

CURRICULUM VITAE

Personal information

ANTONIO CARONNI

M.D., Ph.D.

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Nationality Italian

Birth date 01/11/1980

Work experience

from April 2023
on going Researcher (RTDB)
Department of Biomedical Sciences for Health
Università Degli Studi di Milano
Via Giuseppe Colombo 71
20133 Milano

from November 2021
on going Consultant Psychiatrist
Department of Neurorehabilitation Sciences
I.R.C.C.S. Istituto Auxologico Italiano
Ospedale San Luca
Via Giuseppe Mercalli 28
20122 Milano

from October 2018
to November 2021 Consultant Psychiatrist
Neurological rehabilitation unit
I.R.C.C.S. Santa Maria Nascente
Fondazione Don Carlo Gnocchi Onlus
Via Alfonso Capececiatello 66
20148 Milano

from June 2015
to September 2018 Assistant Psychiatrist
Neurological rehabilitation unit

Casa di Cura del Policlinico spa
U. O. di riabilitazione ad alta intensità di cure
Via Giuseppe Dezza 48
20144 Milano

Education and training

1999: High School Diploma, scientific studies (100/100), Liceo Scientifico G.B. Grassi, Saronno (VA).

2006: **Degree in Medicine** (M.D., 110/110 cum laude), Università degli Studi di Milano.

2008 – 2009: visiting research fellow at the Sobell Department of Motor Neuroscience and Movement Disorders, UCL, London (UK).

2009, **Ph.D. in Physiology**, Università degli Studi di Milano.

2015: Postgraduate Specialisation in **Physical and Rehabilitation Medicine** (70/70 cum laude), Università degli Studi di Milano.

2016, course in **clinical neurophysiology** of the Società Italiana di Neurofisiologia Clinica (*XXXVI Corso Teorico Pratico di Cultura in Elettromiografia e Neurofisiologia Clinica, Abano Terme*).

Clinical skills

As a **physiatrist**, I am devoted to rehabilitating patients with neurological diseases. I developed particular expertise in managing early **inpatient rehabilitation** after an acute neurological impairment (e.g. stroke, traumatic brain injury, acute polyneuropathies).

In addition, I am interested in the outpatient rehabilitation of peripheral neuropathies and other diseases of the peripheral nervous system. With this regard, I am also competent in **clinical neurophysiology** (mainly nerve conduction studies and electromyography).

Research skills

Expertise in the techniques for the study of the **Human motor control**, including movement and EMG recording, techniques for the assessment of Human spinal and cortico-spinal excitability (e.g. conditioning of the H-reflex, conditioning of the motor potentials evoked by the TMS) and repetitive TMS.

Expertise in **psychometric methods** for evaluating and developing questionnaires and scales (**Rasch analysis** in the first place).

Expertise in the use of clinical tests, force platforms and inertial measurement units for **balance and fall risk assessment**.

Expertise in **data analysis** with R.

Language skills

Native Italian speaker

English

Roles in scientific societies

from September 2021 (ongoing): member of the Regional Secretariat (Lombardy) of the Italian Society of Physical and Rehabilitation Medicine (Società Italiana Medicina Fisica e Riabilitativa, SIMFER)

from October 2021 to October 2023: member of the Board of Directors of the Italian Society of Movement Analysis in Clinics (Società Italiana di Analisi del Movimento in Clinica, SIAMOC)

Roles in scientific journals

from January 2023 (ongoing): Associate Editor of the International Journal of Rehabilitation Research

from December 2021 to January 2023: member of the Editorial Board of the International Journal of Rehabilitation Research

from July 2022 (ongoing): member of the Editorial Board of Frontiers in Neurology

Publications

Papers (57) on PubMed and Scopus or Web of Science

Leading position: 37 papers

First author: 23

Last author: 10

Corresponding in central position (§): 4

H index (Scopus): 15

57) Derchi CC, Arcuri P, Comanducci A, **Caronni A**, Pagliari C, Viganò A, Volpato E, Navarro J, Trimarchi PD. Italian translation and cultural adaptation of the Agitated Behavior Scale (ABS-I) in patients with acquired brain injuries. *J Rehabil Med.* 2024

56) **Caronni A**, Picardi M, Scarano S, Rota V, Guidali G, Bolognini N, Corbo M. Minimal detectable change of gait and balance measures in older neurological patients: estimating the standard error of the measurement from before-after rehabilitation data thanks to the linear mixed-effects models. *J Neuroeng Rehabil.* 2024

55) Tesio L, Scarano S, **Caronni A**. Physical and Rehabilitation Medicine: say relational or functional, not holistic. *Eur J Phys Rehabil Med.* 2024

54) Perucca L, Scarano S, Russo G, Robecchi Majnardi A, **Caronni A**. Fatigue may improve equally after balance and endurance training in multiple sclerosis: a randomised, crossover clinical trial. *Front Neurol.* 2024

- 53) **Caronni A**, Picardi M, Scarano S, Malloggi C, Tropea P, Gilardone G, Aristidou E, Pintavalle G, Redaelli V, Antoniotti P, Corbo M. Pay attention: you can fall! The Mini-BESTest scale and the turning duration of the TUG test provide valid balance measures in neurological patients: a prospective study with falls as the balance criterion. *Front Neurol.* 2023
- 52) Guidali G, Picardi M, Franca M, **Caronni A**, Bolognini N. The social relevance and the temporal constraints of motor resonance in humans. *Sci Rep.* 2023
- 51) Zaina F, Ferrario I, **Caronni A**, Scarano S, Donzelli S, Negrini S. Measuring Quality of Life in Adults with Scoliosis: A Cross-Sectional Study Comparing SRS-22 and ISYQOL Questionnaires. *J Clin Med.* 2023
- 50) Tesio L, **Caronni A**, Russo C, Felisari G, Banco E, Simone A, Scarano S, Bolognini N. Reversed Mirror Therapy (REMIT) after Stroke-A Proof-of-Concept Study. *Brain Sci.* 2023
- 49) Sansone F, Pellegrino GM, **Caronni A**, Bonazza F, Vegni E, Lué A, Bocci T, Pipolo C, Giusti G, Di Filippo P, Di Pillo S, Chiarelli F, Sferrazza Papa GF, Attanasi M. Long COVID in Children: A Multidisciplinary Review. *Diagnostics (Basel).* 2023
- 48) Negrini S, Zaina F, Buyukaslan A, Fortin C, Karavidas N, Kotwicki T, Korbek K, Parent E, Sanchez-Raya J, Shearer K, Yilmaz HG, Donzelli S, **Caronni A**. Cross-cultural validation of the Italian Spine Youth Quality of Life questionnaire: the ISYQOL international. *Eur J Phys Rehabil Med.* 2023
- 47) Cerina V, Tesio L, Malloggi C, Rota V, **Caronni A**, Scarano S. Cervical Proprioception Assessed through Targeted Head Repositioning: Validation of a Clinical Test Based on Optoelectronic Measures. *Brain Sci.* 2023
- 46) Tropea P, Infarinato F, Sterpi I, Ottaviani M, Antoniotti P, Romano P, Picardi M, Goffredo M, Re R, Pournajaf S, Seregini A, **Caronni A**, Franceschini M, Corbo M. Action Observation Treatment for Upper Limb Rehabilitation in Patients With Stroke: Protocol for a Multicenter Randomized Controlled Trial. *JMIR Res Protoc.* 2023
- 45) **Caronni A**, Picardi M, Scarano S, Tropea P, Gilardone G, Bolognini N, Redaelli V, Pintavalle G, Aristidou E, Antoniotti P, Corbo M. Differential Item Functioning of the Mini-BESTest Balance Measure: A Rasch Analysis Study. *Int J Environ Res Public Health.* 2023
- 44) Tesio L, **Caronni A**, Simone A, Kumbhare D, Scarano S. Interpreting results from Rasch analysis 2. Advanced model applications and the data-model fit assessment. *Disabil Rehabil.* 2023
- 43) Tesio L, **Caronni A**, Kumbhare D, Scarano S. Interpreting results from Rasch analysis 1. The "most likely" measures coming from the model. *Disabil Rehabil.* 2023
- 42) **Caronni A**, Ramella M, Arcuri P, Salatino C, Pignini L, Saruggia M, Folini C,

Scarano S, Converti RM. The Rasch Analysis Shows Poor Construct Validity and Low Reliability of the Quebec User Evaluation of Satisfaction with Assistive Technology 2.0 (QUEST 2.0) Questionnaire. *Int J Environ Res Public Health*. 2023

41) Scarano S, Sansone VA, Ferrari Aggradi CR, Carraro E, Tesio L, Amadei M, Rota V, Zanolini A, **Caronni A**. Balance impairment in myotonic dystrophy type 1: Dynamic posturography suggests the coexistence of a proprioceptive and vestibular deficit. *Front Hum Neurosci*. 2022

40) Tesio L, Scarano S, Hassan S, Kumbhare D, **Caronni A**. Why questionnaire scores are not measures: a question-raising article. *Am J Phys Med Rehabil*. 2022

39) Guerini FR, Bolognesi E, Lax A, Bianchi LNC, **Caronni A**, Zanzottera M, Agliardi C, Albergoni MP, Banfi PI, Navarro J, Clerici M. HLA Allele Frequencies and Association with Severity of COVID-19 Infection in Northern Italian Patients. *Cells*. 2022

38) Lencioni T, Meloni M, Bowman T, Marzegan A, **Caronni A**, Carpinella I, Castagna A, Gower V, Ferrarin M, Pelosin E. Events Detection of Anticipatory Postural Adjustments through a Wearable Accelerometer Sensor Is Comparable to That Measured by the Force Platform in Subjects with Parkinson's Disease. *Sensors (Basel)*. 2022

37) Scarano S, Rota V, Tesio L, Perucca L, Robecchi Majnardi A, **Caronni A**. Balance Impairment in Fahr's Disease: Mixed Signs of Parkinsonism and Cerebellar Disorder. A Case Study. *Front Hum Neurosci*. 2022

36) **Caronni A**, Arcuri P, Carpinella I, Marzegan A, Lencioni T, Ramella M, Crippa A, Anastasi D, Rabuffetti M, Ferrarin M, Castagna A. Smoothness of movement in idiopathic cervical dystonia. *Sci Rep*. 2022

35) **Caronni A**, Picardi M, Redaelli V, Antoniotti P, Pintavalle G, Aristidou E, Gilardone G, Carpinella I, Lencioni T, Arcuri P, Corbo M. The Falls Efficacy Scale International is a valid measure to assess the concern about falling and its changes induced by treatments. *Clin Rehabil*. 2021

34) Comanducci A, Viganò A, **Caronni A**. Letter to the editor: COVID in patients with brain injury with a disorder of consciousness: a pathogenetic theory. *Brain Inj*. 2021

33) **Caronni A**, Picardi M. Letter to the editor concerning the article: "A prospective study to establish the minimal clinically important difference of the Mini-BESTest in individuals with stroke". *Clin Rehabil*. 2021

32) Saresella M, Trabattoni D, Marventano I, Piancone F, La Rosa F, **Caronni A**, Lax A, Bianchi L, Banfi P, Navarro J, Bolognesi E, Zanzottera M, Guerini FR, Clerici M. NK Cell Subpopulations and Receptor Expression in Recovering SARS-CoV-2 Infection. *Mol Neurobiol*. 2021

31) Lencioni T, Fornia L, Bowman T, Marzegan A, **Caronni A**, Turolla A,

Jonsdottir J, Carpinella I, Ferrarin M. A randomized controlled trial on the effects induced by robot-assisted and usual-care rehabilitation on upper limb muscle synergies in post-stroke subjects. *Sci Rep*. 2021

30) Carlomagno C, Bertazioli D, Gualerzi A, Picciolini S, Banfi PI, Lax A, Messina E, Navarro J, Bianchi L, **Caronni A**, Marengo F, Monteleone S, Arienti C, Bedoni M. COVID-19 salivary Raman fingerprint: innovative approach for the detection of current and past SARS-CoV-2 infections. *Sci Rep*. 2021

29) **Caronni A**, Liaci E, Bianchi A, Viganò A, Marengo F, Comanducci A, Cabrini DM, Meloni M, Alberoni M, Farina E, Bianco M, Galeri S, Devalle G, Navarro J. Clinical course of SARS-CoV-2 infection in patients with severe acquired brain injury and a disorder of consciousness: an observational study. *Brain Inj*. 2021

28) **Caronni A**, Picardi M, Gilardone G, Corbo M. The McNemar Change Index worked better than the Minimal Detectable Change in demonstrating the change at a single subject level. *J Clin Epidemiol*. 2021

27) Picardi M, Redaelli V, Antoniotti P, Pintavalle G, Aristidou E, Sterpi I, Meloni M, Corbo M, **Caronni A**. Turning and sit-to-walk measures from the instrumented Timed Up and Go test return valid and responsive measures of dynamic balance in Parkinson's disease. *Clin Biomech (Bristol, Avon)*. 2020

26) Attanasi M, Pasini S, **Caronni A**, Pellegrino GM, Faverio P, Di Pillo S, Cimino MM, Cipolla G, Chiarelli F, Centanni S, Sferrazza Papa GF; Collaborators for the RECOVER Investigators Study Group. Inpatient Care during the COVID-19 Pandemic: A Survey of Italian Physicians. *Resp*. 2020

25) **Caronni A**, Gervasoni E, Ferrarin M, Anastasi D, Bricchetto G, Confalonieri P, Di Giovanni R, Prosperini L, Tacchino A, Solaro C, Rovaris M, Cattaneo D, Carpinella I. Local Dynamic Stability of Gait in People With Early Multiple Sclerosis and No-to-Mild Neurological Impairment. *IEEE Trans Neural Syst Rehabil Eng*. 2020

24) Negrini S, Donzelli S, Di Felice F, Zaina F, **Caronni A**. Construct validity of the Trunk Aesthetic Clinical Evaluation (TRACE) in young people with idiopathic scoliosis. *Ann Phys Rehabil Med*. 2019

23) Castagna A, **Caronni A** §, Crippa A, Sciumè L, Giacobbi G, Corrini C, Montesano A, Ramella M. Sensorimotor Perceptive Rehabilitation Integrated (SPRInt) program: exercises with augmented movement feedback associated to botulinum neurotoxin in idiopathic cervical dystonia-an observational study. *Neurol Sci*. 2019

22) **Caronni A**, Picardi M, Pintavalle G, Aristidou E, Redaelli V, Antoniotti P, Sterpi I, Tropea P, Corbo M. Responsiveness to rehabilitation of balance and gait impairment in elderly with peripheral neuropathy. *J Biomech*. 2019

21) **Caronni A**, Donzelli S, Zaina F, Negrini S. The Italian Spine Youth Quality of Life questionnaire measures health-related quality of life of adolescents with spinal deformities better than the reference standard, the Scoliosis Research

Society 22 questionnaire. Clin Rehabil. 2019

20) **Caronni A**, Picardi M, Aristidou E, Antoniotti P, Pintavalle G, Redaelli V, Sterpi I, Corbo M. How do patients improve their timed up and go test? Responsiveness to rehabilitation of the TUG test in elderly neurological patients. Gait Posture. 2019

19) Antoniotti P, Veronelli L, **Caronni A**, Monti A, Aristidou E, Montesano M, Corbo M. No evidence of effectiveness of mirror therapy early after stroke: an assessor-blinded randomized controlled trial. Clin Rehabil. 2019

18) Sandrini M, **Caronni A**, Corbo M. Modulating Reconsolidation With Non-invasive Brain Stimulation-Where We Stand and Future Directions. Front Psychol. 2018

17) **Caronni A**, Sterpi I, Antoniotti P, Aristidou E, Nicolaci F, Picardi M, Pintavalle G, Redaelli V, Achille G, Sciumè L, Corbo M. Criterion validity of the instrumented Timed Up and Go test: A partial least square regression study. Gait Posture. 2018

16) **Caronni A**, Sciumè L, Donzelli S, Zaina F, Negrini S. ISYQOL: a Rasch-consistent questionnaire for measuring health-related quality of life in adolescents with spinal deformities. Spine J. 2017

15) **Caronni A**, Cattalini C, Previtera AM. Balance and mobility assessment for ruling-out the peripheral neuropathy of the lower limbs in older adults. Gait Posture. 2016

14) **Caronni A**, Sciumè L. Is my patient actually getting better? Application of the McNemar test for demonstrating the change at a single subject level. Disabil Rehabil. 2016

13) **Caronni A**, Sciumè L, Ferpozzi V, Blasi V, Castellano A, Falini A, Perucca L, Cerri G. Mirror movements after stroke suggest facilitation from nonprimary motor cortex: a case presentation. PM R. 2016

12) **Caronni A**, Sciumè L. There is a need once again for a multifactorial assessment and intervention for fall prevention among the elderly. J Spinal Cord Med. 2016

11) Tesio L, Benedetti MG, Rota V, Manfrini M, Perucca L, **Caronni A**. Surgical leg rotation: cortical neuroplasticity assessed through brain mapping using transcranial magnetic stimulation. Int J Rehabil Res. 2014

10) Ruge D, Muggleton N, Hoard D, **Caronni A**, Rothwell JC. An unavoidable modulation? Sensory attention and human primary motor cortex excitability. Eur J Neurosci. 2014

9) **Caronni A**, Zaina F, Negrini S. Improving the measurement of health-related quality of life in adolescent with idiopathic scoliosis: The SRS-7, a Rasch-developed short form of the SRS-22 questionnaire. Res Dev Dis. 2014

8) Perucca L, **Caronni A** §, Vidmar G, Tesio L. Electromyographic latency of

postural evoked responses from the leg muscles during EquiTest Computerised Dynamic Posturography: Reference data on healthy subjects. *J Electromyogr Kinesiol.* 2014

7) Coco M, Alagona G, Perciavalle V, Perciavalle V, Cavallari P, **Caronni A**. Changes in cortical excitability and blood lactate after a fatiguing hand-grip exercise. *Somatosens Mot Res.* 2014

6) **Caronni A**, Bolzoni F, Esposti R, Bruttini C, Cavallari P. Accuracy of pointing movements relies upon a specific tuning between anticipatory postural adjustments and prime mover activation. *Acta Physiol (Oxf).* 2013

5) Bologna M, **Caronni A**, Berardelli A, Rothwell JC. Practice-related reduction of electromyographic mirroring activity depends on basal levels of interhemispheric inhibition. *Eur J Neurosci.* 2012

4) Kojovic M, **Caronni A**, Bologna M, Rothwell JC, Bhatia KP, Edwards MJ. Botulinum toxin injections reduce associative plasticity in patients with primary dystonia. *Mov Disord.* 2011

3) **Caronni A**, Cavallari P. Supra-spinal circuits shape inhibitory postural adjustments anticipating voluntary index-finger flexion. *Exp Brain Res.* 2009

2) **Caronni A**, Cavallari P. Anticipatory postural adjustments stabilise the whole upper-limb prior to a gentle index finger tap. *Exp Brain Res.* 2009

1) Lourenço G, **Caronni A**, Cavallari P. Mechanical and focal electrical stimuli applied to the skin of the index fingertip induce both inhibition and excitation in low-threshold flexor carpi radialis motor units. *Eur J Neurosci.* 2007

Other publications

2) **Caronni A** Pain and pain killers: the falls tradeoff. Response on "Prevention of falls in older people living in the community", <http://www.bmj.com/content/353/bmj.i1419/rr-3> *BMJ.* 2016

1) Tesio L, **Caronni A**. Understanding sensory-motor organization and anticipatory postural actions in voluntary movement: suggestions for therapeutic exercise *It J Physiotherapy.* 2013