

Toxins Cause Heart Failure and Cardiomyopathy

STORY AT-A-GLANCE

- › Patients with severe heart failure have 12,000-fold more antimony in their heart muscle cells than healthy controls and 22,000-fold more mercury
- › Heavy metals like mercury, cadmium and copper directly impair mitochondrial function, which is crucial for cellular energy production
- › Antimony exposure is linked to cardiovascular issues and has estrogenic activity, which may contribute to chronic diseases including cancer
- › The heart often serves as a collection site for heavy metals, significantly contributing to heart failure
- › Chelation therapy may reverse heart damage caused by heavy metal toxicity. Routine phlebotomy is recommended for managing high iron levels and can also lower your microplastic burden

According to research¹ published in 1999, people with severe heart failure have 12,000-fold more antimony in their myocytes (the heart muscle cells responsible for contraction) than healthy controls. They also have 22,000-fold more mercury.

Mercury is a highly toxic metal that causes oxidative stress, weakening of the antioxidant defense system, enzyme inactivation and increased oxidative damage, all of which contribute to the deterioration of heart function.² Long-term exposure to antimony has also been linked to cardiovascular problems. Antimony also has estrogenic activity, which drives many chronic diseases, including cancer.

The oxidative stress caused by heavy metals is one of the primary ways in which they destroy your mitochondrial function. Some heavy metals, including mercury, cadmium and copper, also interfere directly with the mitochondrial electron transport chain,³ leading to reduced ATP production, which is crucial for cellular energy.

Mercury's interaction with mitochondrial enzymes and membranes further amplifies oxidative damage, impairs cellular respiration, and can trigger cell death.

High Concentrations of Heavy Metals Are Nearly Always Present in Failing Hearts

In a November 2023 article,⁴ Dr. Thomas Levy, contributing editor for the Orthomolecular Medicine News Service, pointed out that the heart is “the preferred collection site” for most heavy metals, and as such, heavy metal toxicity is a common contributor to, and sometimes direct cause of, heart failure.

Various toxins, especially heavy metals like lead, copper, iron, mercury, aluminum, cadmium and others, can accumulate in heart tissue, contributing significantly to heart failure by directly damaging heart muscle cells and affecting their function. As reported by Levy:⁵

“Many different toxins, including many heavy metals, have been either linked to heart failure or clearly shown to be the direct cause. Furthermore, one or more of these toxins is nearly always present in high concentrations in the affected heart muscle. A partial list of such agents includes the following:

- *Lead*
- *Copper*
- *Iron*
- *Mercury*
- *Aluminum*
- *Cobalt/Chromium*

- *Cadmium*
- *Gold/Silver*
- *Chemotherapy*
- *COVID spike protein”*

Levy cites studies showing how each of these toxic agents damage your heart and deteriorate cardiac function. Lead, for example, is linked to acute heart failure and myocarditis; copper toxicity to hypertrophic cardiomyopathy; iron to congestive heart failure; and mercury to idiopathic dilated cardiomyopathy (IDCM).

Recognizing and treating heavy metal toxicity can dramatically improve heart function, Levy notes, adding that chelation therapy has shown promise in reversing toxicity-related heart damage.

The Safest Way to Lower Your Iron

While Levy reviews the use of an iron chelator (deferoxamine) for severe iron overload, routine phlebotomy (blood donation) is another, likely safer, option. Side effects of deferoxamine include but are not limited to allergic reactions, respiratory issues, vision disturbances, hearing loss, muscle spasms and bone pain.⁶

For those with elevated iron levels, I recommend donating blood two to four times a year. If losing 10% of your blood in one sitting is too problematic, you can remove blood in smaller amounts once a month on the schedule listed below. If you have congestive heart failure or severe COPD, you should discuss this with your doctor, but otherwise this is a fairly appropriate recommendation for most.

Men

Postmenopausal Women

Premenopausal Women

150 ml

100 ml

50 ml

As reported by Levy:⁷

“[A] case report described a 27-year-old woman with ‘severe heart failure’ completely normalizing on an iron removal regimen. Patients with severe iron overload cardiomyopathy have an average survival of only one year when therapeutic phlebotomy (blood donation) and iron chelation are not utilized.

This form of cardiomyopathy begins with restricted filling of the heart (diastolic dysfunction), and then evolving into a congestive cardiomyopathy. Iron overload cardiomyopathy occurs most commonly in patients with hereditary hemochromatosis or secondary hemochromatosis (as with β -thalassemia and sickle cell anemia).

However, excess iron short of that seen in full-blown hemochromatosis can still be expected to inflict its own dose-dependent toxicity. Most adults already have excess levels of iron in their bodies, as reflected by elevated ferritin levels that erroneously remain regarded as normal in laboratory reference ranges.

Excess iron in the heart is also a predisposing factor to developing atrial fibrillation, an arrhythmia that contributes its own increased morbidity and mortality.

In animal studies, excess cellular iron in heart cells has been shown to increase oxidative stress and impair the ability of the mitochondrial electron transport chain (ETC) to produce ATP. As ATP is the primary energy-providing molecule in the body, any decrease in its production always results in compromised cellular function and disease.

Of note, resveratrol supplementation has been shown to dramatically improve heart function in animal models of iron overload cardiomyopathy. In another animal study,⁸ either deferiprone or N-acetylcysteine was effective in decreasing cardiac iron concentration.”

Where Does the Antimony Come From?

In personal correspondence with me, Levy pointed out that one of the primary sources of antimony is PET-containing plastics, with plastic water bottles being the top source.

“By comparison, antimony is more toxic than arsenic,” he told me. “After presenting this info recently, a Veteran in the audience told me that they dropped huge pallets of bottled water to the troops in the Middle East, and he would get sick every time he drank the water, but there was no other source of water. Of course, heat accelerated the antimony release into the water.”

Chapter 3 in Defend Our Health’s 2022 report, “Problem Plastic: How Polyester and PET Plastic Can be Unsafe, Unjust and Unsustainable Materials,” detail how antimony in plastic threaten our health, especially that of our children. Here’s a small excerpt:⁹

“Antimony (in the form of antimony trioxide) is the preferred catalyst for speeding the final chemical reaction that produces PET plastic. Small amounts of antimony can continually escape from PET during use and disposal of plastic bottles, food packaging, and from polyester clothing, children’s products, and other textiles.

Antimony has been known to adversely affect health for decades based on health studies of exposed people and laboratory animals ... Children are exposed to multiple sources of antimony from its use as a plastic additive, including its common use with flame retardant chemicals, including in PET and polyester.

In addition to exposure from food and beverages, antimony may be ingested from house dust and from the mouthing of polyester-based toys and clothing. This aggregate exposure to antimony by children appears to exceed the maximum daily dose established by the State of California to protect against chronic organ toxicity.”

Importantly, antimony also has **estrogenic activity** and estrogen is not something you want too much of. The “Problem Plastic” report cites research that found estrogenic activity in 7 of 9 PET bottles tested.

Aside from being a known carcinogen and a driver of obesity, estrogen is also a metabolic inhibitor that slows down energy production in the cell. And, as stressed by Levy in the quote above, any decrease in energy production “always results in compromised cellular function and disease.”

Beware of Beverages in Plastic Bottles

In February 2022, Defend Our Health tested 20 popular beverages for the presence of antimony. All of the beverages were bottled in PET plastic, and all had detectable levels of antimony. Eight of the 20 samples (40%) had antimony concentrations that exceeded California’s Public Health Goal for drinking water of 1 part per billion (ppb), and 18 of the samples (90%) exceeded the 0.25 ppb limit recommended by Defend Our Health.

According to the “Problem Plastic” report:¹⁰

“The highest concentration was found in the Campbell’s V8 vegetable juice sample, which had 3.45 parts per billion (ppb) of antimony, more than three times California’s public health goal for antimony in drinking water.

The soda sample with the highest antimony concentration was Coca Cola (packaged in 100% recycled PET) at 2.2 ppb. Nestle’s Perrier water had the highest concentration of antimony among the sampled bottled waters, at 1.58 ppb.

The plastic from 11 bottles had concentrations of antimony in the range of 216 to 321 parts per million (ppm). These concentrations fall within or slightly above the previously documented range of 172 to 261 ppm in PET bottles known to use an antimony catalyst.

Three bottles tested had undetectable concentrations of antimony. These PET samples were Simply Lemonade, Mountain Dew, and 7up bottles. Titanium concentrations for these PET samples were found to be six to seven times higher than in the other tested bottle samples ...

Aluminum levels were also elevated in the plastic from two of these samples (Simply Lemonade and 7-up), suggesting that these bottles may have been produced using a titanium- and/or aluminum-based catalyst.”

Nanoplastics Linked to Heart Attacks and Stroke

In related news, recent research¹¹ has also linked nanoplastics to an increased risk of heart attacks and stroke. The study, published in the New England Journal of Medicine, analyzed tissue from 257 individuals undergoing carotid endarterectomy.

Arterial plaques were found to contain several kinds of nanoplastics, including polyethylene, which was detected in 58.4% of patients, and polyvinyl chloride, found in 12.1%.

Disturbingly, individuals with microplastics or nanoplastics in their carotid artery tissues were found to have fourfold higher risk of suffering a cardiovascular event such as heart attack or stroke over the next three years compared to those without such plastics. They were also more likely to die from any cause.

Increasing Cellular Energy Is an Important Part of Heart Failure Treatment

The heart and the brain between them consume nearly one-third of your body's energy. The brain is 2% of your body weight and consumes 20% of your body energy, while your heart is only 0.5% of your body weight (or 75% less than your brain) yet still consumes 7% to 8% of your body's energy. Gram per gram, this is 50% more than your brain consumption.

If you are unable to produce adequate cellular energy, you simply won't have enough power to allow your heart to pump efficiently. This is why it is so vital to implement the strategies we have discussed previously in other articles to improve cellular energy production.

The following are key concepts that need to be integrated to improve all cellular energy, and certainly energy produced for the heart. They all revolve around improving mitochondrial function:

- **Lower LA as much as possible** — This is the single most important mitochondrial poison. Watch my comprehensive video on why this is so and how to do it.
- **Lower estrogen excess** — **Estrogen**, yes even bioidentical, is nearly as dangerous as LA in destroying mitochondrial function. Aside from avoiding all estrogen supplements and plastics, as they are potent sources of xenoestrogens, you can take trans mucosal progesterone, not oral or transdermal, as it is a potent estrogen blocker. See section below for more details.
- **Make sure your thyroid is working well** — Thyroid function is absolutely essential to make sure you have a high metabolic rate and produce plenty of ATP. If you are going to do a thyroid test, it is important your TSH be well-suppressed and below 0.5. You can also confirm by taking your temperature first thing in the morning and two hours after meals. Low temperatures indicate low thyroid activity.
- **Optimize your microbiome** — This is key, as not only are 95% of people metabolically inflexible, but because of mitochondrial poisons their microbiome is out of balance with a preponderance of pathogenic endotoxin-producing bacteria, which is another potent mitochondrial poison. We will be reviewing essential strategies to reverse this pervasive condition in the near future.

Lower Your Toxic Burden With Blood Donation and Sauna

In addition to lowering iron, blood donation can also lower the levels of certain plastic chemicals in your blood. Another effective way to excrete heavy metals and plastic chemicals from your tissues is through sweating. I recommend using a near-infrared sauna with low EMFs for this purpose, as the near-infrared rays can penetrate far deeper into your body than far-infrared.

Other [benefits of sauna](#) use include improved cardiovascular fitness and reduced all-cause mortality, lower blood pressure, reduced dementia risk, improved mental health, strengthened immune function, improved athletic endurance, reduced inflammation, stem cell activation, improved insulin sensitivity and a reduction in stress hormones.

As a general recommendation, stay in the sauna for 20 to 30 minutes, or until you reach subjective fatigue, which is a sign that you've maxed out the benefits you're going to get. It's not about reaching a point of suffering – just that point where you're feeling mildly anxious and tired and want to get out.

As for the frequency, research has consistently shown that it's dose-dependent, so the more often you do it, the greater the benefits. The sweet spot seems to be right around four times a week, because you'll also be losing minerals along with toxins. So, you need to rehydrate and replenish those minerals to avoid mineral deficiencies. For more details, including how to build your own near-infrared sauna, see "[Near-Infrared Sauna Therapy – A Key Biohack for Health.](#)"

Progesterone Counteracts Xenoestrogen Exposure From Plastics

To counteract the hazards of estrogenic exposure from plastics you can use progesterone, which is a natural estrogen antagonist. Progesterone is one of only four hormones I believe many adults can benefit from. (The other three are thyroid hormone T3, DHEA and pregnenolone.)

As a general recommendation, I recommend taking 25 to 50 mg of bioidentical progesterone per a day, taken in the evening one hour before bed, as it can also promote sleep. For optimal bioavailability, progesterone needs to be mixed into natural vitamin E. The difference in bioavailability between taking progesterone orally without vitamin E and taking it with vitamin E is 45 minutes versus 48 hours.

Another good reason for taking progesterone with vitamin E is because it binds to red blood cells, which allows the progesterone to be carried throughout your body and be distributed to where it's needed the most.

Simply Progesterone by Health Natura is premixed with vitamin E and MCT oil. You can also make your own by dissolving pure USP progesterone powder into one capsule of a high-quality vitamin E, and then rub the mixture on your gums. Fifty milligrams of powdered progesterone is about 1/32 teaspoon.

Do not use synthetic vitamin E (alpha tocopherol acetate – the acetate indicates that it's synthetic). Natural vitamin E will be labeled "d alpha tocopherol." This is the pure D isomer, which is what your body can use. There are also other vitamin E isomers, and you want the complete spectrum of tocopherols and tocotrienols, specifically the beta, gamma, and delta types, in the effective D isomer.

I do not recommend transdermal progesterone, as your skin expresses high levels of 5-alpha reductase enzyme, which causes a significant portion of the progesterone you're taking to be irreversibly converted primarily into allopregnanolone and cannot be converted back into progesterone.

Preventing Toxic Exposures Is Key

Of course, prevention – minimizing your exposure to heavy metals and estrogenic compounds such as microplastics – really needs to be your first line of defense.

While that sounds easy enough, it can be tricky business, for the simple reason that these toxins are all around us, in our food, water, household dust, clothing, household and personal care items and even the air we breathe. That said, making a concerted effort to rid your household of plastic can go a long way toward minimizing your and your children's exposure. Here are a few suggestions to get you started:

Filter your tap water and avoid water bottled in plastic – If you need to buy bottled water, opt for glass bottles. Also make sure the filter you use to purify your tap water can filter out microplastics.

Choose organic foods whenever possible.

Opt for low-mercury fish such as anchovy, catfish, wild-caught Alaskan salmon, sardines and tilapia – These fish are categorized as "Best Choices" for consumption due to their lower mercury levels, making them safer options for everyone, including pregnant women and children.¹²

Steer clear of all farmed fish, however, as farmed fish tend to be heavily contaminated. Also avoid large carnivorous fish such as marlin, sea bass and tuna, including canned tuna, as these tend to contain some of the highest concentrations of mercury.

Maintain proper ventilation to reduce indoor pollutants.

Boil hard tap water – If you have hard tap water, consider boiling it before using it for cooking or drinking, as hard water traps more microplastics. Recent research shows boiling hard tap water for five minutes removes up to 90% of the microplastics in the water.¹³

Choose alternatives to plastic packaging – Opt for products packaged in glass, metal, or paper instead of plastic. This can significantly reduce the amount of plastic waste that potentially breaks down into microplastics. At home, use wax paper, parchment paper or paper bags to store foods rather than plastic wrap.

Use reusable containers – Replace single-use plastic bottles, cups, and containers with reusable alternatives made from safer materials like stainless steel or glass.

Never microwave plastics – Heat can cause plastics to leach chemicals into food. Use glass or ceramic containers for microwaving.

Avoid plastic cutting boards – Opt for wood or glass cutting boards instead.

Opt for natural fibers – Whenever possible, choose clothing and other textile products made from natural fibers like cotton, wool and linen, as synthetic fabrics such as polyester shed microfibers and leach xenoestrogens.

Wash synthetic clothes less frequently – When washing synthetic textiles, use a microfiber filter in your washing machine to trap synthetic fibers and prevent them from entering the water system.

Opt for food grade cosmetics and personal care products – Some cosmetics, toothpastes, and personal care products contain microbeads or other plastic particles. Look for products free of these materials. Ideally, opt for all-natural, food grade products.

Ensure proper disposal or recycling of electronics and batteries.

Sources and References

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