

Presentation: An exergaming experience

M. COLOMBO, E. MARELLI, R. VACCARO, E. VALLE, S. COLOMBANI, S. GAROLFI, S. FOSSI, A. GUAITA, E. POLESSEL. **Virtual reality for persons with dementia: An exergaming experience.** *Gerontechnology* 2012;11(2):402; doi:10.4017/gt.2012.11.02.253.00 **Purpose** Cognitive stimulation may improve quality of life for people with light to moderate dementia¹. We explored feasibility and results of video gaming for persons with dementia, in terms of acceptability and pleasure. We argued that participants could experience fun and engagement in a context of supervised physical activity². As a secondary goal, participants' cognitive performance might benefit from such exercise³. **Method** A total of 10 patients in our long-term special care units were screened according to their ability and their will to engage with videogames; cognitive impairment ranged from severe to mild [crude Mini Mental Status Examination (MMSE 11-24); balance ranged from impaired to almost normal (Tinetti balance 6-15), and gait ranged from impaired to normal (Tinetti gait 3-12). Withdrawal and social interactions were measured by a-MOSES scale and ranged from 25 (worst) to 17 (best). Persons with dementia were invited by a trainer to exercise their upper limbs by blowing up blue bubbles from a screen that captured the image of the person. Sessions were held twice weekly in quiet rooms. Exergames were shown stepping through increasing difficulty levels (different colours, speed of movement, bi-manual dexterity required). Exergames (EyeToy: play for PlayStation2) were played from a console that had an USB-camera placed on the top of the TV reproducing the person on the screen. The screen displayed a background on which the target stimuli, the blue bubbles, were presented together with red bubbles that must not be scratched. When the first stages of the game were executed correctly, the game proceeded to levels of increasing difficulty. In the easier levels the player had to make a visuo-spatial analysis and attentional monitoring of the action: in this stage the arm movements can be inaccurate. In the upper levels, problem solving, action planning, praxis abilities, motor coordination and psycho-motor speed are also involved. **Results & Discussion** Subjects played from 2.416" to 14.400" (mean 8.535", SD 4.098"); they achieved difficulty levels ranged from 3rd (moderate) to 7th (top level), during sessions lasting from almost 4' up to 20' (longest duration allowed). Highest difficulty levels achieved correlated to spared ability levels in activities of daily living; no correlation was found with motor, cognitive or behavioural variables. Balance, gait and behaviour were no different at the end of the trial. Adjusted mean MMSE increased from 16.4±4.6 to 18.0±4.6 ($p < 0.05$ by Wilcoxon paired sample test). Overall, persons with dementia participated well; they took an interest in the game. Technical subjects appreciated the game, which they perceived as a tool to improve their health and mobility, when playing them they usually implicitly remembered previous sessions. Motor performances improved especially in subjects interested in the game from the outset. No adverse events occurred, with special regard towards behavioural and psychotic symptoms, staff created a pleasant atmosphere while supervising and gently helping when needed, so that the behaviour was appropriate and cooperative. In conclusion, our preliminary experience shows that exergaming for persons with dementia may be proficient towards selected patients. Both our intended outcomes (acceptability-leisure, and cognitive benefit) were achieved. Results concerning cognitive improvement must be considered with caution.

References

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Keywords: virtual reality, persons with dementia, exergames, leisure

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Full paper: doi:10.4017/gt.2012.11.02.253.641