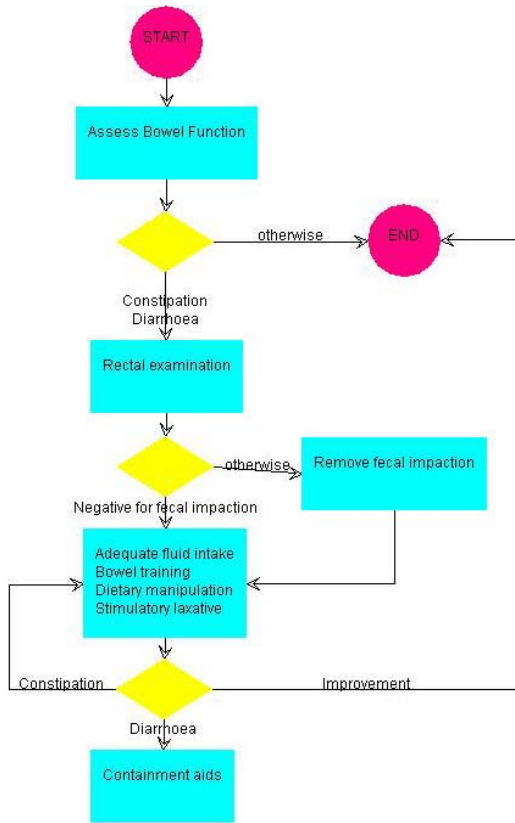


**THE SDA\* MODEL v1.0:** Clinical Algorithms are schematic models of the clinical decision pathways described in a clinical practice guideline or in a part of it. The SDA\* Model is a framework that extends the representation of Clinical Algorithms with states, non-determinism, time constraints, and indications on the performers.

SDA\* Algorithms are flowcharts that combine patient states and professional decisions and actions. States define the sort of patient conditions that define a feasible starting point of the treatment. Decisions are conditions that may derive the treatment in one direction or another. Actions represent the activities of the actors participating in the treatment (i.e., professionals, patients, relatives, etc.).



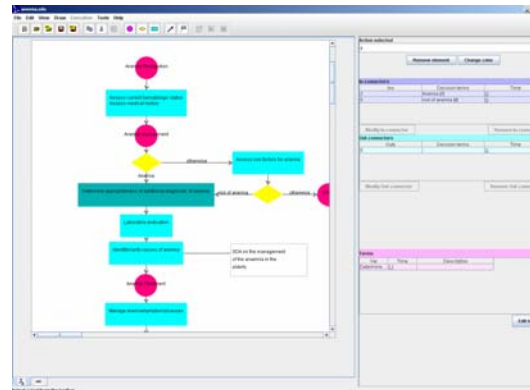
In a SDA\* Algorithm, states are represented as red circles, decisions as yellow diamonds, and actions as blue boxes, which are mutually connected with

arrows. Arrows may contain temporal delays that affect the treatment, and they may define loops.

Arrows going out of decisions contain the condition that derives the treatment in the direction of the arrow. The treatment starts in one of the states and follows a path through the arrows that are satisfied till a temporal minimal delay is found or a state is reached that is not satisfied by the patient.

Medical non-deterministic situations and actions may be represented in the SDA\* Algorithm and they are solved at the time of using the SDA\* Algorithm. Individual actions in the action boxes can be related to one or several *petitioners* (sorts of actors that is allowed to order the action) or *performers* (sorts of actors that are allowed to apply the action).

**SDA\* EDITOR:** The K4CARE Platform incorporates a graphical interface editor to create, incorporate, view, and modify SDA\* Algorithms. These algorithms represent K4CARE FIPs and they are informational elements to guide health care professionals in the determination of the best treatment of a particular patient.



**FORMAL INTERVENTION PLANS:** K4CARE provides a family of Formal Intervention Plans for all the syndromes, diseases, and social issues available. These are represented as SDA\* Algorithms and they are ready, after professional authorisation, to guide the treatment of the K4CARE patients.

**SYNDROMES:** In K4CARE, a syndrome is a complex health situation in which a combination of symptoms and signs occurs more frequently than would be expected on the basis of chance alone and it generates a functional decline. K4CARE deals with the syndromes *Cognitive Impairment* and *Immobility*.

**DISEASES:** In home care, diseases are physiological or psychological dysfunctions. The K4CARE project provides support to the treatment of fifteen diseases and six sorts of dementia.

- |                         |                                       |
|-------------------------|---------------------------------------|
| <b>A. SYNDROMES</b>     |                                       |
| SY1.0                   | Cognitive Impairment                  |
| SY2.0                   | Immobility                            |
| <b>B. DISEASES</b>      |                                       |
| DI01.0                  | Anemia                                |
| DI02.0                  | Arthritis                             |
| DI03.0                  | Cerebrovascular diseases              |
| DI04.0                  | Chronic ischaemic heart disease       |
| DI05.0                  | Chronic Obstructive Pulmonary Disease |
| DI06.0                  | Decubit ulcer                         |
| DI07.0                  | Delirium                              |
| DI08.0                  | Dementia                              |
| DI08.1                  | Alzheimer type Dementia               |
| DI08.2                  | Vascular Type Dementia                |
| DI08.3                  | Mixed Type Dementia                   |
| DI08.4                  | Other degenerative Dementia           |
| DI08.5                  | Secondary Dementia                    |
| DI08.6                  | Unspecified Dementia                  |
| DI09.0                  | Depression                            |
| DI10.0                  | Diabetes                              |
| DI11.0                  | Heart failure                         |
| DI12.0                  | Hypertension                          |
| DI13.0                  | Idiopathic cognitive impairment       |
| DI14.0                  | Parkinson disease                     |
| DI15.0                  | Other disease                         |
| <b>C. SOCIAL ISSUES</b> |                                       |
| SI01                    | No Family support                     |
| SI02                    | Low Income                            |
| SI03                    | No Social-network                     |
| SI04                    | Bad Environment                       |
| SI05                    | Insanity                              |

There are several international classifications of diseases, among which K4CARE uses the "International Classification of Diseases, Injuries and Causes of Death, 10th revision Clinical Modification" (ICD-10-CM) to codify and also to structure the diseases that are related to the HC syndromes.

**SOCIAL ISSUES:** Social issues are matters that can be explained only by factors outside an individual's control and immediate social environment which affect many individuals in a society. In K4CARE we consider principal social issues that involve elder which are assisted at home.

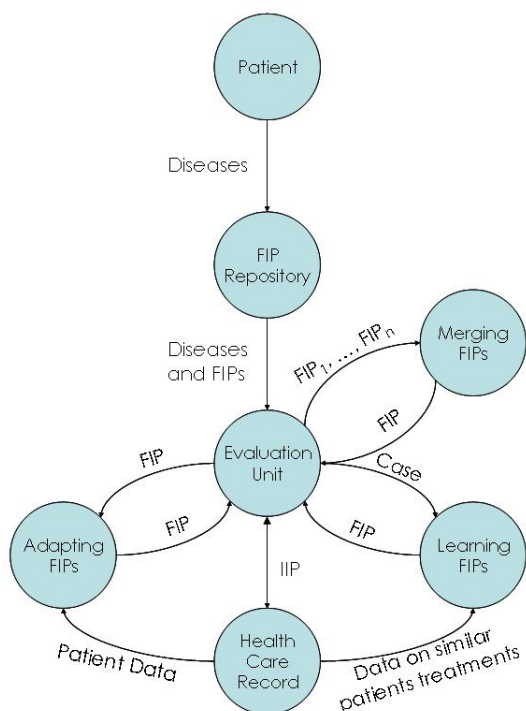
**INDIVIDUAL INTERVENTION PLANS:** At any time after a multi-dimensional assessment, all the patients of the K4CARE model have an active *Individual Intervention Plan* (IIP) attached that is decided by the professionals participating in the *Evaluation Unit* of the patient. The IIP of a patient may be changed each time the patient is re-evaluated.

An IIP is the result of merging, adapting, and learning FIPs.

*Merging* is defined as the process of combining several FIPs that affect one patient in order to provide a single treatment for that patient (e.g., treatment of comorbidities).

*Adapting* is the process by which some parts of a FIP are identified as irrelevant for the *target* patient due to the particularities of that patient (e.g., antecedents in the Health Care Record).

*Learning* is the process by which the health care records of the patients that are similar to the *target* patient are recovered from the K4CARE Electronic Health Care Record, and the data on their treatments used to induce a FIP that summarizes the treatment followed for similar patients in the past.



All these procedures are available in the K4CARE Platform for the professionals in the *Evaluation Unit* to define the IIP of the *target* patient.

All the consecutive IIPs of a K4CARE patient are stored in the Health Care Record of that patient as

the history of treatments that have been applied to that patient, and they are ready for consultation.

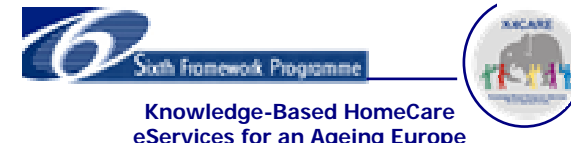
<b>FIPs on Anemia</b>
Recognition, Assessment, Treatment, and Monitoring Management in the Elderly
<b>FIPs on Arthritis</b>
Treatment of Osteoarthritis
<b>FIPs on Cognitive Impairment</b>
Treatment
<b>FIPs on Coronary Heart Disease</b>
Treatment
<b>FIPs on Chronic Obstructive Pulmonary Disease</b>
Pharmacological Treatment Acute Exacerbation Treatment
<b>FIPs on Delirium</b>
Treatment
<b>FIPs on Depression</b>
Pharmacological Treatment Depression with Cognitive Impairment Treatment Depression with Dementia Treatment Suicide Risk Assessment
<b>FIPs on Heart Failure</b>
Chronic Heart Failure Treatment Chronic Heart Failure Monitoring
<b>FIPs on Hypertension</b>
Life Style Modification Treatment (Stage I) Treatment (Stage II)
<b>FIPs on Immobility</b>
Assessment Patient Bedridden Treatment Bowel Dysfunction Treatment Bladder Dysfunction Treatment Pain Treatment
<b>FIPs on Parkinson's Disease and Parkinsonism</b>
Treatment Initial Pharmacotherapy in Early Stages

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## K4CARE Formal Intervention Plans

[www.k4care.net](http://www.k4care.net)

The K4CARE project (IST-2004-026968) is an EC 6FP project aiming at the development, the integration and the use of several Information and Communication Technologies (ICT) and intelligent Computer Science (CS) technologies in the framework of Home Care (HC).

K4CARE is based on:

- a model for HC service which can be shared by the EU countries;
- an Electronic Home Care Record;
- a telematic and knowledge-based CS platform;
- an Actor Profile Ontology for representing the profiles of the subjects involved in the K4CARE model;
- a Case Profile Ontology for representing symptoms, diseases, syndromes;
- Computer-Based Formal Intervention Plans.

The K4CARE project is developed by thirteen EU partners: eight centres with geriatric, medical and healthcare competencies and five ICT and CS centres.

K4CARE Formal Intervention Plans (FIP) are a family of clinical algorithms that determine the way that diseases, syndromes, and social issues in the K4CARE project are treated. The formalism to represent FIPs is called SDA\*, this standing for the combination of states, decisions, and actions. The K4CARE Platform implements mechanisms to edit, adapt, merge, learn, and execute SDA\* algorithms. These SDA\* algorithms are related to the K4CARE Electronic Health Care Records of the HC patients and they may be used to rule their treatment.