

**Information for Different Strokes
16/05/11**

RESEARCH PROJECT TITLE

Making music after stroke: using creative activities to enhance arm function recovery

PROJECT TEAM

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SUMMARY OF THE PROJECT

Aim

The purpose of our project is to design a prototype for a new type of music intervention, designed to improve arm function in people affected by stroke. The intervention will be based on Nintendo Wii technology, which will be interfaced with music.

Background

Stroke is one of the most disabling long term conditions in the UK¹. Loss of arm function is particularly common; between 80-95% of those with upper limb impairment after stroke never regain full arm function². This causes distress³ and affects mood and independence⁴. Current clinical initiatives and UK health policies aim to facilitate early supported discharge after stroke⁵ and self-management of long term conditions⁶. There is therefore an urgent need to improve community-based self-management strategies for people with stroke, who continue to experience reduced arm function. Such strategies should not just be safe and effective; they should also stimulate intrinsic motivation to maintain treatment effects. The Wii-fit is an example of a technology, designed to improve physical activity in the home environment. Activities are tailor-made and engaging, feedback is readily available, and there are opportunities to engage with others. However, this technology needs to be carefully examined with stroke survivors, as it has not been purpose-built for people with this condition.

Exciting new opportunities for stroke rehabilitation are emerging from the field of **neurologic music therapy (NMT)**, which aims to improve cognitive, sensory and motor function in people with neurological conditions through the therapeutic application of music⁷. Studies have reported improved gait as a result of using rhythm^{8,9} and others have shown that auditory cueing can improve arm function after stroke¹⁰. Music playing can also improve aspects of motor function in people with stroke¹¹. However, a recent Cochrane systematic review on the effects of music therapy in people with acquired brain injury demonstrated a clear gap in the literature on music as an intervention to enhance arm function after stroke: only one randomised controlled trial (RCT) and one pseudo RCT were included¹². It is clear that there is a need for more robust clinical trials to evaluate the effects of music making on arm function after stroke.

At GCU, unique opportunities exist to design technology for this purpose by integrating NMT with audio technology. Interfaces can be tailor-made to individuals with a range of upper limb disabilities and musical preferences. Compared to conventional rehabilitation, the strength of this technology is that detailed data can be collected about the therapeutic input, while outcomes can be quantified. Current systems developed by audio technology staff at GCU allow comprehensive wireless remote control of audio and music. This needs to be adapted for people with stroke and pilot tested to ensure that: 1) the instrumentation affords UL activity that is safe and appropriate; 2) the measures of motor performance during music playing are valid and reliable; 3) feedback to the user is accurate and user-friendly; 4) the system is considered acceptable by service users.

- **Where are we now?**

We have recently received pump priming funding from GCU to design a system that meets the requirements listed above. We would now like to **invite stroke survivors** who have impaired arm function as a result of their stroke, to participate in our study and help us design this new intervention. For this initial pilot study, we would like to invite **three** people with stroke, with different levels of arm impairment (i.e. one with mild, one with moderate, and one with severe impairment – more detail will be provided in the project information sheet).

- **What would participating in the study involve?**

In a nutshell, participating in this study would involve two, 1-hour individual sessions in our lab at Glasgow Caledonian University. Transport will be reimbursed and participants are welcome to bring a companion if they wish. Refreshments will be available.

- We will follow GCU Ethics procedures, which means that **before** participants decide to participate, they will have been given an information sheet to read and discuss at home, and there will be an opportunity to ask questions. We will also check that participants are eligible to join the study (most people will be able to participate but there are a few things we need to check, which will be explained in the information sheet).
- **The first session** will involve trying out the prototype intervention with different types of rhythm and music. Participants will be invited to bring some of their own music to play with. Having tried the intervention, we will then discuss their experiences and note any suggestions they may have. We will then work on these and invite them for a second session.
- **The second session** will involve the same participants trying out the next version of the prototype. We will then follow a more formal procedure and undertake an in-depth interview to gauge their opinions on this intervention. With participants' consent, we will collect video data on them playing the music, and measure some aspects of their performance. These data will be analysed in-depth, which will inform a larger study with an improved version of the intervention, which incorporates their views and suggestions.

- **What next?**

If agreed by Different Strokes, Frederike would like approach the group lead in **Glasgow** to discuss how best to involve stroke survivors in this project. She would be delighted to come to one of the group sessions to talk about the project, provide information and answer any questions.

If anyone of the staff at Different Strokes would like to know more about the project, please do not hesitate to contact **Frederike van Wijck** on:

- **Telephone: 0141 331 8967**
- **Email: Frederike.vanWijck@gcu.ac.uk**

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