

OBJECTIVES

MEMORY AND LANGUAGE

- Recognize the different types of memory –
 - Short-term
 - Declarative (explicit)
 - Procedural (implicit)
- Know which parts of the forebrain transfer knowledge of facts and events from short-term to long-term storage
- Be able to explain why some disorders of the brain impair memory:
 - Transient global amnesia
 - Alzheimer's disease
 - Korsakoff's psychosis
- Know the locations of cortical areas involved in –
 - Perception of heard or read communications
 - Production of spoken or written communications
- Be able to estimate the probable locations of lesions that impair the ability to understand communications from other people, or to produce meaningful speech or writing

DIFFERENT TYPES OF MEMORY

Short-term **Less than one hour**
Forgotten if not stored

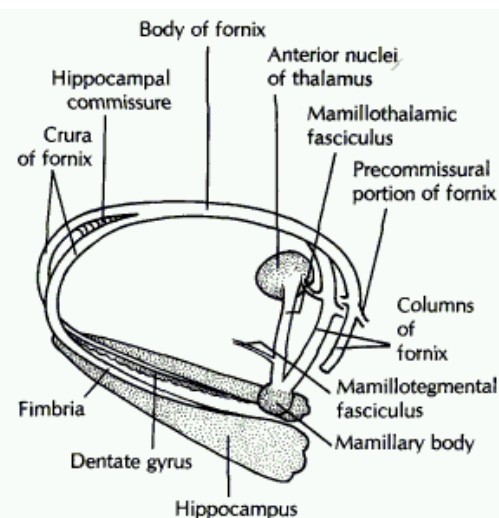
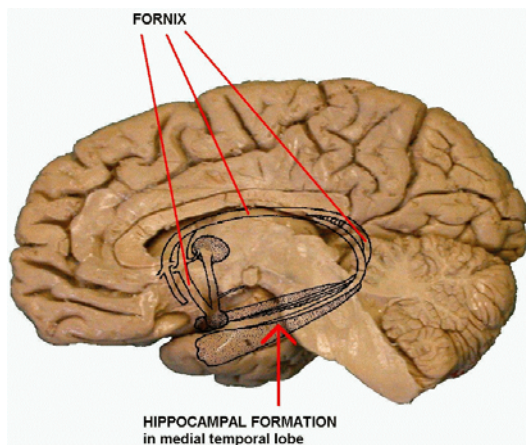
Declarative (= explicit or semantic)

Facts or events that can be recalled
Acquired on a single occasion
Recall requires mental effort
Less mental effort if recalled recently

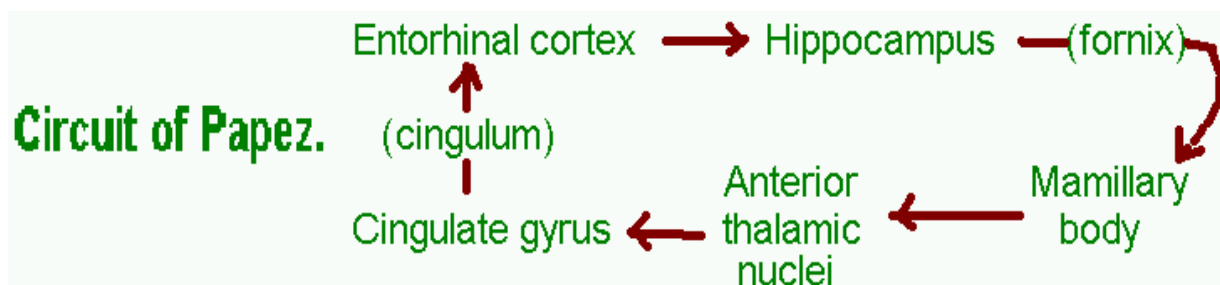
Procedural (= implicit)

For learned tasks, including manual skills and language (vocabulary and grammar)

Learning occurs gradually and is improved with repetition



The hippocampal formation, fornix, mamillary body and anterior nuclear group of the thalamus.



SOME LESIONS THAT IMPAIR MEMORY

Karl Lashley
(1920s-1950s)

"In search of the engram"



Cortical ablations in rats, monkeys.
Memory deficits increase with amount of cortex removed, but not with locations of the lesions.

Mass action theory of memory



Paul Bucy
(1904-1992)



← **Heinrich Kluver**
(1897-1979) →

Bilateral temporal lobectomy in monkeys.
Removal of neocortex, amygdala and hippocampus
Anterograde amnesia

Patient H.M. Bilateral temporal lobectomy in 1954.
Has learned no new facts and remembers no events since surgery.
Can remember events from before operation.

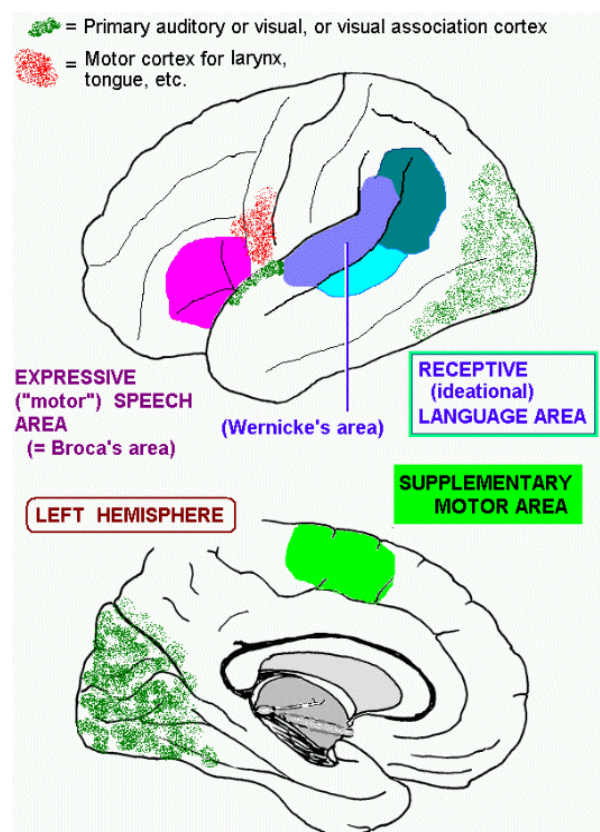
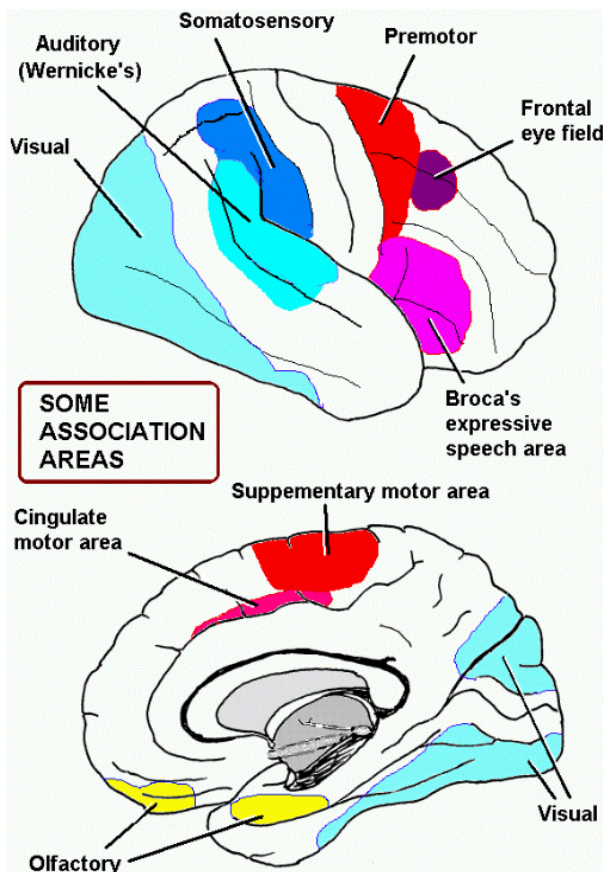
Alzheimer's disease.

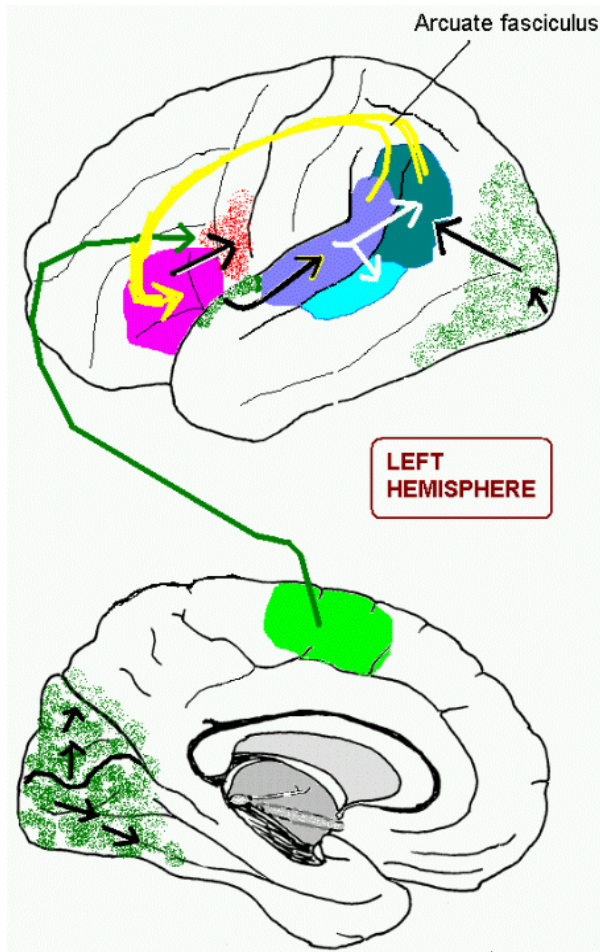
Degeneration and death of neurons in cerebral cortex and elsewhere.

Earliest changes in entorhinal area; next in hippocampus; then temporal, parietal & frontal cortex.

Anterograde amnesia is an early symptom.

Korsakoff's psychosis. Lesions in the mamillary bodies; dorsomedial thalamus (injuring mamillothalamic tract). Anterograde amnesia; confabulation.





Aphasia (dysphasia)

Expressive (Broca's aphasia).

Non-fluent, because patient can hear the speech and recognize it as nonsense.

Due to damage to Broca's area, left side.

Receptive (Wernicke's aphasia).

Fluent, because patient cannot recognize that anything is wrong with the speech.

Due to damage to Wernicke's area, left side.

Conduction aphasia.

Speech production and comprehension OK.

Failure of repetition.

Attributed to arcuate fasciculus lesion.

