La PET nella patologia benigna

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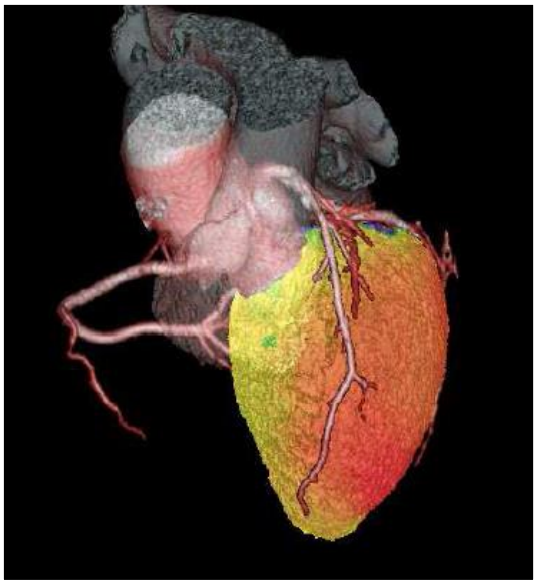
Ospedale Santo Stefano, Prato

SOCIETÀ MEDICA DI SANTA MARIA NUOVA
VIII EDIZIONE
Giornate Mediche di Santa Maria Nuova 2016
L'Ospedale dei Fiorentini
SANTA MARIA NUOVA: DALL'OSPEDALE DEL CENTRO DI FIRENZE ALLA USL TOSCANA CENTRO
Condivisione di percorsi gestionali comuni e di peculiarità assistenziali
7 - 8 Ottobre 2016

Biomarkers



"a characteristic that is objectively measured and evaluated as an indicator of normal biological **processes**, pathogenic processes, or pharmacologic responses to a therapeutic intervention." NIH

"any substance, structure, or process that can be measured in the body or its products and influence or **predict the incidence of outcome** or disease" WHO

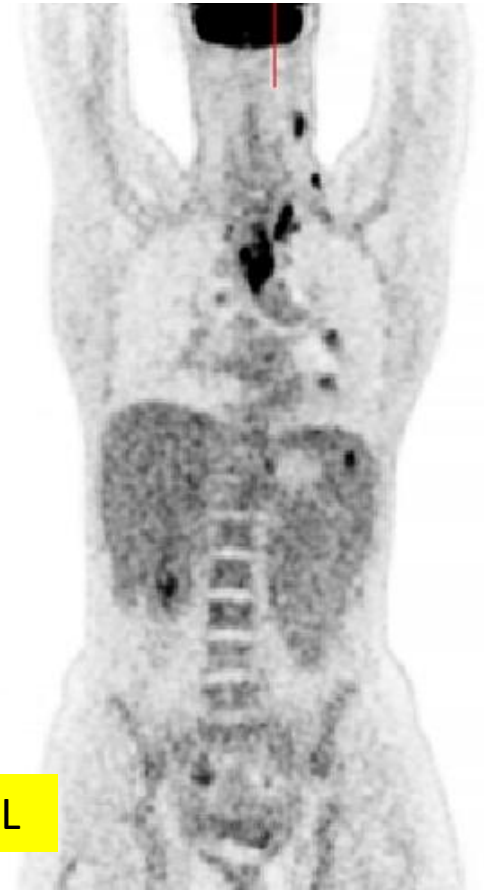
visualizzazione dei processi

objective indications of medical state **observed from outside** the patient

Medicina Nucleare utilizza biomarkers

F18DG-PET

biomarker della glicolisi



HL

oncologia

modifica fino al 20-40 % l' iter dei pazienti oncologici

Hillner BE Cancer 2009; 115(2)410-418

Pictorial Review

FDG PET/CT in infection and inflammation—current and emerging clinical applications

S. Vaidyanathan [a,b], C.N. Patel [a,b], A.F. Scarsbrook [a,b], F.U. Chowdhury [a,b,*]

F18DG Biomarker

rBF; Glut 1 ; Glut3; esochinasi

↓

visualizzazione della glicolisi

↓

- **Diagnosi**
- **Grading**

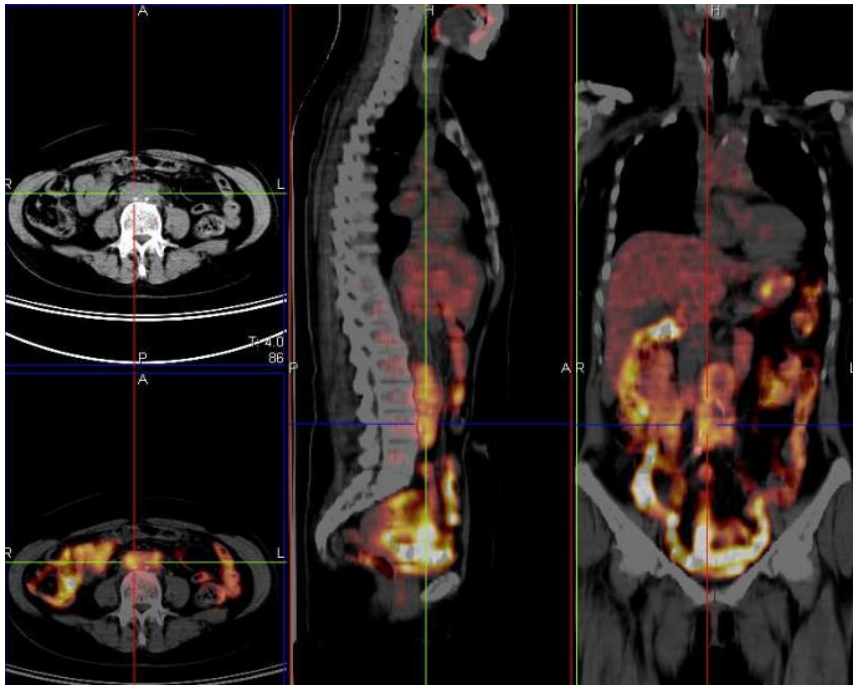
↓

risposta al trattamento

EANM/SNMMI Guideline for ^{18}F-FDG Use in Inflammation and Infection*

Francois Jamar[1] (Chair), John Buscombe[2], Arturo Chiti[3], Paul E. Christian[4], Dominique Delbeke[5], Kevin J. Donohoe[6], Ora Israel[7], Josep Martin-Comin[8], and Alberto Signore[9]

THE JOURNAL OF NUCLEAR MEDICINE • Vol. 54 • No. 4 • April 2013



Fibrosi retroperitoneale

Pictorial Review

FDG PET/CT in infection and inflammation—current and emerging clinical applications

S. Vaidyanathan [a,b], C.N. Patel [a,b], A.F. Scarsbrook [a,b], F.U. Chowdhury [a,b,*]

Clinical Radiology 70 (2015) 787–800

vasculiti
spondilodisciti
sarcoidosi
FUO
connettiviti
polimialgia reumatica
periaortite
fibrosi retroperitoneale

sarcoidosi

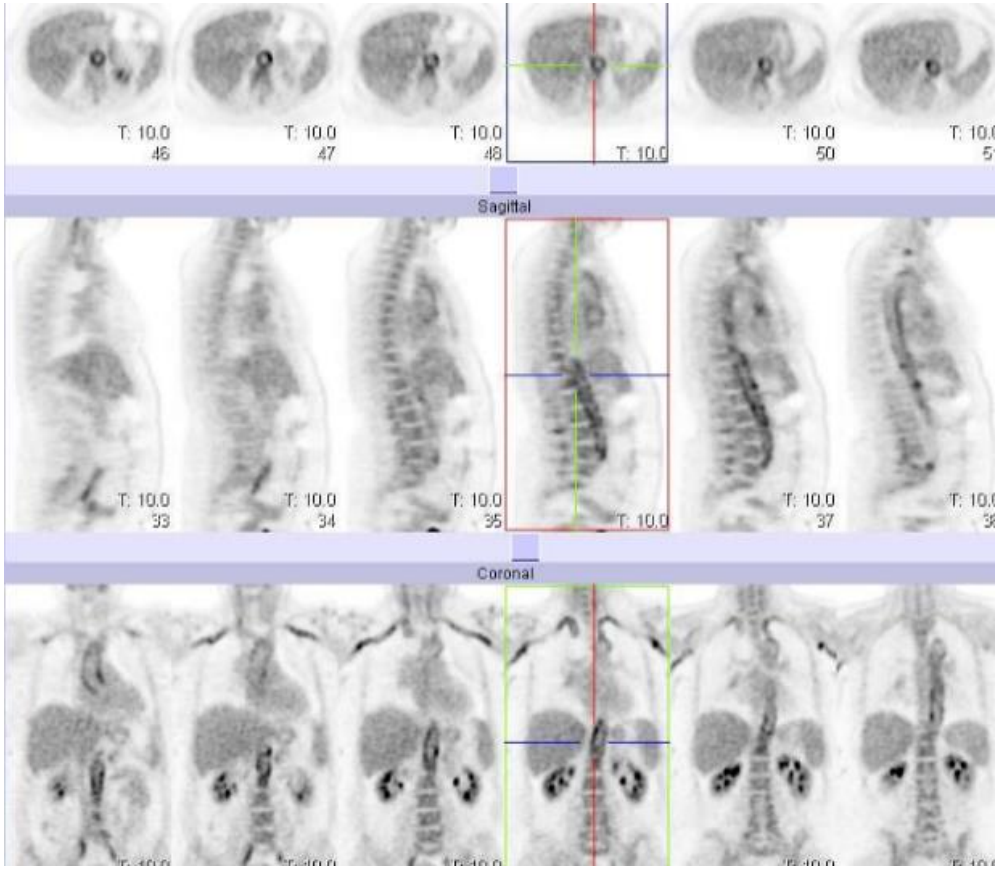
vasculiti

La FDG-PET è in grado di diagnosticare efficacemente le vasculiti in fase metabolicamente attiva (Otsuka H 2007

Sensibilità (77-92%)e Specificità (89-100%) nella diagnosi di vasculiti dei grossi vasi in presenza di elevati valori dei markers di flogosi (Zerizer I 2010, Webb M 2006)

In particolare la FDG-PET permette la diagnosi di vasculite più **precocemente** delle tecniche di imaging convenzionale permettendo di impostare rapidamente il corretto trattamento (Zerizer I 2010)

vasculiti



L' entità dell'uptake è **proporzionale** al grado di infiammazione
Scala di grading a 4 punti con riferimento l'uptake epatico (Walter MA 2005)

Scansione WB

Estensione e valore prognostico

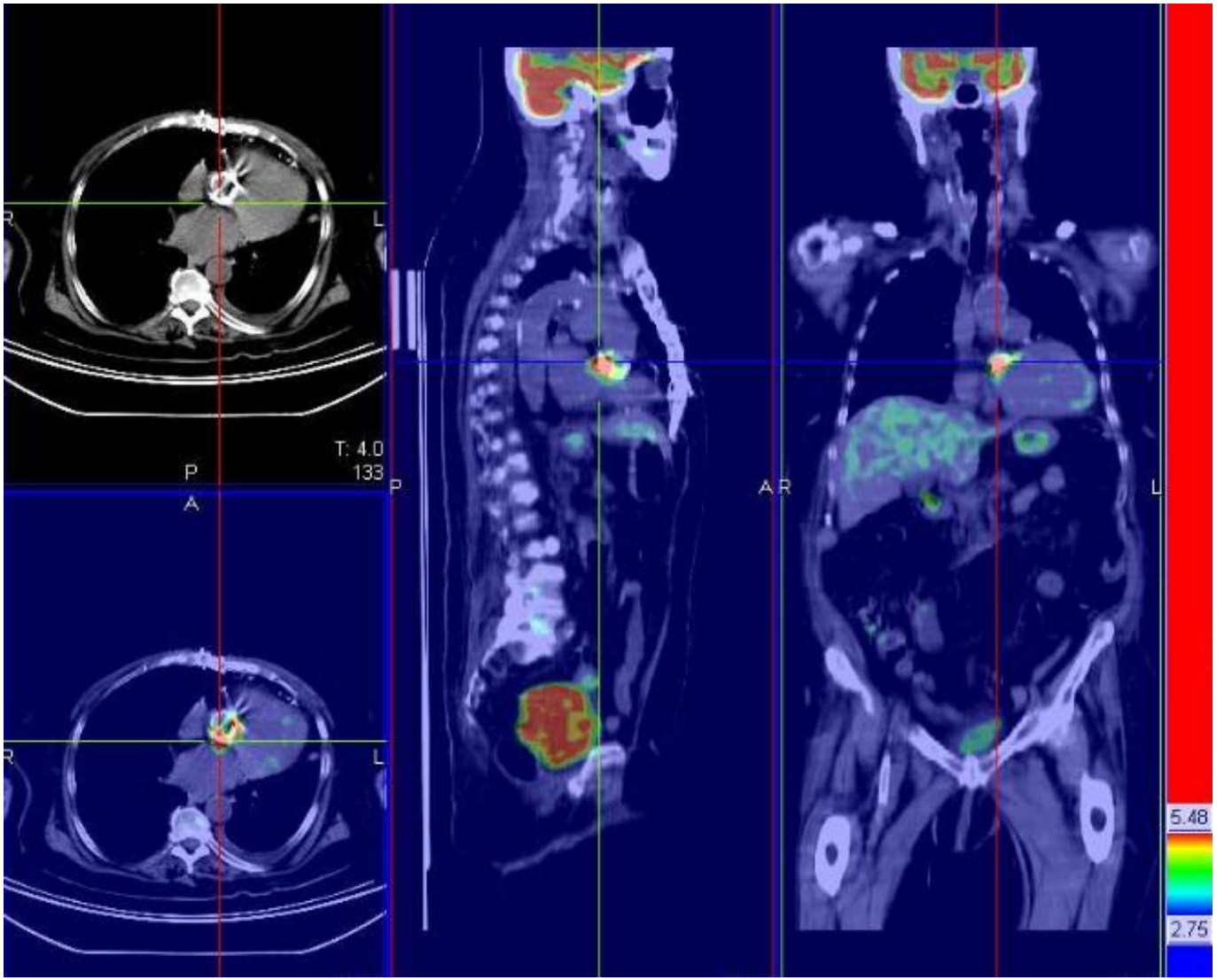
Limite per i piccoli vasi e aterosclerosi

Risposta al trattamento (Brodman M 2004, Tezuka D 2012)

Importanza di pazienti naive alla diagnosi

FUO

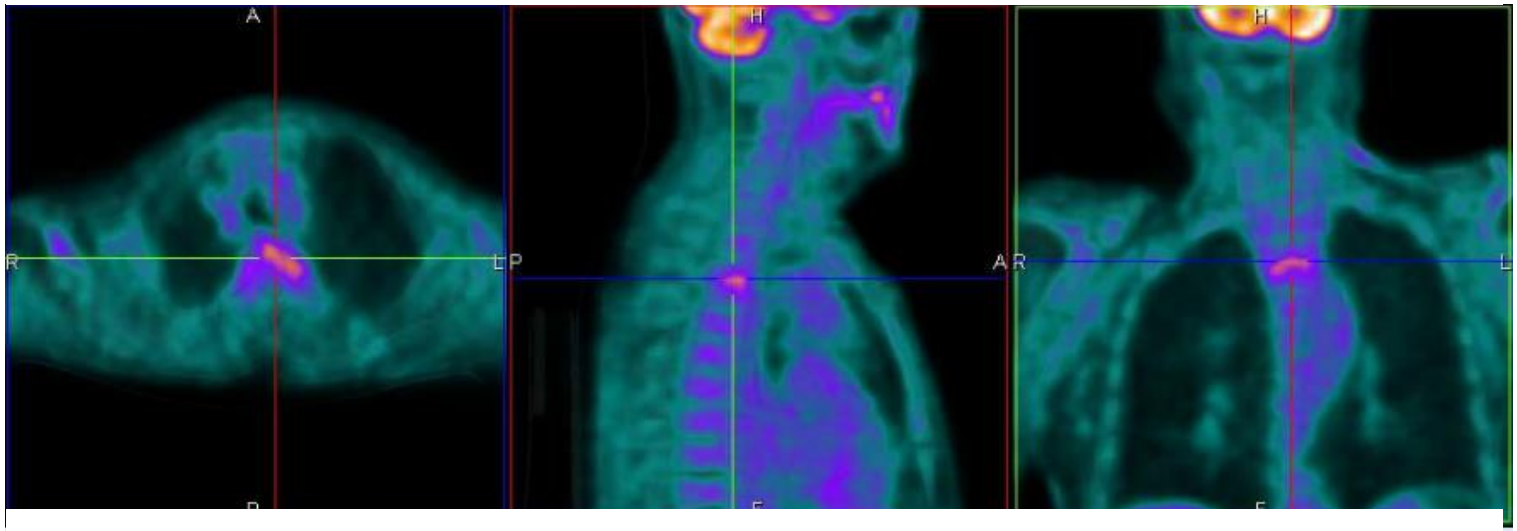
Protesi infetta



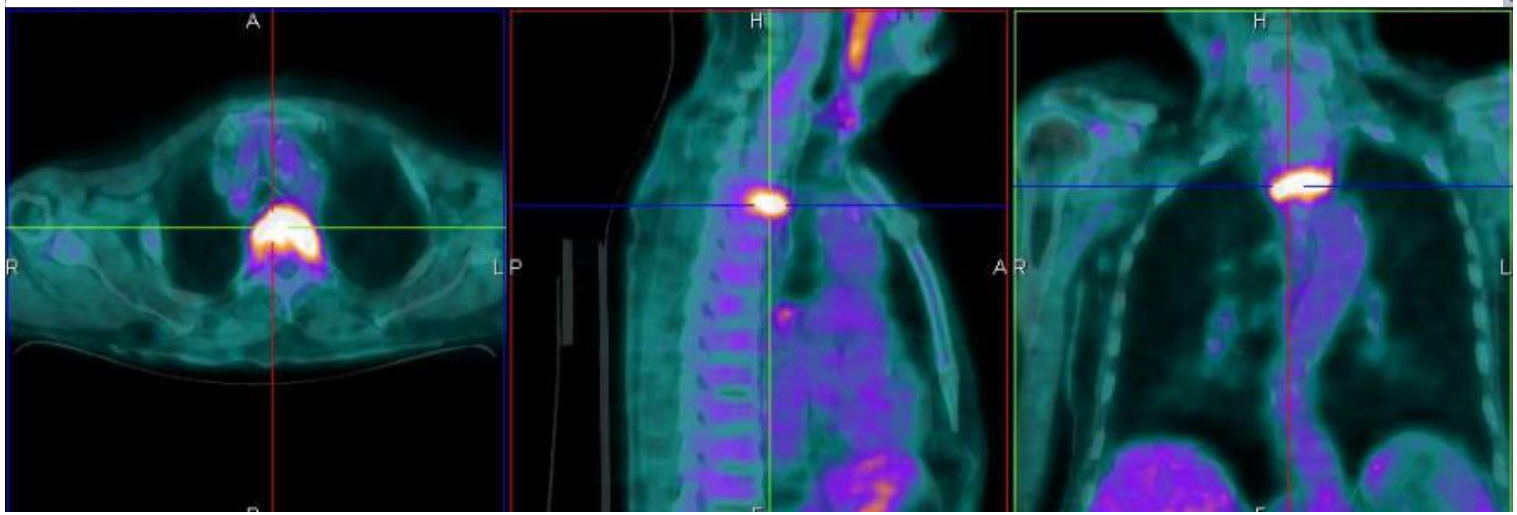
spondilodisciti

buona risposta

dopo 3 settimane di terapia antibiotica



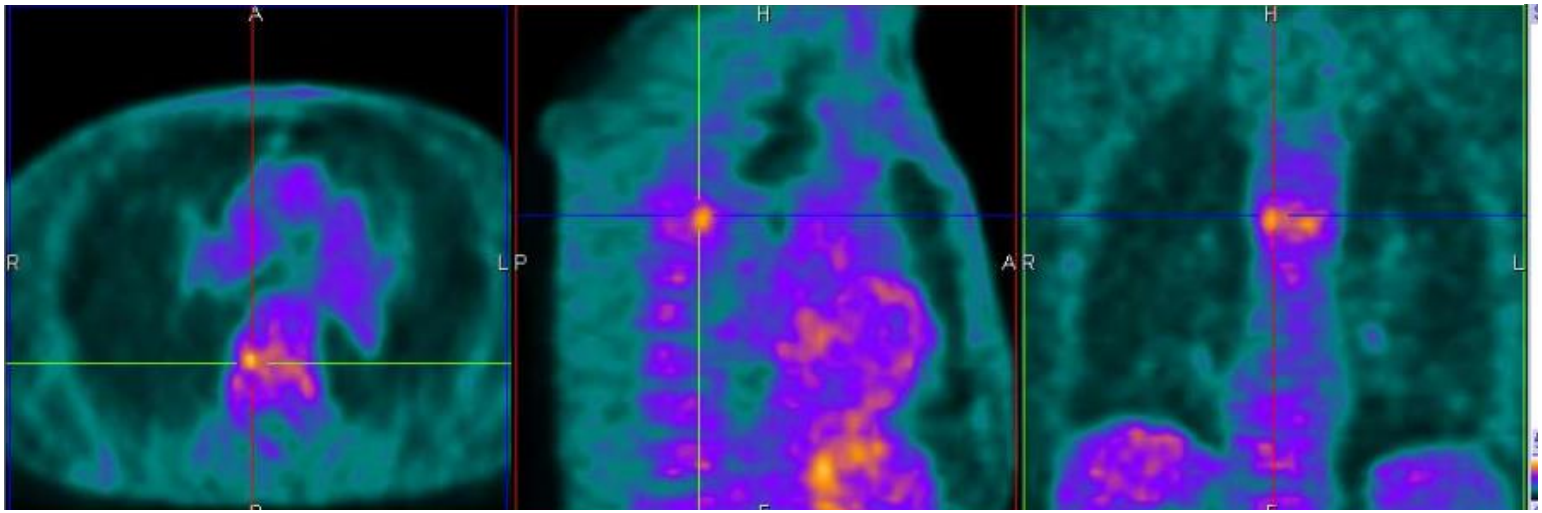
base



spondilo disciti

ridotta risposta

dopo 3 settimane di terapia antibiotica



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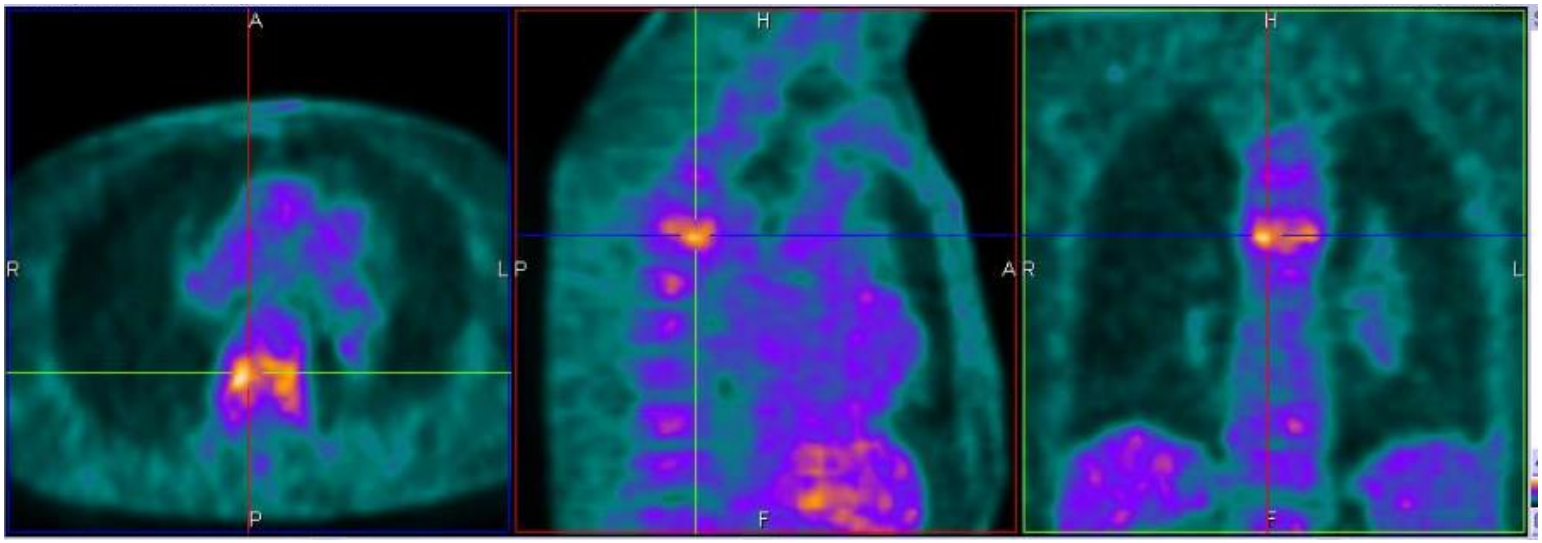
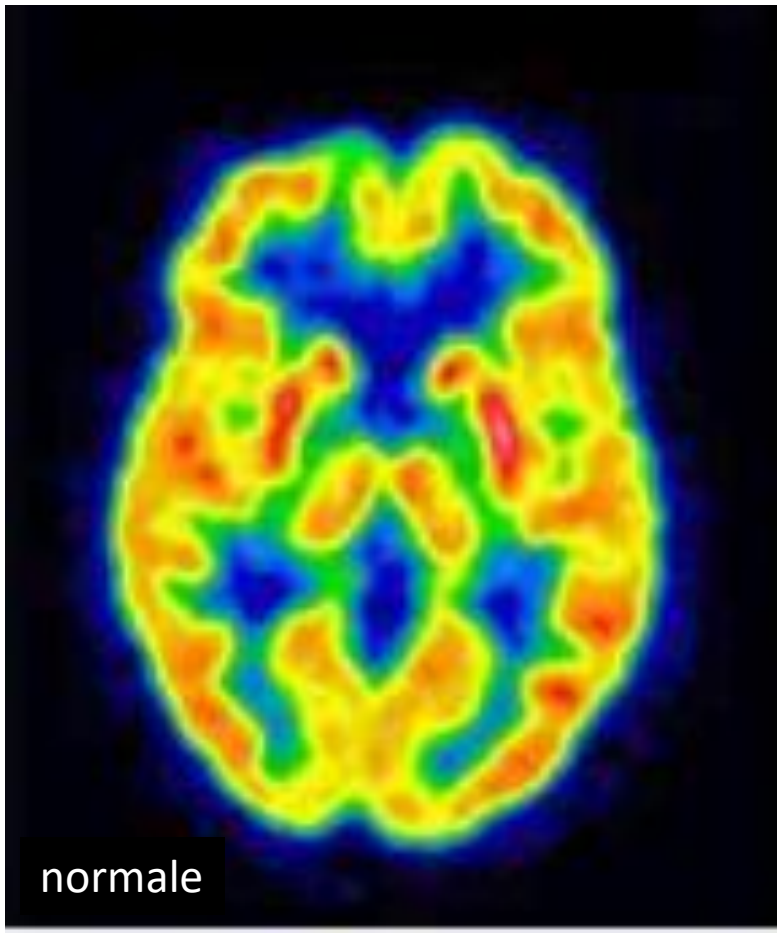


m. neurodegenerative

FDG **biomarker** della glicolisi

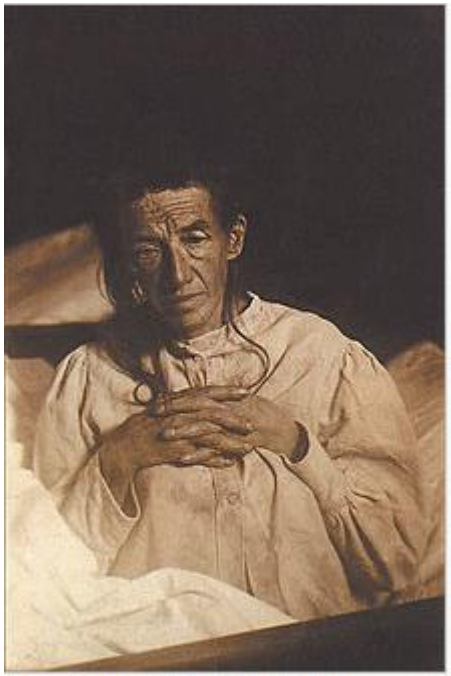


Il cervello che rappresenta solo il 2 % del peso corporeo usa circa il 20% del glicosio

m. neurodegenerative

Demenze

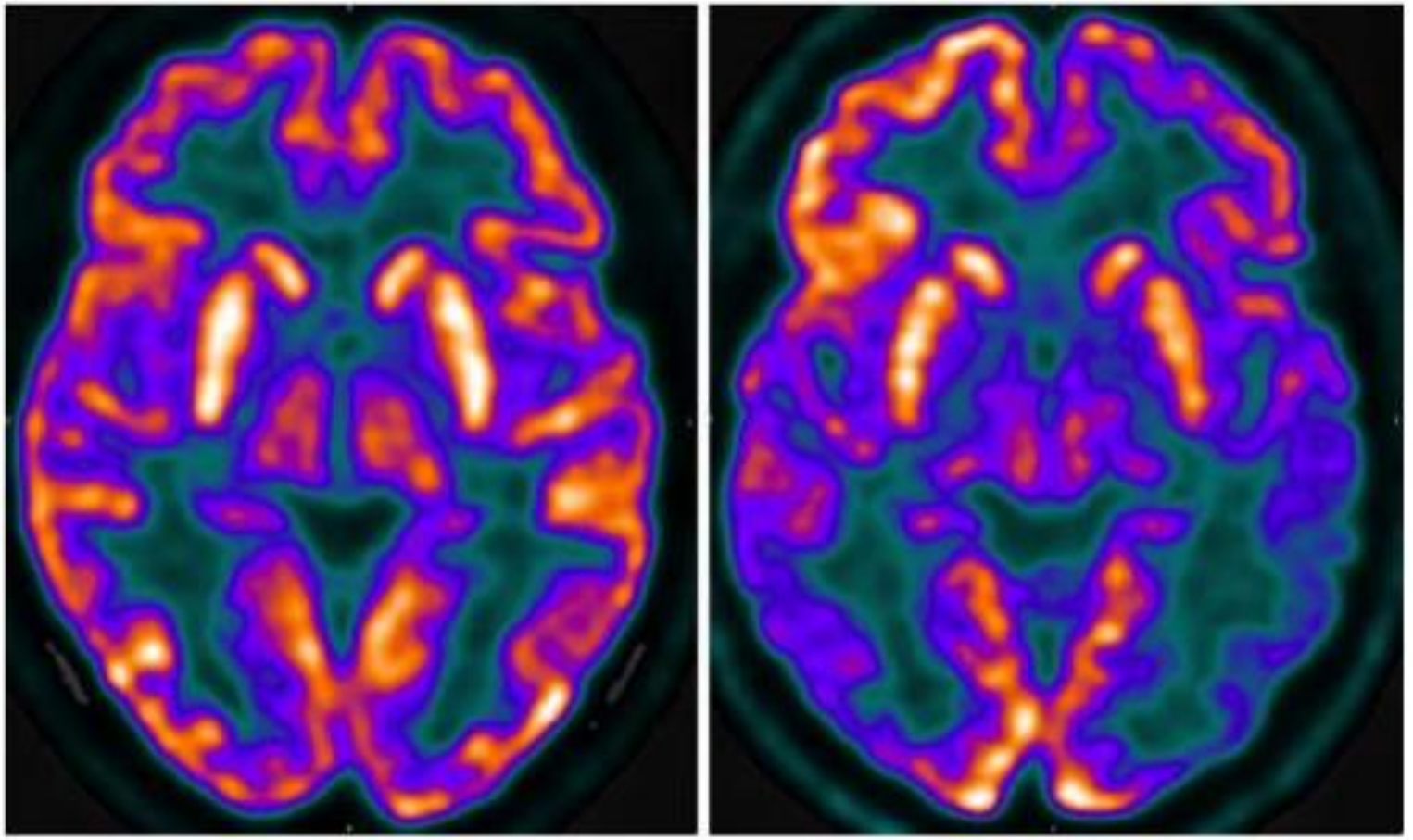
In Italia 1.2 milioni di persone sono affette da AD… ma si stima un incremento del 400 % come conseguenza dell'invecchiamento



La signora Auguste Deter (1850-1906), paziente del dottor Alois Alzheimer, il primo caso documentato della malattia.

m. neurodegenerative

FDG - PET



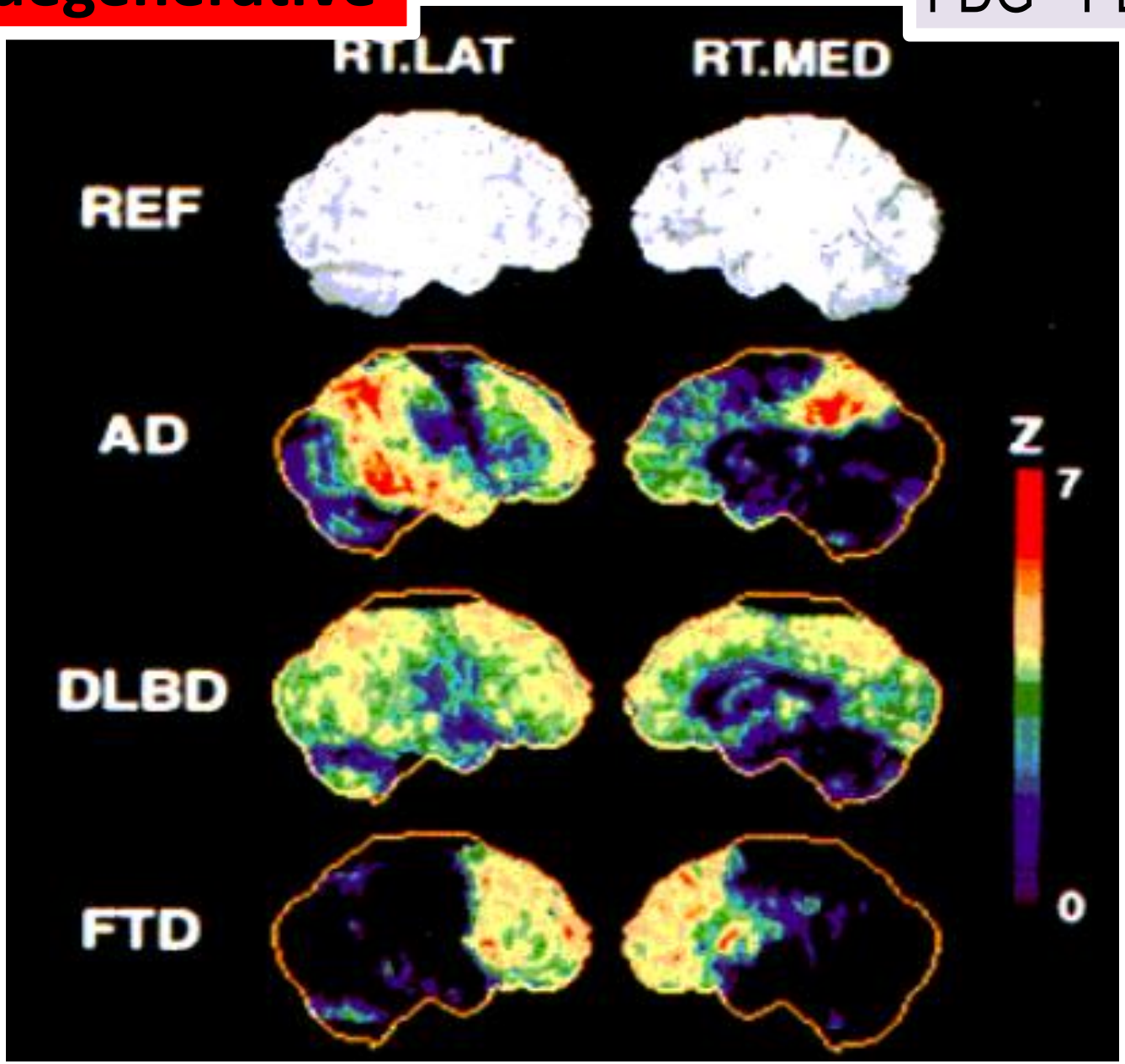
normale

AD

http://www.lanfrancobarbieri.com/prevenzione/elementi-di-anatomia-e-fisiologia-del-cervello.html

m. neurodegenerative

FDG - PET



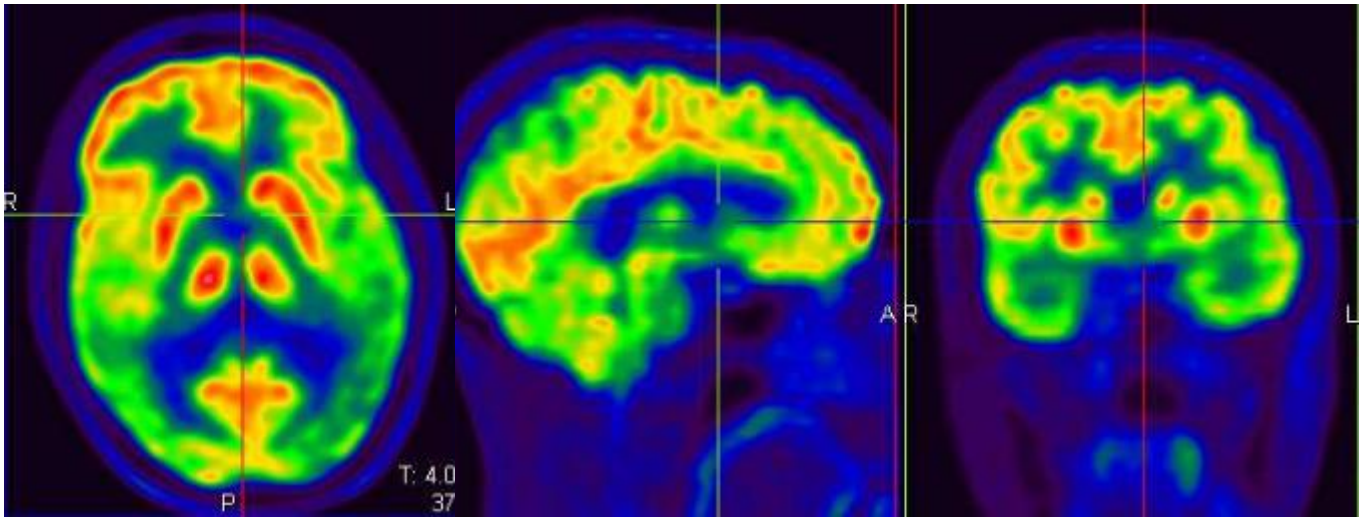
http://www.lucignani.it/download/neuroradiologia1.pdf

neurologia

F18 –DG

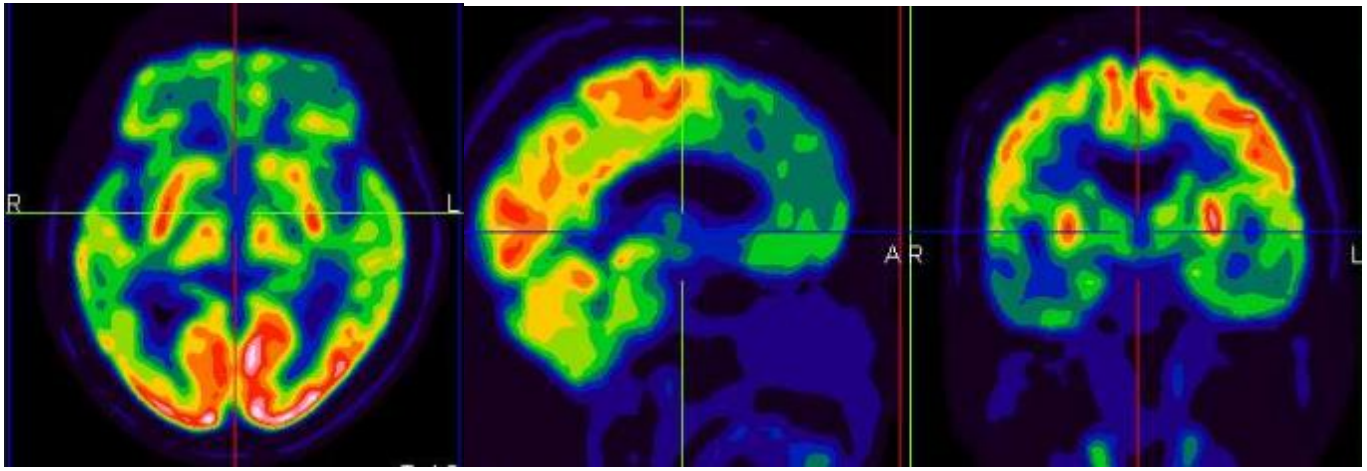
Dismnesia

AD-like ?



Demenza multidominio
AD frontale ?
FTD?

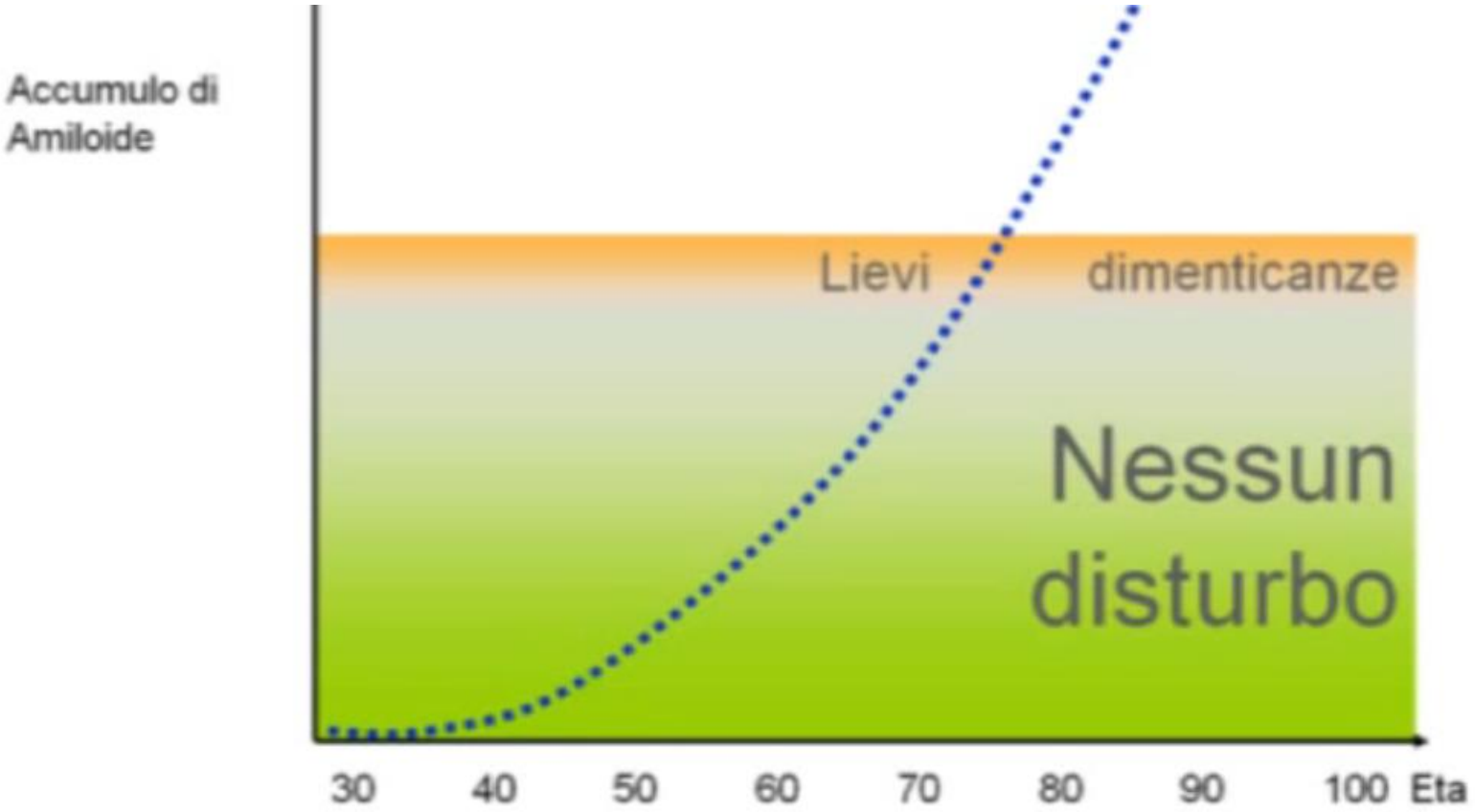
FTD ?



m. neurodegenerative

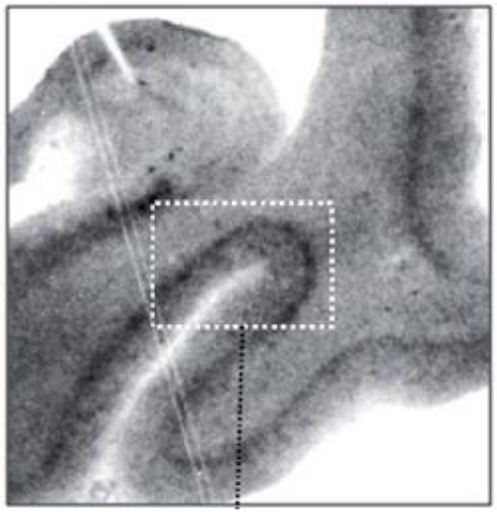
Alzheimer Disease: la causa ?

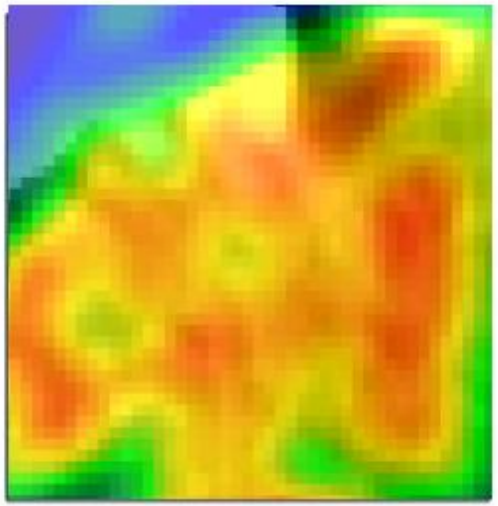
Ora sappiamo che il peptide beta-amiloide, neurotossico, è l' elemento principale delle placche che si formano nei tessuti e nelle strutture vascolari cerebrali e che costituiscono uno dei marchi dell'AD

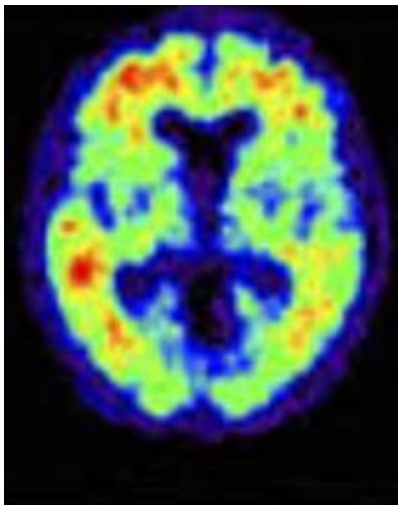


m. neurodegenerative

PET * ligand della Aβ
biomarker







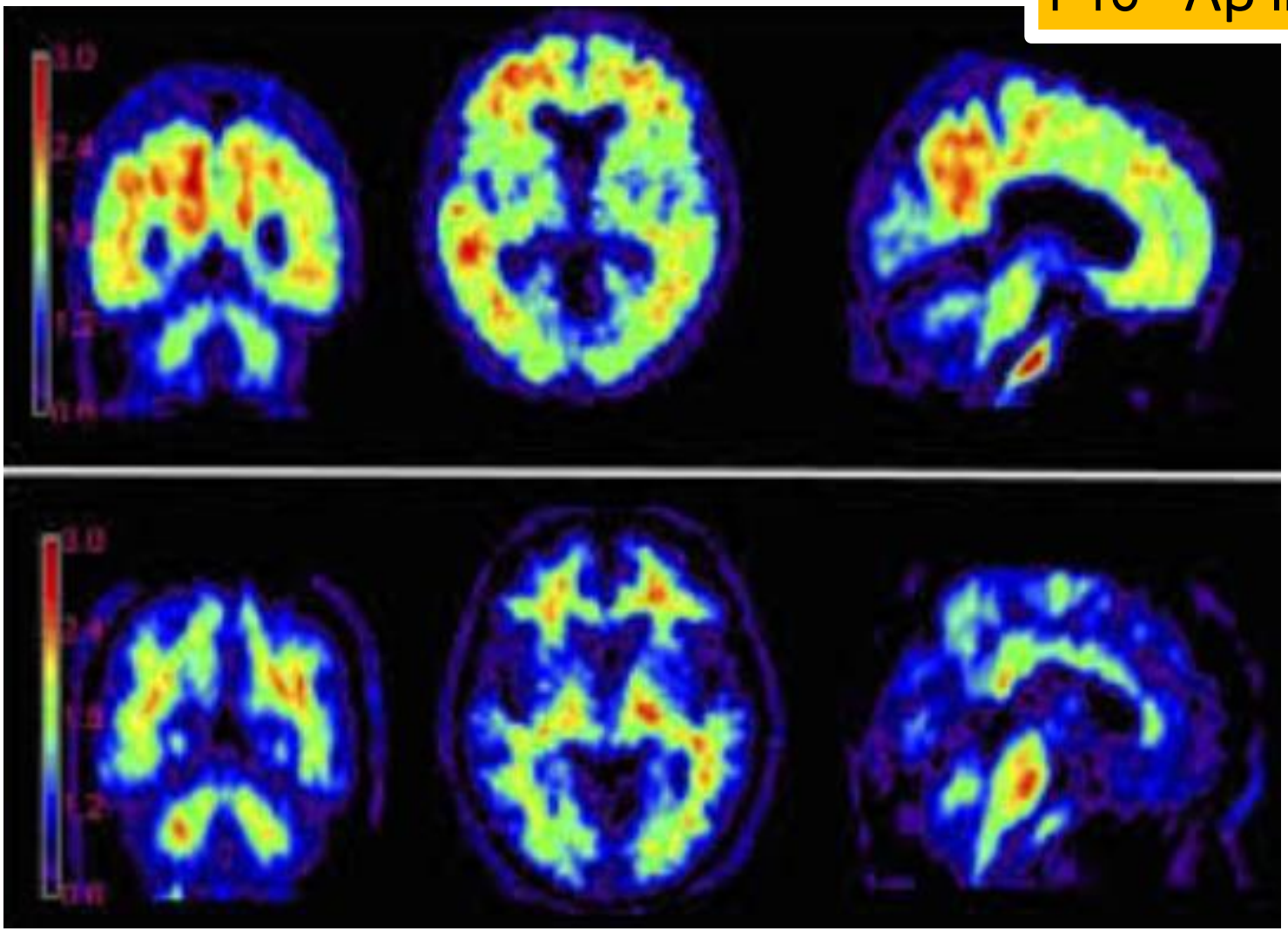
Post-mortem C11-PET ligand F18 ligand

Because the same misfolded protein can manifest as different and distinct clinical phenotypes, and a particular phenotype can be caused by different misfolded proteins, **definitive diagnosis is still reliant on post-mortem neuropathology**

... oggi non più necessario, perché possiamo vedere accumulo di proteine patogene direttamente in vivo.

m. neurodegenerative

F18 –Aβ ligand



AD

controllo

F18 amyloid ligand

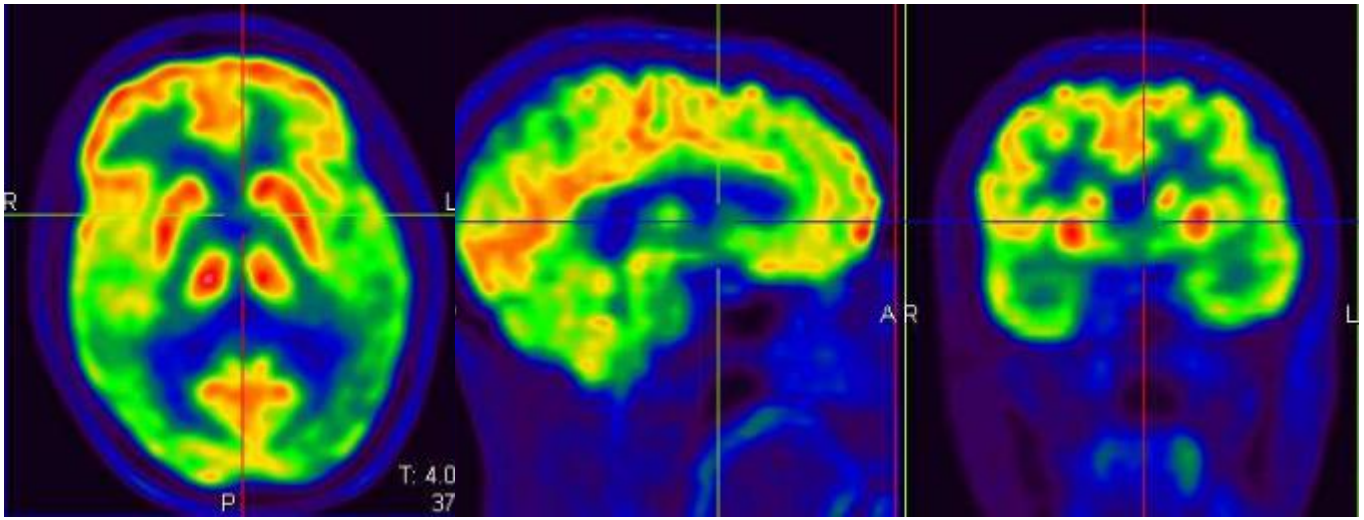
m. neurodegenerative

F18 –DG

F18 –Aβ ligand

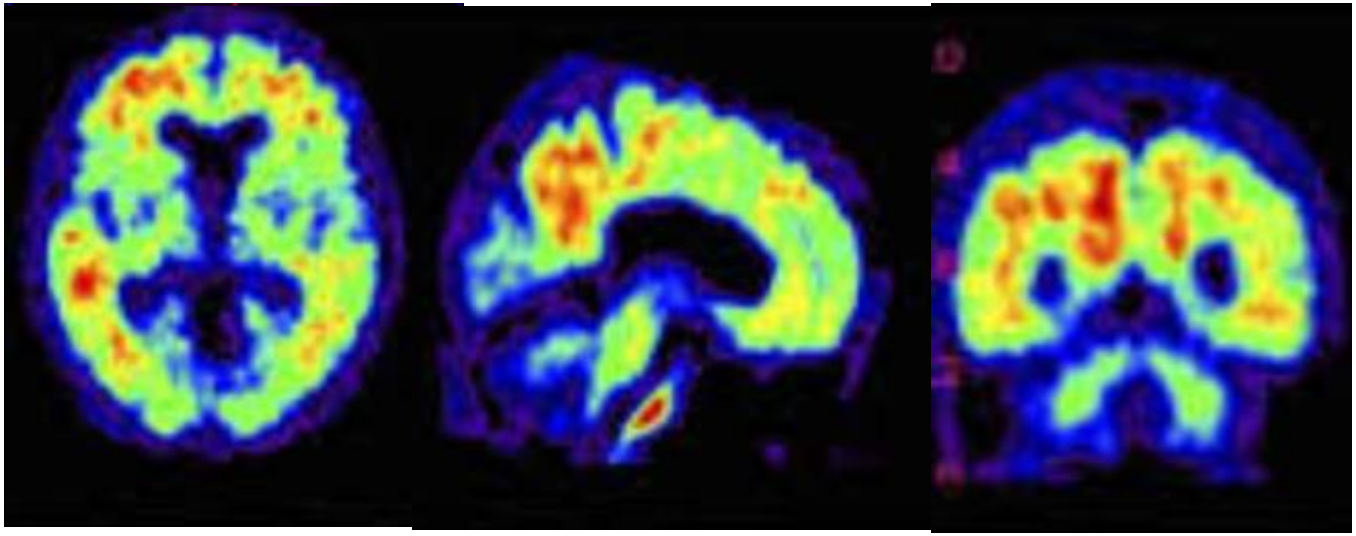
Dismnesia

AD-like



Captazione corticale

AD



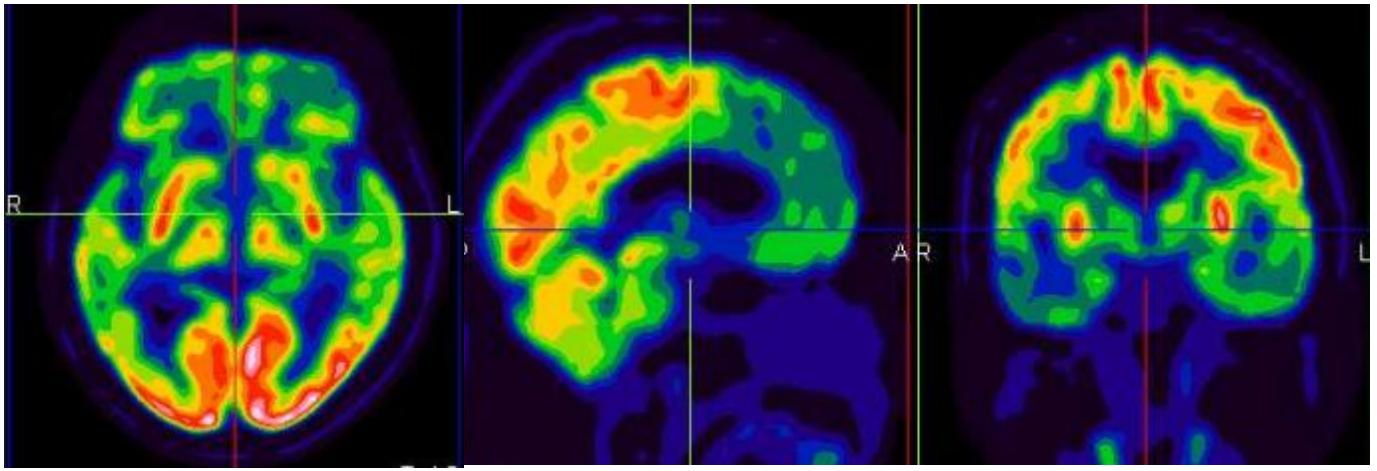
m. neurodegenerative

F18 –DG

F18 –Aβ ligand

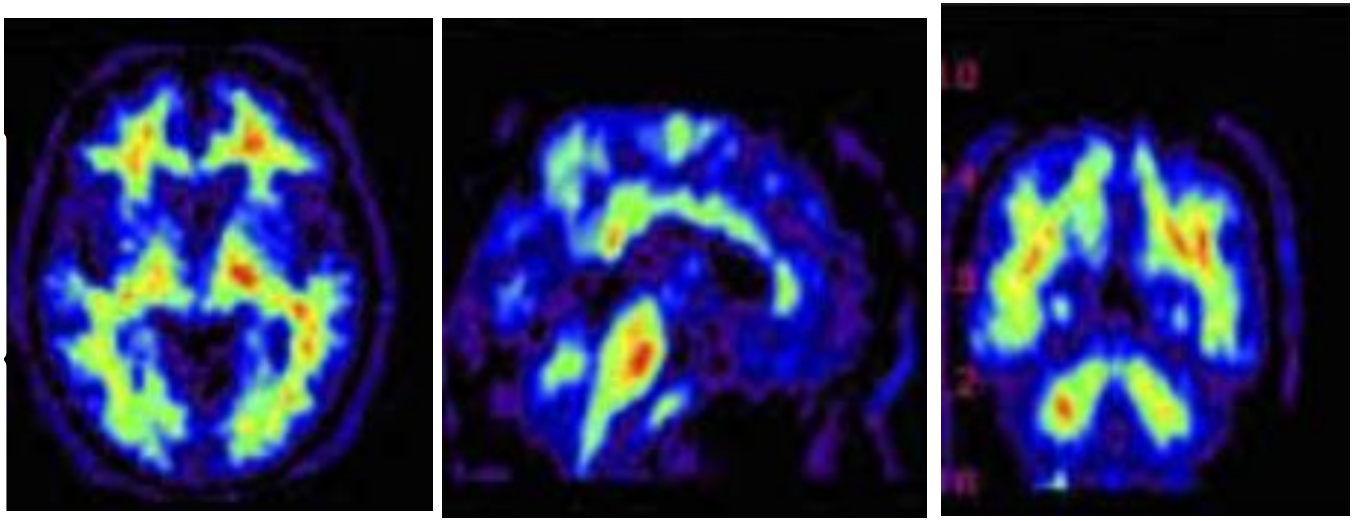
Demenza multidominio AD frontale ? FTD?

FTD ?



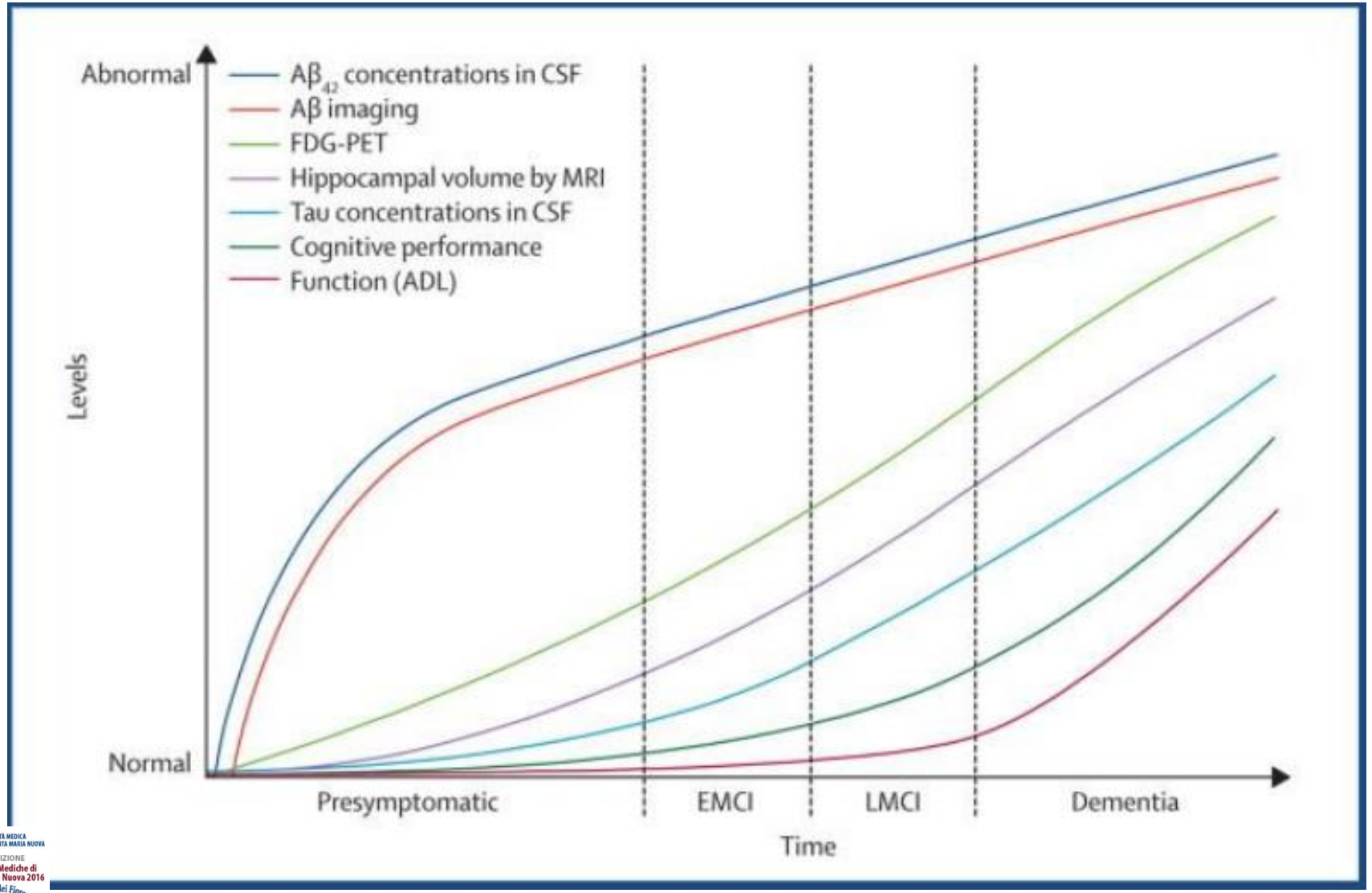
NON Captazione corticale

FTD



m. neurodegenerative

biomarker di AD

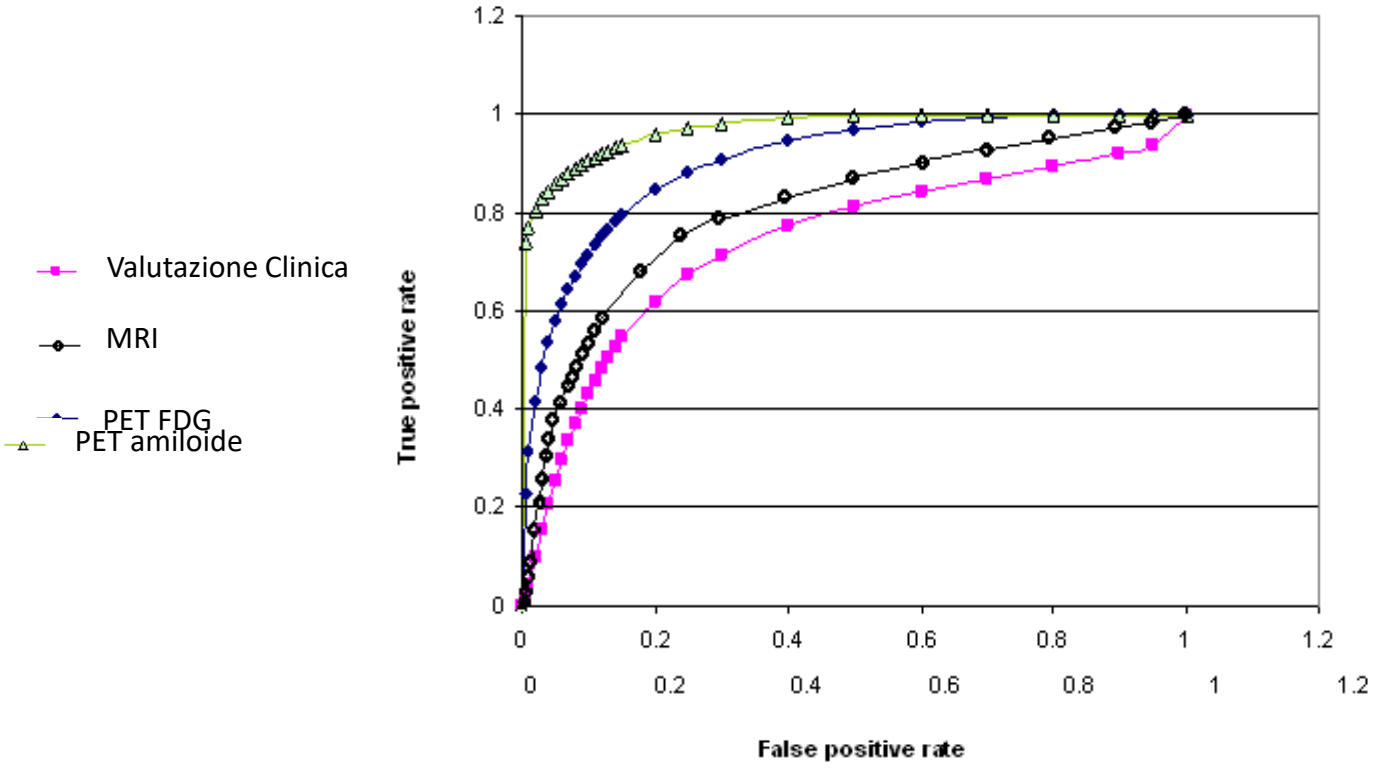


The Lancet Neurology 2010; 9:4-5)

m. neurodegenerative

biomarker di AD

Percorso diagnostico della PET amiloide



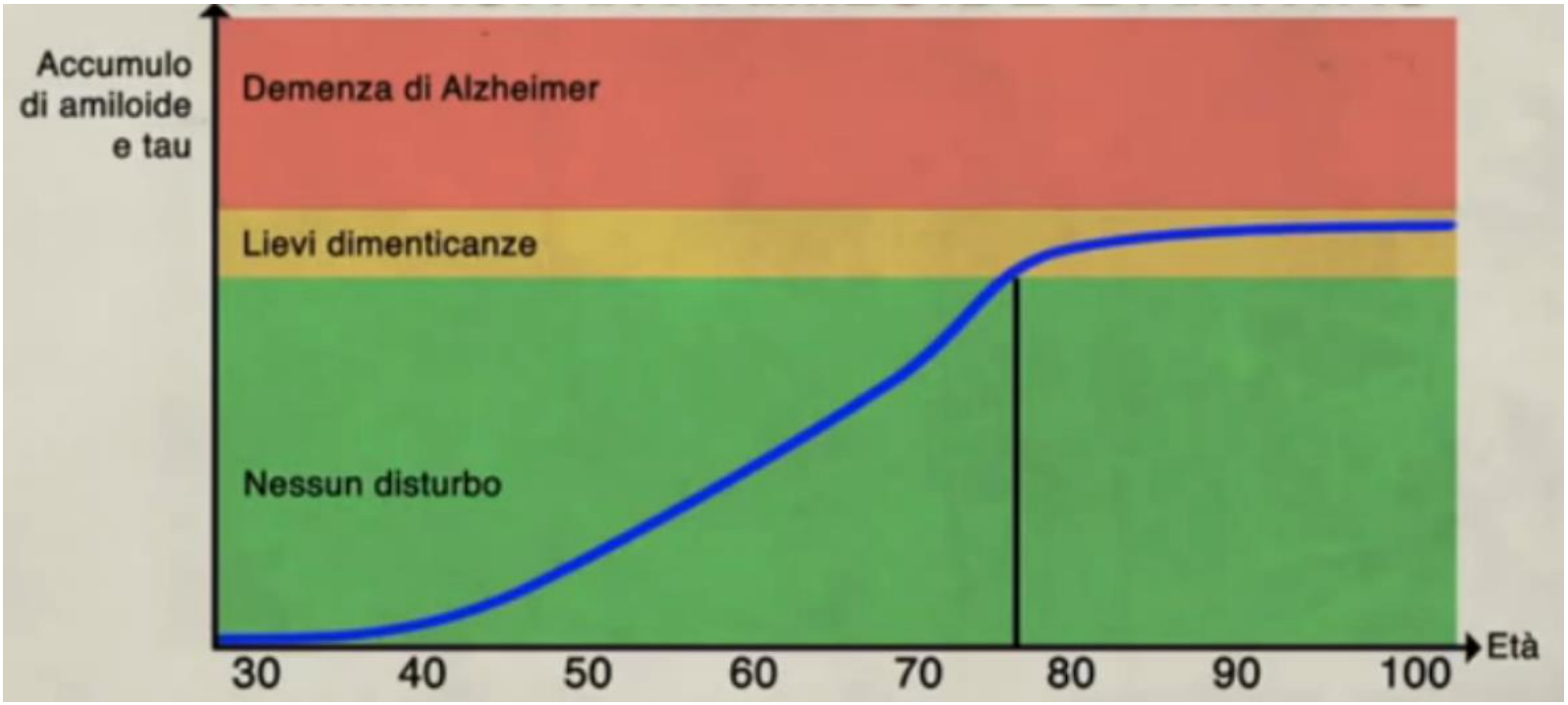
Sestini S. 2016

Guerra UP, Nobili FM, Padovani A, Perani D, Pupi A, Sorbi S, Trabucchi M. Recommendations from the Italian Interdisciplinary Working Group (AIMN, AIP, SINDEM) for the utilization of amyloid imaging in clinical practice. Neurol Sci. 2015 Jan 24.

m. neurodegenerative

AD: nuovi farmaci ?

Sono prossimi alla registrazione dei farmaci per prevenire o rimuovere l' accumulo di beta-amiloide (immunoterapia)
Si pensa che una causa del fallimento di alcuni trials possa dipendere dalla "fase" di malattia --- > una diagnosi precoce permetterebbe una terapia mirata, precoce e maggior speranza di successo



m. neurodegenerative

AD: nuovi farmaci ?

The antibody aducanumab reduces Aβ plaques in Alzheimer's disease

Jeff Sevigny[1]*, Ping Chiao[1]*, Thierry Bussière[1]*, Paul H. Weinreb[1]*, Leslie Williams[1], Marcel Maier[2], Robert Dunstan[1], Stephen Salloway[3], Tianle Chen[1], Yan Ling[1], John O'Gorman[1], Fang Qian[1], Mahin Arastu[1], Mingwei Li[1], Sowmya Chollate[1], Melanie S. Brennan[1], Omar Quintero-Monzon[1], Robert H. Scannevin[1], H. Moore Arnold[1], Thomas Engber[1], Kenneth Rhodes[1], James Ferrero[1], Yaming Hang[1], Alvydas Mikulskis[1], Jan Grimm[2], Christoph Hock[2,4], Roger M. Nitsch[2,4]§ & Alfred Sandrock[1]§

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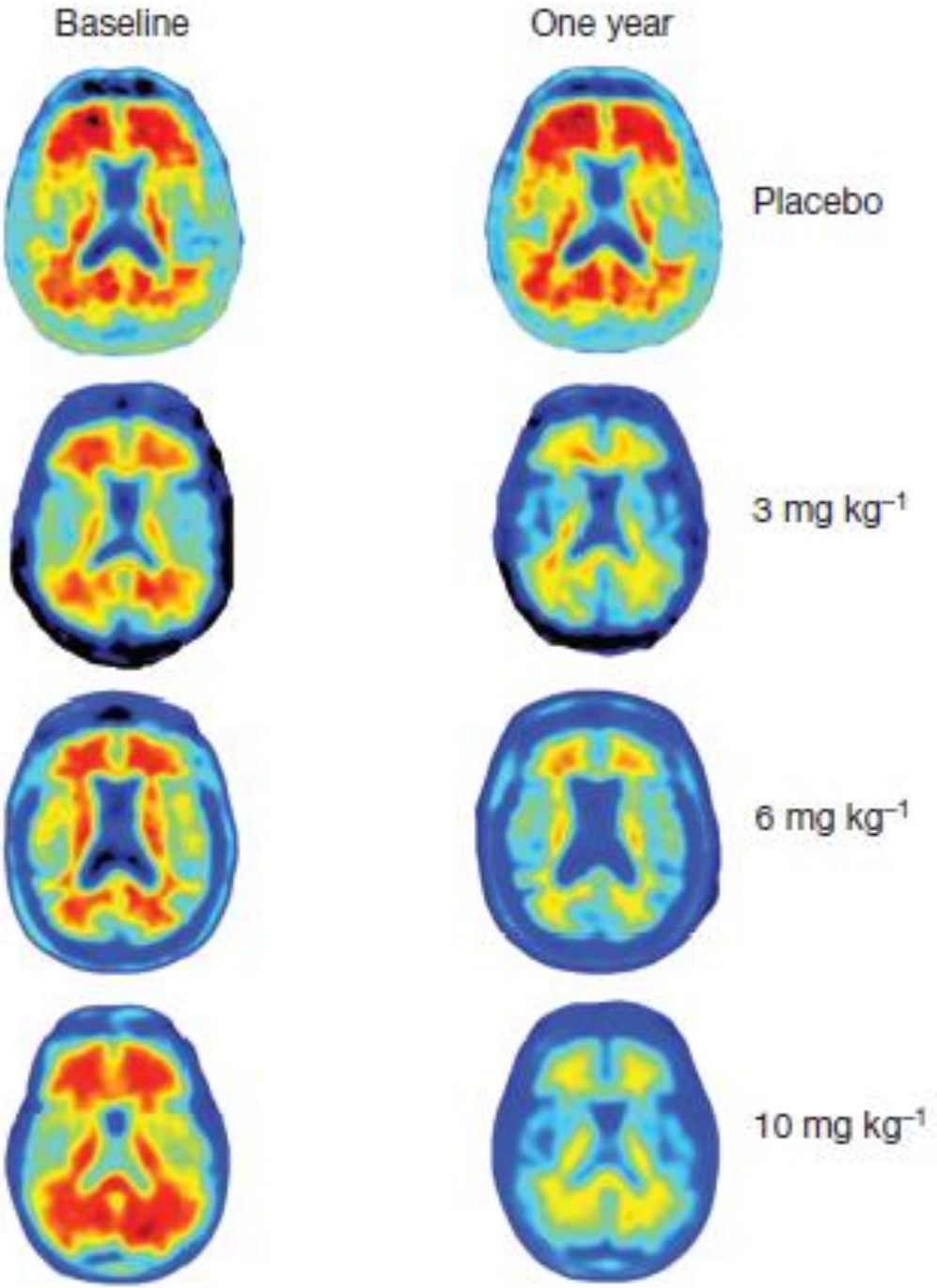
PET-F18 –Aβ ligand

Biomarker per l' accesso

Biomarker per il monitoraggio



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