Scientists find that individuals in vegetative states can learn

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Scientists have found that some individuals in the vegetative and minimally conscious states, despite lacking the means of reporting awareness themselves, can learn and thereby demonstrate at least a partial consciousness. Their findings are reported in today's (20 September) online edition of *Nature Neuroscience*.

It is the first time that scientists have tested whether patients in vegetative and minimally conscious states can learn. By establishing that they can, it is believed that this simple test will enable practitioners to assess the patient's consciousness without the need of imaging.

This study was done as a collaborative effort between the University of Buenos Aires (Argentina), the University of Cambridge (UK) and the Institute of Cognitive Neurology (Argentina). By using classical Pavlonian conditioning, the researchers played a tone immediately prior to blowing air into a patient's eye. After some time training, the patients would start to blink when the tone played but before the air puff to the eye.

This learning requires conscious awareness of the relation between stimuli - the tone precedes and predicts the puff of air to the eye. This type of learning was not seen in the control subjects, volunteers who had been under anaesthesia.

The researchers believe that the fact that these patients can learn associations shows that they can form memories and that they may

benefit from rehabilitation.

Lead author Dr Tristan Bekinschtein, from the University of Cambridge's Wolfson Brain Imaging Unit, said: "This test will hopefully become a useful, simple tool to test for consciousness without the need for imaging or instructions. Additionally, this research suggests that if the patient shows learning, then they are likely to recover to some degree."

In 2006, the Cambridge Impaired Consciousness Group at the Wolfson Brain Imaging Unit showed, using functional imaging, showed that patients in vegetative states (as defined by behavioural assessment in the clinic) can in fact be conscious despite being unable to show consistent voluntary movements.

More information: The paper 'Classical conditioning in the vegetative and minimally conscious state' will be published in the Advanced Online Publication of Nature Neuroscience on 20 September 2009.

Source: University of Cambridge (news : web)