



ההסתדרות הרפואית בישראל

הכנס השנתי ה-59
של האיגוד הישראלי
לרפואה פיזיקלית ושיקום

שיקום 2008 REHABILITATION
מדע בסיסי ויישומים קליניים
BASIC SCIENCE
AND
CLINICAL APPLICATIONS

תוכנית הכנס

AVENUE - מרכז אירועים וקונגרסים, קריית שדה התעופה
רביעי - חמישי, 3 - 4 בדצמבר 2008, 1' - ז' בכסלו תשס"ט

**Self Mobility Improvement in the eLderly by counteractING falls
(SMILING)**

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Background: Elderly at risk of falling suffer from a stereotyped motor behavior that restricts their participation in outdoor activities. A way to overcome such a situation is to break the stereotyped walking schema and activate a new motor learning process to better approach real life environments. The new approach is intended to challenge the patient to solve new motor problems in real time by inducing variable environments that need active response and problem solving in walking.

The SMILING solution, a wearable non-invasive computer-controlled shoe, is aimed to apply chaotic unexpected perturbations to the lower extremities during active walking by slight alterations of the height and slope of the weight-bearing surface.

The primary objective of SMILING - a multidisciplinary European FP7 project - is to develop and test a new training approach for elderly at risk of falling.

Methods: Following research and development of the SMILING shoe a multi-center trial will validate the system.

60 healthy elderly and those at risk of falling will be asked to validate the system in each of four countries following a 6-week training program.

Outcomes represent standardized functional tests and gait analysis data to be collected from the system itself.

Summary: SMILING project intends to develop a complete system to prevent elderly people falling by developing an intelligent shoe that will train the function of walking.