

Study offers a clearer picture of brain at rest

February 7 2014, by Paul Mayne

(Medical Xpress)—New research from Western into the resting state of the brain could lead to better treatment for patients suffering from head injuries.

Led by Physics and Astronomy professor Andrea Soddu, in collaboration with The University of Liège in Belgium and Central University Colombia, the new strategy offers a fresh approach to forecasting consciousness conditions in an individual's [brain](#). The findings were published recently in *Cortex*, an international journal devoted to the study of the nervous system and behaviour.

While the brain is always active, Soddu's research into spontaneous brain activity, utilizing functional magnetic resonance imaging (fMRI) technology, looks at a patient studied for a period of approximately 10-15 minutes with the absence of outside stimuli.

"There is no participation in the fMRI scanner, such as counting or any [visual stimuli](#), so measurements are not biased by the participants," said Soddu, a principal investigator at Western's Brain and Mind Institute.

Should a patient suffer serious head trauma, having this clearer picture of the brain at rest will more accurately detect differences in the [brain patterns](#).

While the ability for every patient to have his or her own personal study is not logistically possible, the creation of a common network, based on age and sex, can be of tremendous assistance in determining a patients

state of consciousness, Soddu said.

"By being able to recognize the networks of (brain) activity in a state of rest, should you suffer a brain injury, these regions can be partially or completely destroyed," he said. "The first thing a patient would have is an MRI, and you'd see right away where the damage is, so you can expect functionality to be damaged or affected.

"But imagine if you had the spontaneous activity of everybody, and the moment something happens you could check where the changes are. In the brain, we know certain regions are connected. Using the fMRI as a clinical tool, we can see if these same regions are doing the same things at the same time functionally."

Classifying patients automatically based on fMRI resting state data is the first step toward single subject objective diagnostics, said Soddu, which he sees as imperative as the global medical community investigates the customization of health care.

Soddu said this new approach could even have clinical possibilities for patients suffering from brain-related diseases such as Alzheimer's and Parkinson's.

Provided by University of Western Ontario

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