

Increase in microplastics found in brains

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A new study shows that microplastics are making their way into human brains – with potentially dangerous effects on people’s health and mental acuity.

A paper published yesterday in Nature Medicine found that the tiny fragments of plastic are passing the blood-brain barrier and into human brains, and the amount of microplastics in the brain appears to be increasing over time. There were 50% more fragments in brains analysed in 2024 than in 2016.

The scientists also examined the brains of 12 deceased patients diagnosed with dementia, and found that they had three to five times more microplastics than normal brains.

“Every time we scratch the surface, it uncovers a whole host of, ‘Oh, is this worse than we thought?’” one of the paper’s lead authors, University of New Mexico toxicology professor Matthew Campen, said in an interview about an earlier version of the paper.

Microplastics are tiny pieces of plastic – less than 5 millimetres in size, that are either manufactured or slough off of plastic objects. Nanoplastics are even smaller, and can be a fraction of the width of a human hair. Most of the microplastics found in brains in the study were on the nano scale.

In recent years, scientists have realised that many plastic items (plastic bags, water bottles, tires, polyester or synthetic clothing) can shed small fragments or fibres that make their way into air, food and water. Many of those particles are burrowing deep into the human body.

Microplastics have been identified in the liver, placenta, blood, testicles, even certain arteries that lead to the heart.

For the new study, scientists analysed 52 brain specimens, 28 that were autopsied in 2016 and 24 autopsied in 2024. They found microplastics in every sample, but there were significantly higher numbers of microplastics in those from 2024.

Researchers then obtained additional brain samples going back to 1997 and found that they followed the same trend: more recent samples had much higher numbers of microplastics. They found no correlation with how old the person was when they died.

Campen said that with just a single study, there was reason to be cautious when interpreting the results. But he added the amount of plastics produced globally doubled every 10 to 15 years, which suggested that humans' level of exposure had skyrocketed. "To see it go up 50% in eight years in human organs ... I think that's perfectly in line with what we're seeing in the environment."

The researchers estimated that the average brain studied had around 7 grams of microplastics in it, or a little more than the weight of a plastic spoon. But they cautioned that could be an overestimate, as some other particles in the brain can resemble microplastics.

Jaime Ross, a professor of neuroscience at the University of Rhode Island who has studied microplastics' effect on mouse brains, praised the new research and said the increased "plastic burden" of microplastics in the body was concerning because it could exacerbate inflammation. Phoebe Stapleton, a professor of pharmacology and toxicology at the University of Rutgers who was not involved in the study, said in an email that scientists have long wondered whether microplastics could pass the blood-brain barrier – the thick membrane that protects the brain from toxins and viruses.

While it's not the first time researchers have found microplastics in the brain, the new study shows that the pieces of plastic are reaching deeper into the frontal cortex.

Last year, a group of researchers found microplastics in the olfactory bulb, or the part of the brain that processes smells. The particles were present in eight of the 15 brains studied. "This paper provides clear evidence that micro and nanoplastics are indeed in the human brain," she said.

The paper also showed the brain appears to be more susceptible to microplastics than other organs – brain samples had seven to 30 times more microplastics in them than similar tests of the liver and kidneys.

Mornings are busy enough without staring desperately into the fridge trying to figure out what's going to go in the lunch box that will not end up still languishing there at the end of the day. Lifestyle coach Renee Rigden and wellness advocate Sarah Tanner have written the ebook *Healthy Start – Lunchbox Edition* with suggestions for tasty and nutritious school lunches in time for the back-to-school rush. ¹/₂