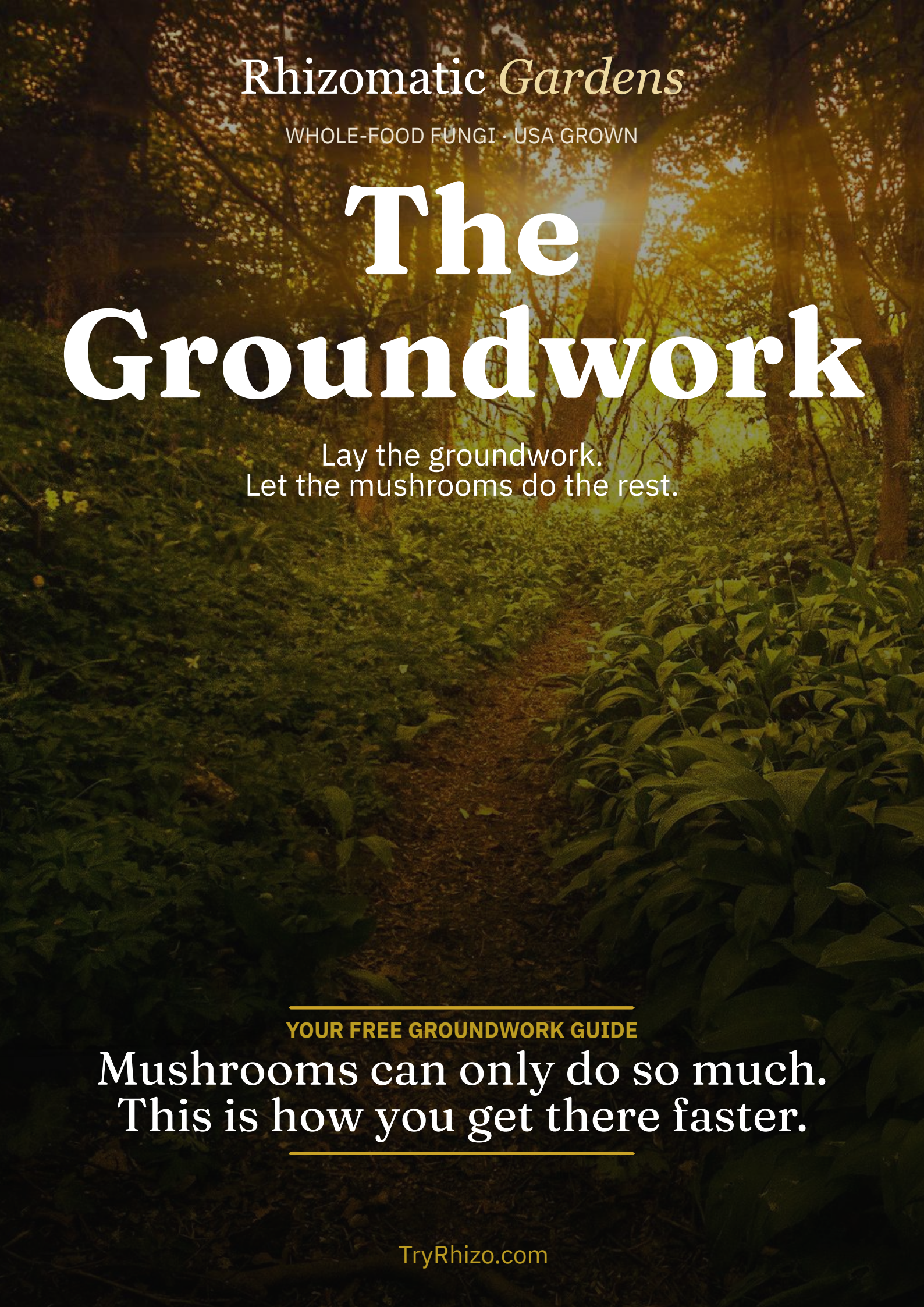




Rhizomatic *Gardens*

WHOLE-FOOD FUNGI · USA GROWN

# The Groundwork

Lay the groundwork.  
Let the mushrooms do the rest.

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**YOUR FREE GROUNDWORK GUIDE**

Mushrooms can only do so much.  
This is how you get there faster.

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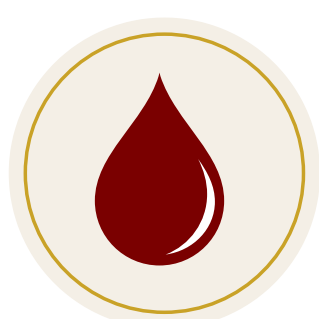
[TryRhizo.com](https://TryRhizo.com)



START HERE

# Lay the Groundwork

**Mushrooms can only do so much.** These three layers are what make everything else work - including your Rhizomatic Gardens mushroom stack. Implement them, and you get where you're going faster.



## LAYER ONE - DONATE BLOOD

*Page 3*

*The Human Oil Change.*

For eligible donors, blood donation removes iron, and research has shown that repeated blood or plasma donation can lower certain serum PFAS levels.

**Supports healthy iron balance • May reduce certain serum PFAS**



## LAYER TWO - HYDRATE PROPERLY

*Page 27*

*Good Water + Minerals = Foundational Hydration.*

Hydration needs vary, but water and electrolytes work together to maintain fluid balance and support normal cellular function.

**Supports immune function • Circulation • Metabolic balance**



## LAYER THREE - SMART SUPPLEMENTATION

*Page 48*

*Real Food First. Supplement With Purpose.*

Start with nutrient-dense whole foods, then use supplements intentionally when there is a clear need.

**Whole food first • Dose matters • Supplement with purpose**



## LAYER FOUR - STACK YOUR MUSHROOMS

*Page 71*

*Where the groundwork pays off.*

With the foundation in place, functional mushrooms can become another layer in a routine built around nutrition, hydration, movement, sleep, and consistency.

**Sleep • Focus • Energy • Gut**

**Build Your Stack → [TryRhizo.com](https://TryRhizo.com)**



Rhizomatic *Gardens*

LAYER ONE



# Donate Blood

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The Human Oil Change -  
how giving blood clears out  
what your body can't.

[TryRhizo.com](http://TryRhizo.com)

## JUST THE FACTS

# Blood Donation Quick Sheet

**Donating Blood =  
HUMAN OIL CHANGE**



Blood donation removes red blood cells and iron from circulation, while the body naturally replaces the donated cells afterward.

## The Simple Routine

- **If eligible, follow your blood donation center's frequency guidelines.**
- **Hydrate well before your donation.**
- **Eat normally before donating and follow your donation center's preparation instructions.**
- **If you drink coffee, keep intake reasonable before donation, especially if caffeine affects your heart rate or blood pressure.**
- **Donation centers typically check basic metrics such as blood pressure, pulse, temperature, and hemoglobin before donation.**



**That's all there is to it. Know your numbers.  
Follow the guidelines.**

- Removes iron through donated blood
- Supports healthy iron balance
- Triggers the body's normal production of replacement blood cells
- Repeated blood or plasma donation may reduce certain serum PFAS
- Provides lifesaving blood for people in need





# What’s Inside

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# The #1 Reason NOBODY TALKS ABOUT

Your blood donation helps people in need - that part is well known. What most people never hear is how much the donor benefits. Humans have practiced it for 3,000 years - and modern research shows real, measurable gains.

## THE REASON NOBODY TALKS ABOUT

*Whole-blood donation removes red blood cells and iron from circulation. Research has also shown that repeated blood or plasma donation can lower certain serum PFAS levels, persistent environmental chemicals commonly known as “forever chemicals.”*

## What the Donor Gains:

- Removes iron through donated blood
- Supports healthy iron balance
- Triggers normal replacement of red blood cells
- May reduce certain serum PFAS with repeated donation
- Helps provide lifesaving blood to others

*An ancient practice  
now being examined  
through modern science.*

But first, let's cover the basics of donating blood. →





# DONATE BLOOD: The Basics

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Donating blood is a voluntary act. The RedCrossBlood.org and OneBlood.org are two well-known blood centers to consider. All blood centers in the U.S. are regulated by the FDA and are required by law to follow its rules, guidelines, and deferral policies.

The actual process of blood withdrawal is about 8-15 minutes once the initial steps are completed.

Blood donation centers typically require a registration process with a photo ID (Driver's License) and a health history review.

## **The health history review will require information such as:**

- Recent illness/sickness
- Current prescription and over-the-counter medications
- Places you have recently traveled

## **A health screening will be performed, typically this includes metrics such as:**

- body temperature, blood pressure, pulse
- hemoglobin and cholesterol levels

## **During the blood collection, sit back and relax!**

After collection and a short rest, free refreshments are offered, and information about your blood collection and your health screening metrics can be accessed through an online donation portal, and some donation centers will give you a free t-shirt and gift card as a thank you!



# UNDERSTANDING BLOOD

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Blood keeps your body functioning and defends against intruders. Blood is produced from your stem cells, where the cells develop and mature in bone marrow. The flow of human blood allows for body temperature regulation and blood clotting to manage bleeding.

*“Blood as a compartment makes up 6–7% of body weight in humans. It irrigates the body’s organs and is the transport pathway for oxygen, nutrients and potentially also plastic particles around the body to other tissues and organs.” ~ Heather Leslie, Author*

Yes, you read that right, plastic particles are in our blood. Leslie continues to refer to these plastics and their elimination occurring via the kidneys, or “deposited in either the liver, the spleen, or in other organs...”

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Purifying, or cleansing, your blood is a common web search, and many products on the market claim to do just that...

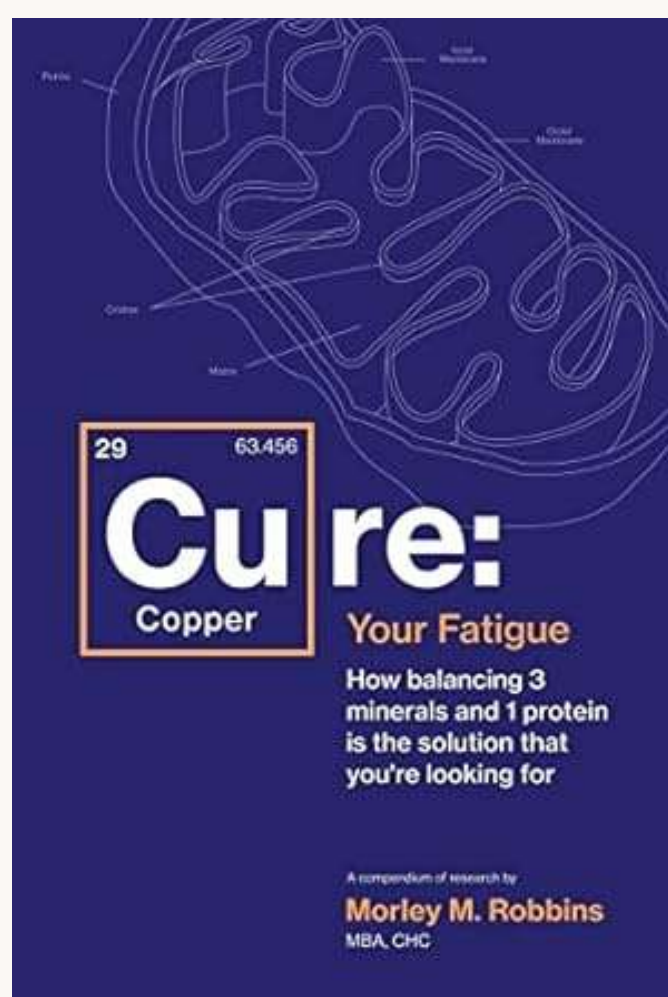
However, as you read on, consider the effects of donating blood as a “Human Oil Change” that is not dependent on products marketed as such.





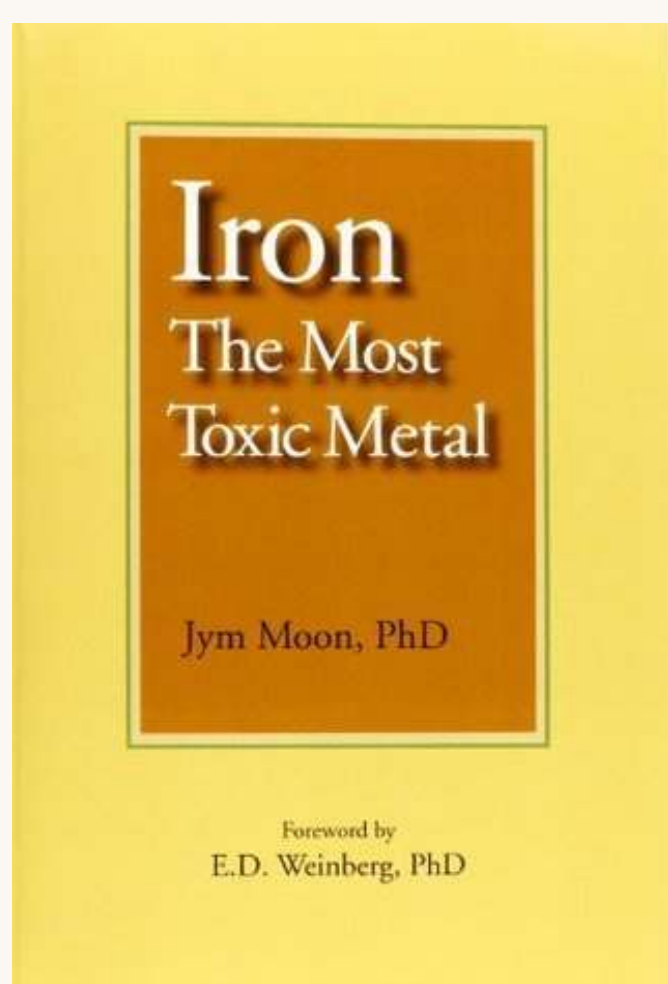
# UNDERSTANDING IRON OVERLOAD

Iron is essential for life, but **it can accumulate excessively in some people and conditions**. Because the body has limited ways to eliminate absorbed iron, understanding how iron is stored, regulated, and recycled is important. These two books take a deeper look at iron metabolism, accumulation, and its potential effects on human physiology.



These two books take a deeper look at iron accumulation, regulation, and its potential effects on human physiology.

In *Iron: The Most Toxic Metal*, Dr. Jym Moon argues that iron deserves the same level of concern given to other potentially toxic metals. He contends that excess iron may contribute to more illness and death than many commonly recognized toxic metals combined.



Iron is still essential for life. It is necessary for oxygen transport, metabolism, and many enzyme systems. The concern is not iron itself, but what can happen when iron accumulates beyond the body's ability to safely regulate and store it.



# HOW IS IRON Accumulated?

## Iron: A Cumulative Toxin

*“The inability to excrete iron is the primary problem; we can excrete only around 1.2 mg per day, no matter how much we absorb. Once iron has been absorbed more than the body’s need, it is very difficult to remove it. Much of the excess will be stored in the liver as ferritin. When ferritin is saturated, hemosiderin is released in the liver and can lead to all of the damaging effects of iron on liver cells.*

*The excess iron that we consume, which is more than the amount we absorb, is carried through the intestines and excreted in the feces. This iron can be very dangerous because it can exist in free form and generate oxygen radicals, resulting in intestinal damage and colon cancer.” ~Dr. Jym Moon, Iron: The Most Toxic Metal*

**Dr. Moon later refers to the most hazardous characteristic of iron: iron is drawn to and accumulates in injured tissue. Thus, elevated amounts of free iron are found in:**

- Neurofibrillary tangles of Alzheimer's disease
- the substantia nigra of Parkinson's disease
- the atherosclerotic plaques of coronary artery disease
- the inflamed joints of arthritis
- the pancreatic islet cells of adult-onset diabetes
- In athletes who sustain serious injuries or have repetitive injury-like states.

## The Question Becomes:

**Is disease brought on by the iron or is the iron drawn to the ill tissue?**

**This is Unknown...**

**However...**

*“The clinical consequences of iron overload are the same regardless of the etiology and pathophysiology of the overload.” ~Dr. James Hamilton*

**Fortunately this form of physiologic damage can be avoided by:  
Donating blood • Certain Dietary Practices • Sweating**





# Iron Fortification

## HISTORICAL PERSPECTIVE

**Iron fortification began in the early 1940s and continues today**, with many grain products, even those sold in natural food stores, still enriched with iron.

Dr. Jym Moon has pointed to the 1990s Institute of Medicine debate around this practice. Despite 50 years of fortifying grains, iron deficiency anemia, especially among premenopausal women, remained common. Instead of questioning the effectiveness of the program, the response was to push for even more iron fortification.

The reality is simple, after five decades, the initiative had not solved the problem it was designed to fix.

### Yet, Iron was still added.

*“The simple fact is that 'iron deficiency anemia' is not a nutritional deficiency disease...no matter what its origin may be, is a medical problem, not a nutritional problem.” ~ Jym Moon*

Several iron toxicologists who testified before the Food and Nutrition Board warned that iron should be treated like other metals the body can accumulate over time. Their position was simple, excess iron should not be consumed unless there is a clear physiological need.

Without that need, iron can become harmful, with the potential to damage tissues throughout the body. Dr. Jym Moon later highlighted these concerns in his book, including excerpts from specialists who challenged the safety of widespread iron fortification.

### What the Iron Toxicologists Warned →



# WHAT IRON TOXICOLOGISTS WARNED

*Excerpts from Dr. Jym Moon's Iron: The Most Toxic Metal*

Randall B. Lauffer, PHD, Harvard Medical School, warned the Food and Nutrition Board that his investigations indicated that iron excess may be a primary cause of coronary artery disease. Dr. Lauffer is the editor of the first book on iron toxicology, *Iron and Human Disease* (CRC Press, 1992).

E.D. Weinberg, PHD, Indiana University, warned that there is an association between iron and hepatocellular carcinoma. He pointed out that iron has been demonstrated to be carcinogenic in laboratory animals and is known to cause hepatocellular carcinoma in humans.

Baruch S. Blumberg, MD, PhD, Nobel Laureate in medicine, has spent many years studying the relationship between the hepatitis B virus and liver iron. He warned that high liver iron stores feed the hepatitis B virus and that this may explain the high incidence of liver cancer found among people infected with the hepatitis B virus.

Dr. J.L. Sullivan, MD, Department of Pathology, University of Florida College of Medicine, provided direct evidence of iron deposits in heart tissue and showed that stored iron levels are a better predictor of heart disease than is blood cholesterol.

Dr. William Crosby, Director of Hematology at the Chapman Cancer Center in Joplin, Missouri, argued that the Delaney Amendment of 1958 specifically forbids the addition of any substance to food that induces cancer in animals. He suggested that food fortification with iron should be terminated because iron has been shown to cause cancer in both laboratory animals and humans.





# IRON FORTIFICATION: The Push to Enrich Continues...

If 50 years of iron-fortified grains did not eliminate iron-deficiency anemia in premenopausal women, continuing the same strategy deserves serious questioning.

**According to Dr. Jym Moon, there is ample evidence that iron excess causes many deadly disorders and exacerbates other chronic illnesses.**

## What the Cereal Found

A study by Paul Whittaker, *Iron and Folate in Fortified Cereals*, found several important concerns:

- Analyzed iron and folic acid levels were often higher than the labeled values.
- Adults commonly consumed about 200% of the labeled serving size.
- When serving sizes are doubled, and nutrient levels are higher than declared, actual intake can become much greater than expected.
- Daily consumption of fortified cereals may contribute to excessive intake of both iron and folate.

**The label may not reflect what people are actually consuming.**

## The Food and Nutrition Board's Contradiction

The Food and Nutrition Board continued to support iron fortification, while also warning that it may be prudent for certain groups to avoid iron supplements and highly fortified foods, including men and perimenopausal women.

The Board warned people to avoid highly fortified foods, yet gave no clear way to identify or avoid them...

**"nor has there been any attempt to inform people that they may be harmed by these foods." ~Dr. Jym Moon**

## Why This Matters

"The most dangerous feature of iron is that it is attracted to and deposits in damaged tissue." ~Dr. Jym Moon

...Hence why it is so hard to excrete



# DISEASES ASSOCIATED WITH IRON OVERLOAD

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Too much iron has been linked to many diseases and underlying health issues.

**In Iron: The Most Toxic Metal, Dr. Jym Moon argues that iron accumulation becomes increasingly common with age and may affect far more people than is generally recognized.**

Dr. Kristin Walter also notes that some people have a genetic condition that causes too much iron to be stored in the organs.

**Iron overload can also develop quietly. Some people with hereditary hemochromatosis or elevated iron stores may have few or no obvious symptoms, allowing excess iron to accumulate before it is recognized.**

**Why Iron Overload Is Difficult to Understand** One major challenge is determining whether iron causes disease, or whether iron is drawn into already damaged tissue and makes the problem worse. Either way, excessive iron is known to accumulate in major organs and tissues, including:

**Heart • Brain • Liver • Lungs • Endocrine Glands • Bone Marrow**





# **DISEASES ASSOCIATED WITH IRON OVERLOAD** Cont.

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## **Neurological Degeneration**

- The brain is a major target for excess iron
- Accumulation of iron in the brain either causes or contributes to neurological diseases such as Parkinson's disease and Alzheimer's disease

## **Cancer**

- Excess iron is a well-documented cause of liver cancer
- Elevated levels of iron predispose to breast cancer
- Animals fed iron excesses develop colon cancer, believed to be the result of free radical generation by unabsorbed iron

## **Heart Disease**

- Excess iron accumulates in the heart and arteries
- Free iron found in the heart and arteries may provoke arterial damage.

## **Parasitic infection**

- Parasites feed on iron as a fuel source, causing infection.

## **Diabetes**

- Iron deposits are found in pancreatic islet cells in people with adult-onset diabetes
- In hereditary hemochromatosis, excess iron accumulates in the pancreas, where it disrupts insulin secretion and causes adult-onset diabetes.

## **Joint Inflammation/Arthritis**

- Iron is found in free form in arthritic joints



# **DISEASES ASSOCIATED WITH IRON OVERLOAD** Cont.

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## **Osteoporosis**

- People with transfusion siderosis develop osteoporosis at a very young age
- Iron accumulation in bone causes osteopenia and osteoporosis

## **Bacterial Infections**

- Iron buildup in white blood cells impairs their ability to fight invading organisms

## **Pituitary Function/Sexual Dysfunction**

- People with hereditary iron overload may have "hypogonadism" infertility due to iron accumulation in the pituitary gland
- Iron overload diseases are uniformly associated with sperm damage
- Erectile Dysfunction may be caused by gonadal iron deposition

## **Other areas known in common literature to be affected by iron overload include:**

- Eye diseases (Age-related macular degeneration)
- kidney damage
- Hypertension
- Hearing Loss
- Cerebrovascular accidents (stroke)

**For eligible healthy donors, regular  
blood donation also removes iron  
from the body.**





# IRON OVERLOAD CAN BE SILENT

*“Organ damage is slow and subtle, and fatigue and nonspecific systemic symptoms often occur early.”*

*~Dr. James Hamilton in the Merck Manual*

In other words, iron-related stress may begin before obvious symptoms appear.

## Why Blood Donation Matters

Blood donation directly removes iron from the body. For people with elevated iron stores, reducing excess iron may help lower:

**Iron burden • Oxidative stress • Tissue exposure to excess iron**

### WHAT THE RESEARCH SUGGESTS

A 2023 MedicalNewsToday article reported that among over 1 million blood donors, there was:

- 30% lower chance of death from any cause
- 4% lower chance of developing cancer

Another analysis reported:

***“For each annual donation, a person’s risk of dying from any cause fell by 7.5%, on average.”***

These are **observational findings**. Blood donors had lower mortality risk, but the studies do not prove donation caused it. Some of the difference may reflect the **healthy-donor effect**.

# A HUGE BENEFIT TO DONATING BLOOD: Lowering the Body's PFAS Burden

## Iron is not the only hidden burden in the blood.

Modern life also exposes us to a growing mix of environmental particles and chemicals. Studies have detected microplastics and nanoplastics in the human body, as well as plastic-associated chemicals such as phthalates and BPA, and persistent compounds such as PFAS, commonly known as “forever chemicals.”

*“Using these values, EWG estimates that, at the upper end of potential exposures, an adult could be taking in the equivalent of about 12 grocery bags worth of plastic particles a year through water, food and plasticware. At the lower end, it's three bags.” Varun Subramaniam, M.S., Tasha Stoiber, PhD*

“...an adult could be taking in the equivalent of about 12 grocery bags worth of plastic particles a year” -ewg.org



**Also reported by the CDC**, numerous phthalate metabolites were detected in quantifiable concentrations in the general population, as reported in the Fourth National Report on Human Exposure to Environmental Chemicals by the CDC. This research suggests that phthalate exposure is common among Americans.





# **A HUGE BENEFIT TO DONATING BLOOD:**

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## **Lowering the Body's PFAS Burden**

Cont.

The CDC has detected phthalate metabolites in a large majority of people tested in U.S. population studies, demonstrating widespread exposure. Research has also linked exposure to certain phthalates with effects on reproductive development and reproductive hormones. Phthalates can be found in:

**Soaps • Body washes • Shampoos • Cosmetics • Personal care products**

### **WHY THIS MATTERS**

Recent research has also detected microplastics and nanoplastics in human arterial plaque. That does not prove plastics are the sole cause of disease, but it does raise an important question:

**If microplastics and environmental chemicals are being detected throughout the human body, what are the long-term health implications of that exposure?**

### **THE BLOOD DONATION CONNECTION**

This is where an important distinction matters. Blood donation has not yet been shown to remove microplastics generally. However, a randomized clinical trial found that repeated blood and plasma donation significantly reduced blood levels of certain PFAS, commonly called “forever chemicals,” compared with observation alone.

**“Plasma and blood donations caused greater reductions in serum PFAS levels than observation alone over a 12-month period.” ~ Dr. Robin Gasiorowski**

### **BOTTOM LINE**

Blood donation may do more than reduce iron. In a randomized clinical trial, repeated blood donation lowered certain serum PFAS levels, while plasma donation produced even greater reductions. Whether lowering PFAS levels translates into improved long-term health outcomes remains under study.

**This makes blood and plasma donation practical interventions that have been shown to reduce certain PFAS levels in the blood.**



# **DONATE BLOOD: Additional Positive Effects**

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## **May help lower blood pressure in people with hypertension**

In an observational study of 292 donors, repeated blood donation was associated with significant reductions in systolic and diastolic blood pressure among donors who started with hypertension.

## **May improve blood vessel function**

In a prospective study of healthy adult men, repeated blood donation was associated with improved flow-mediated dilation, a marker of endothelial function.

## **May reduce oxidative stress and inflammatory markers**

In 96 healthy volunteers, researchers measured blood before and 24 hours after donation and found lower hs-CRP and pentraxin-3, higher superoxide dismutase activity, and changes consistent with reduced oxidative stress after donation.

## **May improve glucose handling / insulin sensitivity**

A 2026 double-blind randomized controlled trial found that a standard blood donation modestly reduced HbA1c and glucose exposure during an oral glucose tolerance test, with improvements tracking reductions in ferritin. Earlier observational work also found frequent donors had higher insulin sensitivity than matched non-donors.

## **May improve certain lipid markers**

In a prospective study of healthy men, repeated blood donation was associated with increased HDL and reduced LDL oxidation, suggesting favorable changes in certain lipid markers.



## DONATING BLOOD

# Potential Side Effects

**“Donating blood is safe. You can’t get AIDS or any other infectious disease from giving blood because we always use new, sterile needles that are discarded after one use.**

**~American Red Cross**

## AFTER DONATING BLOOD

OneBlood recommends the following after donation:

- Drink plenty of water
- Avoid alcohol for 24 hours
- Avoid heavy lifting
- Avoid rigorous exercise for the rest of the day

## COMMON MILD SIDE EFFECTS

Most people feel fine after donating. However, some may experience mild side effects, including:

- **Bruising**
- **Fatigue**
- **Dizziness**
- **Arm soreness**
- **Lightheadedness**
- **Physical weakness**
- **Nausea**
- **Continued bleeding at the needle site**

“Most donors feel fine after donating blood, but if you do feel faint or fatigued, simply lie down until you feel better.” ~American Red Cross

## WHEN TO SEEK MEDICAL HELP

Red Cross, One Blood and other blood donation centers will provide more information regarding what to expect and when to seek medical attention. For most healthy adults, blood donation is safe, simple, and well tolerated. The key is to hydrate, rest, avoid heavy activity afterward, and pay attention to how your body responds.

## IN SUMMARY

# Blood donation is the human oil change.

It may help reduce excess iron, lower part of the body's chemical burden, and give someone else the gift of life.

After a few donations, ask yourself:

- *How do I feel?*
- *Do I notice more energy?*
- *Has anything improved?*
- *Does donating every 8 weeks feel right for me?*

Your body's response is one of the best metrics. Own your health. Do your own research. Use the following references as a starting point.

## Next Step

Schedule your blood donation.

Then tell your family, friends, and community.

Because one simple act may support your health and help save someone else's life.



**American  
Red Cross**



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Rhizomatic Gardens

LAYER TWO



# Hydrate Properly

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Why most people are  
dehydrated even when they  
drink plenty - and how to fix it.

[TryRhizo.com](https://TryRhizo.com)



## JUST THE FACTS

# Hydrate Properly Quick Sheet

Hydration =  
**IMMUNITY**



Proper hydration is foundational to normal immune, circulatory, metabolic, digestive, and cellular function.

## **Water + Celtic Sea Salt + Mineral-Rich Foods + Sodium Bicarbonate**

- Drink clean water consistently throughout the day.
- Use Celtic sea salt as a source of sodium, chloride, and naturally occurring trace minerals.
- Drink water before meals as part of the Groundwork hydration routine.
- Eat mineral-rich whole foods to provide potassium, magnesium, calcium, and other electrolytes.
- Use sodium bicarbonate as part of the Groundwork protocol to support the body's bicarbonate buffering system and acid-base balance. See Page 38 for context, use, and cautions.
- Good mineral-rich foods include spinach, kale, avocados, sweet potatoes, beans, almonds, peanuts, soybeans, tofu, strawberries, and watermelon.

**That's all there is to it. Enjoy the benefits.**



- Supports immune function
- Supports heart and circulatory health
- Supports metabolic balance
- Supports healthy digestion



# What’s Inside

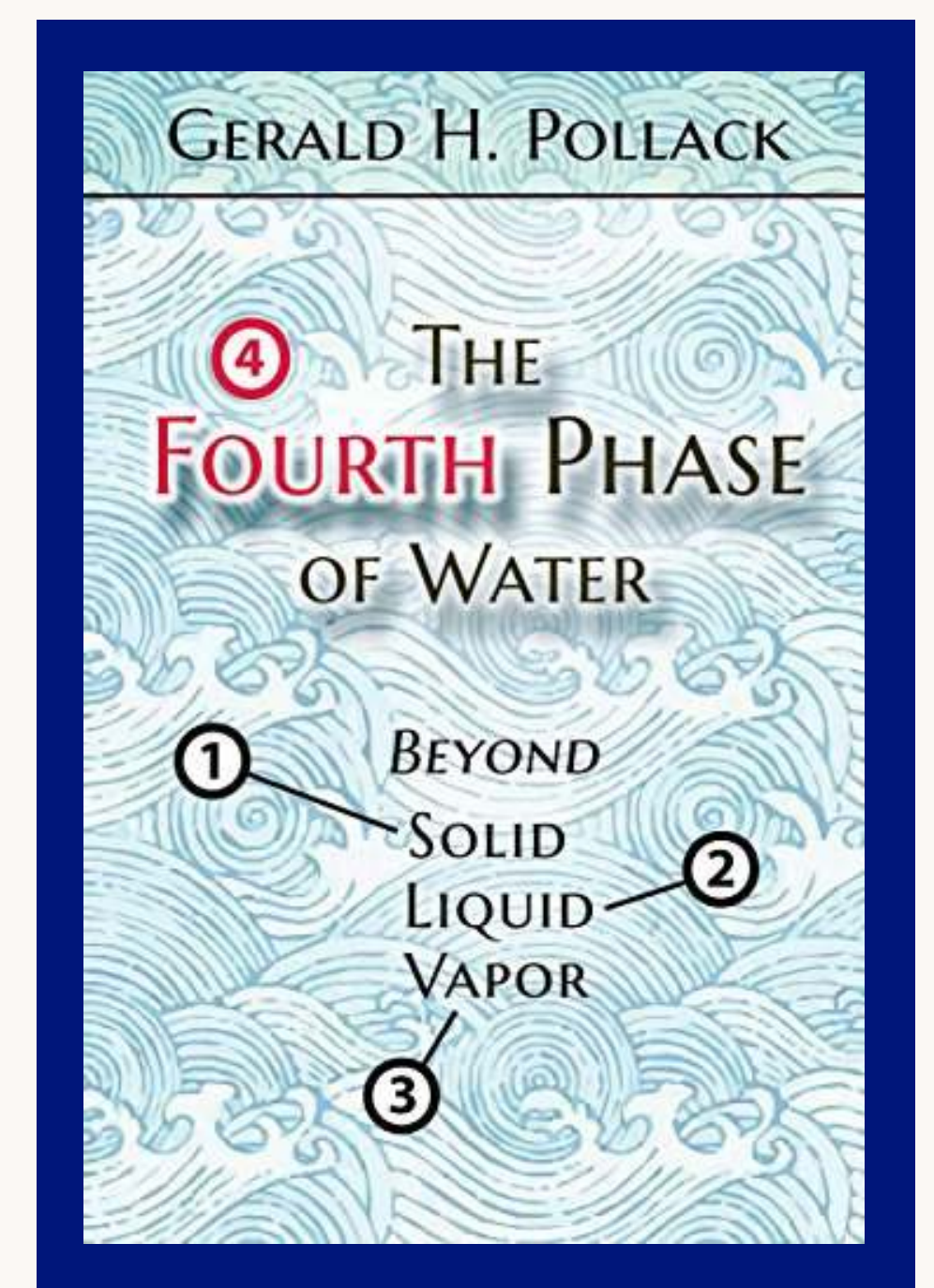
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# UNDERSTANDING ENERGY

**Everything we do requires energy.** Every thought, movement, heartbeat, and biochemical process depends on ATP, or adenosine triphosphate, the body's energy currency. Mitochondria are the energy factories inside our cells. They produce ATP, but ATP reserves are not unlimited. As we age, or make poor lifestyle choices, mitochondrial health may decline, leading to lower energy. Most people think energy comes only from food. Food matters, but water may also play an important role.

**Dr. Gerald Pollack, water scientist and biomedical engineer, has introduced a different way of looking at water.** In his work, including *The Fourth Phase of Water*, he describes water as having a fourth phase, a semi-crystalline structure that may help cells organize and use energy. Dr. Pollack's research suggests that light energy, especially from the sun, may interact with water in and around our cells.



True energy depends on healthy mitochondria, nourishing food, proper hydration, sunlight, and the body's ability to convert these inputs into usable cellular power.



# UNDERSTANDING WATER

| Water as percentage of body weight in adults |                                |                                |                                | Body Part and Water % |     |
|----------------------------------------------|--------------------------------|--------------------------------|--------------------------------|-----------------------|-----|
| Adults                                       | Ages 12 to 18                  | Ages 19 to 50                  | Ages 51 and older              | brain and heart       | 73% |
| Male                                         | average: 59<br>range: 52%–66%  | average: 59%<br>range: 43%–73% | average: 56%<br>range: 47%–67% | lungs                 | 83% |
| Female                                       | average: 56%<br>range: 49%–63% | average: 50%<br>range: 41%–60% | average: 47%<br>range: 39%–57% | skin                  | 64% |
|                                              |                                |                                |                                | muscles and kidneys   | 79% |
|                                              |                                |                                |                                | bones                 | 31% |

<https://www.healthline.com/health/body-water-percentage#body-water-charts>

**Water is essential in every system and function of the body.** According to Healthline, our bodies are mostly water. As babies, we are 3/4th water and this volume of water decreases as we age.

## Water Helps:

- Transport nutrients
- Build new cells
- Remove waste
- Protect the brain and sensitive tissues
- Regulate body temperature
- Lubricate joints
- Cushion the spine

**Water carries some of the most important molecules of life, including proteins and DNA.**

## Water Goes Where It Is Needed Most

In *Your Body’s Many Cries for Water*, Dr. Fereydoon Batmanghelidj explains that the body prioritizes water delivery to vital areas first. In other words, water helps transport hormones, chemical messengers, and nutrients according to where the brain sees the greatest need.

## Bottom Line

Water is not just something we drink. It is a transporter, protector, cushion, temperature regulator, cellular support system, and one of the body’s most important foundations for life.



# HYDRATION IS CRITICAL

**According to Healthline**, our body naturally tries to maintain healthy water levels by excreting excess water in urine. The more fluids you drink, the more urine is produced in the kidneys. One commonly used estimate for daily water intake is:

Weight in Pounds /2 = Approximate # of ounces of water per day

For example: 200lbs/2 = Approximately 100 oz of water per day

This is a starting point, not a fixed requirement. Individual hydration needs vary with activity, climate, diet, health, sweating, and other factors.

**Dr. Fereydoon Batmanghelidj also emphasized consistent daily water intake and hydration timing. The following recommendations reflect his hydration framework:**

- Your body needs an absolute minimum of six to eight 8-ounce glasses of water per day.
- Alcohol, coffee, tea, and caffeine-containing beverages don't count as water. These beverages indeed contain water, but they also contain dehydrating agents.
- The best times to drink water are: one glass one half hour before taking food - breakfast, lunch, and dinner - and a similar amount two and a half hours after each meal. This is the very minimum amount of water your body needs. Two more glasses of water should be taken around the heaviest meal or before going to bed.
- Thirst should be satisfied at all times. With an increase in water intake, the thirst mechanism becomes more efficient. Your body might then ask you to drink more than the above minimum.
- Adjusting water intake to mealtimes prevents the blood from becoming concentrated as a result of food intake. When the blood becomes concentrated, it draws water from the cells around it.
- Dry mouth is the very last sign of dehydration. The body can suffer from dehydration even when the mouth is fairly moist.
- Urine should, ideally, be almost colorless to light yellow. If it begins to become dark yellow or even orange, in color, you are becoming dehydrated. This means that the kidneys are working hard to get rid of toxins in the body in very concentrated urine.



# BEYOND THE MAINSTREAM

## Perspectives on Water & Human Health

*Water is life's matter and matrix, mother and medium. There is no life without water."* - Albert Szent-Gyorgyi, the Father of Modern Biochemistry

*"Since my eyes were opened to water as a natural medication, I have developed and applied this technique to the point where it has alleviated and healed hundreds of traditionally incurable sicknesses and chronic pains. I have seen water completely reverse conditions such as: asthma; angina; hypertension; migraine headaches; arthritis pain; back pain; colitis pain and chronic constipation; heartburn and hiatal hernia; depression; chronic fatigue syndrome; high cholesterol; morning sickness; overweight problems - even heart problems thought to need bypass surgery. All these disease conditions have responded simply and permanently to water."* - Fereydoon Batmanghelidj, M.D.

*"Water's centrality for health is nothing new, but it has been progressively forgotten. With the various sciences laying emphasis [on] molecular, atomic, and even sub-atomic approaches, we have lost sight of what happens when the pieces come together to form the larger entity. The whole may indeed exceed the sum of its parts. 99% of those parts are water molecules. To think that 99% of our molecules merely bathe the "more important" molecules of life ignores centuries of evidence to the contrary. Water plays a central role in all features of life."* - Gerald H. Pollack, PhD

*Water is life's matter and matrix, mother and medium. There is no life without water."* - Albert Szent-Gyorgyi, the Father of Modern Biochemistry

*"Pure water is the world's first and foremost medicine."* Slovakian Proverb





# THE BUSINESS OF SYMPTOM MANAGEMENT

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## **Managing disease is profitable.**

Natural remedies, hydration, food, sunlight, movement, and lifestyle changes are difficult to patent, which means they are often dismissed or overlooked in favor of more profitable interventions.

## **Are we treating the cause, or simply managing the symptoms?**

Many people now replace water with coffee, tea, alcohol, soda, juice, and processed drinks. But these cannot fully replace the body's need for clean water. Over time, this can contribute to chronic, low-level dehydration.

## **Dehydration Can Mimic or Worsen Symptoms**

With advancing age, the water content in the body's cells decreases. If chronic dehydration is not recognized, the symptoms it causes can mimic diseases. When the body's urgent signals for water are misunderstood, they are often misinterpreted as abnormal and treated with medications.

Dr. Fereydoon Batmanghelidj took this idea much further. In his work, he proposed that **some persistent symptoms and unexplained pain may represent signals of inadequate hydration**. He encouraged people and practitioners to consider hydration status before automatically assuming that every symptom requires a more complex explanation.

Based on his clinical observations, he reported improvements in a wide range of symptoms after increasing water intake.

## What if hydration is part of the picture?

### Dr. Batmanghelidj's Proposed “Thirst Signals”

Dr. Batmanghelidj argued that **greater attention to hydration could significantly reduce healthcare costs** and decrease unnecessary reliance on pharmaceuticals.

In Your Body's Many Cries for Water, Dr. Batmanghelidj described the following conditions and symptoms as potential **“thirst signals” associated with chronic dehydration**:

- Dyspeptic (Digestive) Pain: Colitis Pain, False Appendicitis Pain, Hiatus Hernia
- Rheumatoid Arthritis Pain: Low Back Pain, Neck Pain, Anginal Pain, Headaches
- Stress and Depression
- High Blood Pressure
- Higher Blood Cholesterol
- Excess Body Weight
- Asthma and Allergies

*“With the appearance of these signals, the body should be provided with water for the rationing systems to distribute. However, medical practitioners have been taught to silence these signals with chemical products...The various signals produced by these water distributors are indicators of regional thirst and drought of the body. At the onset, they can be relieved by an increased intake of water, yet they are improperly dealt with by the use of commercial chemical products until pathology is established and diseases are born. “*

*-Dr. Batmanghelidj*



# NOT JUST WATER, ADD MINERALS

Hydration is not only about drinking more water.

Our cells need to properly absorb and use the water we drink. Drinking too much water without enough minerals can create its own problems. *Healthline* notes that frequent urination, waking often at night to urinate, or completely colorless urine may be signs of overhydration.

## Dr. Fereydoon Batmanghelidj warned:

*“Do not overdrink, thinking you can undo the damage of many months or years of dehydration by excessive intake of water in a few days.”*

His point was simple, drink a normal amount each day and support the body with minerals.

## Why Salt Matters

Dr. Batmanghelidj emphasized the importance of salt when increasing water intake. If water intake increases but salt intake does not, the body may become salt-deficient.

## Possible Signs Include:

**Muscle Cramps • Dizziness • Feeling Faint • Weakness • Frequent Urination**

## Celtic Sea Salt

Barbara O'Neill, a natural health teacher, is one of many who emphasizes adding Celtic sea salt to support hydration. Her presentations on water and Celtic sea salt can be found on YouTube and TikTok.

## Water Hydrates, Minerals Help the Body Use that Water

Proper hydration is not just about drinking more, it is about helping water move into the cells where it is needed most.



# UNDERSTANDING CELTIC SEA SALT

Celtic sea salt provides sodium, chloride, and naturally occurring trace minerals that support fluid and electrolyte balance.

**Celtic sea salt should not be confused with regular table salt.**

Unlike standard table salt, which is more refined and primarily sodium chloride, Celtic sea salt is less processed and retains a broader natural mineral profile.

**Barbara O'Neill suggests placing a very small crystal of Celtic sea salt on the tongue before drinking water. Her starting recommendation is simple:**

- Begin with a crystal smaller than a sesame seed
- Place it on the tongue
- Drink a glass of water
- Monitor urine color and output
- Increase slowly only if the body responds well



**Dr. Fereydoon Batmanghelidj emphasized paying attention to urine output when increasing salt and water intake:**

“...you should make sure that your kidneys are producing urine. Otherwise, the body will swell up. If you sense your skin and ankles are beginning to swell, do not panic. Reduce salt intake for a few days, but increase your water intake until the swelling in the legs has disappeared.”

## Why Celtic Sea Salt Is Used in the Groundwork

- Provides sodium and chloride
- Supports normal fluid and electrolyte balance
- Provides naturally occurring trace minerals
- Helps replace sodium lost through sweat
- Works alongside potassium- and magnesium-rich whole foods





## 3<sup>rd</sup> KEY TO HYDRATION:

### **Sodium Bicarbonate** (baking soda)

Barbara O'Neill has discussed sodium bicarbonate, commonly known as baking soda, as part of her water and hydration teachings. The body naturally uses bicarbonate as part of its acid-base buffering system, and the stomach lining also relies on bicarbonate to help protect against stomach acid.

### **Why Sodium Bicarbonate Matters**

Sodium bicarbonate may help support:

- Acid-base balance
- Occasional heartburn relief
- Bicarbonate buffering
- Digestive comfort

Some natural-health practitioners also use small amounts of baking soda in water as part of broader hydration and digestive-support routines.

### **A Word of Caution**

Sodium bicarbonate should not be overused. Because it contains sodium and can affect stomach acidity, it may not be appropriate for everyone, especially those with high blood pressure, kidney issues, heart conditions, swelling, or certain medications.

**Dr. Mark Sircus, author of *Forbidden Cures*, has written about sodium bicarbonate as an alternative therapy that deserves more attention.**

His work may be useful for those interested in alternative approaches, but sodium bicarbonate should not replace appropriate medical care for serious conditions.

Water provides the fluid. Minerals support electrolyte balance. Bicarbonate supports the body's buffering system. Within the Groundwork framework, sodium bicarbonate is used to support acid-base balance and digestive comfort when used carefully and appropriately.

# WATER: Tap, Bottle, Filtered & Glass

**Tap Water** - Environmental Working Group, or EWG, provides a Tap Water Database that allows you to search local drinking water contaminants by ZIP code. This is a helpful starting point for understanding what may be in your local water supply.

<https://www.ewg.org/tapwater/>

**Water Filtration**, since both tap and bottled water can contain unwanted contaminants, a quality water filter may be one of the best long-term options. EWG's Water Filter Guide can help you compare filter options and verify the effectiveness of your current system.

<https://www.ewg.org/tapwater/water-filter-guide.php>

**Glass Over Plastic**, food-grade glass bottles are a cleaner choice than plastic. Borosilicate glass is a strong option because it is durable, reusable, and does not leach plastic-related chemicals into your water. A helpful guide to glass water bottles can be found here:

<https://www.waterbottlenerd.com/the-7-best-glass-water-bottles-for-a-healthy-chemical-free-hydration-option/>

**Bottled Water** is not always cleaner or safer. Since 2009, EWG has raised concerns about the bottled water industry's lack of transparency, including unclear labeling around water source, filtration methods, contaminant testing, and product quality. EWG has also reported finding multiple contaminants in popular bottled water brands.

Start by knowing what is in your water.

Then choose a quality filter and store your water in glass whenever possible. Clean water matters, and the container matters too.





# FLUORIDE IN OUR WATER

There has been a long-standing debate over fluoridated drinking water (as well as in many products commonly used). Do your research! Learn more here:



## Moms Against Fluoridation

*It's A Matter of Choice*

### 4 Facts You Need To Know

- 1) We now know drinking fluoride effects the endocrine system and the thyroid. (National Research Council, 2006)
- 2) We now know that nearly half of our young people have mottled tooth enamel (white blotches). This is a sign of systemic toxicity. Get the facts.
- 3) We now know fluoride can harm the brain of the developing fetus.
- 4) Fluoride is not FDA approved because it has never been vetted for safety and efficacy.

- 💧 **MYTH:** Fluoridated water has no negative effects or side effects and is safe to ingest in large amounts.
- 💧 **FACT:** Drinking fluoridation chemicals can lead to a host of adverse health effects, from arthritis to hypothyroidism, to ADHD, and neurological and digestive side effects. No long-term rigorous safety clinical trials were ever conducted.
- 💧 **MYTH:** Fluoride is safe to ingest for pregnant women, babies and children.
- 💧 **FACT:** Drinking fluoridation chemicals is especially concerning for pregnant women, babies and children. Science has learned that the placenta is not protective.
- 💧 **MYTH:** Drinking fluoridated chemicals is scientifically supported by U.S. government agencies.
- 💧 **FACT:** The FDA classifies sodium fluoride as an **UNAPPROVED prescription drug** that is "...not generally recognized as safe and effective." No government agency takes responsibility for water fluoridation programs but all "endorse" it.

"Fluoride seems to fit in with lead, mercury, and other poisons that cause chemical brain drain. The effect of each toxicant may seem small, but the combined damage on a population scale can be serious, especially because the brain power of the next generation is crucial to all of us."

—Dr. Philippe Grandjean, Adjunct Professor of Environmental Health, Harvard School of Public Health (HSPH)



### 50 REASONS TO OPPOSE FLUORIDATION

Written by  
**PAUL CONNETT, PH.D.**  
Fluoride Action Network

OTHER CONTRIBUTORS:  
James Beck, MD, PhD  
Michael Connert, JD  
Hardy Limeback, DDS, PhD  
David McRae  
Spedding Micklem, D.Phil

"The evidence that fluoridation is more harmful than beneficial is now overwhelming."  
Dr. Hardy Limeback  
Former President of the Canadian Association for Dental Research.

"Fluoridation goes against all principles of pharmacology. It's obsolete."  
Dr. Arvid Carlsson  
Nobel Laureate in Medicine/Physiology.

"In summary, we hold that fluoridation is an unreasonable risk."  
U.S. Environmental Protection Agency's Headquarters Union of Scientists and Professionals (2001)

UPDATED AUGUST, 2012

*"Fluoride seems to fit in with lead, mercury, and other poisons that cause chemical brain drain."*

Philippe Grandjean, MD, PhD, Harvard study co-author, Danish National Board of Health consultant, co-editor of Environmental Health, author of over 500 scientific papers





# DEEPER DIVE: Structured Water

Dr. Gerald Pollack's book, *The Fourth Phase of Water: Beyond Solid, Liquid, and Vapor*, explores the idea that water may exist in a structured state beyond the familiar solid, liquid, and vapor phases. This structured form of water is often described as more organized, gel-like, or semi-crystalline. Plants also rely on structured water within their cells to support hydration, nutrient absorption, and growth. Structured water is sometimes called:

**Structured Water • Fourth-Phase Water • EZ Water • Hexagonal Water • Living Water**

## What Is Structured Water?

Dr. Gerald Pollack's research explores the idea that water near certain surfaces can form a more ordered state, often described as exclusion-zone, or EZ, water. This has led to broader interest in how sunlight, minerals, movement, and natural environments may influence water structure. Characteristics explored by structured-water advocates often include:

- Better cellular hydration
- Improved nutrient movement
- Greater energy support
- More balanced mineral interaction
- A more organized internal environment

## Where Is Structured Water Found?

Structured water is often associated with water found in nature, especially water that has been exposed to movement, minerals, sunlight, or pressure. Natural sources may include:

- Spring water
- Tumbling streams
- Rainwater
- Water inside fruits and vegetables
- Water exposed to sunlight
- Mineral-rich natural water

## Why It Matters

Structured water may help explain why water from natural sources can feel different from stagnant or heavily processed water.

**Water is not just H<sub>2</sub>O, but a living medium that may carry structure, energy, minerals, and information.**



Water Crystal Photograph  
Credit, Dr. Masaru Emoto

**For more information on hexagonal or structured water, visit:  
<https://hexagonalwater.com/index.html>**



# STRUCTURING OUR WATER

Clean water and mineral balance come first. Some traditional and emerging approaches also explore whether sunlight and movement may influence water structure.

## *Sunlight*

Place clean, filtered water in a high-quality glass bottle and allow it to sit in direct sunlight as part of the Groundwork hydration practice. This traditional approach is often associated with Surya Jal Chikitsa in Ayurvedic culture.



## *Vortexing*

Movement is another approach commonly used in structured-water practices. Vortex machines are available, but a simple version can be created by stirring clean water vigorously with a spoon or whisk for several minutes.



The goal is not simply to drink more water...

The goal is to support water quality, mineral balance, and how effectively the body can use what you drink.



## In Summary

# DO YOUR RESEARCH!

**Water is necessary for life,  
especially pure water that has been drawn from the natural world.**

*“The cell is immortal, It is merely the fluid in which it floats that degenerates. Renew this fluid at regular intervals, give the cells what they require for nutrition, and as far as we know, the pulsation of life can go on forever.” ~Dr. Alexis Carrel, Nobel Prize Recipient in Medicine*

*“In medical school I learned that water was unimportant to the body. Water was inactive, simply along for the ride.” ~Dr. Jultan Whitaker’s October 1994 edition of Health and Healing*

*“Your local doctor has the same basis of wrong education about the human body and its calls for water. Now that you know better, tell him where he has gone wrong in your case. Ask him to supervise your condition when you begin to adjust your daily water intake and your diet. If he or she is unfamiliar with what you are talking about, share the information you have acquired on the problems associated with long-standing chronic dehydration of the body.” ~Dr. Batmanghelidj*

*“It is your responsibility to help your doctor become aware of the paradigm shift. It is your responsibility to help change the healthcare system to work for you and not the commercial and political aims of its administrators.” ~Dr. Batmanghelidj*



**Bottom Line: Be your own advocate!! Do your homework!  
Start Slow! Track how you feel! Researching new scientific  
truths and increasing the level of thinking about the human  
body will empower us to become practitioners of preventive  
medicine for ourselves!**





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*Rhizomatic Gardens*

LAYER THREE



# Smart Supplementation

Why real food  
beats synthetics -  
and what to take instead.

[TryRhizo.com](http://TryRhizo.com)



**JUST THE FACTS**

# **Smart Supplementation**

**Real Food**  
**OVER SYNTHETICS**



While supplementation may have a place in specific situations, this section focuses on five commonly overused synthetic supplements that deserve caution.

## **CHOOSE WHOLE FOODS OVER SYNTHETIC...**

- **IRON Supplements**
- **VITAMIN D3 Supplements**
- **CALCIUM Supplements**
- **ZINC Supplements**
- **VITAMIN C Supplements**

**Instead, focus on organic, nutrient-rich whole foods that provide vitamins and minerals in their natural form, with the cofactors the body recognizes and uses.**

**That's all there is to it. Enjoy the benefits**



- Synthetic supplements isolate nutrients.
- Whole foods deliver nutrients in context.
- Eat real food, support your energy, and let the body work with what nature already designed.



# What’s Inside

|                                                       |            |
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| Supplements Were Never Meant to Replace Real Food     | Page 53    |
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# THE CASE AGAINST SYNTHETICS

**In recent years, the use of synthetic and isolated-nutrient supplements has surged**, with many people turning to pills and powders to improve their health.

**For this guide, “synthetic” refers to nutrients or compounds manufactured or highly processed into isolated forms rather than consumed within their natural whole-food matrix.**

**The main concern is whether isolated nutrients are always necessary, appropriately dosed, and supported by strong long-term evidence.**

Common concerns include:

- Synthetic or isolated nutrient forms
- High-dose exposure
- Nutrient imbalances
- Questionable ingredient quality
- Hidden fillers and additives
- Inconsistent product quality
- Limited long-term data for some products
- False confidence that pills can replace real food

Many people are told they are “low” or “deficient” and immediately ask “what pill should I take?”

**The better question is:  
What whole foods naturally contain what my body needs?**





# LACK OF RIGOROUS SCIENTIFIC SUPPORT

One reason some people question synthetic and isolated-nutrient supplements is that the **evidence is not equally strong across all products**. Some nutrients, including vitamin D and calcium, have been studied extensively, while others have more limited, mixed, or product-specific evidence.

Multivitamins, herbal extracts, probiotics, and other supplements can vary widely in formulation, dose, quality, and study results. Some show benefit in specific situations, while **others show little or no meaningful effect**.

## The Regulation Problem

**Dietary supplements are regulated differently** from pharmaceuticals and generally do not require the same pre-market clinical testing before being sold.

Because of this, product quality, dosing, purity, and marketing claims can vary considerably between brands. For evidence-based decisions, the better approach is not to avoid every supplement, but to **evaluate each one** based on:

Actual need • Quality of evidence • Dose • Form • Purity and testing • Potential interactions • Whether food can meet the need first

**Not every supplement is necessary, and not every supplement is ineffective.**

The key is to evaluate each product individually instead of assuming that more supplementation automatically means better health.





# Supplements Were Never Meant to Replace Real Food

**One thing is certain: A nutrient-dense, well-balanced food plan cannot be replaced by supplements. Period.**

*"Supplements are meant to be supplementary, meaning they enhance benefits already provided by eating a well-rounded diet."*

*~ Dr. Jeffrey Millstein, a Penn Medicine physician who was quoted in the article  
The Truth About Supplements: 5 Things You Should Know*

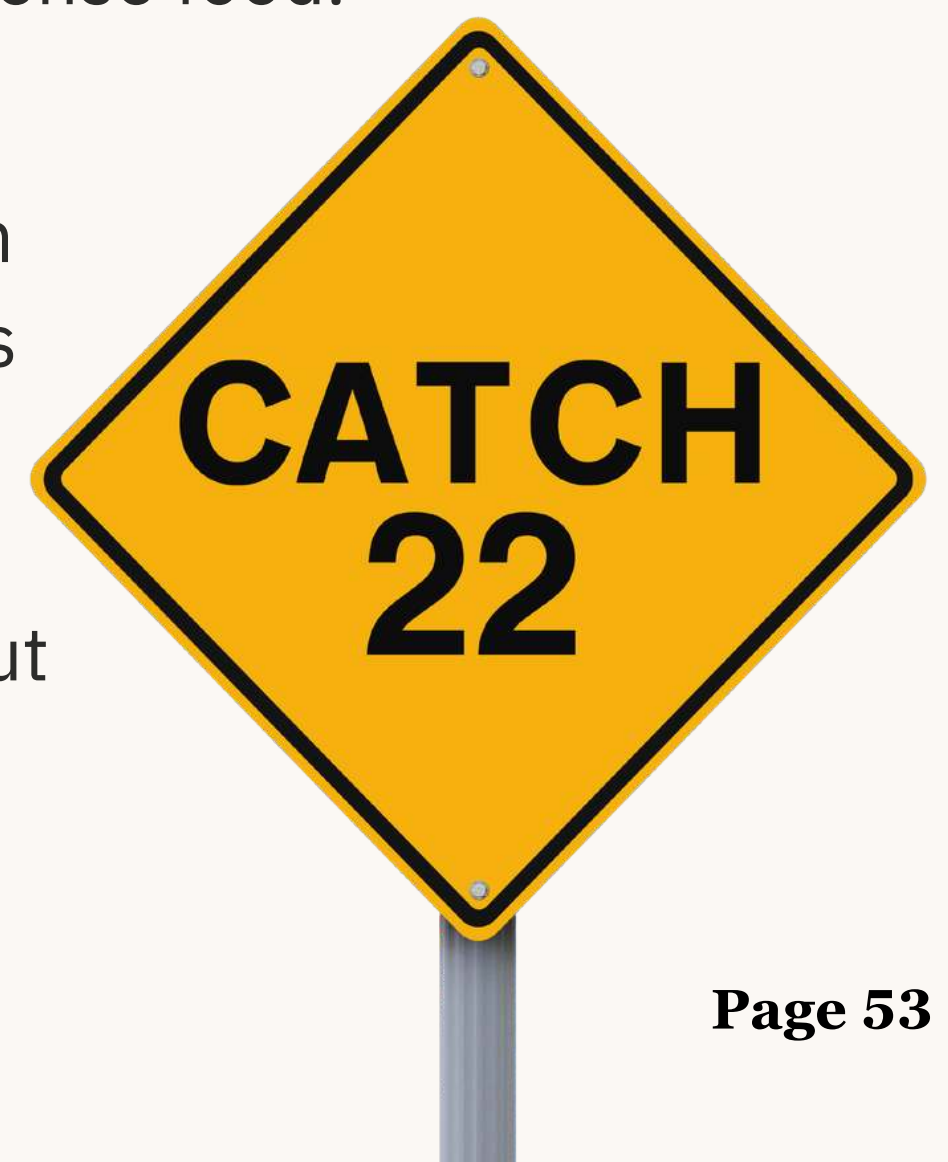
## **\$7 BILLION ANNUAL MARKETING AGENDA "HAVE A PROBLEM, TAKE A PILL"**

The “Have a Problem? Take a Pill” mindset highlights a common critique of our mainstream medical system, suggesting that the quick fix of medication (or supplementation) is often prioritized over addressing underlying issues. While medications can be essential for managing certain health conditions, this mindset tends to overlook holistic approaches, such as proper dietary guidance, lifestyle changes, and preventive care.

**The Missing Piece: Nutrition Training in Medical School.** One major issue is that most medical doctors receive very little nutrition education in medical school. Many doctors are minimally trained in food, minerals, hydration, lifestyle, soil quality, and prevention. This does not mean doctors are not valuable, however...

**The system is not built around food-first healing.** As a result, many people are offered pills before they are ever taught how to rebuild health through nutrient-dense food.

**Recognizing the Underlying Issue** Here's the Catch 22 - food sold in grocery stores is often harvested too early or grown with chemicals to maximize yields. Consequently, this food typically lacks the nutritional density of vitamins and minerals, which can lead to various physiological problems and increase the risk of long-term illness if not addressed. This situation drives many people to seek out supplements as a solution.





# HEALTH RISKS AND KNOWN SIDE EFFECTS

Supplements are often marketed as natural, safe, and harmless. But “natural” does not always mean risk-free. Many individuals may experience adverse side effects over time rather than immediately, particularly when synthetic or isolated nutrients are taken in high doses or combined with medications.

## The Quality Problem

Supplements have been linked to serious health issues (refer to page 55 for examples). Supplement quality can vary greatly from brand to brand.

Concerns include:

- Inconsistent dosing
- Poor ingredient purity
- Hidden fillers
- Contamination
- Synthetic nutrient forms
- Lack of standardization
- Unpredictable results

## The Industry Problem

Perhaps the most concerning issue is this:

*Almost anyone with enough money and basic knowledge can start a supplement company.*

## Think about that for a moment.

The product may look professional. The label may sound scientific. The marketing may feel convincing. But that does not always mean the product is safe, necessary, or effective.

## EXAMPLES: Common Supplements & Potential Side Effects

**Vitamin D:** Excessive intake can lead to high levels of calcium in the blood, resulting in nausea, weakness, and kidney damage.

**Vitamin A:** High doses can cause toxicity, leading to symptoms like dizziness, nausea, and even liver damage. Chronic toxicity can cause serious health issues, including blurred vision and bone pain.

**Calcium:** Excessive calcium supplementation can increase the risk of kidney stones and may interfere with the absorption of other minerals.

**Fish Oil (Omega-3 fatty acids):** While generally considered safe, high doses can lead to increased bleeding risk, gastrointestinal issues, and potential interactions with blood-thinning medications.

**Herbal Supplements:** Many herbal supplements, such as kava or comfrey, can have serious side effects. For instance, kava has been linked to liver damage, while comfrey can cause liver toxicity.

**Weight Loss Supplements:** Some synthetic weight loss supplements may contain stimulants or other harmful ingredients that can cause increased heart rate, high blood pressure, or even serious cardiovascular issues.



It's important to consult with a healthcare provider before starting any new supplement, especially synthetic ones, to avoid potential side effects and interactions with other medications or health conditions.



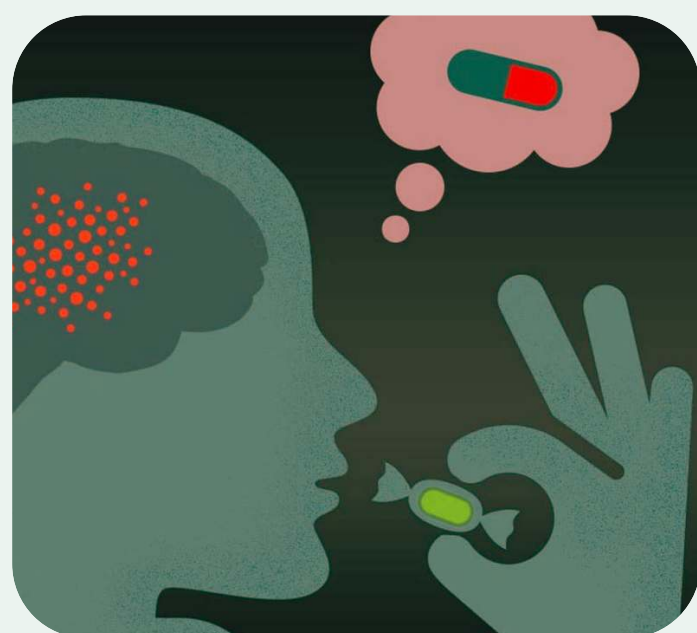
# PLACEBO EFFECT OR OVERBLOWN CLAIMS?

**Supplement use often comes with expectation.** People may feel better simply because they believe a product will help, even when the benefit may not be coming from the supplement itself. This is known as the placebo effect.

**Marketing strategies often exaggerate the benefits of supplements, leading to inflated expectations.** Claims of "miracle cures" or promises of quick results - such as rapid weight loss, increased muscle gain, or enhanced mental clarity - can mislead consumers. These claims can create unrealistic expectations and make people believe they need products they may not actually need.

**When the promise does not match the outcome, people often feel disappointed, confused, or misled.** Before taking another synthetic supplement, start with food first. If you believe you are lacking a nutrient, look up whole foods naturally rich in that nutrient and begin there.

## Top 5 Popular Supplements to Reconsider:



Iron  
Vitamin D3  
Calcium  
Zinc  
Vitamin C

**The body was designed to recognize food, not depend on synthetic shortcuts. The next pages will dive deeper into the Top 5.**

# RETHINK IRON SUPPLEMENTS...

## Here's Why!

**Excessive iron (Fe) intake**, whether from dietary sources or supplements, poses significant health risks and contributes to oxidative stress, often leading to fatigue and various health issues.

**Iron fortification** began in the 1940s as a public health initiative to combat widespread iron-deficiency anemia, particularly among women and children. This effort quickly expanded to include grains, cereals, and processed foods, but has raised concerns about the health risks associated with excess iron, especially from inorganic forms.

**The addition of iron supplements** can further exacerbate these risks. Many healthcare professionals confuse 'iron dysregulation' - where the body cannot effectively manage iron - with 'iron deficiency,' which occurs when there is insufficient iron. These conditions require distinct treatment approaches.

**A major challenge in managing iron intake** lies in the diagnostic tests used to assess the need for supplements, which are often misinterpreted. Key markers for evaluating iron status—hemoglobin, serum iron, and serum ferritin—are crucial in this assessment. Hemoglobin accounts for about 75% of the body's total iron, but is frequently overlooked, while ferritin, indicating the body's iron stores, is often misinterpreted, leading to incorrect diagnoses and unnecessary supplementation.

**Understanding these complexities is essential** for effective iron management and preventing the adverse effects of excessive iron intake. Educating both patients and healthcare providers on these diagnostic markers can facilitate informed decisions about iron supplementation and overall nutritional health.





# RETHINK IRON SUPPLEMENTS...

## Here's Why! Cont.

**Our bodies are not built to depend on iron supplements.**

Most of the iron used each day for red blood cell production is supplied through the body's iron-recycling system, supported by nutrients like copper.

**Adding iron to processed foods, like grains and cereals, can be harmful.**

Fortified foods can add iron to the diet, which may be unnecessary for people who already have adequate or elevated iron stores. Research shows that too much iron can lead to oxidative stress, which damages our cells - particularly the mitochondria - the parts of our cells that produce energy. When mitochondrial function is impaired, it can slow down our metabolism and lead to health problems like fatigue and metabolic syndrome.

**When iron accumulates beyond the body's ability to safely regulate it, it can promote oxidative stress, inflammation, and tissue damage.**

**Instead of relying on iron supplements, it's better to focus on eating whole foods that naturally provide the nutrients our bodies need to manage iron effectively. This approach helps maintain better overall health.**



# BEFORE YOU TAKE VITAMIN D3...

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**UNDERSTANDING VITAMIN D TESTING** Vitamin D is more complex than one number. The standard blood test is 25-hydroxyvitamin D [25(OH)D], which is converted into the active hormone 1,25-dihydroxyvitamin D [1,25(OH)<sub>2</sub>D]. Although 1,25(OH)<sub>2</sub>D is active, it is tightly regulated, so 25(OH)D remains the primary marker of vitamin D status.

**THE VITAMIN A CONNECTION** Vitamin D does not work alone. Its receptor, VDR, commonly partners with the retinoid X receptor, RXR, linking vitamin D with vitamin A-related signaling. This is one reason fat-soluble vitamins should be viewed as an interconnected system rather than in isolation.

**TOO MUCH VITAMIN D** A 2013 Johns Hopkins observational study found that higher 25(OH)D levels were associated with lower mortality up to about 21 ng/mL, with no additional mortality benefit observed above that level. This does not make 21 ng/mL an ideal target, but it challenges the idea that higher vitamin D levels always mean greater benefit.

**SEEK BALANCE** Vitamin D works within a larger system involving vitamin A-related signaling, magnesium, calcium regulation, diet, sunlight, and individual physiology. Start with whole foods, appropriate sunlight exposure, and proper testing. Understand your individual need before automatically reaching for high-dose D3.





# BEFORE YOU TAKE VITAMIN D3... THE REAL REASONS

**Vitamin D acts more like a hormone** than a simple vitamin, so high-dose or unnecessary D3 should be considered in the context of the larger nutrient system.

## **Vitamin D and Potassium**

Older research found that high vitamin D exposure can increase renal potassium loss. This does not mean routine D3 commonly causes potassium deficiency, but it shows vitamin D can influence mineral handling.

## **The Magnesium and Copper Connection**

Magnesium is required for vitamin D metabolism.

**Vitamin D uses magnesium → Magnesium supports energy → Copper supports cellular respiration → Mitochondria depend on mineral balance**

**Vitamin D does not work by itself. It works with other nutrients in the body, including vitamin A.**

**Vitamin D uses a receptor called VDR, and that receptor often works together with another receptor called RXR, which is connected to vitamin A-related signaling. (page 59).**





# RETHINK CALCIUM SUPPLEMENTS...

## Here's Why!

**Calcium is essential, but calcium supplements are not always the answer.**

Many people, especially women, are told to take calcium to prevent or treat osteoporosis. However, calcium carbonate supplements can interfere with the body's natural process of building bones and producing energy.

*People often think that as we age, we lose bone density due to a lack of calcium. But research shows that too much iron in the body can actually harm bone-building cells called osteoblasts. It also disrupts an important enzyme, alkaline phosphatase, which is necessary for creating new bone tissue.*

**Excess iron can damage the bone marrow**, where new blood cells are made, and lead to deficiencies in vital nutrients like vitamin A, copper, and magnesium. These nutrients are crucial for strong bones, as they help activate the enzymes needed to rebuild bone.

**Without enough copper and magnesium**, bones can lose calcium, which might then be deposited in soft tissues, including arteries. This can contribute to both osteoporosis and hardened arteries, known as atherosclerosis.



**For a balanced approach to bone health**, it's important to focus on a diet rich in these nutrients rather than relying solely on supplements. Foods high in calcium, copper, and magnesium, along with proper iron management, can support overall bone health.



# RETHINK CALCIUM SUPPLEMENTS...

## ————— Here's Why!

Cont.

### Calcium Needs Magnesium

Calcium and magnesium work together in maintaining healthy bones. **Magnesium supports enzymes involved in bone formation and mineralization and also plays an important role in vitamin D and calcium regulation.**

Many calcium supplements provide considerably more calcium than magnesium. Rather than focusing on a universal calcium-to-magnesium ratio, the more important goal is to ensure **adequate intake of both minerals based on individual needs.**

**Calcium is widely available in food, while magnesium intake is often lower than recommended. A food-first approach can provide both minerals alongside other nutrients involved in bone health.**

**Research on calcium supplements and cardiovascular risk is mixed, with some studies raising concerns about high supplemental calcium intake. This is another reason to avoid assuming that more calcium is always better.**

*Strong bones depend on more than calcium alone. Focus on a nutrient-dense diet that provides calcium, magnesium, vitamin D, vitamin K, protein, and other nutrients involved in healthy bone metabolism.*





## ZINC: DOSE & COPPER MATTER

**Zinc is essential.** It supports immune function, antioxidant defenses, gene regulation, and many enzymes throughout the body. Zinc deficiency can impair immunity, while appropriate zinc intake can help restore normal zinc-dependent functions. But more is not always better.

High supplemental zinc increases metallothionein in intestinal cells. Metallothionein binds copper strongly, which can trap copper inside those cells and reduce how much reaches the bloodstream. This is a well-established reason prolonged high-dose zinc can contribute to copper deficiency.

**Low available copper may affect:**

**Cellular energy • Iron regulation • Oxygen transport • Metabolism • Fatigue**

### Copper, Iron, and Energy

Copper-dependent proteins help the body mobilize and transport iron. Copper is also required for mitochondrial enzymes involved in cellular energy production.

When copper becomes too low, normal iron handling and energy metabolism can be disrupted.

### BOTTOM LINE

**Zinc is necessary, but balance matters. High-dose zinc can interfere with copper absorption, especially when used for extended periods.**

**Prioritize food sources that naturally provide zinc and copper, including meat, seafood, nuts, seeds, legumes, and whole grains.**





## ZINC, THE MORE YOU KNOW!

High-dose zinc can increase metallothionein in intestinal cells, which binds copper and reduces copper absorption.

**More zinc → More metallothionein → Less copper absorbed**

Duce and colleagues found that zinc can also affect iron-export pathways in the brain, showing how closely zinc, copper, and iron regulation are connected.

*Orthomolecular researchers including Carl C. Pfeiffer and William Walsh explored relationships among zinc, vitamin B6, copper, and pyrrole compounds. Their work emphasized the importance of mineral balance, although this framework remains debated.*

Zinc and copper need to work together for our bodies to function properly. When we take zinc supplements, they can disrupt the balance of copper, which is crucial for energy production and overall health.

### BOTTOM LINE

**Zinc is essential, but balance matters. High-dose zinc can disrupt copper status. Food first. Supplement with purpose.**





# HIGH-DOSE VITAMIN C: WHAT TO KNOW.

Manufactured ascorbic acid is the form of vitamin C commonly used in supplements. Although it is chemically vitamin C, it is an isolated compound and does not provide the broader nutrient matrix found naturally in whole foods.

High supplemental doses of ascorbic acid may also influence copper metabolism and ceruloplasmin activity. Ceruloplasmin is a copper-containing protein involved in iron regulation, antioxidant defense, and normal cellular function.

*A 1983 human study found that young men taking 1,500 mg of ascorbic acid daily for 64 days experienced a significant reduction in ceruloplasmin activity. Serum copper also trended lower, although values remained within normal physiological ranges.*

Whole-food sources provide vitamin C alongside naturally occurring flavonoids, polyphenols, minerals, and other plant compounds that are not present in isolated ascorbic acid supplements.

**Vitamin C is essential, but more is not always better. Prioritize whole-food sources, and consider high-dose isolated ascorbic acid in the context of copper balance, overall diet, and individual need.**



## IN CONCLUSION...

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**The supplement industry continues to grow, but more people are questioning whether these products are truly necessary, safe, or effective.**

For those seeking evidence-based, natural approaches to health, supplementation may seem unnecessary or even counterproductive. The decision to use or avoid supplements is a personal one, but it's essential to stay informed and weigh the risks and benefits carefully.

**Bottom Line:  
Do your research.  
Question the marketing.  
Understand the risks and benefits.**

Ultimately, achieving lasting health and wellness often comes down to cultivating good lifestyle habits and making mindful dietary choices rather than relying on supplements as a crutch.





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