Clinical Scientists: Innovation in the field

Whilst preparing to write this article, I have been reflecting on my role within postural management and how I would most like to use my skills and knowledge in moving forwards with my career. I have recently returned from a planned career break after getting married just the weekend before the PMG conference (thank you to Dave Long for organising a memorable shout-out at the Gala dinner!). With one years experience working full-time in specialist seating and postural management at Oxford, following my Clinical Scientist training in Salisbury; attending the conference was a great chance to discover more about the academic and commercial projects which are emerging in the area. I believe that one of the most beneficial reasons for hosting conferences is to encourage collaboration and sharing across many disciplines, and the strong sense of community and working towards a similar goal was evident from the conversations and interactions I had over the three days. Most importantly for me, it was an opportunity to learn more about what fellow Clinical Scientists are achieving in the field.

This article highlights one particular session which was presented by two Clinical Scientists and a Rehabilitation Engineer. *Is your performance affected by stability? (John Colvin, Simon Fielden and Mike Heelis)* was a brilliant session showcasing the innovation and service development which they have instigated in their respective departments. They presented the various ways which stability is measured for wheelchair users and the development of a load cell based 'stability platform' which users can roll on and roll off. I have only had experience using a variable ramp to assess stability in clinic, a process which presents with a variety of safety considerations both for the user and clinicians and some users find daunting. Therefore, hearing about this alternative method which has been developed with the user in mind was a brilliant thing to learn and take away from the conference.

During the presentations, they were transparent about the fact that they are still trying to work out the significance, if any, of the data which they had collected. How would the readouts affect the adjustment and set-up of the chair? Would it change the overall selection? And what does 'better' really mean in terms of stability? There are so many factors which have to be taken into consideration when working with a user to guide the selection of a wheelchair which will work best for them, and so often we are only presented with a snapshot of their life and function during their time in clinic. It is not practical to sit and ask them about all of the different road surfaces, gradients and cambers which they come across when in their wheelchair, or map the pattern of their driving to understand the dynamic stability when accelerating and braking. As with most of the decisions made in clinic, it is a balance of risk versus benefit, whether that is postural or functional benefit, and having confidence of reasoning to make that decision.

The two presentations included in the session were very complementary, with Simon and Mike talking about how to improve confidence of reasoning in clinical decision making. They discussed the three main scenarios of powered, attendant and self propelled wheelchairs and the important guidelines and measurement tools which could be used to assess their stability alongside performance. Through use of these tools, your confidence level can gradually build to the point at which you would be happy to commit to a decision and could be sure it is backed with clear reasoning.

This exciting project, WheelSense, is being trialled in 3 large hospitals in the UK (Stefanov et al, 2015). The system uses several force platforms which sense the weight distribution of the wheelchair, the contact points of the wheels and the distance between them. This then gives useful information as to the centre of gravity and where it is acting within the wheelchair and calculates the wheelchair stability parameters (Stefanov et al, 2014). All of this is presented with a user interface for the clinician to decide whether the system could be optimised for the user and can then provide them with direct comparisons of different configurations.

Having worked in specialist seating for the past year, a system like this would provide several advantages over the current variable ramp test. When interfacing custom seating to a wheelchair, adding accessories (bespoke footplates, armrests and medical equipment) and accounting for anatomical differences; several variables have been introduced, straying away from the manufacturer's intended purpose. To have the opportunity for live feedback of wheelchair stability data, in a comfortable and safe environment for the user, would provide clinicians with increased confidence in the system which has been provided and may enable more directed advice to be given as to the use and manoeuvrability of the wheelchair. Still in the trial phase, more evaluation and iterations of the design are necessary to make it accessible for all clinics. Currently the cost and overall weight of the system appear to be its primary limiting factors.

The session prompted many thoughts and good discussion. It also highlighted some relevant and informative online literature which may be useful for services to adapt or offer to users. British Healthcare Trades Association have produced guidelines on stability for wheelchair users (BHTA, 2016) and the Medicines and Healthcare products Regulatory Agency device bulletin which provides a useful refresher for visualising aspects of the wheelchair set-up and usage which could adversely affect stability (MHRA, 2004).

Being granted to the opportunity to attend the PMG Conference at this stage of my career has been incredibly helpful. From my time training and working in two hospitals, I had already begun to create important ties with many different healthcare professionals, but incorporating those relationships with the potential of the PMG community will prove invaluable in my career going forward. Having the time and space to explore the commercial options within the industry whilst matching them to clinical practice is a great way to accelerate your professional development and help to kick-start change within your own practice or encourage collaboration to direct and develop a service.

**References**

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