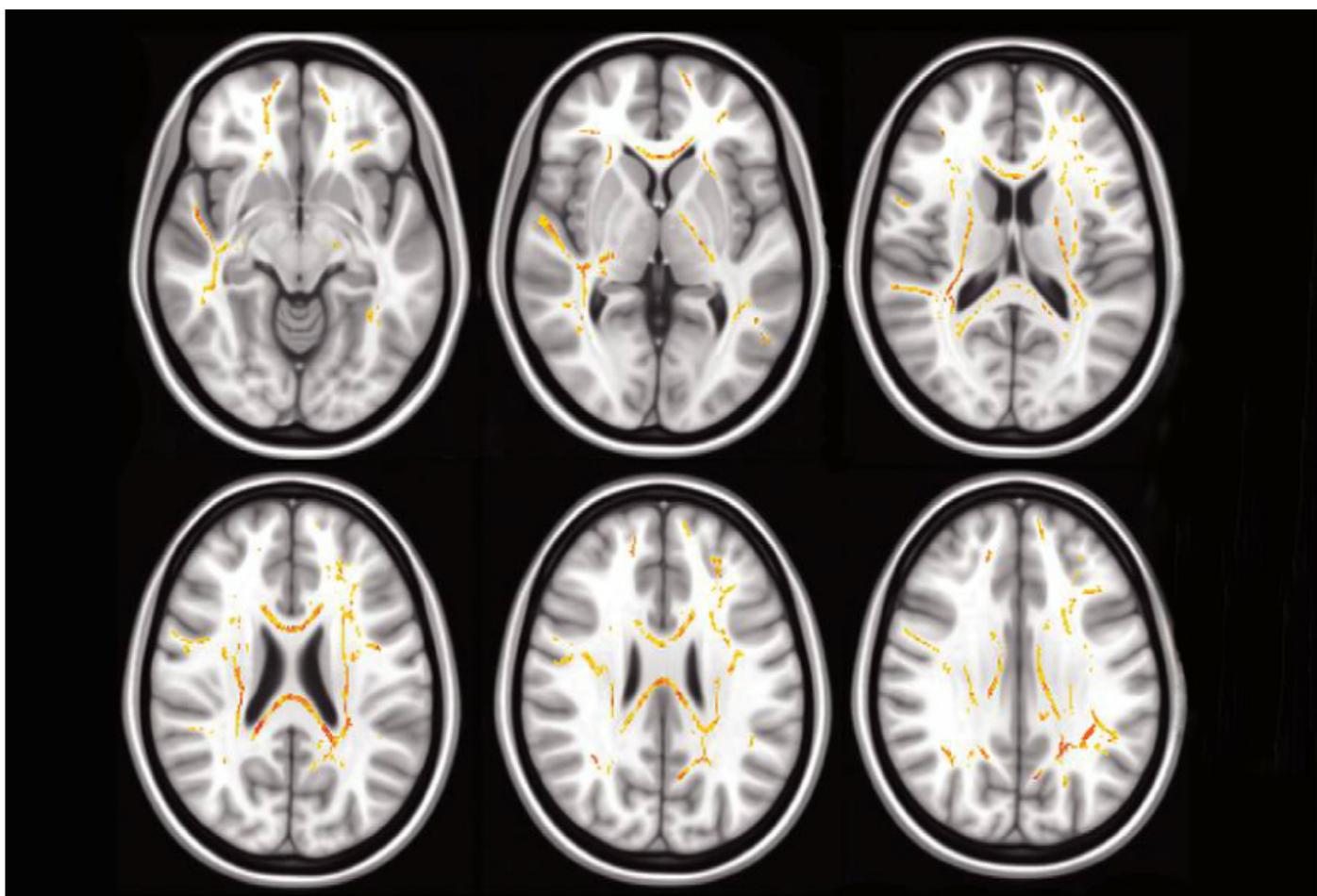


NEWS

# Common brain signature marks autism, attention deficit

BY ANN GRISWOLD

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Autism shares **genetic roots** with **obsessive-compulsive disorder** (OCD) and **attention deficit hyperactivity disorder** (ADHD). The three conditions have features in common, such as impulsivity. New findings suggest that they also share a brain signature<sup>1</sup>.

The first comparison of brain architecture across these conditions has found that all are associated with disruptions in the structure of the **corpus callosum**. The corpus callosum is a bundle of nerve fibers that links the brain's left and right hemispheres. The results appeared 1 July in the *American Journal of Psychiatry*.

Clinicians may find it difficult to **distinguish autism from ADHD** based on symptoms alone. But if the conditions are marked by similar structural problems in the brain, the same interventions might be useful no matter what the diagnosis is, says lead researcher **Stephanie Ameis**, assistant professor of psychiatry at the University of Toronto.

The **unique aspects of each condition** might arise from other brain attributes, such as differences in the connections between neurons, says **Thomas Frazier**, director of research at the Cleveland Clinic Foundation. "A reasonable conclusion is that autism and ADHD don't differ dramatically in a structural way, but could differ in connectivity," says Frazier, who was not involved in the study.

## Broken links:

Ameis' team examined the brains of 71 children with autism, 31 with ADHD, 36 with OCD and 62 typical children using **diffusion tensor imaging**. This method provides a picture of the brain's white matter, the long fibers that connect nerve cells, by measuring the diffusion of water across these fibers.

The researchers saw widespread disruptions in white matter structure among children with any of the three conditions. They found fewer alterations in the children with OCD than in those with autism or ADHD, however.

This finding may relate to the early onset of autism and ADHD. Localized white matter disruptions may produce problems associated with OCD later in childhood, Ameis says.

Parents also assessed their children's attention and social communication skills, **obsessive behaviors** and ability to perform everyday tasks. Children who showed the least independence on daily tasks have the most significant disruptions in white matter. The researchers found no connection between brain structure and the other behaviors.

"There is an association between what your brain looks like, in terms of its impairment, and how impaired you are in everyday life," says Ameis.

## Tracing tracts:

The researchers also looked for problems in particular white matter tracts. The only tract that looks alike in all three groups is the corpus callosum, suggesting that disruptions of this tract may underlie the features the conditions have in common.

“What’s interesting is that [the corpus callosum] is one of the first tracts to develop and it’s the largest in the brain. So it could be a tract that creates vulnerability for these neurodevelopmental conditions,” Ameis says.

The findings are preliminary, however. The researchers detected changes in only a small section of the corpus callosum, so it isn’t clear whether the aberrations they saw are clinically meaningful, says **Ruth Carper**, assistant research professor of neurosciences at the University of California, San Diego, who was not involved in the study.

It’s also possible that the differences among the three groups stem from **movement in the scanner**, a common problem when scanning children with these conditions, Carper says.

Still, researchers say the findings are an initial step toward teasing out the similarities and differences between the three conditions.

**REFERENCES:**

1. Ameis S.H. *et al. Am. J. Psychiatry* Epub ahead of print (2016) **PubMed**