



Consiglio Nazionale Ricerche



**SCUOLA SUPERIORE DI NEUROLOGIA
V CORSO
“NERUROIMMAGINI NELLA MALATIA DI
PARKINSON E NEI PARKINSONISMI”**

Genova, 21-22 febbraio 2017



**MIBG-SCINTIGRAPHY-PRECLINICAL
AND PREMOTOR PHASE OF
PARKINSON DISEASE**

Maria Salsone

**Unità di Ricerca Neuroimmagini
IBFM-Consiglio Nazionale delle Ricerche
Germaneto, Catanzaro**

Genova, 22 Febbraio 2017

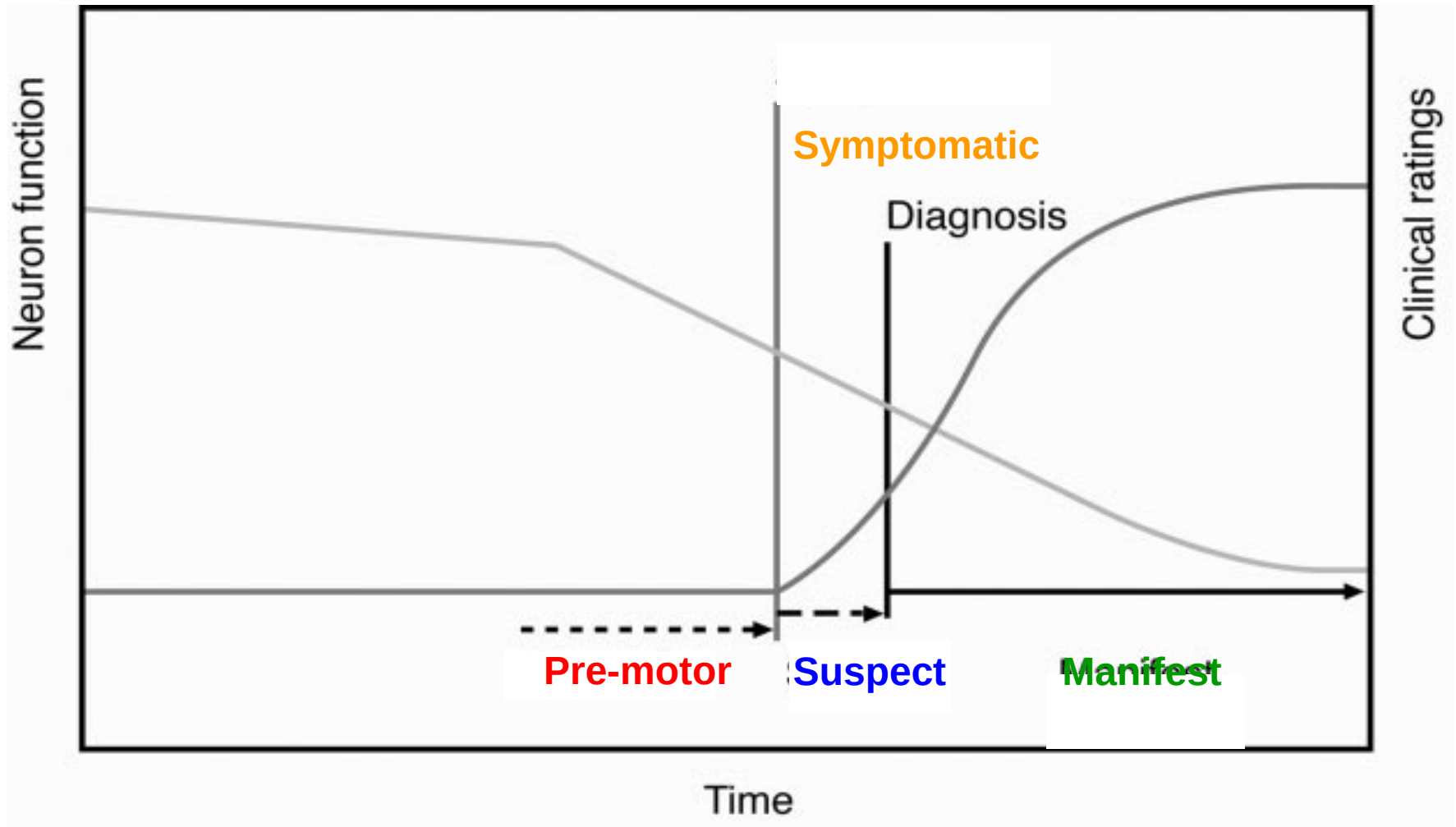


OUTLINE OF THE PRESENTATION:

- ✓ **MIBG-Scintigraphy;**
- ✓ **MIBG-Scintigraphy in Parkinson Disease and Parkinsonism;**
- ✓ **MIBG-Scintigraphy in Preclinical and Premotor Phases of Parkinson Disease and Parkinsonism;**

Can we Image premotor Parkinson Disease (PD)?

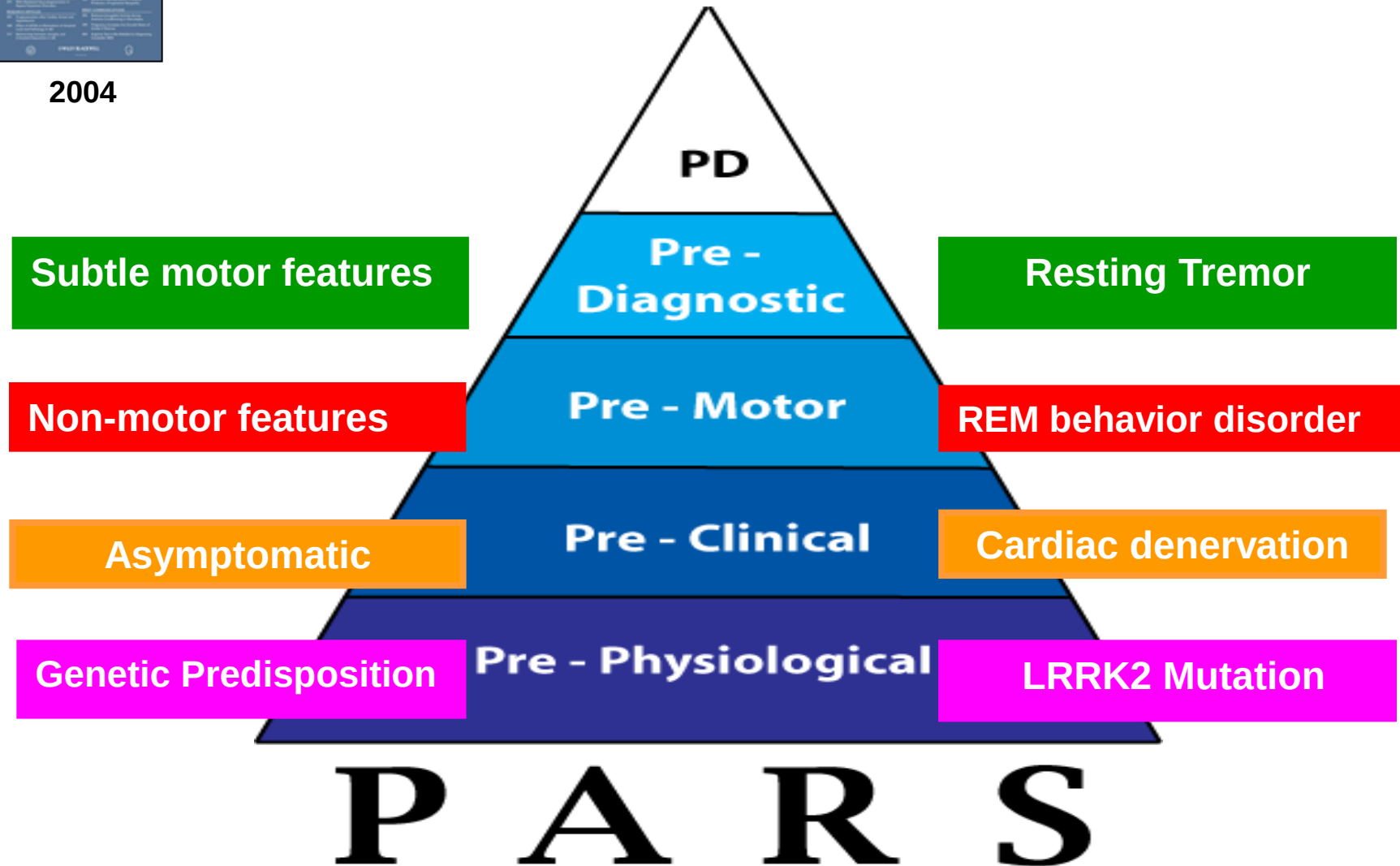
Natural history of motor PD



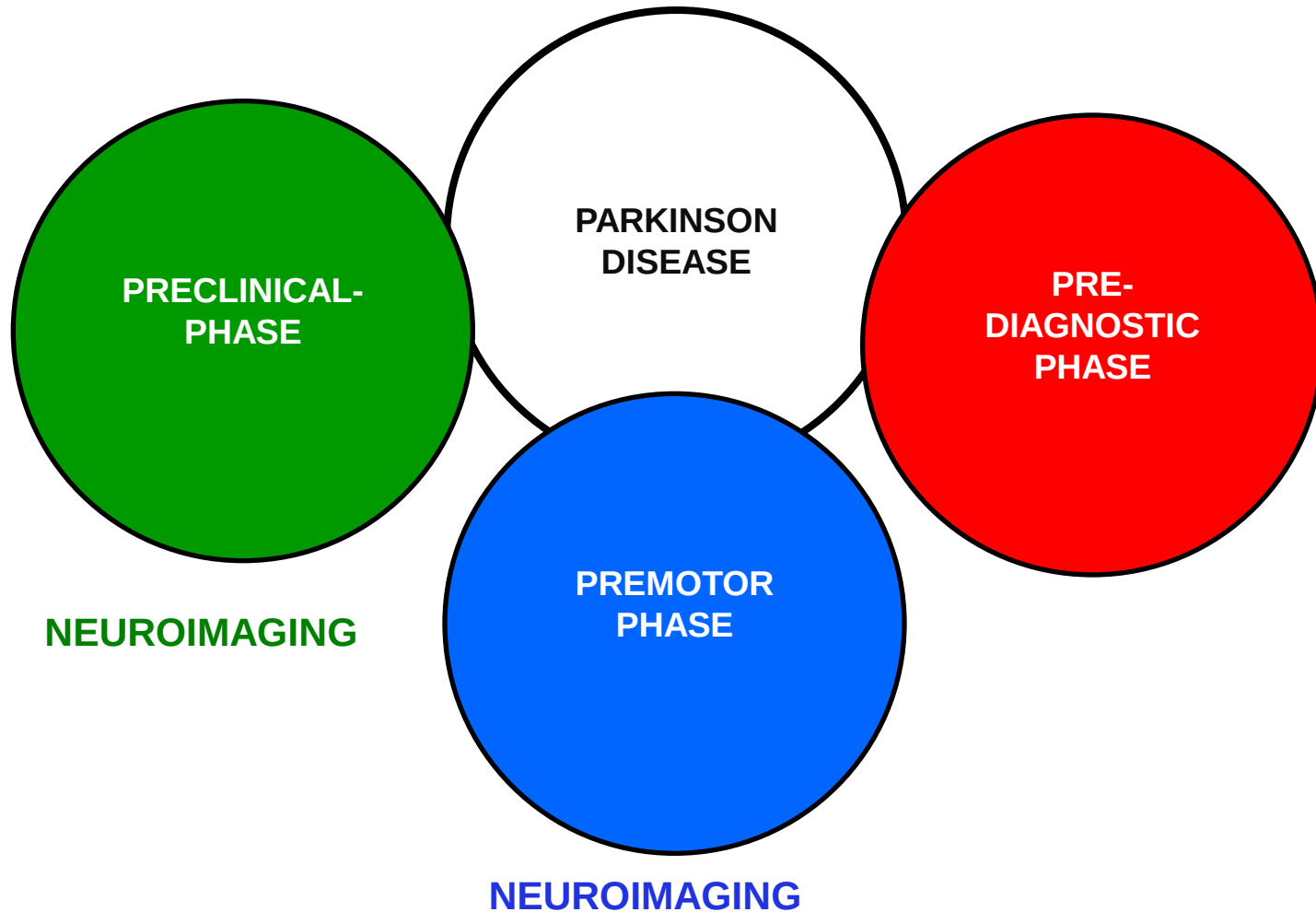


2004

Parkinson's Disease Associated Risk Syndrome



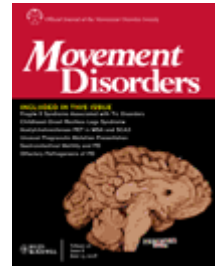
MIBG-SCINTIGRAPHY IN PARKINSON DISEASE



MIBG-SCINTIGRAPHY IN PRECLINICAL STAGE OF PD

Cardiac Sympathetic Denervation Correlates with Clinical and Pathologic Stages of Parkinson's Disease

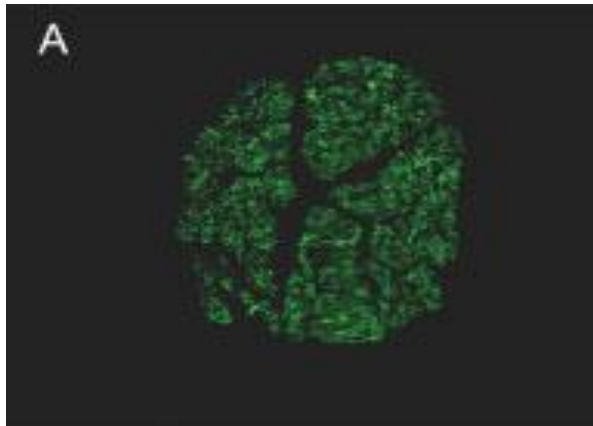
Hiroshige Fujishiro, MD, PhD,^{1,2} Roberta Frigerio, MD,³ Melinda Burnett, MD,³ Kevin J. Klos, MD,⁴ Keith A. Josephs, MD, MST,³ Anthony DelleDonne, PhD,^{1,2} Joseph E. Parisi, MD,⁵ J. Eric Ahlskog, MD, PhD,³ and Dennis W. Dickson MD^{1,2*}



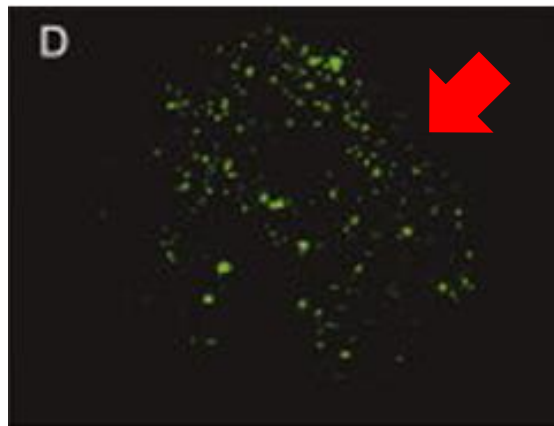
2008

“This study demonstrates that cardiac sympathetic degeneration and α -synuclein pathology is present in Incidental Lewy Body disease.”

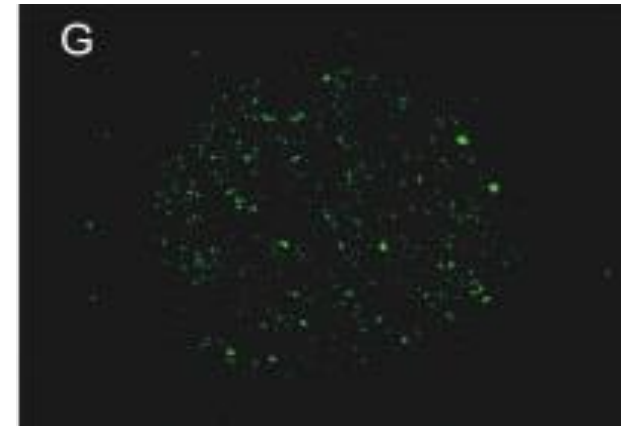
Controllo



Incidental LBD

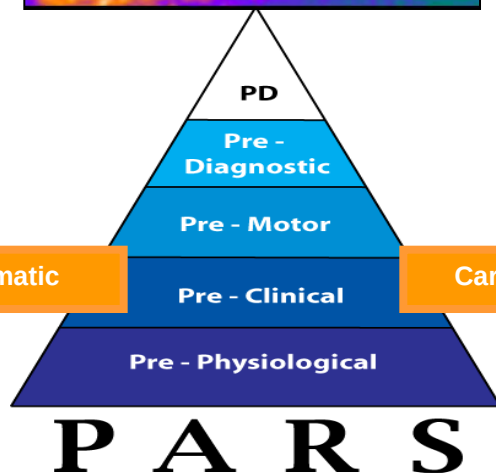
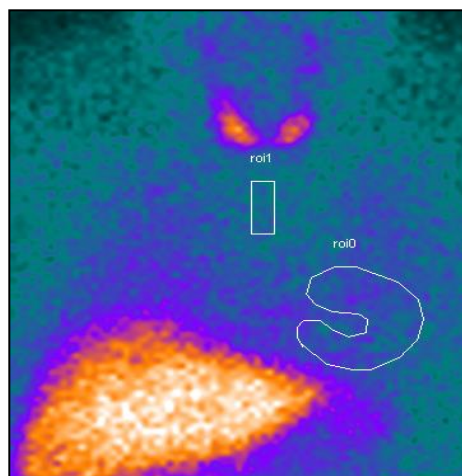


Parkinson



Fibre epicardiche immunoreattive per Tirosina Idrossilasi

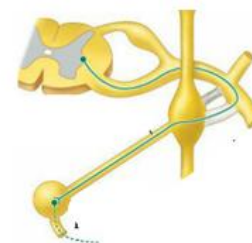
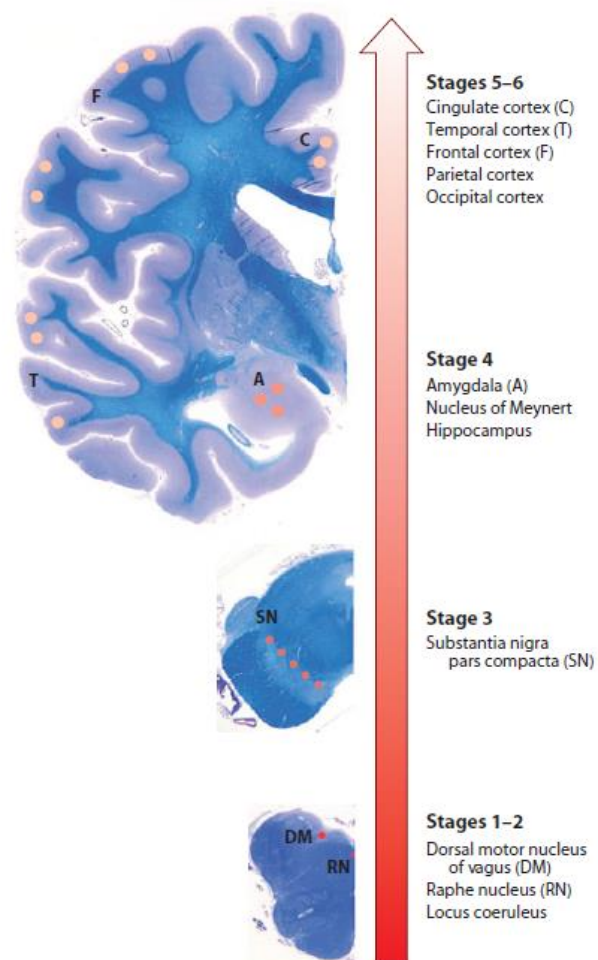
MIBG-SCINTIGRAPHY IN PRECLINICAL PHASE OF PD



Asymptomatic

Cardiac denervation

Adattata da Arch Neurol 2009;66:167-172



Parasympathetic
and sympathetic
pre- and
postganglionic
neurons

MIBG-SCINTIGRAPHY IN PREMOTOR STAGE OF PD

REM BEHAVIOUR DISORDER (RBD)

E' una parasonnia clinicamente caratterizzata da sogni “*spiacevoli*” (essere attaccati o derubati) e comportamenti vigorosi durante la fase del sonno rem in cui il paziente sembra vivere il sogno (scalciando, cadendo dal letto, urlando);

RBD puo' essere classificato come idiopatico o secondario (quando esiste una causa ben precisa);

in aggiunta esiste una forma sintomatica inserita nel contesto di un quadro clinico di una malattia definita;

RBD SI RISCONTRA NEL 60% DEI PAZIENTI CON MALATTIA DI PARKINSON;



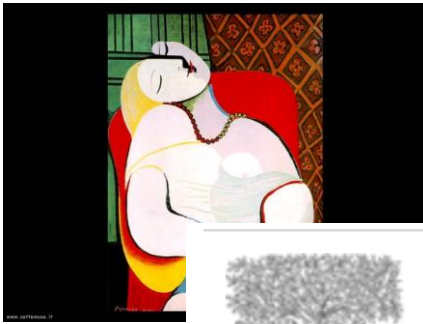
Figure 1: Sleep-related injury on the forehead of patient with idiopathic rapid eye movement sleep behaviour disorder who jumped out of bed and hit the nightstand



Figure 2: Bed rails and chair barricade as protective measures to prevent falling out of bed

REM BEHAVIOUR DISORDER (RBD)





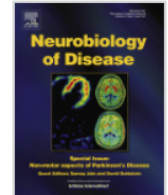
Pablo Pica



Neurobiology of Disease

Volume 46, Issue 3, June 2012, Pages 553–558

Non-motor Aspects of PD



Review

REM sleep behavior disorder: From dreams to neurodegeneration

Ronald B. Postuma^{a, b},  , Jean-Francois Gagnon^{b, c}, Jacques Y. Montplaisir^{b, d}

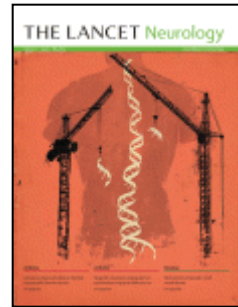
 [Show more](#)



RBD: BIOMARKER OF PARKINSON'S DISEASE ?

Neurodegenerative disease status and post-mortem pathology in idiopathic rapid-eye-movement sleep behaviour disorder: an observational cohort study

Alex Iranzo, Eduard Tolosa, Ellen Gelpi, José Luis Molinuevo, Francesc Valldeoriola, Mónica Serradell, Raquel Sanchez-Valle, Isabel Vilaseca, Francisco Lomeña, Dolores Vilas, Albert LLadó, Carles Gaig, Joan Santamaria



2013

82% dei pazienti con iRBD
sviluppa una
malattia neurodegenerativa
definita dopo 7 anni



44% PD;
39% LBD;
3% MSA;
14% MCI;

"These findings suggest that iRBD is not really idiopathic, but in most cases is an integral part of a defined neurodegenerative syndrome. Perhaps the term idiopathic RBD should be abandoned" Iranzo et al.

MIBG SCINTIGRAPHY IN PREMOTOR PHASE OF PD:

Reduced cardiac ^{123}I -MIBG scintigraphy in idiopathic REM sleep behavior disorder

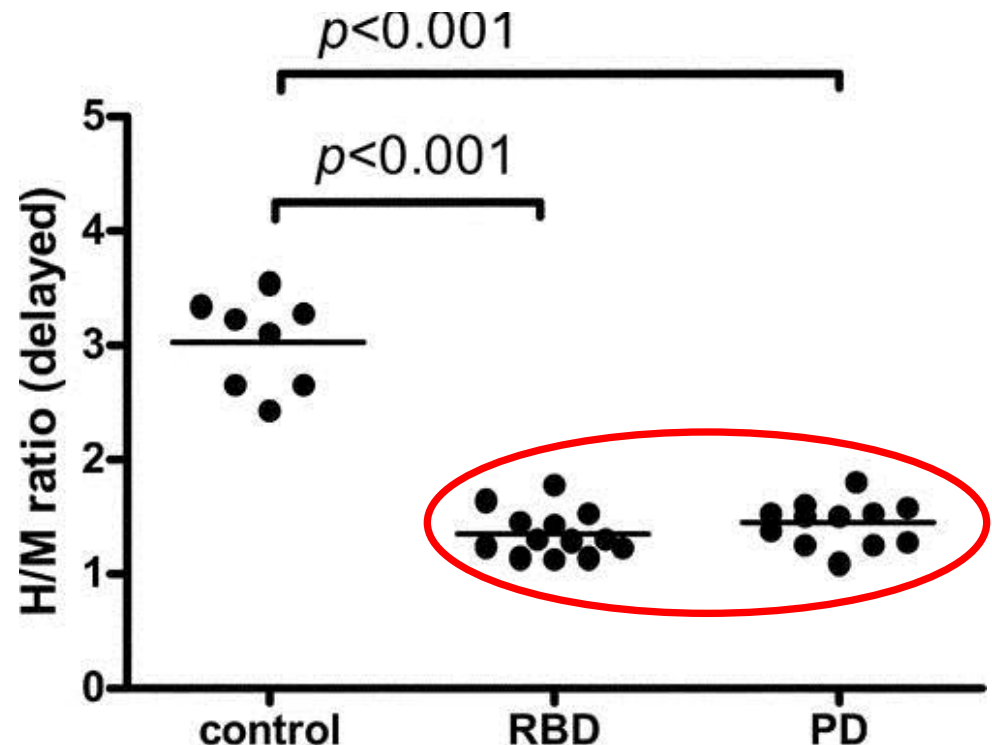
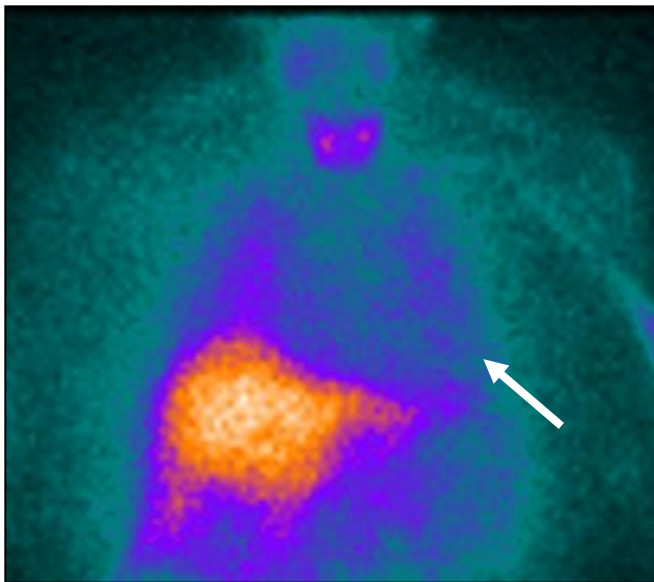
Abstract—Idiopathic REM sleep behavior disorder (RBD) may represent prodromal synucleinopathies. We report markedly reduced cardiac ^{123}I -metaiodobenzylguanidine uptake, consistent with the loss of sympathetic terminals, in idiopathic RBD. We also demonstrate that this reduction is of the same magnitude as that found in patients with Parkinson disease. The results are consistent with the hypothesis that idiopathic RBD in older patients is a forme fruste of Lewy body disease.

NEUROLOGY 2006;67:2236–2238

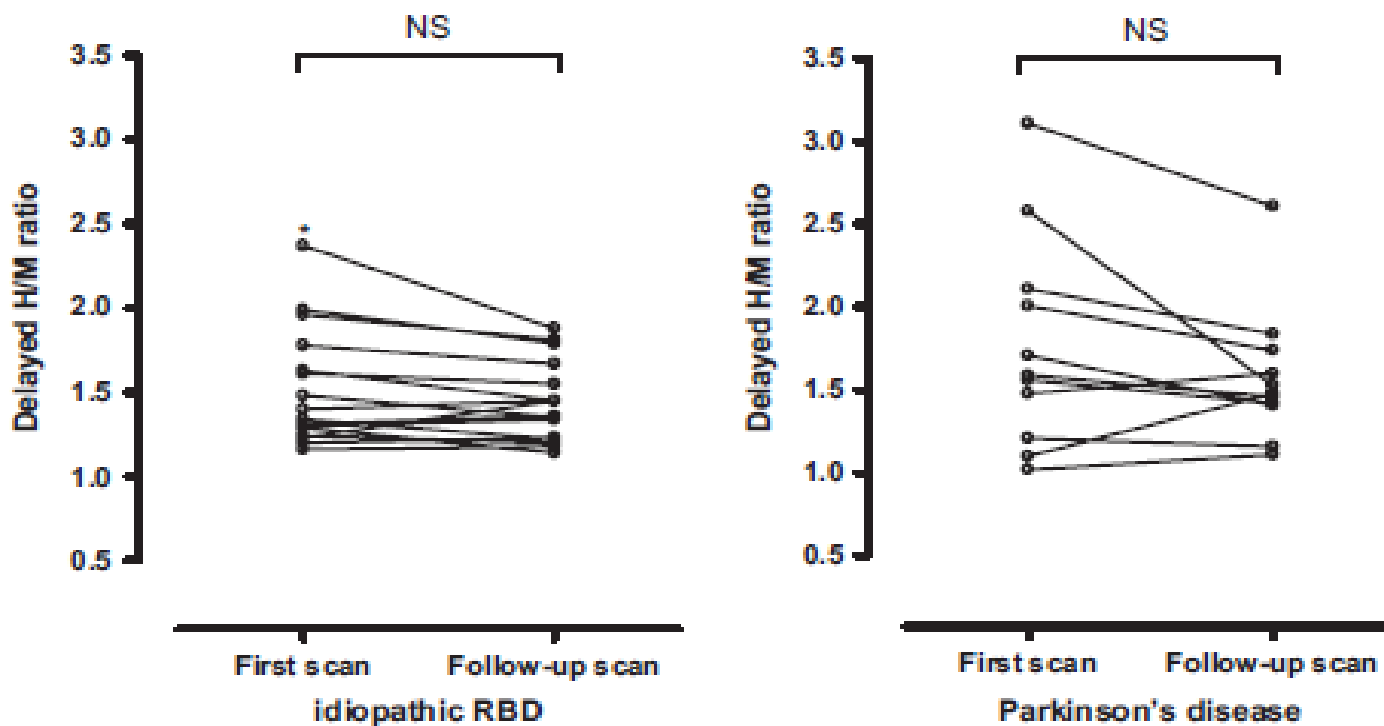


2006

T. Miyamoto, MD, PhD; M. Miyamoto, MD, PhD; Y. Inoue, MD, PhD; Y. Usui, MD; K. Suzuki, MD; and K. Hirata, MD, PhD



Follow-up study of cardiac MIBG scintigraphy in idiopathic REM sleep behaviour disorder

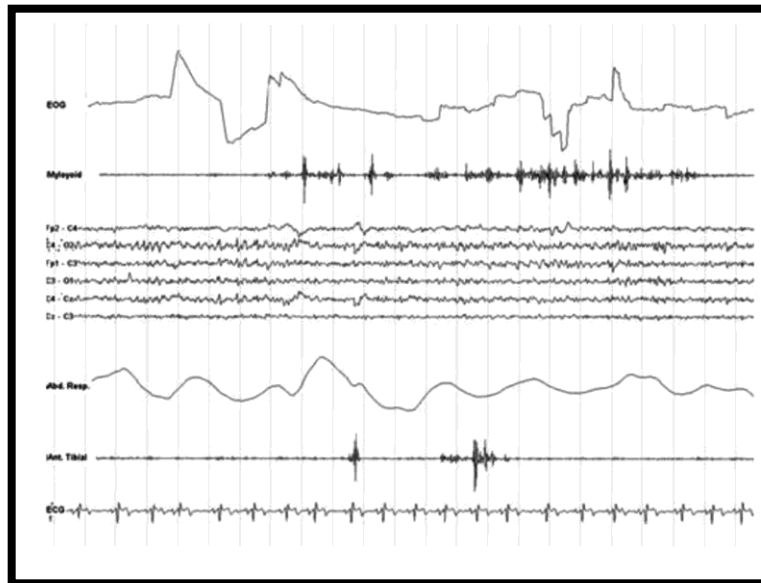


Miyamoto T, Miyamoto M, Iwanami M, Hirata K, 2011

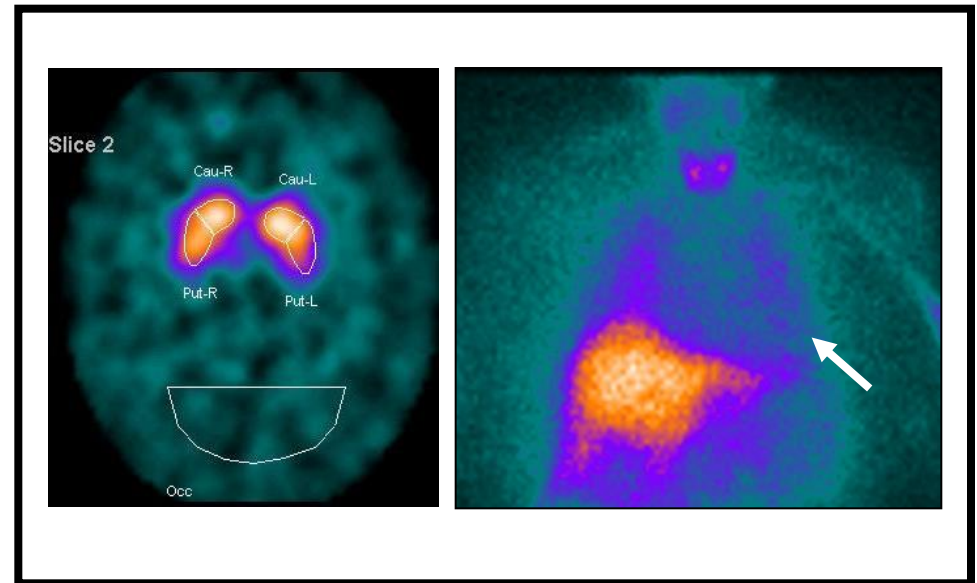
Letter to the Editor

Involvement of cardiac sympathetic nerve endings in a patient with idiopathic RBD and intact nigrostriatal pathway☆

Polisonnogramma



Scintigrafie cerebrale e miocardica

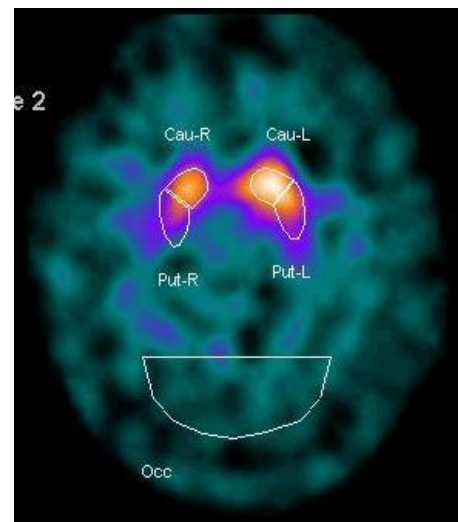
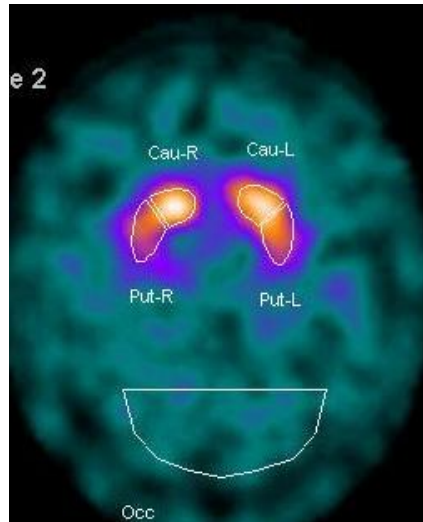
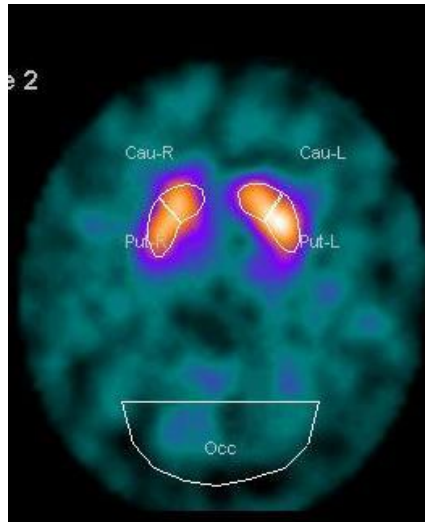
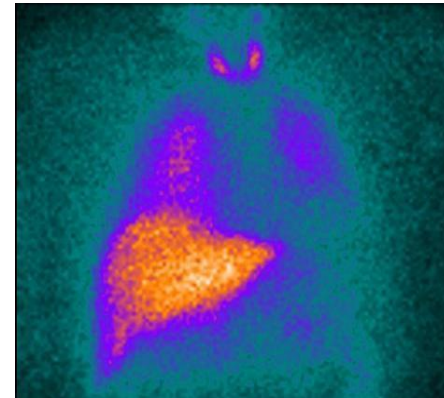
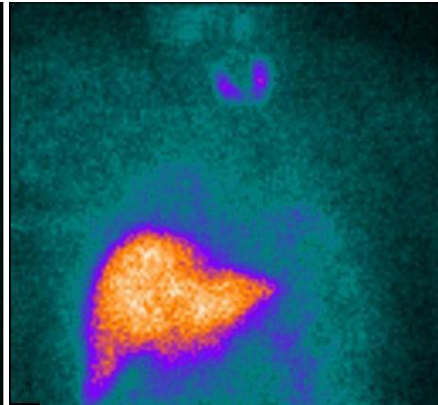
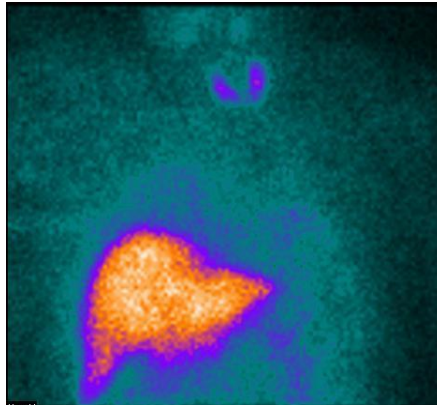


LETTERS: NEW OBSERVATIONS

Cardiac Denervation Precedes Nigrostriatal Damage in Idiopathic Rapid Eye Movement Sleep Behavior Disorder



2012



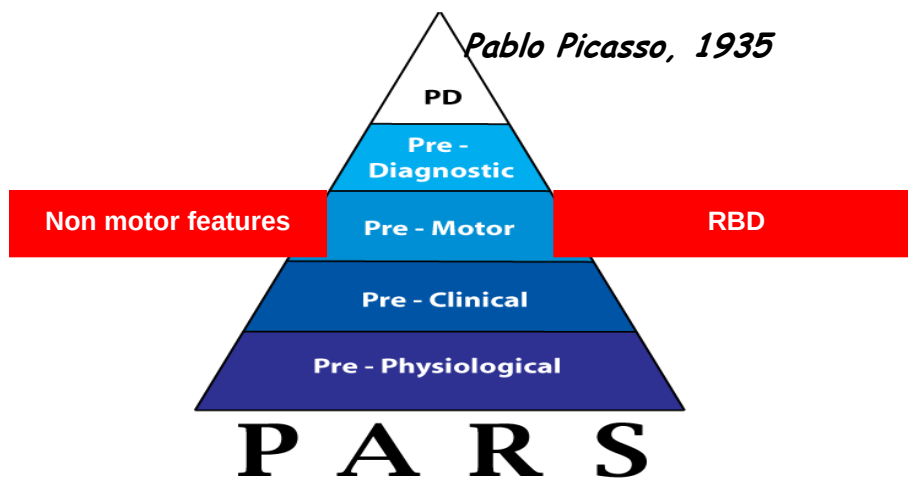
Maggio 2009

Febbraio 2011

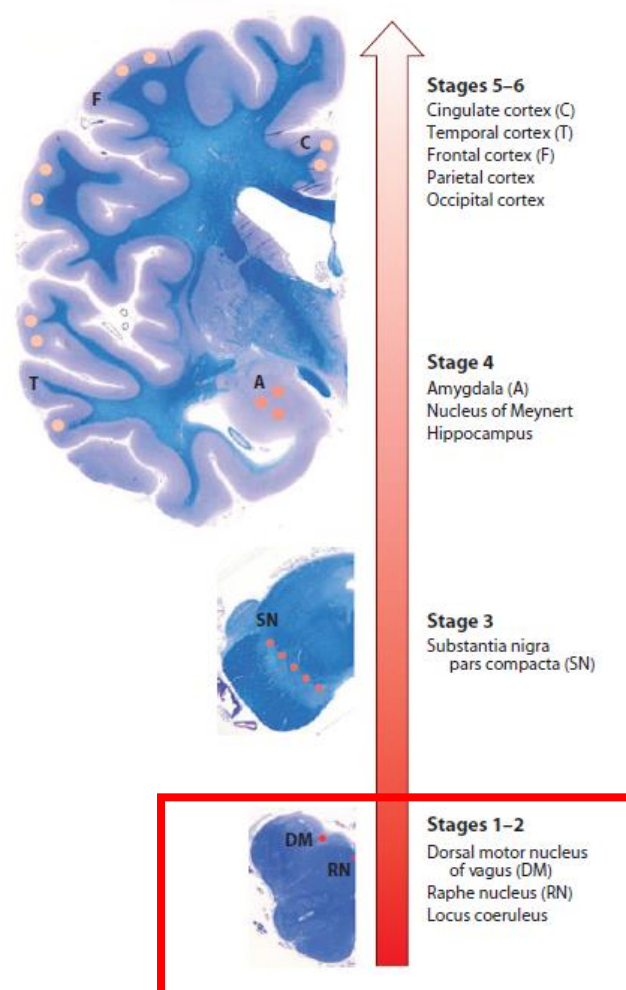
Settembre 2011

Salsone et al., 2012

MIBG-SCINTIGRAPHY IN PREMOTOR PHASE OF PD



Adattata da Arch Neurol 2009;66:167-172



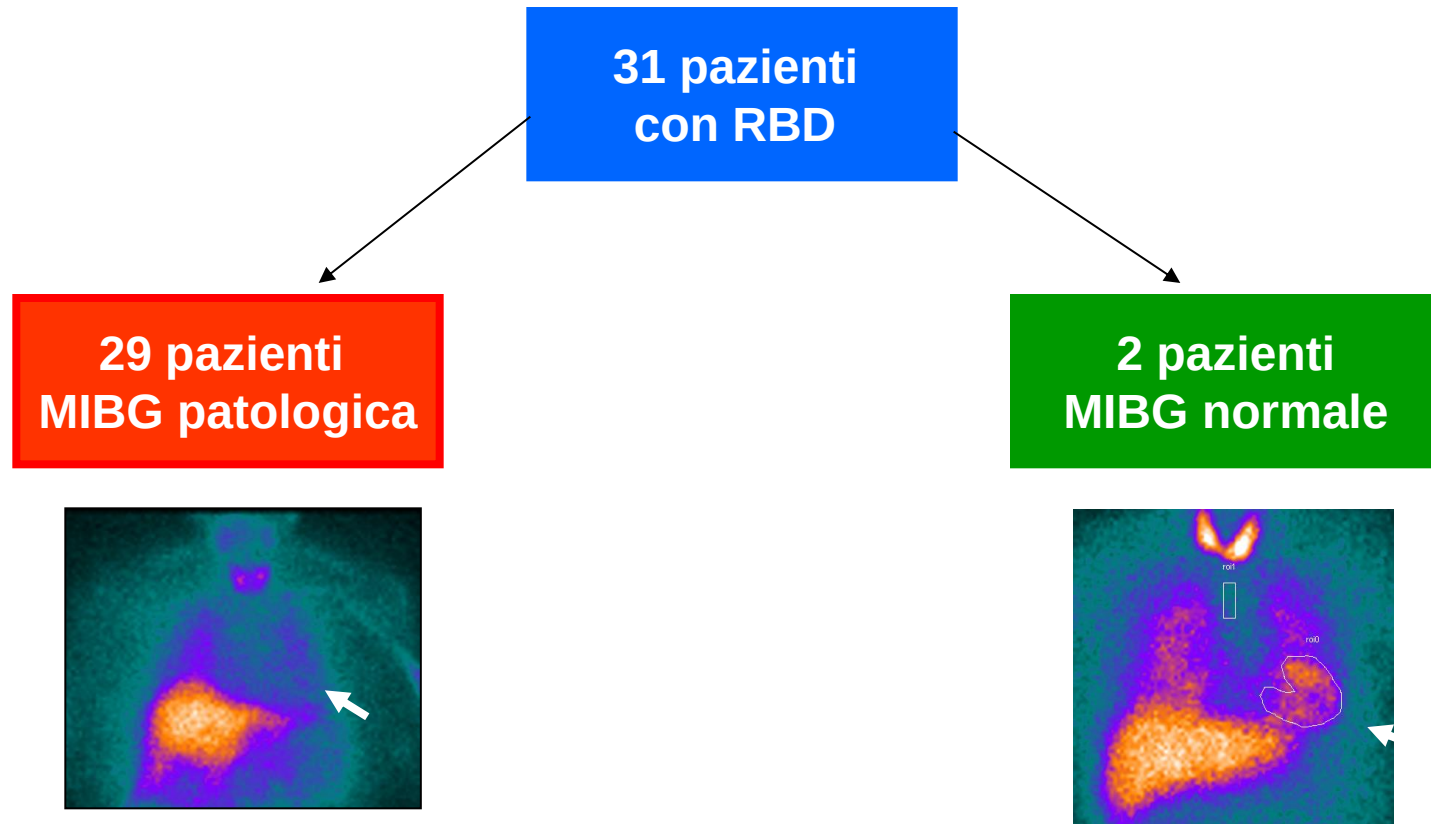
REM SLEEP BEHAVIOR DISORDER

^{123}I -MIBG Cardiac Scintigraphy Provides Clues to the Underlying Neurodegenerative Disorder in Idiopathic REM Sleep Behavior Disorder

Tomoyuki Miyamoto, MD, PhD; Masayuki Miyamoto, MD, PhD; Keisuke Suzuki, MD, PhD; Momoka Nishibayashi, MD; Masaaki Iwanami, MD; Koichi Hirata, MD, PhD



2008



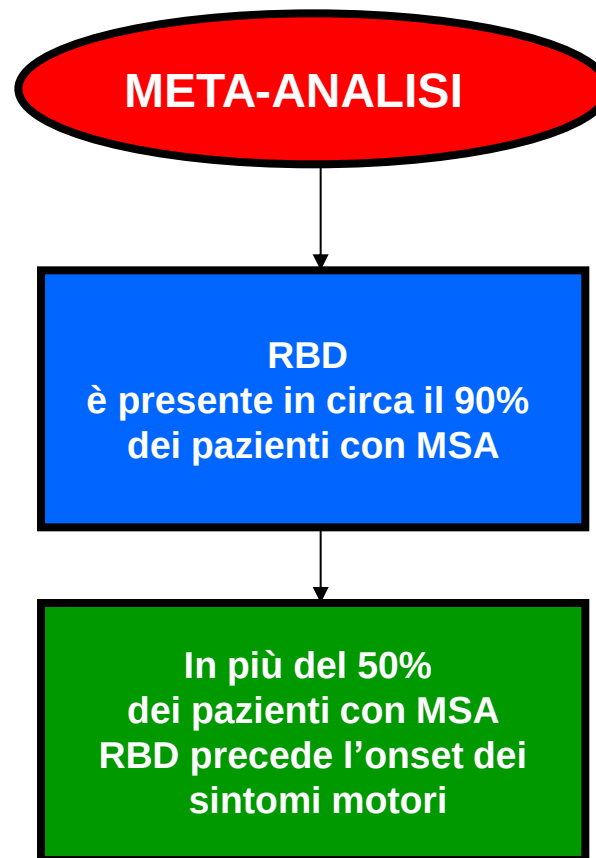
RBD ISOLATO: ATROFIA MULTISISTEMICA?

Prevalence of REM sleep behavior disorder in multiple system atrophy: a multicenter study and meta-analysis

Jose-Alberto Palma · Clara Fernandez-Cordon · Elizabeth A. Coon · Phillip A. Low ·
Mitchell G. Miglis · Safwan Jaradeh · Arijit K. Bhaumik · Praveen Dayalu ·
Elena Urrestarazu · Jorge Iriarte · Italo Biaggioni · Horacio Kaufmann

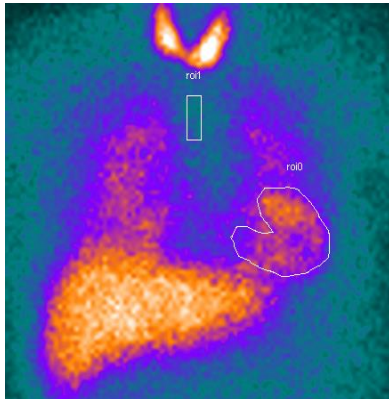


2015



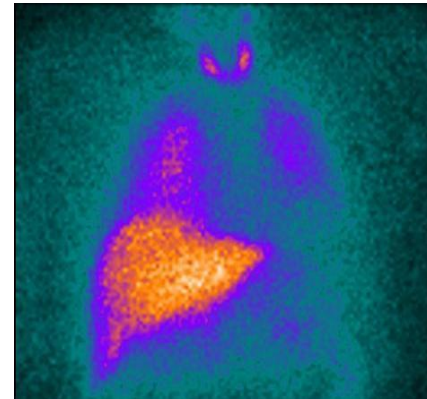
MIBG-SCINTIGRAPHY IN PREMOTOR PHASE OF PD

**RBD
MIBG -**



**No
Lewy Body
Disease**

**RBD
MIBG +**



**Lewy Body
Disease**

Idiopathic REM sleep behavior disorder and neurodegenerative risk: To tell or not to tell to the patient? How to minimize the risk?



What to communicate to a patient and how: ethical and psychological issues



Arnaldi et al, 2016

CONCLUSIONI

La scintigrafia miocardica puo' essere un valido supporto per la diagnosi preclinica e premotoria della Malattia di Parkinson e di Parkinsonismi atipici.

In pazienti con RBD-fase premotoria di Malattie a corpi di Lewy come la Malattia di Parkinson, la scintigrafia miocardica è patologica.

In pazienti con RBD-fase premotoria di Malattie non a corpi di Lewy la scintigrafia miocardica, quali Parkinsonismi atipici puo'essere normale

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