Would you rather squeeze a ball to exercise your weaker hand or play video games? An EU-funded project tested the concept on a group of patients in Israel recovering after a stroke. The idea was unanimously popular and also saw patients working harder – without realising it – than during traditional rehabilitation exercises.

In the EU and the 12 countries associated to its research programmes, 1.1 million people suffer a stroke every year. Today there are currently six million individuals who have had a stroke living in these countries.

A stroke occurs when blood flow to part of the brain is interrupted, causing damage to the brain. The abilities controlled by that part of the brain, such as muscle control, sensation and memory are then lost or impaired.

People who have sustained a stroke are given immediate hospital treatment, but once discharged, many are not active enough, says occupational therapist and coordinator of the VR STROKE project, Dr Debbie Rand. At the chronic stage (more than six months after the stroke), many have completed their rehabilitation programmes, but have not fully regained their movement or independence in everyday life. This limited function leads to insufficient activity.

Many people can live for a very long time following a stroke. But without maintaining a level of activity, physical and mental functions can deteriorate, potentially impacting on quality of life, and perhaps leading to a further stroke and hospitalisation.

System reboot
The goal of any stroke rehabilitation programme is to stimulate movement and cognitive function. By putting video games on the programme, Rand and her colleagues Drs Weingarden and Zeilig at the Chaim Sheba Medical Center, also in Israel, were also trying to introduce elements of fun and motivation.

To test whether fun would also translate into results, stroke patients were divided into two groups; one followed a conventional rehabilitation programme, while the other became acquainted with video consoles.

Five different consoles were used, with off-the-shelf games and one system designed specifically for rehabilitation. Games varied, including bowling, table tennis and others.

In the first stage of the study, individuals went to the rehab centre twice weekly for three months to play at work stations in groups. “This was the first time video games had been used in a group setting. The idea was to add to the fun, to make it sustainable and keep the individuals active for a long time,” explains Rand.

During the second stage, individuals were given their own console at home with the instruction that they should play for one hour each day.

**Progress through play**

While the patients were focusing on scoring points and moving up a level, they were also pushing themselves physically through arm and hand movements. As they played the games standing up, they were also working on balance and trunk control.

Essentially they were working hard (harder than those following the conventional programme, the results showed), but as they were playing, they were oblivious to this, says Rand. And not once did the gamers take a break while the therapist’s back was turned (a temptation well known to many therapists and witnessed in the traditional group).

The results confirmed that video games are indeed an effective form of rehabilitation. Gait speed and grip strength in both hands improved. The functionality gained was no greater in the gaming group than in the other, but levels of contentment certainly were. All participants, from the youngest at 29 to the oldest at 78, reported enjoying the video games very much. This is likely due to the competition, the music and the motivating games, says Rand.

“You can do boring exercises and improve, or you can play fun games and improve,” she says of the results.

Rand has already presented her results at conferences and reports very positive feedback. But her work is not yet over. “I have also been playing with touchscreen tablets to see whether they’re suitable for rehabilitation,” she reports. A pilot study is underway at the same hospital, testing impact on finger and hand movement.

The methods studied by Rand could also be used for other types of rehabilitation, and in particular with those who have suffered a brain injury. Meanwhile clinicians in South America plan to adapt Rand’s approach and use video games in a group setting to treat people with Parkinson’s disease.

**See also:**
CORDIS [2]
**Project:**
Virtual reality intervention for stroke rehabilitation

**Project Acronym:**
VR STROKE REHAB


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