

TCS/26/15 - FacialPARS: Advancing Objective Assessment of Facial Paralysis through Artificial Intelligence

Facial paralysis affects the patients' ability to speak, eat, close their eyes, show emotions, and interact socially. It affects around 100,000 people in the UK. The most common causes of acute facial paralysis are ischemic stroke and Bell's palsy and timely intervention improves treatment outcomes. Current ways of assessing facial paralysis are often subjective, time-consuming, and only available in specialized clinics. This can lead to delays in treatment and inconsistent care. We will develop and validate a mobile tool FacialPARS that uses artificial intelligence (AI) to analyse short videos of facial expressions of patients, with two main goals: (i) to differentiate stroke related facial weakness from Bell's palsy. (ii) to provide an objective facial paralysis score based on widely accepted grading scales (House-Brackmann and Sunnybrook), supporting both rehabilitation planning and the remote tracking of recovery. We will recruit 75 patients with post stroke facial weakness and 75 with Bell's palsy, and capture short videos of their face expressions. Three trained clinical assessors will rate videos to provide the ground truth for training and testing the developed AI models. We are committed to ensuring that the mobile tool is inclusive, secure, ethically designed, underpinned by robust Patient and Public Involvement and Engagement (PPIE) activities. The project will run for 30 months. We will deliver a validated and NHS ready prototype, and a safety and implementation package to enable the FacialPARS's adaption within NHS Scotland stroke, Bell's palsy and rehabilitation pathways.