

Virtual Coaching Activities for Rehabilitation in Elderly

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D1.2 Narratives booklet for rehabilitation assistance Extended summary

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The overall scope of this report is to build a bridge between medical and technical perspectives.

vCare's medical experts have written up detailed patient clinical profiles and behaviours. These descriptions are focused on narratives and use cases. The narratives represent the evolution of the user or patient's status based on health, behavioural, and environmental monitoring, and modifications in care objectives. Eight narratives address 14 use cases. Thirty-two levels of interaction are described in the 14 use cases.

Two clinical domains are highlighted: neurology and cardiology. In the neurological domain, the list includes treatments related to physical/motor activity, emotional recognition, risk factor modification (fall) and cognitive enhancement. In the cardiological domain, the list includes treatments addressed to the physical/motor activity, emotional recognition (anxiety, depression), risk factor modification (smoking, weight) and adherence to therapy (pharmaceutical intake).

The **vCare** methodological approach was developed in the project's first work package (WP1). The approach consists of two phases:

Clinical Concept (the design the overall user framework)

Piloting (testing and validation of the **vCare** solution).

The Clinical Concept is composed of three tasks:

Task 1.1: Healthy, Behavioural & Well-Being models

Task 1.2: Narratives for virtual coaching

Task 1.3: Knowledge representation requirements.

This report is the outcome of the second task of WP1 of the **vCare** project. The report can be usefully read in conjunction with deliverables D1.1 and D1.3. The **vCare** model outlined in D1.1 can be associated with specific use cases that each have a selected rehabilitation pathway. The narratives related to automatic reasoning (D1.3) propose those aspects of the **vCare** system which, from a clinical perspective, could be automated.

BACKGROUND

There are three technological dimensions to the **vCare** model. They address a continuum that lies between "intrusiveness" and "interaction". They show that a workflow (occasionally called a "model of action") between the virtual coach and the patient is foreseeable in most of the use cases depicted (see deliverable D1.1).

PATIENTS' NEEDS – NARRATIVES AND USE CASES

Each clinical partner designed the solutions related to the patients' needs according to two different perspectives – narratives and use cases:

- **Unstructured narratives.** These narratives are based on an analysis of the patient profile from a clinical perspective. They provide indications of the actions foreseen in an extended rehabilitation programme, focused on the home setting.
- **Structured use cases.** These use cases are based on the description of a specific workflow, as a sequence of steps within a process (including support services). The use cases are presented according to the level of interaction between the virtual coach and the specific patient.

NARRATIVE STRUCTURE

Each narrative has a structure consisting of five parts – scenario, need, personalised home rehabilitation pathway, services, and processes:

1. Scenario

The scenario describes the medical history of the character selected, various details, and background information about disease and related impairments. It helps to identify a realistic sample of user screened for the purposes of **vCare** purpose. It introduces the concept of needs (i.e., use cases). Some scenarios end with sentences, pronounced by users, related to difficulties experienced in real life settings.

2. Need (use case)

The patient impairments and deficits are described. These are the clinical challenges to which technologies must try to give an answer.

3. Personalised home rehabilitation pathway

The pathway contains the rehabilitation programme written by a doctor who is in charge of physical medicine and rehabilitation. It includes two parts: the results of hospital rehabilitation treatment, and the activities planned for the period of rehabilitation at home that will be carried out by the **vCare** system.

4. Services

This part defines and includes the desirable features (services) of the **vCare** system that respond to the patient’s needs. Each service is composed of a technological setup, sensing environments, and machine learning rules that are capable of fulfilling the user’s needs and use cases proposed.

5. Processes

This is the last part of the narrative. It describes all the services identified. Like a “screenplay”, it includes all the possible interactions between users and the **vCare** system. It provides a typical example, and predicts variables, for all three processes – dialogue, interaction and sensing of data.

A sample use case is shown in *Figure* (below).

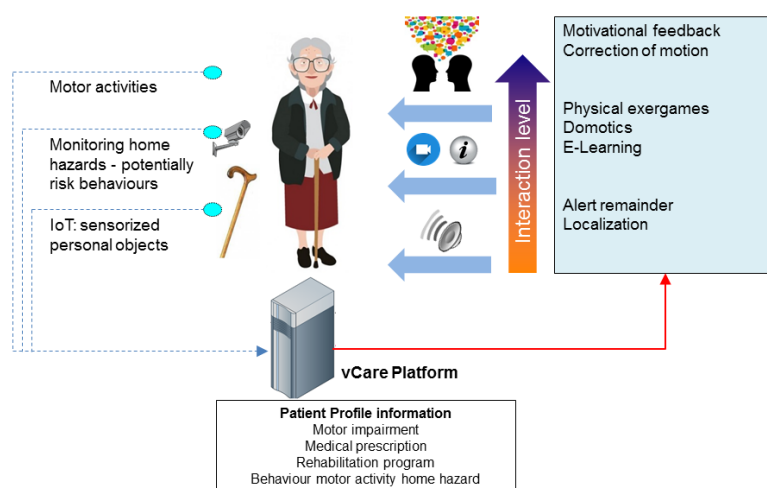


Figure: Schematic representation of proposed personalised home rehabilitation

USE CASES

The use cases permit the design of clinical pathways which help to prioritise the use cases and could fit the needs of more than one pilot centre. These representations are important to identify an implementation plan which should be both feasible and useful: feasible because it is built with the relevant available tools/background knowledge, and useful because it supports the purposes of the technical partners.