



Welcome to the first of the six monthly newsletters for the CuPiD project.

The CuPiD project is developing and field testing home rehabilitation services for the major motor disabilities caused by Parkinson's disease.

**CuPiD proposes three services:**

1. Virtual Reality rehabilitation games and exercises including sit-to-stand and walking.
2. A portable aid providing external cues upon detecting (or predicting) freezing of gait.
3. Wearable biofeedback aids for self-training of the activities of daily life.

In order for the rehabilitation to be effective, CuPiD monitors the user's performance and supports remote supervision by clinical specialists. All the exercises are closed-loop: feedback from the exercise affects the user; feedback from the user's performance affects the nature of the exercise.

This is the first time that such a diverse and comprehensive training has been proposed for patients with Parkinson's disease in the home setting. The outcomes of CuPiD will establish the feasibility and long-term efficacy of closed-loop rehabilitation protocols. CuPiD makes a critical contribution to self-directed rehabilitation in Parkinson's disease and enhances the field of non-pharmaceutical intervention.

### Partners:

- Università di Bologna - Italy
- Tel-Aviv Sourasky Medical Center – Israel
- Eidgenössische Technische Hochschule Zürich - Switzerland
- Katholieke Universiteit Leuven - Belgium
- Oxford Computer Consultants - UK
- ST Microelectronics - Italy
- EXEL - Italy
- Fundació Illes Balears Innovació Tecnològia - Spain

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## Closed-loop system for personalized and at-home rehabilitation of people with Parkinson's disease

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### Virtual reality exercises are proposed

Three main impairments are considered to have a direct impact on the function of patients with PD. These include difficulty in displacing the centre of mass, reduced amplitude of movement, and slowness of movement (bradykinesia).

CuPID's major goal is to provide a system for independent home training that will address these impairments as they progress throughout the course of the disease, while ensuring patient safety. The training will include several tasks at different levels of difficulty that will take place in various virtual reality environments addressing the functional difficulties typically incurred by patients with PD.

### Description of Tasks

Four levels of practice are chosen according to difficulty level:

1. Sitting
2. Standing to sitting
3. Standing
4. Walking

Each level consists of several tasks that progress throughout the training course, combining both motor and cognitive aspects.

### CuPID loves dissemination

Our logo represents our desire to bring closed-loop rehabilitation exercises into the home. The person with Parkinson's is at the centre of what we do.

And the arrow – its CuPID's best weapon!



The CuPID website was born [www.cupid-project.eu/](http://www.cupid-project.eu/) from which our press release and two-page fact sheet are available: [www.cupid-project.eu/publications](http://www.cupid-project.eu/publications).

### CuPID doesn't love snow

At our meeting in Leuven, Belgium our Italian partners were missing. Deep snow hit Bologna. <http://www.cupid-project.eu/leuven>

**CuPID receives funding from the European Union - Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 288516 (CuPID project)**