



VCARE

VIRTUAL COACHING ACTIVITIES
FOR REHABILITATION IN ELDERLY

VCARE EXPERIENCE: A DIGITAL COACH TO ENHANCE HOME REHABILITATION

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 769807.



CASA CURA POLICLINICO

- CCP is a fully integrated **multi-specialty Clinical Centre** (148 beds), accredited by the Italian National Health System
- CCP provides both inpatient and outpatient services, mainly directed to **neurological patients**.
- These services improve **rehabilitation care pathways**, responding to an integrated and multidisciplinary approach

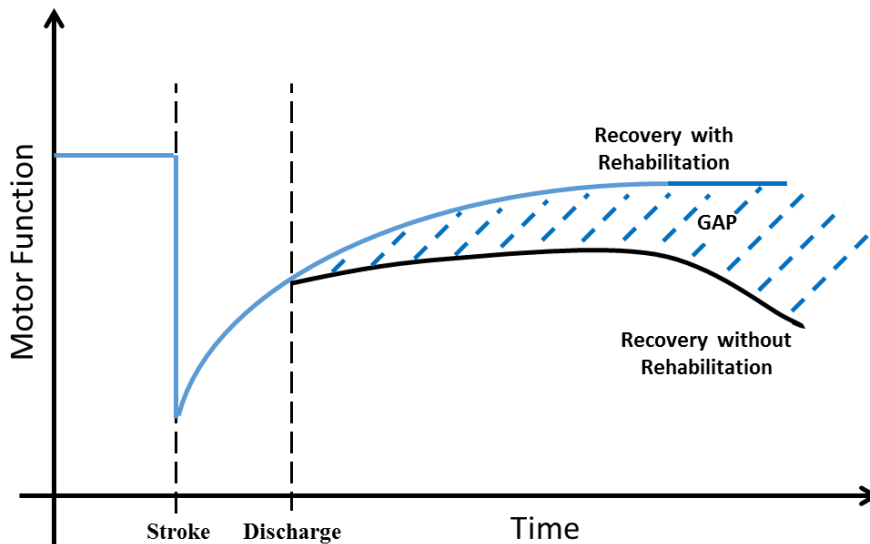


BACKGROUND



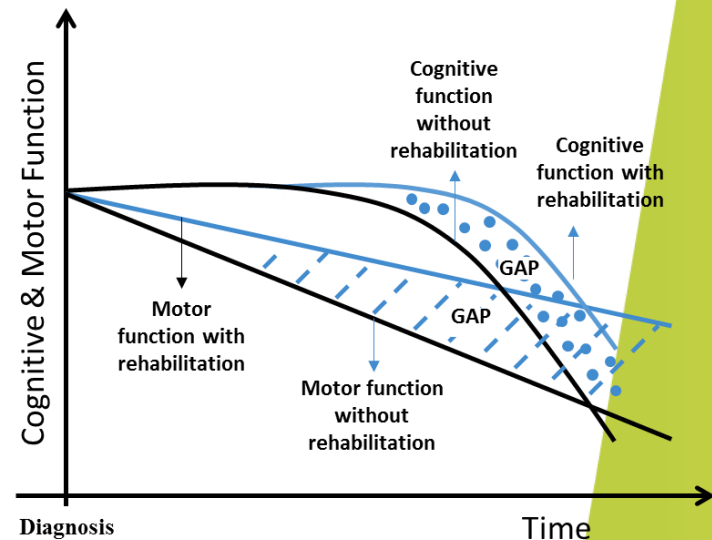
Often the continuity of the rehabilitation process interrupts with the transition to the home environment.

Stroke Recovery Model



Modified from *Langhorne, Bernhardt, and Kwakkel 2011*

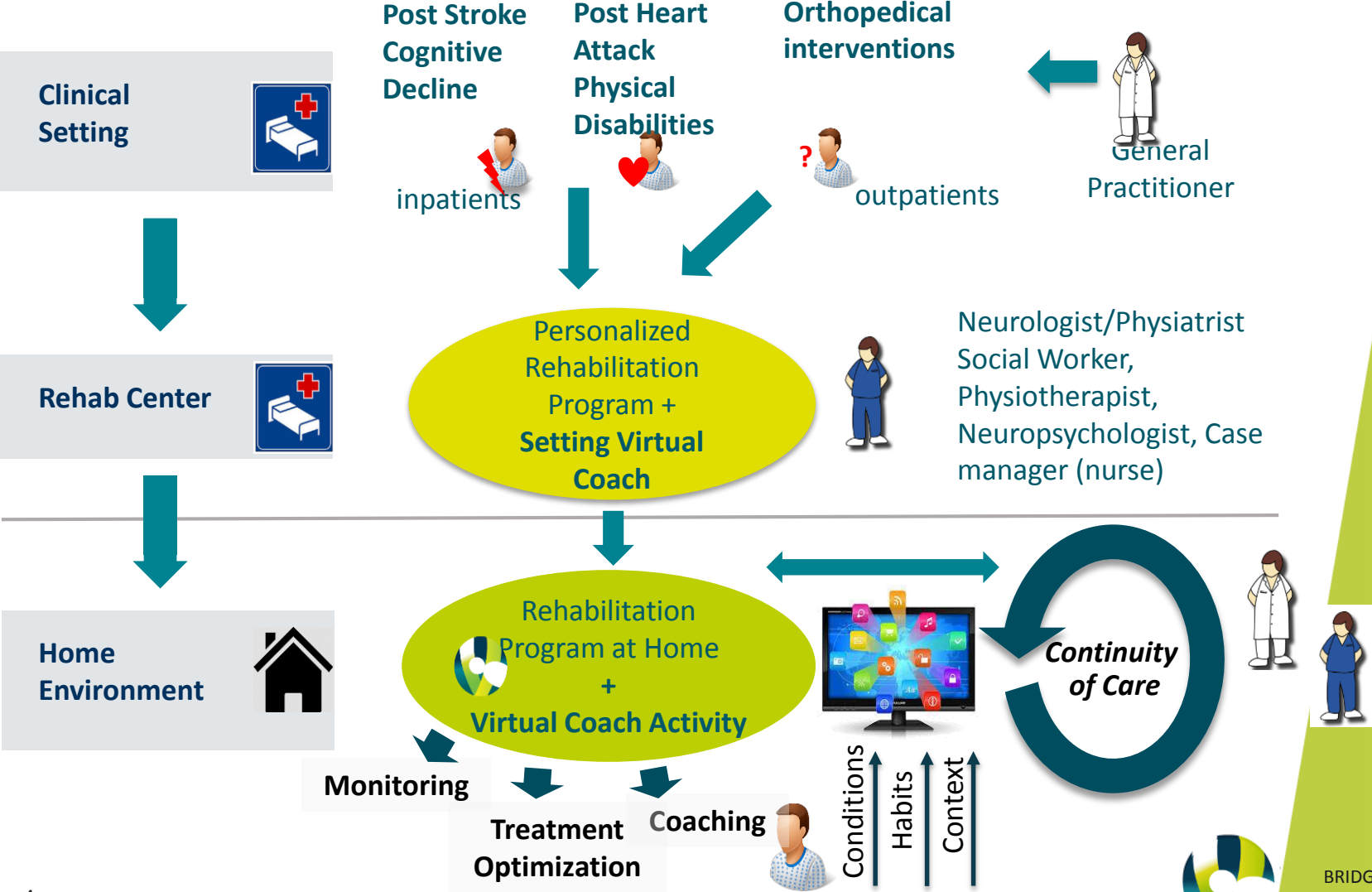
Progression in Parkinson's disease



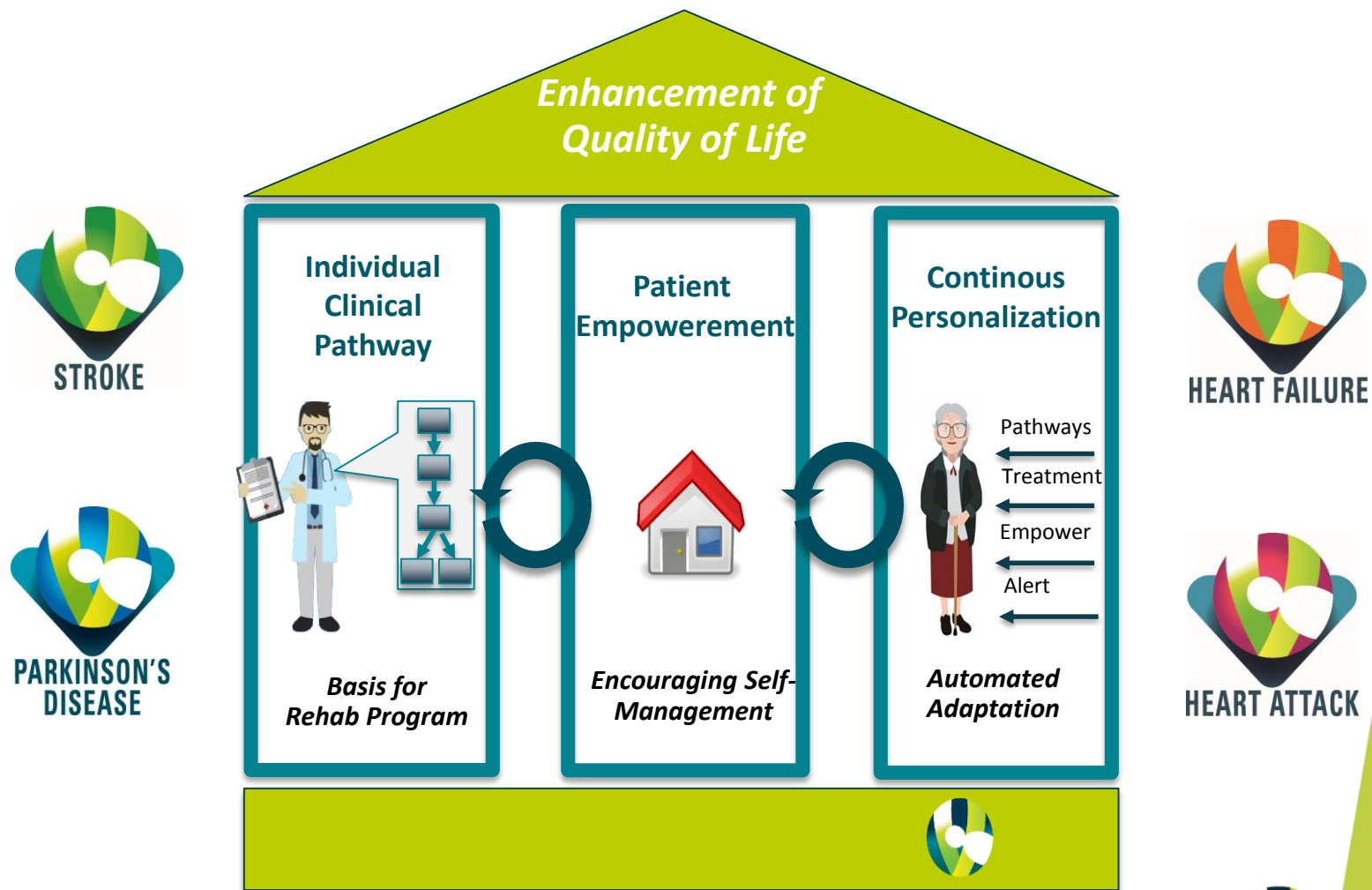
Modified from *Nocera and Hackney M E 2015*



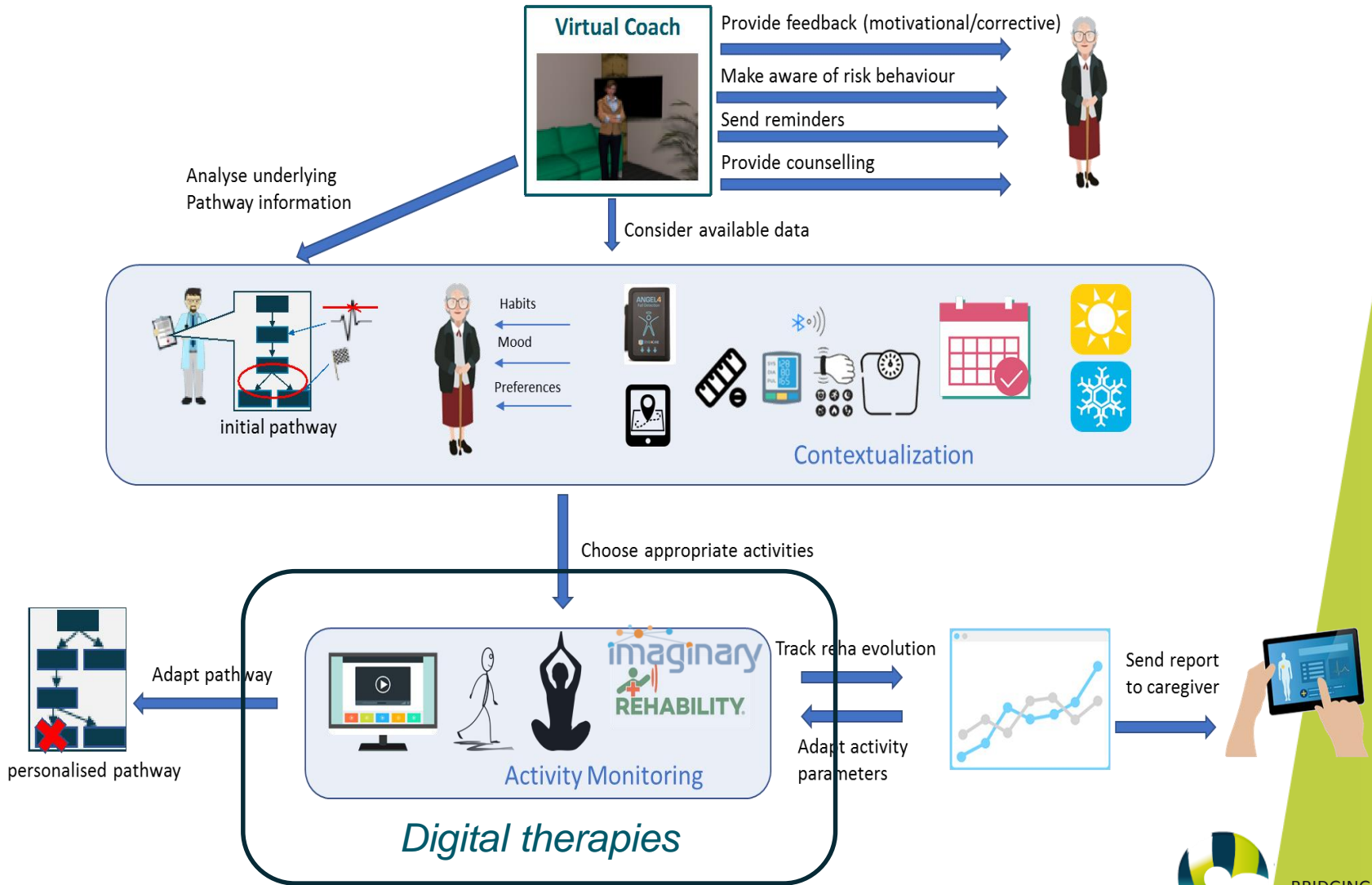
DESIDERED SITUATION IN REHABILITATION



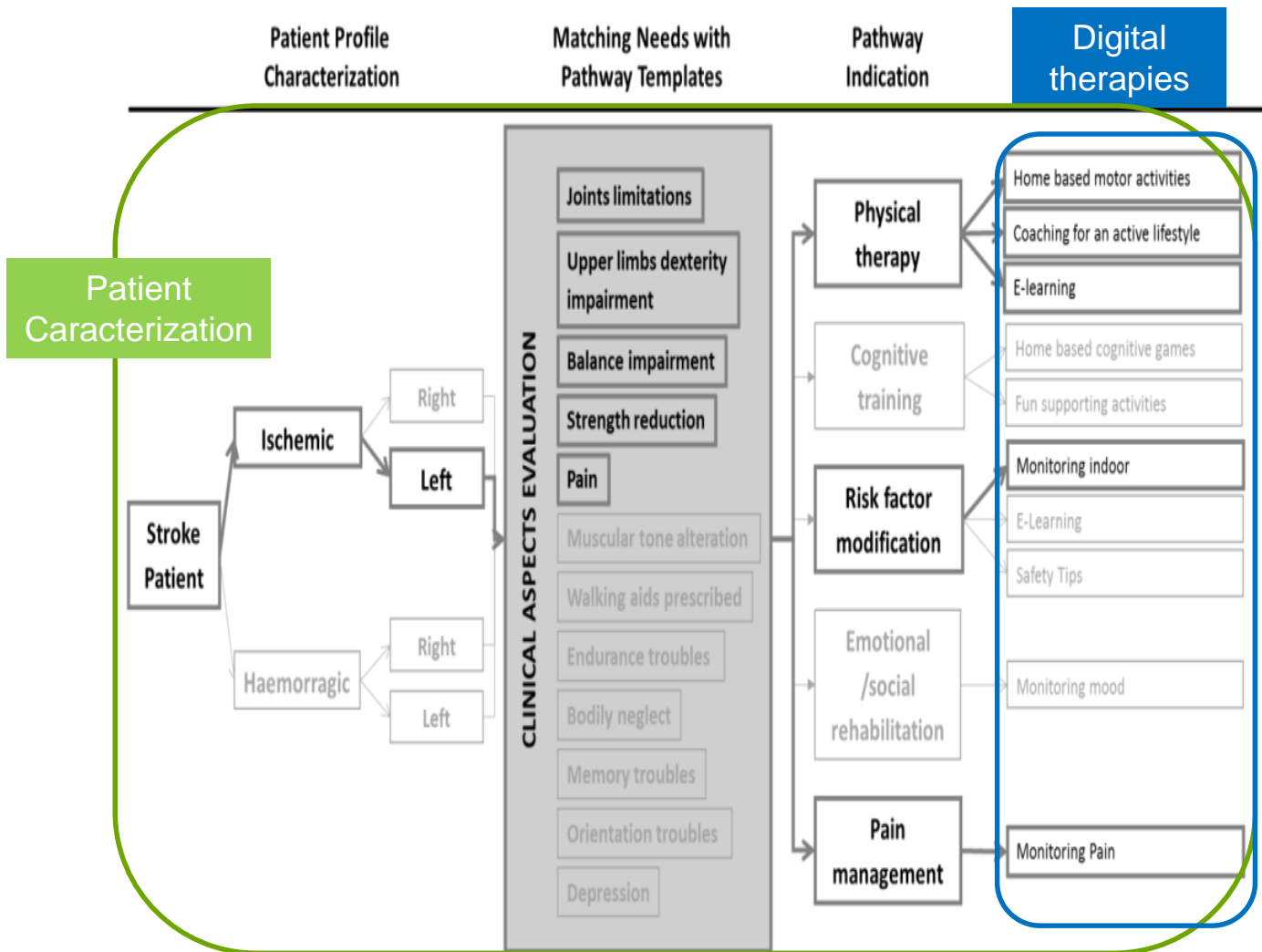
KEY ASPECTS OF VCARE



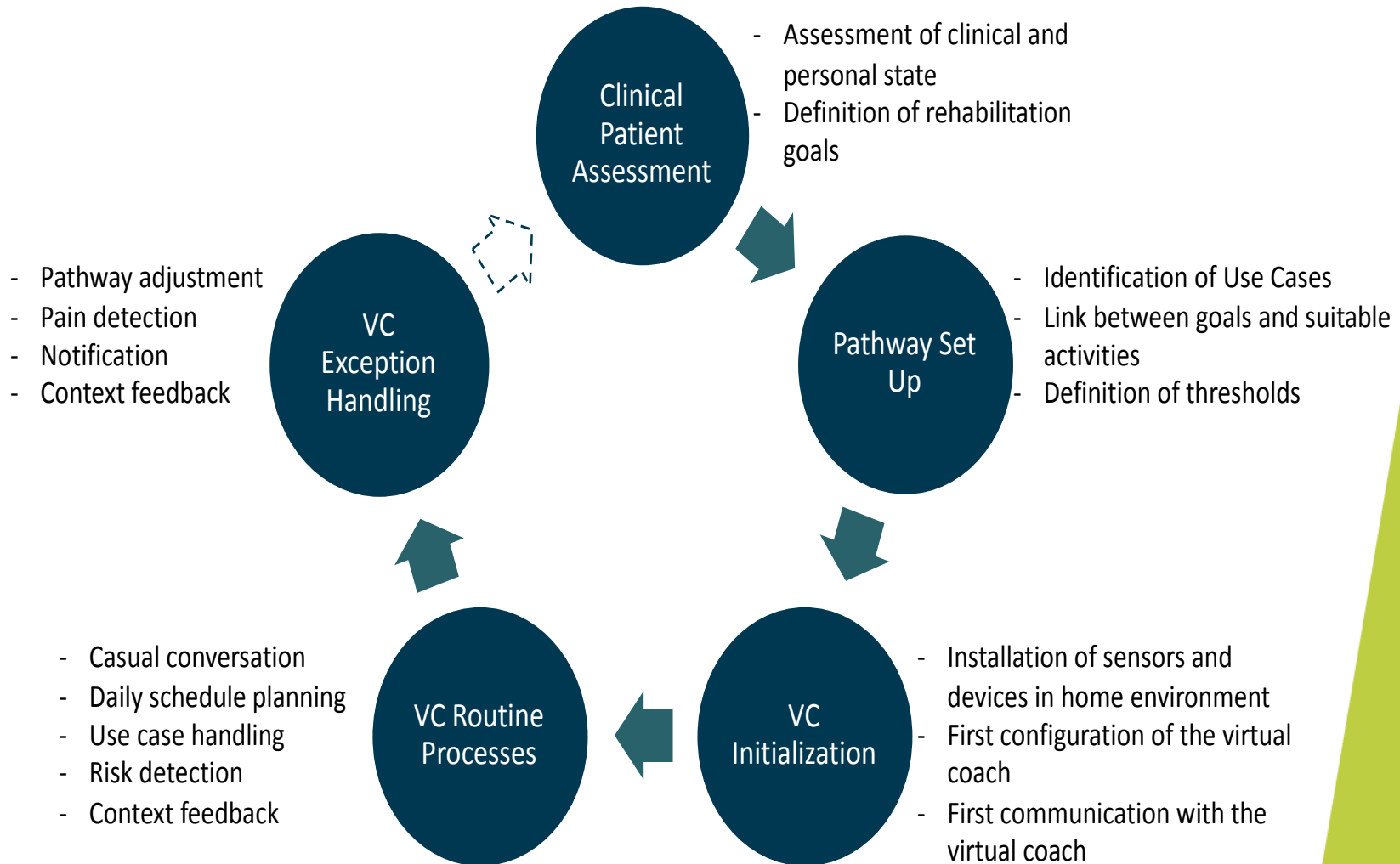
VCARE LAYERS



CLINICAL PATHWAYS: THE STROKE CASE

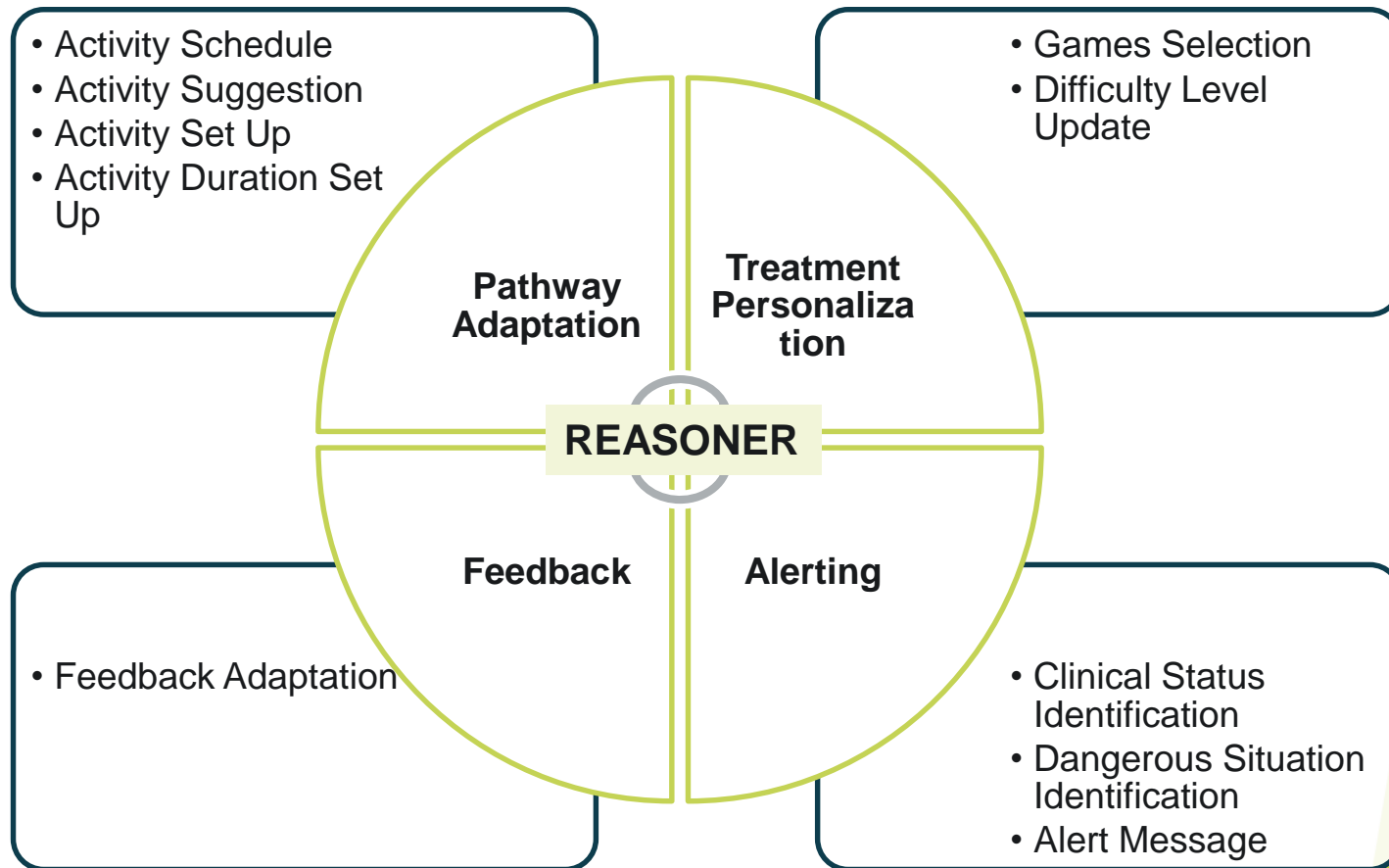


DIGITAL THERAPIES & ML LOOP

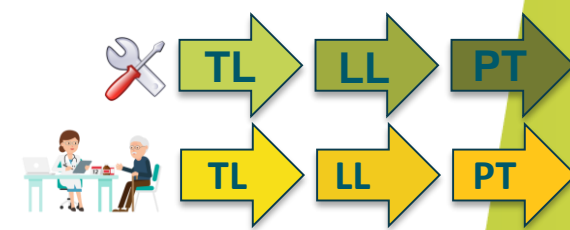


THE ROUTINE PROCESS AS A BASIS FOR ML

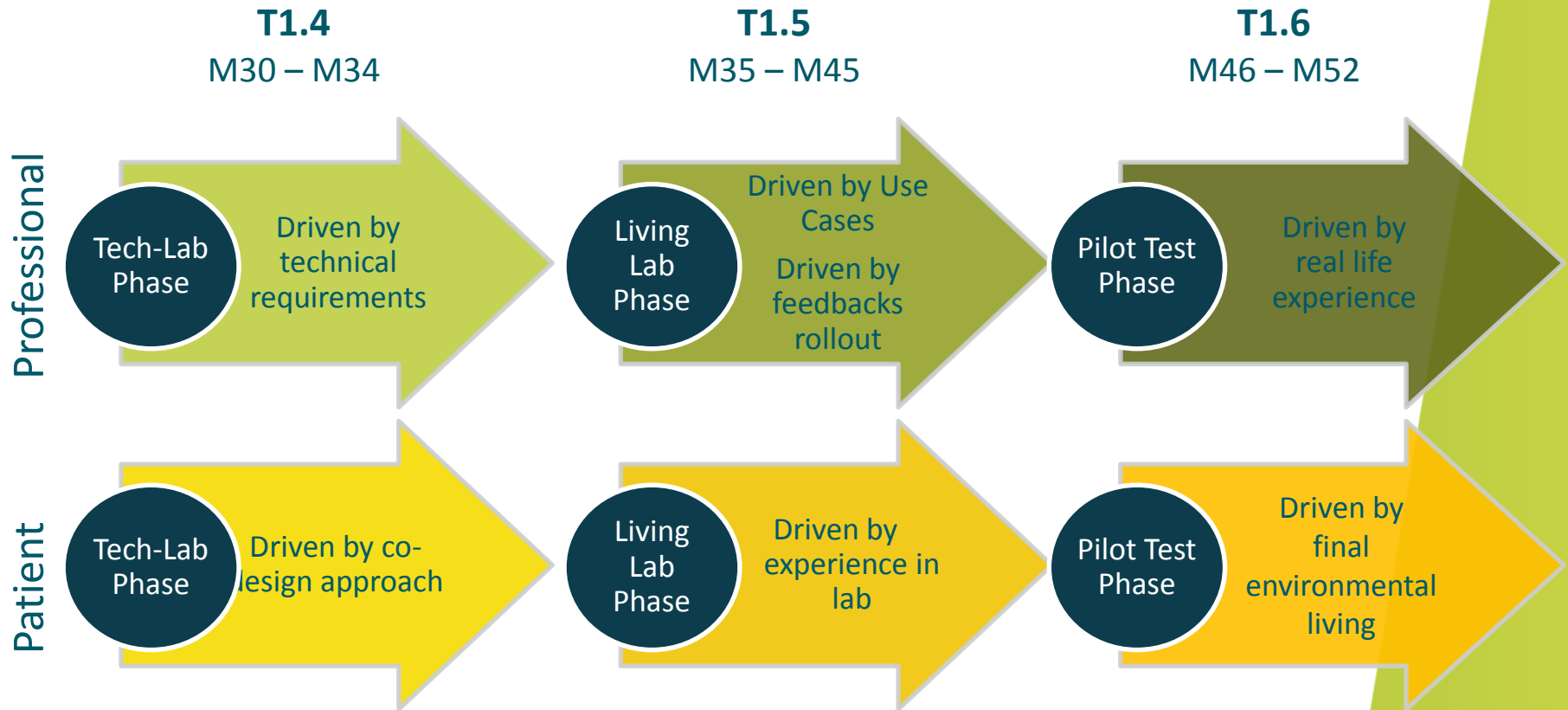
The focus is on the overall **Clinical Pathway adaptation** to the patient



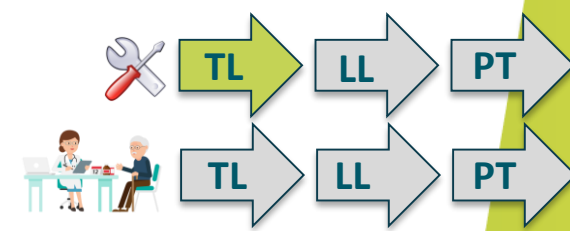
THE APPROACH TO VALIDATION



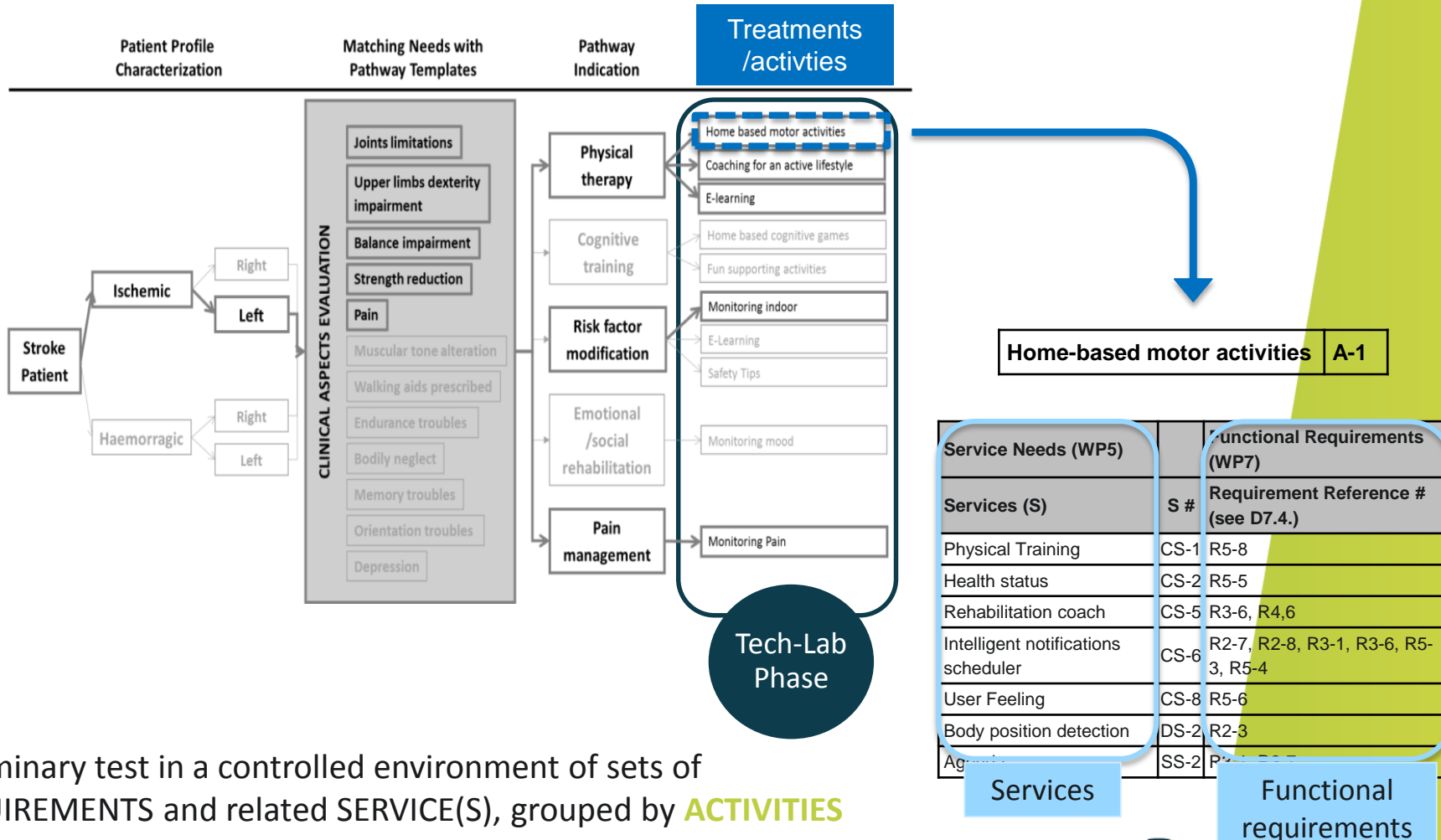
Sequence of **tasks** in which to “involve users as main drivers for the innovation at all stages of the project”



TECH LAB PHASE



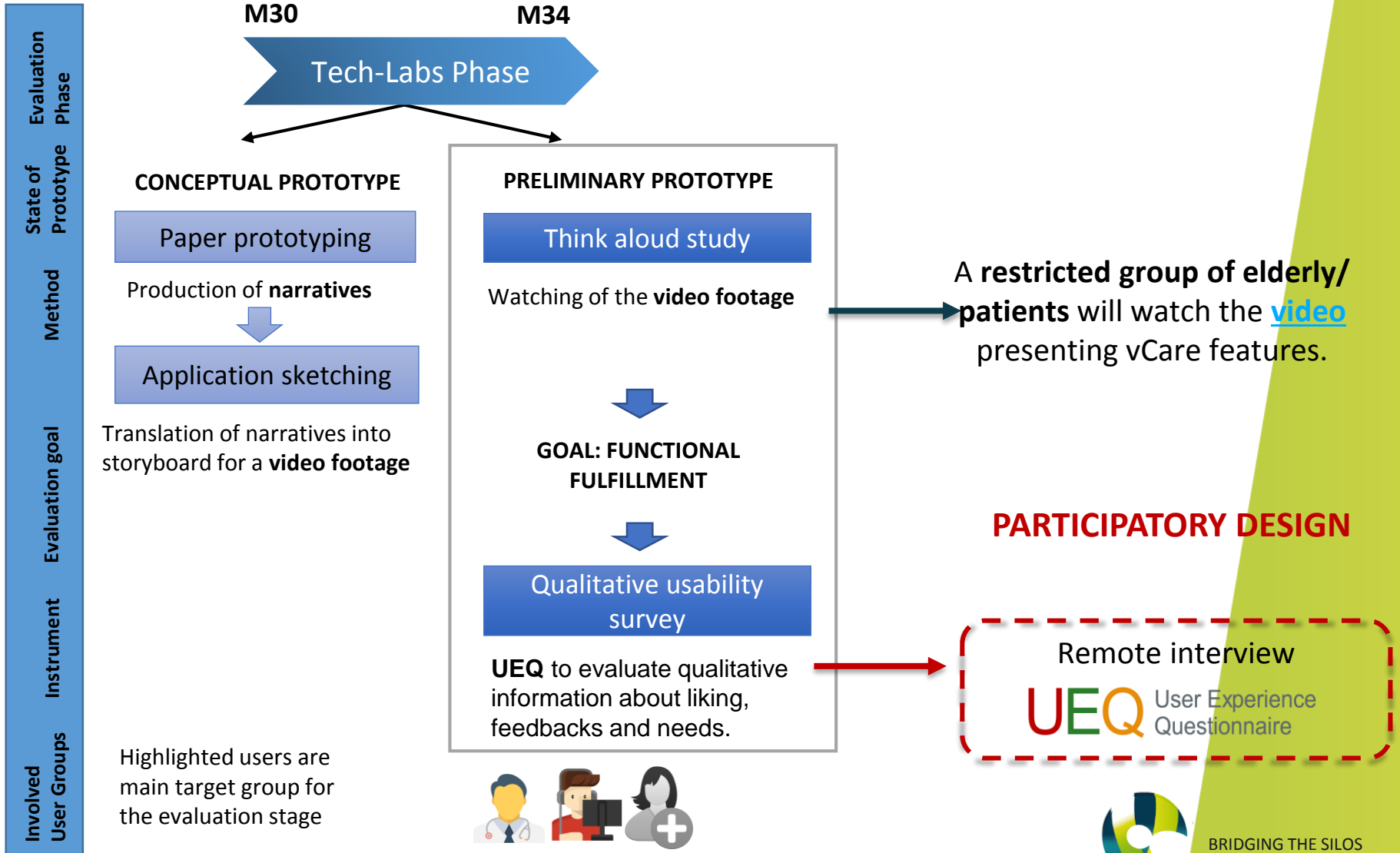
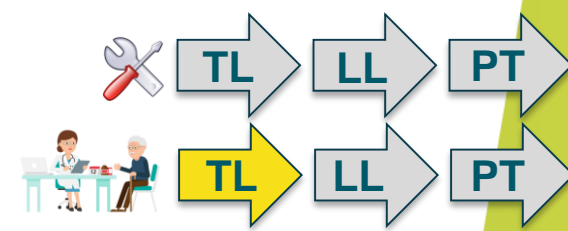
CLINICAL PATHWAY from D1.4



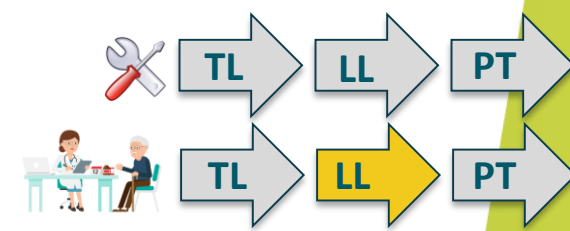
Preliminary test in a controlled environment of sets of REQUIREMENTS and related SERVICE(S), grouped by **ACTIVITIES**



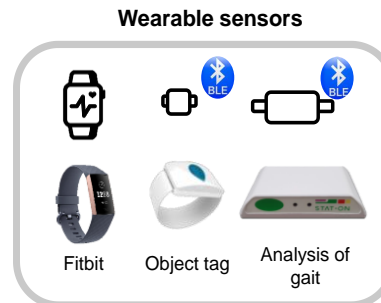
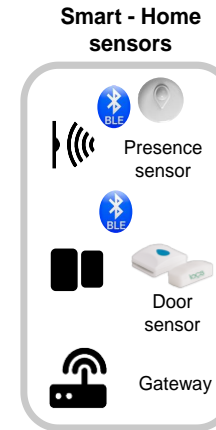
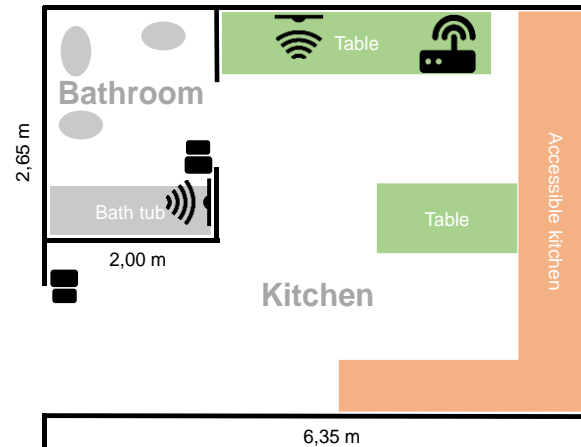
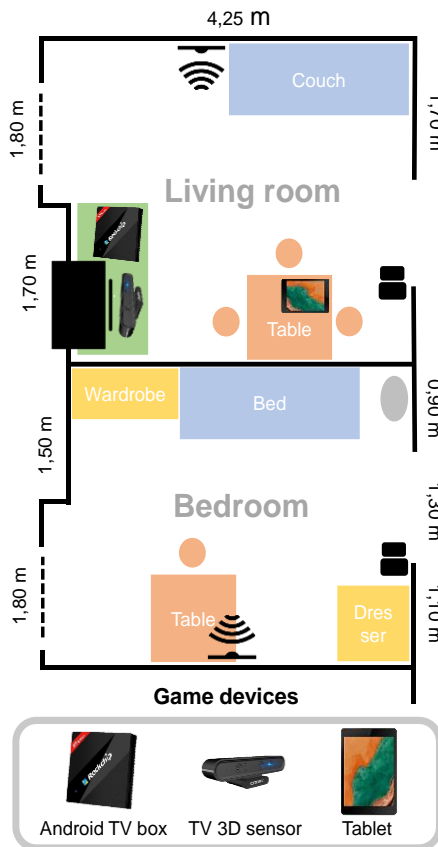
TECH LAB PHASE



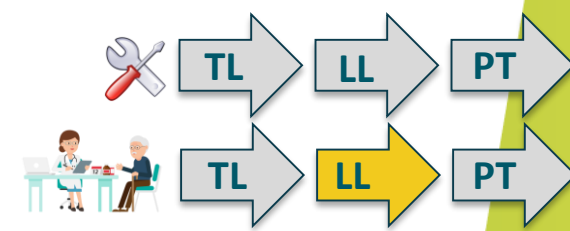
LIVING LAB PHASE



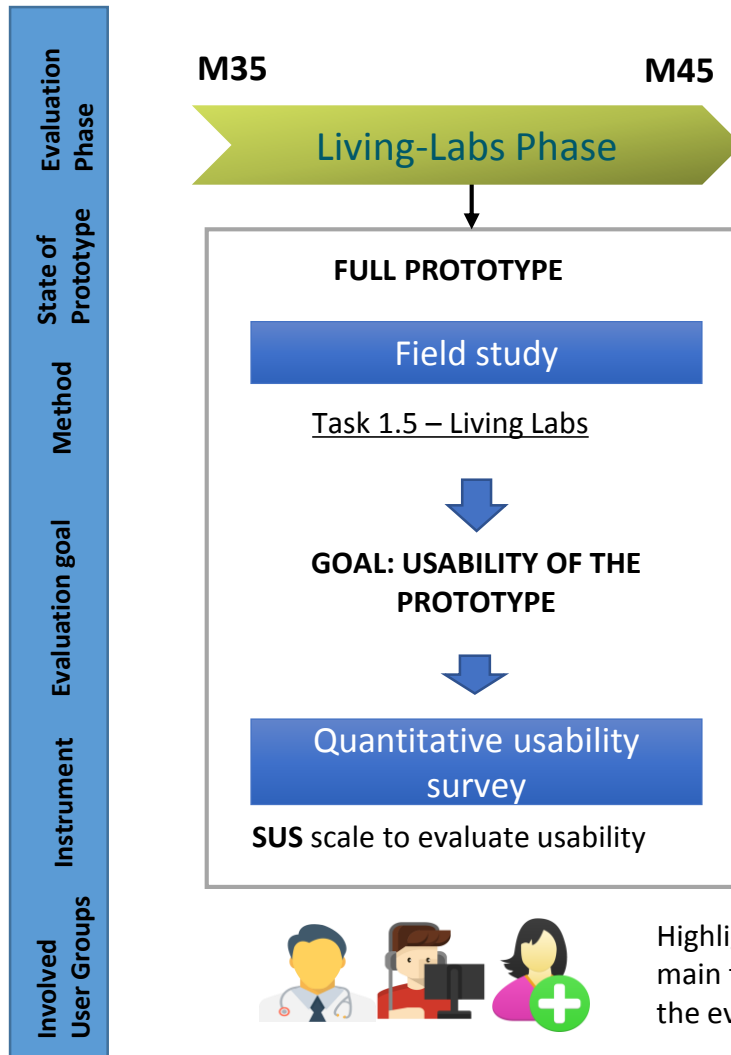
Living Labs can be defined as **Ecological Systems** in which users evaluate new ICT-solutions experimenting and testing them in a familiar usage framework and within a real-world context².



LIVING LAB PHASE



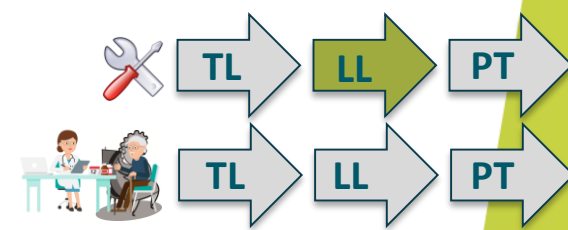
Testing of the system by the vCare **final users** in a *“controlled environment”*



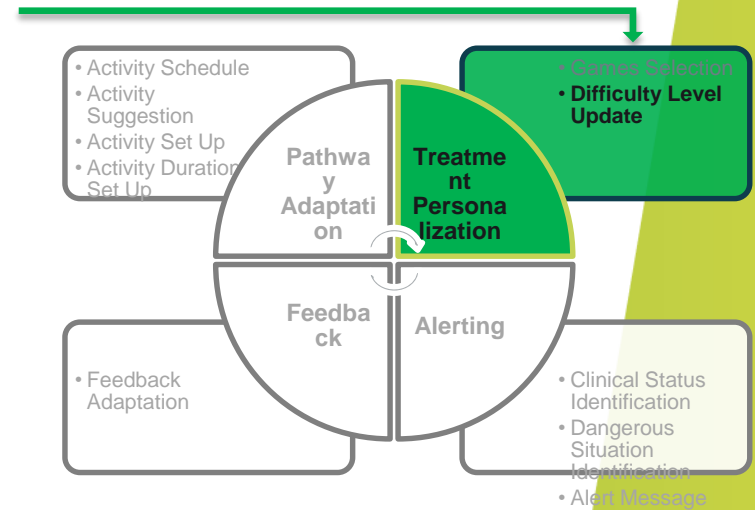
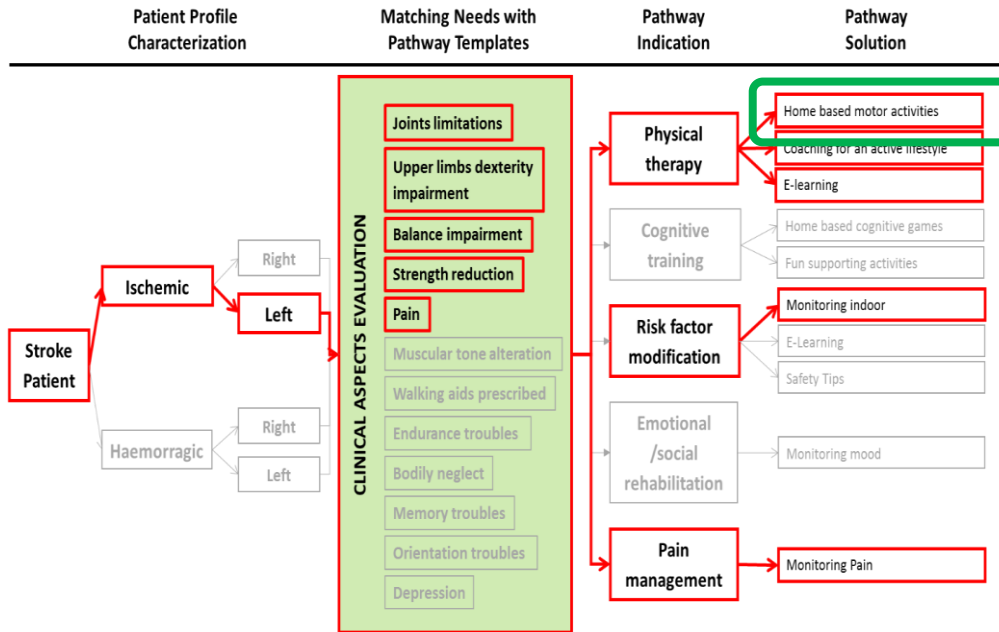
Highlighted users are main target group for the evaluation stage



LIVING LAB PHASE - EXAMPLE



Stroke - First Narrative: Mrs. Maria – Use cases #1

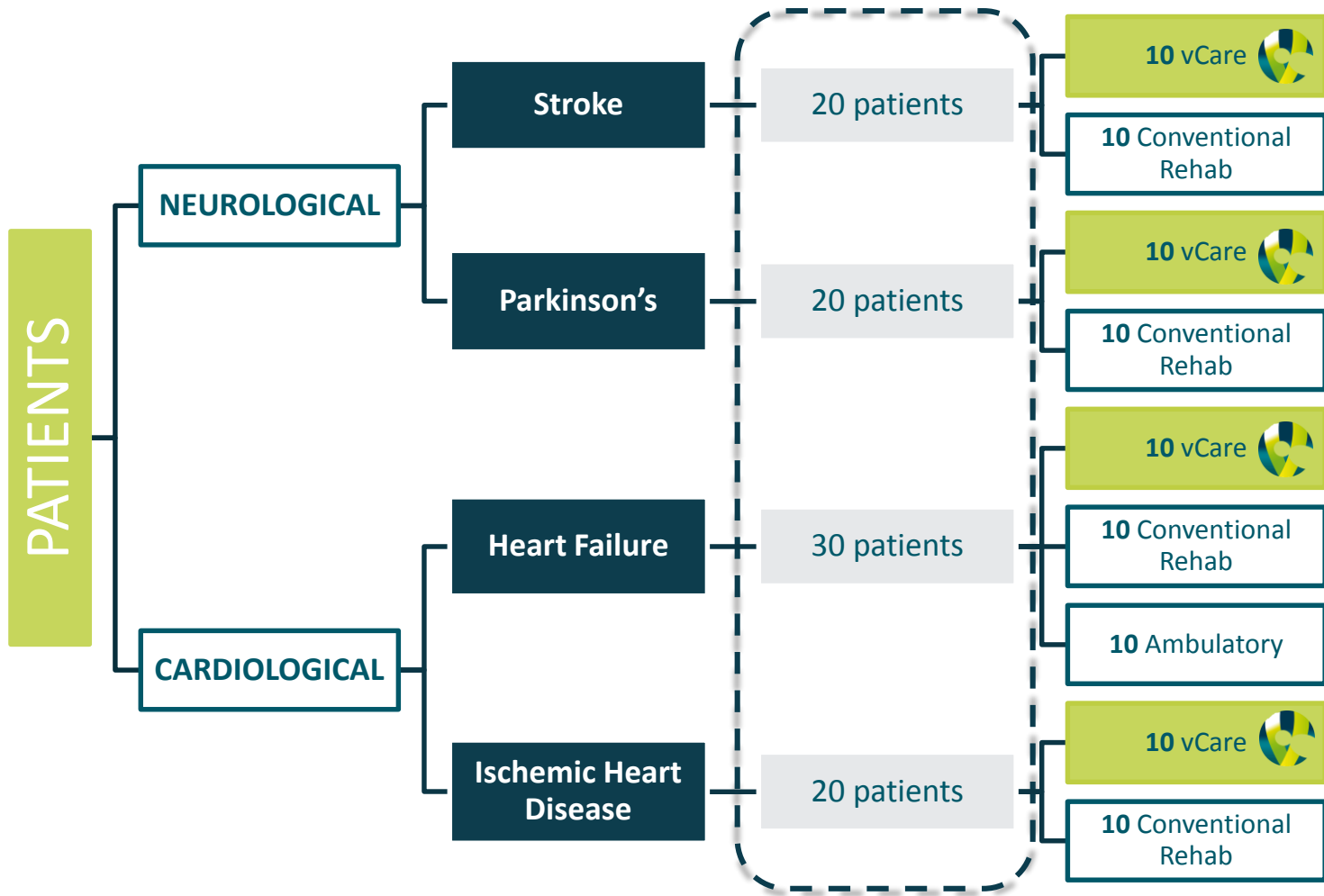
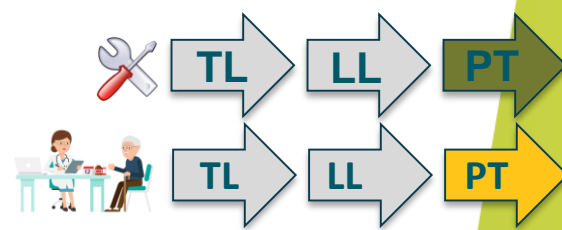


DIFFICULTY LEVEL UPDATE

Rules (D1.3)	Test (D1.5)	KPI (D1.7)
<p>if (Game #N Score) Week > tGNS+5% tGNS → tGNS = tGNS +(5% tGNS)</p> <p>if (Game #N Score) Week < tGNS-5% tGNS → tGNS = tGNS -(5% tGNS)</p> <p>If tGNS automatically updated for 3 consecutive times → the game level improves</p>	<p>Check on the update of the difficulty level of the task by the vCare system based on the patient's performance computed data.</p>	<p>Agreement/disagreement between “VC difficulty level automatically adjusted” and “Therapist difficulty level change”. They must correspond at least in 75% of cases.</p> <p style="text-align: right;">BRIDGING THE SILOS 17/12/2020</p>

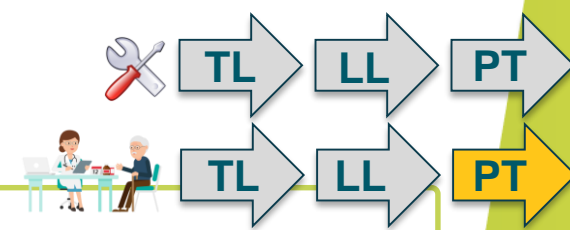
PILOT TEST PHASE (T1.6)

Clinical protocol for the final validation of the system



PILOT TEST PHASE

STROKE



Eligibility criteria

•Inclusion criteria

- Patients who suffered a recent (less than one month) stroke (either ischemic or haemorrhagic) confirmed by CT and/or MRI scan, with a NIH Stroke Scale/Score (NIHSS) score of ≤ 14 , corresponding to a mild-moderate neurological impairment.
- age ≥ 65 years

•Exclusion criteria

- Global aphasia
- Presence of cognitive impairment (i.e. MMSE ≤ 22)
- Any evidence of a serious condition that may affect participation in the study (e.g. traumatic brain injury, oncological, hepatic/renal, immune-based, metabolic/endocrine, psychiatric, respiratory, or infective disorders)
- Unable to understand and comply with the protocol or to give informed consent.

Expected outcomes

Enhancement of QoL

- (1) 10% increase of the QoL score (**SF-12**)
- (2) 15% increase of the **SF-12 mental sub-score** (Mental Component Summary)
- (3) 10% increase of the QoL score on the **Stroke Self-efficacy Questionnaire**, at the end of in-house Pilot Study period (6 months)

1)Risk factor reduction

- 2)(1) daily number of steps improvement of at least by 10% in six months;
- 3)(2) time spent exercising improvement of at least by 10% in six months.

Better adherence to care plan at home

- (1) Total n° of subjects that adhere to the Care Plan with vCare, raised up to 80%.
- (2) N° of rehabilitation treatments, performed autonomously by the patient supported by vCare, raised up to 70%.

Personalization and Health promotion

Refinement rate of rehabilitation therapy (exercises and programs) raised up to the 60% of the cases that require a change of treatment.



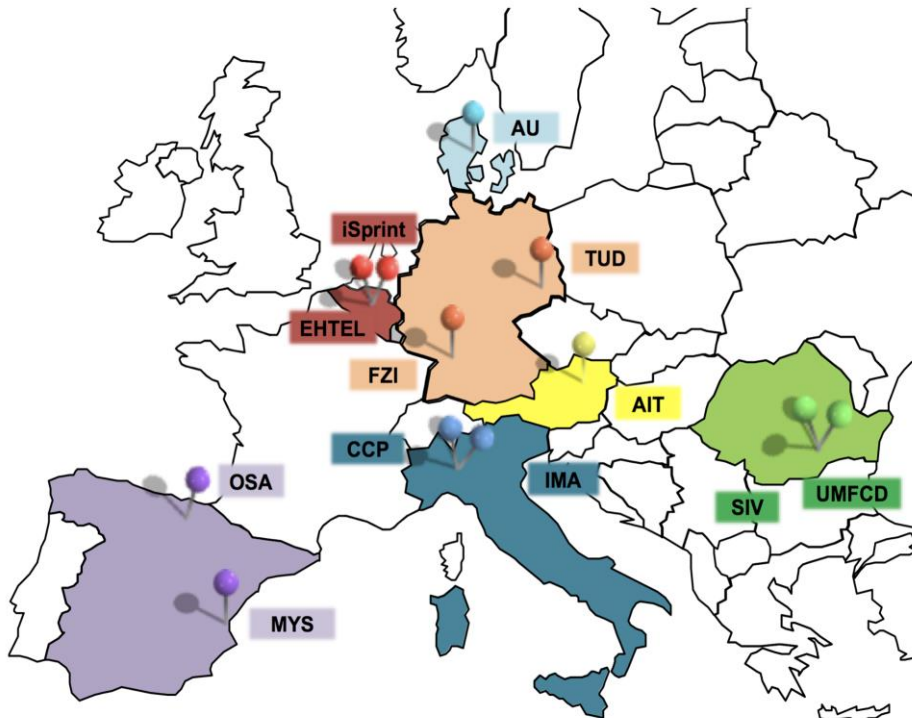
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THANK YOU

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