

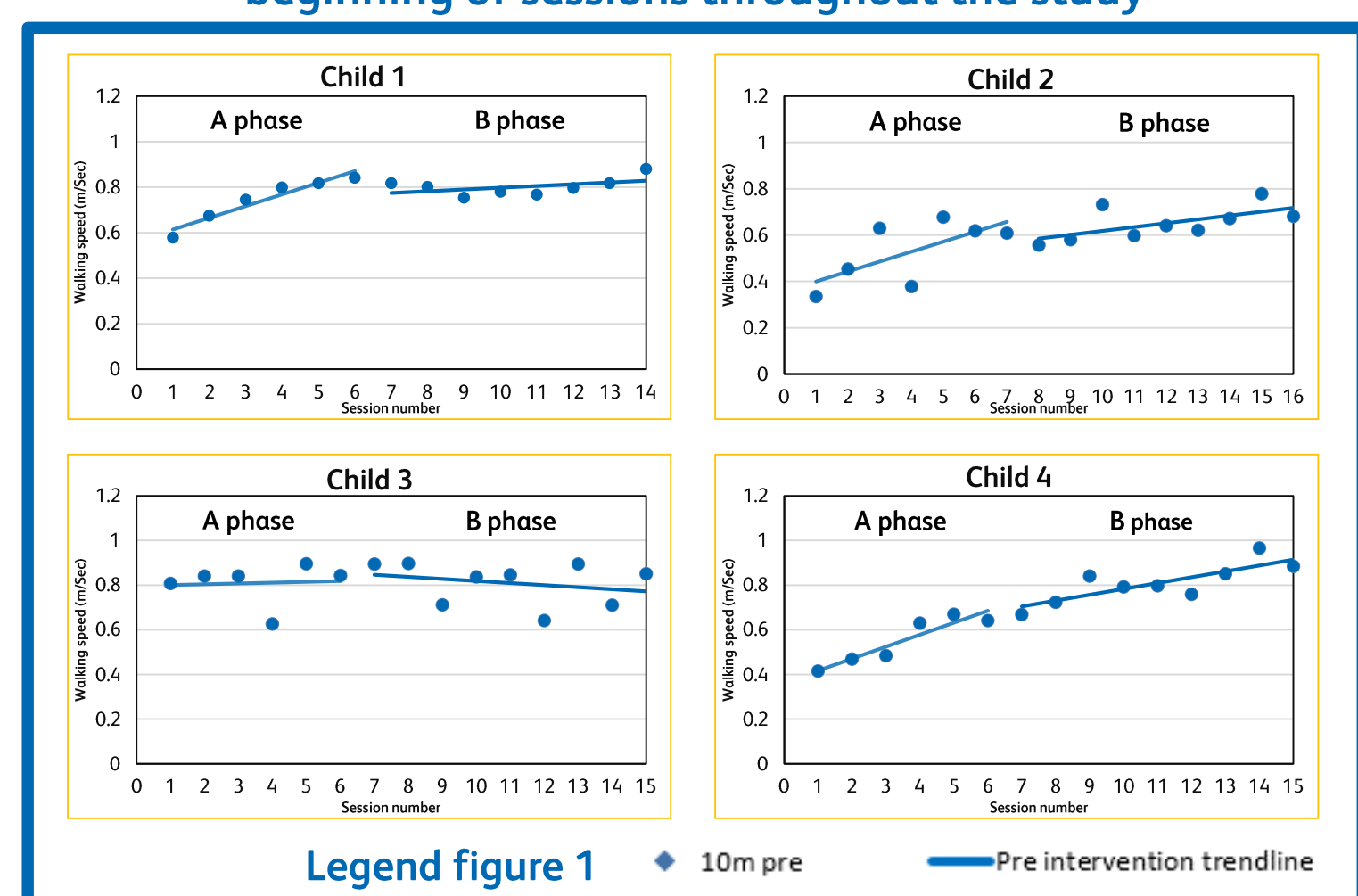
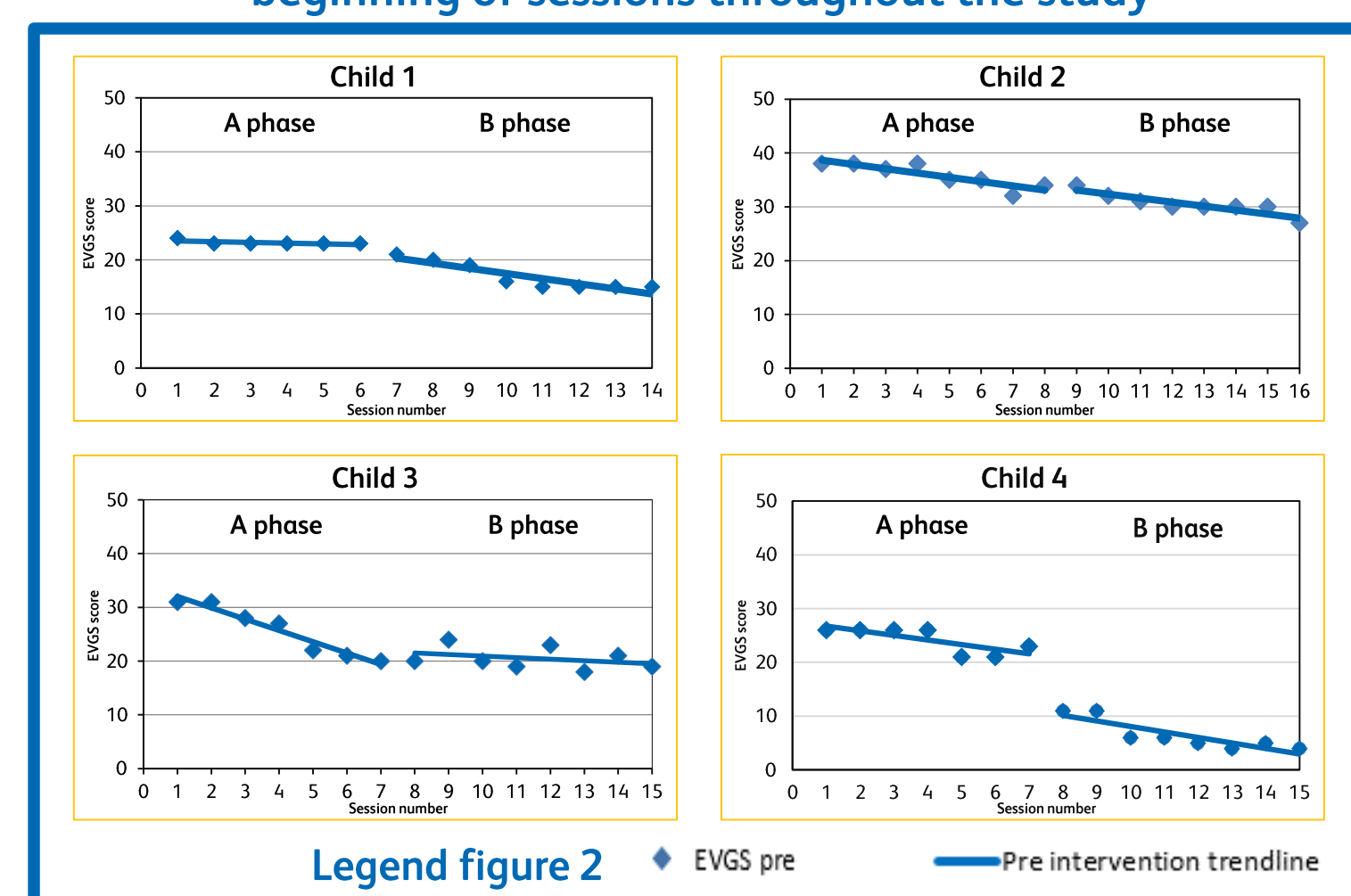


Figure 2: EVGS scores for the four children taken at the beginning of sessions throughout the study



Conclusion

- RAS may be effective in targeting gait speed and quality in children with ABI, and could be considered alongside other gait interventions.
- Studies investigating RAS in larger doses, and in a cross over design are required to establish the efficacy of RAS with CYP with ABI, and which group of children will gain the most benefit from RAS.
- Research in this low incidence, highly heterogenous population who are on an improving trajectory is challenging, but necessary to ensure treatments offer optimal benefits.

References

- Nascimento et al (2015) *Journal of physiotherapy*, 61(1),10-15.
- Thaut and Abiru (2010) *Music Perception*, 27, 4, pp. 263-269.
- Thaut and Rice (2014) *Handbook of Neurologic music therapy*, Oxford.

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