

Early exposure to manganese could affect teens' cognitive ability and motor control

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Early-life exposure to the mineral manganese disrupts the way different areas of the brain involved in cognitive ability and motor control connect in teenagers, Mount Sinai researchers report in a study published in *PLOS ONE* in August.

This study is the first to link evidence of metal exposure found in baby teeth to measures of brain connectivity. Researchers found links between early-life [manganese](#) exposure and altered functional connectivity of brain areas that support cognitive and [motor control](#), potentially leading to low IQ, attention disorders, and hyperactivity.

"These findings could inform prevention and intervention efforts to reduce these poor outcomes in adolescents exposed to high levels of manganese," said Erik de Water, the first author and a postdoctoral fellow in the Department of Environmental Medicine and Public Health at the Icahn School of Medicine at Mount Sinai.

People can be exposed to manganese via air pollution, diet, drinking water, pesticides, and secondhand smoke. Researchers measured manganese concentrations in baby teeth to determine exposure during pregnancy, the first year of life, and early childhood.

They used [functional magnetic resonance](#) imaging (fMRI) scans to measure intrinsic functional connectivity of the brain in adolescents. Higher manganese concentrations in the first year of life were associated with increased intrinsic functional connectivity within cognitive control

brain areas, but decreased connectivity between motor areas in adolescents.

Provided by The Mount Sinai Hospital

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