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Micro- and Nanoplastics in the Blood Linked to Increased Heart Attack Risk Factors

Analysis by Dr. Joseph Mercola | November 04, 2026

STORY AT-A-GLANCE

- People having the most severe type of heart attack were far more likely to have micro- and nanoplastics in the blood flowing through their coronary arteries than people with stable heart disease or normal coronary arteries, suggesting these particles are linked to more advanced cardiovascular damage
- Tiny plastic particles don't simply circulate through your bloodstream; research shows they damage the protective lining of your blood vessels, increase oxidative stress, trigger chronic inflammation and make artery-clogging plaque more likely to become unstable
- Smoking and exposure to air pollution were strongly associated with higher levels of plastic particles in the bloodstream, showing that multiple environmental exposures work together to increase stress on your cardiovascular system
- Many of your largest sources of plastic exposure are within your control, including your drinking water, food packaging, plastic food containers and other everyday products, giving you practical opportunities to lower your overall exposure
- Replacing plastic where possible, filtering your drinking water, choosing fresh whole foods, reducing seed oils high in linoleic acid and supporting healthy blood vessels through lifestyle habits all help reduce the biological conditions linked to cardiovascular disease

Heart disease remains the leading cause of death worldwide, and coronary artery disease sits at the center of that problem. Coronary artery disease, meaning the arteries that supply your heart become narrowed or blocked by fatty plaque, is characterized by chest pain, shortness of breath, fatigue and, in some cases, a sudden heart attack when blood flow stops completely. Left untreated, it raises your risk of permanent heart muscle damage, heart failure and death.

One of the most important questions you can ask is not only what causes plaque to build up, but what hidden environmental factors are making that process worse. High blood pressure, smoking, poor diet, sedentary living — researchers have been studying these risk factors for decades. Yet cardiovascular events still strike people who appear to be managing those risks.

That gap between known risk factors and real-world outcomes has pushed scientists to look more closely at the materials we encounter every single day without thinking twice. Two recent studies now connect that search to something found in nearly every modern environment: plastic.

Heart Attack Patients Carried Far More Plastic Particles in Their Coronary Blood

A study published in the European Heart Journal investigated whether **micro- and nanoplastics** are present in the blood flowing through the coronary arteries and whether their levels differ between people with different forms of coronary artery disease.[1] The researchers analyzed blood collected during coronary angiography, a procedure that allows doctors to examine the arteries supplying the heart.

They also compared plastic levels with markers of inflammation, smoking history and air pollution exposure to better understand how these factors are connected.

The study included 61 adults: 19 people experiencing an ST-segment elevation myocardial infarction (STEMI), the most severe type of **heart attack** — caused by a complete blockage of a coronary artery that cuts off blood flow entirely — 20 people

with chronic coronary syndromes, meaning stable narrowing of the coronary arteries, and 22 people whose coronary arteries appeared normal.

- **People having heart attacks carried far more plastic particles and a greater variety of plastics —** Detectable micro- and nanoplastics were found in 84.2% of patients experiencing a STEMI, compared with 40% of patients with chronic coronary syndromes and 31.8% of people whose coronary arteries appeared normal. Researchers also found that heart attack patients carried a median of three different types of plastic, while the other groups typically had none to two.

  Polyethylene — the plastic commonly used in grocery bags, food packaging and bottles — appeared in 97% of patients with detectable plastics. Other plastics, including polypropylene, polystyrene, polyethylene terephthalate (PET) and nylon 66, also appeared much more frequently in the STEMI group.

- **The highest plastic concentrations appeared exactly where blood flow became blocked —** Researchers measured how much plastic was present and where those particles were concentrated. In patients having a STEMI, plastic concentrations were highest in blood collected from the coronary artery just upstream of the blockage, before doctors crossed it with the catheter. Concentrations were lower in blood collected after the blockage and lower still in blood drawn from the arm.

  This pattern suggests the particles accumulate where blood flow becomes impaired rather than circulating evenly throughout the body. To strengthen confidence in the findings, the researchers also tested catheters, tubing and other medical equipment for contamination and found no detectable background plastics. In addition, some participants in every study group had no detectable plastics at all, showing the results reflected genuine biological differences rather than contamination.

- **Higher plastic levels went hand in hand with stronger inflammation —** Patients with the greatest plastic burden also had significantly higher levels of two inflammatory proteins that act as chemical messengers for the immune system. Persistently

elevated levels of these proteins are associated with unstable plaque inside the arteries and a greater likelihood of heart attacks.

Rather than appearing as an isolated finding, higher plastic exposure consistently clustered with stronger inflammatory activity throughout the study population.

- **Smoking was the strongest predictor of plastic particles in the blood —** After accounting for multiple cardiovascular risk factors, smoking history remained the only independent predictor of detectable micro- and nanoplastics, increasing the odds nearly sixfold.

  This finding suggests cigarette smoke serves as an important route of exposure or influences how these particles accumulate within the body. For smokers, this means tobacco exposure isn't simply affecting the lungs and blood vessels — it also appears closely linked to the amount of plastic circulating through the coronary arteries.

- **Air pollution and plastic exposure appeared to reinforce each other —** Researchers also found that patients exposed to PM2.5 concentrations above 15 micrograms per cubic meter were more likely to have detectable plastics in their blood. PM2.5 refers to extremely small airborne particles that are small enough to travel deep into your lungs and enter your bloodstream.

  Every participant who both smoked and experienced PM2.5 exposure above that threshold had detectable micro- and nanoplastics in their coronary blood.

  Together, these findings suggest environmental exposures don't occur one at a time. Instead, smoking, air pollution and plastic exposure appear to accumulate together, creating conditions associated with more severe cardiovascular disease.

Tiny Plastic Particles Disrupt Blood Vessels Long Before a Heart Attack Occurs

A review published in Particle and Fibre Toxicology examined laboratory and animal research investigating what happens after micro- and nanoplastics enter the bloodstream.[2] Unlike the first study, which documented where plastic particles were found in people with heart disease, this review focused on the biological damage those particles cause.

The researchers explained how plastics spread through the body, injure blood vessels, interfere with normal heart function and trigger the chain of events that contributes to cardiovascular disease. Understanding these mechanisms gives you a clearer picture of why reducing plastic exposure matters long before symptoms appear.

- **The smallest plastic particles travel farther and cause greater disruption —** Researchers explained that nanoplastics are much smaller than ordinary microplastics, allowing them to pass through biological barriers that normally protect your organs. Once inside the bloodstream, they travel beyond the digestive tract and reach the heart, blood vessels and other tissues.

  Their extremely small size also makes them easier for cells to absorb through several transport pathways, allowing them to accumulate inside tissues where they interfere with normal cellular function. The review also notes that plastic particles often carry chemical additives from manufacturing along with pollutants picked up from the environment, exposing your body to far more than plastic alone.

- **Plastic particles weaken the protective lining of your blood vessels —** Healthy arteries depend on a thin layer of cells called the endothelium, which forms a smooth lining that helps regulate blood flow, blood pressure, clotting and inflammation. According to the review, micro- and nanoplastics injure these cells, reducing their survival and impairing their ability to function normally.

  The particles also trigger oxidative stress, meaning harmful unstable molecules overwhelm your body's antioxidant defenses and damage proteins, fats and DNA inside blood vessel cells. At the same time, plastic exposure reduces nitric oxide

production. Nitric oxide is a natural signaling molecule that keeps arteries relaxed and flexible. When nitric oxide levels fall, blood vessels become stiffer, circulation declines and conditions become more favorable for cardiovascular disease.

- **Chronic inflammation turns your immune system against your arteries —** Inflammation normally helps your body fight infection and repair injuries, but the review found that plastic particles keep this response switched on for far too long. Instead of resolving, the inflammatory response stays switched on, with immune cells continuing to release chemical messengers that damage blood vessel tissue from within.

  Over time, this ongoing inflammation damages the arteries rather than protecting them, creating an environment that supports cardiovascular disease.

- **Immune cells begin building plaque that becomes increasingly unstable —** According to the review, chronic inflammation encourages immune cells to absorb cholesterol and transform into foam cells, which are fat-filled cells that accumulate inside artery walls. Foam cells form one of the earliest building blocks of atherosclerotic plaque and continue fueling its growth.

  Persistent inflammation also weakens the fibrous cap that covers these fatty deposits. As that protective cap becomes thinner and more fragile, plaque becomes much more likely to rupture, triggering the formation of blood clots that block blood flow to the heart or brain.

- **Multiple biological changes work together to increase cardiovascular risk —** Rather than causing a single type of damage, micro- and nanoplastics affect several protective systems at once. The review describes injury to blood vessel cells, excessive oxidative stress, reduced nitric oxide production, chronic inflammation, plaque formation and plaque instability as interconnected processes that reinforce one another.

  Together, these mechanisms help explain why plastic exposure is associated with progressively worsening cardiovascular health instead of one isolated problem.

Reduce the Plastic Burden Before It Reaches Your Bloodstream

The research points to a simple idea: the fewer micro- and nanoplastics you take into your body, the less opportunity they have to circulate through your blood vessels. At the same time, lowering inflammation and protecting your blood vessels gives your cardiovascular system a stronger foundation. Every change doesn't have to happen overnight. Each step you take removes another source of exposure and moves you toward better long-term health.

The encouraging news is that many of your biggest sources of microplastic exposure are already within your control. The water you drink, the food packaging you use and many of your daily product choices all influence how much plastic enters your body.

That's exactly why I wrote my book, **Microplastics Cure**, which is available for preorder. In it, I explain what current research reveals about how these tiny particles accumulate, why your body has such a difficult time removing them once they're stored in tissues and the practical, science-based steps you can take to lower your exposure.

If everything feels overwhelming, don't try to change your entire lifestyle in one day. Focus on one habit at a time. The goal isn't perfection. It's making steady progress that adds up over months and years.

1. **Start with cleaner drinking water —** Your drinking water is one of the most consistent sources of daily exposure, making it one of the smartest places to begin. I recommend installing a high-quality filtration system that's specifically designed to remove microplastics, pharmaceutical residues and other emerging contaminants.

   Many standard pitcher filters improve taste and reduce chlorine, but they aren't designed to capture the smallest plastic particles. A properly designed filtration system lowers your exposure every day without requiring you to think about it.

2. **Choose fresh, minimally processed foods whenever possible —** Highly processed foods typically undergo more manufacturing, packaging and handling, creating additional opportunities for contamination with microplastics. I recommend

building your meals around fresh fruits, vegetables, properly raised animal foods and other minimally processed whole foods.

Buying loose produce instead of individually wrapped items also reduces unnecessary plastic exposure before food even reaches your kitchen.

3. **Improve the quality of the air you breathe every day —** The first study found that higher exposure to fine particulate air pollution occurred alongside greater detection of plastics in coronary blood. If you live near busy roads, industrial areas or regions affected by wildfire smoke, keep your windows closed during poor air-quality days and use a high-quality HEPA air purifier indoors.

   If you smoke, quitting is one of the most powerful steps you can take because the research identified smoking as the strongest predictor of detectable plastics in coronary blood.

4. **Support your blood vessels by lowering chronic inflammation —** The studies showed that higher plastic exposure was associated with inflammatory activity that damages blood vessels. You help counter that by building your diet around foods that actively support your blood vessels — leafy greens, berries, pasture-raised eggs and grass fed butter — while maintaining healthy blood sugar, getting regular movement, sleeping well and spending time outdoors.

   These habits strengthen the cells lining your arteries and reduce many of the same biological processes linked to cardiovascular disease. Another important step is avoiding excess linoleic acid (LA), the polyunsaturated fat found in **seed oils** such as soybean, corn, sunflower, safflower and canola oil.

   When LA becomes damaged through oxidation, it produces harmful compounds that injure cell membranes and activate inflammatory pathways throughout your body, including your blood vessels, liver and nervous system. Reducing your intake of these oils removes a persistent source of chronic inflammation and helps protect the arterial lining that micro- and nanoplastics are actively working to damage.

5. **Reduce unnecessary plastic contact throughout your home —** Small changes add up over time. Choose wooden, stainless steel or glass kitchen tools instead of plastic whenever practical. Store leftovers in glass containers, avoid heating food in plastic and replace worn plastic cutting boards and scratched food containers that shed more particles as they age.

   If you're just getting started, pick one room in your home each month and gradually replace plastic items with safer alternatives. That steady approach makes lasting progress much easier than trying to change everything at once.

FAQs About Micro- and Nanoplastics and Heart Attack Risk Factors

Q: What are microplastics and nanoplastics, and why are they a concern for my heart?

A: Microplastics are tiny fragments of plastic, while nanoplastics are even smaller particles that are invisible to the naked eye. Research suggests these particles don't simply pass through your digestive system. They enter your bloodstream, reach your blood vessels and heart, and trigger biological changes such as inflammation, oxidative stress and damage to the lining of your arteries that are associated with cardiovascular disease.

Q: Did researchers actually find plastic particles inside the arteries of people having heart attacks?

A: Yes. Researchers detected micro- and nanoplastics directly in blood collected from the coronary arteries during heart procedures. People experiencing the most severe type of heart attack had both higher levels of plastic particles and a greater variety of plastic types than people with stable coronary artery disease or normal

coronary arteries.

Q: How do tiny plastic particles damage my blood vessels?

A: Laboratory research shows these particles injure the cells lining your arteries, increase oxidative stress, reduce nitric oxide production that helps blood vessels stay flexible and activate long-lasting inflammation. Together, these effects encourage plaque to grow and become more unstable, increasing the likelihood of dangerous blood clots.

Q: What increases your exposure to micro- and nanoplastics?

A: The studies identified smoking and exposure to fine air pollution as important factors associated with higher levels of plastics in the bloodstream. Everyday sources such as drinking water, food packaging and plastic food containers also contribute to ongoing exposure, making your daily habits an important part of reducing your overall plastic burden.

Q: What are the most effective ways to reduce my plastic exposure?

A: Focus first on the biggest sources you can control. Drink filtered water from a filtration system designed to remove microplastics, choose fresh whole foods over heavily packaged processed foods, avoid heating food in plastic containers, reduce unnecessary plastic products in your home, improve indoor air quality and lower chronic inflammation by eating a whole-food diet and avoiding seed oils high in LA. Small, consistent changes made over time have the greatest impact.

This article is for informational purposes only and does not constitute medical advice. Consult a qualified healthcare provider before making changes to your health regimen.

Sources and References

- [1] European Heart Journal July 14, 2026
- [2] Particle and Fibre Toxicology 2026 Feb 28;23:16