

Evaluating the effectiveness of visualising patients' motion data during stroke rehabilitation

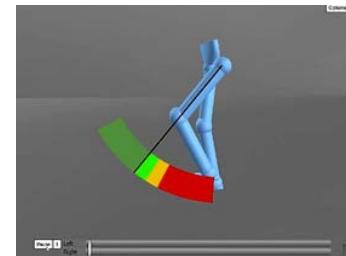
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Rehabilitation after stroke can be long and difficult, and maintaining a sense of progress made through the process a major challenge (Wartman et al., 1983), (Rosewilliam et al., 2011). This paper describes research which aims to use visualisation software to enhance communication between patients and therapists about how to perform the rehabilitation exercises correctly, and to enable the patient's progress to be measured and shown throughout the rehabilitation programme.

To achieve this, custom visualisation software was created which presents 3D visualisations of the patient's own motion capture data in real-time during the rehabilitation session with the therapist (Figure 1(a)). The visualisation tool as an intervention in stroke rehabilitation is being evaluated using quantitative patient outcome measures in three randomised controlled trials (Medical Research Council, 2000): lower limb rehabilitation (Figure 1(b)); upper limb rehabilitation(Figure 1(c)); and ankle foot orthosis tuning (Figure 1(d)).



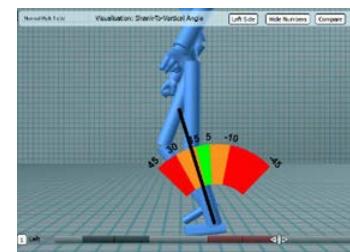
(a)



(b)



(a)



(b)

Figure 1: (a) Patient using the visualisation software with a physiotherapist in clinical trials (b) Knee lift exercise visualisation in lower limb rehabilitation following stroke (c) Reach and grasp visualisation in upper limb rehabilitation following stroke (d) Shank angle visualisation for Ankle Foot Orthosis tuning after stroke

This paper describes the qualitative user-centred design and evaluation process with patients and health professionals, which ran throughout the research, closely integrated with the quantitative trials process (Lewin et al., 2009). The paper reflects on the process as an example of designing and evaluating an intervention in healthcare including: the pre-trial design stage; interviews/questionnaires before the trials to record the expectations of patients and health professionals; through to the post-trial stage, including post-trial interviews and participant workshops with patients and therapists who had used the visualisation software.

References

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