

Real Solutions for Neurological Diseases

Neurological diseases are some of the most frustrating, complex, and debilitating conditions known to man. In many cases, just getting a proper diagnosis can be a nightmare. And since their cause or origin can be due to multiple factors, even prevention can be difficult.



Dr. David Williams
Parkinson's disease is a prime example. I've been writing about Parkinson's and other neurological diseases for decades. I'm always studying the latest research and quizzing my worldwide contacts for any new (or ancient, for that matter) tidbits that help prevent, slow, or reverse these disorders.

It truly is an area of great concern. Parkinson's is the second most common neurodegenerative

disease in the world, affecting 1 in every 500 people.

Although we've been reassured by numerous organizations and researchers that the incidence of Parkinson's has remained steady, many of us "on the ground" have felt otherwise. A newly released study seems to support this.

Researchers from the Mayo Clinic have found that the incidence of Parkinson's and "parkinsonism" has increased significantly in the 30-year period (from 1976 to 2005) they were able to look at birth-to-death health records. The increase was particularly strong in men 70 years and older. Parkinsonism is an umbrella term that includes Parkinson's disease and other disorders that involve slowness of movement and at least one other symptom, such as a tremor while at rest, muscle rigidity, or a tendency to fall. (*JAMA Neurol* 2016 Aug;73(8):981-9)

the case a few decades ago. Many pharmaceutical drugs have now been linked to mental decline, dementia, and neurological damage. Statins are just one example.

Additionally, the use of and exposure to pesticides has skyrocketed, which I believe is a huge contributing factor.

The majority of pesticides directly affect the nervous system. If you observe the tremors, inability to move, stiffness, and loss of balance that cockroaches experience after getting sprayed with pesticide, it's like watching a greatly accelerated film clip of the progression of Parkinson's disease. However, the condition progresses much more slowly in humans.

We also know that head trauma may be a factor in the development of Parkinson's. Boxing legend Muhammad Ali recently passed away following his 30-year battle with the disease.

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You will observe with concern how long a useful truth may be known, and exist, before it is generally received and practiced on.

— BENJAMIN FRANKLIN

Why the Rise?

We don't yet know what is causing the rise in Parkinson's disease, and it's hard to pinpoint since many environmental and lifestyle changes have occurred in the last several decades.

Prescription drug use is almost universal, which certainly wasn't

Improvements in Detection

Until now, it has been hard to detect Parkinson's since symptoms usually appear only after 70 percent of the brain's dopamine-producing cells have already been destroyed. Hopefully that will change with a new test that

was revealed in recently published research.

Researchers at University College London Institute of Ophthalmology in the United Kingdom have discovered a new method of observing changes in the retina that can be seen in Parkinson's disease before changes in the brain occur and symptoms become evident. This could be a major breakthrough in diagnosing the disease before permanent damage has taken place. It is inexpensive and uses common instruments routinely utilized in eye clinics and by optometrists. (*Acta Neuropathologica Communications Neuroscience of Disease* 2016;4:86)

Nicotine as Prevention

You may recall that a few months ago, I reported on numerous studies that found that cigarette smoking actually reduced the risk of developing Parkinson's.

Everyone is still trying to figure this out. But the nicotine in cigarettes appears to somehow provide some protection.

The latest theory has to do with "misfolded" proteins that show up in diseased nerve cells of Parkinson's patients. Misfolded proteins start to clump together and disrupt normal cellular function, eventually leading to cell

death. Nicotine helps reduce this protein misfolding. (*J Neurosci* 2016 Jan;36(1):65–79) (*Mov Disord* 2012 Jul;27(8):947–57)

Obviously no one is recommending that you take up smoking to prevent Parkinson's. The significant increase in the risk of cancer, emphysema, and other pulmonary diseases is not a good trade off. A far better option would be to include specific foods in your diet that naturally contain nicotine. The research has actually shown that individuals who eat higher levels of nicotine-containing foods have a lower risk of developing Parkinson's disease.

Nightshades & Nicotine

The best dietary sources of nicotine appear to be plants in the *Solanaceae* family (more commonly referred to as nightshades), which include tomatoes, potatoes, eggplant, and peppers.

Nightshades are shunned by a lot of people unnecessarily because throughout history, many have been labeled as poison. Belladonna is probably one of the best-known poisonous nightshades and was traditionally valued for its use as such. The poison in the plant is related to the naturally occurring compounds they contain called alkaloids. And while it's true that nightshades contain alkaloids, the

amount in the edible plants are safe for most healthy people. In fact, we're learning that many actually improve digestion and immune function and can provide a neuro-protective effect.

I've talked about it before, and I'm sure you've read elsewhere, that plants produce their own form of chemical repellent to protect themselves from being eaten or destroyed by insects, mold, and even animals. Research continues to show that these plant compounds—alkaloids—can have a very positive effect on our overall health. (Other plant compounds like flavonoids work in much the same way by protecting the plants. These pigments produce the colors that attract beneficial pollinating insects, while repelling potentially harmful ones.)

Alkaloid compounds include solanine in potatoes (the highest concentration is found in green patches and just under the skin), nicotine in eggplant and tobacco, capsaicin in chilis, and caffeine in coffee and tea. While they may be potent enough to repel or even kill an aphid or bug, their concentration is far too low to be deadly or even harmful to healthy humans.

There are exceptions, of course. For example, someone with inadequate digestive enzymes or an improper balance of bacterial flora

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Dr. Williams works with Healthy Directions, LLC to develop his unique formulations that supply many of the hard-to-find nutrients he recommends. Dr. Williams is compensated on the sales of these nutritional supplements and health products, which allows him to continue devoting his life to worldwide research and the development of innovative, effective health solutions.

in the gut might have problems with nightshades. A compromised digestive system might not be able to handle even small amounts of alkaloid compounds. The increased immune stimulation they trigger might worsen the symptoms of an autoimmune disease like rheumatoid arthritis or psoriasis.

Also, someone whose lower intestine doesn't have the proper balance of bacteria to neutralize the alkaloids might experience increased intestinal permeability or "leaky gut." This would allow various compounds to leak from the gut into the bloodstream and set off an immune response.

The bottom line is, people who are nightshade sensitive (which is usually indicative of other underlying issues like poor digestive enzymes and/or gut flora, leaky gut, compromised immune system, and autoimmune disease) need to avoid these foods. If you're healthy and have no sensitivities, nightshades shouldn't be a problem. And keep in mind, you can reduce alkaloid content by peeling potatoes, avoiding green tomatoes, and cooking the vegetables.

Getting back to the nicotine content in common foods, it appears that eggplant might have one of the

highest concentrations. (Refer to the chart below.)

To put this in perspective, if you sit in a lightly smoke-filled room for three hours, you would absorb roughly 1 microgram of nicotine. You would absorb about 1 milligram from smoking one cigarette. It's difficult to say how much you would get from electronic cigarettes (vaping) since the amount in the liquids vary from manufacturer to manufacturer.

At first glance, compared to smoking, it might appear that eating nightshade vegetables to prevent Parkinson's might be a wasted effort. The amount of nicotine in cigarettes dwarfs that found in these vegetables, and hardly any smoker stops at just one cigarette a day. But eating more of these vegetables is not a wasted effort.

As I've explained many times in the past, if you're trying to prevent disease, it's important that your body has a constant and consistent supply of the right protective and restorative components. You don't have to consume therapeutic doses for prevention. Smaller amounts of these compounds are typically found in beneficial foods. And when consumed regularly, they potentiate the protective effects.

Even the most extensive nutritional studies generally only last a few years, but even some of those

studies have revealed that children's diets can have a dramatic effect on their health 40 or 50 years later. When it comes to diet, and supplements in particular, consistency is key. And although sooner is always better, it's never too late to start.

Treatment With NAC

The current treatments for Parkinson's focus on 1) temporarily replacing the neurotransmitter dopamine in the brain, and 2) slowing the progression of the disease process. Both goals rely on manipulating body chemistry through the use of drugs. While somewhat effective in the short term, drugs don't necessarily protect or repair the damaged neurons that produce dopamine. There is, however, a natural compound that was recently found to do just that.

Researchers at Thomas Jefferson University in Philadelphia have just reported that the amino acid N-acetyl cysteine (NAC) not only slows the advancement of Parkinson's disease but also protects the neurons that produce dopamine. (*PLoS One* 2016 Jun;11(6):e0157602)

Parkinson's patients were placed into two groups. The first group received a combination of oral and intravenous (IV) NAC for three months. They received 50 mg/kg of NAC intravenously once per week, and 600 mg orally twice a day on the non-IV days. The second group, the control patients, received only their standard pharmaceutical care.

All the patients were evaluated at the start of the study and again three months later. The assessment consisted of 1) the Unified Parkinson's Disease Rating Scale

Plant	Micrograms of nicotine/gram	Grams needed to obtain 1 milligram of nicotine
Eggplant	100	10
Green Tomato	42.8	23.4
Red Tomato	10.7	93.5
Pureed Tomatoes	52	19.2
Potato	7.1	140.4

(UPDRS), which is a survey administered by doctors to determine the stage of the disease, and a brain scan that measures the amount of dopamine transporter in the basal ganglia, the area most affected by Parkinson's.

Compared to the controls, the disease in those patients receiving the NAC stopped progressing. Additionally, they had improvements of 4–9 percent in dopamine transporter binding, and their UPDRS score improved roughly 13 percent. The researchers commented that never before had they seen this kind of effect in the treatment of Parkinson's disease.

If you know of any Parkinson's sufferers, I urge you to tell them about this study and have them discuss it with their doctors. NAC is a true game changer.

Glutathione—The Most Powerful Antioxidant

The body converts NAC into glutathione, which is one of the most powerful antioxidants and detoxifiers known. In fact, 20 years ago, in the May 1996 issue of *Alternatives*, I went into great detail about the importance of maintaining robust glutathione levels.

Your glutathione level is one of the premiere biological markers of aging. It is directly related to your overall current health and an indication of your potential longevity. Your lifespan has a strong relationship to your body's ability to repair damaged DNA, the master molecule of all body functions.

When DNA is damaged, a couple of things can happen. When there is adequate glutathione available, it can attach to the damaged area and repair it. But when glutathione

isn't readily available, oxygen attaches to the damaged area, and the damage becomes irreversible. So by increasing glutathione levels, you can slow the aging process.

Glutathione is so important to me that every morning I add about 600 mg of powdered NAC to my whey protein shake. This daily dose has been shown to raise glutathione blood plasma levels by 38 percent and levels in red blood cells by 31 percent. (*Eur J Cancer* 1995 Jun;31A(6):921–3)

(I should mention that I've eaten and tasted some horrible things in my life—insects, snakes, rodents, sea creatures, and plants that would gag an elephant. But NAC has to be one of the most horrible tasting amino acids I have ever had. You might want to consider capsules if you can't mask the taste in a protein shake. I use the bulk powder to save money, but I can stomach the taste...at least most of the time.)

You can also boost your glutathione levels by eating cruciferous vegetables. These include Brussels sprouts, cauliflower, broccoli, cabbage, kale, bok choy, cress, mustard, horseradish, turnips, rutabaga, and kohlrabi. Eating these veggies is one of the least expensive options available if you don't want to spend money on supplements.

It's no surprise to learn about the amazing effect NAC has in Parkinson's disease. Research has shown that it slows the aging process in general by protecting the brain and nervous tissue. It is also instrumental in preventing cardiovascular disease, eye problems like cataracts and macular degeneration, and almost every other

condition associated with aging. Those who have higher glutathione levels and/or eat cruciferous-rich diets also have been shown to have a significantly lower risk of developing cancers of the breast, prostate, lung, esophagus, bladder, and especially colon.

Acetaminophen Depletes Glutathione

It's important to note that acetaminophen (Tylenol) is one common medicine known to deplete both glutathione and cysteine in the liver, lungs, and kidneys.

In the 1996 issue of *Alternatives* that I mentioned earlier, I wrote about a study in which researchers evaluated the glutathione levels of three groups of animals after they were given acetaminophen. Each group represented a different phase of life (growth, maturity, and aging/senescence). Keep in mind that glutathione levels at the beginning of the study were already 30 percent lower in the aging animals than in the other two groups.

Four hours after taking acetaminophen, the glutathione levels in each group dropped 70–80 percent. After 24 hours, the glutathione in the growing animals had recovered to 94 percent of its original value, and in the mature group, it recovered to 66 percent of the original value. But in the aging group, glutathione returned to only 41 percent of its original level. (*Drug Metab Dispos* 1990 Nov–Dec;18(6):882–7)

It would be interesting to see a study that looked at the correlation between acetaminophen use

and the increase in the rate of Parkinson's disease.

Multi Benefits of Multivitamins

I want to let you know about a couple of other very significant research studies dealing with Parkinson's and Alzheimer's.

When nutraceuticals are studied, researchers typically test only one or, at most, a few ingredients. But for more than 15 years, researchers at McMaster University in Ontario have been studying the effects of a multi-ingredient supplement on brain cell loss. To date, their work has dealt with mice, but mice experience the exact same basic cell mechanisms that contribute to neurodegeneration as humans do. Their latest findings are profound, but have been largely ignored in medical circles. (*Environ Mol Mutagen* 2016 Jun;57(5):382-404)

To speed up the degeneration process, the researchers used specially bred mice that experienced characteristics of accelerated aging, which included chronic oxidative stress, mitochondrial dysfunction, insulin resistance, muscle wasting, elevated inflammatory processes, and reduced longevity. These are the same characteristics we associate with human aging.

At one year of age, if untreated, the mice lost over half of their brain cells in the midbrain region, which is comparable to what is seen in severe Alzheimer's disease. The mice exhibited all the typical symptoms of Alzheimer's such as severe cognitive decline and loss of sensory and motor function,

as well as arthritis, cataracts, and sarcopenia.

However, if the mice were given a blend of 30 different vitamins and minerals from the time they were weaned, the age-related neurological, muscle, and other dysfunctions could be prevented or significantly delayed.

The comparison testing between the mice that received the supplement and those that didn't was extremely detailed and extensive. Researchers tested smell, behavior, balance, sensory ability, motor function, problem solving, vision and eye health, and brain cell loss. The mice even got brain scans and, eventually, autopsies.

The results of taking the supplement proved to be so dramatic that the researchers intend to start human trials in the next couple of years. They feel the multivitamin/mineral can reverse dementia and other neurodegenerative conditions, and even prevent brain damage associated with aging.

This decade and a half of research is particularly exciting to me because the ingredients in the supplement they used are widely available. Here's a complete list of the nutrients: vitamins B1, B3, B6, B12, C, D, and E, acetyl L-carnitine, alpha lipoic acid, ASA, beta-carotene, bioflavonoids, chromium picolinate, cod liver oil, coenzyme Q10, DHEA, flaxseed oil, folic acid, garlic, ginger, *Ginkgo biloba*, ginseng, green tea extract, L-glutathione, magnesium, melatonin, N-acetyl cysteine, potassium, rutin, selenium, and zinc.

Even with multi-year studies like these, every few months some medical journal publishes

an article claiming multivitamins are a waste of money and even harmful to your health. Here's the standard verbiage you see in practically all of them: "Evidence is sufficient to advise against routine supplementation... The message is simple: Most supplements do not prevent chronic disease or death, their use is not justified, and they should be avoided." (*Ann Intern Med* 2013 Dec;159(12):850-1)

Although there are thousands of studies that prove otherwise, government agencies that have our best interests at heart (yeah right!) cherry-pick their supporting research when trying to discount the use of supplements. The party line has always been that vitamins are useless at best and harmful at worst. The US Preventive Services Task Force has concluded that there is no persuasive evidence to suggest that routine supplementation offers any meaningful benefits.

This is undoubtedly one of the reasons we spend more on health care per person than any other country on the planet (18 percent of our gross national product and growing), yet the efficiency of our health care system ranks 46th out of the top 48 countries. And in the last 20 years, our life expectancy has dropped from 13th out of the top 34 industrialized nations, to 26th.

If you don't already, start taking a daily multivitamin/mineral supplement. You can bet every one of these researchers is taking one. They darn sure aren't waiting for

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Alternatives MAILBOX

Zika-Proofing Yourself

Question: I live in Florida and the whole situation with the mosquito-born Zika virus scares me. Although I have no plans to become pregnant, I do want to protect myself and my family. However, I prefer not to douse everyone in DEET every time we leave the house. No one seems to know how long this is going to be a problem and the effects of continuous DEET exposure can't be good. Do you know of any natural mosquito repellents that actually work?

— Karen F., Miami, FL

Answer: The Zika virus is a huge problem, particularly in areas like yours where there's no really cold winter to provide a reprieve from pests like mosquitoes.

Although DEET is one of the best insect repellents available and generally considered safe, I too am leery about what potential issues could be associated with continued long-term use. Possible side effects include skin and eye irritation, insomnia, seizures, and in children under two years of age and pregnant women, it may affect the nervous system. Just the fact that DEET can "melt" some forms of plastic and synthetic materials is a little spooky to me.

DEET-containing repellents come in various concentrations. After a certain point, though, higher concentrations of DEET don't make the product any more effective. Concentrations over 50 percent provide no added protection. The higher concentrations only mean the product stays effective for a longer period of time.

According to the Centers for Disease Control and Prevention, a DEET concentration of 5–10 percent provides two to three hours of protection. A concentration of 15–24 percent provides four to five hours of protection, and a concentration of 25–30 percent provides up to six and a half hours of protection.

Another chemical, picaridin (often referred to as Icaridin and Bayrepel), was recently approved by

the EPA and CDC. It is just about as effective as DEET and reportedly doesn't irritate the skin or damage plastics.

I've talked about Avon's Skin So Soft Bug Guard before. This product contains a chemical called IR3535 and it is only effective against mosquitoes for short periods of time—approximately 20 minutes to an hour.

Another effective insect repellent is the chemical permethrin, but it is not meant to be applied to the skin, only clothing.

Natural Repellents

Fortunately, there are a couple of natural alternatives that work about as well as DEET. It's important to keep in mind that it's probably impossible to stop all mosquito bites. Even with the best efforts, you can only hope to minimize that danger as much as possible.

The most effective plant-based insect repellent comes from the Australian gum tree *Eucalyptus citriodora*, also referred to as the lemon eucalyptus. The extracted active ingredient is called oil of lemon eucalyptus (or Citriodiol here in the states).

Citriodiol can be used on the skin, but like many essential oils, it can cause irritation at higher concentrations. It is not recommended for children under the age of three. It is sold in this country under the name Repel Lemon Eucalyptus Repellent.

Consumer Reports recently evaluated several insect repellents and their effectiveness against the *Aedes* mosquito, the one that carries the Zika virus.

The 30-percent oil of lemon eucalyptus found in Repel was found to work for at least six hours and was comparable to a 25-percent DEET product by OFF! Unlike DEET, Repel smells great and doesn't affect plastics. (The top three products specifically for use against the *Aedes* mosquito were Sawyer Picaridin, Natrapel 8-Hour with picaridin, and OFF! Deep Woods VIII with 25 percent DEET).

Repel can be found online and wherever insect repellents are sold.

There are several other essential oils that work as insect and mosquito repellents (catnip, citronella, neem, etc.). However, they don't always protect the same when it comes to the different species of mosquitoes. Since your concern is the Zika virus, I've

limited the discussion to specific products that have been tested on the *Aedes* mosquito.

If the commercial products I mentioned weren't available and I had to make my own, though, neem oil would be near the top of my list. A mixture of 2 percent pure neem oil with coconut oil can provide 85 percent protection from the *Aedes* mosquito.

Most of the studies on the effects of neem oil on mosquitoes have been done in India and deal with the *Anopheles* species, which transmits malaria. The same mixture above was shown to provide 96–100 percent protection against that species. It is also worth noting that kerosene lamps with 1 percent neem oil burned from dusk to dawn in living rooms in India kept mosquitoes out of the room and dropped the incidence of malaria from roughly 10 cases per thousand to only one in a thousand. (*J Environ Biol* 2014 Sep;35(5):917–22) (*J Am Mosq Control Assoc* 1993 Sep;9(3):359–60)

Pure neem oil is readily available online for about \$1 per ounce and organic coconut oil is sold in most grocery and health food stores for about 50 cents an ounce. At these prices, this combination may be one of the least expensive bug and mosquito repellents available. And it appears from the research that you

may be able increase the length of its effectiveness significantly by adding vanillin.

Vanillin is the primary compound found in vanilla extract. It is often added to perfumes to keep any essential oils from evaporating too quickly so that the fragrance lasts longer. Vanilla extract (5 percent) can be added to the neem (1 percent) and coconut oil (94 percent) to reduce the volatility of the neem oil and give it a longer-lasting effect.

Repellent Clothing

Finally, you won't win any fashion awards, but the right clothing can also help you avoid bites. I'm not talking about chemically treated clothes, but instead "bug clothing." There's a company in Canada that sells hooded bug jackets and pants that work very well at keeping people from getting bitten by mosquitoes and black flies. A complete suit with gloves costs around \$75 and comes in both adult and kid sizes. These clothes may not look all that cool, but since they are made of mesh, they help you stay cool in hot weather. It is another way to deal with mosquitoes without having to apply chemicals.

This specialized clothing line is available from Lee Valley Tools (800-871-8158; leevalley.com). Check the gardening section of the site, or simply type "bug clothing" in the search box. ■

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any government recommendation or human study to be completed.

Exercise—No Excuses!

There's one final area that's crucial to brain health: exercise. If you think you don't have the time to exercise, think of another excuse because all it takes is 10 minutes to reap the benefits.

It was once believed (and taught in school) that we are stuck with the number of brain cells that we were born with. But we now know that isn't the case. Research has shown that new nerve cells or neurons are created (a process called neurogenesis) in at least

two circumstances—survival and exercise.

New and exciting experiences have been shown to increase neurogenesis, whereas sedation, stress, routine, and aging decrease neurogenesis.

When your environment changes, neurons are created as a survival mechanism. The change might be from learning a new skill or language, exploring, traveling, changing jobs or locations, etc.

Based on various studies, exposure to an enriching environment triggers stem cells that increase the number of brain neurons by around 15 percent within the first month. However, it takes two

months for the neurons to fully develop. Under normal conditions, roughly 50 percent of the neurons are able to "reach out" and make the necessary connections to survive. The survival rate can be increased to around 80 percent with the addition of exercise. Exercise boosts the production of a protein called noggin (of all things).

Increases in noggin result in more stem cell divisions and subsequent neurogenesis. Higher levels of noggin have been shown to promote tissue repair and improve functional recovery from stroke. Even after years of inactivity, noggin can "wake up" adult stem cells. So it's really never too late to start exercising. (*Neuron* 2000

Dec;28(3):713–26 (Brain Behav Immune 2014 Aug;40:143–54)

And although the exact amount of exercise needed to raise noggins to optimal levels hasn't been determined, it appears only short periods of regular activity are necessary to see significant changes. One way we know this is true is by measuring glucose utilization. Glucose, measured as blood sugar, is one of the body's primary sources of energy, particularly in the brain.

Neurons have the highest energy demand and require a continuous delivery of glucose from the blood. Although the brain makes up less than 2 percent of our body weight, it consumes 20 percent of glucose-derived energy. Researchers have found that regular exercisers have a long-term increase in glucose utilization in areas of the brain where neurogenesis takes place. This is one of the reasons type 2 diabetics can lower and return their blood sugar levels to normal with exercise and avoid the need for medication.

You may have heard about the recent 12-week study showing that three minutes of intense intermittent exercise per week, with a total commitment time of 30 minutes for the entire week, is as effective as 150 minutes per week of moderate-intensity continuous training. (*PLoS One* 2016 Apr;11(4):e0154075)

A total of 27 out-of-shape men were divided into two groups. Both groups worked out three times a week using stationary bicycles.

The first group did sprint interval training. Each of the three

workouts for the week lasted 10 minutes and consisted of:

- 2 minutes of easy cycling warm-up
- 20 seconds of "all-out" cycling
- 2 minutes of easy cycling
- 20 seconds of "all-out" cycling
- 2 minutes of easy cycling
- 20 seconds of "all-out" cycling
- 3 minutes of easy cycling for cool-down

The second group's workout consisted of:

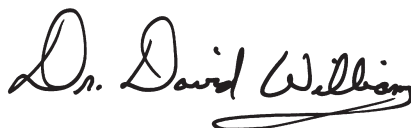
- 2 minutes of easy cycling warm-up
- 45 minutes of continuous moderate pace cycling
- 3 minutes of easy cycling for cool-down

At the end of 12 weeks, the benefits (improvements in cardiorespiratory fitness, blood sugar, muscle adaptation, body mass, etc.) were almost identical in both groups, even though one program involved five times as much exercise and a five-fold greater time commitment.

It's hard to believe that anyone could be too busy to take only 10 minutes three times a week to exercise. You don't need a stationary bike to do this. Three 20-second bursts running or quickly climbing a staircase, interspersed with walking in between, will only take 10 minutes out of a lunch hour.

If you don't want to invest 30 minutes a week to improve your blood sugar or cardiorespiratory health, then do it to keep your brain intact and prevent neurological diseases.

Until next month,



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