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# HELLODOC

HEaLth Service Linking Tele-rehabilitatiOn  
to Disable PeOple and Clinicians



Supported by  
DG Information Society  
Trans European Telecommunication Network



## The HELLODOC project: towards an ICT based clinical service

HELLODOC is the acronym for "HEALTHcare Service Linking Tele-rehabilitation to Disable people and Clinicians". The project is co-financed by the European Community Programme eTen.

The primary objective is the market validation of a home-care service by which upper limb rehabilitation is continued at home under hospital supervision. Market acceptability of the service will be tested in Italy, Spain and Belgium.

Meant for subjects affected by neurological diseases like Traumatic Brain Injury (TBI), Stroke or Multiple Sclerosis (MS), the home-based rehabilitation service will allow patients to benefit from an extensive period of training at home under remote assessment from the hospital.

### HCAD

The pilot service is centred on a home-care device developed within the framework of the European project H-CAD (Home-Care Activity Desk) supported by the IST programme. The device allows the execution of a configurable set of exercises purposely studied to help the recovery of the functionalities of the arm.

### From past to future

The implementation of the service has resulted in the development of an engineered home-care device with the following main improvements:

- larger exercise desk
- self standing table
- fully embedded system
- enhanced feedback toward patient
- interchangeable protection layer
- improved accessory range
- new arm support.



The new home-care device

### Key actions

- to help the hospital or rehabilitation centre with setting the necessary infrastructures and organise the team responsible for the service
- to adapt the hospital data network
- to implement an e-learning platform to educate professionals to use tele-rehab apparatuses.

### Partners

The project team features technical and clinical partners from Belgium, Spain, The Netherlands and Italy. Istituto Superiore di Sanità (ISS) acts as administrative coordinator, responsible for the technical assessment of the device and provider of the e-learning platform. Signo Motus s.r.l. is the scientific coordinator and developer of the mechanical skeleton, modules and network implementation. Pragma Engineering is the developer of the electronic and software heart of the home-care device. Roessing Research & Development (RRD) is the main assessor of the clinical trials performed in the three clinical centres of:

- Unità Organica di Riabilitazione Intensiva Neuromotoria (TBI and Stroke patients);
- National MS Centre (MS patients);
- Fundació Privada Institut de Neurorehabilitació Guttmann (TBI, MS and Stroke patients).

### The service

The system consists of two main apparatuses: a hospital-based server and the portable units to be installed at the patients' homes. The pilot service has already been implemented in the three centres above.

### The e-learning modules

ISS and RRD are the main developers of two e-learning modules, one clinically oriented - focused on TBI, Stroke and MS -, the other technically oriented. Both modules will exploit the potentialities of the Problem-Based Learning (PBL) methodology [[www.edu.iss.it](http://www.edu.iss.it)].

### Network features

- Secure communication by means of VPN technology
- Hospital LAN fully integration.

### Tele-rehabilitation System

The tele-rehabilitation program consists of a set of exercises purposely adapted to the patient's impairment. The patient performs the exercises using the home-based apparatus. Equipped with two webcams, it allows teleconference and video recording. The main parameters of the exercises (i.e. duration, sensor output, number of attempts) as well as videos are then uploaded to the hospital server.

### Some Rehab Exercises

**Key, Jar and Checkers:** for the training of digital grip (thumb and forefinger) in vertical and horizontal displacement

**Keyboard:** pressing coded key sequences

**Light bulb:** to strengthen hand grasp and to train the arm function

**Book:** shoulder flexion/abduction, forearm pronation/supination, elbow extension and hand grasp

**Writing:** writing onto customisable masks for signature/writing exercise as well as pre-graphism exercises.