



### Dental Scholarships and Awards Report Template

Please use typescript or CAPITAL LETTERS when filling out this form

#### SECTION 1 PERSONAL DETAILS

Title (please circle): Mr / Mrs / Ms / Miss [REDACTED]  
OtherDr

Surname: O'Neill

Forename(s): Francis

#### SECTION 2 PROJECT DETAILS

Scholarship(s) Awarded: TC White Young Researcher Award      Amount Awarded: £10,000

Project Name: EVALUATION OF A tDCS DEVICE IN CHRONIC NEUROPATHIC PAIN: (A PILOT STUDY)      Project Location: Pain Research Institute, University of Liverpool.

#### Project Aims and Objectives:

This study aims to quantify the impact of a transcranial Direct Current Stimulation (tDCS) treatment protocol, using a mobile tDCS device, on subjective scores of pain in patients with chronic neuropathic pain.

The primary outcome measure was the change in average daily pain intensity score from baseline to subsequent time points measured during and after treatments.

#### Summary of Project (including pictures, methodology, results and conclusion if applicable):

**Study Recruitment:** The target number of 24 participants was recruited to the study successfully.

**Progress:** The study has finished both recruitment and follow up and has now been closed.

**Introduction/Aims** Successful response to motor cortex repetitive Transcranial Magnetic Stimulation (rTMS) requires continued maintenance treatments. Transcranial Direct Current Stimulation (tDCS) may provide a more convenient alternative. This study aimed to examine response to tDCS in a previously identified group of rTMS subjects.

**Methods** 24 subjects with neuropathic pain, who had at least 2 months previously experienced rTMS motor cortex stimulation (13 with reduction in pain scores, 11 non-responders) were recruited to a double-blind, double-crossover study to self-administer anodal, cathodal and sham tDCS motor cortex stimulation for 20 minutes/day over 5 consecutive days (three weeks washout period). Subjects were instructed how to reproducibly place electrodes and were asked to fill out a NRS pain diary once a day

for 2 weeks beginning at the start of stimulation. Primary outcome measure was change in mean NRS pain scores at day 1, 5 and 14 of each period and secondary outcome measures were change in depression or anxiety and individual domains of SF-36 health survey.

**Results** 21 subjects completed the study. No significant difference was shown between the baseline values of each treatment  $p=0.9941$  (one-way ANOVA), or in NRS mean values between Sham vs Anodal  $p=0.295$  CI (-0.98, 0.30), Sham vs Cathodal  $p=0.514$  CI (-0.48, 0.96 or Cathodalvs Anodal  $p=0.166$  CI (-1.40, 0.24). No significant changes were demonstrated in anxiety, depression or health status measurements.

**Conclusion** This study does not support a beneficial effect of tDCS in the treatment of neuropathic pain even in a group who have previously responded favourably to rTMS.

Several participants expressed an interest in continuing to use the device as they have perceived a benefit from the study. During the course of long term follow up however this perceived benefit did not persist.

**Adverse events:** There were no significant adverse events.

**Presentations:**Presentations have been given to the Research Education Meeting at the Walton Centre for Neurology and Neurosurgery in January of 2013 and at the 5th International Congress on Neuropathic Pain May 14-17, 2015 in Nice, France. Copies of these are available if required.

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**Learning Outcomes (*how aims and objectives were met*):**

Aims and objectives were achieved via satisfactory completion of research trial.

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**Evaluation(*including description of the impact of the project/award on your clinical and/or NHS practice*):**

Although results of this study were not statistically significant they are still important. Multiple clinicians and private healthcare companies are offering this technique as a therapy for neuropathic pain with little scientific evidence, often at significant cost to patients, especially in the US. Several researchers expressed an interest in these results when presented at the 5th International Congress on Neuropathic Pain May 14-17, 2015 in Nice, France. They also urged the publication of this study as an important negative result. This paper is in preparation and will be submitted shortly.

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I would like to thank the college once again for its help and generosity.

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