

“Canadian Consensus on Measures and Assessments in Mobility, Exercises and Cognition in the Elderly. From the CIHR-CCNA”

Thursday, April 16th, 2015

Salon H, Hotel Bonaventure, Montreal, QC

A Theme In A Day

Manuel Montero-Odasso MD, PhD, AGSF, FRCPC



**Canadian Consortium
on Neurodegeneration in Aging.**
The Canadian Component of CIHR's International
Collaborative Research Strategy for Alzheimer's Disease.



What makes a person look old?



- Slow Gait
- Mental Slowing

**Mobility and Cognition in Seniors. Report from the 2008 Institute of Aging
(CIHR) Mobility and Cognition Workshop.**

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Stephanie Studenski , (MD, MPH, AGSF)⁵; Karen Gopaul, (MSc.)¹; Afua Oteng-Amoako,
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Hunter^{1,7},(PT, PhD); Mark Speechley, (PhD); Richard Camicioli , (MD, FRCPC)¹¹.

Canadian Geriatric Journal, 2015 (in press)



Gait and Cognition: A Complementary Approach to Understanding Brain Function and the Risk of Falling

Manuel Montero-Odasso, MD, PhD, AGSF,*[†] Joe Verghese, MB, BS,[‡] Olivier Beauchet, MD, PhD,[§] and Jeffrey M. Hausdorff, PhD^{||#**}

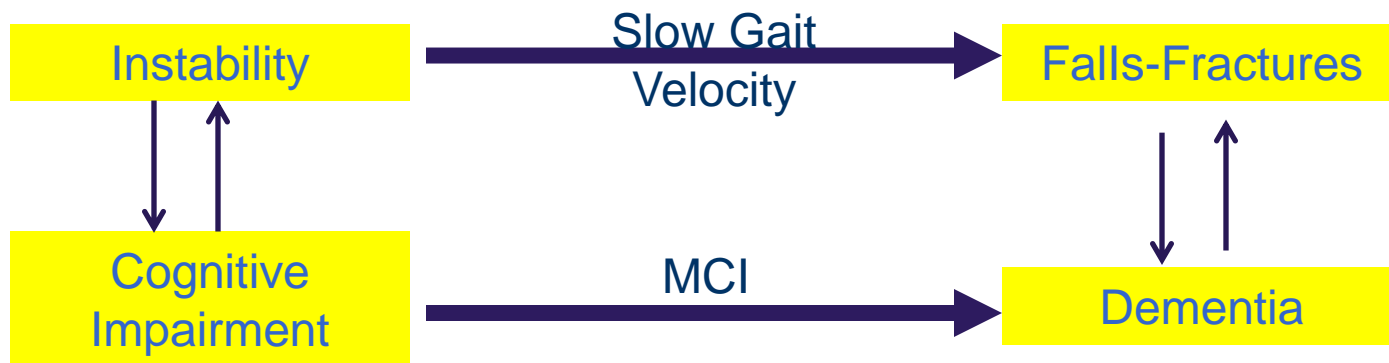
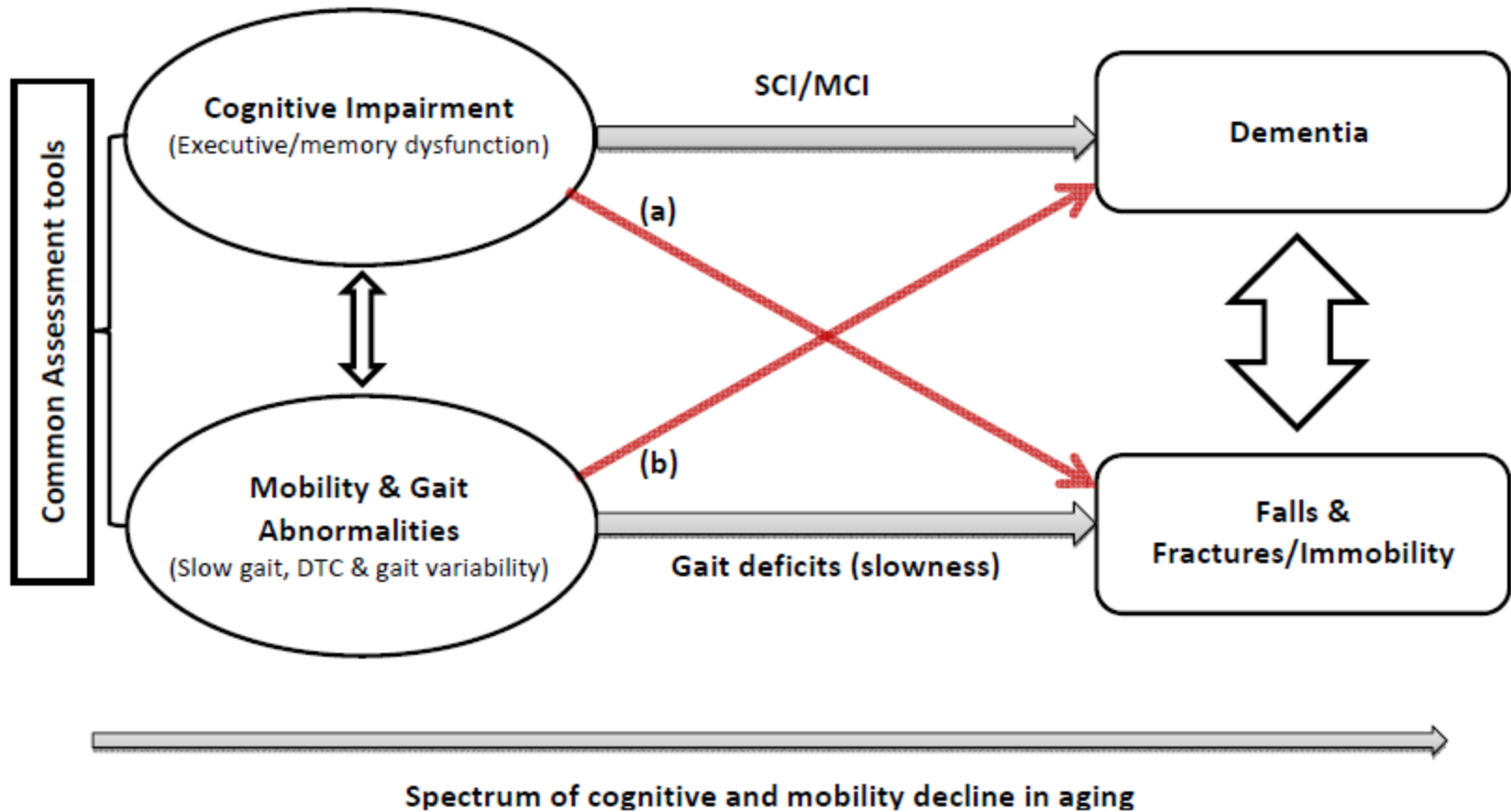


Figure 1 Conceptual Framework of Cognitive and Mobility decline. Modified from^{1,7}



Note: DTC: dual-task gait cost



CCNA Motor, Exercise & Cognition (MEC) Team



CIHR IRSC
Canadian Institutes of Health Research
Instituts de recherche en santé du Canada

Canadian Consortium on Neurodegeneration in Aging.

The Canadian Component of CIHR's International Collaborative Research Strategy for Alzheimer's Disease.

Distinctive expertise in
exercise interventions
gait/physical activity
cognition

Including 2 Canada Research Chairs

Teresa Liu-Ambrose
(UBC)

Richard Camicioli
(U of Alberta)

Bill McIlroy
(U of Waterloo/Toronto)

Quincy Almeida
(Laurier U)

Laura Middleton
(U of Waterloo)

Manuel MonteroOdasso
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Susan Hunter
Akshya Vasudev

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Mark Speechley

Louis Bherer
(Concordia U)

Julien Doyon
(U de Montreal)

Karen Li
(Concordia U)

Jose Morais
Sarah Fraser

(McGill U)

MEC Team 12 *Motor, Exercise and Cognition*

Leader: Manuel Montero Odasso Co-Leader: Louis Bherer

Objectives and Deliverables

1- Developing Understanding (years 1-2)

- To develop common tools, language and **outcomes measures** for motor & cognition
- To understand the anatomical substrate of motor & cognition (imaging, biomarkers)
Deliverable: we will create the “**Canadian Consensus on Mobility and Cognition**”

•2- Applying Understanding (years 2-5)

- To conduct a phase II **multimodal clinical trial** using exercises + cognitive remediation + Vitamin D to improve cognition in SCI-MCI
- To translate motor assessments in cognitive clinics as a complementary diagnostic tool for Dementia risk stratification
- To translate **exercise intervention** to improve cognition in the real world

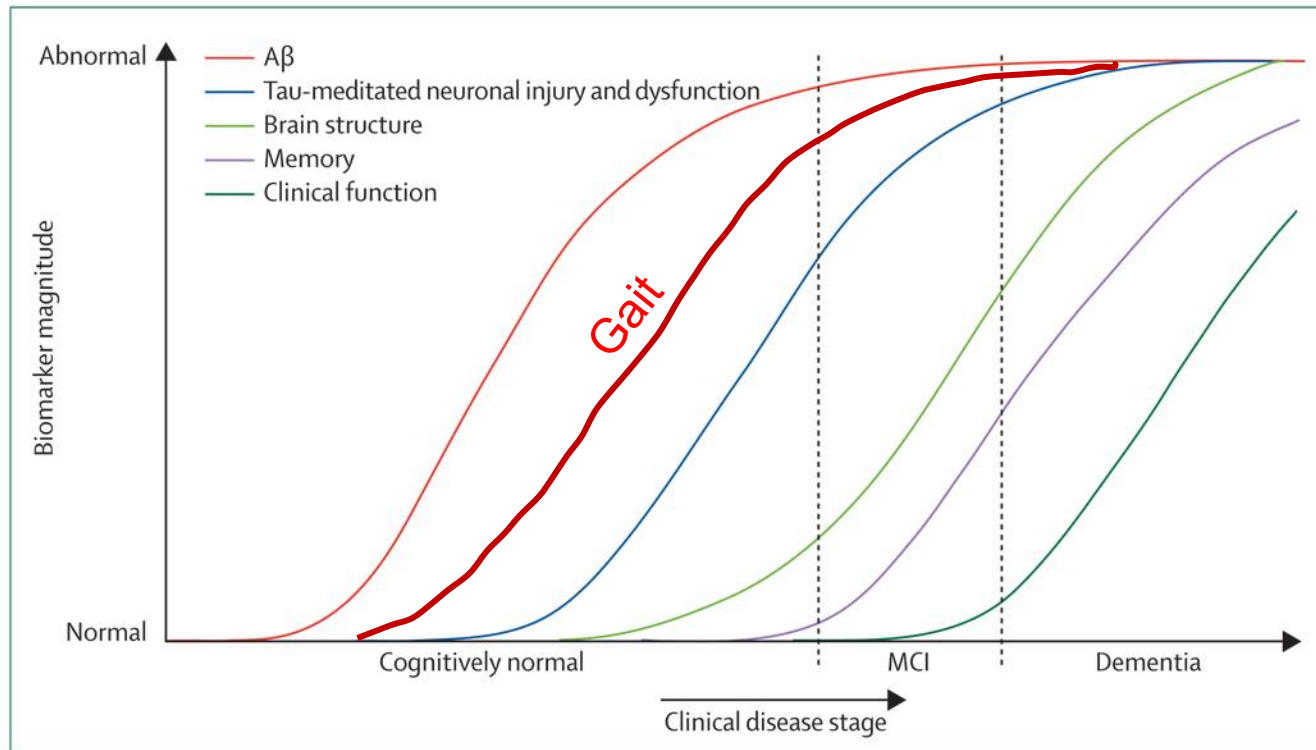
Motor, Exercise and Cognition Team-CCNA Team 12 version 2
A complementary window to understand and treat AD and Neurodegenerative Disease of Aging

| | Developing understanding Gait & Cognition & Exercise | Applying understanding Assessment/Interventions |
|---------------------|---|---|
| Deliverables | 1-Developing tools, techniques and common language in Gait & Cognition and Motor learning | 2-Characterize the “Motor Signature” of cognitive decline in “network” diseases as a new biomarker |
| Projects | 1A – Evidence, diagnostics, interventions and outcomes linking gait, cognition, motor learning, exercise and brain health (Year 1) 1B – Mobility/walking competency, cognition, motor learning and physical activity among older adults (Normal, MCI, AD) (Year 1) | 2A – Dual task paradigm in gait-cognition cohort studies 2B – Vascular & genomics components in network diseases affecting gait & cognition. Role of depression, vitamin D and inflammation. 2C– Frontal-executive, motor function and learning with aging (Years 1-3) |
| Methods | Systematic reviews, consensus panels, technology development, Identification of mediators and moderators | Cross-sectional & prospective studies across the spectrum of mobility and cognition |
| | | 3-Advance diagnostic and research tools 3A – Optimal exercise interventions and logistic of Synergic Trial (Years 1) 3B – Indices of vascular health that relate to impairment of gait and cognition (Years 2-5) 3C- Imaging variables. Blood test (years 1, 3, 5) |
| | | 4-Advance therapeutic strategies: RCT 4A – Exercise + Vitamin D+ Cognitive remediation interventional trial (Years 2 - 5) |

Cross-teams interactions

- Assessment of brain structure (imaging), genotyping, inflammatory markers, and vitamin D levels
- Cross team supervision of graduate student and research fellows
- Interaction with Carol Greenwood’s team : Nutrition and exercise, Dr. Eric Smith’s team: Vascular illness and impacts, Dr Richard Camicioli’s team: Lewy Bodies and Dementia , Dr Sylvie Belleville’s team: Cognitive Intervention and Brain Plasticity, Roger Dixon’s team: Developing New Biomarkers, Dr. Natalie Philips’ team : Interventions at the Sensory and Cognitive Interface, Dr Michael Borrie’s cohort platform and Drs Alan Evans, Louis Collins & Simon Duchesne’s team: Imaging/Database/Information Technology Platform.

Gait as a biomarker of cognitive decline



Jack CR et al. **Lancet Neurology 2010**

Dynamic biomarkers of the Alzheimer's pathological cascade

Aβ is identified by CSF Aβ₄₂ or PET amyloid imaging. Tau-mediated neuronal injury and dysfunction is identified by CSF tau or fluorodeoxyglucose-PET. Brain structure is measured by use of structural MRI. Aβ=β-amyloid. MCI=mild cognitive impairment.

Objectives:

- 1-Identify and establish common nomenclature and assessments for cognition/motor interaction older adults.
- 2-Propose a set of “core mobility and cognitive tests” to assess cognitive and mobility interactions and to be used as outcomes for interventions.
- 3-Identify the best mobility assessment to be used as a complementary diagnostic tool for detecting dementia.
- 4-Identify the best cognitive assessment to be used as a complementary diagnostic tool for detecting seniors at risk of dysmobility, falls and fractures.
- 5-Identify cutting edge research being done by trainees across Canada, highlighted during the consensus session through posters presentations.
- 6-Foster national and international collaborations and data sharing based on the core assessment battery selected by consensus.

Acknowledgments



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www.gaitandbrain.com

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