

Approccio diagnostico e terapeutico alle diverse malattie responsabili di decadimento cognitivo



La diagnostica neuropsicologica
Sindrome soggettiva e MCI

SANTA LUCIA
NEUROSCIENZE
E RIABILITAZIONE

Relatore:
Maria Stefania De Simone

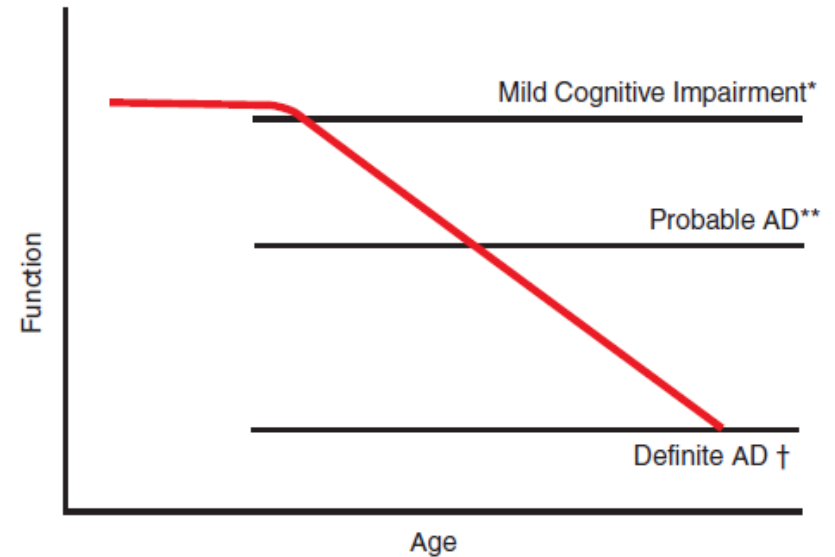
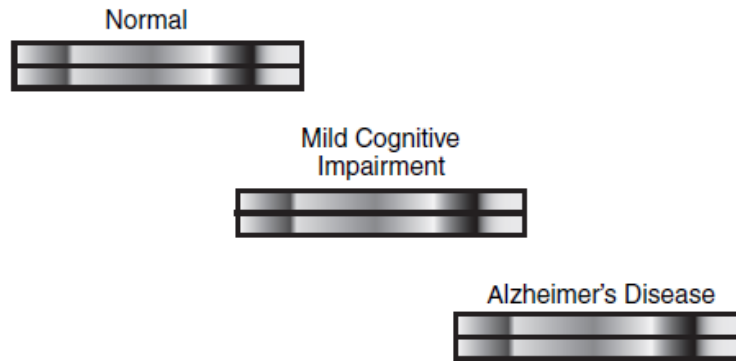
CONVEGNO SIN REGIONE LAZIO

22 novembre 2019

Mild Cognitive Impairment

Clinical Characterization and Outcome

Ronald C. Petersen, PhD, MD; Glenn E. Smith, PhD; Stephen C. Waring, DVM, PhD;
Robert J. Ivnik, PhD; Eric G. Tangalos, MD; Emre Kokmen, MD



Criteria for Amnesic Mild Cognitive Impairment

Memory complaint, preferably corroborated by an informant

Impaired memory function for age and education

Preserved general cognitive function

Intact activities of daily living

Not demented



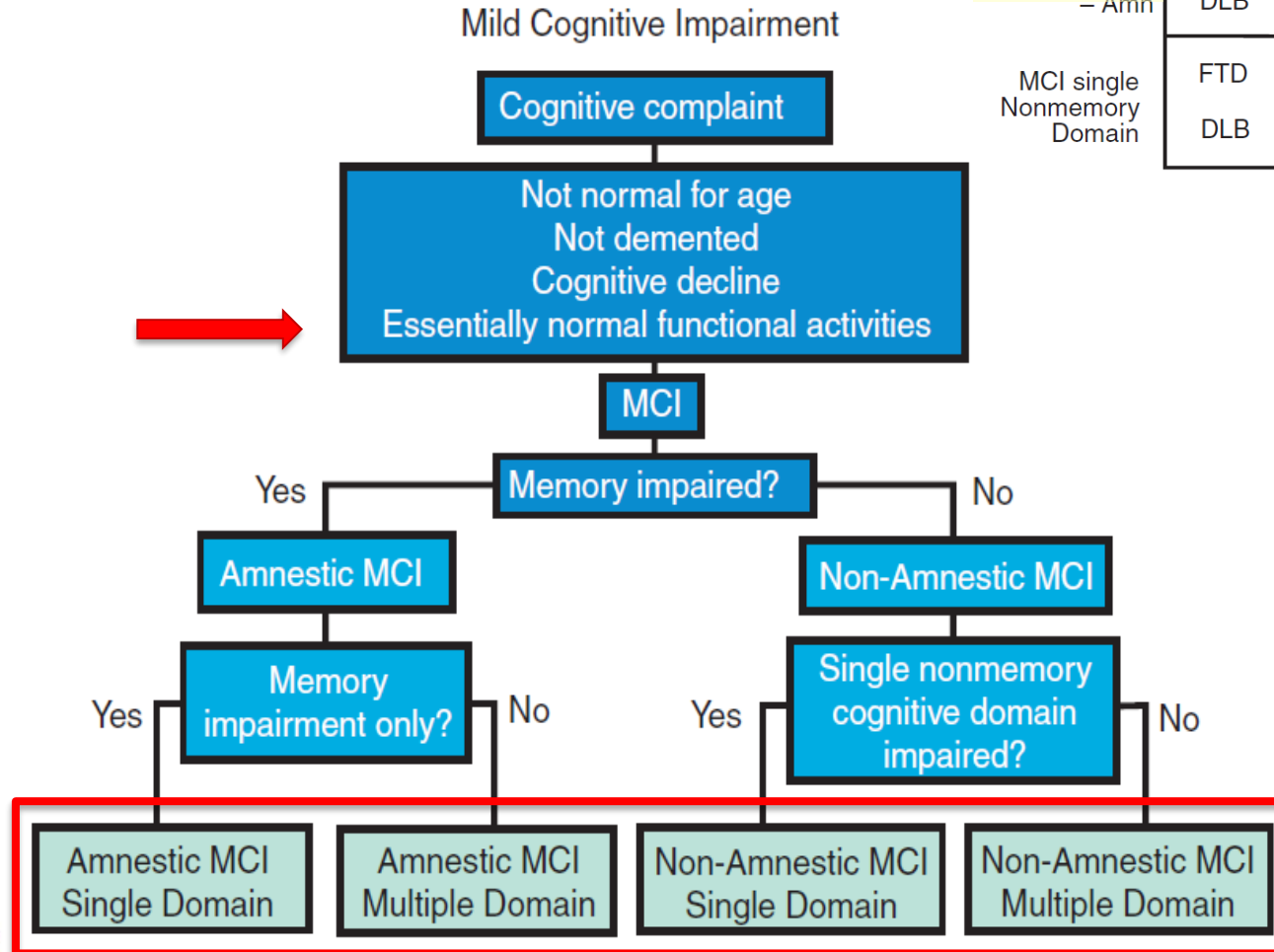
Mild cognitive impairment as a diagnostic entity

R. C. PETERSEN

From the Department of Neurology, Alzheimer's Disease Research Center, Mayo Clinic College of Medicine, Rochester, MN, USA

Aetiology

	Degenerative	Vascular	Psychiatric	Trauma
MCI Amnestic	AD		Depr	
MCI + Amn Multiple Domain	AD	VaD	Depr	
MCI - Amn	DLB	VaD		
MCI single Nonmemory Domain	FTD DLB			



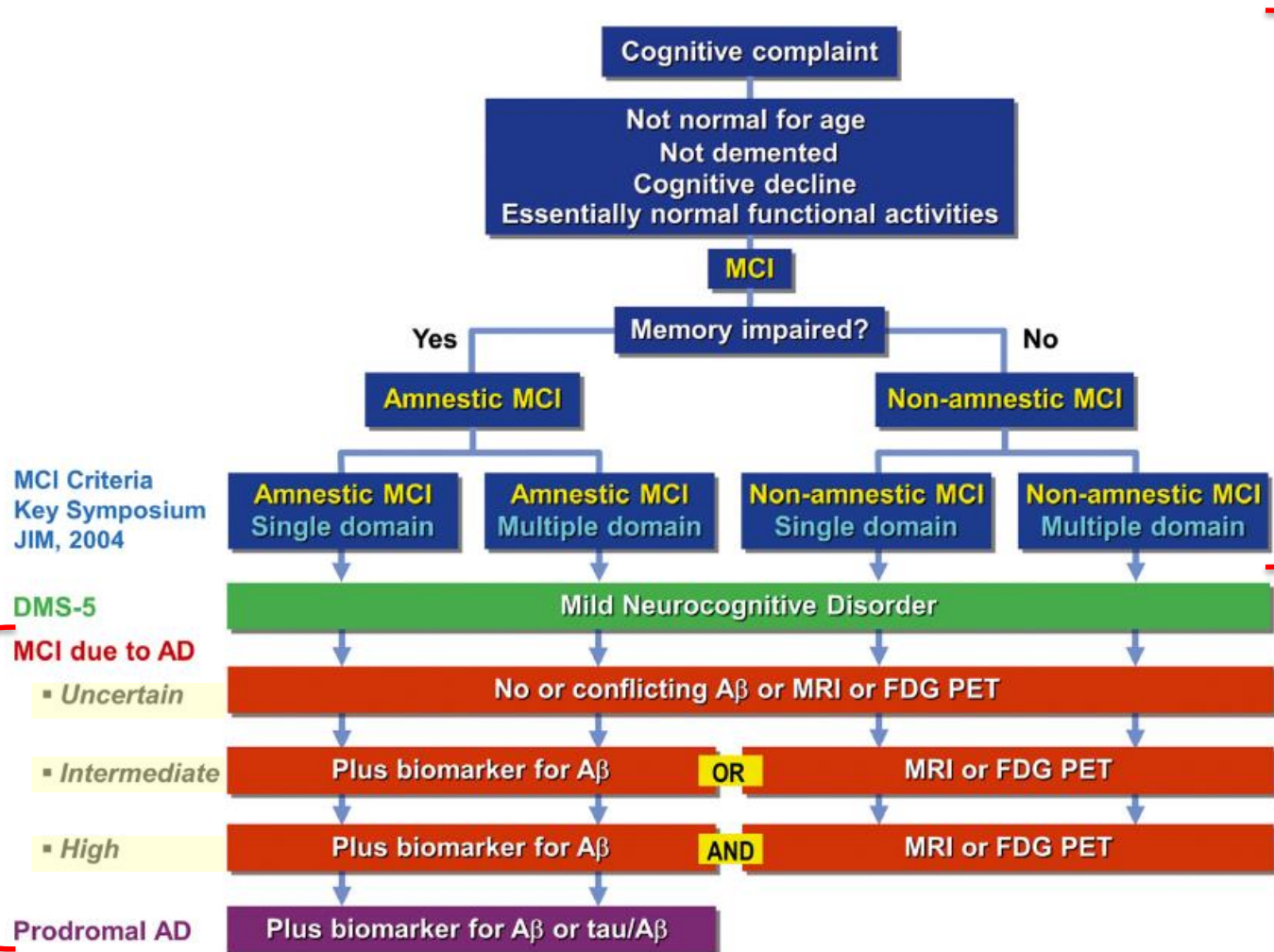
Click here for more articles from the symposium

doi: 10.1111/joim.12190

Watch Guest Editor Professor Mila Kivipelto talk about the 9th Key Symposium: Updating Alzheimer's Disease Diagnosis [here](#).

Mild cognitive impairment: a concept in evolution

■ R. C. Petersen¹, B. Caracciolo^{2,3}, C. Brayne⁴, S. Gauthier⁵, V. Jelic⁶ & L. Fratiglioni^{2,7}



Outcomes of Mild Cognitive Impairment by Definition

A Population Study

Mary Ganguli, MD, MPH; Beth E. Snitz, PhD; Judith A. Saxton, PhD; Chung-Chou H. Chang, PhD;
Ching-Wen Lee, MS; Joni Vander Bilt, MPH; Tiffany F. Hughes, PhD; David A. Loewenstein, PhD;
Frederick W. Unverzagt, PhD; Ronald C. Petersen, PhD, MD

Mild cognitive impairment, amnestic type

An epidemiologic study

Mary Ganguli, MD, MPH; Hiroko H. Dodge, PhD; Changyu Shen, PhD; and Steven T. DeKosky, MD

Incidence and outcome of mild cognitive impairment in a population-based prospective cohort

S. Larrieu, MSc; L. Letenneur, PhD; J.M. Orgogozo, MD; C. Fabrigoule, PhD; H. Amieva, PhD;
N. Le Carret, MSc; P. Barberger-Gateau, MD, PhD; and J.F. Dartigues, MD, PhD



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Frederic R. Herzog, MD

of MCI was 1.9 to 2.8% over 2-year periods; that is, 2 to 3% of previously normal individuals developed “MCI” over that period. Between 11 and 21% of those with MCI remained MCI, and 33 to 56% became non-MCI, half of whom reverted to normal or unimpaired. Among those who survived 10 years of

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Ruolo della Neuropsicologia?



Identificare il profilo neuropsicologico specifico del MCI che è suscettibile di evoluzione a demenza di Alzheimer

Identificare i marker neuropsicologici in grado di discriminare il deficit di memoria legato all'Alzheimer rispetto a quello sotteso ad altra eziologia



W Research criteria for the diagnosis of Alzheimer's disease: revising the NINCDS-ADRDA criteria

Bruno Dubois*, Howard H Feldman*, Claudia Jacova, Steven T DeKosky, Pascale Barberger-Gateau, Jeffrey Cummings, André Delacourte, Douglas Galasko, Serge Gauthier, Gregory Jicha, Kenichi Meguro, John O'Brien, Florence Pasquier, Philippe Robert, Martin Rossor, Steven Salloway, Yaakov Stern, Pieter J Visser, Philip Scheltens

Core diagnostic criteria

A. Presence of an early and significant episodic memory impairment to the following features:

1. Gradual and progressive change in memory function reported by informants over more than 6 months

2. Objective evidence of significantly impaired episodic memory on testing: this generally consists of recall deficit that does not improve significantly or does not normalise with cueing or recognition testing and after effective encoding of information has been previously controlled

3. The episodic memory impairment can be isolated or associated with other cognitive changes at the onset of AD or as AD advances

Supportive features

B. Presence of medial temporal lobe atrophy

- Volume loss of hippocampi, entorhinal cortex, amygdala evidenced on MRI with qualitative ratings using visual scoring (referenced to well characterised population with age norms) or quantitative volumetry of regions of interest (referenced to well characterised population with age norms)

C. Abnormal cerebrospinal fluid biomarker

- Low amyloid β_{1-42} concentrations, increased total tau concentrations, or increased phospho-tau concentrations, or combinations of the three
- Other well validated markers to be discovered in the future

D. Specific pattern on functional neuroimaging with PET

- Reduced glucose metabolism in bilateral temporal parietal regions
- Other well validated ligands, including those that foreseeably will emerge such as Pittsburgh compound B or FDDNP

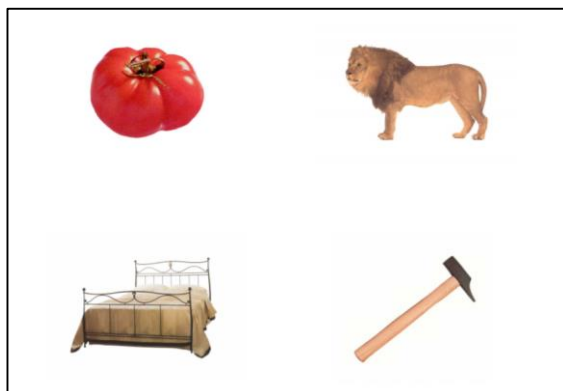
E. Proven AD autosomal dominant mutation within the immediate family

"Amnestic syndrome of the hippocampal type" → CONSOLIDAMENTO



Free and cued selective reminding test: an Italian normative study

P. Frasson · R. Ghiretti · E. Catricalà · S. Pomati ·
A. Marcone · L. Parisi · P. M. Rossini · S. F. Cappa ·
C. Mariani · N. Vanacore · F. Clerici



1. FASE DI CODIFICA CATEGORIALE ASSISTITA
2. FASE DI RIEVOCAZIONE IMMEDIATA: Free recall + Cued recall
3. FASE DI RIEVOCAZIONE DIFFERITA (30 min): Free recall + Cued recall



Amnestic syndrome of the medial temporal type identifies prodromal AD

A longitudinal study

M. Sarazin, PhD*
C. Berr, PhD*
J. De Rotrou, PhD
C. Fabrigoule, PhD
F. Pasquier, PhD
S. Legrain, MD
B. Michel, MD
M. Puel, MD
M. Volteau, PhD
J. Touchon, MD
M. Verny, PhD
B. Dubois, MD

Table 3 Receiver operating characteristic analysis: Demographic factors and neuropsychological tests associated with incident AD dementia

	AUC	CI (AUC)	p Value	Cutoff	Se	Sp
Age	0.72	(0.65, 0.79)				
Age + gender	0.72	(0.65, 0.79)	0.21			
Age + education	0.72	(0.65, 0.79)	0.79			
Age + gender + education	0.73	(0.66, 0.80)	0.49			
FCSRT total recall*	0.94	(0.91, 0.97)	<0.0001	40	79.7	89.9
FCSRT index of cueing*	0.93	(0.89, 0.96)	<0.0001	71	78.0	84.8
FCSRT free recall*	0.92	(0.88, 0.96)	<0.0001	17	71.2	91.8
FCSRT delayed free recall*	0.92	(0.89, 0.96)	<0.0001	6	76.3	90.5
FCSFT delayed total recall*	0.89	(0.85, 0.94)	<0.0001	14	69.5	88.6
FCSRT number of intrusions*	0.87	(0.81, 0.92)	<0.0001	2	64.4	85.4
Verbal fluency (category)*	0.80	(0.74, 0.87)	0.003	13	55.9	82.3
WAIS similarities*	0.78	(0.72, 0.85)	0.04	11	49.2	72.2
FCSRT false recognition*	0.78	(0.71, 0.84)	0.002	1	20.3	98.1
Serial digit learning test*	0.77	(0.7, 0.84)	0.04	80	57.6	67.7
DENO 100*	0.76	(0.7, 0.83)	0.07	89	55.9	67.7
Benton Visual Retention Test*	0.76	(0.69, 0.83)	0.07	11	42.4	77.2
Trail Making test B*	0.75	(0.68, 0.82)	0.09	138	62.7	67.1
WAIS digit symbol test*	0.74	(0.67, 0.81)	0.15	10	37.3	71.5
Stroop test (inhibition condition)*	0.74	(0.67, 0.81)	0.22	59	52.5	58.2
Verbal fluency (letter S)*	0.74	(0.67, 0.81)	0.19	17	57.6	56.3
Trail Making test A*	0.73	(0.66, 0.8)	0.36	53	62.7	58.9
Double task of Baddeley*	0.72	(0.65, 0.79)	1.00	94	50.8	56.3



15-word list recall

Versioni:		Rievocazioni immediate					Differita
Primaria	Parallela	1	2	3	4	5	Dopo 15'
Tenda	Camino						
Tamburo	Tromba						
Caffè	Pane						
Cintura	Manico						
Sole	Letto						
Giardino	Pagina						
Baffi	Moneta						
Finestra	Giornale						
Fiume	Sera						
Paesano	Carota						
Colore	Monte						
Tacchino	Lampada						
Scuola	Albergo						
Casa	Uomo						
Cappello	Vagone						
Totale							____/15

Performance depends also on the ability to self-generate strategies to organize information at both encoding and retrieval

Short story test

Sei / dicembre / La scorsa settimana / un fiume straripò / in una piccola / città / situata / a 20 Km / da Torino /. L'acqua / invase / le strade / e le case /. Quattordici / persone / annegarono / e seicento / si ammalarono / a causa dell'umidità / e del freddo /. Nel tentativo di salvare / un ragazzo / un uomo / si ferì / le mani /.

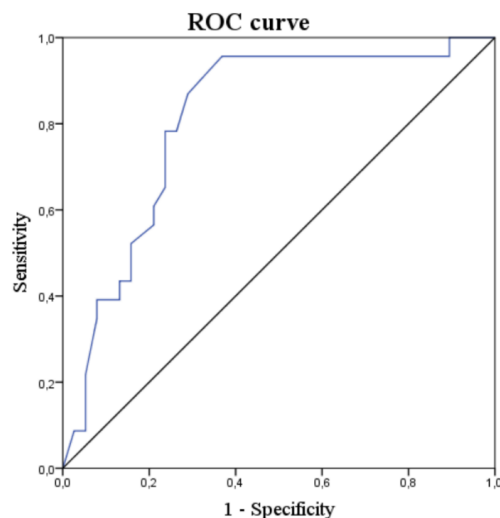
Performance requires less active implementation of retrieval strategies



Different deficit patterns on word lists and short stories predict conversion to Alzheimer's disease in patients with amnesic mild cognitive impairment

Maria Stefania De Simone¹ · Roberta Perri¹ · Lucia Fadda^{1,2} · Massimo De Tollis¹ · Chiara Stella Turchetta¹ · Carlo Caltagirone^{1,2} · Giovanni Augusto Carlesimo^{1,2}

	Word-list (max 15)			Short story (max 8)		
	Immediate	Delayed	Forgetting	Immediate	Delayed	Forgetting
HC	8.74 (2.25)	6.76 (2.65)	-13%	5.57 (1.23)	5.40 (1.21)	-2%
Stable-MCI	6.89 (2.04)	4.05 (2.34)	-19%	4.54 (1.37)	4.14 (1.96)	-5%
Converter-MCI	6.17 (1.61)	2.26 (1.94)	-26%	3.84 (1.67)	2.07 (2.10)	-23%



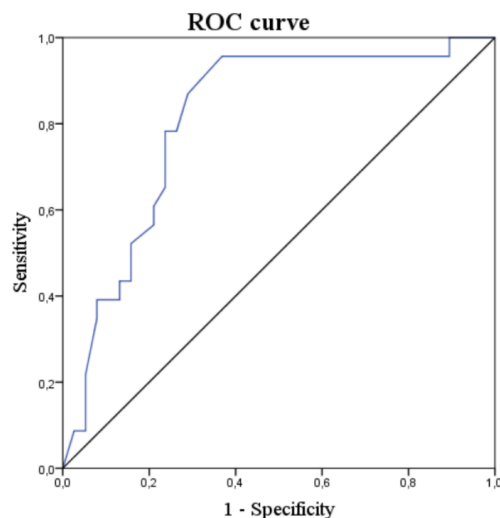
AUC=0.81, 95% CI=0.70-0.93, $p<0.001$
Sensitivity= 87% and Specificity= 71%



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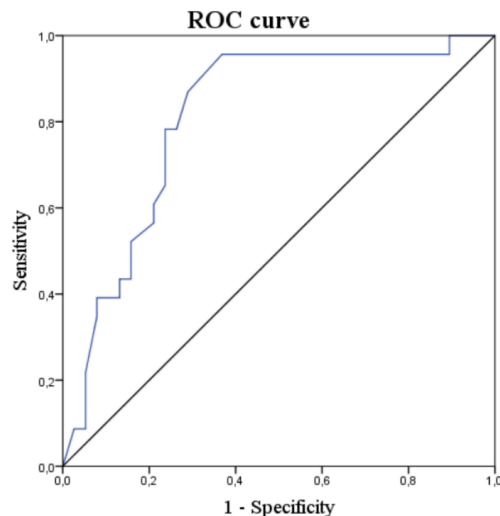
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The diagnosis of mild cognitive impairment due to Alzheimer's disease:
Recommendations from the National Institute on Aging-Alzheimer's
Association workgroups on diagnostic guidelines for
Alzheimer's disease

Marilyn S. Albert^{a,*}, Steven T. DeKosky^{b,c}, Dennis Dickson^d, Bruno Dubois^e,
Howard H. Feldman^f, Nick C. Fox^g, Anthony Gamst^h, David M. Holtzman^{i,j}, William J. Jagust^k,
Ronald C. Petersen^l, Peter J. Snyder^{m,n}, Maria C. Carrillo^o, Bill Thies^o, Creighton H. Phelps^p

Summary of clinical and cognitive evaluation for MCI due to AD

Establish clinical and cognitive criteria

Cognitive concern reflecting a change in cognition reported by patient or informant or clinician (i.e., historical or observed evidence of decline over time)

Objective evidence of Impairment in one or more cognitive domains, typically including memory (i.e., formal or bedside testing to establish level of cognitive function in multiple domains)

Preservation of independence in functional abilities

Not demented

Examine etiology of MCI consistent with AD pathophysiological process

Rule out vascular, traumatic, medical causes of cognitive decline, where possible

Provide evidence of longitudinal decline in cognition, when feasible

Report history consistent with AD genetic factors, where relevant



Practice Effects Predict Cognitive Outcome in Amnestic Mild Cognitive Impairment

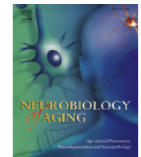
*Kevin Duff, Ph.D., Constantine G. Lyketsos, M.D., M.H.S., Leigh J. Beglinger, Ph.D.,
Gordon Chelune, Ph.D., David J. Moser, Ph.D., Stephan Arndt, Ph.D.,
Susan K. Schultz, M.D., Jane S. Paulsen, Ph.D., Ronald C. Petersen, Ph.D., M.D.,
Robert J. McCaffrey, Ph.D.*



Contents lists available at [ScienceDirect](#)

Neurobiology of Aging

journal homepage: www.elsevier.com/locate/neuaging



Cognition or genetics? Predicting Alzheimer's disease with practice effects, APOE genotype, and brain metabolism



Javier Oltra-Cucarella, Miriam Sánchez-SanSegundo*, Rosario Ferrer-Cascales**, for the Alzheimer's Disease Neuroimaging Initiative¹

Cognitive neurology

RESEARCH PAPER

Measuring cognitive change in subjects with prodromal Alzheimer's disease

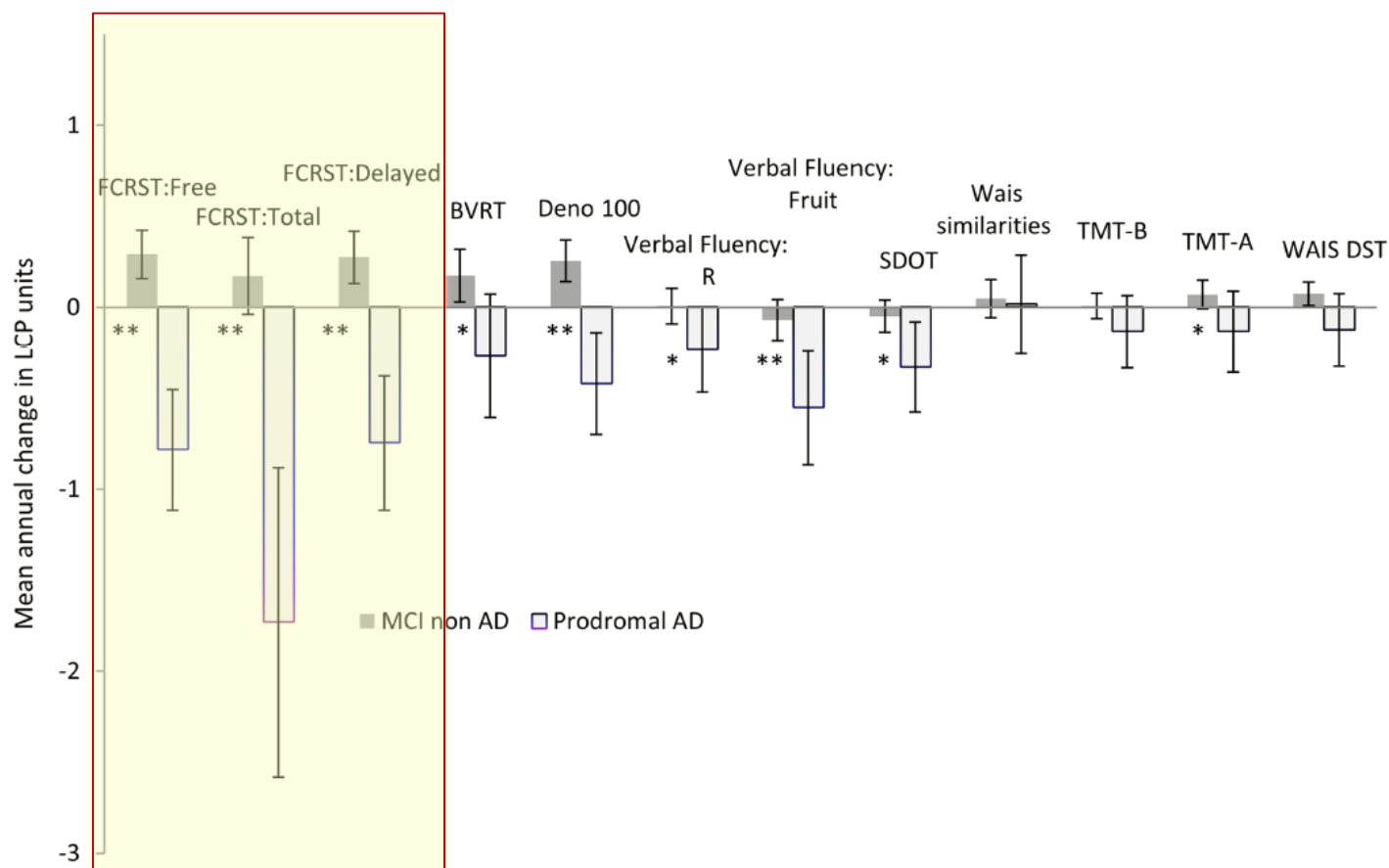
T Mura,^{1,2,3,4} C Proust-Lima,^{5,6} H Jacqmin-Gadda,^{5,6} T N Akbaraly,^{1,2,7}
J Touchon,^{1,2,8} B Dubois,⁹ C Berr^{1,2,8}



RESEARCH PAPER

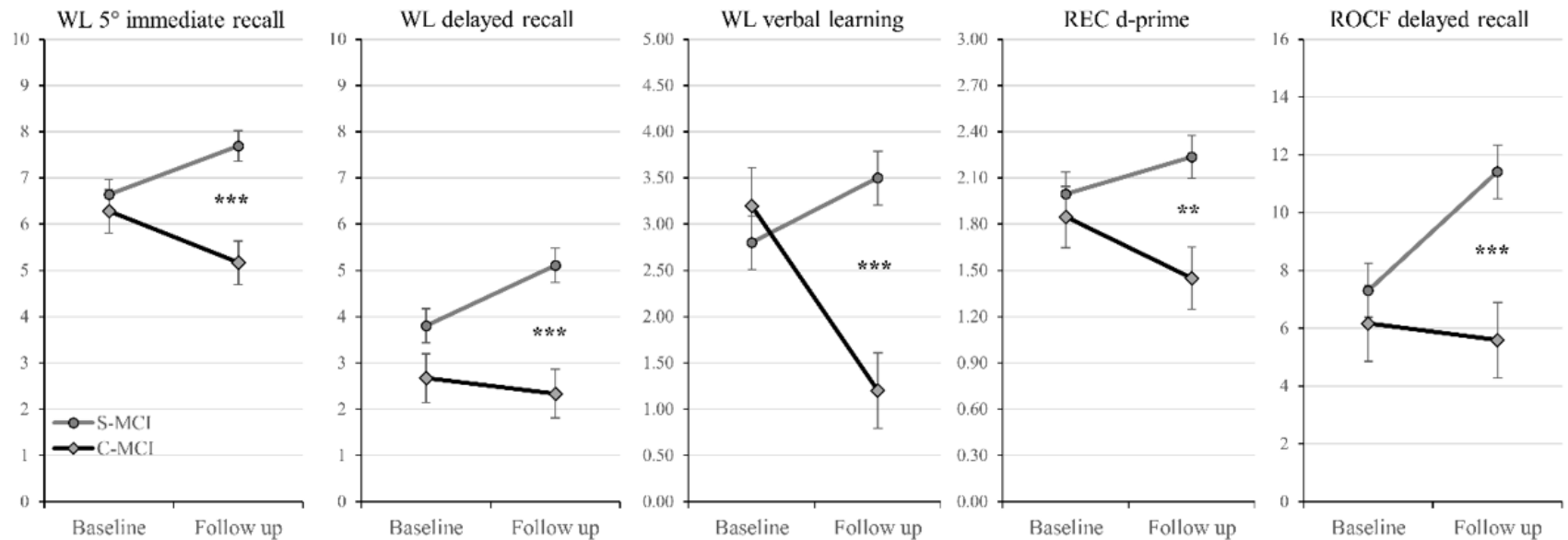
Measuring cognitive change in subjects with prodromal Alzheimer's disease

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J Touchon,^{1,2,8} B Dubois,⁹ C Berr^{1,2,8}



Test-retest decline on memory tasks predict conversion to Alzheimer's disease in patients with amnesic mild cognitive impairment

De Simone MS, Perri R, Rodini R, Fadda L, De Tollis M, Caltagirone C, Carlesimo GA (Submitted)



Mean raw scores on memory tests obtained by stable and converter a-MCI patients on the baseline and follow-up evaluations

S-MCI = Stable a-MCI

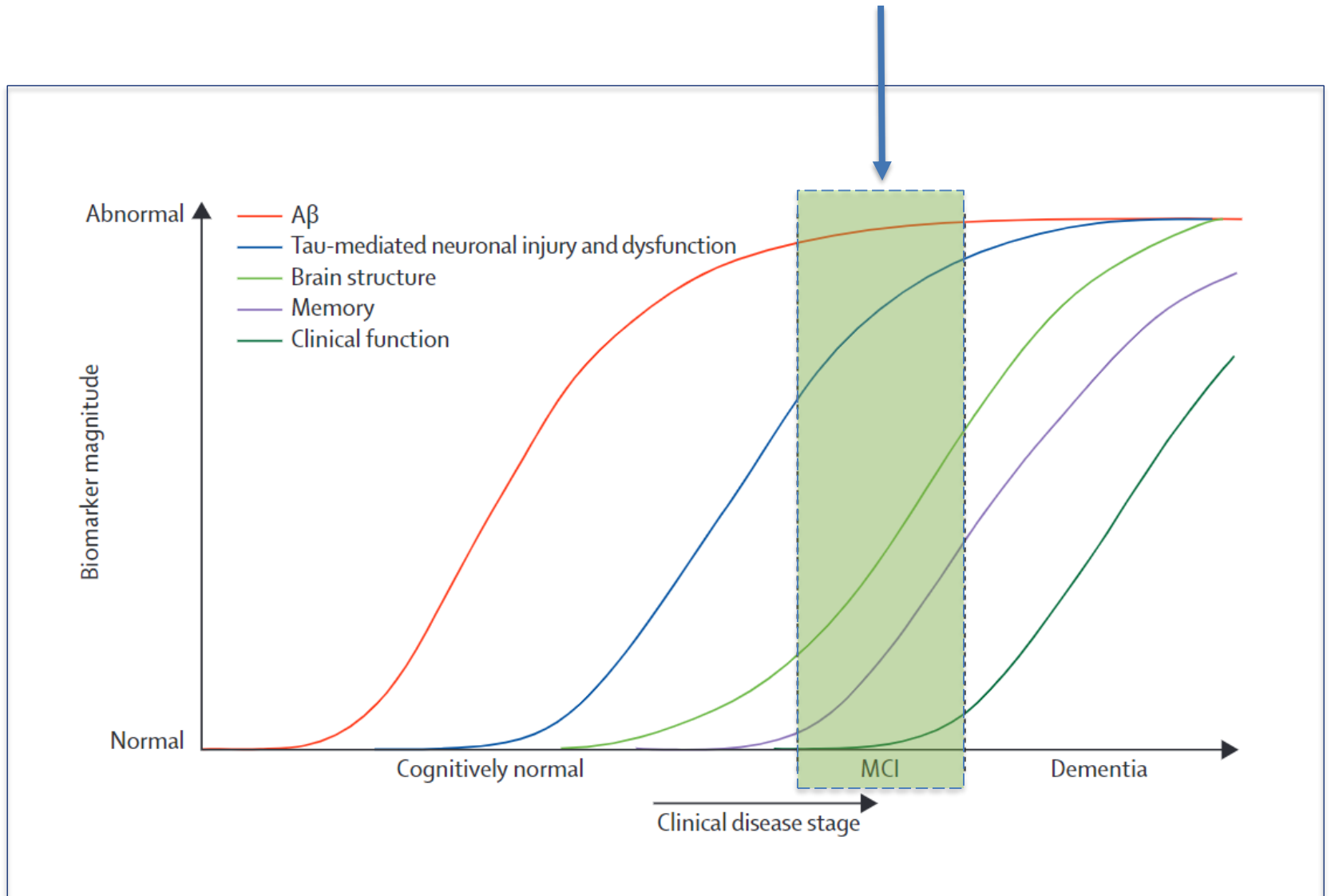
C-MCI = Converter a-MCI

WL = Test delle 15 parole di Rey

REC = Trial di Recognition

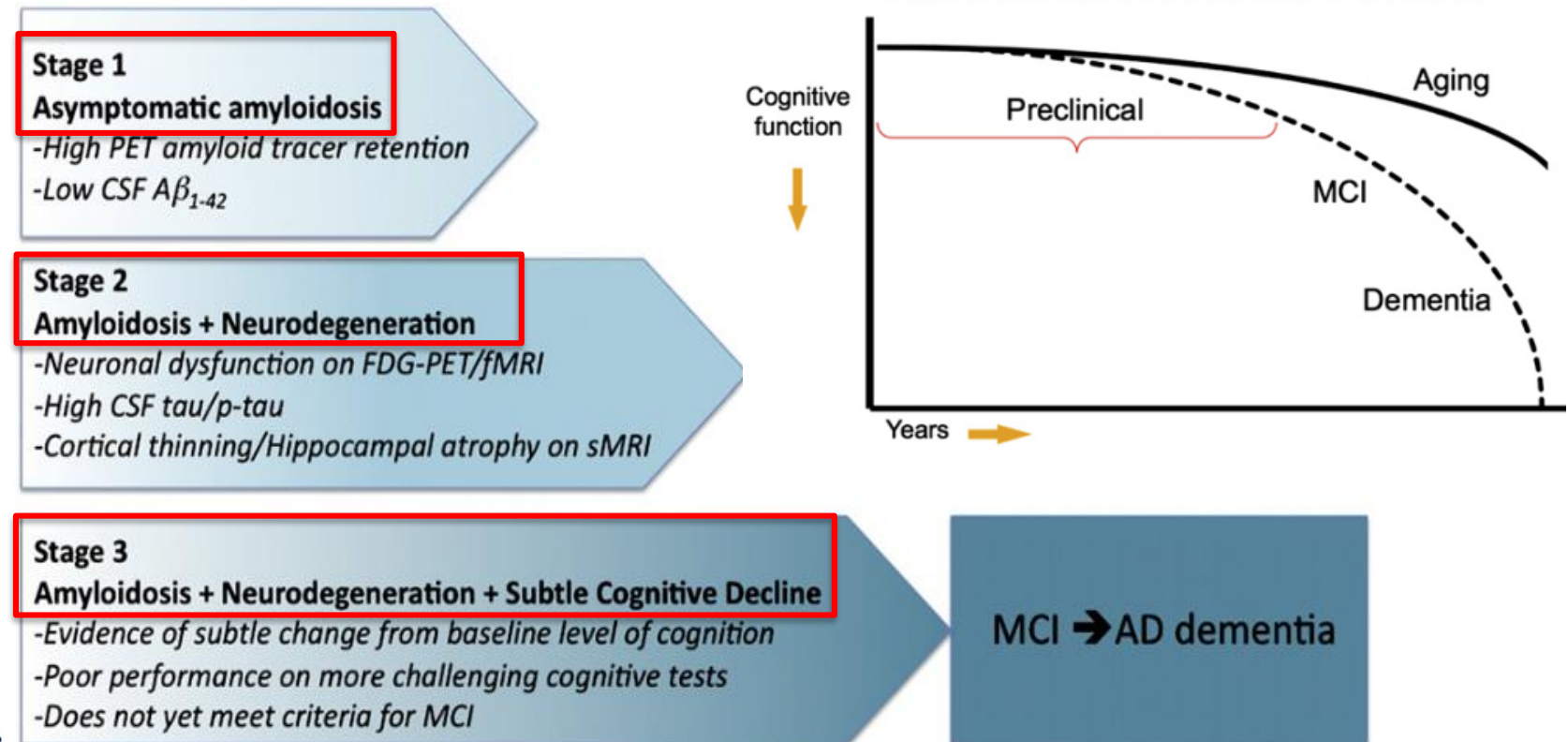
ROCF = Rievocazione della Figura di Rey





Toward defining the preclinical stages of Alzheimer's disease: Recommendations from the National Institute on Aging-Alzheimer's Association workgroups on diagnostic guidelines for Alzheimer's disease

Reisa A. Sperling^{a,*}, Paul S. Aisen^b, Laurel A. Beckett^c, David A. Bennett^d, Suzanne Craft^e,
Anne M. Fagan^f, Takeshi Iwatsubo^g, Clifford R. Jack, Jr.^h, Jeffrey Kayeⁱ, Thomas J. Montine^j,
Denise C. Park^k, Eric M. Reiman^l, Christopher C. Rowe^m, Eric Siemersⁿ, Yaakov Stern^o,
Kristine Yaffe^p, Maria C. Carrillo^q, Bill Thies^q, Marcelle Morrison-Bogorad^r, Molly V. Wagster^r,
Creighton H. Phelps^r



Research criteria for pre-MCI **subjective cognitive decline (SCD)**

1. Self-experienced persistent decline in cognitive capacity in comparison with a previously normal status and unrelated to an acute event.
2. Normal age-, gender-, and education-adjusted performance on standardized cognitive tests, which are used to classify mild cognitive impairment (MCI) or prodromal AD.

1 and 2 must be present

Exclusion criteria

- Mild cognitive impairment, prodromal AD, or dementia
- Can be explained by a psychiatric* or neurologic disease (apart from AD), medical disorder, medication, or substance use

Stage 1

Asymptomatic amyloidosis

- High PET amyloid tracer retention
- Low CSF $A\beta_{1-42}$

Stage 2

Amyloidosis + Neurodegeneration

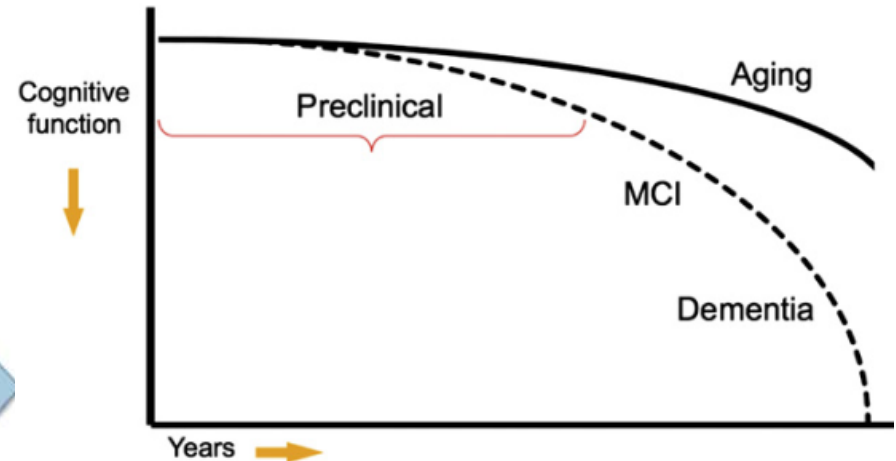
- Neuronal dysfunction on FDG-PET/fMRI
- High CSF tau/p-tau
- Cortical thinning/Hippocampal atrophy on sMRI

Stage 3

Amyloidosis + Neurodegeneration + Subtle Cognitive Decline

- Evidence of subtle change from baseline level of cognition
- Poor performance on more challenging cognitive tests
- Does not yet meet criteria for MCI

The continuum of Alzheimer's disease



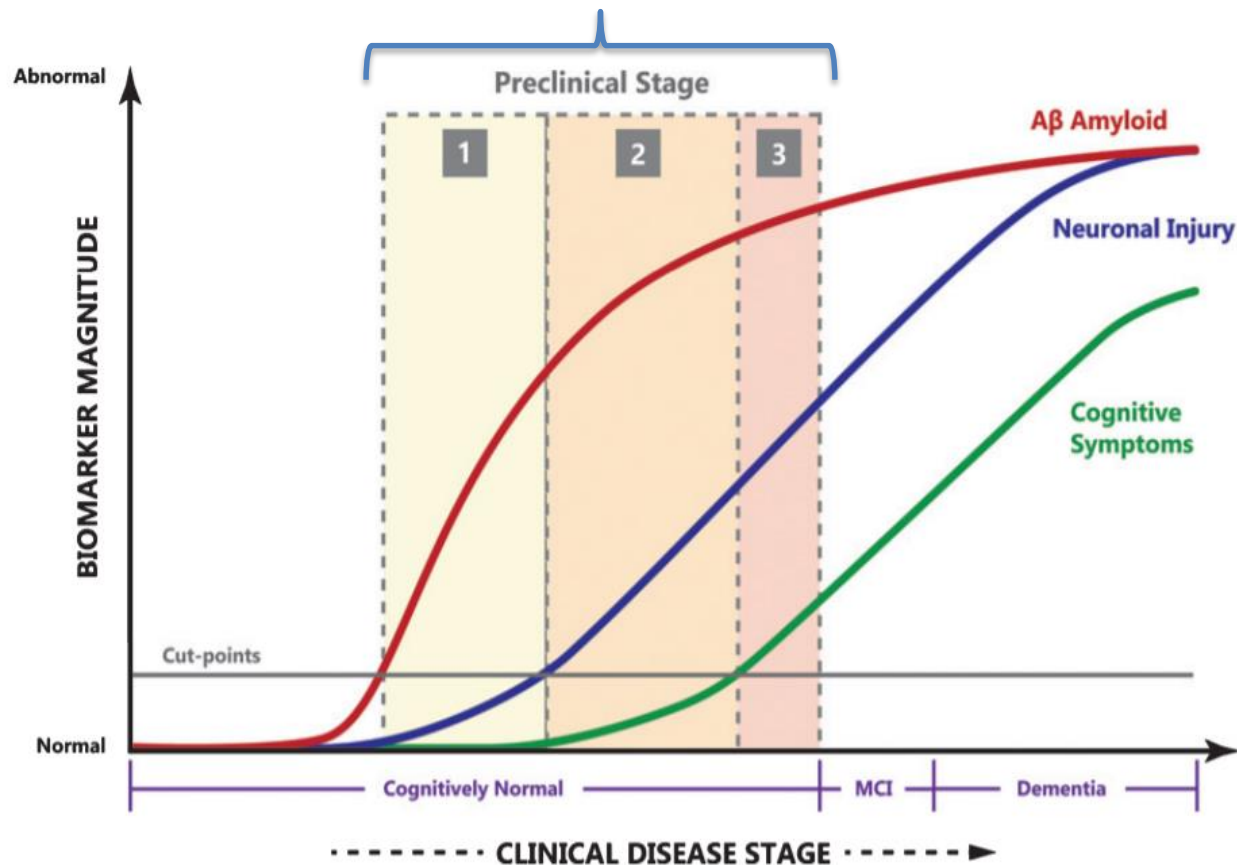
MCI → AD dementia

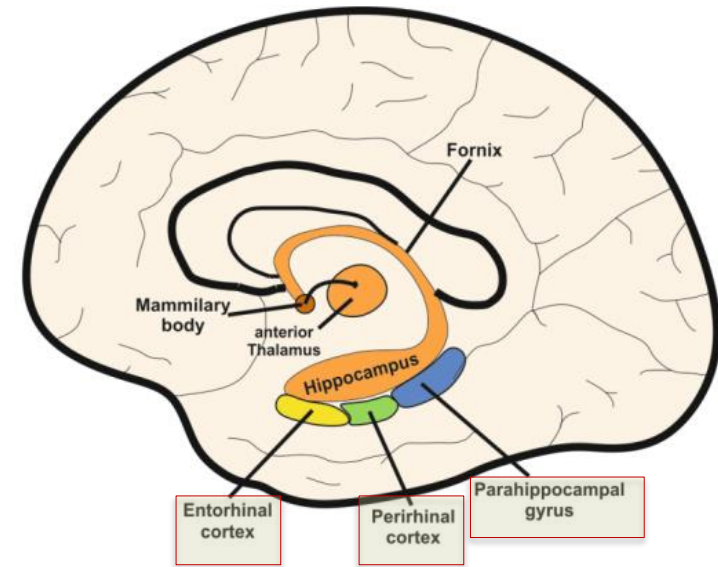
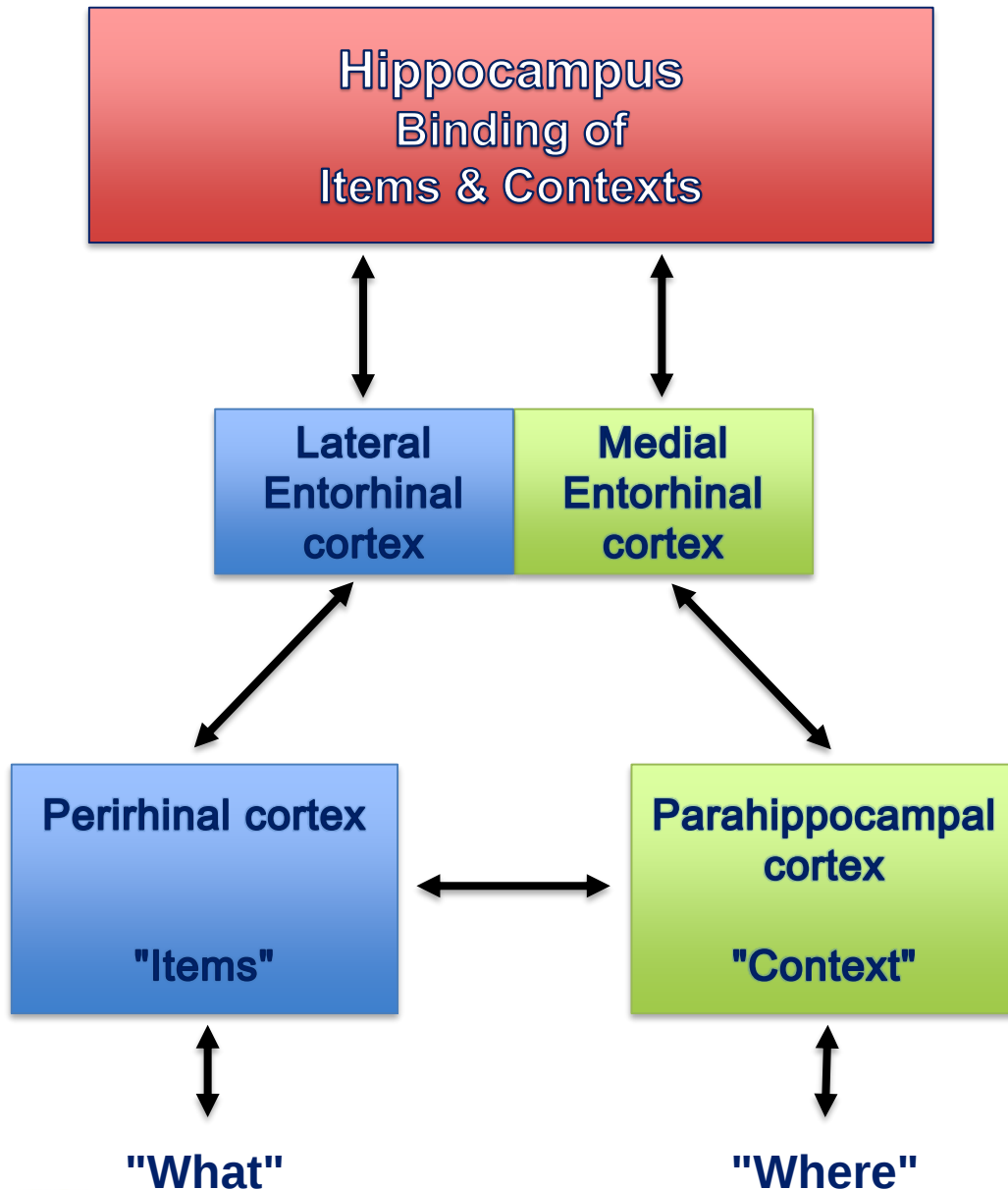


RUOLO DELLA NEUROPSICOLOGIA?

Discriminare tra i soggetti portatori di Malattia di Alzheimer coloro che evolveranno in demenza di Alzheimer da coloro che non svilupperanno mai una sindrome clinica

Identificazione e lo sviluppo di misure cognitive che (1) siano sensibili al rilevamento di stati patologici precoci e (2) convergono con marcatori biologici di patologia AD





Association memory tests



Isabelle



Miriam



Editor



Nutritionist



Courtney



Jane



Dancer



Weaver

Long-term Memory binding tests

LIST A Free and Cued Recall

16 Targets

16 Semantic Categories



LIST B Free and Cued Recall

16 Targets

16 Semantic Categories



LIST A and LIST B Immediate Cued and then, Free Recall

Measures Memory Binding



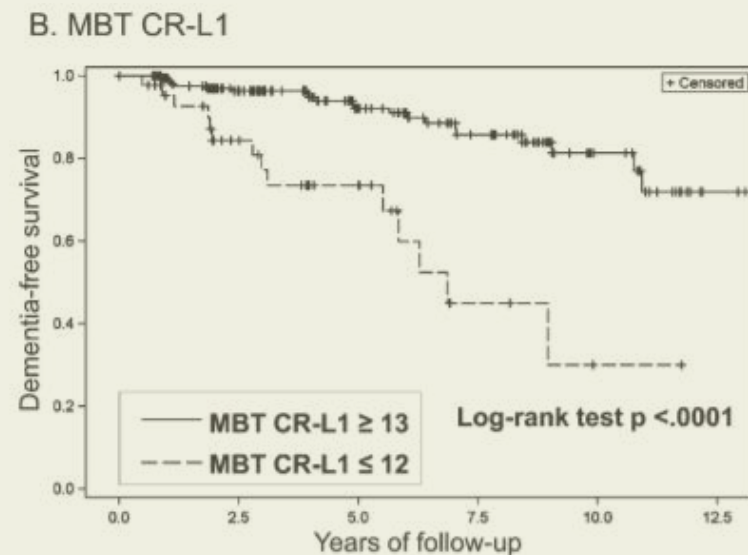
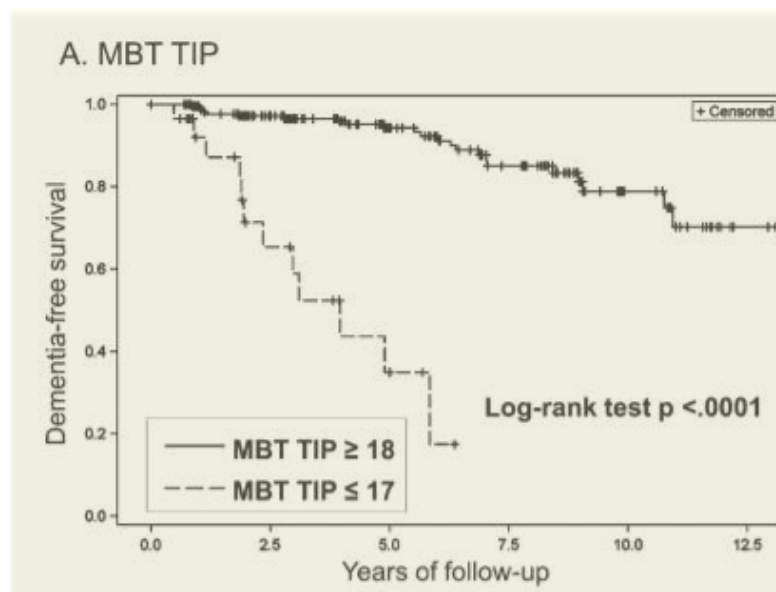
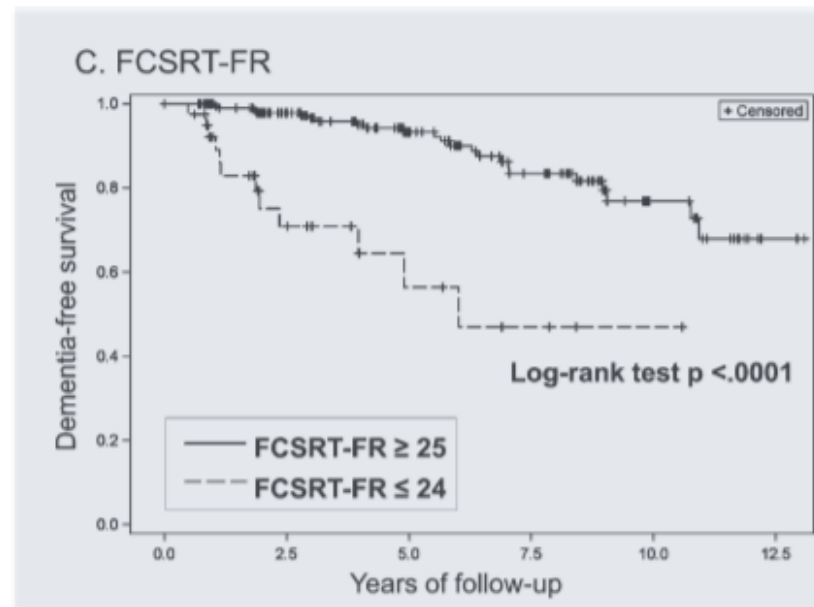
LIST A and LIST B 30-minute Delayed Cued and Free Recall



Memory Binding Test Predicts Incident Dementia: Results from the Einstein Aging Study

Wenzhu B. Mowrey^{a,c,*}, Richard B. Lipton^{b,c}, Mindy J. Katz^{b,c}, Wendy S. Ramratan^{b,c}, David A. Loewenstein^d, Molly E. Zimmerman^{b,c} and Herman Buschke^{b,c}

309 elderly free of dementia at the baseline followed annually for up to 13 years for incident dementia



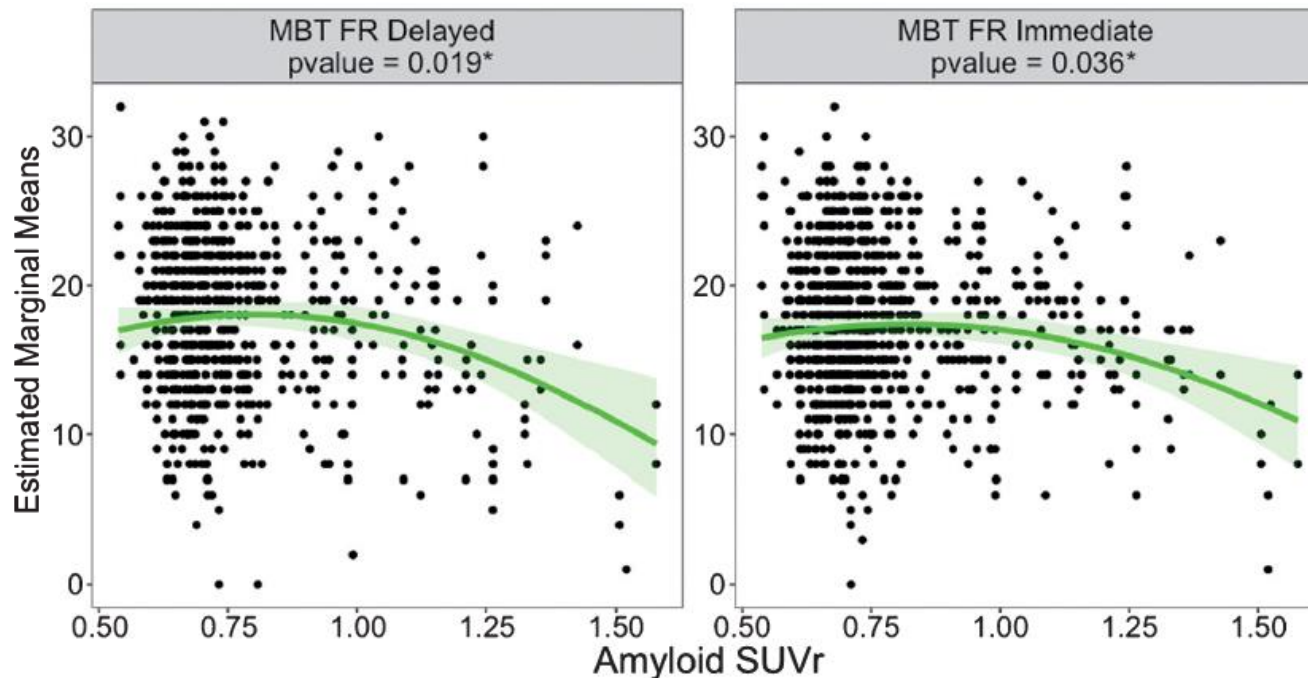
Which Episodic Memory Performance is Associated with Alzheimer's Disease Biomarkers in Elderly Cognitive Complainers? Evidence from a Longitudinal Observational Study with Four Episodic Memory Tests (Insight-PreAD)

Geoffroy Gagliardi^{a,b,*}, Stéphane Epelbaum^{a,b,c}, Marion Houot^{b,d}, Hovagim Bakardjian^{a,b}, Laurie Boukadida^{a,b}, Marie Revillon^{a,b}, Bruno Dubois^{a,b,d}, Gianfranco Dalla Barba^{a,b,g,l} and Valentina La Corte^{b,e,f,l} for the INSIGHT-preAD study group

318 healthy elderly participants with subjective cognitive complaint followed annually for two years

FCSRT
ROCF
Delayed Matching to Sample Task
Memory Binding Test (MBT)

AD biomarkers
(amyloidosis and neurodegeneration)



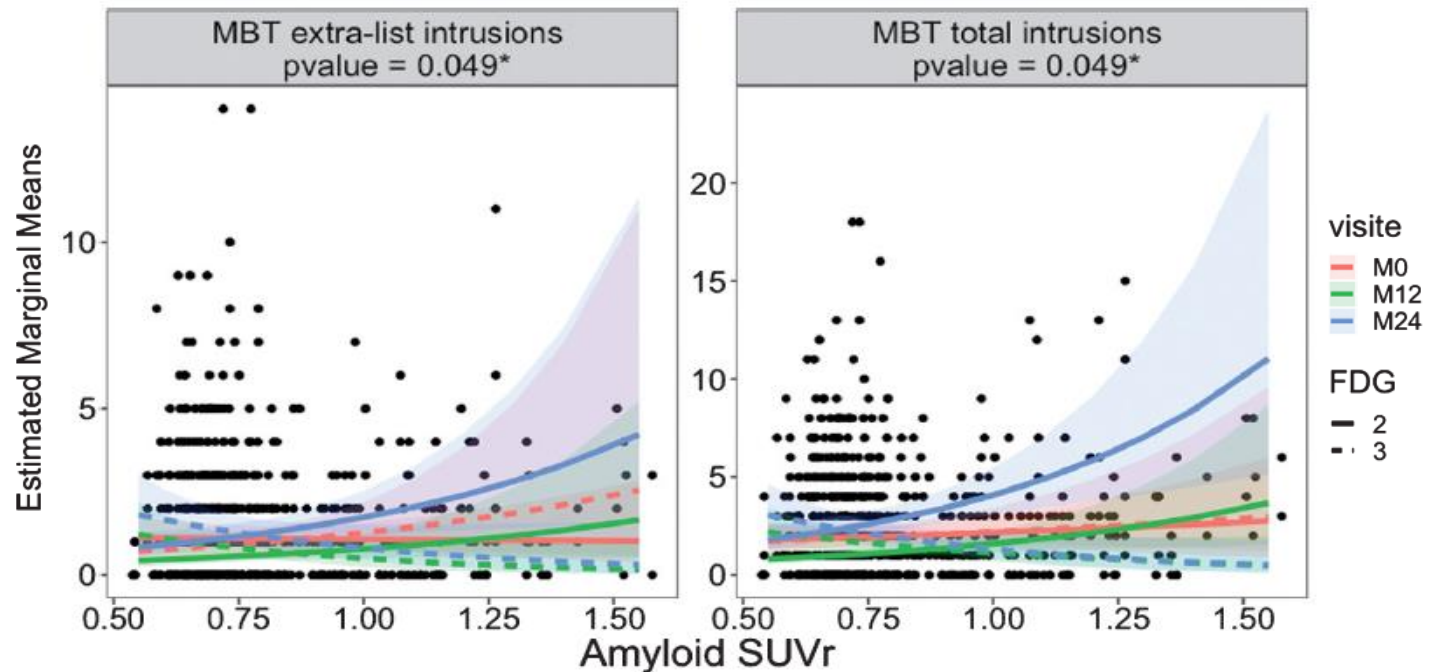
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(amyloidosis and neurodegeneration)



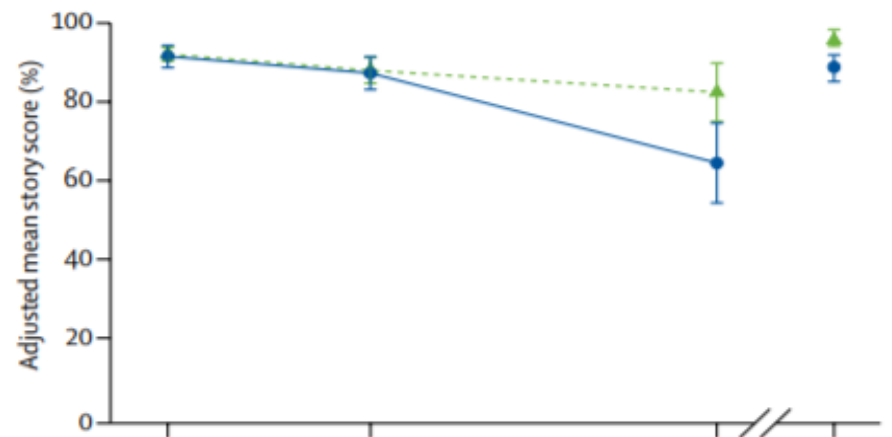
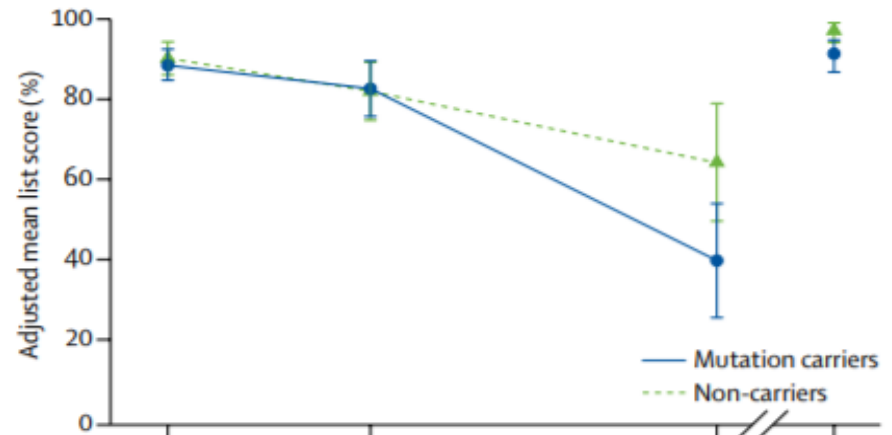
Accelerated long-term forgetting in presymptomatic autosomal dominant Alzheimer's disease: a cross-sectional study

Philip S J Weston, Jennifer M Nicholas, Susie M D Henley, Yuying Liang, Kirsty Macpherson, Elizabeth Donnachie, Jonathan M Schott, Martin N Rossor, Sebastian J Crutch, Christopher R Butler, Adam Z Zeman, Nick C Fox

Uses a 7-day long term recall paradigm to look at % retention of list, story, and figural memory.

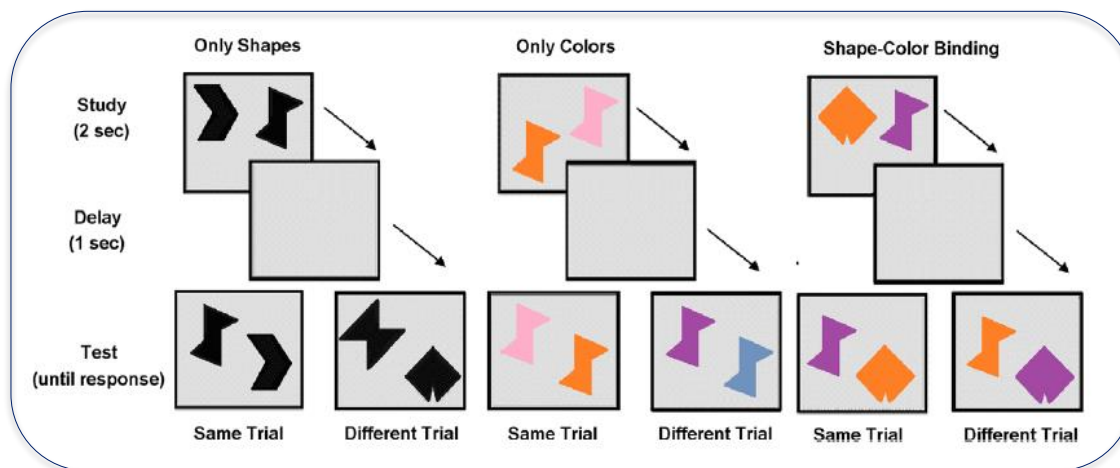
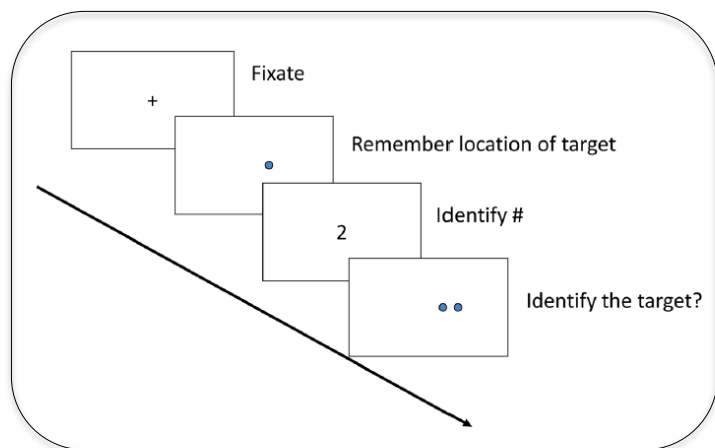
Relative to $n = 14$ noncarriers, $n = 21$ CDR 0 (EYO -7.2y) carriers had 30% lower retention of word list, 20% lower story retention.

**No differences on standard tests between groups



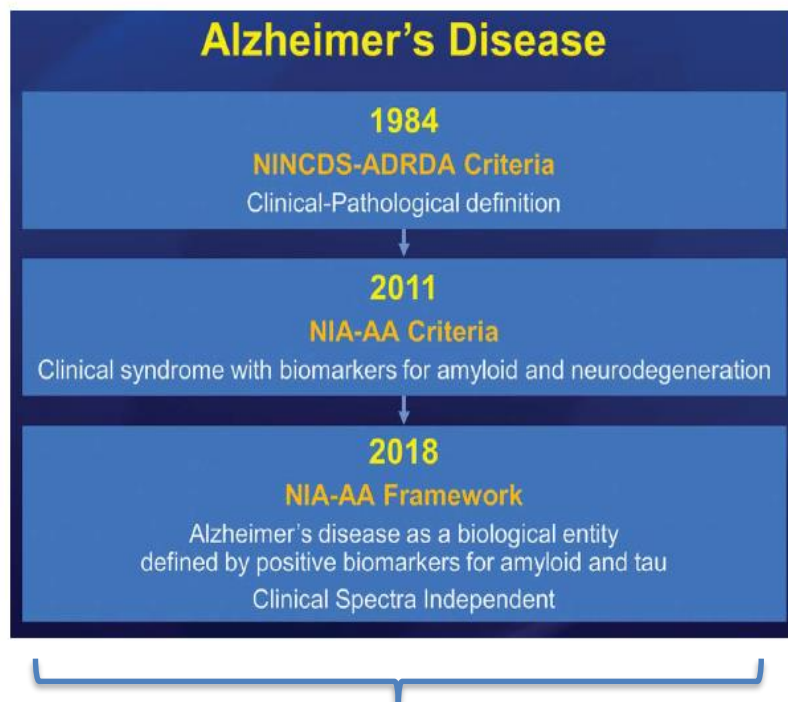
Novel Cognitive Paradigms for the Detection of Memory Impairment in Preclinical Alzheimer's Disease

David A. Loewenstein¹, Rosie E. Curiel¹, Ranjan Duara^{2,3,4}, and Herman Buschke⁵



Conclusione...

Utilità della diagnostica neuropsicologica nell'identificazione precoce di quei casi ad alto rischio di conversione in demenza di Alzheimer



Identificare i marker neuropsicologici in grado di discriminare il deficit di memoria legato all'Alzheimer rispetto a quello sotteso ad altra eziologia

Discriminare tra i soggetti portatori di Malattia di Alzheimer coloro che evolveranno in demenza di Alzheimer da coloro che non svilupperanno mai una sindrome clinica





Grazie per l'attenzione

SANTA LUCIA

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E RIABILITAZIONE

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2018 National Institute on Aging—Alzheimer's Association (NIA-AA) Research Framework

NIA-AA Research Framework: Toward a biological definition of Alzheimer's disease

Clifford R. Jack, Jr.,^{a,*}, David A. Bennett^b, Kaj Blennow^c, Maria C. Carrillo^d, Billy Dunn^e, Samantha Budd Haeberlein^f, David M. Holtzman^g, William Jagust^h, Frank Jessenⁱ, Jason Karlawish^j, Enchi Liu^k, Jose Luis Molinuevo^l, Thomas Montine^m, Creighton Phelpsⁿ, Katherine P. Rankin^o, Christopher C. Rowe^p, Philip Scheltens^q, Eric Siemers^r, Heather M. Snyder^d, Reisa Sperling^s

Contributors[†]: Cerise Elliott, Eliezer Masliah, Laurie Ryan, and Nina Silverberg

AT(N) profiles	Biomarker category	
A-T-(N)-	Normal AD biomarkers	
A+T-(N)-	Alzheimer's pathologic change	Alzheimer's continuum
A+T+(N)-	Alzheimer's disease	
A+T+(N)+	Alzheimer's disease	
A+T-(N)+	Alzheimer's and concomitant suspected non Alzheimer's pathologic change	Non-AD pathologic change
A-T+(N)-	Non-AD pathologic change	
A-T-(N)+	Non-AD pathologic change	
A-T+(N)+	Non-AD pathologic change	

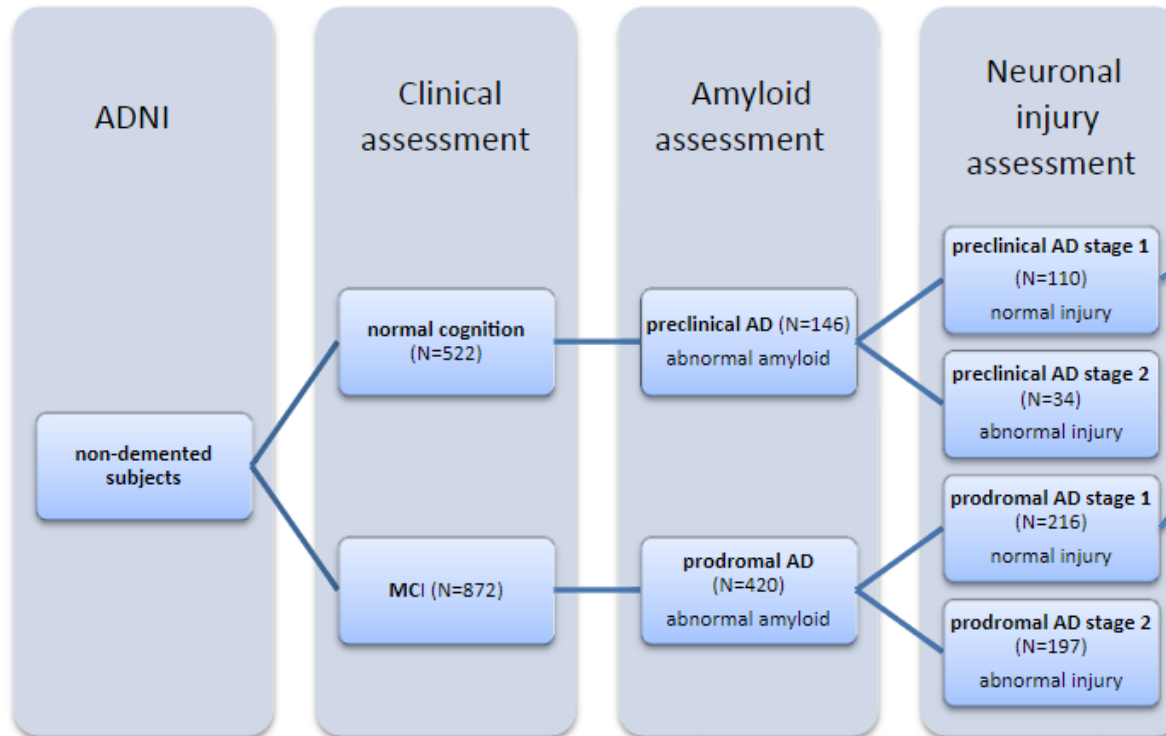
		Cognitive stage		
		Cognitively Unimpaired	Mild Cognitive Impairment	Dementia
Biomarker Profile	A ⁻ T ⁻ (N) ⁻	normal AD biomarkers, cognitively unimpaired	normal AD biomarkers with MCI	normal AD biomarkers with dementia
	A ⁺ T ⁻ (N) ⁻	Preclinical Alzheimer's pathologic change	Alzheimer's pathologic change with MCI	Alzheimer's pathologic change with dementia
	A ⁺ T ⁺ (N) ⁻	Preclinical Alzheimer's disease	Alzheimer's disease with MCI(Prodromal AD)	Alzheimer's disease with dementia
	A ⁺ T ⁺ (N) ⁺	Alzheimer's and concomitant suspected non Alzheimer's pathologic change, cognitively unimpaired	Alzheimer's and concomitant suspected non Alzheimer's pathologic change with MCI	Alzheimer's and concomitant suspected non Alzheimer's pathologic change with dementia
	A ⁻ T ⁺ (N) ⁻	non-Alzheimer's pathologic change, cognitively unimpaired	non-Alzheimer's pathologic change with MCI	non-Alzheimer's pathologic change with dementia
	A ⁻ T ⁺ (N) ⁺			
	A ⁺ T ⁺ (N) ⁺			



Featured Article

The effect of diagnostic criteria on outcome measures in preclinical and prodromal Alzheimer's disease: Implications for trial design

Daniela Bertens^{a,*}, Betty M. Tijms^a, Lisa Vermunt^a, Niels D. Prins^{a,b}, Philip Scheltens^a, Pieter Jelle Visser^{a,c,1}, for the Alzheimer's Disease Neuroimaging Initiative



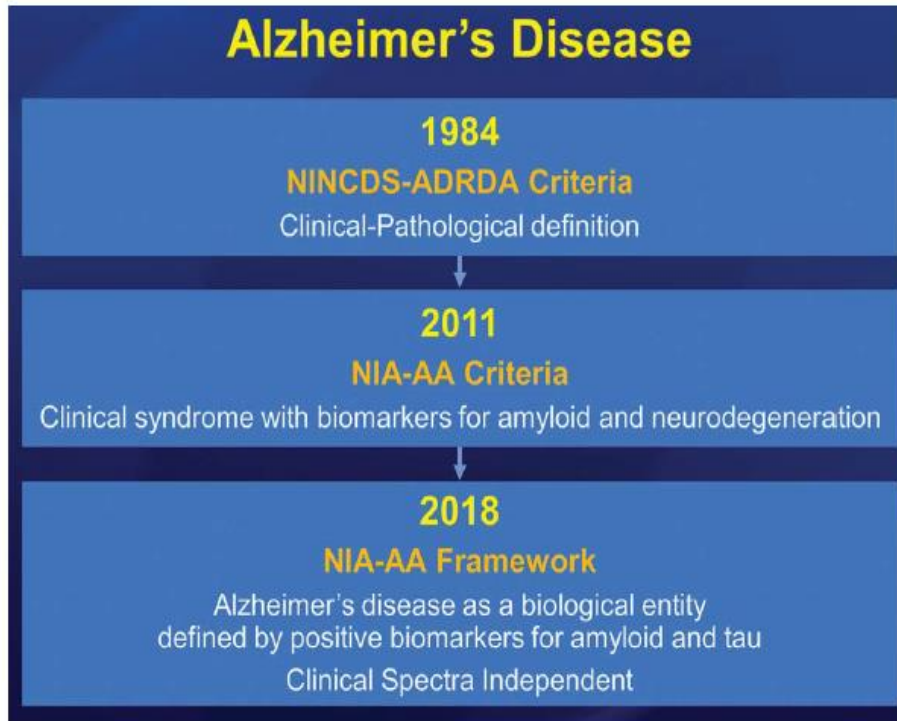
Stage 1

No evidence of mesio-temporal degeneration

No evidence of recent cognitive decline or new neurobehavioral symptoms by report of an observer or by longitudinal cognitive testing



Ruolo della Neuropsicologia?



Identificare il profilo neuropsicologico del MCI amnesico che è suscettibile di evoluzione a demenza di Alzheimer

Discriminare tra i soggetti portatori di Malattia di Alzheimer coloro che evolveranno in demenza di Alzheimer da coloro che non svilupperanno mai una sindrome clinica



Outcomes of Mild Cognitive Impairment by Definition

A Population Study

Mary Ganguli, MD, MPH; Beth E. Snitz, PhD; Judith A. Saxton, PhD; Chung-Chou H. Chang, PhD;
Ching-Wen Lee, MS; Joni Vander Bilt, MPH; Tiffany F. Hughes, PhD; David A. Loewenstein, PhD;
Frederic

Results: Regardless of MCI definition, over 1 year, a small proportion of participants progressed to CDR > 1 (range, 0%-3%) or severe cognitive impairment (0%-20%) at rates higher than their cognitively normal peers. Somewhat larger proportions of participants improved or reverted to normal (6%-53%). Most participants remained stable (29%-92%). Where definitions focused on memory impairment and on multiple cognitive domains, higher proportions progressed and lower proportions reverted on the CDR.

Inc

S. Larrieu, MSc; L. Letenneur, PhD; J.M. Orgogozo, MD; C. Fabrigoule, PhD; H. Amieva, PhD;
N. Le Carret, MSc; P. Barberger-Gateau, MD, PhD; and J.F. Dartigues, MD, PhD



REVIEW

Neuropsychological Measures that Predict Progression from Mild Cognitive Impairment to Alzheimer's type dementia in Older Adults: a Systematic Review and Meta-Analysis

Sylvie Belleville^{1,2} • Céline Fouquet¹ • Carol Hudon^{3,4} •
Hervé Tchala Vignon Zomahoun^{5,6} • Jordie Croteau^{5,6} • Consortium for the Early
Identification of Alzheimer's disease-Quebec

"Verbal memory measures yielded very high predictive accuracy. Other domains (e.g., executive functions, visual memory, language tests) showed better specificity than sensitivity"



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ISSN: 0882-7974

Psychology and Aging

2019, Vol. 34, No. 7, 954–977
<http://dx.doi.org/10.1037/pag0000410>

Performance on Neuropsychological Assessment and Progression to Dementia: A Meta-Analysis

Catherine E. Prado, Stephanie Watt, Matt S. Treeby, and Simon F. Crowe
La Trobe University



Association memory tests



Isabelle



Courtney



Editor



Dancer



Miriam



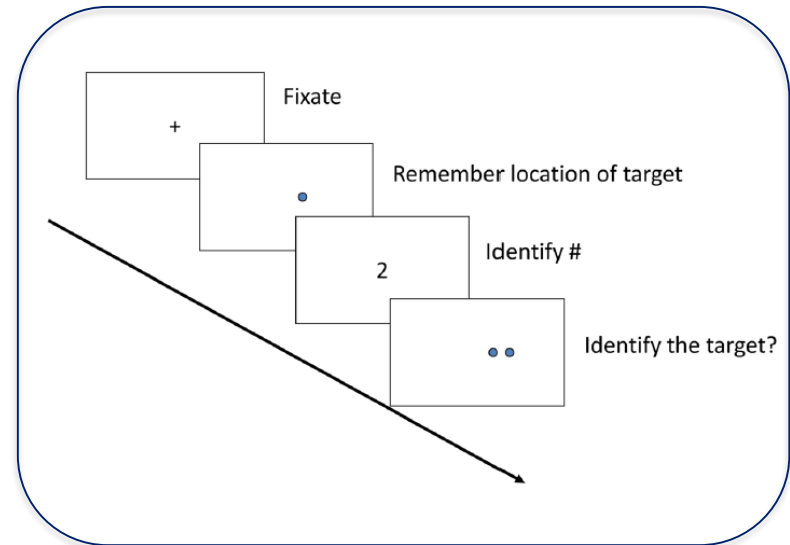
Jane



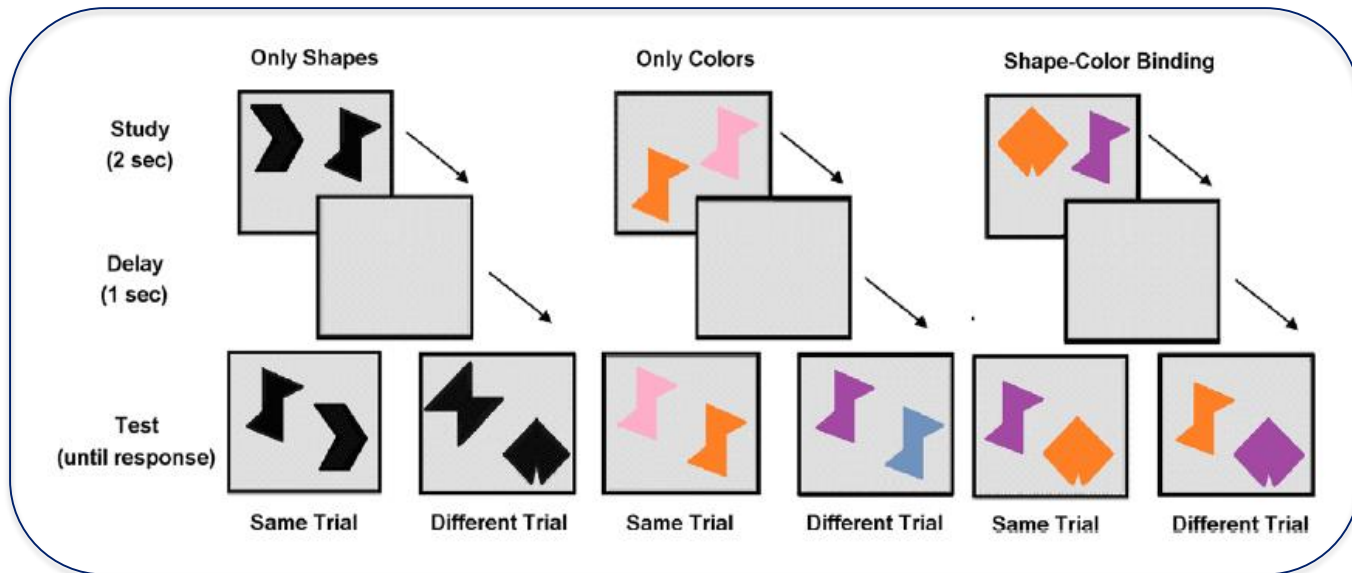
Nutritionist



Weaver



Short term memory binding test



Association memory tests



Isabelle



Courtney



Editor



Dancer



Miriam



Jane

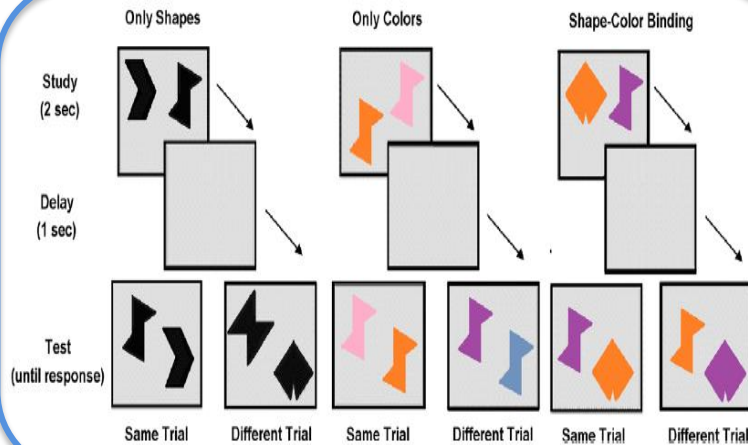


Nutritionist



Weaver

Memory binding tests



LIST A Free and Cued Recall

16 Targets

16 Semantic Categories

LIST B Free and Cued Recall

16 Targets

16 Semantic Categories

LIST A and LIST B Immediate Cued and then, Free Recall

Measures Memory Binding

LIST A and LIST B 30-minute Delayed Cued and Free Recall





Predicting progression to Alzheimer’s disease in subjects with amnesic mild cognitive impairment using performance on recall and recognition tests

Maria Stefania De Simone¹ · Roberta Perri¹ · Lucia Fadda^{1,2} · Carlo Caltagirone^{1,2} · Giovanni Augusto Carlesimo^{1,2}

	Free recall			Recognition	
	5 th Immediate	Delayed	Forgetting	<i>d'</i>	ISR*
HC	9.8 (2)	7.8 (2.6)	-13%	3.7 (1.3)	+ 86%
Stable-MCI	7 (2.2)	4.1 (2.4)	-19%	2.6 (0.9)	+ 81%
Converter-MCI	5.8 (1.4)	2.3 (1.7)	-24%	1.8 (1.1)	+ 70%

* ISR = Index of Sensitivity of Recognition

↓

Stable = Conv

↓

Stable > Conv

↓

Stable = HC
Stable > Conv

