

A “Musical” Treatment for Sleep Apnea

One of the more common questions I receive from readers has to do with how to treat sleep apnea.

Sleep apnea is a growing problem to say the least. Some reports say it afflicts at least 25 million people in this country alone. It is



now estimated that 26 percent of adults between the ages of 30 and 70 have sleep apnea.

Dr. David Williams Obstructive sleep apnea has gotten much worse over the last two decades and just so happens to coincide with our obesity epidemic. If you’ve been around someone with the problem, the signs aren’t hard

to recognize. Snoring, choking, gasping for air, and silent breathing pauses are all telltale signs.

When it comes to treatment, weight loss can help, as can specially designed mouthpieces and CPAP (continuous positive airway pressure) machines that get worn at night. However, weight loss can be difficult and learning to sleep with a mouthpiece or facemask presents challenges.

Sleep apnea hasn’t received the attention it deserves and, as such, it typically gets treated as more of nuisance than a potentially serious health problem. During those silent prolonged pauses between breathing, oxygenation of the blood decreases. And when certain body tissues regularly get deprived of oxygen, it begins to take a toll. This is particularly true in highly oxygen-sensitive areas like the brain and heart.

In one study, researchers found that those individuals with severe, untreated sleep apnea had a reduction in the integrity of brain white matter tissue, which was accompanied by impairments in cognition, mood, and daytime alertness. (*Sleep* 2014 Sep;37(9):1465–75)

Another study found additional anatomical and functional

changes in the brainstems of sleep apnea patients—however most of those functional changes could be reversed by using a CPAP machine for six months. This clearly illustrates the importance of ensuring adequate oxygen reaches brain tissue. And the effects of oxygen starvation to the heart muscle can be just as devastating. (*Neuroimage* 2014 Dec;103:258–66) (*Neuroimage Clin* 2015 Feb;7:799–806)

Researchers in Sao Paulo, Brazil studied 1,101 volunteers and found that nocturnal cardiac arrhythmia (irregular heartbeat) was present in 92 percent of patients with severe sleep apnea compared to only 53 percent without sleep apnea. The more severe the sleep apnea was, the greater the arrhythmia. (*Arq Bras Cardio* 2014 Nov;103(5):368–74)

Numerous studies have repeatedly shown that CPAP therapy can help reduce abnormal blood pressure. Cardiovascular surgeons are now starting to screen for sleep apnea and prescribe CPAP therapy prior to surgery whenever possible. Doing so cuts postoperative cardiovascular complications like cardiac arrest and stroke by more than half. (*J Hypertens* 2014 Dec;32(12):2341–50)

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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

(*Anesthesiology* 2014 Oct;121(4):707-18)

There's no doubt that CPAP therapy works. Users readily notice an improvement in their sleep and energy levels. CPAP forces air through the nose, into the throat, and to the lungs. The air pressure keeps the tissues in the nasal cavity and throat area from collapsing, which would block the airways and cause snoring. With obesity, there's an accumulation of extra fatty tissue in the throat that precipitates the problem. Alcohol consumption can also make things worse by relaxing the muscles in the throat, leading to airflow constriction.

The problem with CPAP, however, is compliance. Most people find it uncomfortable to wear a mask with a tube all night. Plus, it's noisy, it dries out the nose and throat, and the additional air pressure causes some people to have earaches and/or headaches. With time and patience, most users can overcome these frustrations and start to experience the health benefits. But some can't and are always searching for less troublesome ways to treat their sleep apnea. Fortunately, there is a very interesting alternative...

Circular Breathing

A study out of Switzerland found a very unique method to exercise

and strengthen the muscles along the airway and treat sleep apnea naturally. The technique involves playing the didgeridoo. (*BMJ* 2006 Feb;332(7536):266-70)

I became quite familiar with the didgeridoo years ago in Australia when I worked with the various Aboriginal tribes. It is thought by many to be the world's oldest musical instrument. You've probably seen these long, hollow, tubular instruments and heard the distinctive sounds they create.

For purposes here, what makes a didgeridoo unique and particularly good for treating sleep apnea is the breathing technique utilized to play it, called circular breathing. Circular breathing involves inhaling air through the nose and using the throat muscles to separate exiting mouth air from the incoming lung air. It allows one to simultaneously inhale through the nose while blowing out air from the mouth without any pauses.

If you've ever wondered how saxophonist Kenny G can sustain such long notes, it's though circular breathing. He even earned a place in the *Guinness Book of World Records* for playing the longest musical note ever recorded...over 45 minutes.

You don't have to become as proficient as Kenny G to correct sleep

apnea. The Swiss study proved this.

The study involved 25 patients who had moderate sleep apnea (15-30 episodes per night). Some were given plastic didgeridoos, which are easier to learn on than the traditional wooden instruments. They were also given lessons in proper lip technique and circular breathing. They were required to practice at home for a minimum of 20 minutes a day, five days a week for four months. (By the end of the study, most participants enjoyed playing the instrument so much that they practiced more often and for longer periods of time.)

At the end of the four-month study, those using the didgeridoos experienced significantly less daytime sleepiness, fewer episodes of sleep apnea, and their bed partners had less sleep disturbance as well.

If you've tried CPAP and are looking for an alternative treatment, a didgeridoo could be a viable option. Fortunately, you don't have to travel to the outback to purchase one or learn to play. And you don't need the traditional eucalyptus branch hollowed out by Australian termites. There are dozens of places that sell these instruments starting at around \$25 (including didgeridoostore.com, eBay, and Amazon) and they often include an instructional CD to help

Alternatives® Author: Dr. David Williams; Editor: Larissa Long

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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.

teach circular breathing. There are numerous free instructional videos on YouTube, and you can even make your own didgeridoo from PVC pipe (wikihow.com/Make-a-Didgeridoo-out-of-PVC-Pipe).

To be honest, in all the years I spent in Australia, I never came close to mastering the didgeridoo or perfecting my circular breathing. Fortunately, you don't have to master either technique to enjoy the sleep apnea benefits. And you may even find that you like playing the didgeridoo enough to take it up as a hobby. In fact, researchers found that the majority of those in the study continued to play the didgeridoo even after the study ended. ■

Wasp Sting Relief

I'm not sure if it's the dry weather this summer, but I seem to have an overabundance of wasps on my property. If you're ever in the same predicament where you live and happen to get stung, there are a couple of simple remedies that can help stop the pain, swelling, and discomfort.

The best remedy I've found is to quickly apply a paste made from baking soda and vinegar directly to the sting. To make the paste, pour the vinegar on a napkin, paper towel, or cotton cloth and sprinkle the baking soda on top. You will notice bubbling and fizzing as the alkaline soda combines with the acidic vinegar. I've used this simple paste to treat wasp, bee, and even scorpion stings with amazing success.

If there's no vinegar and baking soda handy, try rubbing a freshly sliced onion on the sting.

Finally, if you or someone in your family has a known allergy to stings from wasps or other insects, an epinephrine injection can be a lifesaver, and an EpiPen is one item you should have around at all times. If you have a prescription, there's currently a way you can get the EpiPen for free. Either call Mylan, the company that makes EpiPen, at 1-800-395-3376 or visit epipen.com, print the \$0 co-pay offer card, and present that with your prescription. You can receive as many EpiPens as you need for the rest of the year. ■

Dealing With Dehydration

There are many challenges that can arise when raising young children. Dealing with dehydration caused by diarrhea is one. Diarrheal diseases account for one in nine childhood deaths worldwide, making it the second leading cause of death among children under the age of 5.

Fortunately, the death rate in this country is low compared to many third-world countries, where drinking water, sanitation, and hygiene is substandard and the availability of oral rehydration salts and zinc supplementation is scarce.

The problem we face in this and other Western countries is the ever-growing threat of new and mutated viral strains spreading globally. As the overwhelming immigration situation in Europe

has illustrated, the movement of people worldwide can rapidly bring with it a variety of diseases we are often unprepared to handle.

Currently, a new strain of norovirus, GII.17, has emerged out of China. The norovirus has been around for years, but every few years we see a new, more virulent, mutated variety like the GII.17. It's just the kind of virus that has the potential to spread quickly throughout world, causing extreme vomiting and diarrhea.

Noroviruses like this one have the potential to sicken hundreds of millions of people worldwide. They are highly contagious and transmitted by infected food and people. In this country, norovirus infections are often referred to as the "stomach flu;" elsewhere they use

the term "winter vomiting disease." Antibiotics don't work and no vaccine is available.

Cruise Ships Can Predict Epidemics

One fairly reliable predictor of whether we will see an epidemic of these infections in the upcoming winter is the number of outbreaks we see on cruise ships during the summer.

Cruise ships carry a mix of passengers from all over the world and provide a controlled environment where people are forced to dine, socialize, and mingle together. They are like a micro-world environment where we can watch

(continued on page 7)



Alternatives MAILBOX

SPG Block for Migraines

Question: For years I've suffered from migraine headaches and nothing has seemed to help. I recently read about a procedure called an SPG block. Is that something you would recommend trying?

— Rose S., Mansfield, MO

Answer: An SPG block refers to a technique that deadens the sphenopalatine ganglion. This is a nodule or cluster of cell bodies that make up a central transmission point for motor and sensory nerves in the head and neck. It can be an effective technique for stopping migraine and cluster headaches. It's typically not a complete cure, but in many cases it reduces the number and severity of future headaches, and it can always be repeated.

At the Society of Interventional Radiology annual meeting in 2015, SPG blocks were reportedly used on 112 chronic migraine patients. Prior to treatment, patients reported headache severity on a scale of 1 to 10, with 10 being the most debilitating. They averaged 8.25, with scores greater than 4 at least 15 days a month. The day after treatment, their average scores were cut in half to 4.10. And 30 days after treatment, they reported scores of 5.25, which equates to a 36 percent decrease from their pretreatment scores. And 88 percent of the patients reported they required less or no migraine medication for ongoing relief.

How SPG Blocks Work

This technique has been around since the early 1900s, but it seems as though lately it has regained a degree of popularity. It involves the patient lying on his/her back. Hollow, cotton-tipped applicators (they look like large Q-tips) soaked with 4-percent lidocaine are inserted straight back (perpendicular to the floor and parallel with the roof of the mouth) into each nostril until they touch the back of the throat. This is the location of the sphenopalatine ganglion. The swabs are left in place for 20–45 minutes. A small amount of

additional lidocaine can be added either through the hollow tube or by trickling it down the shaft.

The lidocaine numbs this nerve junction or “blocks” the transmission of nerve impulses. Although it may sound painful, it's not. In fact, some doctors teach their patients how to perform the procedure on their own when they feel a headache coming on.

As I said earlier, this procedure typically doesn't prevent future headaches or totally cure the problem.

Oftentimes other underlying issues have to be addressed, and the best results I've seen for totally eliminating migraines is chiropractic care. Correcting misalignments in the cervical spine, correctly repositioning various bones in the skull, and/or correcting problems with the jaw joint (temporomandibular joint or TMJ) often resolves the problem.

Hormone imbalances, histamine intolerance, blood sugar issues, nutritional deficiencies (vitamins D, B2, and coenzyme Q10), muscle tension, and phenylethylamine reactions from chocolate, cheese, and red wine can also be contributing factors.

Melatonin for Migraines

In past issues, I talked about research studies that have shown how various wavelengths of light affect the brain. If you recall, bright light (particularly blue light) close to bedtime can suppress the pineal gland's production of melatonin, the hormone that helps promote sleep. New research shows that blue light can also make the pain of a migraine more severe. On the other hand, low intensity green light can ease migraine pain. Exactly why green light reduces migraine pain isn't understood, but when 69 migraine patients were tested, the green light decreased pain by about 20 percent.

Migraine patients have been shown to typically have significantly lower melatonin levels at night when compared to healthy controls. And it's interesting to note that, unlike in healthy controls, melatonin levels in migraine patients don't increase during the menstrual cycle like they should. This helps explain why menstrual migraine headaches are very common in women.

Taking 3 mg of melatonin 30–60 minutes every night before bedtime has been shown to eliminate migraine headaches for both men and women. However, one problem with melatonin is that the half-life in the body is only 30 minutes to two hours. This

explains the mixed results people have when trying to use melatonin to improve sleep.

What may be an even better way to increase nighttime melatonin levels is to drink tart cherry juice. Tart Montmorency cherries contain high levels of melatonin, and the juice appears to be more bioavailable than most supplements.

In one study, a group of 20 volunteers were divided to receive either cherry juice twice a day (the first when they woke up and the second before bed) or placebo. The drink was made by adding 1 ounce of cherry concentrate to one pint of water.

At the end of seven days, those drinking the tart cherry juice had significantly higher levels of melatonin, napped less, slept longer at night (an average of 39 additional minutes), and experienced more restful sleep. Those taking the placebo drink had no change in their sleep habits. When the two groups switched and the placebo group received the tart cherry juice and vice versa, the results were the same. Additional studies have found similar results. (*Eur J Nutr* 2012 Dec;51(8):909–16) (*J Nutr Health Aging* 2013;17(6):553–60)

I've recently seen 100-percent tart cherry concentrate available online and at Costco, Sam's Club, and other discount outlets. In addition to increasing melatonin levels, this same juice concentrate has been shown to be effective for stopping gout attacks and reducing the pain and inflammation associated with osteoarthritis. It may even reduce the growth of human colon cancer cells. (*Cancer Lett* 2003 May;194(1):13–9) (*Cancer Chemother Pharmacol* 2009 Jun;64(1):201–11)

To help increase natural levels of melatonin, it's also important to avoid bright lights before bedtime. This can be a problem for most of us since the LED screens on TVs, smartphones, computers, and video games produce a great deal of blue light. Exposure to these screens two hours prior to bedtime has been shown to reduce melatonin concentrations by 22 percent. If you plan on using any of these before bedtime, one of the simplest ways to block the blue light is with special blue light-blocking glasses. To be effective, glasses need to block almost all blue light.

Fortunately, tests have shown that some of the least expensive pairs of glasses work the best. They are called the Uvex Skyper orange-tinted safety glasses (Model S1933X). They sell for about \$10. Wearing these a few hours before bedtime and/or when you're

using a computer or other device with an LED screen could help to naturally increase melatonin levels and prevent future migraines.

Brain Freeze

There's another technique you might want to try next time you feel a migraine or cluster headache coming on. You could call it the "poor man's SPG blocking technique."

When something cold like ice cream, an ice slush drink, etc., sits against the roof of the mouth too long, it induces a mild temporary headache known as brain freeze. (The technical term for brain freeze is sphenopalatine ganglioneuralgia. The "algia" at the end of the word means pain. Neuralgia means nerve pain.) Some people find that inducing a brain freeze has a similar effect as the SPG block.

The top and back of the mouth have a rich blood supply. It's one of the reasons we take body temperature there. Ice cream and other cold drinks and food rapidly cool the area at the back of the throat. This area houses the juncture of the internal carotid artery, which feeds the brain and the anterior cerebral artery, where the brain tissue starts. When the brain detects this rapid decrease in temperature, it realizes this isn't normal and sends out a warning signal in the form of pain to stop it. (Although the brain doesn't feel actual pain, there are pain receptors in the meninges or outer covering of the brain.)

There's research to show that some of these sudden headaches are triggered by a change in blood flow in the anterior cerebral artery. Using Doppler to monitor blood flow, researchers discovered that the anterior cerebral artery dilated rapidly and flooded the brain with blood when the volunteers felt the pain of brain freeze, and then the same blood vessel constricted as their pain subsided.

It's not the change in temperature that causes the pain of a brain freeze. The increased volume of blood pumping into the brain puts pressure on the meninges, and this triggers pain at the base of the brain where the two arteries and meninges meet. Then the trigeminal nerve, which is responsible for all facial sensation, transmits pain impulses to the forehead and face.

Many people find that the temporary headache associated with brain freeze stops their migraine or cluster headaches before they have a chance to take hold. In other words, eating ice cream or

drinking a slushy cold drink and inducing brain freeze stops headaches. In the study, volunteers sipped ice water with the straw pressed against their upper palate to trigger brain freeze.

In summary, I think SPG blocks are certainly a viable option for you to consider. And I'm always game for a little self-induced brain freeze, especially when it's from homemade vanilla bean ice cream.

Nerve Healing Post Injury

Question: In 2012, I suffered from an injury that burst two of the vertebrae in my lower spine (lumbar 3 and 4). I had surgery and was told I would be paraplegic. However, I have undergone numerous therapies and I'm currently going to a trainer three days a week, walking with two canes, and trying to gain strength and balance. Progress is very slow. Right now I have nerve pain-type symptoms in my right foot and much difficulty with digestion. My therapist suggested digestive enzymes and probiotics. I am very healthy, very strong, and have no other health problems. Please let me know what other things might be helpful. I don't believe there is any nerve degeneration, just the previous damage. — A.M.

Answer: With the limited information you have provided, I can try to give you some insight about how I would approach your situation. When I was in active practice, I treated numerous patients with nerve damage, paralysis, etc. Every situation was different and, as such, there was never one single treatment program that worked for everyone.

First, with nerve damage, the quicker you start treatment, the better. One of the things I found was it's very important to keep the nerve tissue itself from degenerating. For the most part, nerves get their "nutrition" from very small blood vessels, but there also seems to be a nutrient-type fluid (similar to cerebral spinal fluid) that transverses along peripheral nerves that is often neglected or discounted. The nutrient factor can be addressed with various supplements I'll mention later, but one of the first things to do is keep the nerve from atrophying or dying. To do so, electrical impulses need to continue to travel along the nerve. Electrical impulses change electrical potential along the nerve walls and facilitate the movement of nutrients into and waste material out of the nerves themselves. This is one reason why exercise helps to re-energize nerve connections

that supply muscles and organs. Having said all of this, one of things I found to be most helpful was the TENS unit. There are many available to the public nowadays for as little as \$30.

If you know exactly what nerves are involved (in your case, the nerve roots of L3 and L4), you can go online and look at anatomy drawings that show the path of these nerves and which muscles they innervate. I used to mark the skin with a marker to show where these nerves ran and then have patients place one of the TENS pads at the beginning of the nerve (in your case where it exits the spinal column and another pad further down the leg near to where the nerve ends). The TENS unit would then be set to a "pulsed" setting for about 10–15 minutes two or three times daily, which allows an electrical impulse to travel along the nerve and help keep it alive.

The TENS unit was also used to help keep any associated muscles with the damaged nerves from atrophying or deteriorating. For example, in your case, if there are specific muscles in your legs that are still weak or not functioning properly, place one pad at the origin of the muscle and the other pad at the insertion of the muscle. (You can also find charts online that demonstrate these specific areas.) Gently turn up the power on the TENS unit until you see a mild contraction of the muscle. Depending on the particular TENS unit, hopefully it can be set to start slowly and gradually increase intensity until a contraction occurs and then repeats. This contraction or "pumping" of the muscle helps improve circulation, which supplies nutrition, reduces scar tissue, and helps keep the muscle "alive" until the nerve has healed and is able to properly control the action of the muscle once again.

I would start using a TENS unit as quickly as possible to prevent any further deterioration and help speed up recovery.

Nutrients for Nerve Healing

Nutritionally, there are several compounds that have been shown to help with nerve healing and regeneration. Many of the studies have focused on nerve tissue in the brain to repair damage from injuries such as a stroke. The ones I'll mention, however, have specifically been shown through research to help restore peripheral nerves like those involved in your injury.

The list is pretty extensive and that's why I firmly believe the very first supplement you consider should be a quality multivitamin/mineral. In one

fell swoop, it will provide many of the B vitamins, trace minerals, and essential fatty acids that nerves require for maintenance and/or repair (lithium vitamins D and E, acetyl-L-carnitine, alpha lipoic acid, and green tea extract, for instance).

Another area that I've been researching and writing about for decades is bone broth. (Lately, it has become a bit of a "food trend.") In your case, I think it could be tremendously beneficial. In addition to being an excellent source of trace minerals, it provides many of the protein fractions that are needed for muscle and connective tissue growth and repair. For details on preparing and using bone broth, visit my website at drwilliams.com.

Also add gelatin to your regimen. Although bone broth contains gelatin, preparing the broth is not always convenient. That's why I suggest taking powdered gelatin on the days you don't have bone broth. I wrote an extensive article on gelatin in the September 2012 issue. (Subscribers have access to past issues of my newsletter at drwilliams.com.)

One final item I would recommend including in your regimen is lecithin granules. I personally use Non-GMO sunflower lecithin. I suggest taking 1–2 tablespoons a day. It can be eaten by the spoonful, sprinkled on a salad, or added to a protein shake (which is what I do). Lecithin is essential to repairing the myelin sheath, the "insulation" around nerves.

I should also mention that cholesterol is an essential component of myelin, so one of the worst things one can do, in my opinion, is to use cholesterol-lowering statin drugs. I won't cover all the details here, but statins have been

shown to inhibit the repair of nervous tissue by blocking the production of myelin by cells called oligodendrocytes. I don't recommend statins, ever, most especially if you are trying to repair or rebuild nerve or muscle tissue.

As for your digestive issue, you didn't specifically mention what problems you're having, but with these nerves involved, it is very often diarrhea or constipation. Bowel movement also requires proper nerve function, and that should improve with time. Probiotics might not fully remedy the situation, but I would still recommend taking a quality probiotic supplement every day. And don't forget about fermented foods (homemade sauerkraut, kimchi, pickled vegetables, etc.), which are also naturally rich in probiotics.

Make sure you're drinking plenty of water. And if possible, I would try not to rely on laxatives. The effects of long-term use can be a nightmare.

Nerve healing is very often a long process and, as I said earlier, it would have been best to implement these recommendations almost immediately after the injury. However, the body is made to repair itself when given the right materials and environment. It's difficult to get any more specific based on the limited amount of information you gave me, but I hope this gives you some additional avenues to explore as you continue the healing process. Even so, it sounds like you've made a remarkable recovery thus far and I wish you all the best as you continue this journey. ■

(continued from page 3)

the effects of a viral epidemic at an accelerated pace.

Once an infection gets started, it's amazing to me that those working on cruise ships have any chance of stopping it from spreading. According to the Centers for Disease Control and Prevention (CDC), as little as 18 viral particles on food, hands, or surfaces can make someone sick. This means that the number of viral particles

on a pinhead is enough to infect more than 1,000 people.

Viruses have become a nightmare for cruise lines, forcing them to become experts at isolating passengers in their rooms and disinfecting ships during and between cruises. If, not when, we start to see these types of outbreaks in the general population, isolation will be one of the first recommendations for avoiding infection. The CDC reported 23 norovirus

outbreaks on cruise ships in 2015, compared to 17 in 2014. This new norovirus strain has been detected all over Europe, Asia, South America, Australia, and the US.

If you recall, earlier this year Chipotle restaurants had a nationwide closure due to a norovirus outbreak that affected hundreds of employees and customers. And one of the latest outbreaks involved

13 California delegates to the Republican National Convention.

Protect Against Dehydration

The CDC says norovirus causes 19–21 million cases of acute gastroenteritis a year in the US alone. It results in 400,000 visits to emergency departments, between 56,000 and 71,000 hospital admissions, and at least 800 deaths. The deaths occur mostly in young children and the elderly.

Small children with even mild gastrointestinal problems can quickly lose significant amounts of fluid and essential electrolytes. And unlike adults, it can be difficult to get them to drink electrolyte solutions to restore the necessary balance.

Fortunately, children and adults alike can use a homemade oral rehydration solution. This is the most basic solution, with ingredients that can be found practically anywhere in the world. And this formula meets 100 percent of the WHO and UNICEF guidelines for oral rehydration salts:

Ingredients:

- 6 level teaspoons of sugar
- 1/2 level teaspoon of salt
- 5 cups of clean drinking water

The recommended intake is:

- Under 2 years of age, give a minimum of 1/2 cup after each bout of diarrhea
- Over 2 years of age, give a minimum of 1 cup of after each bout of diarrhea

Better Than Pedialyte

Many rely on Pedialyte as a rehydration drink. Unfortunately, it's little more than sugar water

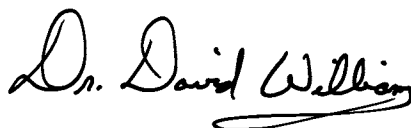
with an abundance of artificial flavors, colors, and sweeteners like acesulfame potassium and sucralose. In fact, Gatorade is far less expensive, tastes much better, and promotes rehydration probably equally as well as Pedialyte.

There are numerous variations and formulas for oral rehydration. Some include various amounts of water, orange juice, lemon juice, honey, coconut water, celery juice, V8, etc. I'm sure some of these formulas probably work, but these ingredients aren't always readily available or proven to be effective. But water, sugar, and salt are practically everywhere.

A study involving 647 children between the ages of 6 months and 5 years has shown that diluted apple juice can also successfully restore electrolyte balance in children with mild gastroenteritis. Children given half-strength apple juice experienced treatment failure and required intravenous rehydration less often than those given a commercial electrolyte maintenance solution. (*JAMA* 2016 May;315(18):1966–74)

I recommend saving this issue of *Alternatives*. (Hopefully you save them all.) Having this information during times of a widespread viral pandemic can be a lifesaver.

Until next month,



This Month Online



Visit my website at **drwilliams.com**, where you'll find information and recommendations for many of your top health conditions, including:

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