motion increased from 11.3 ± 9.5 to 16 ± 10.1 ($P = 0.04$). Participants reported high satisfaction with the program.
Discussion.– The developed telerehabilitation program is an accessible alternative to in-hospital and outpatient training and allows high-tech rehabilitation at any location.

http://dx.doi.org/10.1016/j.rehab.2014.03.414

CO74-004-e

Performance analysis of adults with acquired brain injury making errands in a virtual supermarket

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Keywords: Cognitive functioning; Activities of daily Living; Virtual reality; Assessment
Introduction.– Virtual environments (VE) offer the opportunity to analyse the performance of people with Brain Injury in activities of daily living. A number of studies have been carried out on 'The virtual supermarket' VAP-S (Marié et al., 2003; Klinger et al., 2004) that included adult populations presenting with cognitive problems. Dysexecutive components, such as planning have been identified from VAP-S outcome measures.
Objective.– To explore the links between patients' performance, daily life integration and a battery of neuropsychological tests.
Population.– Ninety-five subjects with brain injury included from a social and work integration program.
Method.– A Principal Component Analysis (PCA) was performed for 50 subjects among 95 including the whole neuropsychological battery, community integration questionnaire and performance in the VAPS.
Results.– The PCA raises four components that explain 70% of the total variance. These factors show that the dynamic performance in the VAPS can't be only explained by executive functioning.
Conclusion.– A virtual environment like VAPS simulating an activity of daily living quickly raises through functional performance numerous pieces of information about presence and impact of neuropsychological diseases in daily life.

http://dx.doi.org/10.1016/j.rehab.2014.03.415

CO74-005-e

Evaluating efficacy and users' expectations of a virtual reality training system: A multicenter randomized controlled trial

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Keywords: Virtual reality; Stroke; User experience; Efficacy
Background.– Virtual reality (VR) has found its way into neurorehabilitation. The aim of this study is the evaluation of an intensive VR training system compared to conventional occupational or physiotherapy treatment in a multicentre setting with three participating centres.
Methods.– Based on power calculation, 60 stroke patients will be randomly allocated to an experimental VR (EG) or a conventional therapy (16 sessions, 45 minutes each) control group (CG). Patients manipulate virtual objects and environment in real time. Blinded assessors test patients' motor and cognitive performance five times during the trial using a set of standardized stroke assessment for motor control, activity and participation.
Results.– Therapists in all centres completed the study training. Patients are being recruited. Until now, 18 of 21 screened patients were eligible for inclusion, tested and randomized (1:1 ratio) to either EG ($n = 9$) or CG ($n = 9$): 5 females, 6 × right side affected, age ranged between 20–76 years, mean 61.5 years; time since stroke 0.5–10 years, mean 3.3 years.
Discussion.– The study protocol seems to be feasible and patients enjoy VR training. The staffs in all centres are highly motivated and ensure high ethical and research standards. This CTI sponsored trial is on time in its schedule and registered with clinicaltrials.gov: NCT01774669.

http://dx.doi.org/10.1016/j.rehab.2014.03.416

Posters

P484-e

Serious games and rehabilitation

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Keywords: Serious games; Virtual reality; Rehabilitation; Handisport
Introduction.– An efficient tool was developed in order to quantify and improve cognitive and physical capabilities of a disabled person using the concept of Serious Games.
Methods.– The system uses a computer and a sensor games (WIIMOTE or KINECT). Three serious games have been developed for people with motor disabilities.
Method.– The disabled patient is placed in a virtual reality environment in order to practice a chosen game. In applying the guidelines of the therapist and/or trainer (in the case of HandiSport), a real-time tracking of his gestural activity is obtained.
Results.– Three serious games have been developed (handi-bowling, handi-curling, and handi-bowls). The acquisition movements and data processing are performed in real time. At the end of each sequence, the patient (or the player) and the therapist (or coach) obtain the results in the form of curves, tables. . . Their exploitation is used to analyse and quantify a gesture to be corrected and improved.
Discussion.– Serious games can offer a wide range of innovations in opening new perspectives in the field of rehabilitation.

http://dx.doi.org/10.1016/j.rehab.2014.03.417

P485-e

Virtual reality exposure therapy in post-traumatic stress disorder: Developing new opportunities of rehabilitation of post-fall syndrome in elderly subjects

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Keywords: Virtual reality; Post-fall syndrome; Elderly subjects
Background and aim.– We showed in a monocenter prospective survey that about 30% of elderly subjects after a fall showed post-traumatic stress disorder (PTSD) symptoms at 2 months. Since it has been shown that virtual reality

exposure therapy (VRET) has recently been successfully used to treat combat-related PTSD, we are developing a VRET technique for the treatment of post-fall syndrome in elderly subjects.

Methods.– Randomized controlled trial in order to compare the efficacy and acceptability of VRET versus a standard rehabilitation approach for elderly subjects with post-fall PTSD. The main hypothesis is that the functional and motor autonomy will be significantly improved in the VRET group compared to the control group.

Results.– We developed a scenario for VRET after interviewing elderly patients during post-fall rehabilitation. We were able to propose a scenario where an avatar has to walk down a long corridor and where each wall will tend to move away gradually and where the end of the course cannot be seen.

Conclusions.– This virtual reality program is under development and will be soon available to carry out a study with the appropriate methodology to show the good acceptability and efficiency of this tool in the management of post-fall PTSD.

http://dx.doi.org/10.1016/j.rehab.2014.03.418