Medical Xpress

Brain continues to develop well into our 20s: research

September 22 2011

The human brain doesn't stop developing at adolescence, but continues well into our 20s, demonstrates recent research from the Faculty of Medicine & Dentistry at the University of Alberta.

It has been a long-held belief in medical communities that the human brain stopped developing in adolescence. But now there is evidence that this is in fact not the case, thanks to medical research conducted in the Department of Biomedical Engineering by researcher Christian Beaulieu, an Alberta Innovates – Health Solutions scientist, and by his PhD student at the time, Catherine Lebel. Lebel recently moved to the United States to work at UCLA, where she is a post-doctoral fellow working with an expert in brain-imaging research.

"This is the first long-range study, using a type of imaging that looks at brain wiring, to show that in the white matter there are still structural changes happening during young adulthood," says Lebel. "The white matter is the wiring of the brain; it connects different regions to facilitate cognitive abilities. So the connections are strengthening as we age in young adulthood."

The duo recently published their findings in the Journal of Neuroscience. For their research they used magnetic resonance imaging or MRIs to scan the brains of 103 healthy people between the ages of five and 32. Each study subject was scanned at least twice, with a total of 221 scans being conducted overall. The study demonstrated that parts of the brain continue to develop post-adolescence within individual subjects.

The research results revealed that young adult brains were continuing to develop wiring to the frontal lobe; tracts responsible for complex cognitive tasks such as inhibition, high-level functioning and attention. The researchers speculated in their article that this may be due to a plethora of life experiences in young adulthood such as pursing post-secondary education, starting a career, independence and developing new social and family relationships.

An important observation the researchers made when reviewing the brain-imaging scan results was that in some people, several tracts showed reductions in white matter integrity over time, which is associated with the brain degrading. The researchers speculated in their article that this observation needs to be further studied because it may provide a better understanding of the relationship between psychiatric disorders and brain structure. These disorders typically develop in adolescence or young adulthood.

"What's interesting is a lot of psychiatric illness and other disorders emerge during adolescence, so some of the thought might be if certain tracts start to degenerate too soon, it may not be responsible for these disorders, but it may be one of the factors that makes someone more susceptible to developing these disorders," says Beaulieu.

"It's nice to provide insight into what the brain is doing in a healthy control population and then use that as a springboard so others can ask questions about how different clinical disorders like psychiatric disease and neurological disease may be linked to brain structure as the brain progresses with age."

Provided by University of Alberta

Citation: Brain continues to develop well into our 20s: research (2011, September 22) retrieved