

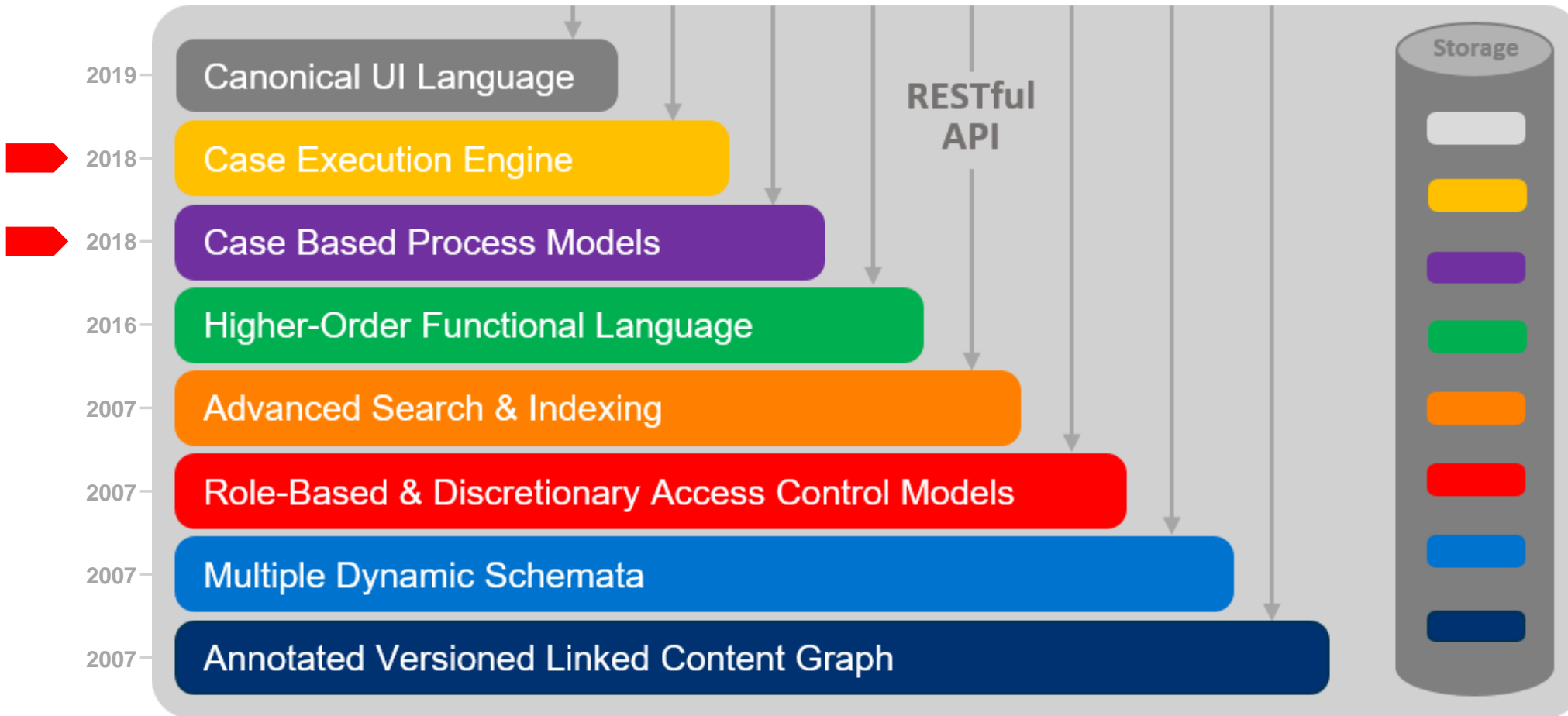
A workflow engine to support knowledge-intensive processes

Felix Michel, 20.09.2018

Chair of Software Engineering for Business Information Systems (sebis)
Faculty of Informatics
Technische Universität München
www.matthes.in.tum.de

A Practice-Proven Reference Architecture for Model-Based Collaborative Information Systems

Continuously enhanced architecture layers



Source: Hernandez-Mendez, A., Michel, F., & Matthes, F. (2018). A Practice-Proven Reference Architecture for Model-Based Collaborative Information Systems. *Enterprise Modelling and Information Systems Architectures*, 13, 262-273.

Personalized Connected Care for Complex Chronic Patients (CONNECARE)



CONNECARE



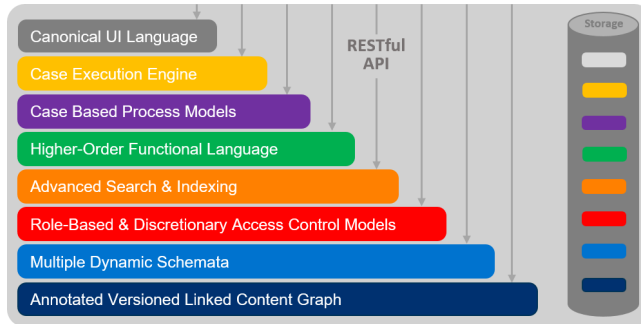
The ambition is to co-design, develop, deploy, and evaluate a novel **smart, adaptive integrated care system for chronic care management.**

Kartendaten © 2018 Google, ORION-ME

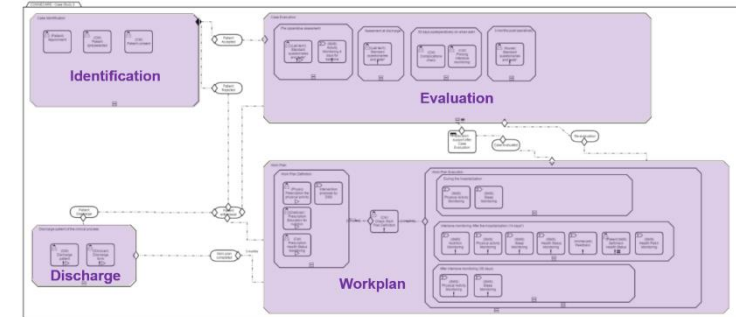
Personalized Connected Care for Complex Chronic Patients (CONNECARE)

Current state

1 System Development



3 Modellig Clinical Case Studies

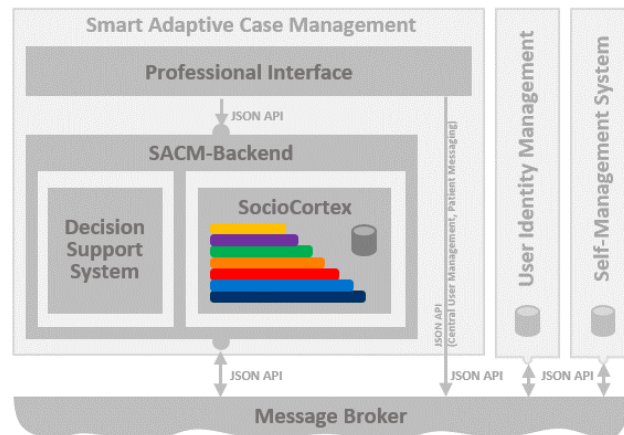


TODAY

2015

2019

2 System Integration



4 Clinical Trails

Case Study 1

- Groningen (NL)
- Tel Aviv (IL)
- Leida (ES)
- Barcelona (ES)

Case Study 2

- Groningen (NL)
- Tel Aviv (IL)
- Leida (ES)
- Barcelona (ES)

5 Evaluation & Publication

Integrated care for complex chronic patients.

A Practice-Proven Reference Architecture for Model-Based Collaborative Information Systems.

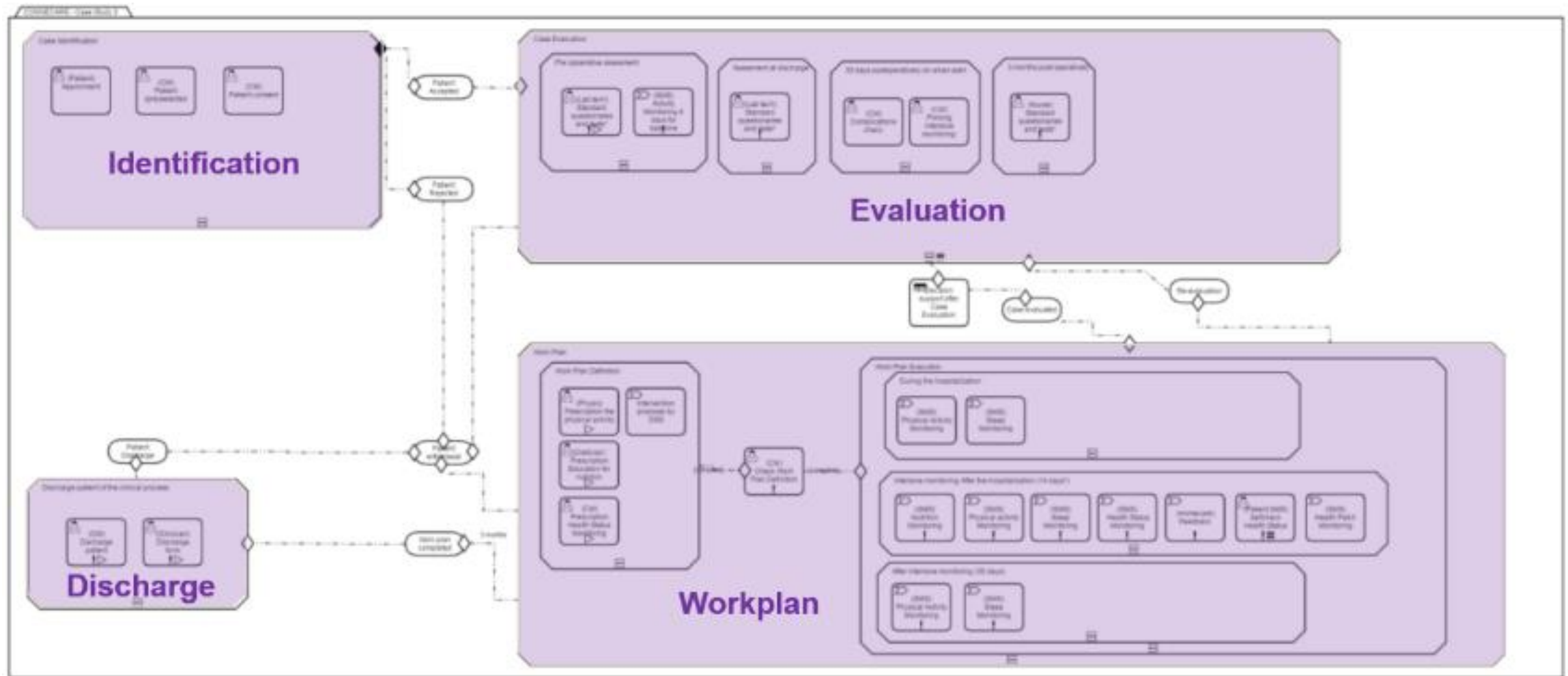
A holistic Model-based Adaptive Case Management Approach for Health-Care

An Overview of Complementary Tools for an Integrated and Adaptive Health-Care Approach.

Personalized Connected Care for Complex Chronic Patients (CONNECARE)

Current state

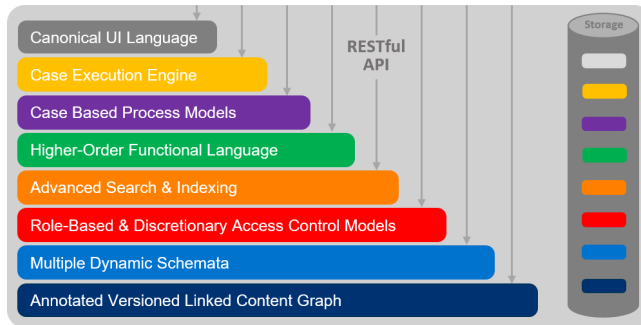
3 Modellig Clinical Case Studies



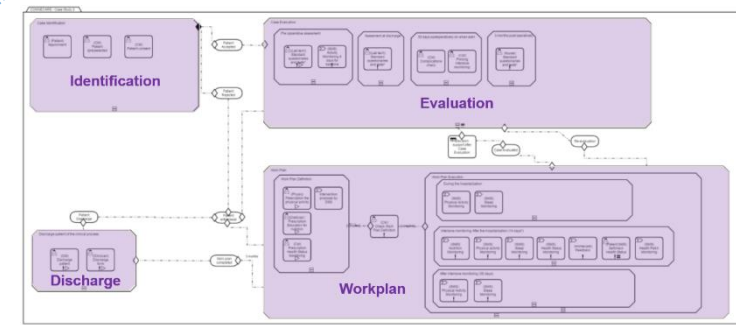
Personalized Connected Care for Complex Chronic Patients (CONNECARE)

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3 Modellig Clinical Case Studies

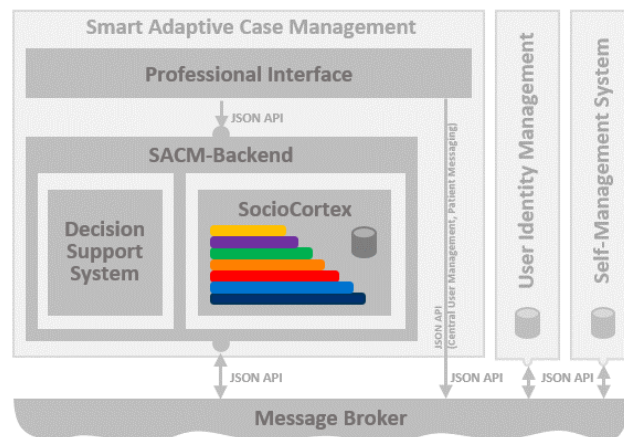


TODAY

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Personalized Connected Care for Complex Chronic Patients (CONNECARE)



Demo preview – task in progress page



English

Welcome: Felix

Home > My Cases > GCS2_Groningen (Not Known) > Case Identification > Assign Patient

Groningen CS2 Current Stage: **Case Identification** Case ID: **a656at8z8xzp** Case Actions

Summary Process Data Team Notifications Messages Notes

Assign Patient

Clinician:	Set Owner	<p>Professional</p>
Role:	Umcg Professional	
Due Date:	Set Date	
State:	Active	

Patient * ?

John Kelly (jak.kelly@adi-uk.com)

Clinican *

--

Jerry Schultz
(jerry.schultz@professionals.umgc.org)

Matthijs Plas

COMPLETE **TERMINATE**

Personalized Connected Care for Complex Chronic Patients (CONNECARE)



Demo preview – completed task page

Charlson

Clinician:	firstNameprof lastNameprof
Role:	Umcg Professional
Due Date:	25-Aug-2018
State:	✓ Completed

Professional

Myocardial infarct *

Yes

Congestive heart failure *

Yes

Peripheral vascular disease *

Yes

Cerebrovascular disease (except hemiplegia) *

No

Charlson Comorbidity Index (unadjusted) 22

CORRECT

Personalized Connected Care for Complex Chronic Patients (CONNECARE)



Demo preview – dashboard page



English

Welcome: Felix



Notifications

- Discharge Form** ✕
Groningen CS2 | Eloisa Vargiu (37) We 27.06
Max Mustermann corrected the task parameters "Com..."
- Discharge Form** ✕
Groningen CS2 | Eloisa Vargiu (37) Fr 22.06
Max Mustermann corrected the task parameters "Com..."
- Assign Patient** ✕
Groningen CS2 | Elo Steps (44) Th 28.06
Felix Michel corrected the task parameters "Patient" ...
- Patient Questionnaire (SF12)** ✕
Groningen CS2 | Elo Steps (44) Tu 19.06
ERROR when trying to create the prescription: The pat...
- Discharge Form** ✕
Groningen CS2 | Eloisa Vargiu (37) We 27.06
Max Mustermann corrected the task parameters "Com..."
- Discharge Form** ✕
Groningen CS2 | Eloisa Vargiu (37) Mo 25.06
Max Mustermann corrected the task parameters "Com..."

Messages

Ilya Kurnosenkov | Team ✓
Groningen CS2 | Thomas Williams (38) Tu 19.06
asdf asdf sadf

Tasks

- Asthma control (ACQ)**
| Eloisa Vargiu (37) Due 6 months ago
- Mini Nutritional Assesment (MNA-SF®)**
| Eloisa Vargiu (37) Due 6 months ago
- Spirometry**
| Eloisa Vargiu (37) Due 6 months ago
- Nutritional Risk Screening (NRS)**
| Eloisa Vargiu (37) Due 6 months ago
- Mini Nutritional Assesment (MNA-SF®)**
| kitiara nokia groningen (20) Due a month ago
- Nutritional Risk Screening (NRS)**
| kitiara nokia groningen (20) Due a month ago
- Instrumental Activities of Daily Living (iA...**
| kitiara nokia groningen (20) Due a month ago
- Hospital Anxiety and Depression Scale (...)**

Personalized Connected Care for Complex Chronic Patients (CONNECARE)

Demo preview – summary page

Home > My Cases > Elo Lleida Demo

CS2 Lleida - Versió OK - Elo Lleida Demo Age: 69 Current Stage: **Avaluació del cas** Case ID: voej94dxaijo

Case Actions ▾

Summary

Process

Data

Team

Notifications **1**

Messages

Notes

Estat del pacient

Charlson 7

HAD Ansietat 0

HAD Depressió 0

Pfeiffer 3

Barthel 90

Not available at current stage

Not available at current stage

Not available at current stage

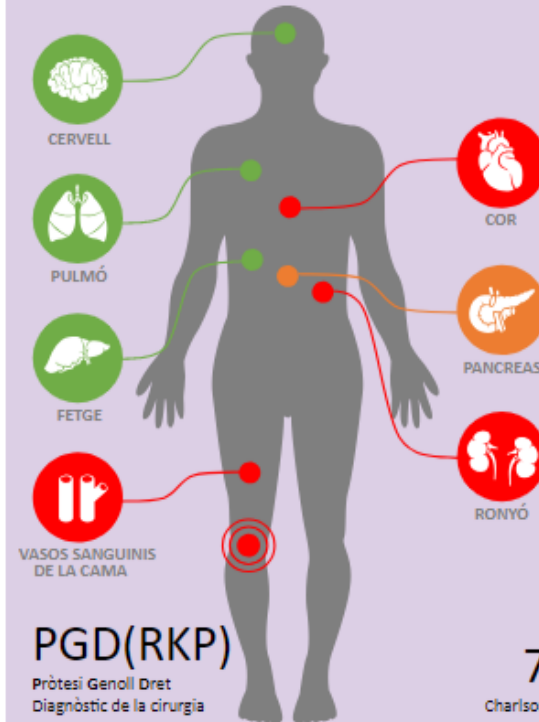
Hb (gr/dl) N/A

Prot (gr/dl) N/A

ASA de tipus: II

WOMAC D. N/A

Diagnosi



PRESERVAT **DANY LLEU/MODER** **DANY SEVER**

Barreres

Compliment farmàcia N/A

Dificultat tractament N/A

Quan s'ha de curar la ferida? N/A

Habitatge Social N/A

Capacitat Cuidador N/A

- Praxis proven API interfaces that are used by the CONNECARE partners to build the frontend application and the middleware for the system integration.
- Development focused on the end-user interface. Clinical processes can be modelled via XML files.
- **Initially planned as workflow engine, now a holistic model-based adaptive case management engine that:**
 - **Support a model-based full stack approach** (Data Models, Case Models, Role-based Access Rights, Simple User Interface Models)
 - **Support third-party system integration** (Hooks, Notifications, ...)
 - **Support coordination and communication** (Messages, Notes, Notifications)
- Most developed elements such as the tasks, the dashboard and summary page are generic and could be applied for other use cases such as:
 - Administration processes
 - Chancellery processes
 - Student admission process



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