

**This is Not a Fad and Your Heart Will be Glad,
For the Truth Must Come Out: Not All Sugars are Bad.**

From an athlete recovering from an intense workout, to newborn parents, to a heart attack survivor going from a sitting to a standing position, most of us are familiar with the feeling of fatigue. Being fatigued is all about not having enough energy. The intensity of your body's energy demand along with its ability to restore deficits in the ingredients used up in the energy production process, is proportional to the severity and duration of fatigue related symptoms.

Most often fatigue and energy can be linked to diet and lifestyle. What you eat and drink, your quality of sleep, and the amount of exercise that you get each day are the keys to determining how your body feels and how healthy you really are. Rightfully so, among the most demonized substances that we put into our bodies are refined sugar and carbohydrates. They promote inflammation by altering our gut flora and stripping our bodies of the nutrients necessary to maintain a healthy balance.

While we have the freedom to choose what we put into our bodies and how active we are, moderation is not often a factor for those of us who ingest refined sugars and carbohydrates faster than they can be metabolized while at the same time getting little to no exercise to burn it off. Over time these eating patterns and lethargy create confusion and delay with our bodies, making our systems less resilient at maintaining harmony. However, would you be surprised that not all sugars are bad? It's true. Would you be interested to know that in the energy production process sugar can be utilized as a medicine? If so, read on as we highlight and explore the benefits provided by the simple sugar known as D-Ribose. Ongoing research indicates that D-Ribose can be a useful tool to boost athletic performance, and improve symptoms of chronic fatigue syndrome, fibromyalgia, congestive heart failure and more.



As we have discussed in previous newsletters, stress is at the core of how we feel from day to day. Stress not only depletes energy, but it hampers the body's ability to produce energy efficiently. The effects of stress can linger long after the stress itself has passed. In fact, it is the stress that we have experienced in the past, both long and short term, which can be an indicator of what our health condition is during the present. If left unchecked, the dysfunction that can develop over prolonged periods of stress can produce many undesirable symptoms. Muscle pain and weakness, loss of memory and difficulty concentrating, headaches, unrefreshing sleep, poor detoxification, and slow healing are all related to energy production.

The more stress the body experiences the higher the energy demand will be on the body in order to deescalate the situation. The interval between which the body makes new energy to replenish the energy that has been spent is not synchronous however, which is why fatigue most routinely takes several days to recover from. In truth, ATP, adenosine triphosphate, provides energy for every move you make and every process and chemical reaction that takes place in your body. When the energy level drops to such a degree that the body is no longer able to carry out its many functions and processes efficiently, the body is at increased risk for developing the disease states that routinely occur across much of the Western population today.



Consider this, our immune system is driven by energy to fight infections and eliminate toxins, and it never takes a break. We need energy to digest our food and transport our nutrients into our cells, which need energy as well to repair, and rebuild our bodies. Our muscles, especially our hearts are constantly burning energy. So, what is it that you can do today to reduce fatigue and stress, improve heart and muscle function, shorten recovery time, and generally maximize your body's ability to achieve health and wellness? The answer, give your body the tools that it needs to effectively and efficiently produce energy. In short, consider supplementing with D-Ribose.

Vitamin C, the family of B Vitamins, good cholesterol and glucose, are necessary to make CO Q10. CO Q10, magnesium, L-Carnitine and D-Ribose are the building blocks for the production of energy in the form of ATP (adenosine triphosphate). ATP is critical to health and it allows us to maintain energy for every cell in our bodies. D-Ribose is the fuel that is essential for the body to make ATP and replenish energy stores in the mitochondria of each cell. The mitochondria is known as the "powerhouse" of the cell, since it is the site inside of the cell that is responsible for producing energy compounds like ATP.

In addition to stress, infections, and trauma, ATP deficits on a cellular level develop as a natural consequence of aging. As mentioned above, eating a nutritionally deficient diet is also a major factor in creating the downward spiral. Consider that the American diet consists of approximately 62% processed food, which is a conservative estimate, and you can see why the top three leading causes of death in the United States today are cardiovascular disease (heart attack), cancer, and cerebrovascular disease (stroke).

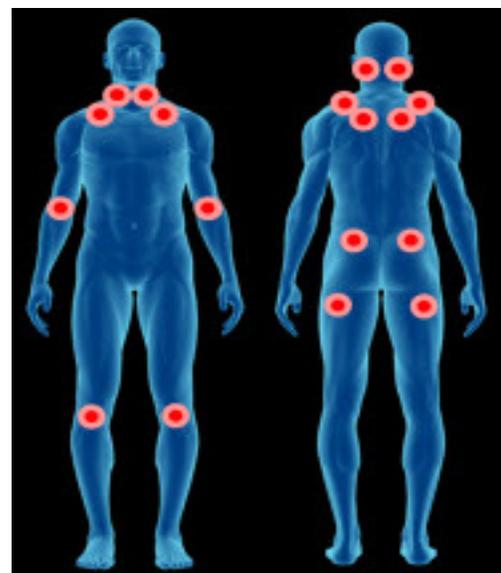
The process of making D-Ribose in order to produce ATP takes several days. The human body is designed to make enough ATP to carry our normal every day bodily functions. So, if our energy stores are depleted we become more susceptible to developing chronic illness. As the immune system fights harder and harder, consuming more energy to combat the illness, the process of energy production becomes overburdened. The more burdened the process of energy production becomes, the more insidious the disease state becomes. It becomes almost impossible to recover from such a catastrophe. By adding D-Ribose to the treatment protocol, however, the body can get the raw material that it needs to jump start the healing process, reducing the time that it takes to make more ATP, and breaking the cycle of decline.

There is a body of evidence which indicates that D-Ribose is clinically beneficial for chronic fatigue syndrome and fibromyalgia. Chronic fatigue syndrome is a debilitating condition characterized by profound fatigue manifesting in symptoms of muscle pain and weakness, impaired memory and difficulty concentrating, and insomnia. Often this leads the individual to become less engaged in the world around them, affecting relationships and careers, and fostering apathy.

Fibromyalgia is a condition in which a person develops systemic long term body pain and tenderness in the joints, muscles and tendons. Fibromyalgia has also been associated with fatigue, poor sleep, headaches, depression and anxiety. Both chronic fatigue syndrome and fibromyalgia are among the debilitating conditions that are associated with impaired cellular energy metabolism.

Dr. Jacob Teitelbaum, author of the book *From Fatigued to Fantastic* says that, "Not having enough ribose in your body is like trying to build a fire without kindling--nothing happens...ribose is a unique and powerful addition to our complement of metabolic therapies. For those suffering from fatigue, muscle soreness, stiffness, and a host of related medical complications the relief can be life changing...I suspect we will find that our understanding of ribose may be the most important nutrient discovery of the decade. I'd recommend it be used in all chronic fatigue syndrome cases, fibromyalgia, and cardiac patients as well as athletes. Though healthy, I take it daily myself as I like the extra energy boost it gives me."

Dr. Teitelbaum also conducted a small research study with forty-one patients with confirmed chronic fatigue syndrome or fibromyalgia seeking to determine the clinical significance of D-Ribose supplementation for people with such conditions. After giving each patient 5 grams of D-Ribose three times a day for a total of 280 grams, the participants completed a questionnaire which indicated an improvement in energy, sleep, mental clarity, pain intensity and wellbeing. Overall, participants indicated that the D-Ribose was well tolerated and they experienced a 66% improvement while taking it, with a 45% increase in energy and a 30% increase in wellbeing. Consider that the study took place over approximately a two and a half week period and the clinical significance is difficult to dispute.



The study concluded that D-Ribose significantly reduced clinical symptoms in patients suffering from chronic fatigue syndrome and fibromyalgia. It is interesting to note that when the patients discontinued the use of D-Ribose it was not long before their symptoms returned and so prolonged use is suggested.

Patients with congestive heart failure are routinely prescribed a conventional prescription combination consisting of diuretics, digoxin, angiotensin-converting enzyme inhibitors (ACE inhibitors), and beta-blockers. Despite undergoing treatment with these prescription medications, these patients often experience significant fatigue. Also, the prescription medications come with their share of side effects, and notwithstanding their importance the success of such medications is not guaranteed.

Diuretics stimulate the kidneys to remove more water and sodium from the body, which can help to relieve the swelling that occurs due to congestive heart failure. Unfortunately, diuretics remove many nutrients from the body such as water soluble Vitamin C, B Vitamins, and magnesium, all necessary ingredients for the synthesis of ATP. This is why people on diuretics are routinely prescribed potassium to replenish what is lost due to the shedding of excess water. If you are currently taking a diuretic, consider discussing the mineral/nutrient depletion with your doctor and pharmacist today to make sure that you are replenishing what is being lost.

Digoxin is part of a drug class called inotropic agents, which increase the contractile strength of the heart to make the heart beat harder. This puts considerable strain on the heart's ability to supply enough energy to support the increased heart beat activity. Long term use of such agents drains the cellular energy reserves of the heart, putting it in a chronic state of energy depletion, making the individual increasingly weak, fatigued, and with their heart function progressively worsening.

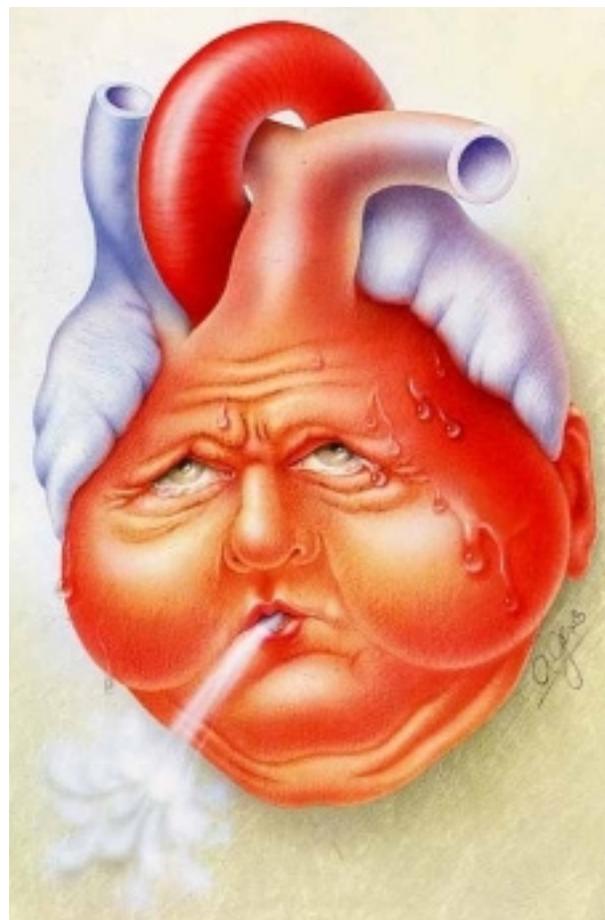
ACE inhibitors cause a dilation of the blood vessels which helps to improve the amount of blood that the heart pumps as well as lowering blood pressure so that the heart does not have to work as hard to do its job. ACE inhibitors usually do not cause side effects in most people. But they do cause people to experience dizziness when going from a position of lying down in bed to getting out of bed. Often when people taking ACE inhibitors get out of bed too quickly they can lose balance and fall over. So if you are taking an ACE inhibitor and you feel dizzy when you get up in the morning, take your time. Start by dangling your legs over the side of the bed before sitting up, and then sit up on the side of the bed for a couple of minutes before standing.

Beta blockers are a class of drug that help to reduce stress on the heart by blocking the action of the involuntary nervous system which can cause the heart to beat faster. This results in a slowing of the heart beat and a lessening of the force with which the heart contracts. The downside is that there is a reduction in the flow of oxygen to the rest of the body. Due to less oxygen circulating, patients often lose endurance and experience feelings of weakness when performing routinely simple tasks like going up and down stairs or going from a sitting to a standing position.

Together these drugs are a lifesaving combination for millions of Americans that have been diagnosed with congestive heart failure. The patient's life is prolonged, but the quality of life may never return to what it was before the life changing event of the heart dysfunction occurred. Since no secondary conventional prescription therapy exists to address the symptoms of low energy and fatigue, complementary therapeutic options like D-Ribose are being used and yielding promising results.

ATP is essential for heart function and integrity. To emphasize this point, consider again that ATP is produced in the mitochondria of the cell and each heart cell contains up to 1000 mitochondria or more. In congestive heart failure where the heart is oxygen deprived, ATP levels can become reduced by as much as 50% with supply not meeting demand. This is detrimental to diastolic relaxation, or the filling of the heart with blood between muscle contractions, which is energy dependent. Considering the time that it takes to replenish ATP stores, it does not take long for the heart to devolve into a dysfunctional state.

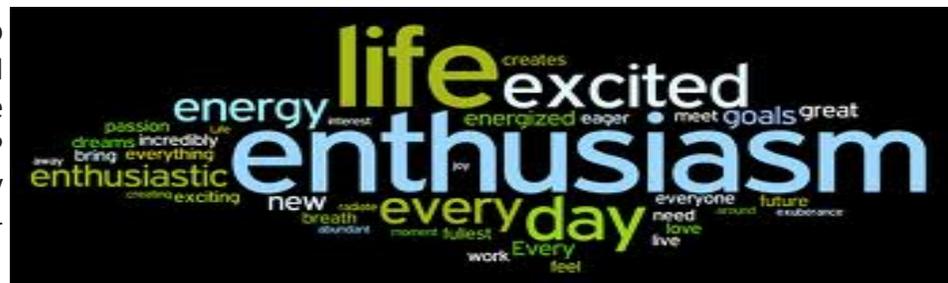
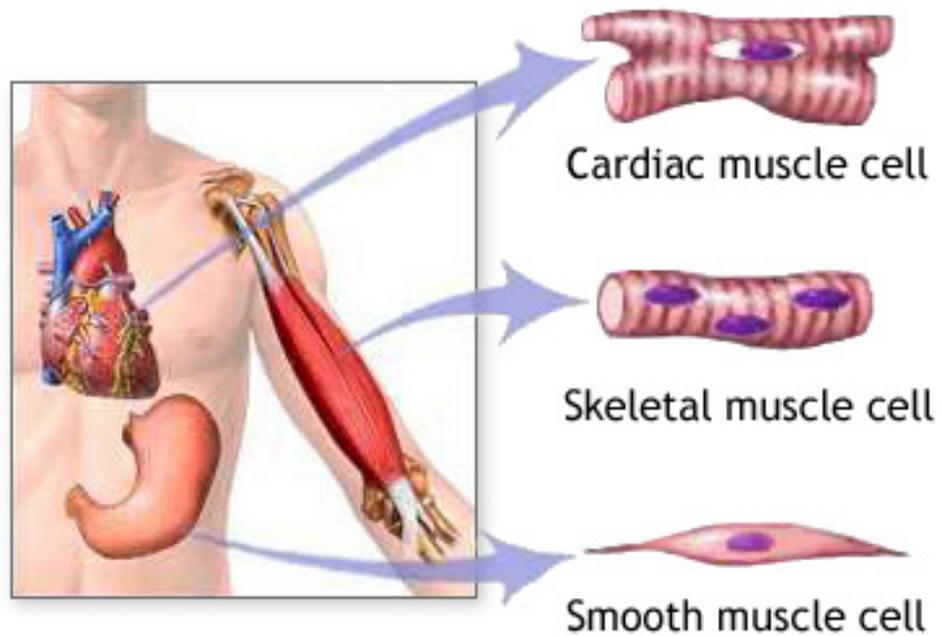
Human clinical trials have yielded positive results for patients with congestive heart failure by supplementing them with D-Ribose. D-Ribose bypasses the time limiting steps that it takes the body to synthesize its own, which allows the heart cells to produce ATP in a shorter time and recover more quickly. Patients who take D-Ribose experience noticeable improvements in their energy and ability to be more active for longer periods of time without reaching exhaustion.



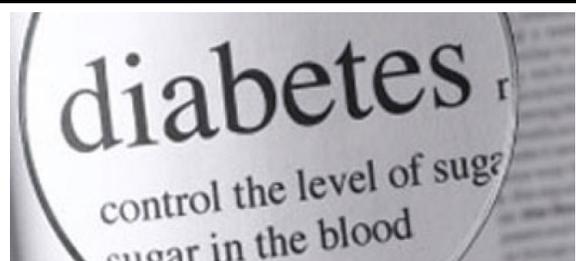
This renewed sense of energy and wellbeing can be inspiring for such patients and make it more likely that they will adopt the life changing practices, like a healthier diet and exercise, which will be necessary for them to improve and maintain cardiovascular health. Research indicates that the duration the patient supplements with the D-Ribose is significant, as the benefits can be reversed if the regimen is discontinued too soon. Therefore, physicians who implement D-Ribose supplementation for their patients with congestive heart failure should consider continuing the therapy for a prolonged period of time. How long is subjective to each patient's needs, however.

One of the most effective ways to prevent cardiovascular disease is to maintain a regular exercise regimen. But most people simply do not work out at all due to the fact that exercising is not enjoyable if you are out of shape. Many people begin to exercise, but because they feel wiped out, they quickly abandon their resolution to finally maintain a healthier lifestyle.

As we have discussed in great detail above, D-Ribose has been shown to boost muscle energy. So naturally, it makes sense that supplementing with D-Ribose can enhance exercise and reduce recovery time as well. When you exercise, some of the ATP from your muscle cells is depleted and needs to be replaced. Since it is a slow process, it can take several days for your body to replenish the ATP that is lost due to exercising under normal circumstances. In the meantime, your muscles can be sore and your energy may wane. While supplementing with D-Ribose before, during, and after your workout will not enhance your athletic ability, reduced ATP levels will affect your strength and endurance. Both the fast twitch and slow twitch actions of your muscles require ATP, and your heart needs ATP to ensure that it is pumping adequate amounts of oxygen rich blood to your muscles. So, ATP levels can be reduced by poor blood flow and from exercise, and the more D-Ribose that is available the faster ATP levels will return to normal. A faster recovery time and more energy can mean more enthusiasm and looking forward to the next workout.



With the positive effects of D-Ribose proving to be substantial, it must be noted that individuals with type 2 diabetes should exercise caution when using this supplement. Clinical trials have concluded that taking high doses of D-Ribose can have a blood sugar lowering effect. The severity of the hypoglycemic effect appears to be dose related, so the larger the dose the more the lowering effect of the blood sugar. In order to offset this effect it is recommended that D-Ribose be taken with food and not on an empty stomach.



In the past individuals with low energy due to chronic fatigue syndrome, fibromyalgia, or just as a natural consequence of aging, may have been told by their medical practitioners that they would just have to accept their pain and exhaustion. People with congestive heart failure would have to understand that they may never recover to their lives the way they were before having a heart attack. All of these assumptions may still be considered true but for the possibility of supplementing with D-Ribose.

Today people of all ages and conditions are benefiting from the energy rejuvenating potential of D-Ribose by more effectively and efficiently restoring their ATP levels. While taken in supplement form, D-Ribose is not a vitamin. If given enough time, and provided with the raw materials, the body makes it naturally. But when stressed, the interval with which the body restores depleted ATP does not keep up with the demand. In truth, and thanks to significant clinical research and pilot studies, doctors and scientists have discovered that by giving the body the raw materials that it needs to make ATP, stress can be reduced, damage can be repaired, and normal function can be restored and boosted to levels necessary to begin the rehabilitation process for a better quality of life.