



**EIP ON AHA**

La valutazione neuropsicologica nell'ageing

**Pr. Martina Amanzio**  
**Dipartimento di Psicologia,**  
**UNITO**

**6° Convegno su: COGNITIVITÀ E MALATTIE NEUROLOGICHE**  
**Torino, 10 novembre 2017**  
**SALA CONGRESSI INTESA SANPAOLO**  
**Via Santa Teresa, 1/G 10121 Torino**

## Gruppo di Ricerca

*Neuropsicologia del deterioramento cognitivo e delle patologie degenerative del Sistema Nervoso Centrale*

### Componenti

Coordinatore

Amanzio Martina

Membro  
Membro  
Membro

Geminiani Giuliano  
Rosato Rosalba  
Palermo Sara

Dottorando  
Dottorando

Barbiani Diletta  
Bartoli Massimo

### Tematiche di Ricerca

- Fragilità dell'anziano
- Disfunzioni esecutive e funzionali nelle patologie neurodegenerative
- Effetto Placebo e Nocebo

### Settore ERC

- SH4\_3 Neuropsychology and clinical psychology
- SH4\_4 Cognitive and experimental psychology: perception, action, and higher cognitive processes



## **Commitment**

Screening and early diagnosis of MCI and Cognitive Frailty

### **A3 Group**

Functional decline and Frailty

### **A1 Group**

Synergy on ICT and adherence in ageing population with chronic diseases and polypharmacy





**A1**  
Adherence to prescription



**A2**  
Falls prevention



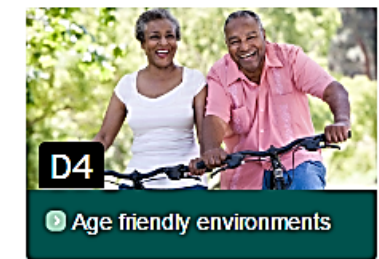
**A3**  
Functional decline and frailty



**B3**  
Integrated care



**C2**  
Independent living solutions



**D4**  
Age friendly environments



**ACTIVITY DETAILS**

We are interested in determining the principal frailty characteristics of normal elderly people and patients with neurological diseases in order to study conversion rates and outcomes of neurodegenerative diseases. This theme will be based on the construction of new frailty indexes associated to biomarkers, cognitive and behavioural impairment in MCI and neurodegenerative diseases with no cognitive impairment. Indeed, frail subjects with neurodegenerative diseases have a higher risk of negative outcomes. Through this theme we will demonstrate how important assessment frailty is in early diagnosis, cognitive impairment and the loss of autonomy in daily life and prognosis. The research group is made up of researchers, experts in assessing neuropsychology of elderly people.

Action Group: A3 Functional decline and frailty

Other organisations participating in the commitment: Department of Neuroscience, University of Turin (PhD Sara Palermo), Martini Hospital, Turin (MD Daniela Leotta), VG59 srl, moltosenso srl

Objective:  
A3 - 3. Scaling up of good practices focusing on the exploitation of ICT tools

Lead organisation name:  
Department of Psychology, University of Turin

Organisation country: Italy

Contact person: Prof. MARTINA AMANZIO

Contact person email: [martina.amanzio@unito.it](mailto:martina.amanzio@unito.it)

Activity type: Commitment

Synergy led by: A1 Adherence to prescription

Start date: 29/03/2016

End date: 29/03/2020

Geographic coverage: Piemonte

Last update: 04/09/2017

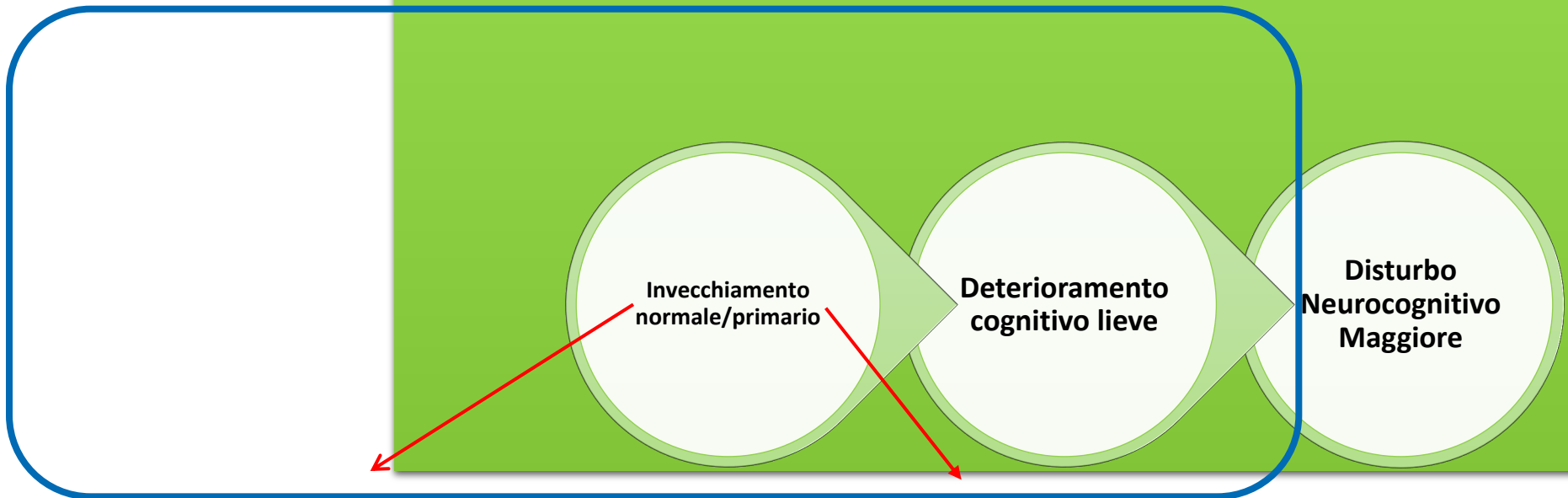
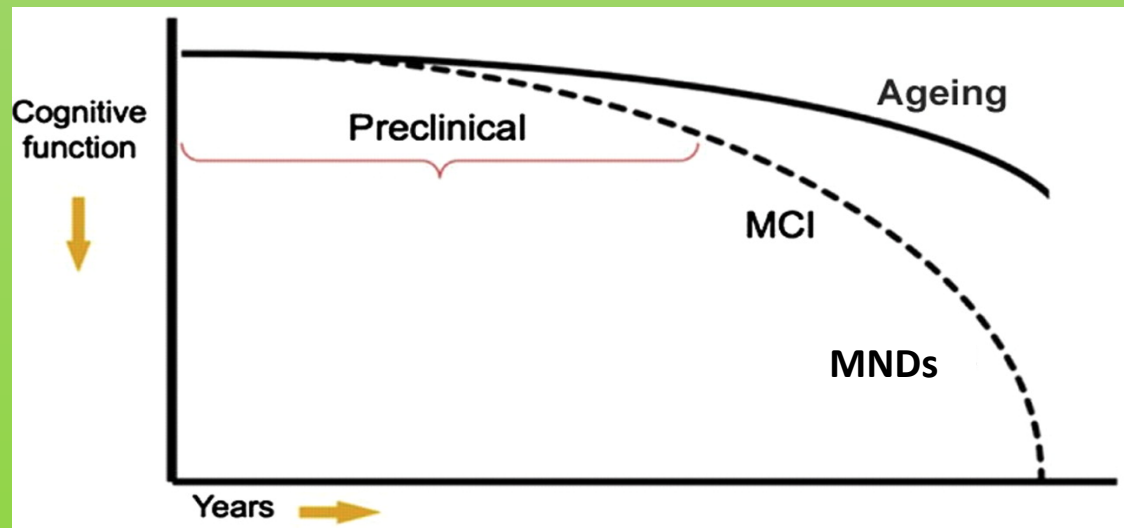
**CURRENT STATUS**

▶ Ongoing

The frailty syndrome has focused principally on the physical domain. Recent studies, however, suggested that cognitive function have a significant role in the pathogenetic mechanisms of physical frailty. The purpose of our study is to analyze the existence of a relationship between a multidimensional assessment of frailty and different neuropsychological variables that may represent a novel explanation of the phenomenon. Our data, not yet being published, support the novel notion that frailty is related with metacognitive executive dysfunction. We have hypothesized that frailty may arise as a result of a disruption of the comparator mechanisms responsible for monitoring cognitive disturbances and behavioural mood changes.

# Obiettivi di un lavoro congiunto EIP on AHA sulla popolazione anziana

- Studiare le caratteristiche dell'invecchiamento sano ed attivo
- Identificare le prime difficoltà nell'ambito ecologico nel 'typical cognitive ageing'
- Effettuare uno screening precoce in ambito preclinico
- Diagnosi precoce del "Mild Cognitive Impairment (MCI)"



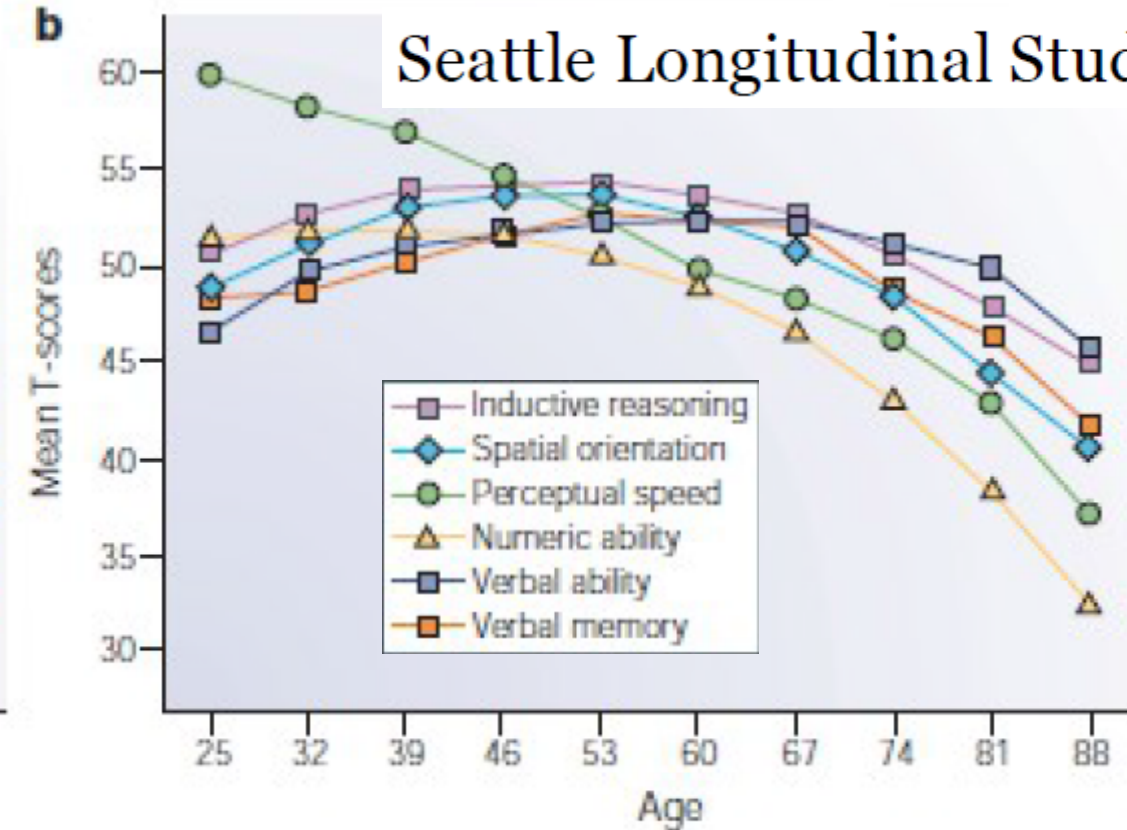
Optimal aging / Successful aging

Typical cognitive aging

# Modificazioni Cognitive

Longitudinale

Seattle Longitudinal Study: Effetti dell'età su diverse funzioni cognitive.



**Cognitive aging**

**Executive functions**

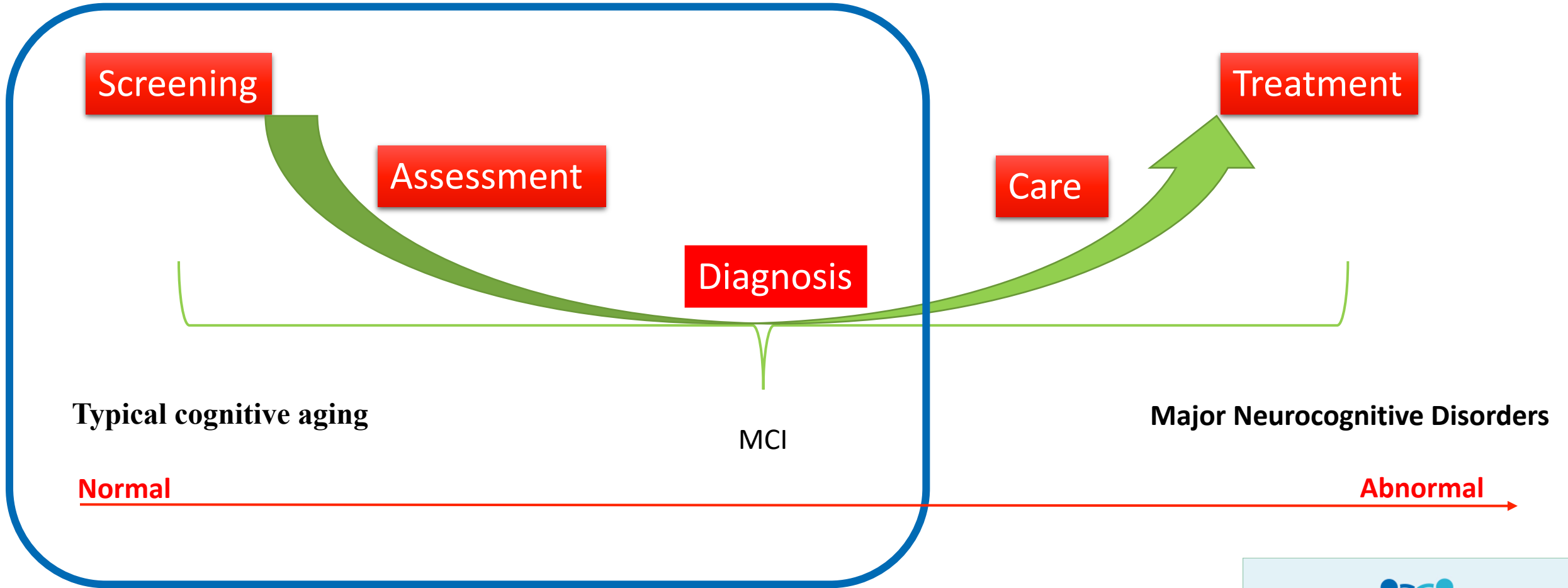
**Attention**

**Memory**

**Language**

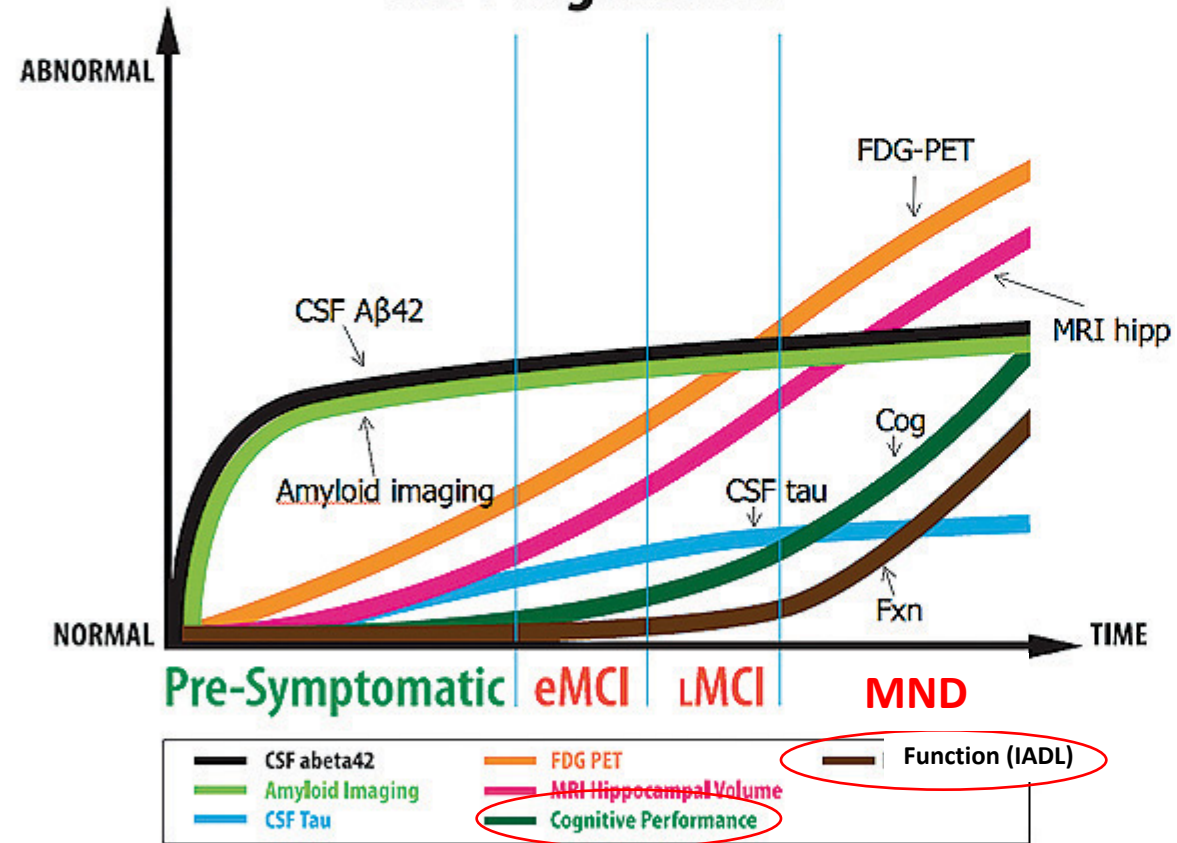
Progressiva riduzione di tutte le  
abilità cognitive

# Ageing population






# AD Progression



# Neuropsychological correlates of pre-frailty in neurocognitive disorders: A possible role for metacognitive dysfunction and mood changes.

 [Martina Amanzio](#)<sup>1</sup>, [Sara Palermo](#)<sup>2\*</sup>, [Milena Zucca](#)<sup>2</sup>, [Rosalba Rosato](#)<sup>1,3</sup>, [Elisa Rubino](#)<sup>2</sup>, [Daniela Leotta](#)<sup>4</sup>, [Massimo Bartoli](#)<sup>1</sup> and [Innocenzo Rainero](#)<sup>2</sup>

<sup>1</sup>Department of Psychology, University of Turin, Italy

<sup>2</sup>Dipartimento di Neuroscienze Rita Levi Montalcini, Università degli Studi di Torino, Italy

<sup>3</sup>Unit of Cancer Epidemiology, Azienda Ospedaliera Citta' Della Salute E Della Scienza Di Torino, Italy

<sup>4</sup>Neurology Division, Ospedale Martini, Italy

**Background:** Recent studies have suggested that cognitive functions in patients with neurocognitive disorders have a significant role in the pathogenic mechanisms of frailty. Although pre-frailty is considered an intermediate, preclinical state, epidemiological research has begun to dislodge cognition and frailty into their specific subcomponents in order to understand the relationship among them. We aim to analyze the possible association between pre-frailty and neuropsychological variables to outline which factors can contribute to minor and major neurocognitive disorders.

**Methods:** 60 subjects complaining of different cognitive deficits underwent a deep-in-wide frailty and neuropsychological assessment. We conducted 3 multiple linear regression analyses adjusted for a combination of demographic measures and involving several neuropsychological-behavioral parameters selected by the literature on physical frailty.

**Results:** We found a significant association between frailty - as measured by the Multidimensional Prognostic Index (MPI) – and action monitoring and monetary gain (cognitive domain), depression and disinhibition (behavioural domain). Moreover, an association between MPI and impaired awareness for instrumental activities disabilities exists.

**Conclusion:** We propose a novel framework for understanding frailty associated with metacognitive-executive dysfunction.

RESEARCH

Open Access

# Mild cognitive impairment and deficits in instrumental activities of daily living: a systematic review

Katrin Jekel<sup>1,2\*</sup>, Marinella Damian<sup>2</sup>, Carina Wattmo<sup>3</sup>, Lucrezia Hausner<sup>2</sup>, Roger Bullock<sup>4</sup>, Peter J Connelly<sup>5</sup>, Bruno Dubois<sup>6</sup>, Maria Eriksdotter<sup>7</sup>, Michael Ewers<sup>8</sup>, Elmar Graessel<sup>9</sup>, Milica G Kramberger<sup>10</sup>, Emma Law<sup>11</sup>, Patrizia Mecocci<sup>12</sup>, José L Molinuevo<sup>13</sup>, Louise Nygård<sup>14</sup>, Marcel GM Olde-Rikkert<sup>15</sup>, Jean-Marc Orgogozo<sup>16</sup>, Florence Pasquier<sup>17</sup>, Karine Peres<sup>18,19</sup>, Eric Salmon<sup>20</sup>, Sietske AM Sikkes<sup>21</sup>, Tomasz Sobow<sup>22</sup>, René Spiegel<sup>23</sup>, Magda Tsolaki<sup>24</sup>, Bengt Winblad<sup>25</sup> and Lutz Frölich<sup>2</sup>

## Results:

In 35 studies, IADL deficits (such as problems with medication intake, telephone use, keeping appointments, finding things at home and using everyday technology) were documented in patients with MCI.

Financial capacity in patients with MCI was affected in the majority of studies.

Effect sizes for group differences between patients with MCI and healthy controls were predominantly moderate to large.

RESEARCH

Open Access

Global instrumental activities of daily living and mild  
cognitive impairment subtypes

Looking at effect sizes, the IADL deficits tended to  
be more pronounced **in multiple-domains MCI than in  
single-domain MCI and also in amnestic MCI than in  
nonamnestic MCI.**



## Neural correlates of reduced awareness in instrumental activities of daily living in frontotemporal dementia

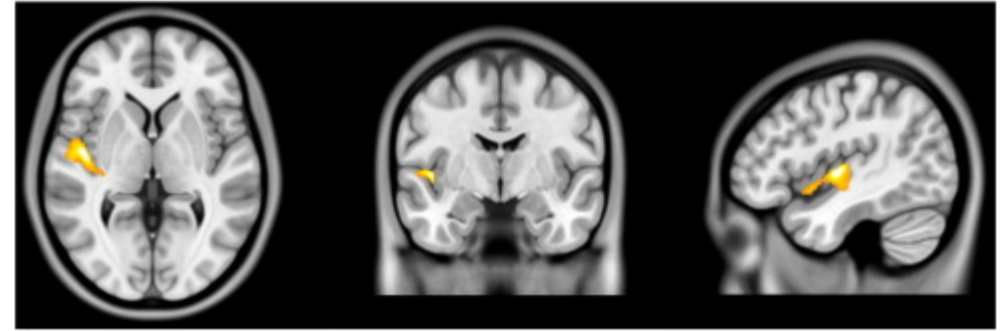
Martina Amanzio <sup>a, b</sup>  , Federico D'Agata <sup>c</sup>, Sara Palermo <sup>d</sup>, Elisa Rubino <sup>e</sup>, Milena Zucca <sup>e</sup>, Antonello Galati <sup>f</sup>,  
Lorenzo Pinessi <sup>e</sup>, Giancarlo Castellano <sup>f</sup>, Innocenzo Rainero <sup>b, e</sup>

### Abstract

A decline in instrumental activities of daily living has been described as the earliest functional deficit in patients with neurodegenerative disease. It embraces specific competencies such as: *"recalling the date and telephone calls, orienting to new places, remembering the location of objects at home, understanding conversation and the plot of a movie, keeping belongings in order, doing mental calculations and handling money, remembering appointments and shopping lists and performing clerical work"*. Since changes in instrumental daily living activities are one of the descriptors of behavioural-variant frontotemporal dementia, we decided to investigate the neural correlates of a reduced awareness in this specific domain in twenty-three consecutive behavioural-variant frontotemporal dementia patients. Gray matter volume changes associated with a reduced awareness for the instrumental domain, assessed using a validated caregiver-patient discrepancy questionnaire, were examined. Interestingly, we found disabilities in instrumental daily living activities and a reduced awareness of these to be related to medial prefrontal cortex atrophy, where the mid-cingulate cortices, dorsal anterior insula and cuneus play an important role. Importantly, if the executive system does not function correctly, the comparator mechanism of action self-monitoring does not detect mismatches between the current and previous performance states stored in the personal database, and produces a reduced awareness for the instrumental domain.

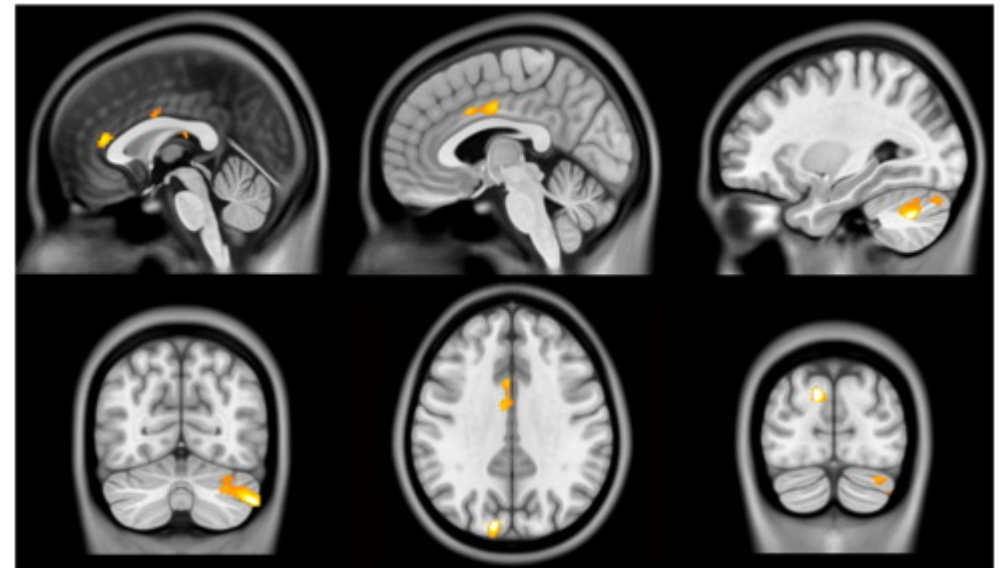
## VBM Results

L Insula




Correlation of regional GM volume with IADL,  $K_e > FWE_c$ . Neurological convention (left is left).

R Anterior Cingulate cortex  
L Middle Cingulate cortex  
R Cerebellum  
L Cerebellum  
L Cuneus



Correlation of regional GM volume in FTLD with AQD-iADL,  $K_e > FWE_c$ . Neurological convention (left is left).





Lo studio dell'invecchiamento normativo nei soggetti in “typical cognitive ageing” è importante per indagare come le polipatologie in soggetti con polifarmacoterapia possa portare a sviluppare condizioni di fragilità fisica e cognitiva associati a una maggiore probabilità di ammalarsi e a una minore aspettativa di vita.

A close-up photograph of an elderly couple smiling warmly. The woman, on the left, has short blonde hair and is wearing a light-colored top. The man, on the right, has short grey hair and is wearing a light blue shirt. They are both looking towards the camera with bright, genuine smiles. The background is a soft, out-of-focus light blue.

# Thank you!

[https://ec.europa.eu/eip/ageing/home\\_en](https://ec.europa.eu/eip/ageing/home_en)