Vascular Cognitive Impairment: There is Something that YOU can do

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Disclosures

- Board member of the Alzheimer Society of Toronto
- Applicant on multiple grants from CIHR, Alzheimer Society of Canada, Parkinson's Society of Canada, Michael J. Fox Foundation – but I do not receive any financial support

PRE-TALK QUIZ

Question 1

- Vascular dementia is just another form of Alzheimer's disease.

  A. True

  B. False

Question 2

- Vascular dementia can be caused by subclinical strokes

  A. True

  B. False

Question 3

- Vascular dementia can be treated.

  A. True

  B. False

Outline

1. Dementia – causes
2. What is vascular dementia
3. Causes of vascular dementia
4. How to make a diagnosis
5. How can you treat this

What is dementia?

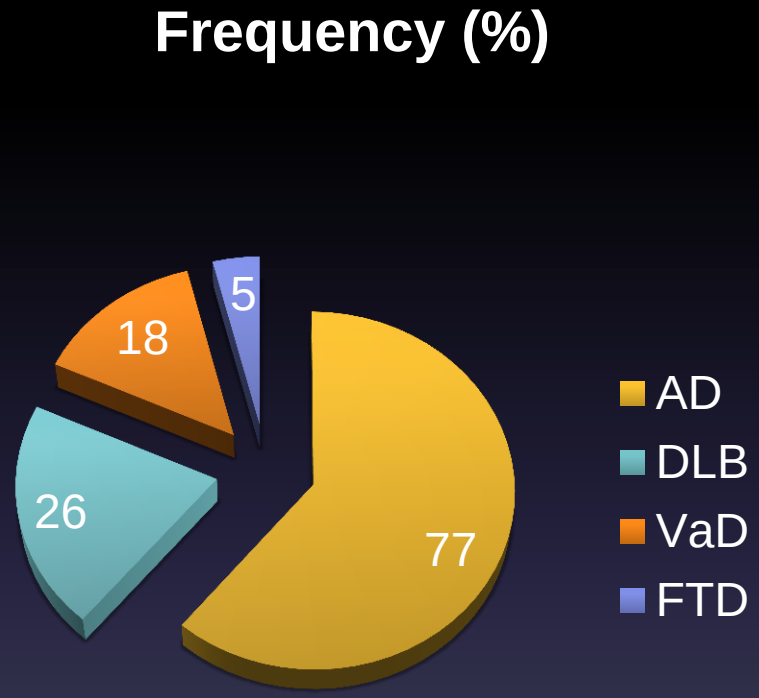
- Need to have
  - impairment in memory
  - Impairment in another cognitive domains such as language, praxis, executive function
  - changes in ability to perform their usual daily activities

Ronald Reagan (1911-2004)

Causes of Dementia

Barker et al., Alzheimer Dis Assoc Disord 2002; 16: 203-212

- Alzheimer's disease (AD)
- Vascular disease (VaD)
- Dementia with Lewy bodies (DLB)
- Frontotemporal dementia (FTD)



Vascular Dementia is Increasing

Pre-2012	Post-2012
1. Alzheimer dementia	1. Alzheimer dementia
2. Dementia with Lewy bodies	2. Mixed vascular-Alzheimer dementia
3. Vascular dementia	3. Vascular dementia

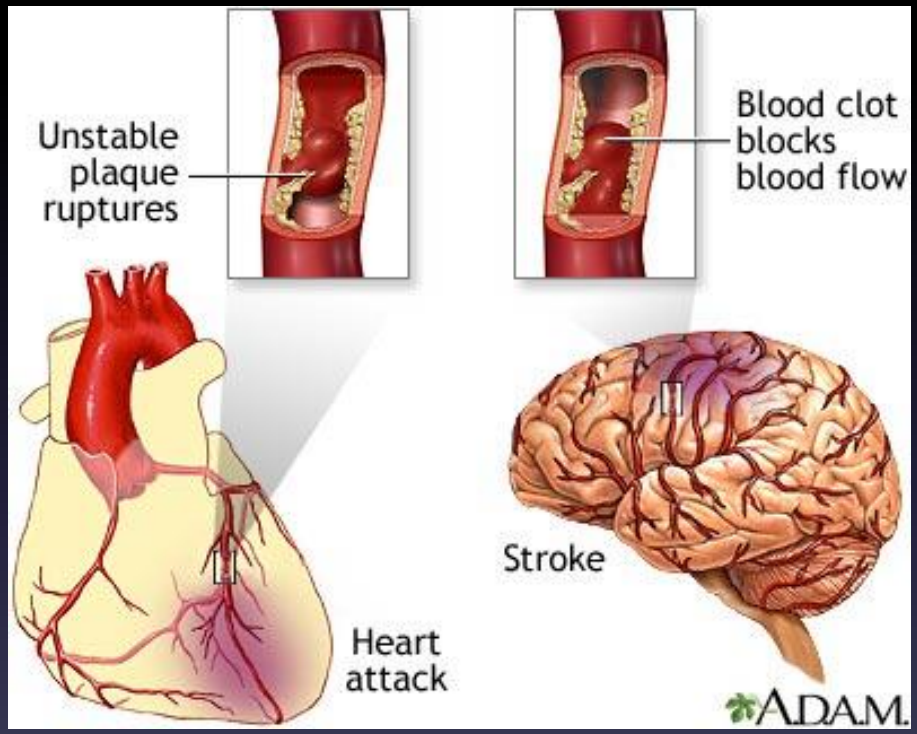
The Many Terms of Vascular Dementia
(…they all mean the same thing)

- Vascular dementia
- Binswanger disease
- Vascular cognitive impairment

Margaret Thatcher (1925-)

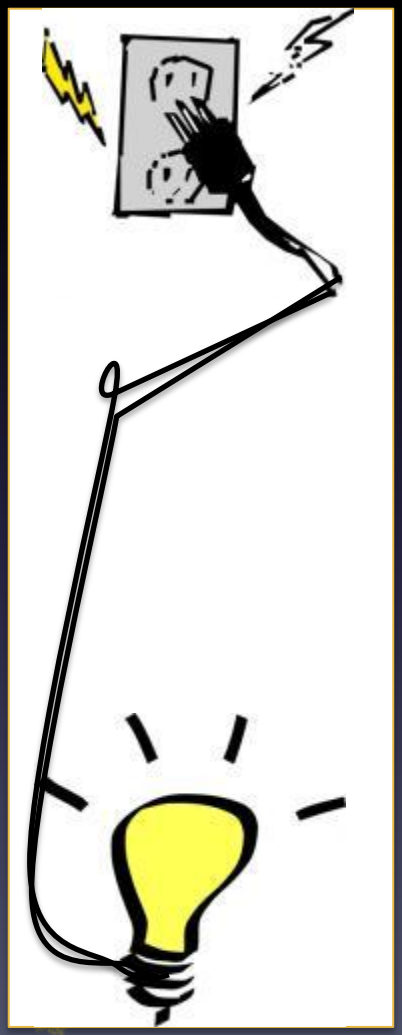
How Does Vascular Disease Cause Vascular Dementia

- Inadequate or blockage of blood flow in the arteries causes damage or kills cells



How Does the Blockage of Blood Vessels and Cell Death/Damage Cause the Dementia in the Brain

Analogy – *Light*



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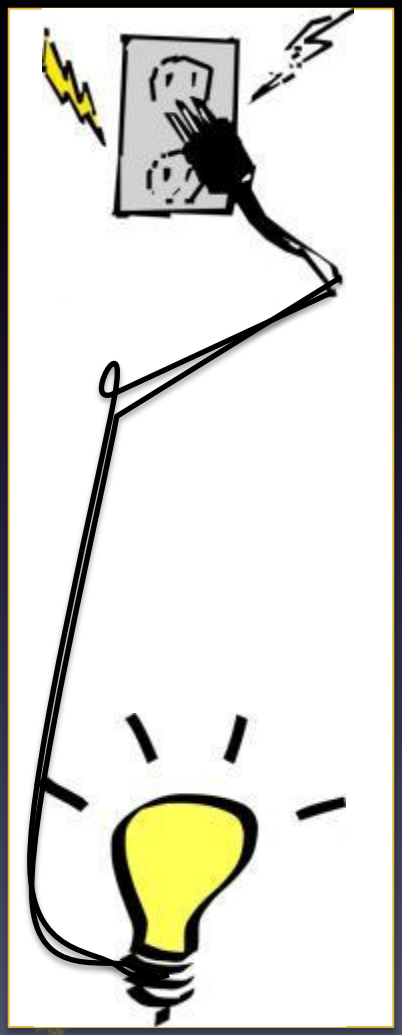
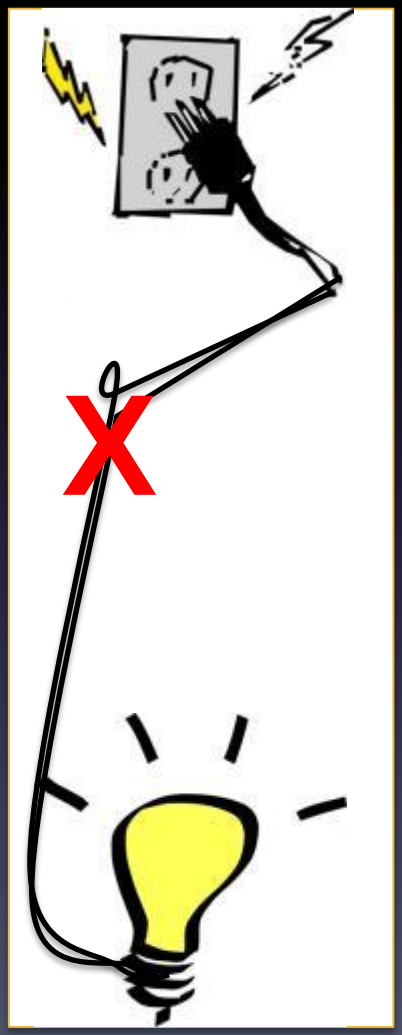
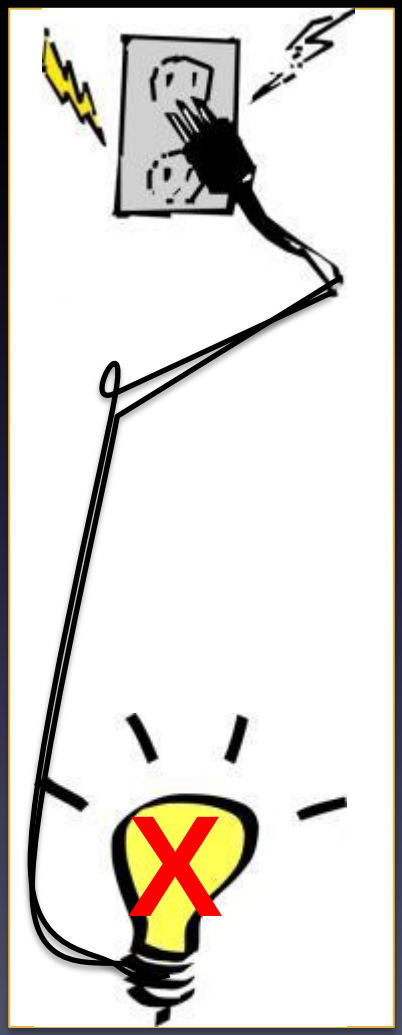


2 ways for light bulb not to work





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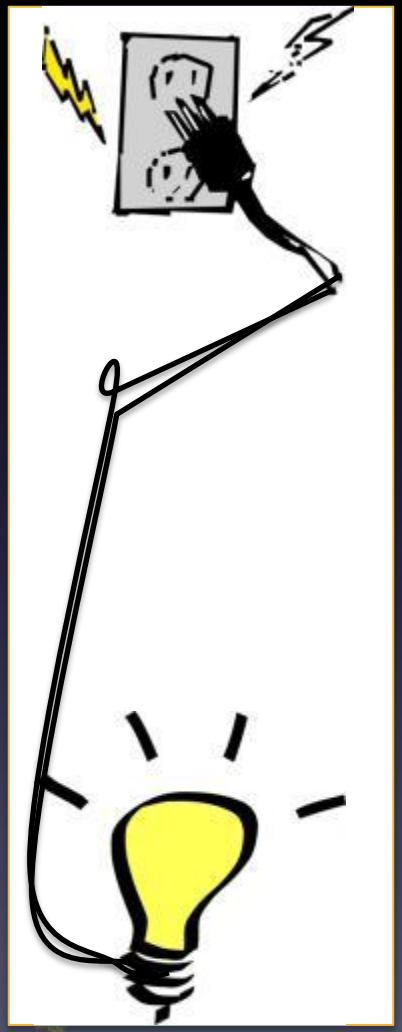

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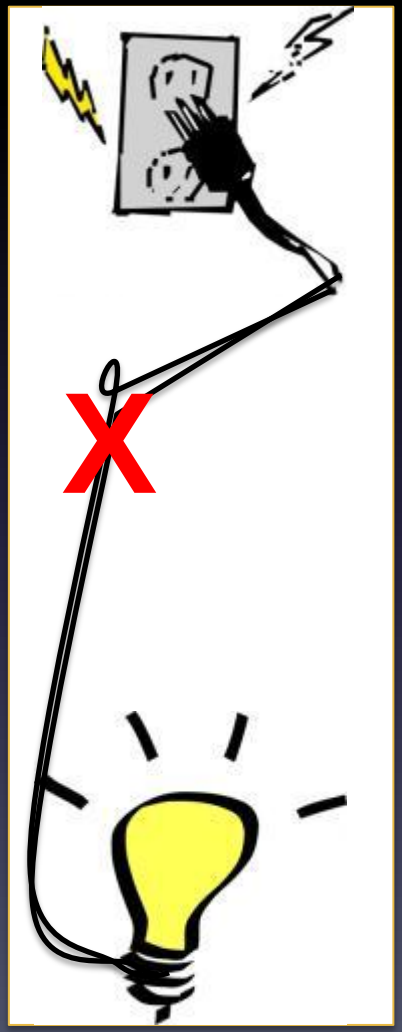
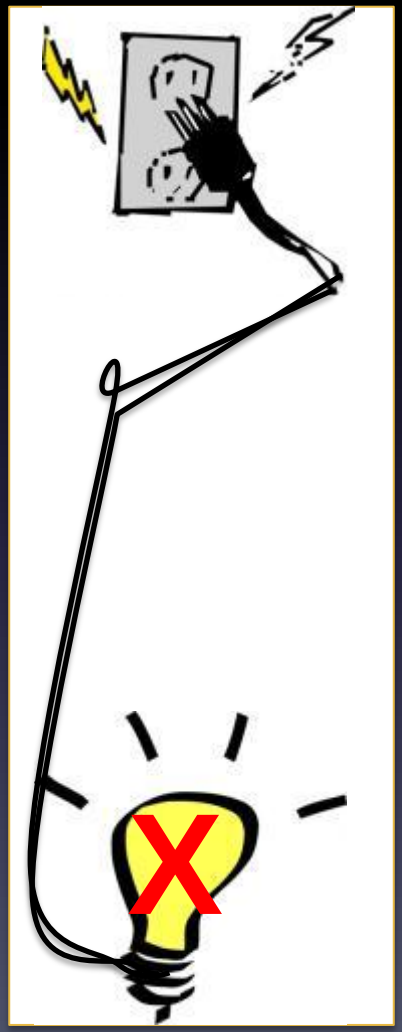




Brain

Classic Presentation of Vascular Dementia

Stroke

↓

Cognitive impairment

↓

Stroke

↓

Cognitive impairment

↓

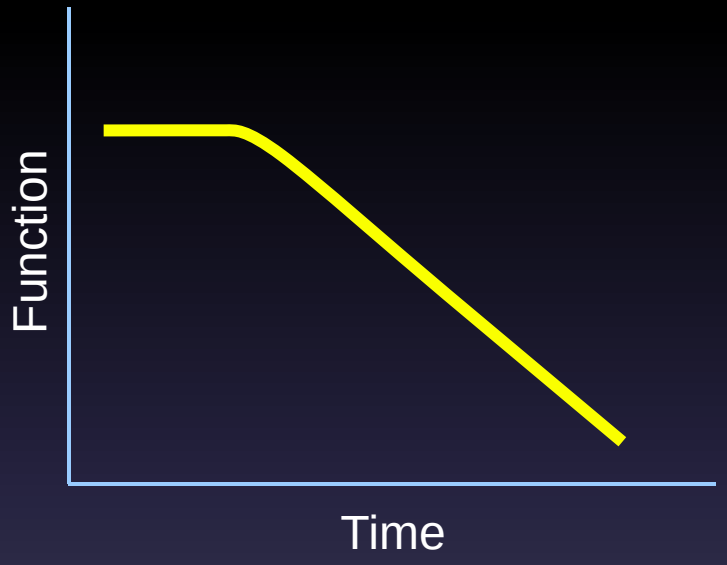
Stroke

↓

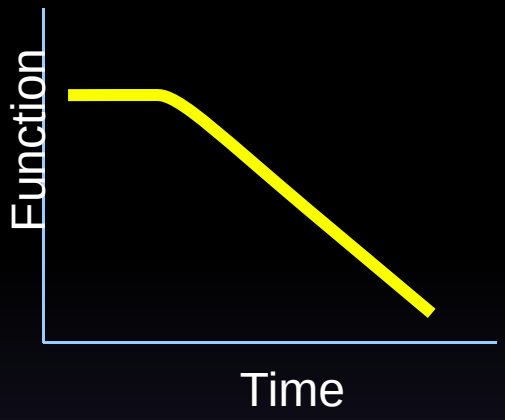
Cognitive impairment

Vascular Dementia
Most Common Presentation

- Progressive decline in cognition and function that may be similar to Alzheimer's disease
  - There is no step-wise decline



Why is There a Discrepancy?



- Strokes cause *sudden* changes
- Tend to focus on vision, weakness, difficulties speaking, dizziness

- More parts of the brain are involved in thinking than movement
- Sudden changes in thinking may not be appreciable (*e.g.* being able to manage 3 tasks at once instead of 5)
- Blockages to the smallest arteries that feed the white matter of the brain (*i.e.* the wiring) may take months to years to occur

Diagnosing Dementia

Decline in cognition

- Memory
- Language
- Executive Function
- Visuospatial
- Praxis

Diagnosing Dementia

Decline in cognition

- Memory
- Language
- Executive Function
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Change in usual daily function

- Forgetting appointment, paying bills
- Word-finding difficulties
- Unable to multitask (e.g. cooking many dishes at the same time
- Getting lost
- Forgetting how to use appliances

Diagnosing Dementia

Decline in cognition

- Memory
- Language
- Executive Function
- Visuospatial
- Praxis

Change in usual daily function

- Forgetting appointment, paying bills
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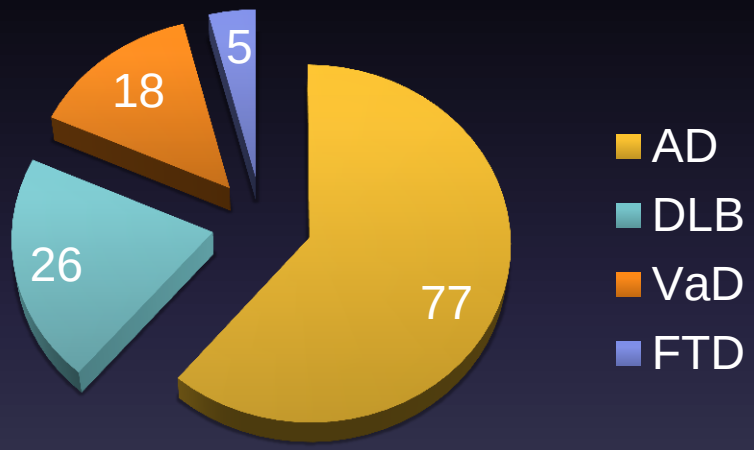
DEMENTIA

How to Suspect the Diagnosis of Vascular Dementia?

Frequency (%)



AD = Alzheimer's disease
DLB = Dementia with Lewy bodies
VaD = Vascular Dementia
FTD = Frontotemporal dementia

Sir Winston Churchill (1874-1965)

U of T NEUROLOGY

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When to suspect this diagnosis?

- Presence of cerebrovascular risk factors
- History of a stroke
- Sudden changes in cognition
- Specific examination findings
- Specific findings on cognitive testing

Risk Factors

- Hypertension
- Hypercholesterolemia
- Diabetes
- Smoking
- Obesity

When to suspect this diagnosis?

- Presence of cerebrovascular risk factors
- History of a stroke
- Sudden changes in cognition
- Specific examination findings
- Specific findings on cognitive testing

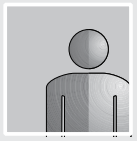
Stroke

- If associated with a change in cognition
- If NOT associated with a change in cognition
- *Presence of a previous stroke is a risk factor to develop another stroke*

Review: Symptoms of a Clinical Stroke

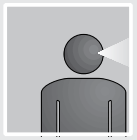
Heart and Stroke Foundation of Canada (www.heartandstroke.com)

SIGNS



Weakness – Sudden loss of strength or sudden numbness in the face, arm or leg, even if temporary.

Trouble speaking – Sudden difficulty speaking or understanding or sudden confusion, even if temporary.



Vision problems – Sudden trouble with vision, even if temporary.

Headache – Sudden severe and unusual headache.

Dizziness – Sudden loss of balance, especially with any of the above signs.

ACTION

If you experience any of these symptoms, CALL 9-1-1 or your local emergency number immediately.

U of T NEUROLOGY

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When to suspect this diagnosis?

- Presence of cerebrovascular risk factors
- History of a stroke
- Sudden changes in cognition
- Specific examination findings
- Specific findings on cognitive testing
- Changes occurring over minutes or overnight and do NOT resolve

When to suspect this diagnosis?

- Presence of cerebrovascular risk factors
- History of a stroke
- Sudden changes in cognition
- Specific examination findings
- Specific findings on cognitive testing

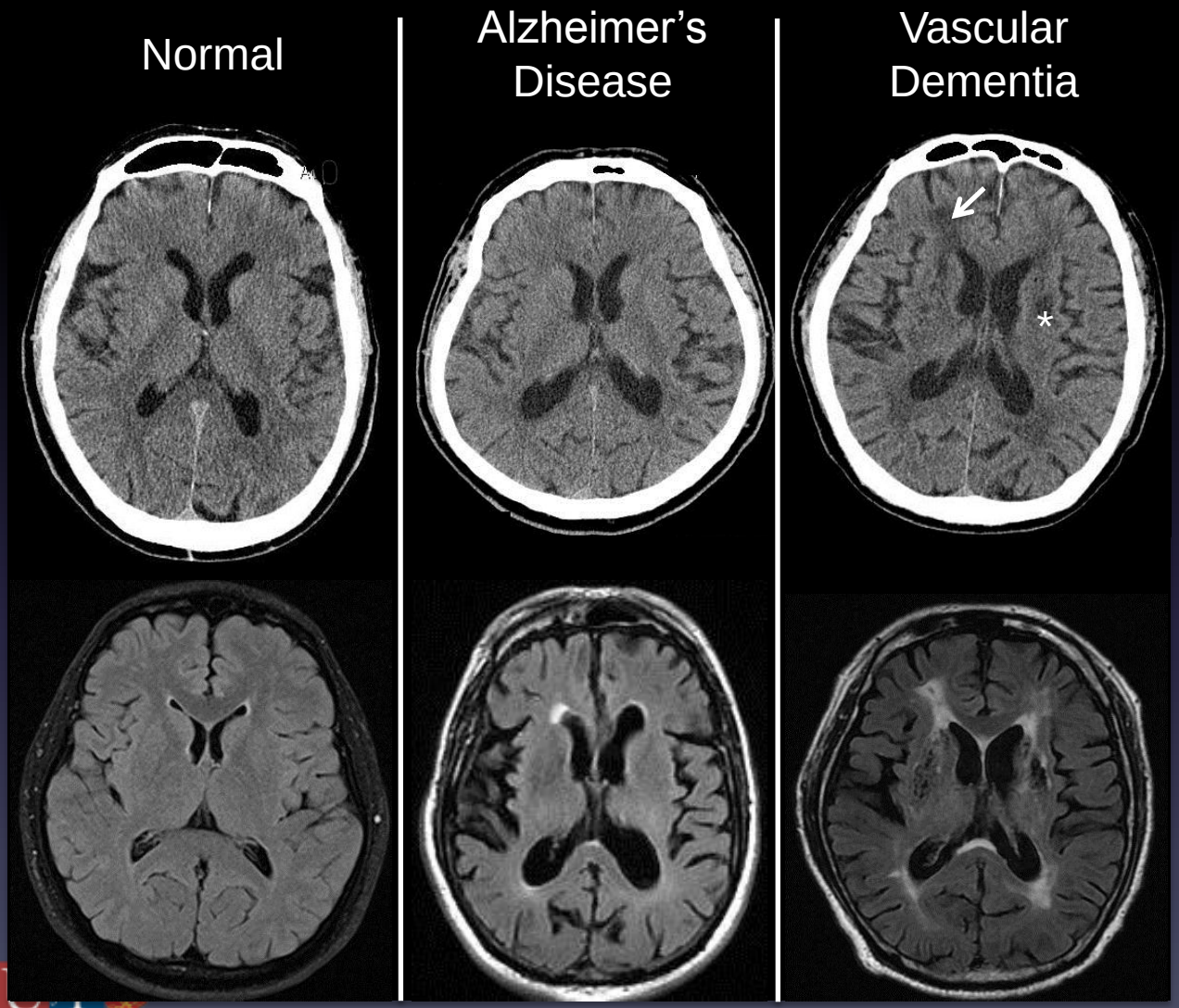
- Elevated blood pressure
- Presence of carotid bruits
- Signs of a previous stroke
  - Specific pattern of weakness (extensors in arms and flexors in legs are weaker than other actions)
  - Reflexes are more easily obtained on one side of the body than the other side
  - Presence of a Babinski sign (“upgoing toe”)
  - Clumsiness or slowness with rapid coordinated activity (*e.g.* touching each finger to the thumb)
- Trouble walking
  - slow, shuffling – almost looking like Parkinson’s disease but there are NO other signs of Parkinson’s disease

When to suspect this diagnosis?

- Presence of cerebrovascular risk factors
- History of a stroke
- Sudden changes in cognition
- Specific examination findings
- Specific findings on cognitive testing
  - Slower thinking
    - Slower than the average typical person with Alzheimer's disease
  - Mini Mental Status Examination (MMSE) or Montreal Cognitive Assessment (MoCA)
    - Longer to learn the words to remember for later (*e.g.* 3-4 trials to learn 3 words on MMSE)
    - Slower to complete timed tasks (*e.g.* comes up with 4 words in 1 minute that start with the letter F on MoCA)

Neuroimaging – CT or MRI brain

Tang-Wai. *Canadian Geriatrics Society Journal* 2012; 2: 18-25



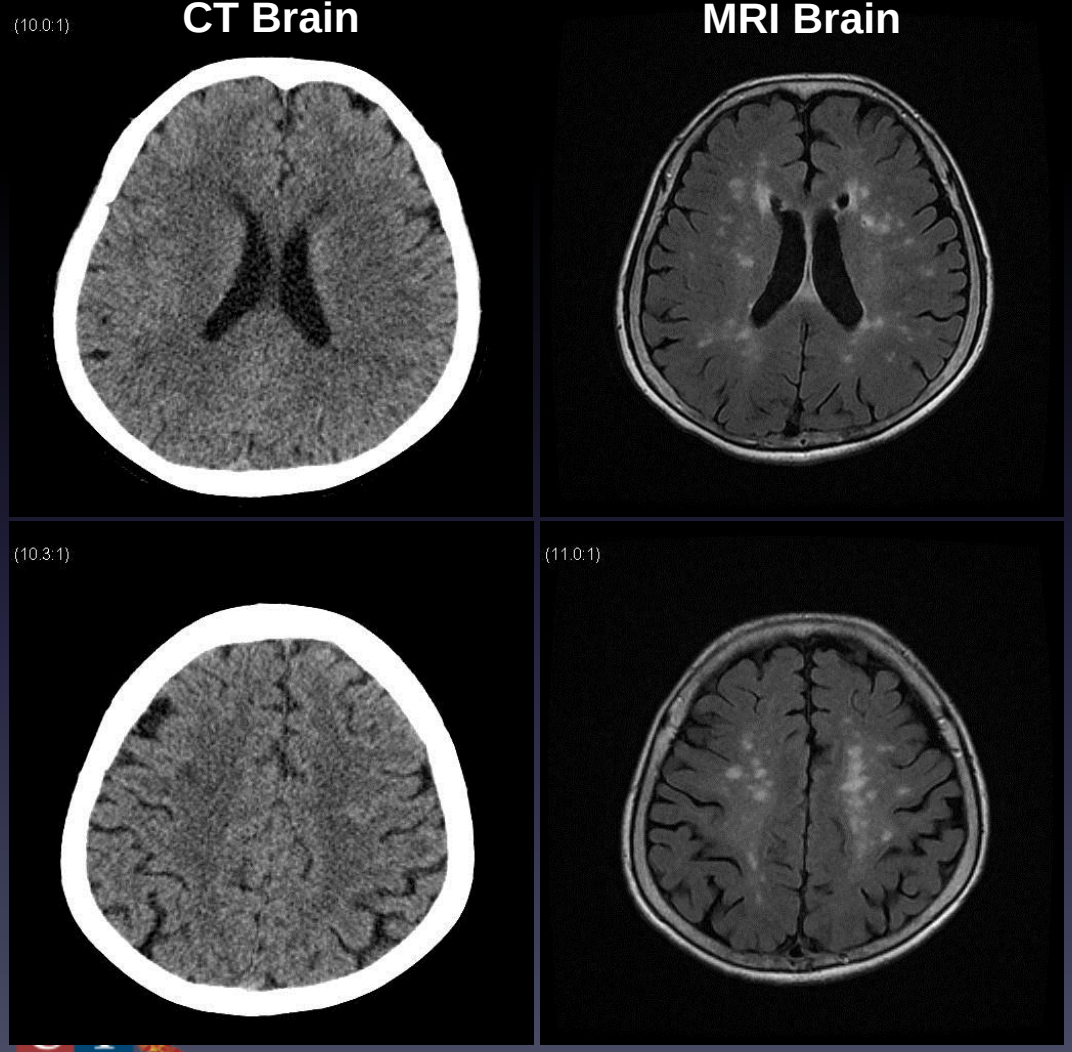
The CT brain of Vascular Dementia, microvascular disease is demonstrated with the presence hypodensities within the white matter that appears as dark gray (white arrows) and strokes that appears as black holes (white stars).

Normal white matter appearance on CT is light gray (see top left picture). The equivalent MRI is also shown with ischemic white matter changes (white areas) and strokes (black holes).

Superiority of MRI to Detect White Matter Lesions

Tang-Wai. *Canadian Geriatrics Society Journal* 2012; 2: 18-25

Vascular Dementia



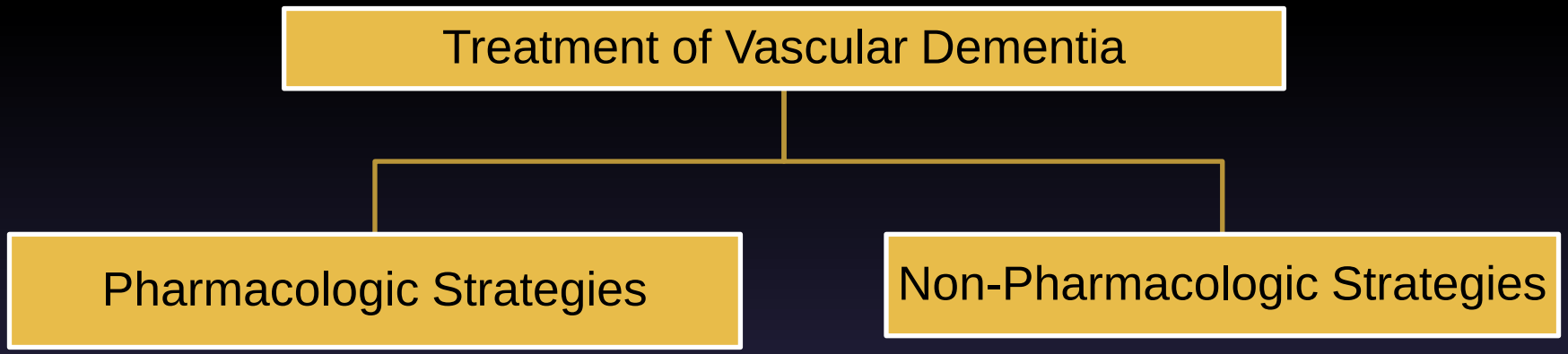
In a person with vascular cognitive impairment (VCI), MRI is more sensitive to CT brain in detecting ischemic white matter disease.

These equivalent sections of a patient with VCI who underwent both a CT and MRI. The MRI (middle panel) demonstrates the ischemic white matter changes (the bright white dots) that is not readily seen on the CT (left panel).

Diagnosis of Vascular Dementia

- Diagnosis is based on the whole person, the whole story, and all the tests
- Having 1 or 2 elements is generally insufficient to make the diagnosis
  - Example: The presence of carotid bruits *alone* will not make the diagnosis of Vascular Dementia

Treatment of Vascular Dementia



Pharmacological Treatment of Vascular Dementia

1. Manage the cerebrovascular risk factors – prevent another stroke
2. Secondary prevention of stroke
3. Medications for Alzheimer's disease

- Treat hypertension, diabetes, elevated cholesterol within recommended limits
- Stop smoking
- Heart (brain) healthy diet
- Weight reduction and increase physical activity

Pharmacological Treatment of Vascular Dementia

1. Manage the cerebrovascular risk factors
2. Secondary prevention of stroke
3. Medications for Alzheimer's disease

- If there is evidence of a clinical stroke, silent lacunar type of stroke (black hole on imaging), consider antiplatelet agents, such as ASA or Plavix, if there are no other contraindications

Pharmacological Treatment of Vascular Dementia

1. Manage the cerebrovascular risk factors
2. Secondary prevention of stroke
3. Medications for Alzheimer's disease

- Cholinesterase inhibitors
  - Donepezil (Aricept®)
  - Rivastigmine (Exelon®)
  - Galantamine (Reminyl®)

Non-Pharmacological Treatment of Vascular Dementia

- Heart healthy diet
- Physical exercise
- Brain/cognitive stimulation exercise
- Stop smoking
- Limit alcohol intake
- Reduce intake of foods high in fat and cholesterol
- Increase intake of “protective” foods (e.g. nuts, fish, vegetables)
- Mediterranean diet
- http://www.alzheimer.ca/en/About-dementia/About-the-brain/Brain-health/Make-healthy-food-choices

Non-Pharmacological Treatment of Vascular Dementia

- Heart healthy diet
- Physical exercise
- Brain/cognitive stimulation exercise
- Stop smoking
- Limit alcohol intake
- Walking
- Swimming
- Aerobics

Non-Pharmacological Treatment of Vascular Dementia

- Heart healthy diet
- Physical exercise
- Brain/cognitive stimulation exercise
- Stop smoking
- Limit alcohol intake

- Socialization
- Socialization
- Socialization
- Reading
- Puzzles
- Any fun activity!

Non-Pharmacological Treatment of Vascular Dementia

- Heart healthy diet
- Physical exercise
- Brain/cognitive stimulation exercise
- Stop smoking
- Limit alcohol intake
- 1 or less alcoholic drink per day

Management of Vascular Dementia is Similar to Management of Alzheimer

Patient

- Changes in cognition and function
- Change in behaviour
- Changes in sleep
- Changes in motor function

Caregiver

- Monitoring for burnout
- Depression
- Sleeplessness
- Health status

Lifespan

Bruandet et al., *J Neurol Neurosurg Psych* 2009; 8: 133-139

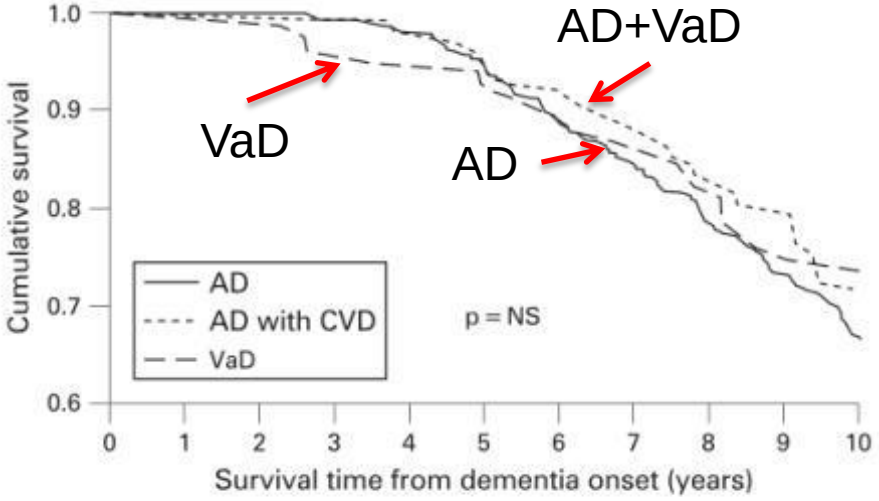


Figure 2 Actuarial survival curves from diagnosis according to type of dementia (N = 970). Results adjusted for age, sex, education, hypertension, diabetes, presence of an informant, and baseline Mini Mental State Examination and Dementia Rating Scale. AD, Alzheimer disease; CVD; cerebrovascular disease; VaD, vascular dementia.

- AD and Vascular dementia all roughly have the same survival
- Although strokes worsen dementia, regardless of underlying cause of the dementia

Prevention or Delay of Dementia

1. Control of cerebrovascular risk factors: blood pressure, cholesterol, diabetes
2. Stop smoking
3. Heart healthy diet
4. Limit alcohol intake
5. Engage in physical and mental activities
   - Exercise
   - Socialize

POST-TALK QUIZ

Question 1

- Vascular dementia is just another form of Alzheimer's disease.

  A. True

  B. False

Question 1

- Vascular dementia is just another form of Alzheimer's disease.

  A. True

  B. False

Question 2

- Vascular dementia can be caused by subclinical strokes

  A. True

  B. False

Question 2

- Vascular dementia can be caused by subclinical strokes

  A. True

  B. False

Question 3

- Vascular dementia can be treated.

  A. True

  B. False

Question 3

- Vascular dementia can be treated.

  A. True

  B. False

Summary

- Vascular cognitive impairment (VCI) or vascular dementia can be a preventative disorder.
- Stroke and heart attack risk factors, namely hypertension, diabetes, hypercholesterolemia, also contribute to this disorder.
- Management of these risk factors can not only delay or prevent the onset of vascular dementia but also mitigate the progression of the disease once a person is affected.
- Treatment of vascular dementia is similar to Alzheimer's disease but emphasis on treating the risk factors of stroke.

Thank you for your attention