WEEK 40, 2022

THE EPOCH TIMES

MIND & BODY

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Lifestyle offers a fundamental cure to the most common diseases—and offers beneficial side effects.

FINDING THE BALANCE

Curing Common Diseases Without Drugs and Surgery

Patients may expect drugs and surgery, but lifestyle is the fundamental cause and cure for many diseases

MARTHA ROSENBERG

In this series we explore ways medical science, and modern medicine and lifestyles have taken us to an unhealthy extreme—and what alternatives and solutions may exist.

It's no secret that mainstream medicine in the United States is driven by money, though fewer know it's the most expensive medical system in the world despite some of the highest per capita government funding.

Nor is it a secret that many, perhaps most, Americans are overweight, not exercising, and not in good health. So it comes as no surprise that expensive surgeries, procedures, and pills are often suggested to patients for medical problems related to unfitness, when simple lifestyle changes could work just as well—and usually better.

Obesity, poor food choices, smoking, alcohol consumption, and lack of exercise contribute to everything from cardiovascular disease and clogged arteries to diabetes, chronic pain, and depression—yet patients are seldom counseled about lifestyle changes to correct their medical conditions. And while insurance can help supply them with drugs or surgery, getting a personal trainer or nutritionist is another matter entirely.

Avoidable Heart Conditions

Heart disease is the leading cause of death in the United States, even though 90 percent of it is preventable through lifestyle, according to the Cleveland Clinic. Coronary bypass operations, which began in 1968, and stents, the use of which began in the mid-1980s, have become immensely popular—even a "rite of passage" for those considered at risk of a heart attack.

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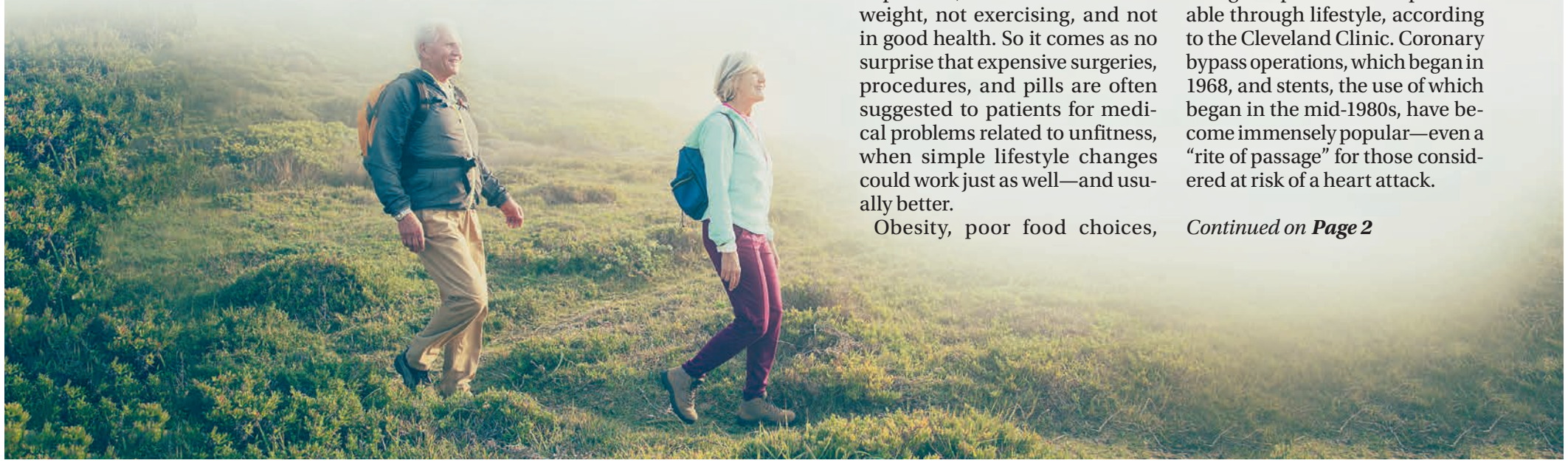

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COVID-19

Study Reveals COVID's Neuropsychiatric Effects

While COVID can shrink the brain, cause long-lasting neuropsychiatric issues, there are ways to support brain health

DR. YUHONG DONG & MERCURA WANG

In this article, we examine the longest and largest study on COVID-19 neurological sequelae and the fundamental cause of COVID-19 injury to our nervous system. Targeting the root cause, we may potentially reverse the situation and potentially live longer.

The medical journal Lancet Psychiatry recently published a large-scale study of the neuropsychiatric sequelae of the COVID-19 infection.

A sequelae is a pathological condition resulting from a disease, or a secondary consequence or result of that disease.

This study is an analysis of retrospective cohort studies by seven scientists from Cambridge University and Oxford University in the United Kingdom, led by professor Paul Harrison, a psychiatrist at Oxford.

The studies spanned four continents (with data collected from the United States, Australia, the UK, Spain, Bulgaria, India, Malaysia, and Taiwan) and 62 medical institutions. The studies were conducted over a period of two years and three months, from January 2020 to April 2022.

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Millions of people are facing mental and emotional problems long after COVID has come and gone.

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Even attending a one-hour dance class twice a week may yield benefits. In one study that compared tango to waltz/foxtrot, both dances led to significant improvements in balance, locomotion, and motor control.

MADE TO MOVE

7 Evidence-Based Activities for Parkinson's Disease

These research-backed therapies offer several health benefits, especially for Parkinson's patients

Simple and enjoyable physical activities such as bicycling, dancing, and tai chi can lead to significant improvements in physical and mental symptoms of Parkinson's disease and sometimes even slow the progression of the disease.

Parkinson's disease is the second-most prevalent neurodegenerative disorder after Alzheimer's, but it's growing quickly.

"In recent years, PD [Parkinson's disease] has undergone the fastest growth in prevalence and disability among neurological disorders, and it has become one of the leading causes of disability worldwide," notes a research article published in Frontiers in Public Health in 2021.

More than 6 million people are affected worldwide—with some estimates putting it at more than 10 million. Parkinson's disease prevalence increased by 21.7 percent from 1990 to 2016, significantly reducing individuals' quality of life while adding a burden to health systems—one that conventional medical systems weren't prepared for.

Already, 1 percent to 2 percent of adults aged 65 and older suffer from Parkinson's, while rates are also increasing in younger adults. Over a five-year period, Parkinson's prevalence increased by more than 50 percent among 30- to 64-year-olds, signaling an urgent need for support.

With no known cures or methods of prevention, those diagnosed with Parkinson's are treated on a case-by-case basis, with treatments directed at symptom relief. There are, however, many natural approaches that may help to improve outcomes and quality of life, including specific physical and mind-body activities.

1. YOGA MEDITATION

Yoga meditation, or YoMed, combines the mind-body elements of yoga's physical postures with the relaxation and breathing techniques used in meditation. Together, yoga meditation may lead to benefits above and beyond yoga or meditation performed separately. This appears true for Parkinson's disease, which involves problems with moving or walking, tremors, and trouble with balance and falls.

In one study, people with mild to moderate Parkinson's disease engaged in YoMed or a proprioceptive training program twice weekly for 12 weeks. Better outcomes were found among the YoMed group, including significant improvements in dynamic posturography, a method for quantifying balance. Yoga also helps with the mental effects of Parkinson's and has been found to lead to long-lasting decreases in depression among people with Parkinson's.

2. BICYCLING

Even when struggling with gait disturbances and freezing of gait, many people with Parkinson's disease can ride a bicycle—and doing so may lead to physical and mental benefits.

In a systematic review and meta-analysis, bicycling was found to be particularly beneficial for the motor performance of people with Parkinson's disease, including improving features of gait. It also led to an improved overall quality of life.

While exercise-based training such as bicycling may not necessarily stop disease progression, researchers noted that it can be considered disease-modifying—capable of delaying the pathological disease process. Past animal studies have shown that physical activity has neuroprotective effects, including enhancing neuroplasticity and attenuating age-related cognitive decline.

3. DANCING

Dancing, particularly tango, has been extensively studied for Parkinson's disease. Research suggests it improves the quality of life, self-esteem, and coping—along with enhancing gait and balance.

Tango is unique in that it not only involves the physical activity of dance, but combines it with working with a partner—adding a social component. The music involved while dancing adds another layer of potential neurological benefit.

Even attending a one-hour dance class twice a week may yield benefits. In one study that compared tango to waltz/foxtrot, both dances led to significant improvements in balance, locomotion, and motor control.

4. QIGONG

Qigong, a mind-body exercise that incorporates meditation, deep breathing, and body movements, may be useful for improving the non-motor symptoms of Parkinson's disease, which include sleep disorders, anxiety, depression, and fatigue. People with Parkinson's who engaged in qigong for 12 weeks experienced significant improvements in sleep quality and overall non-motor symptoms in one study.

Motor symptoms were also improved by qigong in a meta-analysis of 325 people with Parkinson's disease. Those who engaged in qigong had improvements in walking ability, balance, and other motor symptoms, with researchers calling it a "beneficial alternative therapy."

5. TAI CHI

Tai chi's gentle, flowing movements are known for improving strength, balance, and postural alignment while boosting concentration and relaxation. When used by people with Parkinson's disease, tai chi can lead to improvements in motor function, balance, and unusually slow movements known as bradykinesia.

In another trial, in which people with Parkinson's participated in tai chi for 80 minutes a day, three times a week, for two months, tai chi led to greater improvements in walking speed, functional reach, and the time to "up-and-go," compared to routine exercise, and the incidence of falls was also decreased.

At the end of the follow-up period, 9 percent of the tai chi group was also able to stop treatment with the Parkinson's drug levodopa, while those who remained on it were able to decrease their dose. The researchers concluded that not only could tai chi slow down the progression of Parkinson's symptoms, but it may also delay the need to introduce levodopa.

Research shows that synchronized drumming leads to increased activity in the caudate nucleus area of the brain.

Parkinson's disease is the second-most prevalent neurodegenerative disorder after Alzheimer's.

Yoga has been shown to help with the mental effects of Parkinson's and contribute to a long-lasting decrease in depression symptoms.

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6. AI CHI

Ai chi is a gentle exercise similar to tai chi but is performed in the water. When performed twice weekly for 11 weeks, it led to reductions in Parkinson's symptoms, including bradykinesia and rigidity.

Ai chi also led to improvements in balance, mobility, and quality of life in people with Parkinson's and, according to researchers with Ahi Evran University in Turkey, the exercise "should be considered as a rehabilitation option for treatment of patients with mild or moderate Parkinson's disease."

7. DRUMMING

Drumming has been a mainstay of healing rituals in cultures worldwide. Modern research shows that synchronized drumming leads to increased activity in the caudate nucleus, an area of the brain that's dysfunctional in Parkinson's disease, as well as improved prosocial behavior and decreases in depression, anxiety, and inattention.

After six weeks of twice-weekly West African drum circle classes, quality of life significantly improved in people with Parkinson's disease, suggesting drumming may make a worthy addition to standard interventions such as physical therapy.

More than 250 additional substances, from coenzyme Q10 to bee venom, have also been researched for Parkinson's disease, with an estimated 40 percent of people with Parkinson's disease reporting the use of at least one form of complementary therapy. Because the use of complementary therapies is so common, researchers urged conventional medical doctors to work together with holistic health care providers to achieve the best outcomes for patients.

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More than
6
million people are affected by Parkinson's disease worldwide.

Parkinson's disease prevalence increased by
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Coenzyme Q10 is among the many therapies and treatments that have been researched for Parkinson's disease.

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Yet, 2020 research published in the New England Journal of Medicine found neither procedure is better at reducing the risk for heart attack and death in stable ischemic heart disease than lifestyle changes, along with medication. The lifestyle treatments included patient counseling about diet and exercise, and medications for blood pressure, cholesterol, and angina.

"Taken together, the quality of life and clinical results suggest that there is no need for invasive procedures in patients without symptoms," said Dr. David Maron, the study's lead author. "For those with angina, our results show it is just as safe to begin treating with medication and lifestyle change, and then if symptoms persist, discuss invasive treatment options."

Dr. Joel Kahn, a cardiologist, said the study "should lead to a major reduction in the number of stents and bypass surgeries performed," adding that the results confirm the lifestyle medicine work of Dr. Dean Ornish.

Dr. Monica Aggarwal, director of the Integrative and Preventive Cardiology Program at the University of Florida and a fellow of the American College of Cardiology, also lauded the research.

"Many of us [cardiologists] who practice more conservatively believe that lifestyle modification and medications are better than [surgical] intervention, and this trial gave us validated information," she said.

The Trouble With Diabetes Drugs

More than 37 million Americans have diabetes, according to the Centers for Disease Control and Prevention—1 in 10 people. And yet, it's 90 percent avoidable with adequate lifestyle changes, according to research published in the Archives of Internal Medicine in 2009.

Newer diabetes drugs have made a huge splash on Wall Street because of the legions of diabetics and how long the drugs are taken—but some now appear to be risky.

For example, Steglatro (ertugliflozin) "may increase your risk of lower leg amputation, especially if you have had a prior amputation, a foot ulcer, heart disease, circulation problems, or nerve damage," according to Drugs.com. Glyxambi (empagliflozin and linagliptin) has been linked to heart failure, Fournier's gangrene, bullous pemphigoid, diabetic ketoacidosis, and pancreas inflammation. Sulfonylureas, one of the oldest classes of diabetes drugs, are now linked to heart attacks and heart issues, the National Center for Health Research says.

The good news is that lifestyle changes can enable people with Type 2 diabetes to avoid medications.

The 2009 study found that getting enough exercise, eating a healthy diet, not smoking, drinking little alcohol, and maintaining a healthy body weight could prevent diabetes, and doing the opposite could lead to diabetes.

"Overall, 9 of 10 new cases of diabetes appeared to be attributable to these 5 lifestyle factors," it concluded.

When it comes to blood sugar, exercise can be particularly important.

"When you exercise, your muscles use sugar (glucose) for energy. Regular physical activity also helps your body use insulin more efficiently," the Mayo Clinic notes.

When Drugs Undermine Better Habits

Statins and proton pump inhibitors changed thinking about diet and exercise for the worse.

Cholesterol-lowering statins such as Lipitor, the most successful drug class in pharmaceutical history, promised people they could ignore diet and exercise concerns, and their body would "forgive" the bacon cheeseburger.

According to the Mayo Clinic, statins can lower cholesterol in people with high cholesterol, reducing their chances of having a stroke or heart attack, but the drugs aren't risk-free and can interfere with the body's necessary supply of cholesterol. These drugs can cause muscle pain, liver damage, Type 2 diabetes, increased blood sugar, and cognitive problems such as memory loss and confusion—side effects that were underreported during statins' heyday.

Getting exercise, eating a healthy diet, not smoking, drinking little alcohol, and maintaining a healthy body weight could prevent diabetes.

Researchers writing in Drug Safety—Case Reports in 2016 noted correlations between statin use and violent ideation, irritability, depression, and even suicide. The problems resolved when the statins were discontinued but reoccurred when the drugs were started again—strengthening the hypothesis that the mood problems were linked to the drug.

Proton pump inhibitors (PPIs), which are medications that reduce stomach acid production and largely replaced antacids and the related H2-receptor antagonists, were developed in the 1980s and also became instant bestsellers. Like so many medications advertised on television, PPIs are overprescribed and overused, according to medical sources, and can have significant side effects, especially after long-term use. Effects can be intestinal, such as nausea and diarrhea; mood-related, such as anxiety; or muscular, such as serious rhabdomyolysis.

Long-term use of PPIs can interfere with mineral absorption and could cause bone fractures, a warning that the Food and Drug Administration has added to the drugs' labels. The medications can also put users at risk of the intestinal condition Clostridioides difficile (commonly called "C. diff."), spontaneous bacterial peritonitis, bacterial or fungal overgrowth, cardiovascular problems, and possibly pneumonia.

From a lifestyle perspective, PPIs, like statins, "forgive" unhealthy eating by removing the unpleasant consequences and may discourage patients from pursuing better nutritional choices that wouldn't necessitate the drugs.

Worse, the drugs can make a patient dependent on them, notes an article in The Pharmaceutical Journal by Daniel Marks, a clinical pharmacologist at University College London Hospital.

"Once a patient has taken a PPI for longer than a few weeks, acid hypersecretion can occur on discontinuation. This causes rebound symptoms, and frequently establishes a vicious cycle of drug reinitiation and long-term continuation," Marks writes.

Chronic Pain Can Be Addressed Without Drugs

As many as 20 percent of U.S. adults suffer from chronic pain conditions such as low back and neck pain, pinched nerves, spinal disorders, and more. They are often targeted with dangerous and addictive opioids and expensive procedures such as spinal fusion, disc surgery, and nerve ablation.

While it's understandable that pain patients want quick relief, many chronic pain treatments have poor track records. For example, failed back surgery syndrome, defined as persistent or recurrent symptoms in someone who has had spinal surgery, is relatively common.

According to Dr. Sridhar Vasudevan, a pain specialist, opioids may do more harm than good.

"I have personally treated patients who were terrified to titrate off opioids because they were afraid of returning pain, only to find they were in less pain once off the opioids," he writes in "Multidisciplinary Management of Chronic Pain," a book that offers nonsurgical, non-opioid treatments for chronic pain.

Vasudevan also cites the paradox that chronic pain patients fear and resist exercise, but exercise would usually improve their pain through strengthening their muscles, reducing their mental stress, and releasing endorphins.

He urges patients to "consider and explore the possibility that relief can be found by learning to relate to their pain, rather than running from it."

Depression Responds to Lifestyle Change

As The Epoch Times recently reported, the "chemical imbalance" theory of depression has been irrevocably discredited, and there's no permanent, organic brain condition that necessitates the lifelong antidepressant usage that has been so heavily marketed.

"One interesting aspect in the studies we examined was how strong an effect adverse life events played in depression, suggesting low mood is a response to people's lives and cannot be boiled down to a simple chemical equation." said Dr. Mark Horowitz, co-author of the Molecular Psychiatry article that discredited the chemical imbalance theory.

Since depression develops from real-life events and not a chemical imbalance, it can also be treated by addressing such events, say non-medication-oriented health sources. Topping the list of lifestyle changes that depressed people can contemplate are better sleep and more exercise, followed by engaging with life and people (not isolating), pursuing pleasant experiences, taking on new responsibilities and new activities, helping others, and, of course, talk therapy.

As The Epoch Times has reported, antidepressant use has skyrocketed, and 1 in 6 Americans now take such psychiatric drugs. These drugs aren't harmless. In addition to "discontinuation" effects—including anxiety, pain, palpitations, and insomnia when patients try to quit—SSRI antidepressants are also linked to bone loss, fractures, and the same C. diff. risks seen with PPIs. The drugs are also linked to weight gain, sexual dysfunction, and emotional numbness.

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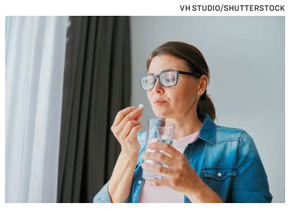

Drugs are the default treatment for conditions ranging from chronic pain to depression but safer treatments exist.

Some Doctors and Patients Disagree

Certainly, many patients lack the willpower to change their lifestyle, and doctors know this because of how frequently they encounter noncompliance with their medical advice. Moreover, many patients may prefer the quick fix of a surgery or a procedure, rather than try to summon up discipline they might not even have.

For example, not everyone prefers exercising every day or seeing a physical therapist frequently, to the prospect of spine-related surgery.

Still, health care professionals can encourage patients and affirm their lifestyle changes, and support groups can also help patients with motivation.

Certainly, we live in a time when high-tech and expensive medical procedures can seem to work miracles. But ignoring less expensive lifestyle changes that can be equally effective doesn't help patients—it only enriches the medical establishment.

And perhaps even more critically, if people don't gain the insight and motivation to improve their lifestyle, many of these chronic diseases will appear at earlier and earlier ages, as we're seeing with obesity, depression, heart disease, cancer, diabetes, and more.

In other words, if our lifestyle is degenerating, it's going to affect future generations even more severely.

Martha Rosenberg is a nationally recognized reporter and author whose work has been cited by the Mayo Clinic Proceedings, Public Library of Science Biology, and National Geographic. Rosenberg's FDA expose, "Born with a Junk Food Deficiency," established her as a prominent investigative journalist. She has lectured widely at universities throughout the United States and resides in Chicago.

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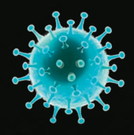
COVID-19

Study Reveals COVID's Neuropsychiatric Effects

COVID can shrink the brain and cause long-lasting neuropsychiatric issues—but there are ways to support brain health

No previous study of COVID-19 cases has achieved such a large and well-matched concurrent control group.



Anxiety, brain fog, and dementia are increasingly prevalent in people suffering from long COVID.

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From the electronic medical records of approximately 89 million patients, the researchers identified more than 1.28 million cases of COVID-19 infection and matched them to a cohort of non-COVID patients who were suffering from other respiratory infections. That is, they matched exactly to the experimental group in terms of age, gender, occupation, risk factors for diseases, and vaccination status, during the same time period. There were more than 1.2 million patients each in the experimental and control groups.

No previous study of COVID-19 cases has achieved such a large and well-matched concurrent control group.

The analysis evaluated two-year time-varying hazard ratios for 14 neurological and psychiatric sequelae of COVID-19 infection. These disorders included:

- Brain fog, dementia, Parkinson's disease, and insomnia
- Anxiety disorders, mood disorders, and psychosis
- Epilepsy, encephalitis, intracranial hemorrhage, and ischemic stroke
- Guillain-Barré syndrome, neurological root and plexus disorders, and neuromuscular joint and muscle disorders

Of the 1,284,437 patients with the COVID-19 infection, their mean age was 42.5 years, ranging from children to the elderly.

Higher Mortality Risk in COVID Group Than Control Group

This analysis has provided us with very valuable information.

First, at six months after diagnosis, most of the 14 neurological and psychiatric disorders still had a significantly higher risk of morbidity among COVID patients than non-COVID patients.

Second, even at the end of the two-year follow-up period, the risk of cognitive deficits (i.e., brain fog), dementia, psychosis, Guillain-Barré syndrome, and epilepsy remained elevated, with far-reaching health consequences.

Let's use dementia, a typical symptom, as an example to explain the situation.

By comparing the cumulative incidence of dementia in the COVID-infected group and the group of patients with other respiratory infections (i.e., the control group), it was found that at six months of diagnosis, the risk of dementia was significantly higher in the first group than in the control group.

This risk remained higher in the first group than that of the control group at the end of the two-year follow-up period.

Another typical symptom is brain fog, whose hazard ratio remained higher than that of the control group at six months after diagnosis, as well as after two years.

The risk of common mental abnormalities such as mood disorders and anxiety disorders recovered after one to two months.

The risk of psychosis, neuromuscular disorders, dementia, and brain fog is significantly higher in adults older than 65 years. The proportion of elderly patients who developed any of these neurological and psychiatric sequelae over two years was as high as approximately 32 percent, and the proportion of these elderly patients who developed these neuropsycho sequelae who died during the two-year follow-up was as high as 34.1 percent.

Of particular note, those older adults diagnosed with dementia, brain fog, or epilepsy had mortality rates of 71 percent, 61 percent, and 83 percent, respectively, over the two-year follow-up period.

It's obvious that the above information is a sign of serious illness. In other words, the occurrence of dementia and brain fog in the follow-up of these elderly patients portends a rather unfavorable prognosis for them.

Severity of Sequelae Varies Among Different Variants

In addition, the researchers had also analyzed information of different COVID-19 variants, including Alpha, Delta, and Omicron during the long follow-up period. This type of unique data has rarely been provided by other studies.

The Delta variant has significantly increased risks for majorities of both the incidence of neurological or psychological sequelae such as ischemic stroke, epilepsy, brain fog, insomnia, and anxiety, and patient mortality.

The Alpha variant has caused no change in either the incidence or mortality.

The incidence of several neuropsychiatric sequelae was significantly increased after Omicron variant infection, such as dementia, mood disorders, and neurogenic disorders. However, there was no increase in patient mortality.

Why Neuropsychiatric Impairments Persist After Infection

From the above information, we can see that even two years after COVID-19 infection, the incidence of some neuropsychiatric sequelae was still persistently higher than that of the control group.

This is an indication that the SARS-CoV-2 virus is indeed different from other viruses as, on the neuropsychiatric aspect, once a patient is injured, it isn't easy for him or her to recover.

Research in this area is proliferating and has been a topic of interest to researchers for a long time.

According to two articles published separately this year, in the journals Science in January and Nature in July, the SARS-CoV-2 virus can directly or indirectly cause nerve cell damage. There are at least seven mechanisms through which the virus may affect the body's nerve cells long after acute infection.

1. It directly causes apoptosis of neuronal progenitor cells.

2. It attacks the blood vessels of the brain, causing ischemia and hypoxia. Endothelial diseases can lead to damage or fragility of the cerebral blood vessels, thrombotic events, or leaks.

3. It causes autoimmune attacks. Autoimmunity not only attacks the virus, but may also attack the components of one's own neurons, including the outer protective layer of nerves (myelin), which has a similar function as the insulation skin of electrical wires. Once myelin is destroyed, our nerves won't be able to transmit neuronal signals as fast as we could. That's one of the reasons that we think, respond, and move more slowly.

4. It causes the nervous system inflammation that induces injuries to our normal nerve cells.

5. It causes mitochondrial damage to nerve cells. The mitochondria are a cell's power plant. Once the mitochondria in nerve cells are damaged, the nerves lose their power supply and won't be able to function properly.

6. It impairs nerve cell lipid metabolism. Lipids account for 60 percent of the brain. Lipid disorders directly link to the dysfunction of the neuronal system.

7. It inhibits autophagic activity. Autophagy is a mechanism by which nerve cells renew themselves and remove waste. The autophagy process is like our internal waste recycling system. The inhibitory effects on autophagic process will cause more garbage to accumulate without an efficient garbage processing system, ultimately speeding up the aging process of brain cells.

It's evident that the impact of COVID-19 infection on the brain and nerves is multifaceted and comprehensive. This damage is far-reaching and long-lasting, and very difficult to recover from.

One phenomenon is worth noting. That is, the study mentioned that the incidence of mood disorders and anxiety in COVID-19 patients was transiently increased, suggesting that these symptoms might be caused by some transient triggers. The causes of such mood disorders and anxiety are different from the mechanism of normal neuron cell death and loss due to brain fog or dementia.

Mild COVID-19 Infections Can Also Alter the Brain

A study published in Nature in March found that even a mild COVID-19 infection can alter the brain.

In this study, Oxford University neuroscientists used UK Biobank's bio-specimens from nearly 800 participants, half of whom were COVID-infected and the other half were uninfected. Ninety-six percent of them weren't hospitalized, suggesting that most were mildly infected.

These subjects underwent magnetic resonance imaging of the brain before and after infection.

The researchers analyzed the structural changes in their brains and found three major ones.

First, COVID-infected participants had a significant reduction in brain volume, commonly known as brain atrophy, suggesting a possible increase in the incidence of dementia. Compared to the control group, the average extra loss of brain volume was 0.2 percent to 2 percent in the COVID-infected patients.

Second, the areas of the brain with reduced volume are mainly the orbitofrontal cortex (associated with decision-making processes), and the gray matter thickness of the parahippocampal gyrus (associated with cognition, emotion, and memory). Here, volume was lost to a greater extent, suggesting an increased risk of brain fog.

Third, the damage to areas associated with the olfactory cortex was also significant.

More importantly, this suggests that the SARS-CoV-2 virus's damage to the brain isn't related to the severity of the disease. Structural and functional abnormalities of the brain can occur even in mild cases.

As aforementioned, Omicron infection doesn't have a high rate of severe disease or mortality, which means that there are a lot of mild cases. However, it can also cause long COVID, the sequelae of the COVID-19 infection, including dementia and neurological diseases, as mentioned in the earlier study.

Of course, studies have reported that the rate of long COVID due to Omicron infection is half of that by Delta. However, because of the large increase of the infected population, the number of long COVID patients due to Omicron isn't necessarily less than that of the previous variants.

Brain Has Ability to Regenerate: Long COVID Can Be Reversed

There's at least one cause for every disease, and it may be complicated. If the underlying causes can be found and resolved, then the disease may be cured or even reversed.

What's behind the neurological damage caused by the COVID-19 infection?

I have been following the neurological and psychological topic of COVID-19 for a long time, and I have read a lot of research. I also have previous research experience in neurology. According to my understanding and conclusion, although the SARS-CoV-2 virus strikes the human nervous system on seven aspects, the most severe cause lies in the virus's lethal strike of the neural stem cells.

In other words, the attack of the SARS-CoV-2 virus on neural stem cells leads to the destruction of the mechanism of neural cell regeneration in the brain, which is the crux of the problem.

Even if there appears to be severe damage to the brain, there are still ways to repair it. Scientists have discovered that the human brain has the ability to repair and regenerate itself.

The brain's regeneration ability was previously thought to be impossible, and this was a conclusion once written in textbooks. Since 1960, scientists have presented convincing evidence that brain nerve cells in adult animals or adult humans can regenerate.

For instance, scientists have found that the hippocampal region produces 600 to 700 new neurons per day. Of course, the brain has a total of 100 billion cells, and these 600 to 700 cells may not seem to be a lot. However, it shows that the brain is capable of regeneration, which is a key mechanism for maintaining brain plasticity and resilience.

And it's this mechanism that the SARS-CoV-2 virus attacks, and it's this regenerative power that it inhibits. So to solve the problem of neurological sequelae after the COVID-19 infection, we have to study it from the perspective of regeneration.

The main areas of nerve cell regeneration are the subventricular zone/olfactory bulb (as they are linked together), and parahippocampal gyrus.

The SARS-CoV-2 virus attacks the olfactory bulb and parahippocampal gyrus.

These two areas are like nerve cell manufacturing plants in our body and are the most important locations for nerve cell regeneration. In other words, the SARS-CoV-2 virus attacks the core of the brain—the area responsible for nerve cell regeneration. This is why the sequelae of nerve damage caused by the COVID-19 infection last so long and are so far-reaching.

So how long does the nerve cell regeneration process take?

One would certainly hope that this process is as fast as possible. In fact, nerve cell regeneration isn't slow. It takes three days for neural stem cells to generate neural progenitor cells, another two weeks to differentiate into naïve nerve cells (i.e., immature neurons), and another four weeks to develop into mature nerve cells. So the entire process usually takes at least six to seven weeks.

Ultra-Simple Aerobic Exercise for Nerve Cell Regeneration

Nowadays, nerve cell regeneration is a popular research topic. Many scientists are using methods such as neural stem cell implantation and neurotrophic factors; however, there are significant limitations in terms of applicability and effects.

I've consulted a lot of literature to find methods that are convenient, accessible, and also effective in helping the mind and body. There are, indeed, many more natural methods, and I can introduce them later when I have the opportunity.

Here, I'm presenting to you one of the simplest, cost-free, easy-to-do ways to regenerate neurons that are readily available to everyone. This method is consistent, regular, relaxing, and voluntary aerobic exercise.

It's generally known that exercise can bring more blood flow to the heart, lungs, and even the brain. However, many people don't know that regular aerobic exercise can also promote the regeneration of brain nerve cells in adults.

Let's first take a look at the data from an animal experiment.

In a study at the Salk Institute for Biological Sciences in California, the researchers divided adult mice into two groups. The experimental group had running wheels and other favorable exercise conditions in their cages, while the control group didn't. It was found that after four weeks of voluntary and relaxing exercise by the adult mice, the regeneration of their hippocampal dentate gyrus nerve cells was significantly increased.

The mice in the experimental group had regenerated approximately three to four times more nerve cells than those in the control group.

Moreover, the exercise accelerated the development of their regenerative neurons.

In 2017, some Argentinian neuroscientists published a study in Cell Reports. The experimental design was similar to that of the previous study. This study discovered that after 21 days of exercise, the newly grown neurons of the exercising mice were significantly more mature, with dendrites four times longer and more branched out than those of the sedentary (with no running exercise conditions) mice.

The neurons of sedentary mice in the graph resembled small bean sprouts, while those of exercising mice resembled well-grown bean sprouts.

According to the results of an electrophysiological function test, the granule cells of sedentary mice lacked action potentials or function. The granule cells of the exercising mice were repetitively discharging electricity, indicating that they were transmitting information and communicating with other neurons.

The development of nerve cells is only accelerated after a long period (three weeks), instead of a short period (one week) of exercise. At one week, the nerve cells haven't yet undergone so many structural and functional changes.

So, does effective exercise have to be running?

Not necessarily. Walking, daily grocery shopping, and household chores, which are related to physical activities, are all effective exercises.

How much physical activity should we undertake every day in favor of neuroregeneration? There are two studies that can give us some insights.

The first is a prospective observational cohort study in which 716 older adults without dementia were continuously observed for their daily physical activity over four years.

After four years, 71 subjects developed clinical Alzheimer's disease, which is a form of dementia, while those with high levels of total daily physical activity had about a 53 percent lower risk of Alzheimer's disease.

The design of this study was rigorous, and the analysis excluded other confounding factors that might influence the onset of dementia in old age, including age, gender, education, social and cognitive activity, as well as factors such as current level of motor function, depressive symptoms, chronic health conditions, and APOE gene allele status.

That is, these confounding factors were balanced in both groups of older adults. The study concluded that daily physical activity level was an independent predictor of the onset of dementia in the elderly.

In another study, which was more detailed, 299 adults (with a mean age of 78 years) were followed up to examine the association between gray matter volume, physical activity, and cognitive impairment.

In this study, physical activity was calculated as the number of blocks walked in a week, and gray matter volume was an index associated with brain regeneration.

Based on their amount of physical activity, the investigators divided the 299 subjects into four groups from Q1 to Q4 (Q1 group had the lowest activity, and Q4 group had the highest activity). After observing them for 13 years, it was discovered that the gray matter volume in the Q4 group was significantly larger than those of the other three groups with less amount of physical activity. This difference was statistically significant, while there was no difference in the gray matter volumes of the other three groups.

Furthermore, the Q4 group had a two-fold lower risk of cognitive impairment than the other groups after 13 years.

So, how much did the Q4 group walk each week?

They walked a cumulative total of 72 blocks per week (around six to nine miles per week).

Therefore, we can tailor the amount of workout and exercise to our own conditions.

So, reflecting on the fact that during the COVID-19 pandemic, lockdowns have been imposed across the globe, and some people couldn't go out and exercise freely, it wasn't beneficial to the neuroregeneration of their brain.

Organic Balance of Movement and Stillness

Some health signals are simple yet easily overlooked. In fact, the human body and mind are closely related.

In addition to the need for nutrients such as glucose and oxygen, the brain's self-repairing and regenerative functions are facilitated by daily soothing, relaxing, and voluntary exercise.

We have previously mentioned the benefits that sitting in meditation brings to the brain. This isn't necessarily conflicting with the exercise advice. The human body is one organic equilibrium that requires a balance of movement and stillness. If our movement and stillness can be dynamically balanced well, our brains benefit from such dynamic equilibrium quite a lot.

This is why we have always emphasized that aerobic exercise that makes you feel comfortable is the best. We can all arrange it appropriately according to our life and work schedule.

There's a saying: "Walking a hundred steps after each meal can help you live to be 99 years old."

Such exercise is not only helpful to our intestines and digestion, but also beneficial to our brain and nerve regeneration. It's easy, cost-free, and natural. It could potentially help us to prevent premature aging and the neurological/psychological sequelae of COVID.

Here, you can see again another example of how one small, healthy habit could make us healthier and even change our lives.

Dr. Yuhong Dong, a medical doctor who also holds a doctorate in infectious diseases, is the chief scientific officer and co-founder of a Swiss biotech company and former senior medical scientific expert for antiviral drug development at Novartis Pharma in Switzerland.

Mercura Wang is a health reporter for The Epoch Times. Have a tip? Email her at: mercura.w@epochtimes.nyc

Neuropsychiatric Symptoms

COVID is linked to neurological issues and neuropsychiatric symptoms like lethargy, depression, insomnia, delusions, psychosis, hallucinations, irritability, and aggression.

Fortunately the brain can regenerate new neurological connections to repair past damage. Mild exercise and a healthy diet can improve recovery.

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During the COVID-19 pandemic, lockdowns were imposed across much of the globe. Many people couldn't socialize or even exercise, which all takes a toll on brain health.

Many people don't know that regular aerobic exercise can promote the regeneration of brain nerve cells in adults.

Over

2

YEARS

Long COVID-induced neuropsychiatric risks can last over 2 years for some people.

People over

65

YEARS

old suffer a higher risk of psychosis, neuromuscular disorders, dementia, and brain fog after being infected with COVID-19.

Not only can light exercise promote more blood and oxygen flow to the heart, lungs, and brain, it can also aid in brain regeneration.

DIMABERLIN/SHUTTERSTOCK

Toxicant-induced loss of tolerance is difficult to detect as it often causes multiple symptoms in different parts of the body.

How Chemically Sensitive Are You?

There's a quiz to find out if toxic exposures are linked to your health issues

MELISSA DIANE SMITH

A new theory of a disease process caused by pesticides and other toxic chemicals may explain multisystem symptoms for which a disease cause hasn't been found.

Many in the medical community have identified widespread pesticide and other chemical exposure as a real health threat, causing serious debilitating health effects.

A questionnaire is now used as a diagnostic tool—along with an introductory brief version of the questionnaire—to help reveal whether you might unknowingly have an underlying disease process called Toxicant-Induced Loss of Tolerance, or TILT.

We're all exposed to toxic chemicals on an ongoing basis, but for some of us, these exposures become intolerable. Perhaps the exposures have accumulated to a problematic level or their bodies are suffering a condition that inhibits their ability to tolerate these chemicals. Whatever the cause, TILT is the result.

This information was presented by Dr. Claudia Miller at the Beyond Pesticides Forum: Seminar 1 on Health, which took place on Sept. 15.

Miller is a professor emeritus and member of the research faculty in the Department of Family and Community Medicine at The University of Texas Health Science Center at San Antonio. She has both treated and studied the effects of toxic chemical and pesticide exposure.

Miller is coauthor of "Chemical Exposures: Low Levels and High Stakes," which you can read for free online, courtesy of the Hoffman Toxicant-Induced Loss of Tolerance Program at the University of Texas Health San Antonio. The book explores the issue of chemical intolerance among a rising number of people.

Brief Questionnaires Can Help Identify Chemical Exposure

As humans, we're exposed to so many more new synthetic chemicals than our ancestors were 50, 100, or even 300 years ago. To get an idea if chemical exposure may be behind some symptoms and health issues you've experienced, answer these three questions from the Brief Environmental Exposure and Sensitivity Inventory (BREESI) questionnaire:

Do you feel sick when you're exposed to tobacco smoke, certain fragrances, nail polish/remover, engine exhaust, gasoline, air fresheners, pesticides, paint/thinner, fresh tar or asphalt, cleaning supplies, or new carpet or furnishings? By sick, we mean headache, difficulty thinking, difficulty breathing, weakness, dizziness, upset stomach, and so forth.

Are you unable to tolerate, or do you have adverse or allergic reactions to, any drugs or medications (such as antibiotics, anesthetics, pain relievers, X-ray contrast dye, vaccines, or birth control pills) or to an implant, prosthesis, contraceptive chemical or device or other medical, surgical, or dental material or procedure?

Are you unable to tolerate, or do you have adverse reactions to, any foods such as dairy products, wheat, corn, eggs, caffeine, alcoholic beverages, or food additives (such as MSG and food dye)?

If you answer "yes" to any of these three questions, consider taking the free online Quick Environmental Exposure and Sensitivity Inventory (QEESI) at tiltresearch.org/qeesi-online and sharing the results with your doctor.

Out of

10,000

AMERICANS

who completed the Brief Environmental Exposure and Sensitivity Inventory (BREESI),

20% reported intolerances to chemicals,

and more than

50% reported food sensitivities.

Chemical exposures come in several forms, from household cleaners to food contaminants, herbicides, and more.

NICKOLAY STANEV/SHUTTERSTOCK

QEESI is the internationally validated reference standard for assessing chemical intolerance and the TILT disease process. It has been translated and used by researchers in more than 16 countries and in more than 80 studies published in peer-reviewed journals.

In surveys of 10,000 U.S. adults who took the brief version, BREESI, 20 percent reported intolerances to chemicals, foods, and drugs, while more than half reported food intolerances.

In chemically intolerant U.S. adults, nearly half of those who have taken the longer QEESI questionnaire reported one or more initiating events. Those initiating events included exposure to mold, remodeling or construction, combustion products, medical procedures and implants, and pesticides. Treatment involves avoidance of the chemicals that trigger symptoms, as well as resolving or healing from the initiating chemical exposure event. One example is properly removing mold in the home if exposure to mold and the toxins that go with it, called mycotoxins, is the initiator.

The Basics of Toxicant-Induced Loss of Tolerance

A toxicant is a toxic substance that's produced by or is a byproduct of man-made activities. Amid this modern spread of toxicants, Miller has proposed a new theory of disease, Toxicant-Induced Loss of Tolerance (TILT), which has the following two stages of development:

- Initiation: caused by a one-time acute event; a series of exposures; or long-term, low-level exposures to toxic chemicals.
- Triggering: caused by previously tolerated chemicals, food, or drugs that can cause multi-system symptoms.

TILT can be confusing to detect because it can cause symptoms in many body systems: cardiovascular; respiratory; ear, nose, and throat; skin; connective tissue and musculoskeletal; gastrointestinal; neuropsychological; and miscellaneous syndromes, such as chronic fatigue syndrome or Gulf War syndrome. Being in a toxic environment day after day can "mask" the symptoms and hide the relationship between exposures and symptoms.

Potential initiators and triggers for TILT include:

- Pesticides.
- Cleaning agents, including ammonia, bleach, and disinfectants.
- Solvents, including paints and glues.
- Drugs and medical devices, including anesthetics, antibiotics, vaccines, implants, and chemotherapy.
- Oil and petroleum products.
- Combustion-related products, including tobacco smoke, tar and asphalt, natural gas, soldering and welding, and engine exhaust.
- Indoor Air Volatile Organic Compounds (VOCs), including new carpet, plasticizers, formaldehyde, fragrances, and mold VOCs.

SOLSKIN/GETTY IMAGES

Researchers continue to learn more about how everyday chemicals affect our health and contribute to disease.

Most people spend the majority of their day indoors, where volatile organic compound exposures are five to 10 times greater than outdoors. These very low-level indoor exposures can trigger symptoms in "TILTed" individuals, Miller said.

Chemical Intolerance, TILT Are Different Than Allergies

Chemical intolerance and TILT aren't the same as classic allergies that involve immunoglobulin E (IgE) antibodies, which most allergists are looking for. The TILT disease process involves toxicant sensitization of mast cells, our immune system's first responders to foreign chemical substances, including synthetic organic chemicals, foods and food additives, medications, and recreational drugs.

In a study published in Environmental Sciences Europe in 2021, Miller and her researcher colleagues gave the following rundown and background on mast cells (MCs):

"These sentinel cells guard the perimeters of our skin and other organs, warding off invaders and protecting our internal milieu. They serve as first responders to most bodily invasions and insults.

"Largely lying in wait, these warriors spring into action if they perceive a major threat, releasing a vast array of mediators all at once.

"Once triggered, MCs can deploy more than 1,000 distinct cell-surface mediator receptors resulting in inflammation, allergic-like phenomena, or altered tissue growth and development."

Melissa Diane Smith is a holistic nutrition counselor and journalist who has been writing about health topics for more than 25 years. She's the author of several nutrition books, including "Syndrome X," "Going Against the Grain," "Gluten Free Throughout the Year," and "Going Against GMOs."

As humans, we're exposed to so many more new synthetic chemicals than our ancestors were 50, 100, or even 300 years ago.

Exposure to volatile organic compounds (VOCs) are

5 to 10 TIMES

greater indoors than outside.

Dramatic Increases in Exposure to Chemicals

Dr. Claudia Miller said three major events have occurred in the past few centuries that have dramatically increased our exposure to toxic chemicals that have overactivated our mast cells.

1760–1820: The industrial revolution gave birth to the chemical industry, resulting in a new chemical presence in human society and the environment.

1940s-present: Research, much of it spurred by World War II, led to new synthetic organic chemicals and their rapid adoptions, including synthetic chemical pesticides, herbicides, insecticides, solvents, dyes, and fragrances. These chemicals creep ever deeper into our personal environments.

Early 1970s: The oil embargo and energy conservation efforts in the 1970s triggered a shift in building design that came with a host of problems. Homes and buildings were sealed more tightly without adequate ventilation to ensure sufficient air exchange. The result was moisture buildup and the development of "sick buildings" that became breeding grounds for toxic molds and the accumulation of contaminants given off from everything from paint to cleaning products. Indoor air pollutants have risen to levels higher than ever before as outgassing from volatile and semi-volatile organic chemicals became trapped indoors.

Only now are researchers learning that our contemporary chemical exposures may be provoking mast cells to release their inflammatory mediators, resulting in "mast cell activation syndrome" with chronic and/or recurrent multi-system symptoms.

Taking the QEESI questionnaire and sharing the results with doctors may help more people identify the previously unrecognized TILT disease process, mast cell activation syndrome or chemical intolerance, and chemical exposures that may have initiated illness, Miller said.

Stories of Toxic Chemicals Causing Terrible Effects

An important part of the questionnaire asks if other people or pets in the household have experienced health problems. Sometimes the answer to this question can provide previously missed information.

Dr. Claudia Miller

In Miller's case, in 1977, she and her husband moved to an old house, and she made what she later realized was a mistake by hiring an exterminator to spray. Within a few months, her kitten died. She now knows that kittens are especially sensitive to the organophosphate insecticides that are sprayed by exterminators—something we all should be aware of because these types of insecticides are still heavily used today.

Jane Little

Jane Little—a BBC journalist who had to drop out of her career for a couple of long spells because of chemical-related health challenges—introduced Miller at the forum. She said she got "hit hard by herbicides" and was plagued by severe neurological symptoms after walking her dog in an area that had been sprayed with two different pesticide concoctions.

PXHARRL/SHUTTERSTOCK

She eventually realized that she suffered her first extreme reaction to chemicals when a cocktail of disinfectants was used on her father's family farm in England in 2001. She believes that may be the instigating event in both her and her father's chemical intolerance.

As long as she avoids the chemicals that trigger uncomfortable symptoms, she's mostly well now. But her experience led her to research and report on chemical-induced disease, including in the deeply personal "Allergic to the 21st Century" radio documentary she did for the BBC.

INTENTIONAL LIVING

The Amazing Benefits of Doing Hard Things

Growing isn't easy, but it's one of the most empowering and rewarding things we can do

MOLLIE DONGHIA

We spend most of our days doing similar routines—waking at the same time, eating the same breakfast, doing similar tasks at work, communicating with the same people, wearing the same outfits, and watching the same TV shows. And on it goes.

When we make our routines and habits effortless, it can help us to feel healthier and less stressed, and even allow us to live longer. Habits are key to maintaining physical and mental health.

But when we become such creatures of habit, we run the risk of getting stuck in a boring rut, deprived of enjoying new or different experiences. This can even result in feelings of depression, laziness, or complacency.

An idea I try to instill in my children is that they have the ability to do hard things. This teaches them to embrace challenges with optimism, strive to keep growing, and use that growth to fuel their motivation to continue learning.

Like many lessons I teach them, I can apply this principle of growth to my own life. I've learned that comfort may sometimes lead to contentment—but it doesn't lead to growth. Doing hard things is never the easy path, but it does deliver the greatest gains.

Comfort Is Our Greatest Nemesis

Feeling comfortable is a universal human desire. This relaxed, sometimes euphoric state of being draws us in and seduces us with a settled mind. Life feels good when we're comfortable.

But this "good" feeling can become empty and unsatisfying—especially when it keeps us from working on our higher aspirations. Comfort may be our greatest nemesis when it comes to making progress on meaningful but difficult tasks and goals.

It's not surprising that trying to escape our comfort zone doesn't come easily. When something unknown, challenging, or new presents itself, we're all but hardwired to retreat. Especially in a culture that upholds convenience and comfort above all else, we're instinctively drawn toward the safety of satisfying comforts.

And that's exactly why many of us struggle to step beyond what's familiar and easy. Here are four reasons we retreat to comfort:

The fear of failure is strong.

It seems like the safest route.

Saying no to something new seems easier than saying yes.

We compare ourselves to others and think we could never live up to those standards.

But let's not let these common tendencies hinder us from taking steps toward growth and goals.

Just think what would've happened if Henry Ford hadn't kept trying to perfect the assembly line production process that transformed the automotive business. Did you know he filed for bankruptcy twice and had two motor car companies before founding Ford Motor Co. in 1903?

Or, what if Walt Disney had given up the dream of creating Disneyland after being told by a newspaper editor that he lacked imagination and had no good ideas?

And imagine if Theodor Seuss Geisel, better known as Dr. Seuss, had given up writing children's books after being rejected by 27 publishers.

Doing Hard Things Produces Growth

"You'll never know until you try" is the type of mindset I try to model for my children. Sure, we could stay in our comfortable safety net, but if we want to grow, live a full life, or have a meaningful impact on the world, we'll need to suffer a bit.

Doing hard things requires grit, perseverance, and courage. None of those traits come from living an easy life, and all of them are necessary for growth.

In the past several years as I've worked to create both a photography business and then a lifestyle blog, I've found the benefits of perseverance far exceed those of simple comfort.

And since then, I've not only been less afraid to do hard things but consciously seek them out as a means of pursuing a growth mindset.

Habits are key to maintaining physical and mental health.

5 Benefits of Growing Through the Hard Things

It opens creative possibilities. According to an article in the journal Cerebrum, when we engage our creative side, it engages the brain's hippocampus, the area where dopamine is released and the brain's pleasure center lights up. Creative pursuits require a learning curve, and that can be uncomfortable. The best musicians, artists, and writers have gone through the process of making mistakes, learning from them, and working to improve.

It teaches us a long-term growth mindset. Failure is an inevitable experience for anyone who tries new things or takes the kind of essential risks necessary to enjoy the opportunities this life can offer. When we choose to continue toward our goals instead of staying put, we learn how to use challenges and failures for growth, and we become more immune to despondency and resignation.

It shows us that a growth mindset lets us push past our weaknesses and use challenges to our advantage. When we believe we can do hard things, we have the key ingredient needed to put our brains' plasticity to use. Research has found that new experiences help the brain's neurons to form new connections. That means that our efforts will make our brains better able to handle whatever we throw at it. Experiencing this growth will inevitably help us build resilience, because we will know that trying things translates into learning and becoming better able to acquire skills and accomplish challenging tasks.

It helps us to gain knowledge of ourselves. Just as spending time with a friend allows us to know them more deeply, the same is true about ourselves when we do hard things. We can better understand our strengths and weaknesses and learn how to continue pursuing a growth mindset by pushing past our fears while also guiding ourselves toward areas of interest.

It reveals the value of criticism. Doing hard things often comes with criticism from others. When criticism arrives, we have the choice of seeing the feedback as judgment, or using it to learn. In the first case, we take it personally and see it as an attack on our abilities. This can shut the door to growth. In the second case, we use feedback as a way to grow, change our approach, or expand our curiosity about what we can learn.

I've learned that growth can't happen when I don't listen to advice or feedback from others. Accepting my own weaknesses as a way to grow has given me more confidence as I take on new opportunities to do hard things.

Doing hard things isn't comfortable, but if it's comfort you seek, you're limiting your ability to learn and grow; you're giving up on the opportunity to become a better version of yourself.

Mollie (and her husband, Mike) blog at This Evergreen Home where they share their experience with living simply, intentionally, and relationally in this modern world. You can follow along by subscribing to their twice-weekly newsletter.

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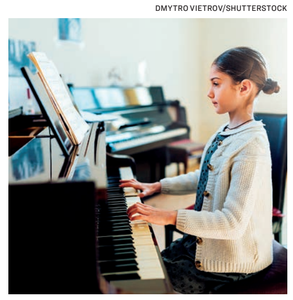

Encourage confidence and determination in children by reminding them that they can achieve much in life, even amid hardship.

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With time and perseverance, you can win the evening, the following morning, and many days ahead.

Trouble Falling Asleep?

These practices can help remedy sleep-onset insomnia

BRANDON LAGRECA

You might remember my previous article about nonrestorative sleep and waking up at 3 a.m., unable to fall back asleep. We looked at the roles stress and blood sugar dysregulation play in causing a nighttime cortisol spike that produces a hyperarousal state, making it difficult to fall back asleep.

That marks one type of disrupted sleep rhythm that culminates in nonrestorative sleep.

The other common deterrent to peaceful slumber is the inability to fall asleep, otherwise known as sleep-onset insomnia. This is a complex problem with many potential causes and several nuances, so realize that there may be one or more factors you need to address if you suffer from this type of insomnia.

The ability to rise rested is predicated upon getting sufficient sleep.

3X

Deaths increased by 3X among those prescribed common hypnotic drugs.

Cultivating Circadian Rhythm

First on that list is perhaps the most overlooked aspect of remedying sleep-onset insomnia—rhythm. Your body has to synchronize many processes and is intimately tied to the cycle of the day and even the seasons.

If you're going to have the energy you need at the peak of the day—and be ready for sleep at the end of the day—your body has to undergo shifts in the levels of different hormones, energy production, and other aspects.

This is one of the reasons that people thrive on rhythm and suffer under chaotic conditions.

Most strategies to improve sleep habits are best implemented when the body-mind is winding down, but sometimes it's important to start much earlier.

For example, the best way to reset your circadian rhythm is to get early morning sunlight. There's also a popular phrase circulating among self-improvement circles: "To win the day, win the morning." It suggests that always getting up at the same time primes the body for a successful day by front-loading self-care before other factors (kids, work, and so forth) exert their influence. Strict adherents of this philosophy refrain from turning on their cellphone until an exercise routine or meditation practice is complete. It's a no-distraction policy to set the pace for the day.

Always getting up at the same time primes the body for a successful day by front-loading self-care before other factors exert their influence.

A sleeping mask is an essential traveling companion.

Wind down before bed by taking a hot bath or reading a book to ensure you receive a good night's sleep.

Although that's a wise practice for the top performers among us, winning the morning may not be enough. Even if you get up and get early morning sunlight, you can lose that gain if your habits at night sabotage your sleep. Maybe the saying should be, "To win the morning, win the evening before." In other words, the ability to rise rested is predicated upon getting sufficient sleep, and that means getting to bed at a consistent time to clock in one's ideal seven to eight hours of sleep.

Leveraging Sleep Hygiene

Sleep habits and the conditions you create for sleep are sometimes referred to as "sleep hygiene." Sleep hygiene includes anything that helps the wind-down process while avoiding that which causes arousal. Hot baths and reading a novel around bedtime are good ideas; doom scrolling on a brightly lit cellphone screen or watching the nightly "if it bleeds, it leads" newscast are bad ideas.

So, too, must caffeine and alcohol be avoided. Caffeine is a stimulant and shouldn't be consumed after noon, and while alcohol is a depressant, it disrupts sleep quality. Many people claim these substances don't affect their sleep only to find out that strict avoidance corrects sleep-onset insomnia.

Other elements of sleep hygiene include a dark bedroom to optimize melatonin secretion from the pineal gland, a light-sensitive gland in the brain that helps regulate circadian rhythm. Bright screens replete with light in the blue spectrum suppress melatonin, to say nothing about the content on those screens that may trigger emotional responses and lead to increased arousal. Best practices include turning off all devices two hours before bed. Consider blackout curtains to eliminate outside light, or use an eye mask—an essential item when traveling.

Room temperature is also important, and most people sleep better in a cooler room. If your significant other needs to be toasty to settle down, ask if they wouldn't mind using an extra blanket.

If outside noise hampers falling asleep, a fan, white noise machine, or air purifier are indispensable. An air purifier doubles as a safeguard against particulate mold spores or pollen that can inhibit proper breathing. Airway restrictions of any type make falling asleep difficult.

The Paradox of Sleep Medications

Making adjustments based on your circadian rhythm and good sleep hygiene may seem like a lot of work, but these efforts are far superior to taking commonly prescribed sleep medications. These sedative pharmaceuticals are notorious for altering the complex biochemical and neurological processes involved in healthy sleep. These drugs can produce the proverbial "robbing Peter to pay Paul" scenario.

Hypnotic drugs modestly increase sleep duration at the expense of sleep quality and, ultimately, optimal health. The most commonly prescribed hypnotic drugs are associated with a threefold increase in death, particularly from cancer, even when taken at a frequency as low as 18 pills per year.

Benzodiazepines are problematic because they increase stage 2 non-REM sleep, decrease stage 3 and 4 non-REM deep sleep, and result in a total reduction in time spent in REM sleep. This shift in sleep microstructure can lead to deficits in concentration and working memory while contributing to weight gain. These drugs also cause dependency and have a high potential for abuse.

Taming the Mind

Even with the best-laid plans to wind down in the ideal sleep setting, the day's stresses can hinder falling asleep. Methods to counteract a busy brain are variable. You might find benefit in journaling about the events of the day, while others have success with a few minutes of meditation or deep breathing. Sleep researchers encourage counting down from 100 by threes or trying to keep one's eyes open (blinking allowed) to trick the mind into slowing down. Whatever method you choose, stick with it and have it reinforce your bedtime routine.

With time and perseverance, you can win the evening, the following morning, and many days ahead.

Brandon LaGreca, LAc, MAcOM, is a licensed acupuncturist in the state of Wisconsin. He is the author of "Cancer and EMF Radiation: How to Protect Yourself From the Silent Carcinogen of Electropollution" and "Cancer, Stress & Mindset: Focusing the Mind to Empower Healing and Resilience." He shares his thoughts at Empowered Patient Blog.

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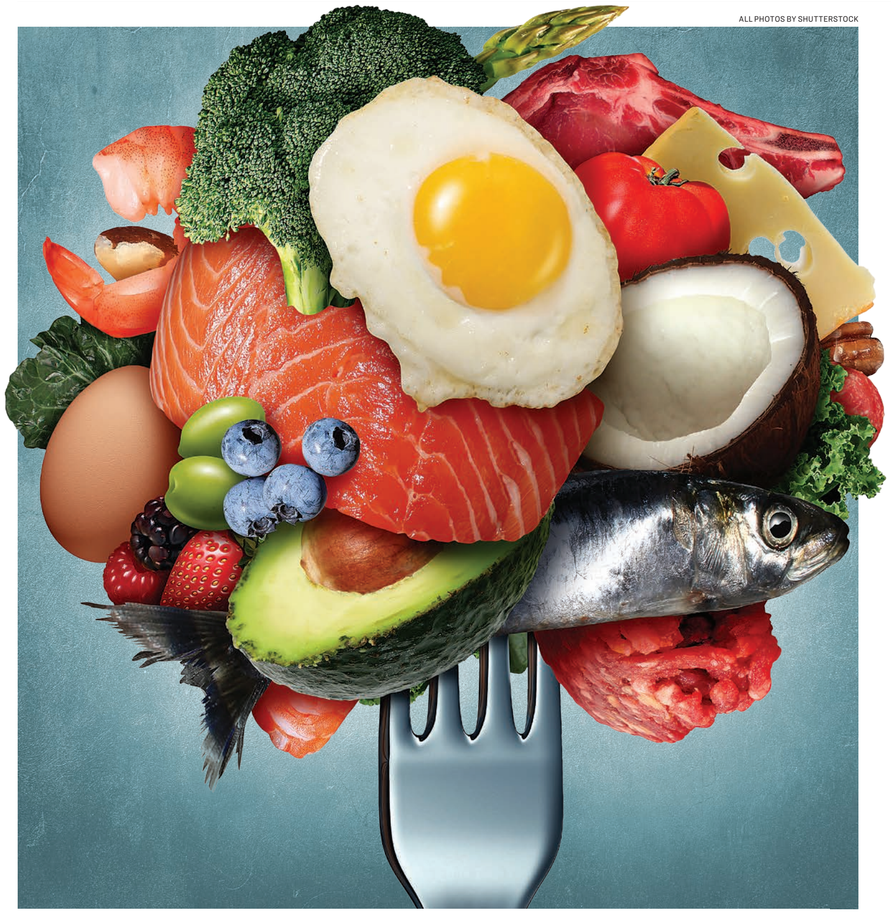

How Potassium Helps to Treat High Blood Pressure

Hypertension affects nearly half the people in this country, and many are unaware they have it

JOSEPH MERCOLA

According to the Centers for Disease Control and Prevention (CDC), nearly one-half—47 percent—of Americans have high blood pressure (hypertension).1 Hypertension carries a high cost to your health. It's a major risk factor for cardiovascular disease and stroke,2 which are in the first and fifth positions, respectively, for leading causes of death in the United States.3

Hypertension comes with a financial burden of more than $131 billion each year in direct medical costs and lost work days,

47 PERCENT

of Americans suffer from high blood pressure (hypertension).

If you eat a lot of processed foods and not many vegetables, there's a good chance your sodium-to-potassium ratio is unbalanced.

but that doesn't include a number of other health conditions worsened by hypertension, including kidney disease and cognitive decline.

Only 1 in 4 of those with hypertension have their blood pressure under control.4 Unfortunately, while blood pressure monitoring has become commonplace at dentists' and eye doctors' offices, the CDC estimates that 1 in 3 people aren't aware they have hypertension.5

There are several ways to reduce your blood pressure without drugs, which I discuss below. Among them is balancing your potassium level, as this electrolyte has a significant effect on muscle contraction and arterial wall relaxation, but most Americans barely get half of the recommended daily allowance.6

What Is High Blood Pressure?

When your physician takes your blood pressure, he uses a sphygmomanometer to measure the amount of pressure your heart exerts to push blood through your arterial system. The top number represents the highest pressure needed, and the bottom number the lowest pressure needed. These numbers are related to the elasticity and diameter of your arterial walls.

When the pressure required to circulate your blood is high, it places an abnormal amount of stress on your heart muscle and smaller arteries, and reduces the amount of oxygen delivered to the smallest blood vessels in your body. Both of these consequences account for many of the secondary effects of hypertension.

Continued on ***Page 12***

The Mental and Physical Effects of Humming

Humming has measurable physiological effects that can be healing and health-promoting

MELISSA DIANE SMITH

Making a simple, self-created sound for just five minutes might help to reduce blood pressure and stress, and keep nasal passages and sinuses healthy.

Humming requires no musical ability. It's a sound that everyone with a voice can make. It's something babies do. It's something elderly people do.

Yet, the benefits of humming go beyond just the fun of humming a favorite tune. Research suggests that humming can be an important, portable self-help tool that can be used to reduce stress, relax, perhaps improve the health of nasal and sinus passages, and more.

"Silence is the place where the sound can create the shifts and changes on a vibrational level, on a physical, emotional, mental, and spiritual level.'

Jonathan Goldman, author, "The Humming Effect: Sound Healing for Health and Happiness"

The Basics of Humming

Sit up straight, close your eyes, and take a few deep breaths, then hum from your mouth up through your nose with your lips closed. You can hum for 10 seconds and longer.

Continued on ***Page 14***

You can try humming at different pitches and take note of how each pitch feels in your body and where it most resonates.

DEAN DROBOT/SHUTTERSTOCK

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Overeating bogs our body down with unnecessary work and calories, while eating fewer calories supports a more robust immune system.

Restrict Calories to Boost Immune Function

Research finds significant long-term benefits to eating fewer calories

JOEL FUHRMAN

New research suggests that moderate calorie restriction in humans has benefits beyond weight loss. In a two-year study, researchers saw improved immune function and T cell production, and a reduction in inflammation in participants who reduced their calories by approximately 14 percent.

Caloric restriction (CR) has been an important topic in aging and longevity research for many years. We've learned from studies on many types of animals—from flies to mice to nonhuman primates—that moderate CR without malnutrition prolongs lifespan, slows biological aging, and delays the development of chronic diseases.

Moderate caloric restriction of 14 percent in the CALERIE trial showed signs of improved immune function.

More recent research has tried to understand the biology behind the beneficial, longevity-promoting effects of CR, and how it could be used to improve human health. The Comprehensive Assessment of Long-Term Effects of Reducing Intake of Energy (CALERIE) trial was the first CR trial conducted in healthy humans. Participants in the CR group were instructed to reduce calorie intake moderately (a goal of 20 percent) for two years.

Previous results from the CALERIE trial suggested moderate CR reduced fat mass, improved insulin sensitivity, reduced inflammatory markers, and improved cardiovascular risk biomarkers.

A new study from the CALERIE trial investigated immune function and gene expression in fat tissue in participants who restricted calories by an average of 14 percent for 2 years.

CR and Immune Function

Some research in animals had suggested that CR could impair immunity. However, these studies usually reduced calories more dramatically, by about 40 percent. These animals lived longer, on average, than control animals but were more susceptible to infection. This suggests that a 40 percent calorie reduction led to insufficient resources for the immune system. Moderate CR of 14 percent, however, in the CALERIE trial, showed signs of improved immune function in the newly published study.

The researchers chose to analyze the thymus, where T cells (a subset of immune cells) mature, in CALERIE participants, because aging of the thymus begins earlier than other organs. Starting in middle age, the thymus begins to shrink, accumulate fat, and release fewer T cells, reducing the capacity for immune surveillance.

Using MRI and indicators of T cell abundance in the blood, the researchers determined that the thymus glands in the CR participants were larger and less fatty, and were releasing more T cells after two years than they were at the beginning of the study, whereas the control group showed no change.

Inflammation-Reducing Changes in Gene Expression

Since excess fat tissue drives inflammation and inflammation drives aging, the researchers also investigated gene expression in adipose (fat) tissue at baseline, one year, and two years of caloric restriction. They found increases in the expression of 233 genes and decreases in 131. Several of the largest gene expression changes were indicative of a lower level of inflammation.

They focused on one particular gene: platelet activating factor acetylhydrolase (PLA2G7), whose expression was decreased in response to CR. Little is known about PLA2G7 so far. However, higher circulating levels of PLA2G7 have been linked to inflammation-related diseases such as cardiovascular disease, autoimmune disease, and Type 2 diabetes.

They investigated PLA2G7 further by deleting the gene in mice, and found lower circulating proinflammatory cytokines, reduced inflammation in fat tissue, limited weight gain, and maintenance of the volume of the thymus compared to control animals. These results are consistent with improved immune health and lower inflammation, and were similar to the results in humans under moderate CR, suggesting PLA2G7 is an important gene underlying the benefits of CR.

Overall, the findings from this study suggest that moderate caloric restriction alters gene expression to promote immune function and reduce inflammation, strengthening the evidence that moderate caloric restriction in the context of micronutrient excellence extends life span.

Excess fat tissue drives inflammation and inflammation drives aging.

I developed the nutritarian diet, a plant-based, nutrient-dense diet, as a powerful way to reverse chronic disease, strengthen immune defenses, and slow the aging process. It's unique in that it pays attention to comprehensive micronutrient adequacy using a wide variety of nutrient-rich foods along with a judicious use of supplements (such as DHA and EPA omega-3 fatty acids, vitamins B12 and K2, zinc, and iodine) to prevent any insufficiencies from reducing or eliminating animal products. This nutritarian approach lowers the instinctual drive for calories, allowing people to be satisfied with fewer calories and to enjoy eating more.

Joel Fuhrman, M.D. is a board-certified family physician, seven-time New York Times best-selling author and internationally recognized expert on nutrition and natural healing. He specializes in preventing and reversing disease through nutritional methods.

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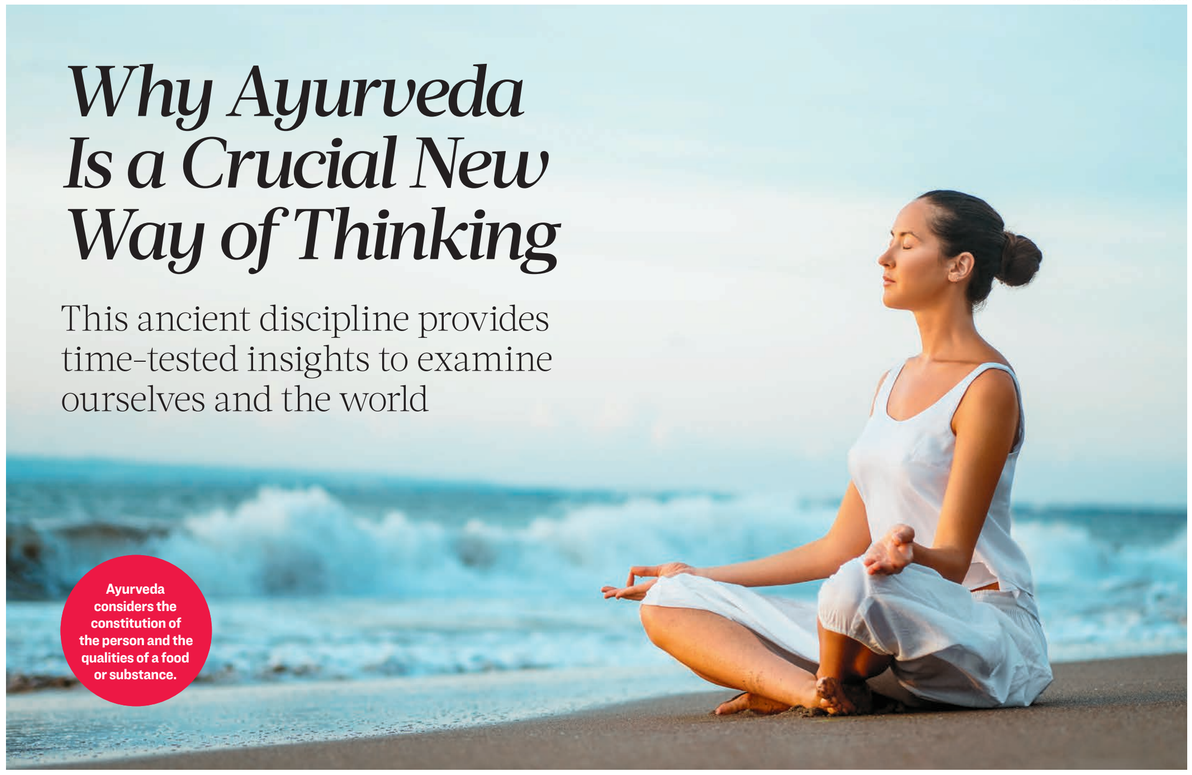
Why Ayurveda Is a Crucial New Way of Thinking

This ancient discipline provides time-tested insights to examine ourselves and the world


Ayurveda considers the constitution of the person and the qualities of a food or substance.

JOHN IMMEL

Ayurveda is a profound way of seeing. Many begin by dabbling in ayurveda and then quickly realize how potent it is. While it may be challenging to understand at first, exposure to ayurveda reveals that there's something special hidden in its strange words.

Ayurveda means "the science of life" in Sanskrit, the classical language of ancient India. But the science of life is more than knowing which herb to use or which food to eat for dinner—it's a new way of thinking altogether.

Thinking ayurvedically requires using a new set of skills, much like riding a bicycle or speaking a new language. Once you get the hang of it, its mysterious allure quickly moves toward awe.

So, what is ayurveda?

Perhaps as profound as an apple falling on Newton's head, the science of life is a tool, like Western science, for analyzing your surroundings.

More specifically, ayurveda is a systematic approach to discovering how our bodies interact with the natural world. Broadly speaking, ayurveda is a tool for comparing and contrasting objects in the natural world. It gives you a feel for how two things might interact. Perhaps, the "science of life" in this context refers to the lively way things interact with one another.

Typically, the ayurvedic approach is used for health, but it also has many other quality of life applications. When your friends start arguing after a spicy Mexican dinner, break out the ice cream to cool everyone down. When your little one can't fall asleep at night, massage her feet with oil for a soothing effect. When you can't get your brain to perk up and focus, brew some spicy tea.

Ayurveda is an objective method of analysis like science, but based on qualifying individual experiences and patterns in nature instead of quantifying them, as science does.

Instead of summarizing natural events with statistical averages alone, ayurveda can switch between statistical models and highly individualized models for assessment with ease.

It can be used alongside the scientific method in a variety of situations such as recovering from chemotherapy, which requires navigating the highly individualized effects of the treatment. For example, a diet of easy-to-digest foods that takes the person's body type into account will enable them to rebuild their digestion (and health) more effectively.

Ayurveda recognizes that all of life is a relationship. In breaking down the dynamics of relationships, ayurveda offers a model for interactions that predicts how your body will respond to contact with your environment. In addition to describing interactions, ayurveda helps people describe sensations they're having and puts their experiences into a context, so they can see how the pieces fit with the whole.

Ayurveda is very easy to learn and use. It makes it possible for individuals to improve their quality of life. It also gives them insight and understanding that increases a sense of well-being and the ability to take care of themselves. These unique advantages of ayurveda make it an especially useful supplement to any health care plan.

How Does Ayurveda Work?

How does ayurveda accomplish all of this? It categorizes the qualities of things. It recognizes that everything is always in flux and that we need to adapt our understanding accordingly.

Ayurveda classifies all substances and experiences by their qualities and how they affect what they come into contact with. It does this through the concepts of biocharacteristics (gunas), elements, and doshas.

A biocharacteristic loosely means an innate property. Ayurveda uses 20 main biocharacteristics, or properties, clinically. These properties describe how a substance will affect the mind and body.

The elements represent the most common states of matter found in nature, and doshas are the main body types or constitutions found in people.

For example, ayurveda would describe a chili pepper as drying, heating, and fiery, as opposed to describing its content in terms of vitamins and chemical makeup.

You'll notice that Western medicine uses nouns when describing disease, medicine, and anatomy. For example, an ulcer is a sore in the intestines. Cancer is abnormal cell growth. The flu is a virus. Western science has spent several hundred years describing things based on their content, since the Enlightenment era. Western science has made extraordinary discoveries by breaking things down into pieces and parts, a technique called reductionism.

Ayurveda, on the other hand, integrates all the pieces and parts into an experience of the whole. It observes and summarizes the relationships of all the pieces and parts interacting.

Both conversations are worth having.

You'll notice that when ayurveda describes disease, medicine, and anatomy, it uses adjectives. A person catches a "cold." Herbs are "bitter" or "pungent." The liver is a "hot" organ.

Ayurveda and Individuality

While Western science categorizes things in a laboratory and isolates them from their environment, ayurveda recognizes that things vary based on context.

Instead of making global statements about a food being healthy or unhealthy, ayurveda matches the properties of the food to an individual in time.

For example, beans may taste sweet to you in the spring and bland in the fall, reflecting your ever-changing relationship with beans according to your body's seasonal requirements.

Ayurveda employs statistical averages as Western medicine does, but also has a model that accounts for one's unique relationship to things.

Using biocharacteristics, ayurveda pinpoints qualitatively why a given food can affect an individual differently at different times.

Ayurveda is a systematic approach to discover how our bodies interact with the natural world.

In fall, for example, your body naturally craves rich, heavy food to create an insulating layer of fat to keep you warm in the impending cold weather. Heavier foods such as root veggies, butter, and meats are appetizing. In spring, your body is looking to lighten up, come out of hibernation, and get active again. Your food cravings will naturally shift to reflect this, and lighter proteins such as beans will be appealing.

The Western model is quantitative, favoring measurements and tests to discern the suitability of a given medicine or treatment.

Ayurveda provides a relational model based on perception and insight. It employs both observation and contemplation when considering which treatments will be most suitable for a given person and recognizes the value of intuition. It even offers tools to hone intuitive skills.

Ayurveda values looking at the whole picture when working with clients—diet, lifestyle, interpersonal relationships, environment, and more—recognizing that effective treatment is nuanced and must be fitted to clients individually. Not everyone's depression or spring cold or heartburn is a result of the same cause, so they can't all be healed with the same approach.


Ayurveda provides a framework to understand the biocharacteristics of the natural world and our interactions with it.

Examining these relationships between things is paramount in ayurveda. It's easy to follow a formula, but knowing the person is so much better. And this aspect is a huge part of ayurveda's popular appeal.

Many people have an aversion to scientific methods that ignore individuality. They don't want to be treated like a statistic. Statistics are valuable but also insufficient, inhumane, and depersonalizing. So many easy opportunities are missed if you lose the home-court advantage by ignoring the individual.

Insight Without Mysticism

We're all seeking insight into life's complexity, and we want to know our world around us. Western science and ayurveda offer two models of perception and discovery. An additional goal of ayurveda is to see the essential nature of a thing, not just its substance, through its unique method of qualitative analysis using biocharacteristics.

This essence helps you to predict the effect of eating or interacting with something.

Ayurveda's methodology anticipates the pharmacological effects of a substance on your body. Everyone needs medical doctors occasionally, but one's quality of life comes from daily living. In a health context, ayurveda allows you to easily match a person with what's good for them in a systematic yet highly individualized way.

Ayurveda recognizes the natural world as the means to basic wellness. It offers a methodical model to approach the natural world as medicine in day-to-day life, which can be used by all.

Ayurveda aims to be accessible to all. Anyone can quickly learn and apply its fundamental concepts, regardless of academic skill level. At its heart, ayurveda is simple. It's a folk tradition that closely follows the rhythms of nature, and its value has kept its tradition intact for thousands of years.

As excited as you may be about ayurveda, be cautious about romanticizing it. When ayurveda is presented as exotic or mysterious, it could be seen as magical or miraculous instead of the valuable, systematic approach that it is.

Mysticism obscures the value of ayurveda. An individual's excitement for ayurveda shouldn't cloud what's truly valuable in ayurveda: a profound method of analysis. Ayurveda's value isn't founded upon mystery, but a systematic approach based on biocharacteristics.

Visit John Immel's website, JoyfulBelly.com, for ayurvedic nutrition one tasty recipe at a time, and professional, clinically focused, ayurveda training courses. Immel also founded the National Association of Ayurvedic Schools and Colleges, and the American Association of Biocharacteristics Clinicians. Outside the clinic, Immel enjoys his Christian faith and his family of six kids.

Eating a diet rich in potassium decreases the risk of having a stroke as it allows for improved oxygenation to the brain.

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How Potassium Helps to Treat High Blood Pressure

Hypertension affects nearly half the people in this country, and many are unaware they have it

Continued from ***Page 9***

Your blood pressure reading can vary throughout the day, so one high reading isn't a concern. It's only when your blood pressure is consistently or chronically higher than normal that significant health conditions may occur.

The validity of your blood pressure reading will be affected by the size of the blood pressure cuff, the position of the cuff on your arm, and whether you're nervous. Measuring your blood pressure in both arms at the same office visit may also give vital information about your circulatory health.

A number of studies have revealed that a significant difference between your right and left arm pressure may indicate circulatory problems that raise your risk for stroke, peripheral artery disease, or other cardiovascular problems.

While small differences between your arms are normal, researchers found people with a difference of 5 points in the systolic reading (top number) had double the risk of dying from heart disease in the following eight years. The difference suggests the presence of plaque in the artery supplying the arm with the higher pressure.

In a meta-analysis evaluating mortality rates of more than 17,000 participants with inter-arm systolic blood pressure differences, researchers found participants with a greater than 10-point difference between arms had a 58 percent increased risk of death from cardiovascular disease compared to those with a less than 10-point difference. When the difference increased to 15 points, the risk increased to 88 percent.

Potassium Level Affects Blood Pressure

Potassium is a naturally occurring mineral that your body uses as an electrolyte, or substance in solution that will conduct electricity. It's vital for normal functioning, as your body relies on electrical charges for countless processes, from cell signaling to nerve impulses to healthy brain function.

Diarrhea, vomiting, excessive sweating (such as when using a sauna), and some drugs may deplete or disrupt your potassium balance. The most common reason that potassium levels aren't within normal limits is due to poor dietary choices.

The average reported intake of potassium from food is about half of the recommended 4,700 milligrams (mg) per day. Research demonstrates that these low levels of potassium may have a significant impact on blood pressure, especially as it relates to the amount of salt normally found in a Western diet.

Dr. Paul Whelton, professor of epidemiology at Tulane University School of Public Health and Tropical Medicine, conducted an analysis in 1997 of more than 29 trials that demonstrated low levels of potassium resulted in higher systolic blood pressure readings. Studies performed since then have found similar results.

According to Whelton's research:

"The results support the premise that low potassium intake may play an important part in the genesis of high [blood pressure]. Increased potassium intake should be considered as a recommendation for prevention and treatment of hypertension, especially in those who are unable to reduce their intake of sodium."

Potassium works in your body to relax the walls of your arteries, keep your muscles from cramping, and lower your blood pressure. The reduction in blood pressure with added potassium has also been associated in studies with a reduced risk of stroke.

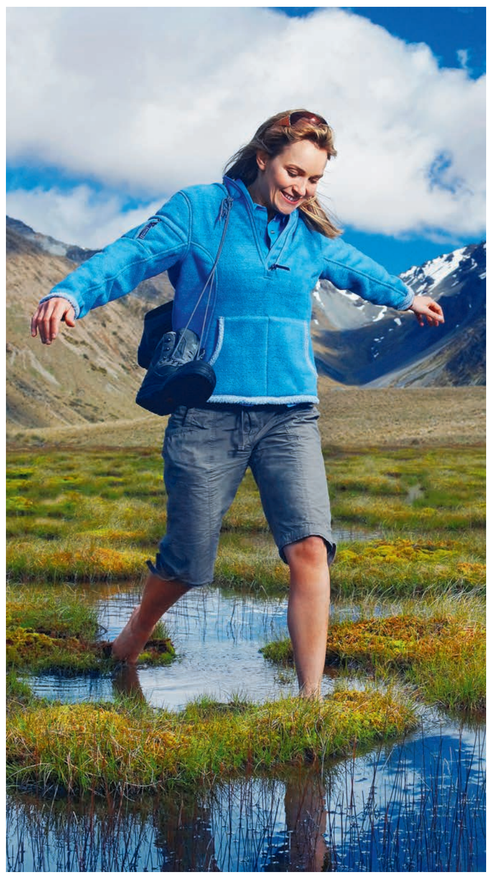
The Many Benefits of Potassium

Research has found that women without hypertension who consumed the most potassium (nearly 3,200 mg per day) had a 21 percent reduced risk of stroke. Further, women who consumed the most potassium were 12 percent less likely to die during the study period than those who consumed the least.

"Potassium may play a role in improving blood vessel function in our brains, according to the study's lead researcher. "This could allow better oxygenation of our brain tissue, and prevent tissue death that occurs from lack of oxygen to the brain.

"The effect of potassium consumption on reduced stroke risk could also be due to a better diet overall, though we did not investigate this in our study."

Only **1 in 4** Americans with hypertension have their blood pressure under control and 1 in 3 aren't aware they have the condition.



Experiments show that walking barefoot outside (also referred to as earthing or grounding) improves blood viscosity, blood flow, and calms your sympathetic nervous system.

Potassium should be the third-most-abundant mineral in the human body. Adequate amounts of potassium also are associated with a quicker recovery from exercise and improved muscle strength. As an electrolyte, potassium helps to regulate the fluid balance in your cells and throughout your body.

Fluid balance is essential to maintaining life, preventing dehydration at the cellular level, and maintaining brain function. Potassium is important in the transmission of nerve impulses in your brain, spinal cord, and peripheral nervous system.

Nerve impulses transmitting information from one nerve to the next occur as the result of electrical activity. This activity is what an electrocardiogram measures as it tracks heart activity.

Low levels of potassium have been linked with high levels of insulin and glucose, associated with metabolic syndrome and Type 2 diabetes. These results have been found in several studies, leading researchers to recommend dietary choices that boost potassium levels and reduce the risk of Type 2 diabetes.

Effects of High Blood Pressure

Unfortunately, 20 percent of people who suffer from high blood pressure are unaware of the condition, significantly increasing their risk of health problems. With uncontrolled or poorly controlled hypertension, you increase the risk of significant health effects that reduce your quality of life and longevity.

Hypertension increases your risk of stroke, since it can cause blood vessels in your brain to rupture or clog more easily. In both instances, oxygen supply to a portion of the brain ceases and a stroke results. The increased workload on the heart muscle may result in heart failure, and damage to the arteries supplying the heart muscle with oxygen may result in a heart attack.

Hypertension may damage smaller arteries, reducing the amount of oxygen delivered and severely impacting the ability of organs to function, such as your kidneys and eyes. This may result in kidney failure and vision loss. The damage to smaller blood vessels is called microvascular disease and may lead to angina, or chest pain, when the heart muscle doesn't get enough oxygen.

Atherosclerosis is another form of damage to the arterial system from hypertension that may result in peripheral vascular disease. The narrowing of the arteries may occur in the legs, arms, stomach, and head, triggering pain and fatigue.

Sodium-to-Potassium Ratio Is Key

The key to relaxing your arterial walls and reducing your blood pressure is the sodium-to-potassium ratio. In the United States and many other developed countries, salt has been vilified as a primary cause of high blood pressure and heart disease. According to research presented at last year's American Heart Association meeting, excessive salt consumption contributed to 2.3 million heart-related deaths worldwide in 2010.

However, it's important to realize that most Americans and other Westerners get the majority of their sodium from commercially available table salt and processed foods—not from natural, unprocessed salt. Not only is the ratio between potassium and sodium important, so is the type of sodium consumed.

If you eat a lot of processed foods and not many vegetables, there's a good chance your sodium-to-potassium ratio is unbalanced. If you aren't sure, try using cronometer.com/mercola, which allows you to enter the foods you eat and calculates the ratio automatically. It's generally recommended that you consume five times more potassium than sodium, but most Americans eat two times more sodium than potassium.

This ratio is more important than your overall salt intake. A better strategy to promote public health would be to forgo the strict sodium-reduction element and instead focus recommendations on a high-quality diet rich in potassium, as this nutrient helps to offset the hypertensive effects of sodium. Imbalance in this ratio not only can lead to hypertension (high blood pressure), but also can contribute to a number of other diseases, including:

- Kidney stones
- Memory decline
- Cataracts
- Osteoporosis
- Erectile dysfunction
- Stomach ulcers
- Rheumatoid arthritis
- Stomach cancer

Why a Balanced Diet Is Your Best Option

Getting nutrients from your food instead of supplements is preferable, as food contains multiple nutrients and in different forms. For instance, the potassium found in fruits and vegetables is potassium citrate or potassium malate, while supplements are often potassium chloride. The citrate and malate forms help produce alkali, which may promote bone health and preserve lean muscle mass as you age.

Bone loss may lead to brittle bones or even osteoporosis. While potassium in fruits and vegetables may help to build bone health, potassium chloride may not.

As researcher Dr. Bess Dawson-Hughes from Tufts University explains:

"If you don't have adequate alkali to balance the acid load from the grains and protein in a typical American diet, you lose calcium in the urine and you have bone loss. ... When the body has more acid than it is easily able to excrete, bone cells get a signal that the body needs to neutralize the acid with alkali. ... And bone is a big alkali reservoir, so the body breaks down some bone to add alkali to the system."

Research by Dawson-Hughes found that people who were in the neutral range for net acid excretion, meaning they had a fairly healthy balance for bone and muscle health, were eating slightly more than eight servings of fruits and vegetables a day along with 5 1/2 servings of grains.

When they rounded that out, it came to about half as many grains as fruits and vegetables. For many Americans, a simple recommendation to increase your alkali (and potassium) while reducing acid is to eat more vegetables and fewer grains.

Drug-Free Methods to Control Blood Pressure

There are several ways to help to keep your blood pressure under control and reduce your risk of organ damage.

Address Insulin and Leptin Resistance

High blood pressure is associated with insulin resistance, which results from eating a diet too high in sugar. As your insulin level rises, so does your blood pressure. Insulin stores magnesium, but if your insulin receptors are blunted and your cells grow resistant to insulin, you can't store magnesium, so it passes out of your body through urination.

Magnesium stored in your cells relaxes muscles. If your magnesium level is too low, your blood vessels will constrict rather than relax, and this constriction raises your blood pressure.

Fructose also elevates uric acid, which drives up your blood pressure by inhibiting the nitric oxide in your blood vessels. (Uric acid is a byproduct of fructose metabolism. In fact, fructose typically generates uric acid within minutes of ingestion.) Nitric oxide helps your vessels to maintain their elasticity, so nitric oxide suppression leads to increases in blood pressure.

If you're healthy, and want to stay that way, the general rule is to keep your total fructose intake to 25 grams per day or less. If you're insulin resistant or have high blood pressure, keep your total fructose to 15 grams or less per day until your condition has resolved.

Eat Real Food

A processed food diet, loaded with net carbohydrates (non-fiber carbs such as sugar, fructose, and grains) and trans fat (margarines and vegetable oils), is a recipe for hypertension. Instead, make whole—ideally organic—foods the focus of your diet.

Also remember to swap non-fiber carbs for healthy fats such as avocados, butter made from raw, grass-fed organic milk, organic pastured egg yolks, coconuts and coconut oil, raw nuts such as pecans and macadamias, grass-fed meats, and pasture-raised poultry.

Mind Your Sodium-to-Potassium Ratio

According to Dr. Lawrence Appel, lead researcher on the DASH diet and director of the Welch Center for Prevention, Epidemiology and Clinical Research at Johns Hopkins University, your diet as a whole is the key to controlling hypertension—not salt reduction alone.

He believes a major part of the equation is this balance of minerals, i.e., most people need less sodium and more potassium, calcium, and magnesium.

According to Appel, "higher levels of potassium blunt the effects of sodium. If you can't reduce or won't reduce sodium, adding potassium may help. But doing both is better."

Indeed, maintaining a proper sodium-to-potassium ratio in your diet is very important, and hypertension is but one of many side effects of an imbalance. A processed food diet virtually guarantees you'll have a lopsided ratio of too much sodium to potassium.

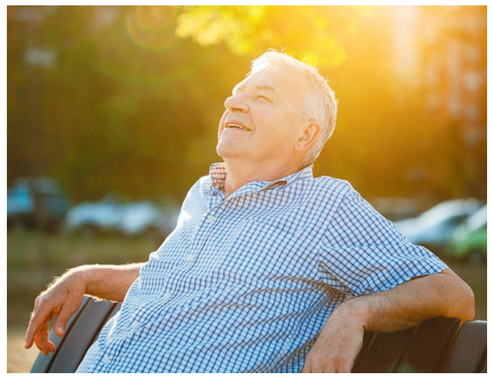
Making the switch from processed foods to whole foods will automatically improve your ratios. Include foods high in potassium such as sweet potatoes, tomatoes, spinach, beets, black beans, wild-caught salmon, edamame, butternut squash, Swiss chard, apricots, cantaloupe, mushrooms, and tuna.

Load Up on Veggies

Juicing is a simple way to increase the amount of vegetables in your diet, and many NO3-rich veggies (which raise your nitric oxide level) are suitable for juicing such as beets, kale, celery, spinach, carrots, and more. Allicin-rich garlic, leeks, shallots, and chives also help to improve your blood pressure, and are easy to add to salads and various dishes.

Optimize Your Vitamin D Level

The sun is your best source of vitamin D. Or rather, your skin is your best source, with its ability to transform sunlight into this essential hormone. Fairer-skinned people need relatively little sunlight to create vitamin D (as little as 15 minutes in sunny conditions), but darker-skinned people need significantly longer.



Getting an adequate amount of sunlight helps regulate hormones and reduces blood pressure.

Potassium is important in the transmission of nerve impulses in your brain, spinal cord, and peripheral nervous system.

Americans report only getting about half of the recommended 4,700 milligrams (mg) of potassium per day.

The best way to boost your omega-3 level is to eat plenty of oily fish that's low in mercury and other pollutants.

Root Vegetables a High Source of Potassium

Some of the foods highest in potassium include root vegetables. Below is a list with the highest concentration.

- Potatoes
- Broccoli
- Beets
- Carrots
- Yams
- Rutabagas
- Parsnip

Boost Your Animal-Based Omega-3 Intake

The best way to boost your omega-3 level is to eat plenty of oily fish that's low in mercury and other pollutants. Good options include wild-caught Alaskan salmon, sardines, and anchovies. Alternatively, take a high-quality krill oil or fish oil supplement. Krill oil has advantages over fish oil, which is why I prefer it.

Consider Intermittent Fasting

Intermittent fasting is one of the most effective ways I've found to normalize your insulin and leptin sensitivity. It's not a diet in conventional terms, but rather a way of scheduling eating in such a way as to promote efficient energy use.

Essentially, intermittent fasting means eating your calories during a specific window of the day, and choosing not to eat food during the rest. When you eat, your body reacts by elevating insulin and leptin.

Exercise Regularly

A comprehensive fitness program can go a long way toward regaining your insulin sensitivity and normalizing your blood pressure. To reap the greatest rewards, I recommend including high-intensity interval exercises in your routine.

I also recommend training yourself to breathe through your nose when exercising, as mouth breathing during exercise can raise your heart rate and blood pressure, sometimes resulting in fatigue and dizziness.

Avoid Smoking and Other Forms of Pollution

Smoking is known to contribute to high blood pressure, as are other forms of air pollution, even noise pollution. To address these, avoid smoking, consider using earplugs during sleep if you live in a noisy neighborhood (provided you can't move away), and take steps to improve your indoor air quality. Plants can help.

Walk Barefoot

Going barefoot will help you to ground to the earth. Experiments show that walking barefoot outside (also referred to as earthing or grounding) improves blood viscosity and blood flow, which help to regulate blood pressure. So, do yourself a favor and ditch your shoes now and then.

Grounding also calms your sympathetic nervous system, which supports your heart rate variability. This, in turn, promotes homeostasis, or balance, in your autonomic nervous system. In essence, anytime you improve heart rate variability, you're improving your entire body and all of its functions.

Address Your Stress

The connection between stress and hypertension is well-documented, yet still doesn't receive the emphasis it deserves. In fact, it has been shown that people with heart disease can lower their risk of subsequent cardiac events by more than 70 percent simply by learning to manage their stress.

Suppressed negative emotions such as fear, anger, and sadness can severely limit your ability to cope with the unavoidable everyday stresses of life. It's not the stressful events themselves that are harmful, but your lack of ability to cope.

The good news is, strategies exist that quickly and effectively transform your suppressed, negative emotions and relieve stress. My preferred method is the emotional freedom technique (EFT), an easy-to-learn, easy-to-use approach for releasing negative emotions.

EFT combines visualization with calm, relaxed breathing, while employing gentle tapping to "reprogram" deeply seated emotional patterns.

Dr. Joseph Mercola is the founder of Mercola.com. An osteopathic physician, best-selling author, and recipient of multiple awards in the field of natural health, his primary vision is to change the modern health paradigm by providing people with a valuable resource to help them take control of their health.

RYANJLANE/GETTY IMAGES

Parents of fussy eaters may turn to toddler formula but real foods are healthier, say researchers.

Sales of toddler formula in the United States rose to

$92 MILLION in 2015

from

$39 MILLION in 2006.

Toddler Formula Raises Concerns and Confusion

Formula may be right for infants, but experts warn that toddlers don't need it

CHRISTINA SZALINSKI

Formula for toddlers is a burgeoning business in the United States. Sales of the drinks more than doubled in recent years as companies convinced parents that their little ones needed the liquid boost. But many experts warn that these products, designed for children aged 1 to 3, fill no nutritional needs beyond what is available in a typical toddler diet, are subject to less regulation than infant formula, and are expensive.

In addition, some parents feed the toddler versions to infants even though they don't meet federal standards for infant formula and may not provide babies with adequate nutrients to sustain their growth.

Pediatricians and federal health officials say that when most children turn 1 year old, they can begin drinking cow milk or an unsweetened plant-based milk substitute. In a 2019 "consensus" statement, the American Academy of Pediatrics and other health and nutrition organizations recommended against using toddler formulas, saying "they offer no unique nutritional value beyond what could be obtained with healthy foods; furthermore, they may contribute added sugars to the diet."

The toddler formulas often contain sweeteners and fats that add calories.

Some of the same companies that produce infant formula—including Enfamil, Gerber, and Similac—also make toddler formulas, as do some smaller, boutique brands that advertise that they have organic or other special qualities.

Toddler formulas often contain sweeteners and fats that add calories.

Toddler formulas are available nearly everywhere infant formulas are sold and are marketed as providing extra nutrients to help children's brain, immune system, and eye development, among other benefits. They are different from medical formulas prescribed for children with specific needs.

A 2020 study found that sales of toddler formula in the United States rose to $92 million in 2015 from $39 million in 2006.

Parents are often confused by the marketing for the formulas, according to a study led by Jennifer Harris, a marketing and public health researcher at the University of Connecticut. She found that 60 percent of caregivers falsely believed toddler formulas have nutrients that toddlers can't get from other foods.

Dr. Anthony Porto, a pediatric gastroenterologist and pediatrics professor at Yale University, said he's concerned these products could be giving toddlers more nutrients and calories than they need. Unlike what's designed for infants, toddler formula has no nutritional regulations; experts say standardizing a supplement to toddlers' diets is impossible because no two children are alike.

In focus groups, Harris said, parents report feeding their children toddler formula to fill nutritional gaps when a child isn't eating enough, a common concern among parents.

"Infants are often voracious eaters," said Dr. Stephen Daniels, chair of pediatrics at Children's Hospital Colorado. But at around a year of age, children's growth plateaus, he said, and "they're suddenly not hungry in the way they used to be anymore." That can worry parents, he added, but "it's a completely normal phenomenon."

If parents have concerns about their children's diet, Daniels said, they should consult a pediatrician or family doctor.

Blanche Lincoln, president of the Infant Nutrition Council of America, which represents the makers of Enfamil, Gerber, Similac, and store brands, said in an email that the toddler formulas can be helpful because they can fill "nutritional gaps during this period of transition to table foods."

Lincoln, a former U.S. senator from Arkansas, said the drinks "help contribute to the specific nutritional needs of toddlers by providing energy and important nutrients, as well as essential vitamins and minerals during this important period of growth and development."

Toddler formula isn't being ingested by toddlers alone—it's also being fed to infants. In a recent study, Porto and colleagues found that 5 percent of infants' parents reported giving their babies drinks marketed for the older age group. And Harris' research indicated that 22 percent of parents of infants older than 6 months had fed their babies toddler formula in the previous month. Both studies were conducted before the recent infant formula shortage, which may have exacerbated the problem.

"Infant formulas and toddler formulas tend to be next to each other in the supermarket," Harris said. "They look similar, but the toddler formulas are cheaper than the infant formulas. So people confuse them, and they grab the wrong one. Or they think, 'Oh, this one is less expensive. I'll get this one instead.'"

According to an email from Food and Drug Administration (FDA) spokesperson Lindsay Haake, toddler drinks don't meet the definition of infant formula, so they aren't subject to the same requirements. That means they don't have to undergo the clinical trials and pathogen safety testing that the infant versions do.

"Unlike infant formulas, toddler formulas are not necessary to meet the nutritional needs of their intended consumers.

Lindsay Haake, Food and Drug Administration spokesperson

22 PERCENT of parents with infants 6 months or older admitted to feeding their babies toddler formula in the previous month in a study conducted in 2020.

"Unlike infant formulas, toddler formulas are not necessary to meet the nutritional needs of their intended consumers," Haake said.

In a statement to Kaiser Health News, the Infant Nutrition Council of America said: "Toddler drinks have a distinctive use and nutritional makeup from infant formula; the two are not interchangeable. The labeling of toddler nutritional drinks explicitly identifies the product as a toddler drink intended for children 12 months and older on the front of the package label."

However, several expensive toddler formula brands made by smaller companies—often advertised as being made from goat milk, A2 whole milk (which lacks one common milk protein), or vegan ingredients that aren't soy—do meet nutritional requirements for infants, and some advertise that.

Harris argued that this confuses parents, too, and shouldn't be allowed. Just because a toddler formula has the nutritional ingredients required by the FDA for infant formula doesn't mean it has met the other tests required of infant formula, she said.

Federal regulators haven't forced any of the companies to withdraw those products.

In an email, FDA spokesperson Marianna Naum said, "The FDA does not comment on potential compliance actions."

One company, Nature's One, whose toddler formulas are named "Baby's Only," received warning letters a decade ago from the FDA about marketing them for infants. That case was closed in 2016. The company's website says that Baby's Only formula "meets nutrient requirements for infants" and that "Baby's Only Organic can be served up to 3-years of age."

Critics say that language implies the formula is fine for babies younger than 1. The company's website and its Instagram account feature customer testimonials from parents who report feeding the formula to their infants, as well as pictures of infants drinking it.

ALL PHOTOS BY SHUTTERSTOCK UNLESS OTHERWISE NOTED

Toddler formulas are often used by parents to fill in nutritional gaps while transitioning their children to table foods.

Jay Highman, CEO and president of Nature's One, said that Baby's Only is clearly labeled as a toddler formula and that the back of the can states that "Baby's Only is intended for a toddler 1-year of age or older OR when directed by a healthcare professional."

He also said that since the company launched in 1999, its formulas have met all the nutritional, manufacturing, and safety standards required of infant formula even though they don't have to.

"We behaved like we are an infant formula, but we were selling it as a toddler formula," Highman said.

He said that the clinical trials required by the FDA are a huge barrier to bringing a new infant formula to market and that many other countries don't require a clinical trial. Baby's Only recently completed a clinical trial, he said, and the company expects to be able to sell it as an infant formula soon.

Yet, pediatricians and nutritional experts continue to caution parents about using the toddler drinks.

"There's no question that infant formula is very important in the first year of life," Daniels said.

But he doesn't recommend the toddler version "because it's not that useful, because it's confusing, because it's expensive," he said.

KHN (Kaiser Health News) is a national newsroom that produces in-depth journalism about health issues. Together with Policy Analysis and Polling, KHN is one of the three major operating programs at KFF (Kaiser Family Foundation). KFF is an endowed nonprofit organization providing information on health issues to the nation.

Christina Szalinski is a freelance science writer and journalist from Philadelphia covering medical research, health, and life sciences.

The Mental and Physical Effects of Humming

Humming has measurable physiological effects that can be healing and health-promoting

Continued from ***Page 9***

For an extended session, you can hum for five minutes followed by five minutes of silence to ground yourself afterward.

Jonathan Goldman, an authority on sound healing, has worked with all sorts of sounds for 40 years. He and his wife, Andi Goldman, a licensed psychotherapist, have worked in the field of sound healing for the past 20 years. They'd been looking for an accessible form of sound healing for the masses. When they considered the simple act of humming and looked at the research on its benefits, they were amazed by what they found and compiled the information in their book "The Humming Effect: Sound Healing for Health and Happiness."

Key Points to Know About Humming

There are two ways that sound affects the body:

1. Through psycho-acoustics: through hearing or listening, which affects the nervous system.
2. Through vibro-acoustics: by making the sound, and the sound literally vibrates the body—all the way down to the cellular level.

"Humming is, from my perspective, the most powerful vibro-acoustic sound we can make," Jonathan Goldman said.

Keep in mind that there are many pitches of hums, and each person is a unique vibratory being. What works for one person doesn't necessarily work for another. As a unique vibratory being, play with the pitch, and hum in the manner that seems best suited to you, the Goldmans recommend.

In addition, to reap the most benefits from humming, Jonathan Goldman says that silence is mandatory. After you hum for five minutes, then go into stillness and silence for a few minutes.

"Silence is the yin to the yang of sound. Silence is the place where the sound can create the shifts and changes on a vibrational level, on a physical, emotional, mental, and spiritual level," he said.

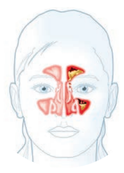
The following lines of research point to several important health benefits of humming, including reduced blood pressure, heart rate, and stress, and increased levels of nitric oxide, which plays an important role in keeping the nasal cavity and sinuses healthy.

Blood Pressure and Heart Rate

In a 2010 study, participants practiced a specific type of humming combined with deep breathing—a yogic practice called bhramari pranayama—for five minutes. The slow-paced humming caused both the systolic and diastolic blood pressures of participants to decrease significantly, accompanied by a slight decrease in their heart rates.

The authors concluded that this type of humming induced "parasympathetic dominance" on the cardiovascular system, which is beneficial, as the parasympathetic nervous system is sometimes thought of as the system that erases stress and puts the body back into a state of balance. Five minutes seems to be the minimum time necessary for sound to create this beneficial effect on the body.

Humming can improve ventilation in the sinuses.



Humming affects the nasal passage in unique and helpful ways.

AXEL_KOCK/SHUTTERSTOCK

The Goldmans have experienced this reduction in blood pressure and heartbeat.

"Andi and I have found that if we're about to go into a meeting or do some task that may be challenging and we find that we're nervous, all that's necessary is for us to spend a couple of minutes taking some nice deep breaths and humming," Jonathan Goldman said. "Our heartbeat and blood pressure most usually will drop quite amazingly—to about the level that pharmaceuticals might achieve."

Chanting 'Om' Can Reduce the Stress Response

A study in the International Journal of Yoga in 2011 found that when participants of the study chanted "Om"—which is often considered to be essentially the same sound as humming—there was deactivation of the limbic system.

The limbic system is the part of the brain that regulates autonomic and hormonal functions, particularly in response to the intense emotions of fear or anger. When the limbic system is activated, we often experience the "fight or flight" phenomenon. When the limbic system is deactivated, we experience a reduction in stress and enhanced calmness.

More Nitric Oxide in the Nasal Passages

Additional research on humming shows that it greatly increases nitric oxide in a localized area of the body—the nasal passages. Nitric oxide is a neural transmitter fundamental to health and well-being. It plays many important roles in the body: It enhances the immune system, cardiovascular system, and respiratory system. In particular, it causes vasodilation, or widening of the blood vessels, which increases blood flow and decreases blood pressure. Nitric oxide production in nasal passages is part of the defense system against bacterial and viral infections, and nitric oxide plays a significant role in developing the innate immune response to many bacterial and viral infections.

A study in the American Journal of Respiratory and Critical Care Medicine shows that humming causes a 15-fold increase in nasal nitric oxide levels compared with quiet exhalation. The authors explained that this effect is likely due to increased contribution of nitric oxide from the paranasal sinuses, which are small, hollow, mucus-lined spaces around the nose. Humming causes the air to oscillate, which, in turn, seems to increase the exchange of air between the sinuses and the nasal cavity.

Humming May Keep the Sinuses Healthy

Sinusitis is a common but painful condition that affects more than 16 percent of the U.S. population. It occurs when the paranasal sinuses become inflamed, causing symptoms such as headaches, pain, and nasal congestion. A reduced nitric oxide production may increase susceptibility to sinus infections.

Research suggests humming may help to keep sinuses healthy. A 2008 research article by Jon O. Lundberg of the Karolinska Institute in Stockholm, explained:

"A more provocative view on humming is that it might by itself help to prevent or resolve sinusitis. The mechanism would simply be that humming speeds up the gas exchange in the sinuses enormously so that fresh air can enter, thereby preventing the pathological processes associated with reduced oxygen levels."

In other words, humming can improve ventilation in the sinuses. During silent nasal breathing, the time it takes to exchange all sinus gases is between five and 30 minutes. With humming, this occurs in one single exhalation, they wrote.

So, the next time you have a stuffy nose or congested sinuses, the Goldmans suggest to try humming to create the maximum amount of nitric oxide. Simply take a few deep breaths, hum for four or five times, and sit in silence for three minutes. You can repeat this one more time if desired.

They also recommend not to strain yourself and not to hum extra loudly or for an extra-long time. Just hum at a tone that is comfortable, most likely at the volume and tone of the sound of your voice when you're in a normal conversation.

Can Projected Humming Benefit Other Areas in the Body?

A hum is a sound that creates a vibration in the body. If you have any question about that, do a soft hum and press your fingers lightly in your ears. You will feel the vibration in your nasal cavity.

"Silence is the yin to the yang of sound.

Jonathan Goldman, author of 'The Humming Effect: Sound Healing for Health and Happiness'

Spending just a few minutes practicing deep breathing and humming can greatly reduce anxiety levels.

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Research by John Beaulieu found that sound—vibration—stimulates cells in a petri dish to release nitric oxide. Furthermore, in a 2003 review article on sound therapy induced relaxation, Beaulieu and his colleagues explained that nitric oxide is responsible for the health effects of music in inducing positive emotions and relaxing effects in the body.

Putting this information together, the Goldmans believe that it's not only possible but relatively easy, with the use of intent and a slight variation of pitch, to project a humming sound to different parts of the body, such as other parts of the skull and the chest. By causing different parts of the body to feel that vibration, is it possible to cause those parts to release nitric oxide and open up blood flow in those areas? The Goldmans believe so, as some others do, and think that humming can act as an internal sonic (vibrational) massage that benefits how we feel.

Try experimenting with different humming tones and see if you notice the feeling resonating more or less in different parts of the body.

"As we have delved deeper and deeper into the subject, we have seen, time and again, the evidence: humming can improve not only your health but also the quality of your life, contributing greatly to your happiness," the Goldmans write in their book.

Melissa Diane Smith is a holistic nutrition counselor and journalist who has been writing about health topics for more than 25 years. She is the author of several nutrition books, including "Syndrome X," "Going Against the Grain," "Gluten Free Throughout the Year," and "Going Against GMOs."

Exploring Is Good for Teens, but Comes With Risks

JAMES DEVITT

WESTEND61/GETTY IMAGES

Young adults who explore more are emotionally healthier but also more prone to risky behavior.

Teenagers become more given to exploration with age and become increasingly likely to visit new places over time, a study finds.

The results also show that greater exploration is associated with enhanced psychological well-being and larger social networks.

The researchers also discovered that adolescents who explored their natural environments more also reported a greater number of risky behaviors.

"While adolescent risk taking is typically seen as a problematic behavior, we found that heightened exploration was also linked to greater social connectivity and emotional well-being," said Catherine Hartley, an associate professor in New York University's department of psychology and the senior author of the study in the journal Psychological Science.

"This suggests that risk taking may have an adaptive function during adolescence."

Previously, Hartley and the University of Miami's Aaron Heller reported that new and diverse experiences are linked to enhanced happiness and that this relationship is associated with greater correlation of brain activity. Those findings, which appeared in the journal Nature Neuroscience, show a connection between our daily physical environments and our sense of well-being.

In the new study, Hartley, Heller, and University of California–Los Angeles doctoral student Natalie Saragosa-Harris sought to better understand teens' and young adults' exploration of their environments, how it relates to behaviors we tend to see as "risky," and what the psychological significance of these behaviors might be.

Earlier studies have suggested that, compared to children and older adults, adolescents and young adults tend to engage in more exploratory and novelty-seeking behaviors—whether it's trying out new hobbies, sampling new friend groups, or visiting new places.

However, most studies of adolescent exploratory behaviors have relied on self-report or behavior in controlled laboratory environments, leaving open the question as to whether heightened adolescent exploration is evident in the real world—when participants are in natural daily settings.

To better capture these phenomena, the scientists measured the everyday lives of 58 teenagers and adults (aged 13 to 27) in New York City, using GPS tracking to measure how often participants visited novel locations over the course of three months. From these measurements, they were able to capture daily exploration based on movement. Based on these GPS data and self-reporting, the researchers found several notable patterns:

- There was an association between daily exploration and age, with individuals near the transition to legal adulthood (18- to 21-year-olds) exhibiting the highest exploration levels.
- Regardless of age, people reported better moods on days when they explored more, supporting the notion that exploration is linked to psychological well-being.
- People who had higher average levels of exploration also reported larger social networks—measured by the number of unique individuals the subjects interacted with via phone calls and direct-messaging platforms.
- Adolescents who explored their natural environments more also reported a greater number of risky behaviors (e.g., gambling, heavy drinking, illicit drug use, and more)—an association not evident in adults.

Greater exploration is associated with enhanced psychological well-being and larger social networks.

"These findings point to an important role for exploration in sustaining adolescent well-being and establishing social connectivity," Hartley said. "And while risky behaviors undoubtedly pose challenges, a healthy amount of exploration is important, particularly as individuals become adults, gain independence, and form their identities."

Support for the work came from the National Science Foundation Faculty Early Career Development Award.