

# CORRELATIONS BETWEEN SEIZURES, DEMENTIA, AND STROKE

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# Definitions

- Seizure: A sudden attack caused by abnormal electrical activity of the brain
- Dementia: NIH: “It is a descriptive term for a collection of symptoms that can be caused by a number of disorders that affect the brain.”
- Stroke: NIH: “A stroke occurs when the blood supply to part of the brain is suddenly interrupted, or when a blood vessel in the brain bursts, spilling blood into the spaces surrounding brain cells.”

# History

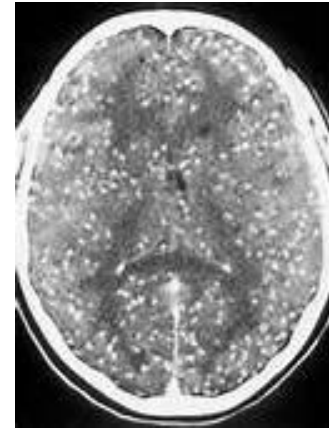
- Seizure: Various languages, late 15th century, “Sudden attack of illness.”
  - Epilepsy: 1570’s, Greek, “a seizure.”
- Dementia: 1806, Latin, “Madness, insanity, being out of one’s mind.”
- Stroke: 1300’s. Old English, “act of striking.”

# History Cont.

- Apoplexy: 14<sup>th</sup> century, Greek, “to strike down and incapacitate.”
    - Hippocrates, father of medicine, first recognized stroke over 2400 years ago (385 BC)
    - In the mid 1600s, Jacob Wepfer found
      - Pt’s who died of apoplexy, could have a hemorrhage
      - Some who died had a blockage
- (Source: Johns Hopkins Medicine Library)

# Major Risk Factors

- Dementia
  - Age, cardiovascular health
- Seizure
  - In 3<sup>rd</sup> world: Neurocysticercosis (Tapeworm)
  - Low birth weight, infantile seizure, abnormal brain formation, ICH, anoxic events, drugs
- Stroke
  - HTN, Smoking, DM, Heart Disease, Age, Gender, Race, Ethnicity, Hyperlipidemia, AFib



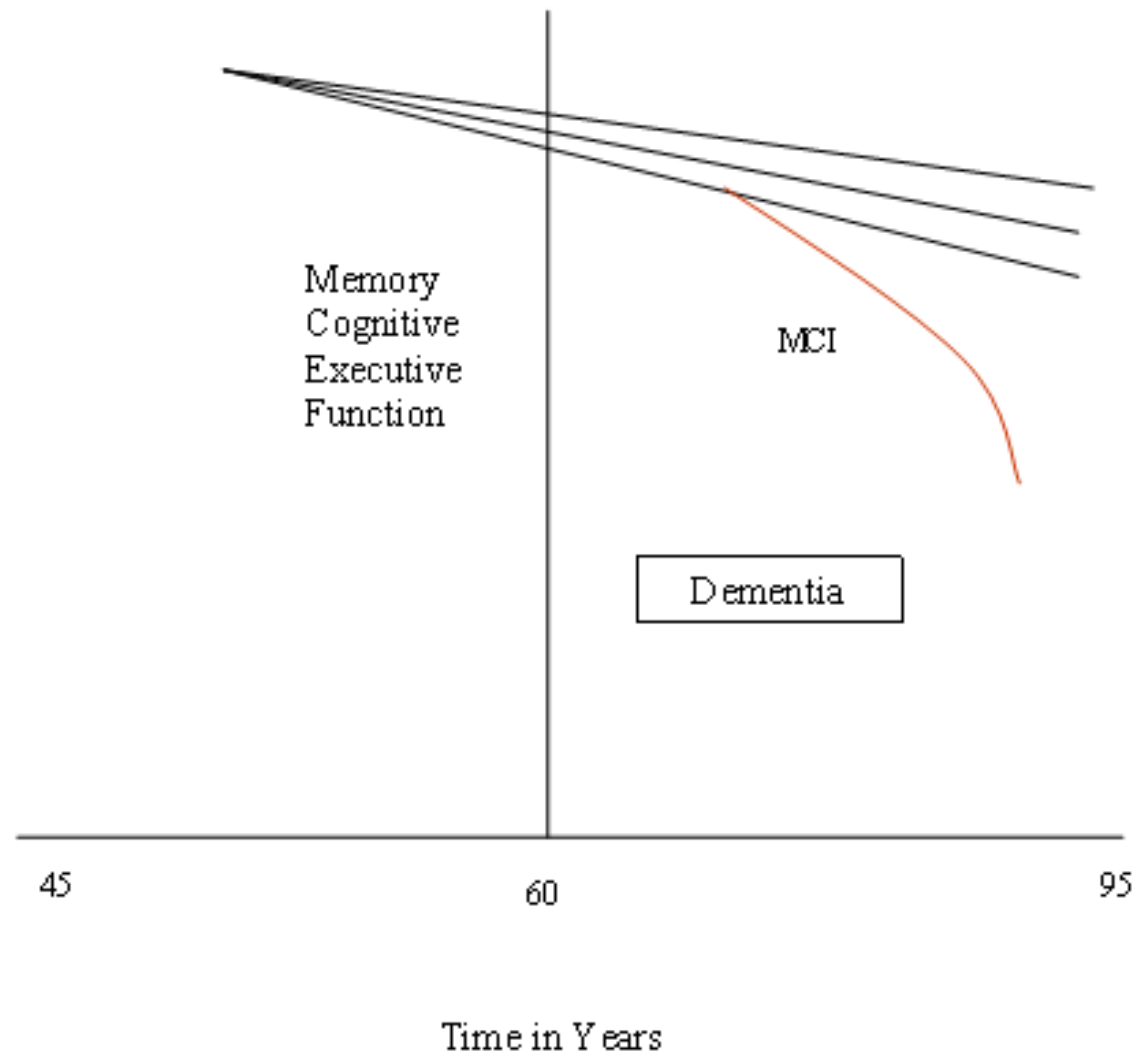
# Incidence

- Stroke
  - 145/100,000. About 800,000/year
- Seizure
  - 1% have some form of epilepsy
  - Each year 150,000 new cases
  - Stroke accounts for about 45% of seizure starting after age 60

# Incidence Cont.

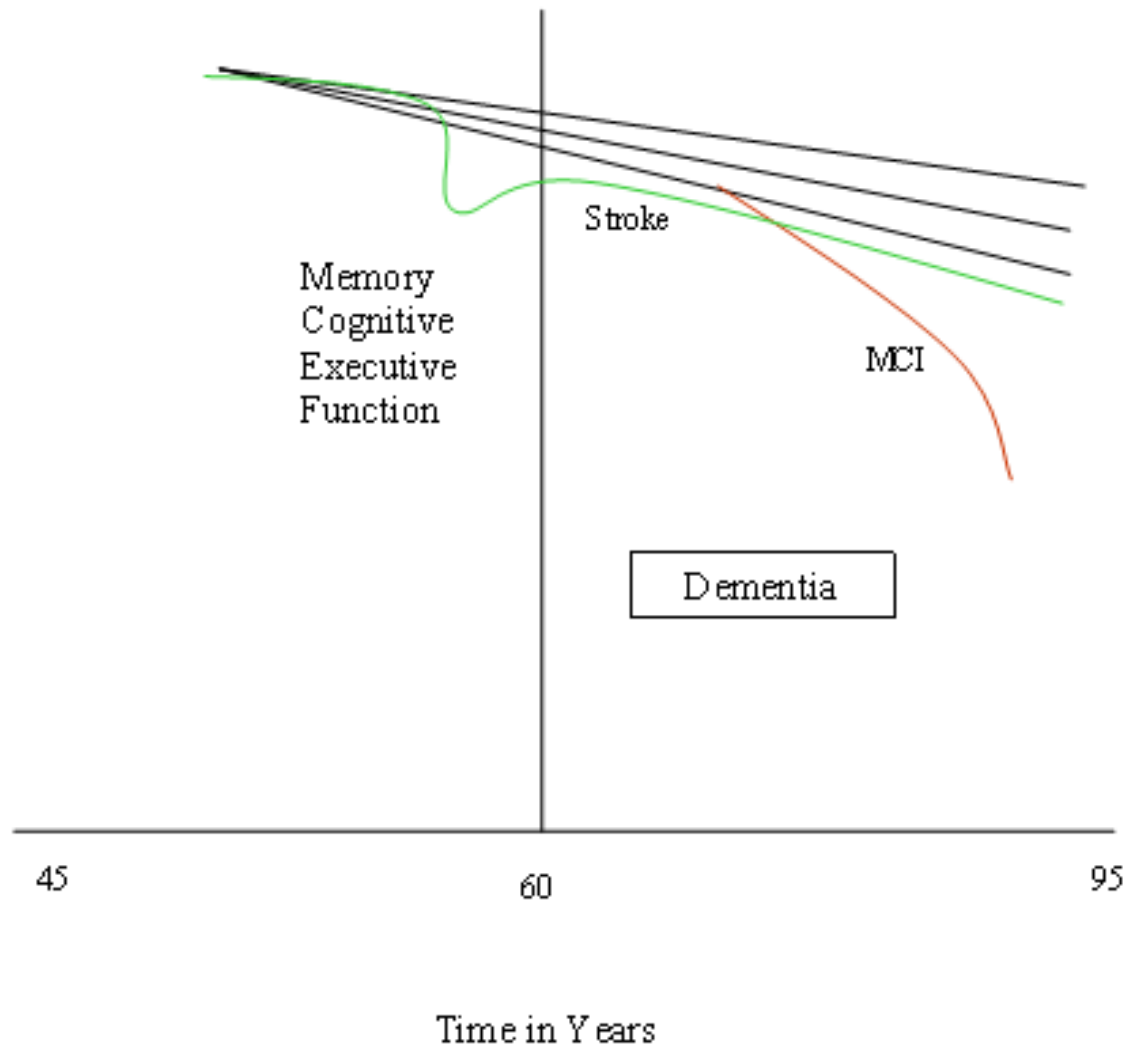
- Dementia
  - Linear progression with age
  - Around 13% at age 65
  - Around 50% at age 85
  - Around 70% at age 90
  - Most common is Alzheimer's Disease (AD), mixed dementia (neurodegenerative plus vascular dementia), other neurodegenerative disorders, less frequent prion infectious disorders, etc.

# MCI and Dementia



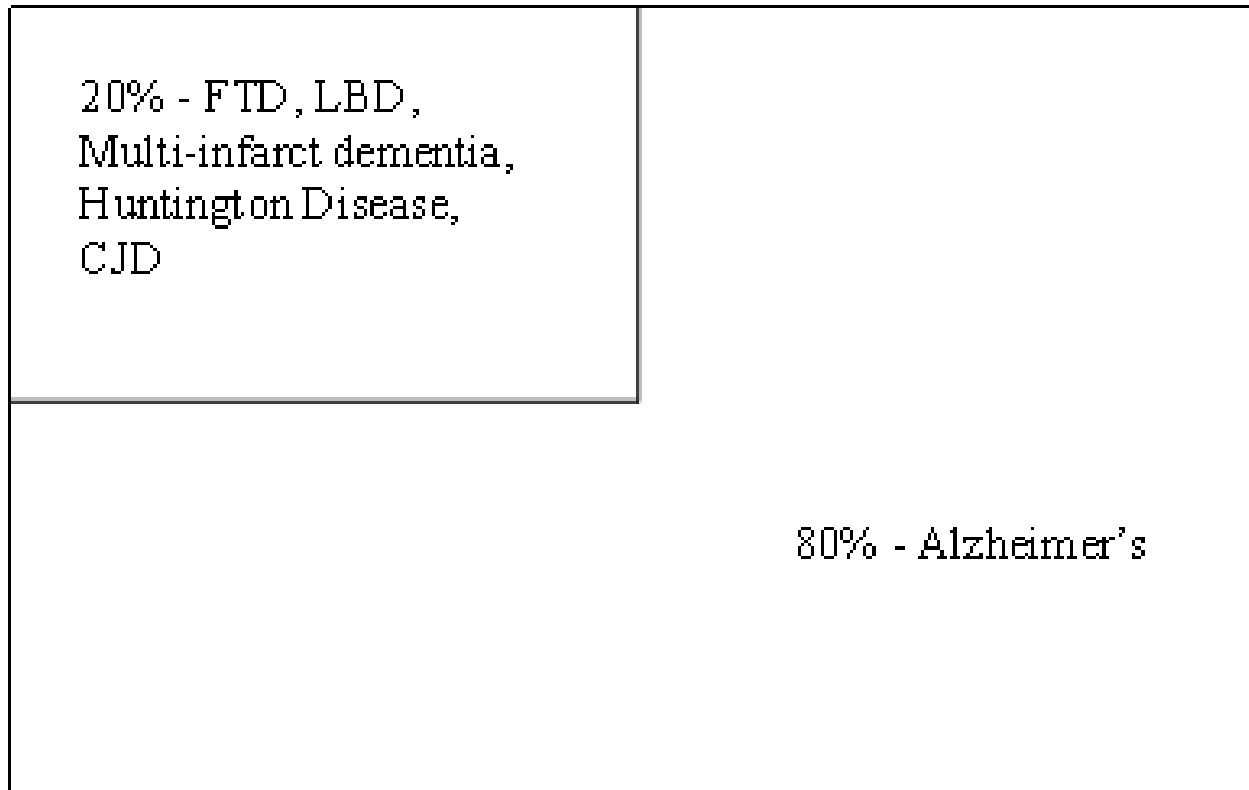


# Post-stroke and Dementia



# Dementia Percentages

100% fit criteria for Dementia

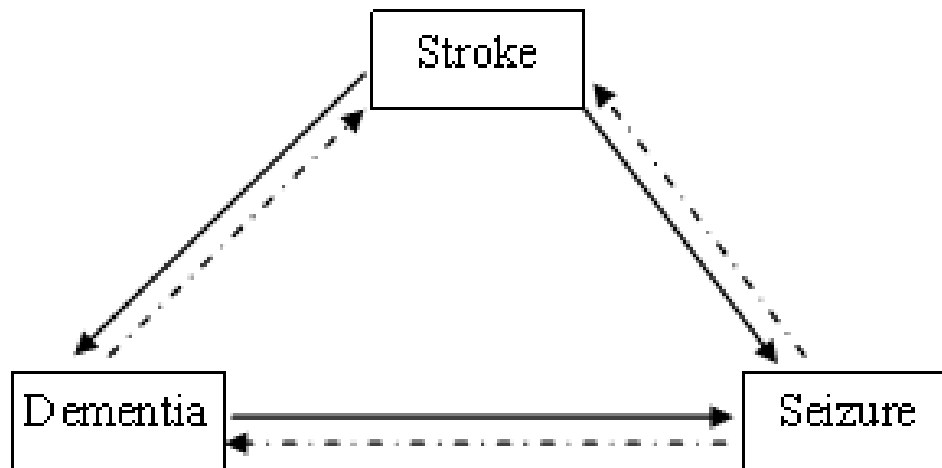


- Mixed dementia

# Clinical Observations

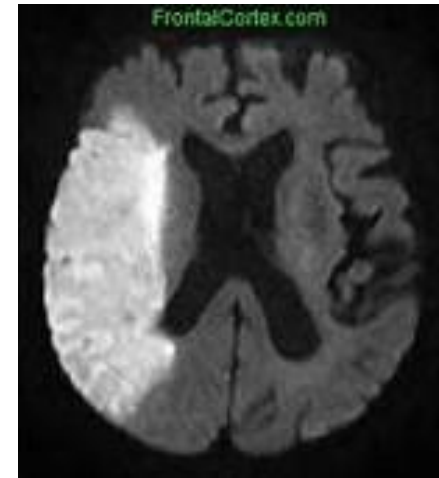
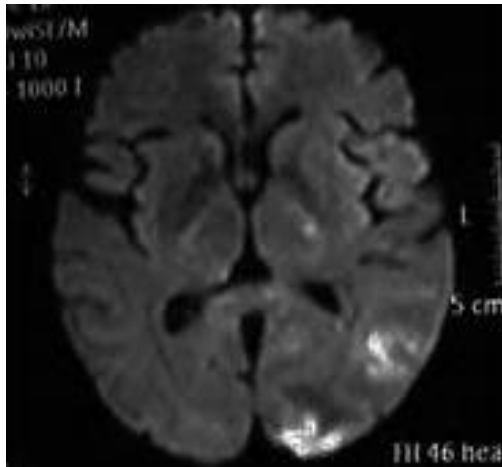
- If positive symptoms, think Seizure: Motor, sensory, mental status changes, empty staring, generalized tonic-clonic convulsion
- If negative symptoms, think stroke: Weakness, absence of function, visual field cut, dysarthria, aphasia, dysphagia, ataxia
- Todd's Paralysis: Post-ictal plegia

# Causative Risk



# MRI DWI Acute Stroke

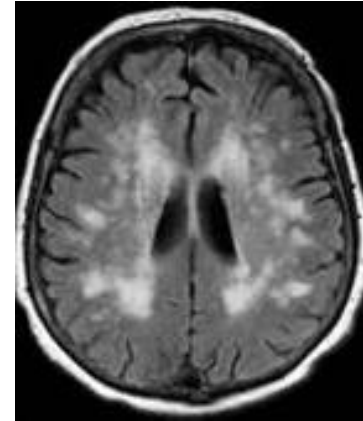
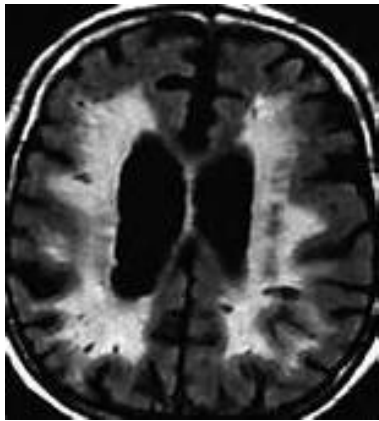
Could present with focal onset seizure from small cortical stroke



Could present and remain demented from the actual stroke

# MRI FLAIR

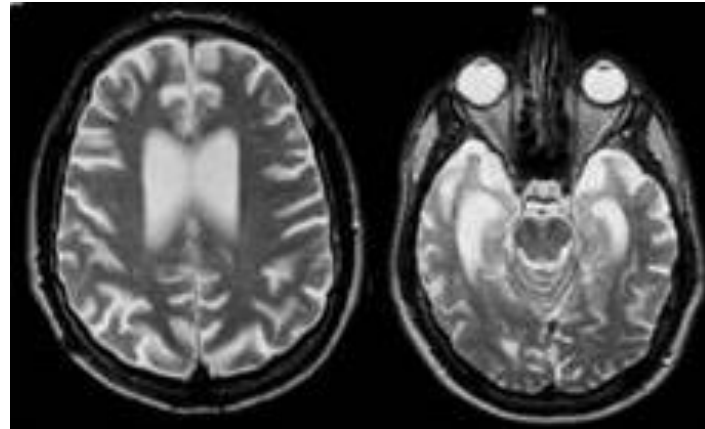
Could be the typical mixed dementia imaging (significant vascular disease and significant cortical atrophy)



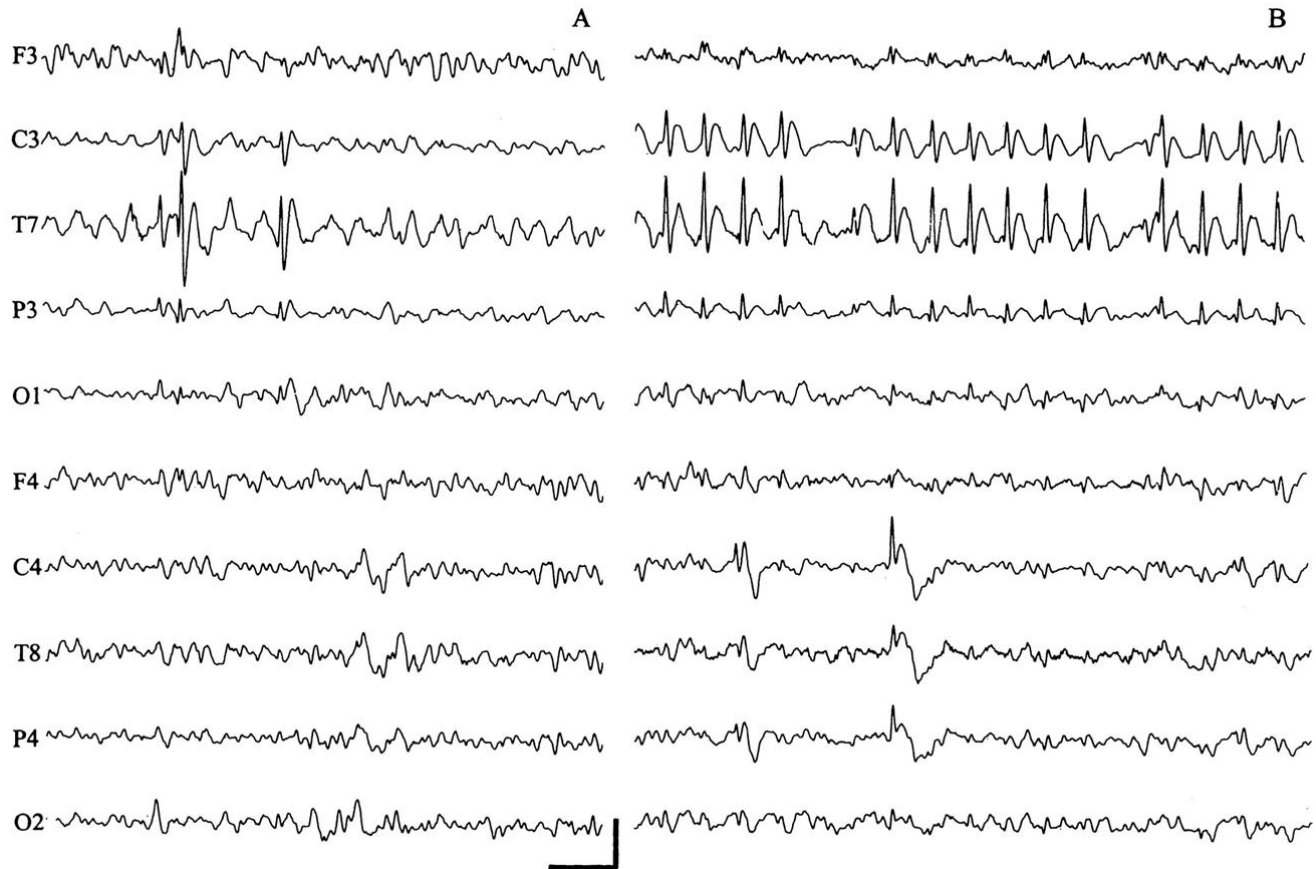
Could be a patient with memory and cognitive difficulties on the basis of small vessel disease or microvascular disease

# MRI AD

Could present with memory and cognitive difficulties. Probable advanced AD.



# Focal Seizure from Left Brain Stroke



EEG tracing of patient who could present with  
right arm and face focal seizure and confusion



# Conclusions

- In certain patients, there will be correlations between stroke, dementia, and seizures
- Each share some risk factors and also have individual risk factors
- Presentation can be from a secondary problem produced by the causative problem
  - Examples: Focal seizure in patient with small cortical stroke. Dementia patient can suddenly no longer use arm or talk/comprehend because of a small stroke

# Question & Answer

