19 - Brain structures involved in memory

Brain structures involved in memory

© SPMM Course 6. Memory Classification of memory According to duration: Immediate memory functions over a period of seconds; closely related to concept of working memory Recent memory applies on the scale of minutes to days; and Remote memory encompasses months to years. According to the type of encoding memory, can be classified into explicit or declarative memory and implicit or procedural memory. Explicit memory can be either semantic (meanings) or episodic (events). Episodic memory depends on the hippocampal–diencephalic system. It is the time-locked memory for personal events (‘when and where’ memory); it includes both anterograde and retrograde memory. Semantic memory involves memory for word meaning and general knowledge. The implicit memory includes skills and procedures e.g. car driving. Working memory refers to the very limited capacity that allows us to retain information for a few seconds.). It is made of a central executive system (attentional system, dorsolateral prefrontal) and at least 2 important buffer systems – the visuospatial sketchpad (right hemisphere) and phonological loop (left hemisphere). The term ‘‘short term’’ memory is applied, confusingly, to a number of different memory problems, but has no convincing anatomical or psychological correlate

Brain structures involved in memory Hippocampus Left hippocampus for encoding declarative verbal and right hippocampus for encoding nonverbal memories. Navigational memory and memory of object location in space are also served by the hippocampus. Animal studies have defined a hippocampal place code, a pattern of cellular activation in the hippocampus that corresponds to the animal's location in space. Unilateral hippocampal lesions are compensated well, and clinically significant amnesia does not occur. Amygdala has been suggested to rate the emotional importance of experience and to regulate the level of hippocampal activity accordingly. It is involved in emotional memory and emotional face processing. It helps in memory consolidation, depending on emotional input for the content of the memory. Amygdalar damage leads to loss of fear conditioning and in monkeys, loss of maternal behaviour has also been noted. Despite the amygdalar damage, learning and consolidation of memory can occur, especially in the absence of emotional valence and arousal. Diencephalic structures such as the dorsal medial nucleus of the thalamus and the mamillary bodies are associated with new learning; their damage leads to diencephalic amnesia seen in Korsakoff syndrome.

Revision #1
Created 2026-01-04 20:03:54 UTC by Omar Ayman
Updated 2026-01-04 20:03:54 UTC by Omar Ayman