

Patients with amnesia 'live in the present'

January 16 2007

Scientists at the Wellcome Trust Centre for Neuroimaging, University College London, have shown that people with damage to the hippocampus, the area of the brain that plays a crucial role in learning and memory, not only have trouble remembering the past but also in imagining new and future experiences.

Damage to the hippocampus can be caused by a lack of oxygen to the brain, for example during a cardiac arrest, or various other illnesses such as limbic encephalitis or Alzheimer's disease.

It has been known for some time that selective damage to the hippocampus can lead to amnesia, with patients unable to recall past events. However, by asking patients to describe imaginary experiences, the research team led by Dr Eleanor Maguire found that the patients' ability to construct fictitious events was also severely impaired. The research is published today in the *Proceedings of the National Academy of Sciences*.

The researchers asked the patients to imagine and then describe in detail situations in commonplace settings, such as a beach, pub and forest, as well as potentially plausible future events such as a Christmas party or a future meeting with a friend.

"We found that the role played by the hippocampus in processing memory was far broader than merely reliving past experiences," says Dr Maguire, a Wellcome Trust Senior Research Fellow at UCL. "It also seems to support the ability to imagine any kind of experience including

possible future events. In that sense, people with damage to the hippocampus are forced to live in the present."

"Furthermore, the patients reported that they were unable to visualise the whole experience in their mind's eye, seeing instead just a collection of separate images," explains Dr Maguire.

Dr Maguire and her colleagues believe that the findings suggest a common mechanism that might underpin both recalling real memories and how we visualise imaginary and future experiences, with the hippocampus providing the spatial context or environmental setting into which the details of our experiences are bound.

Source: Wellcome Trust

Citation: Patients with amnesia 'live in the present' (2007, January 16) retrieved 27 April 2024 from <https://medicalxpress.com/news/2007-01-patients-amnesia.html>

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