

Title: REWIRE symposium: Tuning up home rehabilitation therapy using lifestyle evaluation.

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Introduction: The REWIRE project aims at providing a virtual-reality (VR)-based home rehabilitation tool for patients discharged from hospital. Although the REWIRE rehabilitation platform allows patients to remain connected to their initial center of care for remote therapy planning and performance assessment, VR-based home therapy encompasses several challenges due to the limited supervision during training.

Aims: The purpose of the lifestyle evaluation module, in the framework of REWIRE, is to deliver a feedback to the therapy planning engine which enables automatic, fine-grain adaptation of the rehabilitation exercises based upon patient's short- and long-term physiological and physical functioning metrics.

Methods: The lifestyle evaluation will be performed through a network of unobtrusive body-worn wireless sensors capable of both activity and physiological (heart-rate) monitoring. A multi-time scale assessment is envisioned to quantify patient's daily-life behavior and will be provided as feedback information to the REWIRE therapy planning engine. On one hand, short-term (e.g. day-long) assessment, based on activity type and intensity as well as patient's current physiological state will reflect the current patient's fitness prior starting a rehabilitation session. On the other hand, advanced data mining techniques will provide a longer-term overview of the therapy progress through a longitudinal analysis of patient's lifestyle.

Discussion: Unobtrusive and multi-scale lifestyle evaluation does not depend on the type of rehabilitation/clinical condition and can therefore become an effective assessment tool not only in home rehabilitation but also in "conventional" rehabilitation and/or different conditions (e.g. elderly, orthopedic surgery, post-traumatic conditions).

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