Memory function: A clinical perspective

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This lecture is an up-date on clinical aspects of memory function, molecular memory mechanisms, memory disorders, and possible ways of treatment. Memory is best defined as a mental ability that depends on a jointly work of several brain systems by which humans keep information in mind and are able to reconstruct past experiences. From the clinical standpoint, memory consists of distinctly different types, each governed by a specific region of the brain. The current subdivision of memory is aimed at more precise diagnosis of the underlying cause of memory dysfunction, applying specific memory tests, and introducing targeted therapy. Memory function is a complex process whose meaning is only graspable in context. The persistent issue has long since been to what extent memory has tangible molecular underpinnings or belongs to the powers of the mind or natural aptitudes, such as other Freud's mentalities, the will or instinct, which were, at an earlier time, considered by psychologists to be principal components underlying all mental phenomena. Recent clinical research on memory has distinctly illuminated the former, and demystified the latter. Memory processing includes several complex sequential steps such as encoding, storage, and recall; each having its specialized sets of neurons. The complexity of the processing may be exemplified by mapping and remembering subject's position in a specific place of a space. The 'grid cells', located in the entorhinal cortex, encode information about position and movement and thus form a cognitive representation of space. The information is fed into the hippocampus that is in charge of episodic memory that forms and stores the associations between place and events. The knowledge of neuropsychological aspects of memory would help to effectively counter the pathological processes linked to aging. Memory training is essential for maintaining mental agility and the overall healthspan.