

Plastics in Your Arteries: The Stroke Risk Study You Must Know

Microplastics and Stroke Risk: What a Landmark 2024 Study Found Inside Human Arteries

In 2024, a team of Italian researchers published a study in the New England Journal of Medicine that stopped the cardiovascular science community in its tracks. They found microplastics, tiny synthetic fragments embedded inside the carotid artery plaque of more than half the patients they examined. And the patients who had them faced more than four and a half times the risk of a serious cardiovascular event compared to those who didn't.

This isn't a distant, theoretical risk. These are living people who had already been identified as having carotid artery disease, and plastics were found inside their arterial walls. For stroke survivors and those at elevated risk of stroke, this study raises important questions that the medical system has not yet caught up with.

What the Research Found

The study by Marfella et al., published in the New England Journal of Medicine (2024), enrolled 304 patients who were undergoing carotid endarterectomy, a surgical procedure to remove plaque from the carotid arteries. Researchers analysed the excised plaque for the presence of microplastics and nanoplastics.

Their findings:

58% of patients had detectable levels of polyethylene, polyvinyl chloride (PVC), or polystyrene in their arterial plaque. This was not contamination from the surgical procedure; it was already there.

Over a 34-month follow-up period, patients with microplastics in their plaque had a 4.53 times higher risk of a combined endpoint: non-fatal myocardial infarction, non-fatal stroke, or death from any cause.

Inflammatory markers were significantly elevated in the microplastics-positive group. IL-18 and TNF-alpha proteins associated with systemic vascular inflammation were markedly higher in plaque samples that contained plastics. This suggests the mechanism is not simply physical obstruction, but an inflammatory cascade triggered by the presence of synthetic material in arterial tissue.

What This Means for Stroke Survivors

The carotid arteries are the primary conduits supplying oxygenated blood to the brain. Plaque accumulation in these vessels is one of the leading causes of ischaemic stroke, and carotid artery disease is a condition many stroke survivors are already living with.

“The patients with microplastics in their plaque had a 4.53 times higher risk of stroke, heart attack, or death over the 34-month follow-up. That’s not a marginal finding. That’s a signal the research community needed to take seriously.”

The NEJM study doesn’t yet tell us whether removing microplastic exposure after the fact reduces risk. It doesn’t confirm that healthy individuals with no existing carotid disease are accumulating plastics at the same rate. And it cannot tell us which plastic sources are most responsible because we’re exposed to microplastics through drinking water, food packaging, air, and a dozen other vectors simultaneously.

But what it does tell us clearly and with high statistical significance is that microplastics in arterial plaque are associated with dramatically worse cardiovascular outcomes.

What the Research Does Not Yet Tell Us

Science at the frontier moves in one direction at a time. This study establishes association, not causation. It cannot yet answer:

Whether people without existing carotid disease are accumulating microplastics at comparable rates. Whether reducing exposure actively reverses or slows plaque-associated risk. Which types of microplastics are most biologically harmful? Whether there will be a clinical screening tool for this in the near future.

These are the questions the next generation of research will need to answer. In the meantime, it's reasonable to act on what we do know.

Practical Steps to Reduce Exposure

No clinical screening currently exists for microplastics in arterial plaque. There is no blood test, no imaging, no biomarker that your GP can order today. What you can do is reduce your ongoing exposure, particularly through food and water contact with plastics.

Evidence-informed steps worth discussing with your treating team:

Use glass, stainless steel, or ceramic containers rather than plastic for food and drink storage. Avoid microwaving food in plastic containers; heat accelerates the leaching of plastic particles. Filter your drinking water; some filters (carbon block and reverse osmosis) reduce microplastic levels significantly. Reduce consumption of highly processed foods in plastic packaging. Bring this study to your vascular neurologist, cardiologist, or GP and ask whether it's relevant to your personal risk profile.

This is not a recommendation to take a supplement or start a treatment. It's an invitation to have an informed conversation with the people responsible for your care using the best available evidence.

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