BACKGROUND

- Stroke and other neurological conditions affect the population of infants in percentages that cannot be considered marginal.
- Preterm infants are the infants at highest risk for neurological damage.

<table>
<thead>
<tr>
<th>Where?</th>
<th>How often?</th>
</tr>
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<tbody>
<tr>
<td>Traditional rehabilitation sessions</td>
<td>Rehabilitation centres</td>
</tr>
<tr>
<td>At home</td>
<td>Every day, more times a day</td>
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</tbody>
</table>

- Intensive and multiaxial intervention
- Reduce the cost of entire European Healthcare System
- Increase the efficacy of rehabilitation

To promote early intervention in the first year of life and to reinforce therapy by “CareToy”: a portable low cost smart system telemonitored.

AIM

Expected Results

1° The CareToy system, obtained by integrating the developed modules, will be able to extract fundamental parameters during infants’ rehabilitation therapy in a reliable and accurate way, elaborate these multi-parametric data and to communicate with remote rehabilitation centres.

2° Validate the system as a tool for early intervention of preterm infants with brain injuries such as perinatal stroke.

3° Plans for exploitation: specific ideas and purposive plans for industrialization will emerge.

The Consortium

Scuola Superiore Sant’Anna (Italy)
IRCCS Fondazione Stella Maris (Italy)
Fonden for Helene Elsass Center (Denmark)
University of Ljubljana
Univerza v Ljubljani (Slovenia)
Universität Hamburg
Universitaet Hamburg (Germany)

MR&D S.p.A.
Innovation partner
Marketing Research & Development SPA (Italy)
STMicroelectronics srl (Italy)

Project Information

Project coordinator:
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Starting date: November 1st, 2011
Project Duration: 36 months
Project cost: 3.000.076,00 €
EC contribution: 2.292.972,00 €

www.caretoy.eu
The proposed PLATFORMS

**Telerehabilitation Station**
Remotely communication with the rehabilitation staff for monitoring and assessing the rehabilitation techniques

**CareToy C - 2 units**
For clinical assessment

- vision module (composed by five screens for visual stimulation)
- commercial eye tracker
- infant-seat
- kit of sensorized toys

**CareToy H - 6 units**

- kit of sensorized toys
- sensorized mat module
- interactive walls
- arched gym
- cameras
- wearable sensors
- telerehabilitation module

**FEEDBACK WALLS**
The sensorized mat is surrounded around its two lateral sides by feedback walls. Each wall has a size of about 90 cm x 40 cm and can provide audio-visual stimuli thus they are attractive and stimulating for the infants.

**SENSORIZED MAT**
The sensorized mat has the aim to detect the posture and the movement of the infants during the rehabilitation session.

**SCREEN WALL**
The frontal wall is provided by a screen that can show moving pictures (animations) with and without sounds that switch on and off.

**BELT WALL**
The belt wall completes the structure with an adjustable pillow in order to allow sitting posture. This soft pillow is equipped with a switch and a belt for allowing the infant to sit by laying his/her back against the wall.

**ARCHED GYM**
The arched gym is a structure that can be placed in the CareToy H where toys can be hanged in the three points of interest. Twelve different orange lights are embedded into the arch that progressively switch on and off from one side to the middle and/or to the other side.

**WEARABLE SENSORS**
In order to get some informations about the arms and trunk movements ST Microelectronics (CareToy partner) developed wireless magneto-inertial wearable devices designed as bracelets and chest strap.