

# Arsenic in Water: A Hidden Heart Health Threat

Analysis by [Dr. Joseph Mercola](#)

November 12, 2024

## STORY AT-A-GLANCE

- › Long-term exposure to arsenic in drinking water, even at levels below regulatory limits, may increase the risk of cardiovascular diseases, particularly ischemic heart disease, as highlighted by the California Teachers Study
- › Arsenic exposure leads to oxidative stress and endothelial dysfunction, which are key contributors to heart disease, emphasizing the need for stricter regulatory standards
- › The mechanisms by which arsenic causes damage include mitochondrial impairment and enzyme disruption, such as binding to sulfhydryl groups and substituting for phosphorus in biological reactions
- › Strategies to limit arsenic exposure are important for health, including testing drinking water, making dietary adjustments and using cooking methods that reduce arsenic content in foods like rice
- › Recognizing the diverse impacts of arsenic on health is essential for developing effective public health strategies to mitigate its risks

**Could the arsenic in your drinking water be silently increasing your risk of heart disease? According to a recent study published in *Environmental Health Perspectives*,<sup>1</sup> this alarming possibility is more than just a hypothesis — it's a reality that warrants your attention.**

**Cardiovascular disease remains one of the leading causes of mortality worldwide.<sup>2</sup> While much focus has been placed on factors like smoking, arsenic exposure from**

drinking water is emerging as a significant, yet underrecognized, contributor. This toxic element, naturally occurring in the Earth's crust, has found its way into water supplies in various regions, including parts of the U.S., posing a hidden threat to heart health.

You might assume that existing regulatory limits on arsenic in water are sufficient to protect your health. However, the California Teachers Study challenges this assumption by revealing that even arsenic levels below the federal maximum contaminant level of 10 micrograms per liter ( $\mu\text{g}/\text{L}$ ) elevate the risk of ischemic heart disease.<sup>3</sup>

This research highlights a critical gap in our current safety standards, suggesting what is deemed "safe" may not be protective against long-term cardiovascular risks.

## **California Teachers Study Links Arsenic in Water to Increased Heart Disease Risk**

Long-term exposure to arsenic in drinking water significantly raises the risk of ischemic heart disease among women, according to a recent study. This research, conducted within the California Teachers Study cohort, tracked nearly 100,000 participants over more than two decades.

The findings revealed that women exposed to arsenic levels between 5 to 10 micrograms per liter had an 18% to 20% higher risk of developing ischemic heart disease compared to those with exposure below 1 microgram per liter.<sup>4</sup> As mentioned, even arsenic concentrations below the federal maximum contaminant level of 10 micrograms per liter were linked to increased heart disease risk.

The study also explored how arsenic affects your body. It was found that arsenic exposure leads to oxidative stress and endothelial dysfunction. Oxidative stress occurs when there's an imbalance between free radicals and antioxidants in your body, causing damage to cells. Endothelial dysfunction refers to the impaired function of the inner lining of blood vessels, which is important for maintaining vascular health.

These two factors play significant roles in the development of atherosclerosis, a condition where arteries become clogged with fatty substances, and high blood pressure, both of which are major contributors to heart disease.

Moreover, the research underscores the necessity for stricter regulatory standards on arsenic levels in drinking water. The current limits are not sufficient to prevent long-term cardiovascular risks, especially considering that a large portion of the population may be exposed to arsenic levels that pose a health threat. This study highlights the urgent need to reassess and lower the acceptable arsenic concentrations in public water supplies to better safeguard public health.

By identifying arsenic as a significant risk factor for cardiovascular disease, this study paves the way for new policies and interventions aimed at reducing arsenic exposure in communities. Ensuring cleaner water supplies and raising awareness about the sources and effects of arsenic will help mitigate the risks associated with this toxic element, ultimately protecting and improving heart health on a broader scale.<sup>5</sup>

## **Arsenic's Mechanisms of Damage are Diverse and Impactful**

Another study found that arsenic disrupts numerous essential enzymes in your body by binding to sulfhydryl groups. These groups are involved in the proper functioning of many enzymes that facilitate vital biochemical reactions. When arsenic attaches to these groups, it alters the enzyme's structure and impairs its ability to work correctly, leading to a breakdown in various metabolic processes.<sup>6</sup>

Arsenic also substitutes for phosphorus in many biological reactions. Phosphorus is an essential component of ATP, DNA and other molecules that are vital for cellular energy and replication.<sup>7</sup> By mimicking phosphorus, arsenic interferes with these critical functions, causing widespread cellular dysfunction. This substitution damages the integrity of DNA and disrupts energy production, which leads to cell death and contributes to the development of chronic diseases.<sup>8</sup>

Mitochondrial function is another area severely affected by arsenic exposure. Mitochondria, often referred to as the powerhouses of the cell, are necessary for generating the energy required for cellular functions.<sup>9</sup> Arsenic impairs mitochondrial function by inhibiting key enzymes involved in the energy production cycle. This inhibition leads to decreased energy availability for cells, forcing them to work inefficiently and increasing the production of harmful byproducts like free radicals.<sup>10</sup>

In addition to disrupting enzymes and mitochondrial function, arsenic-induced oxidative stress damages proteins, lipids and DNA, which results in inflammation and contributes to the onset of various degenerative diseases, including heart disease, cancer and arthritis.<sup>11</sup>

These diverse mechanisms highlight the extensive impact arsenic has on your body. By interfering with fundamental biological processes, arsenic not only disrupts individual cellular functions but also contributes to the development of a wide range of chronic health conditions.<sup>12</sup>

## **Strategies to Limit Arsenic Exposure**

Regular testing of drinking water helps ensure arsenic levels do not exceed safety standards. The U.S. Food and Drug Administration advises testing in the spring or early summer to detect potential contamination early and recommends using appropriate filtration methods to remove arsenic from water sources.<sup>13</sup>

In addition to monitoring water quality, adopting a varied and nutritious diet plays a significant role in minimizing arsenic exposure.<sup>14</sup> Consuming a wide range of healthy foods not only provides essential nutrients but also reduces the accumulation of contaminants that may be present in specific food items. This balanced approach to eating supports overall health while mitigating the risks associated with arsenic exposure.

Moreover, specific strategies further lower arsenic intake from certain foods. For example, cooking rice by using excess water and draining it reduces arsenic content by

up to 60%, although this method may also decrease some nutritional value.<sup>15</sup> Parents should be mindful of infants' diets, ensuring that rice cereal is not the sole grain source to prevent excessive arsenic exposure in young children.

By implementing these strategies, individuals can significantly reduce their arsenic exposure, thereby lowering the associated health risks.<sup>16</sup> Regular testing, dietary diversity and mindful cooking practices are key steps in maintaining a safe and healthy environment free from harmful levels of arsenic.

## **Solutions to Reduce Arsenic in Drinking Water**

To safeguard your heart health from arsenic exposure in drinking water, consider the following steps:

- 1. Install a reverse osmosis system** – Reverse osmosis (RO) systems are highly effective at removing arsenic from your water supply. These systems use a semipermeable membrane to filter out arsenic and other contaminants, ensuring that the water you consume is clean and safe. By investing in an RO system for your home, you significantly reduce your exposure to harmful arsenic levels.
- 2. Regularly test your water quality** – Use a home water testing kit or have your water analyzed by a certified laboratory to keep track of arsenic concentrations. Regular testing allows you to take timely action if arsenic levels rise, ensuring that your water remains safe for consumption.
- 3. Choose safe drinking water alternatives** – If arsenic levels in your local water supply remain high despite filtration efforts, consider alternative sources for drinking and cooking water. Water from a trusted local source, such as a natural spring, may provide a safer option.

## **Protect Your Heart by Managing Arsenic Exposure**

Arsenic in drinking water poses a significant risk to heart health, even at levels below current safety standards. Studies have shown that long-term exposure to arsenic increases the likelihood of developing ischemic heart disease by disrupting essential bodily functions.

Remember, arsenic primarily enters drinking water and certain foods, such as rice, which absorb arsenic more easily than other crops. Installing a reverse osmosis system can also effectively remove arsenic from your water. Regular water quality testing and choosing safe drinking water alternatives further minimize the risk of arsenic-related heart disease.

Taking proactive steps, such as maintaining a varied diet and using proper water filtration methods, empowers you to safeguard your health. By addressing arsenic exposure, you'll significantly reduce your risk of heart disease and enhance your overall well-being.

## Sources and References

---

- <sup>1, 3, 4, 5</sup> [Environmental Health Perspectives October 23, 2024, Volume 132, Issue 10](#)
- <sup>2</sup> [BMJ 2011;342:d2431](#)
- <sup>6, 7, 8, 12</sup> [Oncotarget. 2017 Jan 18;8\(14\):23905-23926](#)
- <sup>9, 10, 11</sup> [World J Transl Med. Aug 12, 2014; 3\(2\): 96-111](#)
- <sup>13, 14, 15, 16</sup> [U.S. Food and Drug Administration, What You Can Do to Limit Exposure to Arsenic](#)