TCS/21/30 - A window in the brain 2: Novel quantitative seizure detection tool for paediatric critical care. A multi-centre feasibility study.

Fits (seizures) are common in critically-ill children and affect how their brains recover from illness. Knowing if or when fits happen allows doctors and nurses to treat a fit early and can improve the patients' outcome. Detecting fits in intensive care units (ICU) is very difficult. It requires experts to collect brainwave recordings (EEG) and specialist doctors to review these recordings to see if the patient is having a fit. The collection, recording and review of the recordings cannot be provided at all times. We aim to give ICU doctors and nurses an easy-to-use and accurate fit detection tool that does not require an expert doctor to collect and review the recordings.

We already have an innovative fit detection tool that uses computer software to analyse the brainwave recordings without needing an expert's input. But this tool needs 8 'lines' (electrodes on the head) of the brainwaves to detect fits. ICU bedside nurses and doctors can only collect 4 lines of brainwaves without experts being there. In this project, we will improve this tool's ability to detect fits using just 4 lines of brainwaves, meaning that it can be used at any time without the need for experts. To make sure our fit detection tool works in different ICU, we will work with other hospitals across Britain to collect brainwaves recordings from children. This will let us set-up the first children's brainwave recording database for research and help us improve the care and outcome of critically-ill children.