UNIVERSITY OF WESTERN ONTARIO

EARLY COGNITIVE IMPAIRMENT: WHAT SHOULD WE DO?

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EARLY COGNITIVE IMPAIRMENT: WHAT SHOULD WE DO?

I VASCULAR COGNITIVE APPROACH

II TREAT IT

III PREVENT IT

THE VASCULAR COGNITIVE IMPAIRMENT APPROACH

= Any cognitive impairment associated with or caused by a vascular factor

1. Adopt a common metric system

2. Test several provisional criteria simultaneously

3. Identify and treat the vascular component

Original Contributions

National Institute of Neurological Disorders and Stroke-Canadian Stroke Network Vascular Cognitive Impairment Harmonization Standards

Vladimir Hachinski, MD, DSc; Costantino Iadecola, MD; Ron C. Petersen, MD, PhD; Monique M. Breteler, MD, PhD; David L Nyenhuis, PhD; Sandra E. Black, MD; William J. Powers, MD; Charles DeCarli, MD; Jose G. Merino, MD; Raj N. Kalaria, PhD, FRCP; Harry V. Vinters, MD; David M. Holtzman, MD; Gary A. Rosenberg, MD; Martin Dichgans, MD; John R. Marler, MD; Gabrielle G. Leblanc, PhD

Background and Purpose—One in 3 individuals will experience a stroke, dementia or both. Moreover, twice as many individuals will have cognitive impairment short of dementia as either stroke or dementia. The commonly used stroke scales do not measure cognition, while dementia criteria focus on the late stages of cognitive impairment, and are heavily biased toward the diagnosis of Alzheimer disease. No commonly agreed standards exist for identifying and describing individuals with cognitive impairment, particularly in the early stages, and especially with cognitive impairment related to vascular factors, or vascular cognitive impairment.

Stroke. 2006;37:2220-2241

THE VASCULAR COGNITIVE APPROACH

EVALUATION

1. History and examination
2. Neuropsychological evaluation
3. Investigations
4. Identifying the vascular component
5. Differential diagnosis

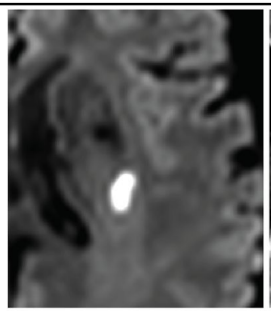
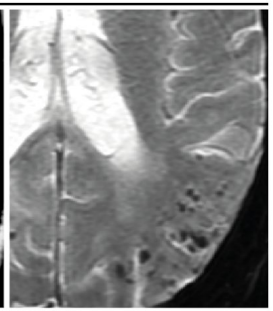
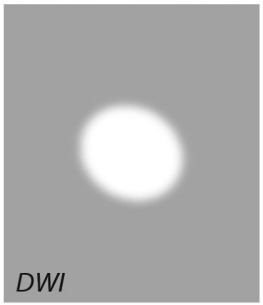
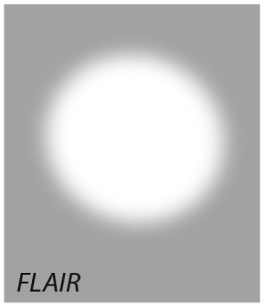
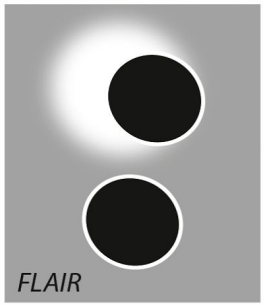
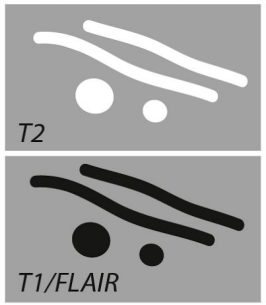
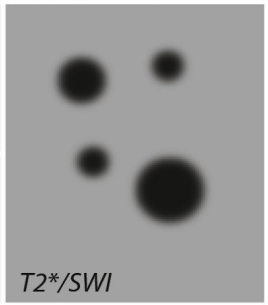
ISCHEMIC SCORE WITH 5 COMPOSITE ITEMS*

Item No.	Item Description	Score if Answer is Yes
1 / 2	Abrupt onset or stepwise deterioration	Scored electronically
3 / 4	Fluctuating course or nocturnal confusion	Scored electronically
6/8	Depression or emotional incontinence	Scored electronically
9/11	History of hypertension or atherosclerosis	Scored electronically
10/12	History of stroke or focal neurological symptoms	Scored electronically
Total		Scored electronically

* A vascular component of cognitive impairment may be indicated after electronic computation

Hachinski V. et al Arch Neurol 2012:69(2):169-175

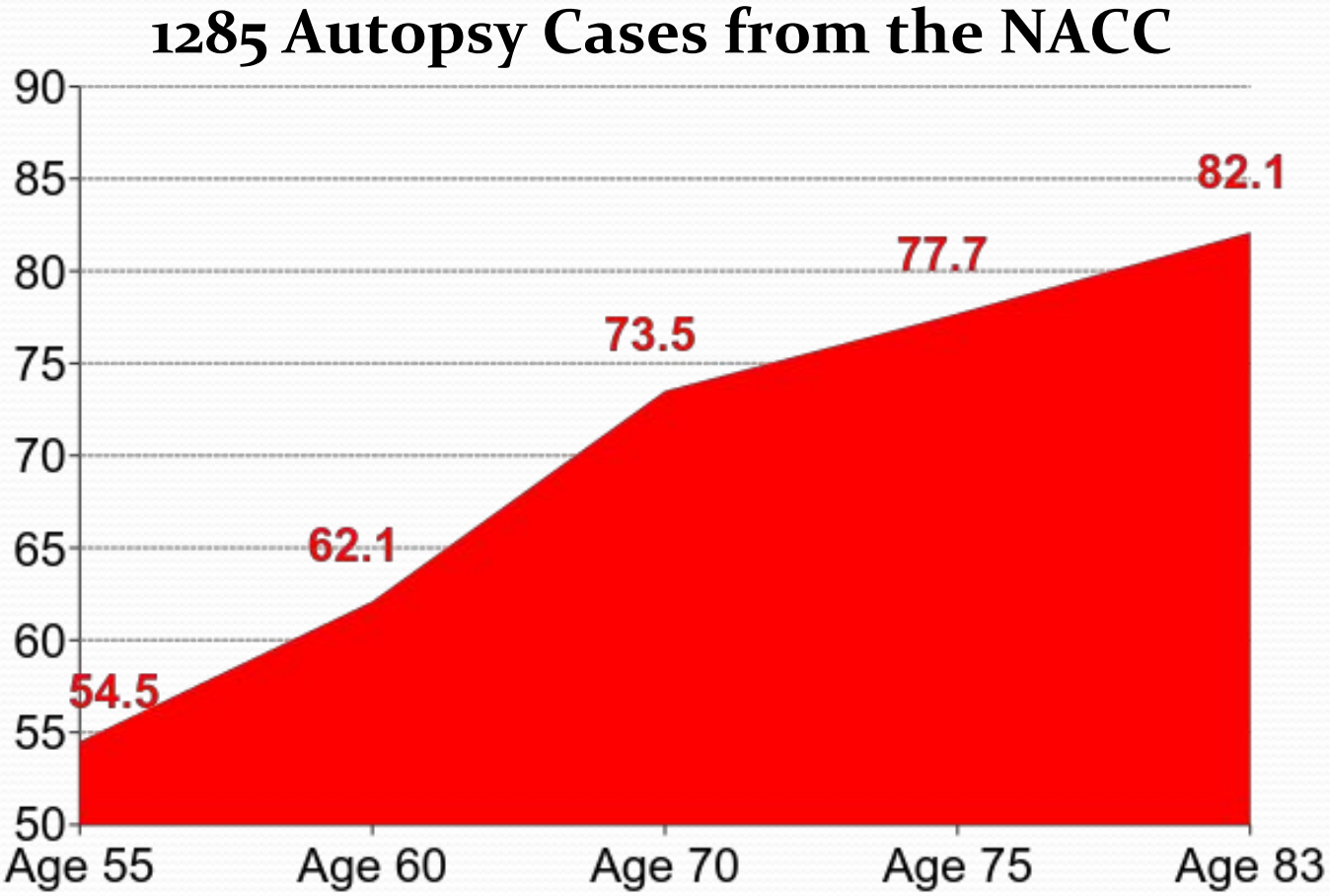
STRIVE: **ST**andards for **R**epor**I**ng **V**ascular Changes on N**E**uroimaging, V1, The Lancet Neurology 2013;12:822-38

	Recent small subcortical infarct	White matter hyperintensity	Lacune	Perivascular space	Cerebral microbleeds
Example image					
Schematic	 *DWI*	 *FLAIR*	 *FLAIR*	 *T2* *T1/FLAIR*	 *T2*/SWI*
Usual diameter[1]	≤ 20 mm	variable	3-15 mm	≤ 2 mm	≤ 10 mm
Comment	best identified on DWI	located in white matter	usually have hyperintense rim	usually linear without hyperintense rim	detected on GRE seq., round or ovoid, blooming
DWI	↑	↔	↔/(↓)	↔	↔
FLAIR	↑	↑	↓	↓	↔
T2	↑	↑	↑	↑	↔
T1	↓	↔/(↓)	↓	↓	↔
T2* / GRE	↔	↑	↔ (↓ if haemorrhage)	↔	↓↓

DIFFERENTIAL DIAGNOSIS OF COGNITIVE IMPAIRMENT

1. Drugs
2. Depression
3. Diseases

Prevalence of Vascular Lesions across Ages at Death in Pathology Specimens from Patients with Alzheimer's Disease as Primary Pathological Diagnosis



Hachinski V & Sposato LA. Unpublished

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THE SPRINT TRIAL

9361 Subjects with BP ≤ 130 mm systolic at increased cardiovascular risk

Randomized to targets of
140mm systolic or

120mm systolic

Trial stopped at 3.26 years

The SPRINT Research Group. NEJM. Nov 9 2015

THE SPRINT TRIAL

120mm systolic target

↓ Mortality HR 0.73 95% CI 0.64 – 0.89

↓ MI, stroke MR 0.75 95% CI 0.64 – 0.89

heart failure

Serious side effects (hypotension, syncope, electrolyte abnormalities, acute kidney injury or failure)

120mmHg group. 4.7% vs 2.5% 140 mmHg group

HR 1.88 $p < 0.001$

Orthostatic hypotension significantly less common in 120mmHg group

The SPRINT Research Group. NEJM Nov 9 2015

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3 STEPS IN PREVENTION

RISK ⇄ **MOTIVATION** ⇄ **ENABLEMENT**

Personality School/Work

Decision Communities

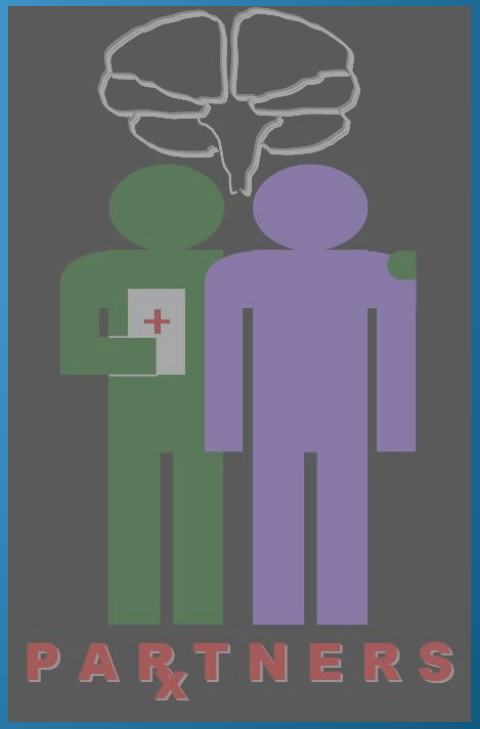
stage Harnessing technologies

and social media

Environment

PARTNERS

A Canadian Multi-Center, Randomized, Controlled, Open-Labeled, Blinded Adjudication Clinical Trial



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

Canadian Stroke Network
Réseau Canadien contre les accidents cérébrovasculaires

LAWSON
HEALTH RESEARCH INSTITUTE
The research institute of London Health Sciences Centre and St. Joseph's Health Care, London.

Western

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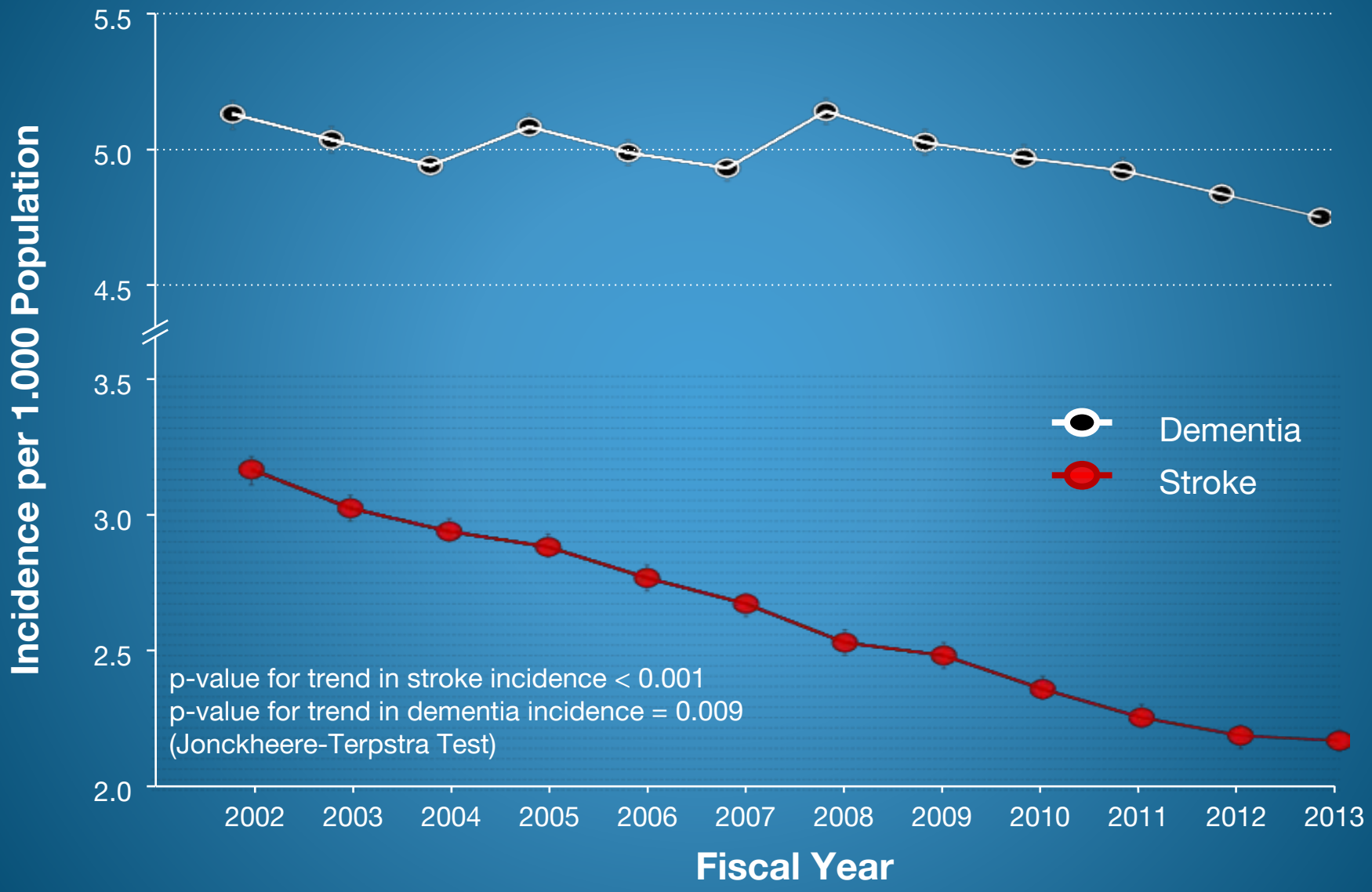
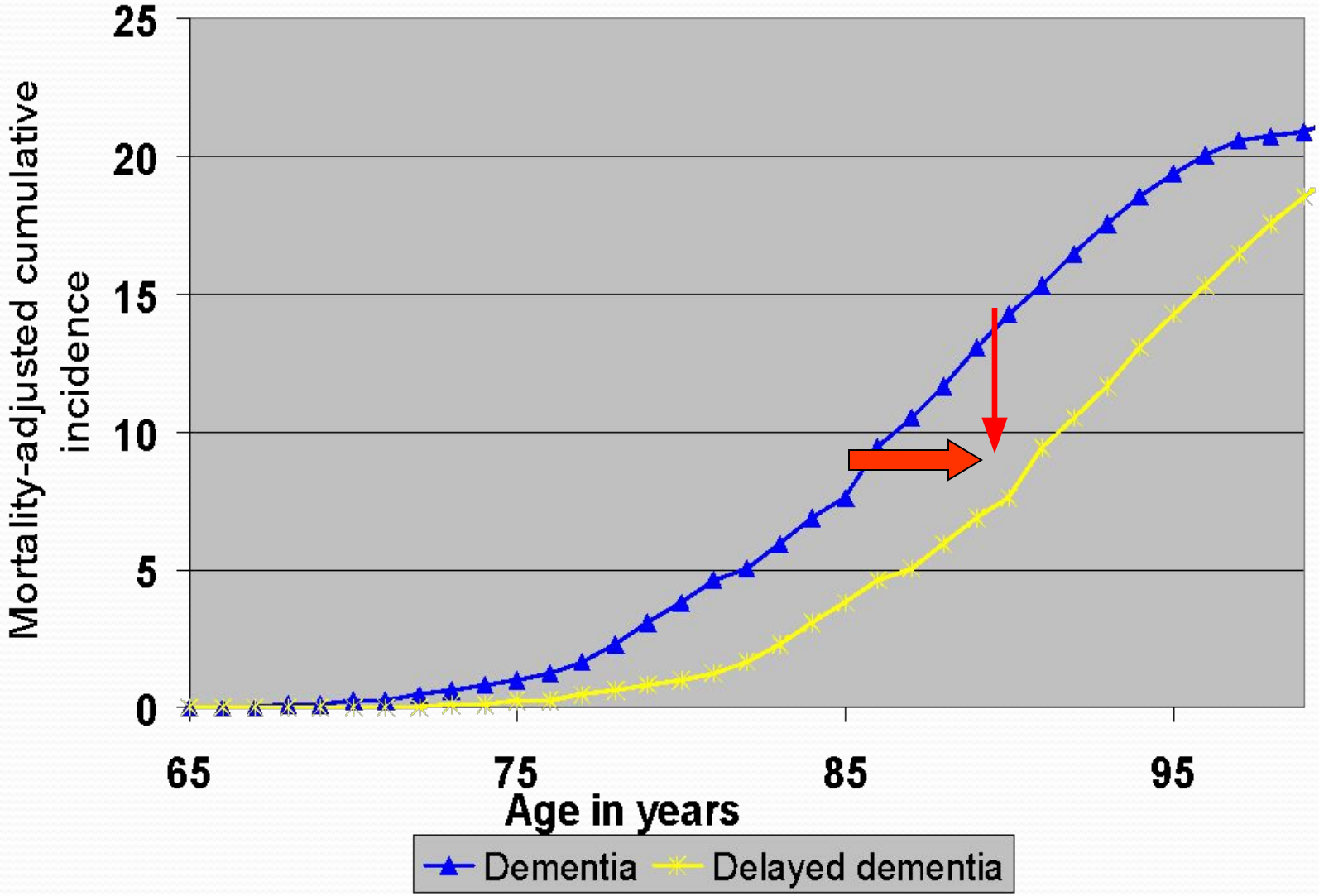


Sposato LA…..Hachinski V. JAMA Neurol. 2015;72:1529-1531

Lifetime Risk of Dementia: Women - 65 yrs



Seshadri et al. Lifetime Risk of Stroke: The Framingham Study. Stroke 2006; 37: 344-349.