

Memory and the Aging Brain

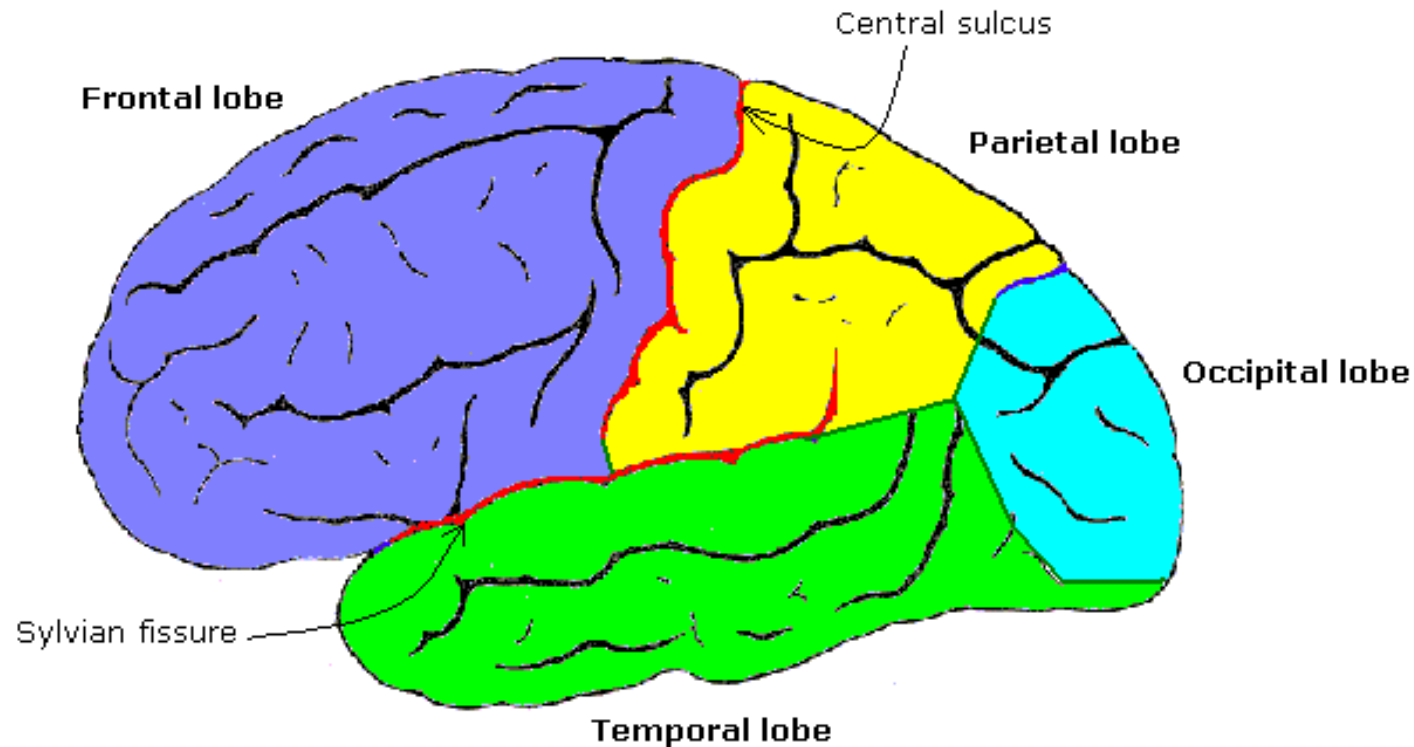
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Memory and the Brain

Lobes of the brain

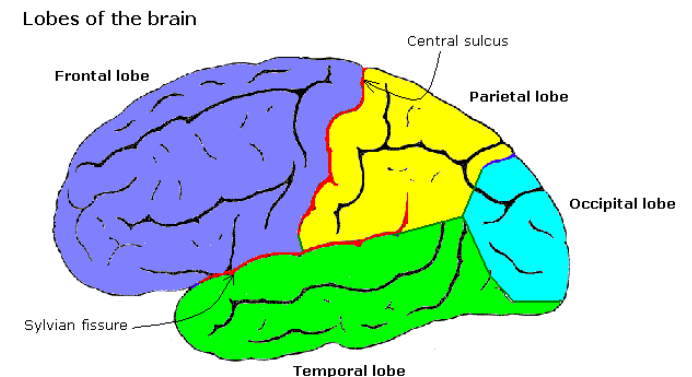


Public domain image from:
http://upload.wikimedia.org/wikipedia/commons/4/47/Main_brain_lobes.gif

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Neuroanatomy

- **Occipital lobe - vision**
- **Temporal lobe - language**
- **Parietal lobe - association cortex**



Neuroanatomy

- **Frontal Lobe Functions**

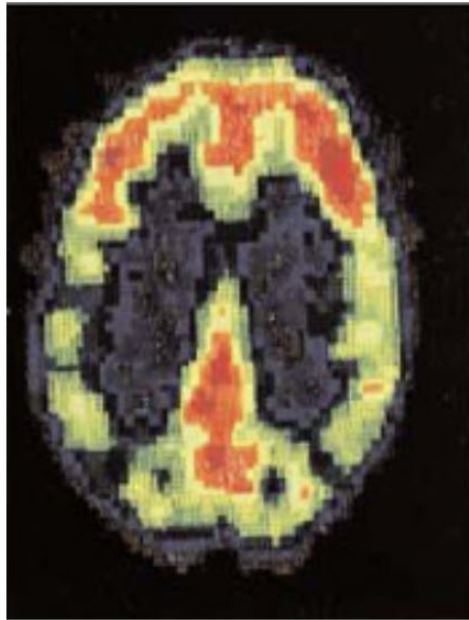
Selective Attention

Sustained Attention

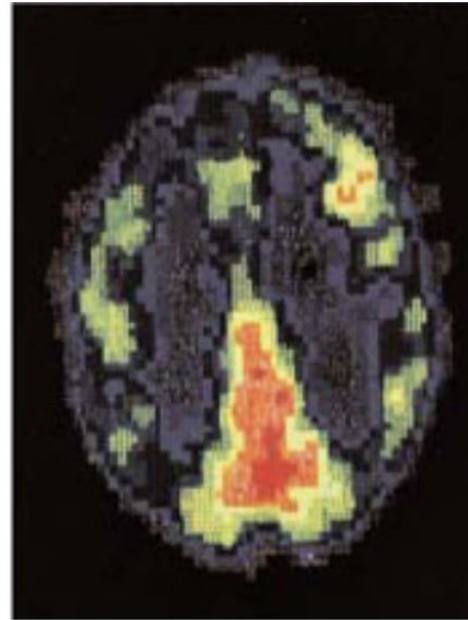
Inhibition - prevents us from just responding to the environment, rather than executing plans.

Regulate social behavior (related to inhibition)

A Tale of Two Brains



Normal Brain



Convicted Murder

From: <https://dana.org/article/murderous-minds-can-we-see-the-mark-of-cain/>

Neuroanatomy

- **Frontal Lobe Functions**

Planning

Problem solving

Executes motor behavior

Executive functioning

Dementia Prevalence is Declining

- For over a decade researchers have seen a decline in the proportion of older adults with dementia (i.e., prevalence), even if that actual number of cases is increasing (incidence).
- In a recent study, researchers reported that the prevalence of dementia was higher in women than men, but the difference shrank between 2000 and 2016. Among men, the prevalence of dementia decreased by 3.2 percentage points from 10.2% to 7.0% percent. The decrease was larger among women at 3.9%, down from 13.6% to 9.7%.

Dementia Prevalence is Declining

- Possible reasons for the ~25% reduction:
 - Reduced smoking
 - Controlling cardiovascular risk factors
 - Cholesterol
 - Blood pressure
 - Better education and possibly more cognitive stimulation
 - Greater awareness of the importance of physical exercise

DEMENTIA

Dementia is an umbrella term that describes a collection of symptoms that are caused by disorders affecting the brain. It is not one specific disease. Dementia affects thinking, behaviour and the ability to perform every day tasks, and brain function is affected enough to interfere with the person's normal social or working life. The most common type of dementia is Alzheimer's disease.

Alzheimer's Disease

Alzheimer's disease is the most common type of dementia accounting for approximately 40-70 % of all dementias.

Vascular Dementias

Vascular dementia is the second most common type of dementia, accounting for approximately 15-25% of all dementias.

Lewy Body Dementia

Lewy Body dementia accounts for approximately 2-20% of all dementias.

Fronto Temporal Dementias

Fronto Temporal Dementia accounts for approximately 2-4% of all dementia.

Other Dementias

Include dementia associated with Parkinson's disease, Huntington's disease, head trauma, human immunodeficiency virus (HIV), alcohol related dementia, Crutzfeldt-Jakob Disease, corticobasal degeneration and progressive supranuclear palsy.

From: <https://www.grepmed.com/images/6262/differential-dementia-diagnosis-umbrella-types>

Understanding Dementia

- Dementia is a global category of disorders. There are many types of dementia, such as Alzheimer's disease, vascular dementia, dementia with Lewy Bodies, Pick's disease, etc.

Dementia and Delirium

Dementia is a syndrome of global cognitive decline that most likely occurs for the first time in old age.

Dementia is different from **delirium** which refers to an acute physiological brain dysfunction that developed over a relatively quick period of time.

Medication

Post-operative effects

Metabolism issues

Chemobrain

Food intake

Dehydration

Infections

Sleep Apnea?

Mini Mental State Exam

- Orientation to time
- Orientation to place
- Registration
- Attention and calculation
- Recall
- Naming
- Repetition
- Comprehension
- Reading
- Writing
- Drawing
- Scores range from 0-30

Symptoms of Dementia

- No two cases are the same but here are some common signs or co-morbid conditions:

- **Depression**

- **Left vs. Right Hemispheric Damage**

“Patients who have disease of the left frontal lobe often are sad, anxious and depressed,” explains Dr. Kenneth Heilman, a neurologist at the University of Florida College of Medicine. “In contrast ... patients with right-hemisphere disease often (appear) indifferent or euphoric and have inappropriate jocularity.”

Symptoms of Dementia

- Depression
 - Anxiety
 - Paranoia
 - Inappropriate social behavior
 - Anger
 - Emotional perseveration
-
- What is the commonality?

Most Common Types of Dementia

- Alzheimer's
 - Young vs. late-onset (and genetics)
- Vascular (multi-infarct dementia)
- Parkinson's Associated
- Lewy Bodies
- Frontal temporal lobe degeneration (including Pick's Disease)

Dementia w/ Lewy Bodies

- A recent study concluded that DLB is associated with worse visuospatial and executive dysfunction.
- We also see visual hallucinations, spontaneous Parkinsonism, and alterations in alertness and attention with DLB.
- The visual hallucinations can be quite severe and medications that are typically used to treat hallucinations and agitation associated with other conditions (i.e., antipsychotic and anti-anxiety medications) often don't work with people who have DLB; they may even exacerbate the symptoms.

Picks Disease and Frontotemporal Dementia

Frontotemporal dementias, including Pick's disease, are often difficult to differentiate from Alzheimer's disease.

- personality change
- language impairment
- Apraxia
- impulsivity
- apathy
- carbohydrate craving
- mania
- grandiose illusions

Picks Disease and Frontotemporal Dementia

It may be worthwhile to try to differentiate Pick's from other types of dementia because the most common class of pharmaceuticals used to treat dementia-related symptoms (i.e., acetylcholine enhancers) may not help the patient with Pick's disease as much. Moreover, these patients may have adverse reactions to acetylcholine enhancers.

Up Next

Next, we will discuss ***Physical Activity and Cognition***