The FrailSafe project

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Healthy Ageing

"The process of maintaining Functional Ability that enables wellbeing"

WHO, World Report on Ageing and Health, 2015

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Healthy Ageing

"**The process of maintaining Functional Ability that enables wellbeing**"

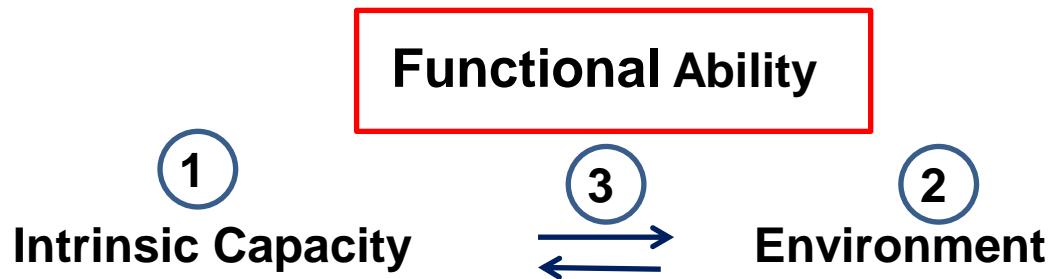**Functional Ability**

1 **Intrinsic Capacity**   **3**   **2** **Environment**

WHO, World Report on Ageing and Health, 2015

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Healthy Ageing

"The process of maintaining Functional Ability that enables wellbeing"

Functional Ability

1 **Intrinsic Capacity** → **3** → **2** **Environment**

Physical and Mental Capacities of the individual

WHO, World Report on Ageing and Health, 2015

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Domains of Intrinsic Capacity

Cesari, J. of Gerontology 2018

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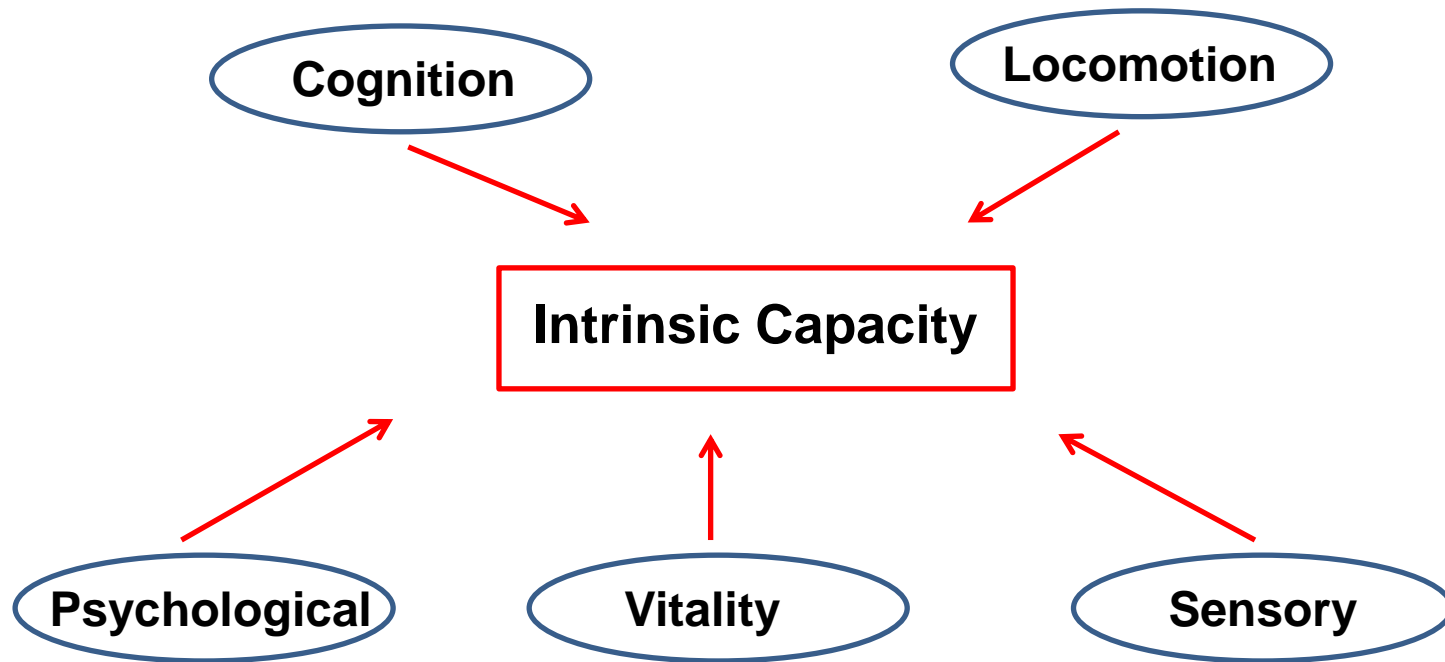
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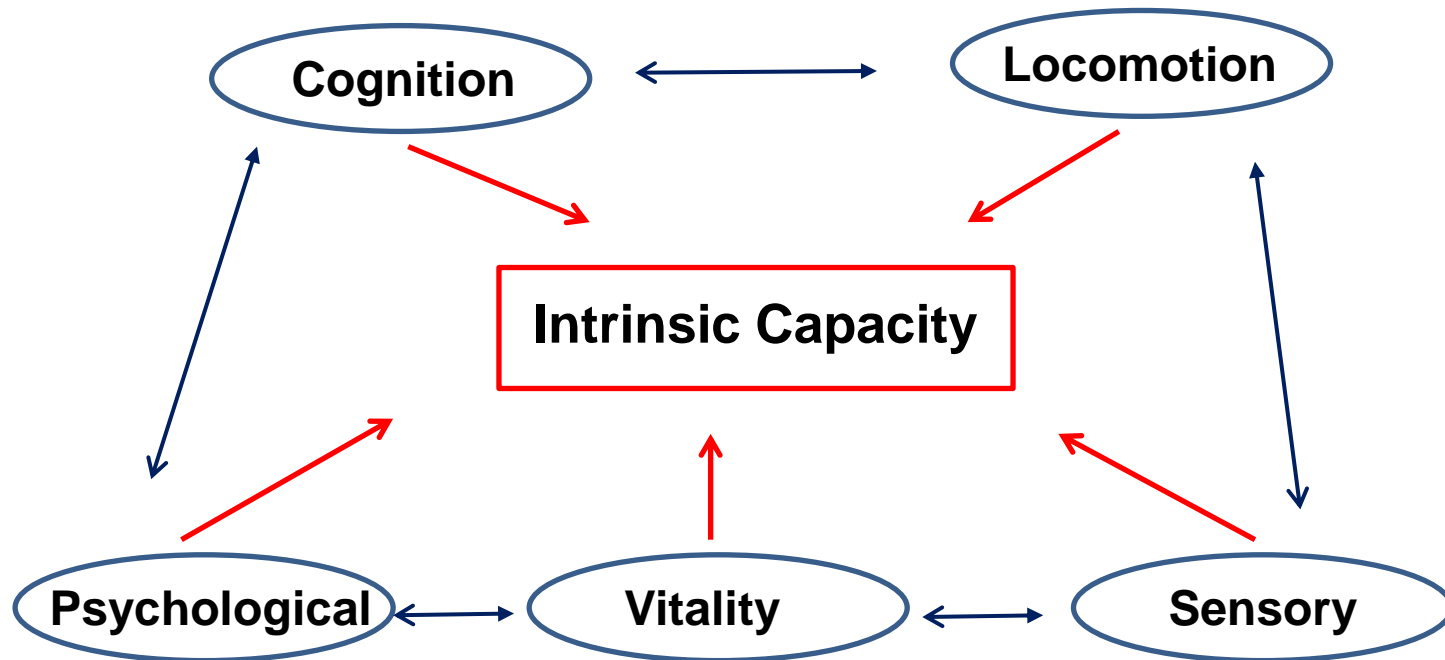
Cesari, J. of Gerontology 2018

Frailty

"Decreased reserves of Intrinsic Capacity that leads the individual to vulnerability to stressors"

Frailty Understanding

Frailty preventing strategies

Conventional Geriatric Assessment

frail safe System

System Improvement

frailSafe System		Conventional Geriatric Assessment
Patient in their natural environment	Ecological aspect	Usual clinical settings
Multiple signals in real time conditions	Time Framework	"Single shot" evaluation
Big data analysis Objectivity in the extrapolation	Data analysis capacity	Limited data Subjective interpretation

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Measurable parameters and units of measurement

Sensorized vest/straps with 9 DoF IMUs (Smartex) → Heart rate, respiration rate, (simpato-vagal index), posture and/or activity, steps/minute, falls, instability

Blood pressure monitor → Blood pressure

Mobil-o-graph → Arterial stiffness

Dynamometer → Grip strength

Impedance scale → Body Weight / Body Mass Index

Questionnaires → Nutrition, Social Interaction, Cognitive state

Medical record → Co-morbidities

AR Serious Game → Cognitive state and Behaviour, Physiological state, Motor state

Smartphone/Tablet → Indoor/Outdoor activities, Physiological state, Motor state, Social Interaction

FrailSafe Conceptual Philosophy

Older Person

Guidelines

Virtual Patient Model

Monitors
Designs Interventions
(adjustment of drugs/drug dosage, lifestyle recommendations)

Clinician

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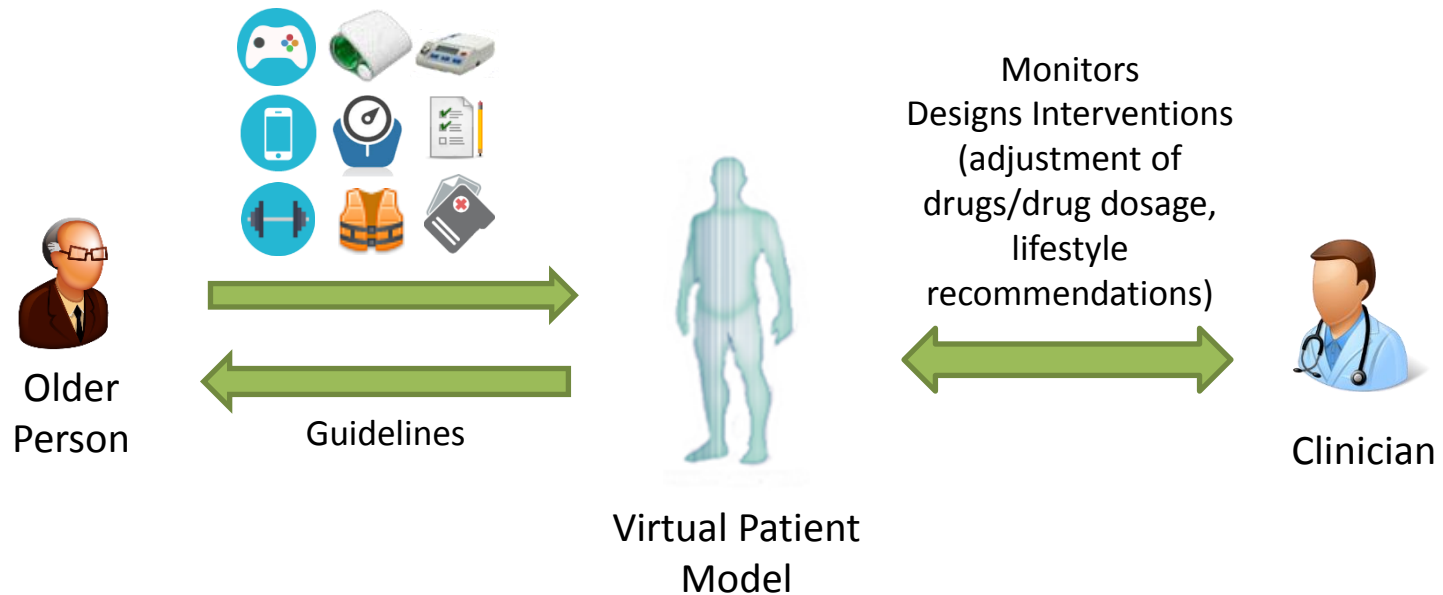
Frailty and event management system

Frailty management

Current status
1. Risk assessment
2. Co-morbidities
3. Frailty diagnosis

Health statistics & trends
1. Lifestyle factors
2. Environmental factors

Management
1. Evaluate lifestyle/environment
2. Enhance motivation
3. Health suggestions
4. Frailty metric update
5. Frailty level analysis
6. VPM adjustment

Event Management Results

Event management

Short-term event recognition

Current status
1. Physiological sensor data
2. Language analysis data

Management
1. Short term adjustment of VPM
2. Alarm for carer, feedback for patient suggesting immediate actions

Risk assessment tool
- Recognition of falls, loss of orientation and other risk events

Objectives

- To better understand frailty and its relation to co-morbidities

- To identify **quantitative and qualitative measures of frailty** (through advanced data mining approaches on multiparametric data) and use them to predict short and long-term outcome and risk of frailty

- To develop a **real life sensing** (physical, cognitive, psychological, social) and **intervention** (guidelines, real-time feedback, AR serious games) **platform** offering physiological reserve and external challenges

- **Definition of a quantifiable frailty metric** and its link to measurable parameters

- Enable **risk estimation** through the FrailSafe and **optimal planning** of the intervention strategies in an automated or self-management manner

Impact

Older people: self-management tools, personalized health support, improved quality of life, increased independence, active participation in care process, decreased risk of adverse outcome, less hospitalization, reduced social exclusion

Family/caregivers: reduced workload, improved management of treatment in cooperation with the doctor

Clinicians/Healthcare personnel: new tools and monitoring methodologies, increased understanding of frailty (including behavioral and psychological interdependencies), improved estimate of frailty stage

Scientific community: ground breaking methodology for management of frailty, availability of approach as open source

Healthcare system: better quality of service, reduction in hospitalization costs

SMEs, Pharma industries: a system for developing and testing treatments, new market opportunities and business concepts for tools/services offered (e.g. self-management system, clinical prediction engine, intervention services, etc)

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Project partners

frail safe

University of Patras
GREECE

Smartex, S.R.L.
ITALY

AgeCare Ltd
CYPRUS

MATERIA GROUP
CARE · NURSING · REHABILITATION

BrainStorm Multimedia
SPAIN

BRAINSTORM

Gruppo SIGLA S.R.L.
ITALY

Gruppo SIGLA
esperienza ed innovazione

AGE Platform Europe
BELGIUM

AGE
Platform Europe

HYPERTECH S.A.
GREECE

HYPERTECH
INFORMATION TECHNOLOGY

CERTH/ITI
GREECE

Inserm
University Hospital (CHU) of Nancy and INSERM
FRANCE

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More information

- **Website**: www.frailsafe-project.eu

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