

What You Need to Know About Deuterium: Fatigue, Cancer, Metabolic Issues



Have you heard of deuterium depletion yet? Deuterium depletion is an incredible biohack for health and wellness.

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I've written this article for people who have never heard of deuterium or deuterium depletion, but also to help combat misinformation. First, we're going to take a look at *why* deuterium is a health concern at all. Then I will explain exactly what deuterium is, the basic science of deuterium, and how and why deuterium negatively affects your body. Finally, I'm going to introduce you to deuterium depletion as a health and wellness biohacking protocol, and point you to further reading and other resources.

How We Know Deuterium is a Real Concern

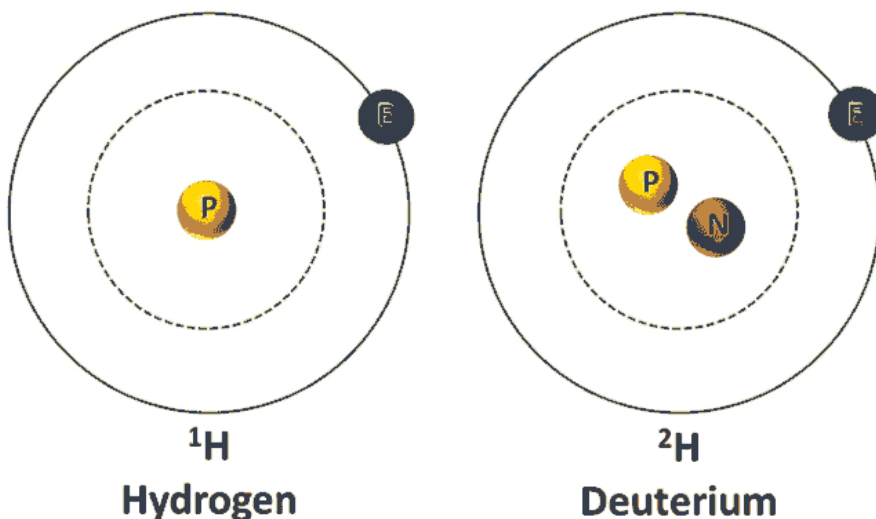
Deuterium exists in your body naturally. It is involved in growth, energy storage, and metabolism. The big concern about deuterium is not its existence or presence, but rather its accumulation. Too much deuterium it is a bad thing because it alters a lot of processes in your body. Cancer and metabolic diseases are on the rise in the "developed" world. Deuterium accumulation is a prime suspect behind these and other modern "diseases of civilization."

When you have high deuterium levels, it causes unhealthy growth like obesity and [cancer proliferation](#). Excessive deuterium changes three-dimensional structures in your body, creating misshapen proteins and lipids that don't function properly. Too much deuterium in your body also causes problems in mitochondria, the "powerhouses of the cell." If you can't get enough energy to your cells, you will experience fatigue and related issues.

Pioneering studies have shown that lowering your deuterium levels can [increase survival time](#) in [multiple types of cancer](#), [slow or reverse tumor development](#), and even [improve mood and mental health](#). By understanding deuterium we can better understand why studies of the [ketogenic diet](#) have shown [positive outcomes](#) for [diabetes](#), cancer, [epilepsy and neurological disorders](#), [obesity](#), and [more](#), and also why [fasting](#) is a useful practice for [health](#) and longevity.

The Science Behind Deuterium

Hydrogen Isotopes



Deuterium was first discovered in 1931 by Harold C. Urey and his associates. Another name for deuterium is "[heavy hydrogen](#)."

Deuterium has an extra neutron, and double the atomic weight compared to regular hydrogen. Normal or "light" hydrogen has one proton and one electron.

Deuterium Occurs Naturally

Regular hydrogen and heavy hydrogen [both occur naturally on the surface of our planet](#). The current concentration of deuterium in water is approximately [155 parts per million \(ppm\)](#).

While 155 ppm sounds like a low concentration, it is more than enough to make a difference in chemical reactions. [Anywhere hydrogen goes in a chemical formula, deuterium can also go as a substitute](#). Water molecules with deuterium instead of normal hydrogen are known as deuterium oxide, "D₂O," or "heavy water."

The boiling point and freezing point of heavy water differ from regular water.

Because of the water cycle, heavy water is more concentrated at low elevations and near the ocean. Higher elevations and glacial regions have less heavy water.

Deuterium is Increasing Everywhere

Our planet has been in a thaw period since the last ice age ended around 11,700 years ago. The changing climate and melting ice have increased surface deuterium levels during that time. In the past, naturally occurring deuterium levels on Earth were probably **at least 30% lower than at present**. Early humans adapted to conditions with much lower deuterium.

Why and How Deuterium Affects Your Body

Here's why your body's deuterium levels are probably too high (above 130 ppm):

- Deuterium levels in the water we drink and breathe have been rising for about the past 11,700 years
- **Eating carbohydrates and processed foods elevates deuterium** in our bodies
- When we get insufficient sleep, sunlight, cold exposure, or exercise, or breathe improperly, we accumulate deuterium

There are at least four key ways deuterium can negatively affect the body:

- Creating unhealthy growth
- Altering three-dimensional structures
- Slowing down chemical reactions (the kinetic isotope effect)
- Damaging mitochondria and breaking ATP nanomotors

Deuterium and Growth

Plants, children, and young animals use deuterium for **healthy natural growth**. But the issue that should concern you is how deuterium can create unhealthy growth. In adulthood, having high levels of deuterium also fosters an environment of growth in your body. Growth "outward" is obesity, and growth in the wrong places in the body is cancerous growth.

Three-Dimensional Structures and Deuterium

When you accumulate a lot of deuterium in your body, your cells will begin to use deuterium in place of regular hydrogen. Remember, deuterium can easily go anywhere normal hydrogen goes, in a chemical formula or reaction. Unfortunately, that's how deuterium alters the 3D shape and the function of molecules in the body.

Here are just a few examples of 3D biomolecules that won't function correctly when deuterated:

- Cholesterol
- Hormones
- Neurotransmitters
- Cellular receptors

Yes, all of those molecules play critical roles in the body. That's another reason why deuterium accumulation factors into a lot of severe disease states that seem unrelated, but in fact have a root cause in common.

The Kinetic Isotope Effect

Your body uses plain hydrogen (one proton, one electron) in many different chemical reactions. When your body substitutes deuterium in place of hydrogen, these reactions are slowed down because of the kinetic isotope effect (KIE). Due to the KIE, many normal reactions involving carbon and hydrogen will be slowed down by 6–10 times in the body when your deuterium levels are high.

Here are examples of what can happen:

- Enzymatic reactions are slowed down
- Neurotransmitter release and reuptake are slowed down
- Cellular division and repair are slowed down
- Liver metabolism is slowed down

Proper timing at the molecular level is critical to your health. Slowing down reactions is a recipe for disaster. The kinetic isotope effect also causes [quantum tunneling](#), putting deuterium in more places it shouldn't be.

Mitochondrial Health and Deuterium

Energy production is impacted by deuterium, too. Our bodies contain trillions of mitochondria. To produce energy and enable your cells to function correctly, tiny motors inside your mitochondria must spin at 6000–9000 rpm.

The [ATP synthase nanomotors](#) use electrons to attract protons (hydrogen ions) then create adenosine triphosphate (ATP, an energy storage molecule), carbon dioxide, and metabolic water. When deuterium enters the mitochondria in place of hydrogen, the [heavy hydrogen can literally break your nanomotors](#). Broken nanomotors means less energy production and big trouble.

Deuterium Depletion and Health

Deuterium depletion means actively lowering your deuterium levels by making changes to diet, lifestyle, and the type of water you drink.

There are several ways to lower deuterium for better health and wellness:

- Fasting and dry fasting lower deuterium
- Ketogenic diet, seasonal ketogenic diet, and low-carb high-fat diets lower deuterium
- Quality sleep in darkness lowers deuterium
- Sunlight, cold exposure, breathwork, and exercise help lower deuterium
- Drinking deuterium-depleted water (DDW) lowers deuterium

Deuterium Testing is Essential

Before you deplete, I *strongly* recommend you test your deuterium levels, especially if you are ill. The Centers for Deuterium Depletion offer a test called the [D-TERMINATOR test](#). This mail-order test involves a breath sample, and a saliva or urine sample. For optimum health you want your body's deuterium levels testing under 130 ppm. If you can't afford to test you can still attempt to lower your deuterium levels, though. You may already be doing some things for your health that deplete deuterium!

Deuterium Depletion: Wellness vs. Therapy

Here's why you may want to deplete deuterium for wellness:

- For better cognition
- To improve energy levels
- To enhance athletic performance and recovery
- To increase your metabolic rate
- To prevent disease

Healthy people typically only need to focus on depleting their deuterium for several months. Then it becomes easier to maintain low levels. If you are currently fighting disease, deuterium depletion therapy is [extraordinarily safe](#) and [works in conjunction with conventional standards of care](#).

It isn't a new experimental drug with scary side-effects — it's merely a way of removing something unhealthy from your body. There are several different ways to deplete deuterium. For best results, you need to implement more than one method.

Fasting, Dry Fasting, Keto, and LCHF Deplete Deuterium

You're probably already familiar with fasting and all the associated health benefits. You may not know that fasting works in part because of deuterium depletion. When you aren't consuming food, your body switches to fat for fuel.

No food means no deuterium coming from carbohydrates, and fat burning means deuterium depletion.

The reason fat burning depletes deuterium is because for every kilogram of fat we burn, our body creates 1.1 kg of metabolic water (using hydrogen from the fat, plus oxygen). Metabolic water is created inside our cells and is naturally deuterium-depleted.

Dry fasting is also a highly effective way to deplete deuterium, but it isn't appropriate for beginners. A dry fast is a fast with no food, water, or liquids. When you dry fast, your body produces metabolic water for hydration. If you dry fast without enough experience, or for too long, you will get dehydrated.

The ketogenic diet or a low-carb high-fat diet is an easy and safe way to deplete deuterium without necessarily fasting. As you reduce your carbohydrate consumption and adapt to using fat as fuel, your deuterium levels will decrease.

Sleep, Sunlight, Cold, Oxygen, and Exercise Deplete Deuterium

Sleeping deeply in a dark room helps you deplete deuterium. If you don't sleep well, you probably have high deuterium levels because you are not depleting enough deuterium at night.

Sunlight also helps our bodies deplete deuterium. The more sun exposure you receive, the easier you can deplete deuterium. That's one reason why **sunlight reduces all-cause mortality**, including **time-adjusted deaths by cancer**, even **melanoma**.

That's also why you may want to adopt a **seasonal eating pattern and eat locally**. Plant photosynthesis in times and places where UV is high tends to create more deuterium in food (carbohydrates), but our bodies can also eliminate it more easily when we get a lot of sunlight. If you eat out of schedule with the seasons, **like consuming bananas in Massachusetts in January**, you will increase your body's deuterium levels.

Cold exposure is another great way to deplete deuterium, especially if you are getting less sun. Cold thermogenesis increases mitochondrial activity through the **loosely coupled pathway**, **activates brown adipose tissue**, and **liberates fat stores**.

Exercise helps deplete deuterium because it increases your metabolic rate, fat burning, and respiration.

Breathing properly — oxygenating tissues — is necessary to deplete deuterium because the aerobic pathways require a lot of oxygen to work.

To enhance deuterium depletion: improve your sleep, get exposure to sunlight and cold, exercise regularly, and do breathwork. These practices probably aren't enough to lower high deuterium levels (over 130 ppm) all by themselves, but they will improve your results. If you have low deuterium levels (under 130 ppm), you'll be able to stay that way by improving depletion mechanisms.

Deuterium-Depleted Water or DDW

Deuterium depleted water (DDW) is a **powerful tool for deuterium depletion**.

You can deplete deuterium without using DDW, but it is useful in the following circumstances:

- If you need to get your deuterium levels lower ASAP
- If you continue eating foods that are higher in deuterium (processed foods and carbohydrates)
- If your body is unable to deplete deuterium on its own due to illness

Technically any water with under 155 ppm deuterium is depleted, but for **real impact**, you want therapeutic DDW — **125 ppm or less**. **Reverse osmosis** purification produces water that is somewhat lower in deuterium. Early adopters of deuterium depletion have shared that **Aquafina** tests at 139.5 ppm deuterium, for example. That's not therapeutic DDW, but it is a lot better than 155 ppm.

Therapeutic DDW is a special type of water manufactured through a process called **fractional distillation**.

I would advise skipping at-home methods of creating DDW as they appear to only decrease the ppm by 1–2. That's not enough to make a difference. There are two credible therapeutic DDW brands available in the United States: **Preventa** and **Qlarivia**. Preventa is available in various ppm, while **Qlarivia is sold in bulk at 25 ppm**.

For deuterium depletion, drink 1–1.5 liters or more of DDW per day and limit or avoid other liquids.

For **wellness**, your DDW consumption should stay between approximately **85–125 ppm**.

You can dilute Qlarivia with Aquafina as follows:

- 8 parts Aquafina + 1 part Qlarivia = 126.77 ppm DDW
- 4 parts Aquafina + 1 part Qlarivia = 116.6 ppm DDW
- 3 parts Aquafina + 1 part Qlarivia = 110.88 ppm DDW
- 2 parts Aquafina + 1 part Qlarivia = 101.33 ppm DDW
- 1 part Aquafina + 1 part Qlarivia = 82.25 ppm DDW

Some healthy people online are using 25 ppm DDW as a biohack for wellness. **That is a bad idea because they could get their levels lower using less drastic measures. Save the 25 ppm for worst case scenarios.**

Again: **don't go below ~85 ppm DDW unless you are terminally ill** or can't achieve acceptable levels using other means.

Buy a **consultation** with DDCenters if you are using deuterium depletion as an adjunctive treatment for illness.

Further Reading and Listening

Neurosurgeon **Dr. Jack Kruse** has been talking about deuterium for a long time. I recommend reviewing his body of work to get a deeper understanding of quantum biology in general, including the role of deuterium in health. You can also search out his podcast appearances, social media posts, YouTube videos, and consider joining his membership site.

Luke Storey **aired two** epic **episodes** on deuterium depletion on his podcast, The Lifestylist. In over five hours of recorded audio, Luke and his guests go deep into deuterium depletion. The interviews even cover topics like the relationship between health supplements and deuterium.

Dr. Laszlo Boros, Dr. Que Collins, and Dr. Anne Cooper are pioneers in the field of deuterium depletion therapy. No one in the English speaking world is doing more than they are to explore deuterium and health.

Their website **ddcenters.com** has free resources for learning more about deuterium and deuterium depletion, as well as deuterium testing and free and paid **consultations**. They also sell Preventa DDW.

MitoHQ, run by business maven Jason Bawden-Smith out of Australia, is the newest arrival in the world of deuterium depletion and quantum health. Keep an eye on the Mito team. Full disclosure: this year, I am collaborating with MitoHQ and Mito Health on some articles.