




IV Nutrition Therapy

EMERALD WELLNESS



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This book is provided to educate one about the health benefits
of **Intravenous Nutrition Therapy**

Please take it, read it, and pass it along.

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IV Nutrition Therapy

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IV Nutrition Therapy is a safe, powerful, and effective way to optimize cellular function within the body and bestow many therapeutic health benefits. With the supervision of a knowledgeable medical professional, injecting high dose vitamins, minerals, amino acids, and antioxidants can be extremely valuable for strengthening immunity, improving energy, fighting the effects of aging, and aiding in the treatment of many health conditions. IV Nutrition therapy is able to have a positive impact on such a wide array of health concerns because it is a diverse treatment modality, which utilizes the distinct biological effects of hundreds of natural substances.

A medical doctor, whom is well-versed in conventional medicine and integrative health treatments, can make the use of IV therapies a vital tool in optimizing the functionality of the human body and treating illness. At **Emerald Wellness**, we pride ourselves in providing our patients with the best possible IV Nutrition solutions for a number of health concerns. IV Therapy can be used as an adjunct to conventional pharmacological practices or as the sole treatment solution, depending which model is discerned to be most optimal for the patient's health.

Introduction

IV Nutrition Therapy is a common practice among Medical and Naturopathic doctors all around the world. It is a well-researched treatment with a long history of use that is able to address nutritional deficiencies, as well as deliver important micronutrients which trigger desired biological reactions within the body.

Nutrient Deficiency

In today's society, many Canadians are suffering from nutritional deficiencies which can lead to less than optimal health and encourage illness. In the most comprehensive national nutrition survey to date, referred to as **NHANES** (The National Health and Nutrition Examination Survey), the CDC found that North Americans are commonly lacking in several important nutrients. When High Quality Nutrient intake is low in the body, it is similar to forgetting to fill your car up with gas. This can lead to problems with energy level, thyroid conditions, poor sleep, depression, obesity, heart disease, diabetes, and more. The **NHANES** discovered that North Americans are most commonly lacking in iron, B vitamins, magnesium, calcium, Vitamin D, and Vitamin C, to name a few.

To understand the importance of this, just a moderate deficiency in Vitamin C can produce symptoms of poor stress tolerance, easy bruising, fatigue, skin wrinkling, gingivitis, dry hair or skin, joint pain, and a weak immune system. Similarly, a deficiency in B Vitamins can cause fatigue, depression, anxiety, memory trouble, neuropathy, incontinence, and headaches. It is critical to maintain a healthy balance of vitamins, minerals, and amino acids within the body in order to optimize health and prevent illness.

Causes of Nutrient Deficiencies

There are many factors which can contribute to nutritional deficiencies in today's modern world. The most common factor is generally a diet which

is lacking in essential vitamins and micronutrients. Unfortunately, our society makes it easy for many Canadians to consume highly processed diets with inadequate amounts of key nutrients. Furthermore, industrial agriculture has made many of our fruits and vegetables much less nutrient-dense than they used to be, meaning we have to consume more in order to receive appropriate levels.

Poor digestion or illness, can also cause our bodies to not properly absorb essential nutrients from our food or supplements. This is often due to a compromised digestive system which is not properly breaking down the contents of our stomach and delivering the nutrients from our food to the cells in our bodies. Assimilating the vitamins and minerals from our food is a long and complicated process, and unfortunately there are many steps that can be interrupted which result in poor absorption.

Furthermore, our own genetics can determine how efficient we are at utilizing certain nutrients in the body. A very common genetic mutation in Canadians, affecting as many as 40% of the population, is a variant of the MTHFR gene. This gene makes certain individuals less able to utilize folate (B9) in the body which can cause a number of health problems. In order to deal with MTHFR mutations it is often necessary to intake much higher levels of folate (B9).

Roles of IV Nutrition Therapy

One of IV Nutrition Therapy's many abilities is to correct nutritional deficiencies and imbalances in the body. By injecting high dose vitamins, minerals, and amino acids directly into the blood stream or tissue, one is able to bypass the digestive system and ensure maximum absorption. Therapeutic agents are delivered right to the cells, correcting any imbalances, nourishing the body, and promoting health. IV therapy is usually the most effective and fastest way to increase the levels of key nutritional compounds in the body.

Addressing nutritional deficiencies is one aspect of IV Nutrition Therapy, yet there are several other means by which this therapy works to promote health.

Hydration

IV Nutrition Therapy is also an excellent treatment protocol for addressing acute or chronic dehydration within the body. Various published statistics suggest that dehydration in the general public is a prevalent condition, especially affecting the elderly, chronically ill, and athletes. Since the human body is composed predominantly of water even mild dehydration can result in significant symptomology and disrupt the optimal functioning of different biological processes. Proper hydration is a mechanism which the body uses to dilute and minimize the negative effects of various offending agents such as allergens, toxins, poisons, and free radicals. IV Nutrition therapy is an excellent way to hydrate the body, while at the same time accurately maintain electrolyte equilibrium.

Heavy Metal Detoxification

Another Role of IV Nutrition Therapy is to be able to safely remove heavy metals and toxins from the body. This is called Chelation Therapy. Heavy metals such as lead, mercury, cadmium, aluminum, etc.. are toxic to the human body and can cause a plethora of health problems. Unfortunately, in today's modern world our bodies are introduced to much higher levels of these toxic metals than in the past. Heavy metal accumulation in the body has

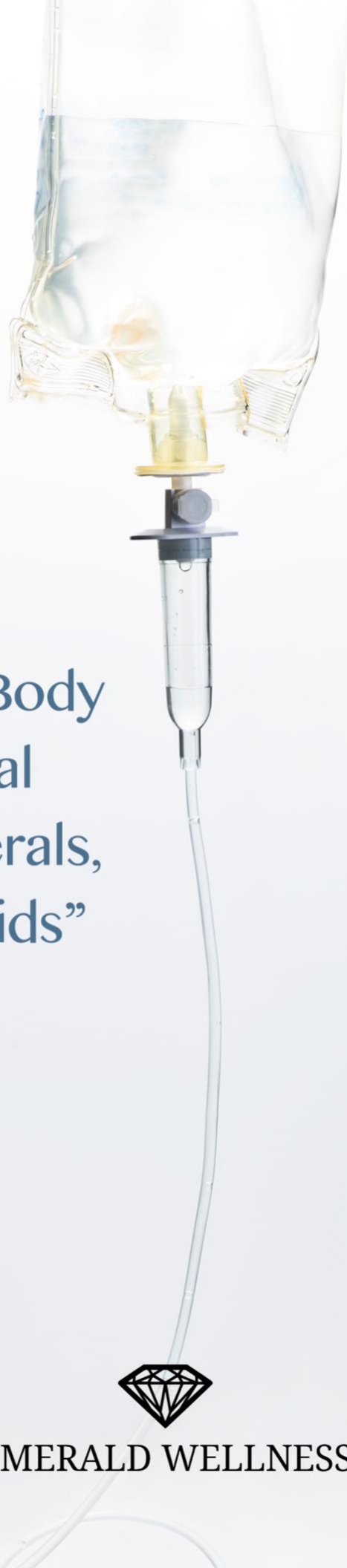
been linked to hardening of arteries, strokes, leg circulation problems, neurodegenerative diseases, Alzheimer's, and several other illnesses. IV Chelation therapy works to remove these toxic metals from the body in order to reduce symptomology and prevent further illness.

Elevating Nutritional Substances Levels Throughout Body

As mentioned before IV Nutrition therapy is an excellent therapy for addressing nutrient deficiencies and bringing the body back into balance. Some health conditions, however, benefit from administering much higher doses of specific nutrients, than simply administering enough to mitigate deficiency. An excellent example of this is seen with Vitamin C. Research has shown that the intravenous injections of Vitamin C, at levels much higher than attained through a healthy diet, are preferentially toxic to tumor cells, and thus can help in the treatment of certain cancers.

There are many substances, both naturally occurring in the body or derived from natural compounds, that have therapeutic health benefits when introduced to the body intravenously at much higher levels than conventional means.

The therapeutic role of IV Nutrition Therapy is as wide-ranging as the 100's of health-promoting natural compounds that can be intravenously introduced to the body. It can be difficult to summarize this treatment's medical applications because it is a diverse science used across a huge array of health conditions. There are a multitude of substances, with unique biological mechanisms, which can be utilized to improve overall health and treat illness. IV protocols have been developed for stress therapies, chelation therapies, detoxification, immune therapies, cell therapies, and even life extension therapies. This book will attempt to educate one about the efficaciousness of IV Nutrition therapy, as well as introduce the reader to the effects of several well-researched nutritional substances.



“Nourish the Body
with Essential
Vitamins, Minerals,
and Amino Acids”



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The Science of IV Nutrition

There are numerous biological interactions through which IV Nutrition Therapy works to promote health. To receive safe and effective intravenous therapy the practitioner should have a thorough understanding of human biology and the mechanisms by which administered substances affect biological processes within the body.

IV Nutrition Therapy

A common denominator for IV Nutrition Therapy is that it utilizes intravenous, intramuscular, or subcutaneous injections in order to effectively deliver therapeutic agents to the body. One may be familiar with receiving conventional intravenous treatments during a visit to a modern hospital. Everywhere from the battlefield to the average hospital room, IV therapy has become a vital part of the recovery and healing process. Many of us know family and friends who have had a brief or extended hospital stay where their recovery was facilitated, and in some cases assured by, conventional IV therapy. IV therapy is so important for the medical field because it allows the doctor to hydrate, and administer medications to the patient in the most effective manner; directly into the bloodstream or tissue.

IV Nutrition Therapy capitalizes on this effective delivery method and capability to heal, but tends to use natural substances to achieve therapeutic effects which generally have less adverse reactions compared to pharmaceuticals. Natural IV therapies are often practiced by medical doctors, and play a role in many healthcare systems around the world. This being said, the majority of IV Nutrition Therapies are not a part of the current Canadian medical curriculum. As such, this therapy is not seen as commonly in the Canadian Healthcare System and one must often seek treatment with a qualified naturopath, or locate an Integrative Medical Doctor.

How does IV Nutrition Therapy Work?

To appreciate how and why IV nutrition is such an effective tool for promoting health and treating illness, it is useful to have an understanding of the 6 primary characteristics found in all living things:

1. All living things are composed of cells, which form the basic building blocks of life. This is the foundation of biology. The way in which a cell works determines how an organism creates energy, and uses this energy to perform its necessary biological functions.
2. Cells also have the ability to associate or aggregate to form more complex structures. Cells can form tissues, tissues can form organs, and organs can form organ systems. It is through cell communication and working together that cells form living organisms.
3. Perhaps most importantly, all living things demand energy and essential elemental compounds to remain living. Cells exist within a nutrient rich chemical medium. This complex mixture of chemical components ensures their proper metabolism and optimal health. Furthermore, the chemical environment surrounding a cell has the potential to either nurture it or damage it.

4. Another characteristic of life is that cells require a stable internal chemical environment. This is a precarious equilibrium that balances the cell's special needs against the outside environment in order to maintain life. Complex regulatory mechanisms sustain these fragile equilibriums, so life processes can be conducted. If the balance is disrupted, the biological processes dependent on them begin to fail and health problems arise.
5. All living organisms necessarily grow and change. Cells divide, and differentiate in order to create new cells, and more complex organ systems. Organisms show a tendency towards biological aging. The process of aging seems to be inevitable but is delayed or quickened by the health of the cells involved.
6. Finally, all organisms have reproductive mechanisms in order to propagate their genetic information. This information is passed on from generation to generation while retaining a plasticity to allow the organism to adapt to a changing environment.

Without any of these essential characteristics, life as we know it cannot exist. By promoting the characteristics of life, one is able to better facilitate the process of life itself. An understanding of how to assist cells and cellular processes is essential for understanding how to promote health in living organisms.

The human body consists of somewhere between 100-200 Trillion cells which are conducting over 500 billion chemical reactions each second. These cells operate in a complex network of organ systems and must be kept in a constant balance to assure optimum health. When these cells have the proper fuel and environment (ie. the proper vitamins, minerals, antioxidants, and amino acids) in which to operate, an individual is usually considered to be healthy. When there is an

imbalance in these essential nutrients cellular dysfunction and health issues arise. IV Nutrition therapy fundamentally aims to correct these imbalances by giving the body's cellular environment what it requires, and consequently optimizing the health of the patient.

So, the science of IV Nutrition Therapy begins with an understanding of cells and how they function. Promoting and enhancing cellular processes requires knowing how cells operate, the mechanics of cell membrane transfer, and how cellular processes are facilitated. Furthermore, providing nutritional support to the cells requires an understanding of blood chemistry, organ systems, nutrition science and IV administration techniques. A medical practitioner providing IV Nutrition Therapy should have in depth knowledge regarding cellular processes and how to optimize their functioning through intravenous administration.

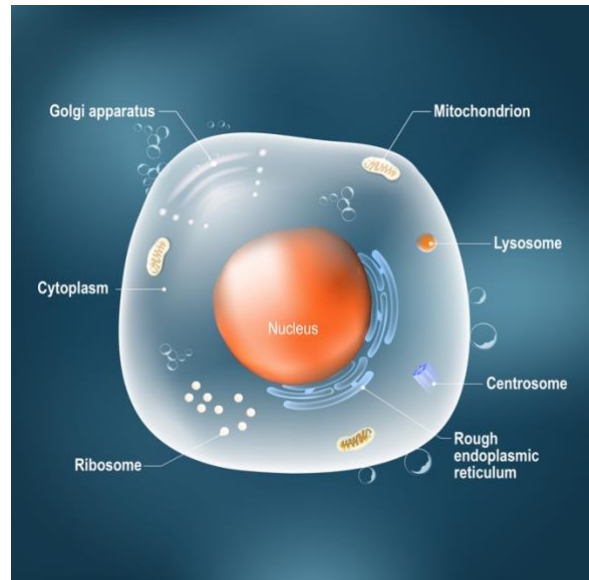
IV Nutrition therapy works to promote healthy cellular function in the body which has the downstream effect of promoting health throughout the entire body. If your cells are healthy and able to correctly carry out their biological processes, then you are healthy. Most chronic illnesses are associated with cellular dysfunction within the body. By assisting your cells, IV Nutrition therapy can reduce inflammation, fight the effects of aging, improve energy, strengthen immunity, and aid in the treatment of numerous health conditions.

Intravenously injecting therapeutic substances directly into the body is the most effective means for administering key nutrients. This is because intravenous administration allows for 100 percent absorption directly into the bloodstream, and consequently directly to our cells.

When we think about good nutrition and optimal health the last thing most of us think about is the cell, yet this is the first thing we should think about. We can eat all the right foods and have the proper blood chemistry but if our cells are not receiving the suitable nutrients our bodies will not function properly. When the energy production

mechanisms of the cell break down due to inadequate cellular nutrition, biological processes start to fail or are severely compromised. This can lead to immune problems, fatigue, dementia, depression, muscle weakness, pain, heart disease, and many other metabolic diseases.

When we understand human health as the byproduct of a complex network of cells interacting with one another in a harmonious balance. It is easy to see how IV therapy, which acts directly on the health of our cells, can be an exceptional tool for maintaining and improving this vital equilibrium. The next section will discuss some common attributes of the natural compounds utilized by intravenous nutrition science.



Structure of a Human Cell



In order to be Healthy
our Cells require
the proper
Fuel and Environment
to conduct their
Necessary
Biological Functions.

IV Nutrition Therapy
works to Optimize
Cellular function
by providing our Cells
with the Nutrients they
need to Thrive

Some Common Attributes of IV Nutrients

The diverse array of natural substances employed by IV nutrition can be sorted into specific categories based on their molecular structure. Furthermore, there are some biological commonalities in regard to the therapeutic actions performed by many of these substances.

As mentioned before the cells in our body require the correct fuel and carefully balanced environment in order to perform optimally. This fuel and environment is primarily constituted of specific types of molecules such as **vitamins, minerals, and amino acids**. Some of these substances are produced naturally within our own bodies and some must be acquired through external sources. Additionally, many of these substances share similar therapeutic properties, such as being

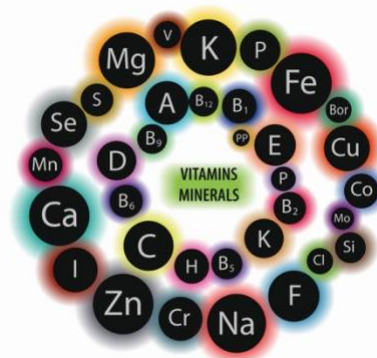
antimicrobial, anti-inflammatory, or an antioxidant. Before we delve into dealing with the health benefits of specific substances and IV therapies it will be useful to first understand some basic principles regarding the molecular structure and biological actions of IV nutrients. Some examples will be used to illustrate different types of substances, however a much more in-depth profile on specific nutrients will be provided at the end of this book.

Vitamins

A vitamin is an **organic compound** which is an essential micronutrient- that is, a substance which an organism needs in small quantities for the proper functioning of its biological systems. Vitamins cannot be created by the body (either at all, or in sufficient quantities), and therefore must be obtained through diet and external sources. Vitamins allow the body to function and participate in various regulatory activities that are essential to life. There are two categories of vitamins, water-soluble such as B and C Vitamins, and fat-soluble such as A, D, and E vitamins. Our bodies require the correct balance consisting of all the existing vitamins in order to be healthy. Because vitamins are delicate organic compounds they are easily destroyed while cooking due to heat or chemical agents. Extra attention is needed while preparing and storing food to preserve the integrity of vitamins.

Minerals

Minerals are **inorganic compounds** and have a much simpler chemical composition than vitamins. Minerals are also much tougher than vitamins and harder to destroy. They can be categorized into macro minerals and trace minerals. Trace minerals are required by the body in small quantities while macro minerals are required in large amounts. Minerals are essential for many critical biological processes. For example, Magnesium plays a role in more than 300 enzymatic reactions, including the breakdown of food, synthesis of proteins, and the transfer of nerve impulses. Some other important minerals we need to function include calcium, zinc, sodium, copper, iron, potassium, and iodine to name a few.

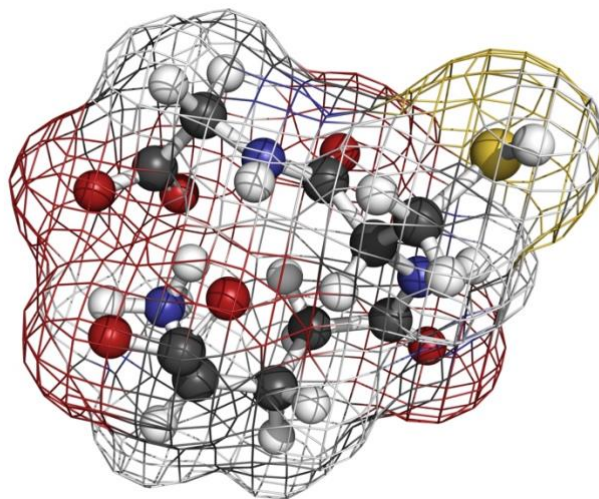


Amino Acids

Twenty percent of the human body is comprised of protein. Protein plays a crucial role in almost all biological processes and **amino acids** are the building blocks of protein. Consequently, a large proportion of our cells, tissue, and muscles are made up of amino acids. They also play a key role in the transport and storage of nutrients, metabolic processes, and are the precursors to many enzymes and neurotransmitters. Similar to vitamin and minerals, different amino acids have various properties and a host of diverse functions within the body. A well-balanced “amino-acid pool” in the body is critical for good health. Unlike vitamins and minerals, many amino acids are synthesized (created) within the body and do not necessarily need to be acquired from external sources such as diet. This being said multiple factors, such as genetics, age, or illness, can cause our bodies to become inadequate at synthesizing critical amino acids and external supplementation can be extremely useful to alleviate any health problems which may arise from this. There are over 200 amino acids with a few popular in IV nutrition being L-cysteine, L-carnitine, L-arginine, L-glycine, and L-Tyrosine.

-An example which highlights the importance of Amino Acids for our health is the role of **Glutathione**. Glutathione is composed of 3 amino acids –cysteine, glycine, and glutamate- and is the most important antioxidant produced by our bodies. It is critical for protecting our body’s systems from disease and deterioration and promotes overall vitality. As we age, or during chronic illness, we become less efficient at producing glutathione which is associated with many health problems. With the use of IV therapy one can counteract this problem by supplementing with key amino acids, and glutathione itself, in order to replenish optimal glutathione levels in the body.

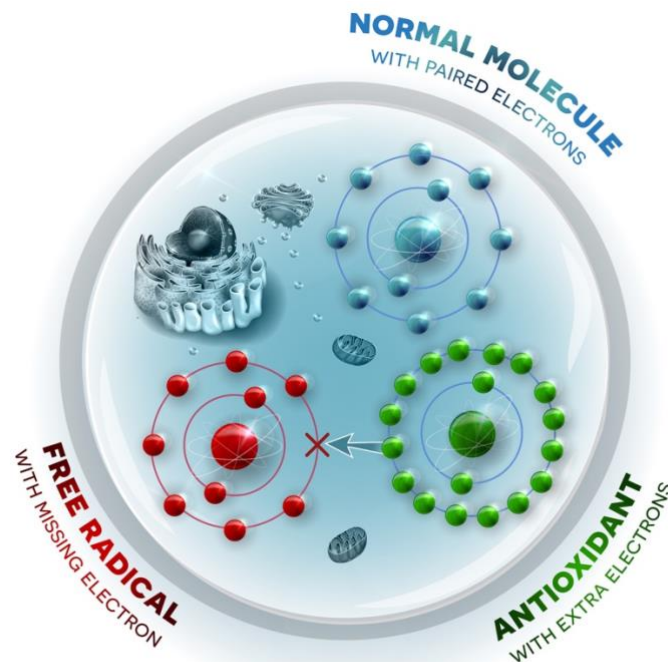
Glutathione is also an example of a substance which should always be introduced to the body intravenously, since its molecular structure is very sensitive to the digestive system. Oral supplementation is minimally effective, with most of the substance being destroyed before it can be absorbed and utilized.



-Molecular Structure of Glutathione-
Composed of the Amino Acids:
Cysteine, Glycine, and Glutamate

Anti-oxidants

Anti-oxidants are compounds that assist the body with **neutralizing toxins and free radicals**. Commonly utilized in IV Nutrition Therapy, these compounds have the effects of organ protection, toxin reduction, and even anti-aging properties, to name a few. Vitamins, minerals, amino acids, and many other substances can have antioxidant effects within the body. Antioxidants work to prevent or stop cell damage caused by oxidants. Oxidants are free radicals which are produced naturally in the body but are also introduced to the body from things such as pollution, cigarette smoke, or over eating. Free radicals are highly reactive because their molecular structure seeks additional electrons- they bind to, and ultimately damage normal cells in the body, such as DNA. Our bodies need to have a balanced ratio of anti-oxidants to oxidants in order to mitigate the damage excess oxidants in the bloodstream can cause to our cells. The fact that a large component of aging is caused by oxidative stresses within our bodies, means that anti-oxidants can be very useful in slowing down the biological effects of aging. One can attempt to increase anti-oxidative substances in the body through diet and supplementation. Some common compounds utilized in IV Nutrition Therapy for their antioxidant effects are Vitamin C, Alpha Lipoic Acid, and Glutathione.



The process by which antioxidants work to stabilize free radicals within the body

Anti-inflammatory Compounds

Inflammation generally occurs as the body's response to threats like stress, infection, or toxic substances. When the immune system senses one of these dangers it reacts by activating certain proteins meant to protect cells and tissues. On a macroscopic level inflammation entails symptoms of redness and swelling at the affected site. On the microscopic level, it entails the injury and massive death of many cells which release substances as they are injured or die. In a healthy situation, inflammation serves as a friend and protector to our body. However, if immune cells start to overreact, inflammation can turn against us and become harmful to our health. This type of chronic inflammation can have a number of causes, such as, an autoimmune disorder, virus or bacteria, intake of sugary foods, or the way one handles stress. Many illnesses are associated with chronic inflammation in the body including rheumatoid arthritis, poor gut health, certain cancers, poor sleep, obesity, and depression. When there is unchecked inflammation in the body there are a number of lifestyle changes one can make to help reduce its harmful effects. IV nutrition therapy utilizes the anti-inflammatory effects of natural compounds to help treat chronic inflammation and pain. The use of IV curcumin, derived from the spice turmeric, is an excellent example of a compound which is able to reduce inflammation throughout the entire body when administered to the bloodstream at high doses. Curcumin is also an example of a natural compound which is not a vitamin, mineral, or amino acid yet still has remarkable therapeutic effects in the body.

There are many other types of natural compounds utilized in IV Nutrition therapy besides vitamins, minerals, and amino acids, however it is useful to become familiar with these molecular groups since they hold a special place as nutrients our bodies require to thrive. Furthermore, the vast array of therapeutic benefits derived from these substances are much more diverse than being anti-oxidative or anti-inflammatory. These are just 2 popular attributes of some IV nutrients which can have amazing health benefits. As we delve into the types of IV Nutrition Therapy, and more specifically about individual compounds, the many other mechanisms by which they assist cellular processes in the body will be examined. Before we do this, we will look at why intravenous supplementation of certain substances, and under certain circumstances, is more beneficial than oral supplementation.



Intravenous Versus Oral Supplementation

There are a number of factors which can facilitate the use of intravenous, intramuscular, and subcutaneous supplementation over oral supplementation. These factors often include the doses required of the substance, the molecular structure of the substance, and the unique health characteristics of the patient.

There are a number of methods which IV Nutrition utilizes to administer substances to the body. The most popular is **intravenous injection**. Intravenous injection involves inserting a small catheter into the patient's vein, most commonly somewhere on the arm, and injecting the therapeutic substance as a liquid directly into the blood stream. This can be done as either an "IV Push", where a syringe is used to administer the liquid, or as an "IV Drip", where the liquid is suspended in an IV bag and slowly injected into the vein using either gravity or a medical fluid pump. An "IV Drip" usually takes much longer than an "IV Push", with both methods being used for different circumstances.

Another delivery method utilized by IV Therapy is **intramuscular injections**. This technique uses a syringe and needle to inject the therapeutic substance deep into the muscle. Common injection locations are the shoulder, buttocks, and

thigh. Our muscles have high blood supply so intramuscular injections are another excellent way to get the therapeutic agent into the system.

Finally, **subcutaneous injections** are similar to intramuscular injections in that they use a syringe and needle however they differ regarding the location of the injection. Subcutaneous literally means under the skin. A needle is used to administer the substance into the tissue layer between the skin and muscle, often in fattier areas such as the stomach.

Generally intravenous injection is the most efficient means of delivering a medication directly into the blood stream, yet all forms of injections have their uses. Intramuscular, and subcutaneous injections are usually absorbed by the body at a slower rate which can be beneficial for certain treatments. For example, B12 intramuscular injections are an excellent way to deliver the critical vitamin to the

system and have its beneficial effects slowly released into the body over a longer duration of time.

What all of these administration methods have in common is that they bypass the human digestive system in order to enter the bloodstream and be cycled within the body.

Oral Supplementation and Digestion

You may ask yourself why I cannot simply receive the benefits from vitamins, minerals, amino acids, and the like from oral supplementation? Well in many cases you can. A healthy diet rich in necessary nutrients is one of the most important things an individual can adopt in order to optimize health and wellbeing. Furthermore, high quality oral supplements can have excellent therapeutic value for many individuals. This being said there are many instances where intravenous supplementation is seen to be advantageous over oral supplementation. Especially if a patient is presenting with a compromised digestive system.

While our knowledge of the digestive system is far from complete, what we do understand is integral to the practice of IV Nutrition Therapy. Awareness of the processes of digestion, nutrient assimilation, and what can go wrong helps the medical practitioner know when to step in with other types of therapies.

In a healthy subject, orally ingested materials traverse through the gastrointestinal tract where it is subject to various harsh environments, consisting of acids and digestive enzymes, designed to breakdown the ingested product into its fundamental parts. This natural process alone makes it impossible for many therapeutic compounds to be delivered intact to the cells of the body, as seen with glutathione.

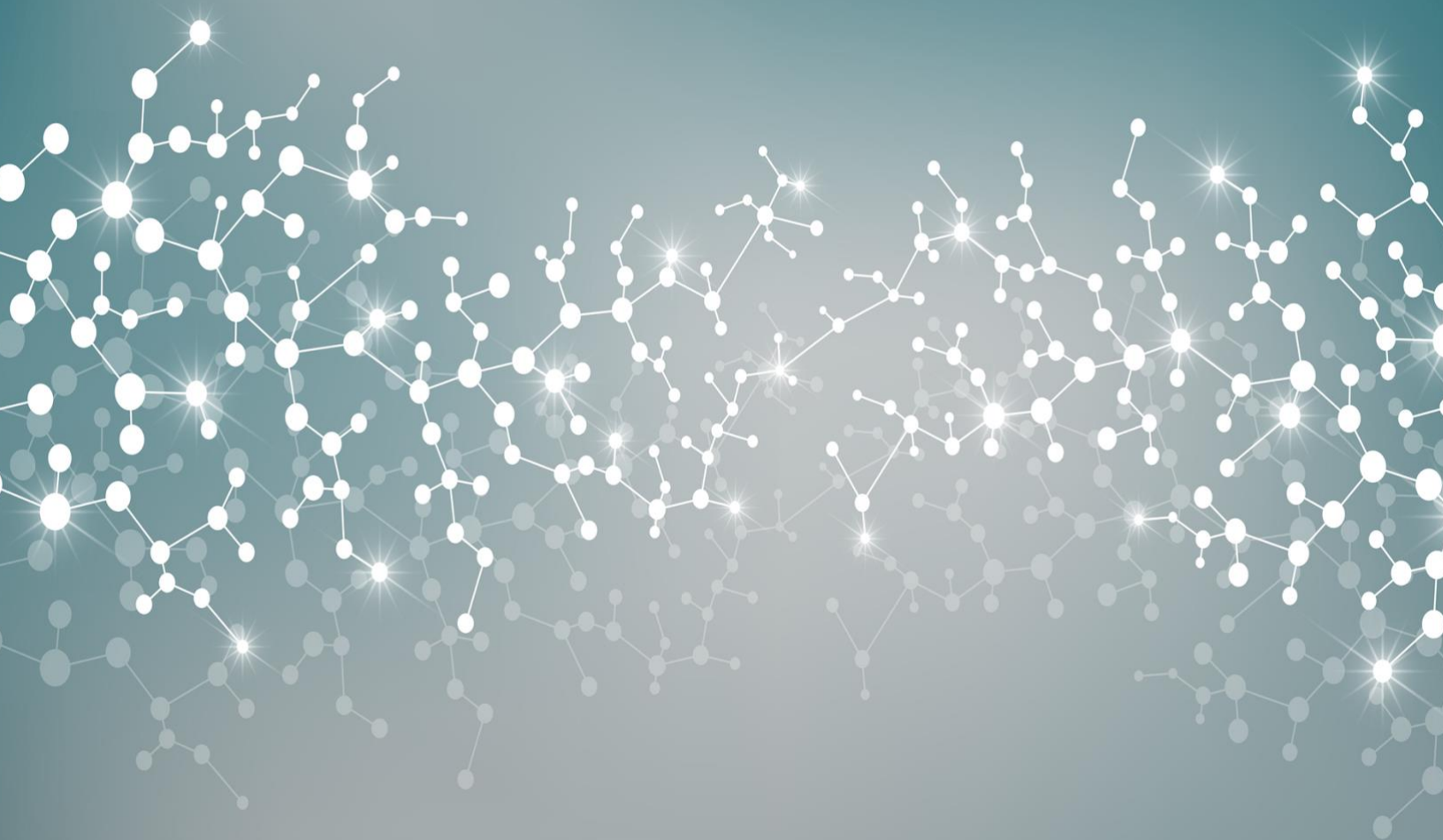
After exposure to the elements of the gastrointestinal tract, the partially digested compound then needs to be absorbed via the intestines, so that it is able to enter the

bloodstream. Unfortunately, there are a number of factors and health states which can significantly alter this absorption barrier and diminish the efficacy of oral supplements.

Finally, once absorbed into the system, the nutrients are siphoned through the liver in a process called 'first pass metabolism', during which the liver further breaks down the nutrients into smaller constituents. The end result is that, even when an individual is healthy, only a fraction of orally ingested supplements is delivered to the target tissues and organs. When we are chronically ill or have digestive health issues even less of the nutrients are able to make it into our bloodstream. It is estimated that the incident of digestive disorders in the general population is about 1 in 4 individuals, but many believe it to be much higher. Assimilating the vitamins and minerals from our food and taking supplements is a long and complex process. There are many steps that can be interrupted, making the use of IV Nutrition Therapy a great tool for bypassing the problems of digestion.

When injecting nutrients intravenously this allows for fast delivery and 100% absorption into the blood stream so that the body can make the most of these essential nutrients. Injection also allows for higher, and often more therapeutic doses, of the substance to be delivered with fewer side effects since oral vitamins can often cause stomach upset. An example would be high dose intravenous Vitamin C, which is able to achieve blood concentrations of the nutrient at a level 10 times higher than through oral supplementation. It is at these high doses that Vitamin C is seen to have therapeutic effects for certain health conditions. Furthermore, IV delivery methods allow the practitioner to have much more control over the doses being administered to the patient. Oral supplementation is often guesswork as to how much of the nutrient is actually surviving the digestive process. The fact that the nutritional substances are delivered directly to the cells through the blood stream makes IV therapy a faster and often much more effective method of delivering therapeutic agents to the body.

The Synergistic Union of
Conventional Medicine
and Clinically Proven
Integrative Health Therapies



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Types of IV Nutrition Therapies

There are many unique IV therapies which can be administered to the body to achieve different therapeutic health effects. Sometimes a single compound may be utilized to achieve a desired effect, or a combination of synergistic compounds may be administered for positive health outcomes.

As stated before IV Nutrition Therapy is able to provide your body with the nutrients it needs in an efficient and effective way, which is able to ignite healing processes at the cellular level. This is a very general description of why IV nutrition is such a powerful therapeutic device. The actual protocols for achieving certain reactions in the body and treating specific conditions are extremely diverse. Different natural compounds, and different combinations and doses of natural compounds have different biological actions in the body. Furthermore, it is rare that a disease or health condition negatively affects only one aspect of a person's health. Illnesses are often complex and affect the patient on multiple biological levels. IV Nutrition therapy must take this into account so that its healing mechanisms can be applied to as many health stressors as possible. An in depth understanding of the causes of patient symptomology, and knowledge of the appropriate compounds to be intravenously administered to

help remedy these symptoms, is of paramount importance for an IV Nutrition practitioner.

Several considerations need to be addressed in the formulation, preparation, and administration of different IV therapies. To realize the complexity of this topic, one must have a grasp of the dynamics of fluid and electrolyte physiology. The human body has a balanced and particular salt concentration which is optimal for health. When introducing any IV fluids to the system, careful calculations must be made to ensure that the administered solution is of a comparatively similar electrolyte concentration to the body to maintain this equilibrium. In addition, some natural compounds can interact with one another which can result in diminished effectiveness of the ingredients or cause unwanted effects in the body. An IV Nutrition practitioner must be aware of these chemical reactions in order to provide safe and effective therapies.

Types of IV Therapies

Earlier in this book we discussed how IV therapies can be utilized to address nutritional deficiencies, remove heavy metals from the body, and assist with chronic dehydration. However, there are numerous IV protocols which exist to help treat many conditions and have positive health effects. Some IV Nutrition protocols being practiced today include:

- Detoxification Therapies
- Stress Therapies
- Immune Therapies
- Allergy and Asthma Therapies
- Cancer Therapies
- Antifungal Therapies
- Brain Enhancement Therapies
- Arthritis Therapies
- Chelation Therapies
- Athletic Recovery Therapies
- Athletic Enhancement Therapies
- Anti-Aging Therapies
- Diabetes Therapies
- Digestive Therapies
- Heart Health Therapies
- Hormone Therapies
- Hypertension therapies
- Migraine Therapies
- Menopausal Therapies
- Vitamin Therapies
- Other Nutrient Therapies
- Antimicrobial Therapies
- Stem Cell Therapies
- Ozone Therapies
- And many more

This list is by no means exhaustive and effective protocols are being discovered, researched, and improved constantly. To outline the science behind, and application, for all of these protocols would have us here all day. What is important to understand is that with any good IV nutrition protocol an understanding of the causes of the patient's symptomology is taken into account and the appropriate IV substances are administered to

provide relief from these symptoms, or better yet, address the root causes.

IV therapies should always be tailored to the patient's individual symptomology and health characteristics. For example, if a patient is presenting with symptoms of joint pain, feeling stressed, and brain fog. There are many possible causes for this constellation of symptoms. Blood work should be done to see if there are any nutritional deficiencies, or markers in the blood chemistry which could be causing problems. IV curcumin might be administered to help with inflammation in the body and possibly remedy joint pain. Inflammation could also be the cause of the patient's stress levels and brain fog, or stress itself could be the culprit. IV administration of B vitamins might be utilized to reduce anxiety and improve stress response. It is possible that this may also improve stress induced brain fog. If not the patient may benefit from the IV administration of a choline source, such as Alpha GPC, in order to improve cognitive functioning and clearer thinking. It is also possible that detoxification therapy may be beneficial for addressing all of these symptoms by removing problematic toxins from the body. As you can see even in this simple example discovering the causes of, and treating, patient symptomology is a complex matter that should always be navigated with a qualified IV Nutrition doctor.

Anti-aging therapies may focus on the use of substances which reduce oxidative stress such as Alpha Lipoic Acid. Antimicrobial therapies often utilize substances which are able to kill viruses and bacteria such as Bioactive Silver Hydrosol. Athletic recovery therapies may attempt to rehydrate the body and replenish key electrolytes such as salt and magnesium.

The array of IV nutrition protocols is as diverse as the array of therapeutic substances employed and health conditions treated. A skilled expert is required to ascertain when certain protocols should be applied in order to achieve the most optimal and effective results.

An excellent example, and popular protocol utilized by many IV Nutrition practitioner's is the **Myer's Cocktail**. Variations of this formulation have been practiced for over 25 years with great success across a wide range of health concerns.

Nutrients in Myers Cocktail Formulation

Magnesium Chloride Hexahydrate 20 % (Magnesium)	2-5mL
Calcium Gluconate 10 % (Calcium)	1-3mL
Hydroxocobalamin 1000mcg/mL (B12)	1mL
Pyridoxine Hydrochloride 100mg/mL (B6)	1mL
Dexpanthenol 250mg/mL	1mL
B Complex 100 (B Complex)	1mL
Vitamin C 222mg/mL (C)	4-20mL

All of the nutritional components within this formulation work synergistically to have positive biological actions within the body. The Myers formulation has had positive patient outcomes for several conditions such as asthma, migraines, fatigue, fibromyalgia, and depression, to name a few.

Case Study: Myers Injection as Migraine relief. *A female patient suffered from frequent migraines, which were often triggered by exposure to environmental chemicals and food allergies. Over a 6-year period, the patient was administered IV therapy on approximately 70 occasions for acute migraines. Almost all of these injections resulted in marked improvement or complete relief from migraine symptoms, often experienced within a few minutes of the injection.*



This positive response to the Myer's formulation is common among migraine sufferers, and you may ask why? It is likely that the stress reducing properties in the B vitamins has a beneficial role to play. Studies have shown that Riboflavin (B2) can be effective for reducing the severity of chronic migraines. Furthermore, the beneficial effect of intravenous magnesium as a treatment for migraines has been demonstrated in clinical trials. In one study, 40 patients with an acute migraine were administered 1 gram of magnesium sulfate over a 5-minute period. Within 15 minutes of the infusion, 35 patients (87.5%) reported at least a 50 percent reduction in symptoms of pain, and 9 patients (22.5%) reported complete relief. In another study, which was a single-blind trial that included 30 patients with an acute migraine attack, IV administration of magnesium completely and permanently relieved pain in 13 of 15 individuals. No patients of the 15 individuals in the placebo group became pain free.

Who Can benefit from IV Nutrition Therapy?

IV therapy can procure therapeutic effects for many individuals across a wide range of conditions. The fact that a number of IV therapies work to promote overall health and wellbeing means that the benefits are not limited to the acutely or chronically ill.

As stated before, because IV nutrition protocols are so diverse in their application for many health conditions, many individuals can benefit from IV therapy for different reasons. Arguably some individuals have much more to gain from the administration of IV nutrients, such as when the digestive system is severely compromised and the introduction of IV fluids are necessary for recovering health. This being said, healthy populations may also seek IV Nutrition Therapy for improved athletic performance, cosmetic reasons, mitigating jet lag, or helping the body age better.

In an ideal world, our diet should provide adequate levels of basic nutrients, however, due to chronic stress, poor diet choices, environmental pollutants, nutrient depleted soil and genetic modification, nutrient status in the body is often not even close to optimal. Healthy diet choices are paramount for good health, and IV nutrition can help with cellular nutrition when there are deficiencies in the body. Helping treat nutritional deficiencies is only one aspect of IV therapy. Different disease states can negatively affect the cellular processes in our body and the IV administration of certain substances directly to the cells can be of great therapeutic value.

The varying benefits of IV Nutrition Therapy can be bestowed upon everyone from the individual with an acute cold, to the patient suffering from the effects of chemo therapy, to the elite athlete looking to improve athletic performance. Many IV Therapy practitioners specialize in the treatment of certain conditions such as cancer, or allergies. It is important to find an IV practitioner whom is well versed in the treatment of your specific condition. IV Nutrition therapy may be used as an adjunct to conventional medicine or as the sole

treatment modality depending on what is determined optimal for the patient.

Some Conditions that may Benefit from IV Nutrition Therapy are:

- Cancer
- Stress
- Cardiovascular Disease
- Allergies
- Chronic Fatigue Syndrome
- Chronic Dehydration
- Migraines
- Autoimmune Diseases
- Pain
- Allergies
- Fibromyalgia
- Arthritis
- Anxiety and Depression
- Infection
- Lyme Disease
- Asthma
- Adrenal Insufficiency/Fatigue
- IBS/IBD
- Lupus
- Weight Loss
- Infertility
- Skin Conditions
- Hormonal Imbalances
- Chron's Disease
- Fatigue
- Insomnia, and Sleep Issues
- Immune support
- Heavy Metal Accumulation
- Morning Sickness during pregnancy
- And more

The above list of possible applications for IV Nutrition Therapy is by no means complete. It makes sense that IV Nutrition is such a versatile treatment because, as we have learned, one of the primary goals is to optimize cellular processes and cell health. It is a myriad of healthy, functioning cells which constitute a health individual. A therapy which keeps this in mind is able to facilitate processes that help the body heal itself, and as such this can be useful for a multitude of health conditions. Instead of individually examining how nutrition therapy can be beneficial to all of these conditions we will look at a couple of examples.

Example #1: Cancer Treatment

There are a number of IV protocols which are designed to improve quality of life and health in cancer patients. One which is employed all over the world is the intravenous injection of high dose Vitamin C. In the 1970's, Nobel Prize winner Linus Pauling, hypothesized the potential clinical benefits of Vitamin C for treating people with cancer. Since then studies in animals and cancer cell structures suggested that high concentrations of ascorbic acid (Vitamin C) might prevent and treat certain cancers. Recent studies have shown that the combined effect of high-dose Vitamin C and conventional cancer treatment can slow the progression of the disease and mitigate some of the negative effects of chemotherapy, compared to receiving conventional treatment alone.

It is thought that the success of High Doses of Vitamin C in cancer patients comes down to an understanding of the difference between healthy and cancerous cells. Due to faulty metabolism which occurs in the mitochondria of cancer cells, these cells produce abnormally high levels of redox active iron molecules. These molecules then react with the vitamin C and form hydrogen peroxide and hydrogen peroxide-derived free radicals. Scientists believe that it is the formation of these free radicals which drive cancer cell death by damaging the cell's DNA. Furthermore, the

free radicals are thought to weaken the cancer cells, making them more susceptible to radiation and chemotherapy. This is an excellent example of how the knowledge of cellular processes, and cell reactions to different environments, can aid in the treatment of patients.

Example #2: Strenuous Activity

When we exercise the body loses precious electrolytes and water via sweat. Furthermore, intensive and repetitive exercise results in mild muscle breakdown and lactic acid buildup. This muscle breakdown causes the release of free radicals and toxin production which can put a strain on the kidneys and other organs, as well as cause inflammation. Exercise is crucial for optimal health but it does have acute negative health effects which disrupt our body's equilibrium, and can result in dehydration, fatigue, lowered performance, and muscle soreness.

IV nutrition therapy can be utilized to mitigate these negative side effects, and help an individual receive the positive benefits of exercise at the same time. After a bout of exercise IV fluids can be administered to replenish key nutrients, water and electrolytes which were diminished, as well as reduce inflammation and fatigue. By assisting the body back into a state of equilibrium IV therapy works to speed up recovery time from strenuous activities so that one can improve athletic performance and be more productive in other areas of life.

These two examples show how IV Nutrition therapy can be beneficial for both ill and healthy individuals alike. What is common between them is that an effort is made to optimize cellular processes and chemical environments within the body through the introduction of therapeutic substances. Adjusting and improving the physiological balance of key nutrients in the body can positively impact many health problems afflicting individuals today.



What is it like to Receive IV Nutrition Therapy?

Although different IV therapies result in different patient experiences there are some common practices a patient can expect. IV therapies should always be administered by a qualified medical professional, ideally in a clinical setting.

All IV Nutrition therapies do require the use of a medical needle to administer therapeutic substances into the body. This can be off-putting to patients with an aversion to needles, but the process is generally quite painless when performed by qualified medical staff whom are trained in IV administration techniques. Different treatments and administration techniques determine the length of treatment times. For example, receiving a B-complex intramuscular injection takes only a few seconds to perform. A glutathione intravenous push may take around 10 minutes, and an IV drip of curcumin can take up to 3 hours. As you can see there is a large degree of variation in the length of individual treatment sessions. During longer IV drips the patient is usually able to relax comfortably in a padded chair while they receive treatment.

The frequency of treatment is also largely variable, with some patients requiring a single session for desired results and some patients receiving daily infusions. A treatment plan should be discussed with the doctor to establish session frequency and expectations. The doctor will usually perform bloodwork on the patient to assist in determining the patient's treatment protocol.

An intravenous drip session is generally a relaxing and enjoyable experience for the patient. Depending on the type of treatment, and individual health characteristics of the patient, positive effects may be felt immediately or after several successive treatments. For example, with a glutathione push many patients report an overall sense of well-being and energy right away. Some patients receive multiple treatments before attaining results.

What to Expect at an IV Drip Therapy Session

1. Eat a substantial meal before arriving for an IV Treatment
2. Any relevant bloodwork or testing will be reviewed with the patient.
3. The nurse or doctor will check the patient's vitals to ensure they are fit to receive IV therapy. Pulse rate, blood pressure, and weight are often recorded.
4. The patient will be able to relax in a comfortable chair or bed during the procedure.
5. The doctor or nurse will access the patient's vein, usually somewhere on the arm, with a medical needle in order to insert the catheter. The needle is removed with the catheter remaining in the vein. This is much more comfortable than if the needle was left in the vein throughout the procedure.
6. The catheter is connected with tubing to the IV bag suspended on an IV pole. The IV bag will have been carefully prepared by a qualified professional to ensure the correct Nutrients and substances are in the mixture. Some patient may receive consecutive IV bags during a procedure if substances are being administered that should not be combined external to the body.
7. Often a medical fluid pump is utilized to control the flow rate of the IV liquid into the patient. Some substances can be delivered at much faster flow rates. Substances such as NAD+ and curcumin require very slow flow rates because at faster rates they can be uncomfortable to the patient.
8. As the therapeutic agents are dripped into the patient, a nurse or doctor will be monitoring the procedure. The patient is able to relax, read a book, work on their computer, or converse with their IV neighbours.
9. Once the patient has completed their IV infusion the nurse or doctor will remove the catheter and apply pressure to the injection site before applying a small bandage. There can be some tenderness at the injection site for a short time.
10. The patient vitals will be checked again to make sure they are in fit condition to leave the clinic.

IV therapy when practiced by a qualified medical professional is an extremely safe procedure with minimal side effects. Allergic reactions to certain IV substances, although rare, is possible. Please advise your practitioner of any allergies you may have. IV therapists should be well trained as to what to do in the event of an allergic reaction and how to avoid possible adverse reactions in the first place. Some patients can experience a burning sensation at the injection site if the flow rate is too high for the individual. Always notify you IV practitioner of any discomfort during the procedure. Certain therapies such as detoxification therapies can make the patient feel fatigued or experience a headache as toxins are mobilized in the body. Generally, these adverse effects clear up within a few hours. Drinking lots of water can help this process.

Conclusion

Hopefully after reading this book one has a more comprehensive understanding of the science behind IV nutritional practices and their application in the field of health and wellness. A much more in-depth profile of some of the popular therapeutic substances utilized by IV therapy is provided in the following pages.

If you are interested in learning whether **IV Nutrition Therapy** may be right for you please contact one of our medical staff to book a **free consultation**. At **Emerald Wellness**, we believe that the synergistic union of conventional medicine and well-researched integrative health therapies can be the best way to achieve positive patient outcomes. We are dedicated to educating our patients, and only recommend specific treatments when we firmly believe they are the right course of action for improving patient health and wellbeing. If we do not deem that IV Therapy is appropriate for your case we will let you know. Our main concern is doing everything within our means to help you find your healthiest self.

We are very proud to be able to provide Canadians, right here at home, the numerous health benefits of Intravenous IV Nutrition Therapy. If this therapy is deemed right for you we will do everything possible to make your treatment an informative and enjoyable experience.

-Dr. Adeleye Lemi Adebayo
Medical Director

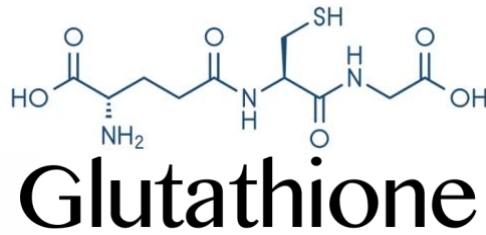


EMERALD WELLNESS
Find your Healthiest Self



We will now delve into a closer examination of a few therapeutic substances utilized by IV Nutrition Therapies





“The Master Antioxidant”

Glutathione is an important substance found in every cell in the body, where it acts as an **antioxidant** to neutralize free radicals and prevent cellular damage. Scientific research has demonstrated glutathione’s importance for humans by showing that cellular glutathione levels are an excellent predictor of life expectancy. This has led many to understand that optimally regulating glutathione levels in the body is an excellent anti-aging method, and promotes overall health. By eliminating free radicals from the body, glutathione is able to protect many of the body’s systems from disease and deterioration. Due to its wide range biological uses it is essential to prevent glutathione levels from becoming low. Unfortunately, natural glutathione production can be easily disrupted, and stores in the body can become quickly depleted by the effects of poor diet, stress, aging, medications, infections, radiation, and other toxins. Having a medical doctor help regulate your body’s glutathione levels can do wonders for maintaining and improving your health. Not only does Glutathione promote health internally, it is also an excellent substance for rejuvenating and lightening skin. Many individuals supplement with glutathione in order to receive its amazing cosmetic benefits for skin health.

Therapeutic Benefits and Uses of Glutathione

- ✓ Healthier, lighter skin
- ✓ Helps prevent depression and stress
- ✓ Increased collagen production
- ✓ Limits Neurodegeneration
- ✓ Acne suppression
- ✓ Helps combat infections
- ✓ Ultimate detoxifier
- ✓ Improves gut health
- ✓ Anti-aging
- ✓ major factor in the regulation of life, proliferation, and death of cancer cells
- ✓ Improves Liver Function
- ✓ improves mood and sense of well-being
- ✓ Can help with respiratory issues
- ✓ essential for maintaining health and addressing toxic related illness
- ✓ May help Rheumatoid Arthritis
- ✓ Fights oxidative stress in the body
- ✓ Helps prevent Glaucoma and Cataracts
- ✓ Helps control inflammation
- ✓ Can treat sleep apnea

Methods of Administration

Intravenous supplementation of **reduced glutathione** is the gold standard for administering high levels of glutathione and regulating levels in the body. Due to glutathione's molecular makeup it is light sensitive and proper precautions must be made to prevent light exposure during administration of the substance. The fact that reduced glutathione is such a reactive substance it is best to use an 'IV push' rather than an 'IV drip' to facilitate better and faster absorption into the bloodstream. Many of the positive effects of a Glutathione push are often felt within 3 hours of administration.

Intramuscular and Subcutaneous injections are also quite effective; however, they must be administered in smaller doses than intravenously.

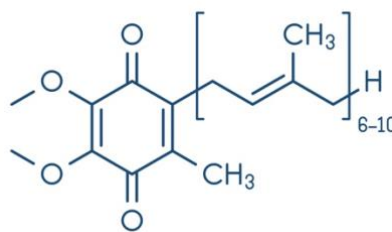
Oral administration of glutathione alone is thought to be ineffective for altering glutathione levels due to hydrolysis during digestion and poor absorption.

Ways to Increase Glutathione Levels Naturally

Consuming Sulfur rich foods such as garlic, onions, and cruciferous vegetables (broccoli, kale, cabbage, collards, cauliflower etc...).

Exercise boosts your glutathione levels and thus aids in boosting your immune system, detoxification, and antioxidant defenses.





Coenzyme Q10

Cellular Energy

Coenzyme Q10 (CoQ10) is a fat-soluble, vitamin-like compound which is produced naturally in the body. It is an essential element for many health systems since it is required for the proper functioning of every single cell in the body. In order to sustain enough energy to perform bodily functions the mitochondria in our cells use fat and other nutrients to create useable sources of energy- this critical conversion process is only made possible by the presence of adequate amounts of CoQ10. As a result, having healthy levels of **cellular energy** is highly dependent on the body's levels of CoQ10. Furthermore, Coq10 is an extremely potent antioxidant which has been used in medical practice to protect cells from the effects of aging and free radicals.

Although the body creates its own CoQ10, it does not always do so consistently or adequately. As we age, or become ill, our bodies can become less efficient at producing this essential compound, and a lack of CoQ10 is associated with decreased energy, the damaging effects of oxidative stress, declining cognition, diabetes, cancer, fibromyalgia, heart disease, muscle conditions, and other health ailments. The fact that CoQ10 is so important for cellular energy and proper cell functioning means that in order to stay healthy it critical to make sure you are balancing your CoQ10 levels. With the aid of a medical professional CoQ10 Intramuscular or Subcutaneous Injections are an excellent way of quickly increasing levels in the body and optimizing conditions for increased cellular energy production and health.

Aside from CoQ10's energy promoting and antioxidant effects in the body, studies have also shown its supplementation to improve heart health, lower side effects of statins, maintain optimal pH levels, protect cognitive health, combat cancer, promote fertility, ease symptoms of autism, and much more. Some of the positive effects of a CoQ10 injection can often be felt quite quickly. Many athletes will supplement with CoQ10 injections prior to intense physical exercise as its energy promoting effects can be useful for peak performance levels.

Therapeutic Benefits and Uses of CoQ10

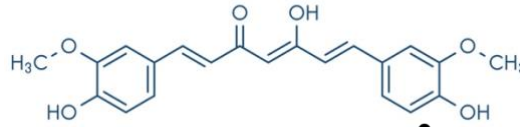
- ✓ Sustains natural energy
- ✓ Combats Cancer
- ✓ Reduces free radical damage
- ✓ Reduces the effect of Diabetes
- ✓ Improves heart health
- ✓ Prevent liver damage
- ✓ Offsets side effects of statin drugs
- ✓ Promotes fertility and Newborn Health
- ✓ Protects cognitive health
- ✓ Reduces surgical complications
- ✓ Helps maintain optimal pH levels
- ✓ Can ease core symptoms associated with Autism
- ✓ Slows down the effects of aging
- ✓ Can improve athletic performance
- ✓ Improves Fibromyalgia
- ✓ Helps with high blood pressure
- ✓ Reduce Migraines
- ✓ Assists Chronic Fatigue Syndrome
- ✓ Treat Alzheimer's disease and dementia

Methods of Administration

The bioavailability of CoQ10 when ingested orally is quite poor due to malabsorption and difficulties passing the GI tract. In order to facilitate the proper uptake of CoQ10 by peripheral tissues in the body it is necessary to raise blood levels of Coq10 many times over. This is best achieved through either intravenous, Intramuscular, or Subcutaneous Injections. At Emerald Wellness, we often opt to supplement CoQ10 with Intramuscular or Subcutaneous Injections since this method of delivery is less invasive than an IV and one can derive the same benefits. If a patient is already receiving IV therapy for other nutritional compounds the CoQ10 may be added to the IV mix or administered through an IV push. Although the bioavailability of oral CoQ10 can be poor it is sometimes still advised to supplement Orally as well as Intravenously in order to increase levels in the body. It can also help to supplement with L-Carnitine in order to increase the effectiveness of CoQ10 within the body.

CoQ10
Energy for your Cells





Curcumin

Amazing Anti-inflammatory

Curcumin is the most active phytochemical in turmeric (the common curry spice) and is one of the most well studied and versatile supplements around. Curcumin is best known for its amazing **anti-inflammatory** effects in the body and as a result provides many benefits for various health conditions. The fact that so many diseases and age-related health problems are due to unchecked inflammation in the brain and body makes curcumin an excellent supplement for optimizing and maintaining health. Aging is directly linked to increased levels of inflammation so a substance which reduces inflammatory cytokines is fundamentally able to slow down the aging progress.

Intravenous Curcumin Therapy has been shown to be extremely beneficial for assisting with the treatment of cancer, autoimmune conditions such as MS and Rheumatoid Arthritis, and for fighting viruses and infections. Curcumin is also beneficial for gut health, improving brain function, and protecting against stress and depression.

As more and more research reveals that many of the most troublesome physical and mental illnesses are directly related to chronic inflammation in body, being able to intravenously supplement curcumin with its anti-inflammatory effects has become an excellent natural treatment with virtually no negative side effects.



-Turmeric Spice-

Therapeutic Benefits and Uses of Curcumin

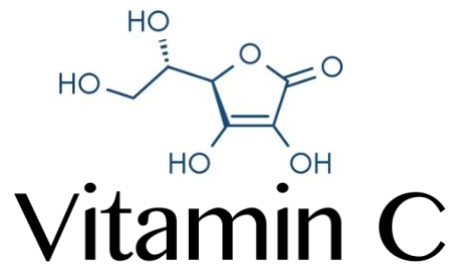
- ✓ Anti-inflammatory
- ✓ Protects against Stress and Depression
- ✓ Improves gut health
- ✓ Protects against Metal Toxicity
- ✓ Fights Autoimmune conditions
- ✓ Helps treat Obesity and Diabetes
- ✓ Is Anti-Viral, Anti-Bacterial, & Anti-Fungal
- ✓ Is Anti-Aging
- ✓ Excellent for Brain health
- ✓ Helps Joint Problems
- ✓ Reverses cognitive decline in Alzheimer's
- ✓ Fights Several types of Cancer
- ✓ Prevents Liver disease
- ✓ Protects Kidney health
- ✓ Prevents Cataracts
- ✓ Neuroprotective

Methods of Administration

It is very difficult to receive therapeutic doses of curcumin by simply consuming Turmeric spice. If one is attempting to supplement orally, curcumin extracts can be ingested to achieve therapeutic doses of the substance but this is not always easy. It is important to note that one must be taking a high-quality curcumin supplement with high bioavailability, as well as have optimal digestion in order to effectively absorb the supplement and derive its benefits. Taking curcumin with piperine has been shown to improve absorption. Studies have also shown that many oral supplements fail to leave the GI tract or cross the blood brain barrier.

Intravenous supplementation of Curcumin is able to bypass the problem of the GI tract by allowing the substance to be readily absorbed into the blood stream at much higher concentrations. This allows one to derive the benefits of curcumin much quicker. It is recommended to administer IV curcumin as a slow IV drip since faster delivery methods can cause slight discomfort at the injection site. Intravenous Curcumin is orangey-brown in colour and depending on dosage often takes a couple of hours to administer during an IV Drip.

Many individuals benefit from supplementing orally as well as intravenously in order to constantly provide their bodies with the amazing anti-inflammatory effects of this nutrient. Supplementing orally is particularly useful for reducing inflammation in the stomach.



An Excellent Antioxidant

Vitamin C (Ascorbic acid) is an essential water-soluble micronutrient which the human body cannot create on its own. Due to this it must be obtained through diet or supplementation. Vitamin C is arguably the most effective **antioxidant** in our blood, due to its water solubility and to the extensive range of radical oxygen species it is able to scavenge. Many know this precious vitamin to be useful for improving the immune system and preventing the common cold but it is also great for a vast array of health issues including, high blood pressure, stroke, cancers, atherosclerosis, inflammation, and obesity.

High dose Intravenous Vitamin C therapy has been used to treat cancer patients since as early as the 1970's. With bodies of evidence showing the treatments' effectiveness, healthcare practitioners around the world now regularly administer high dose Vitamin C to patients, often to treat cancer, infections, and fatigue.

The fact that vitamin C is fundamental for so many functions in the body makes it essential to maintain proper levels for optimal health. Intravenous injections of Vitamin C can regulate nutrient levels, and high dose injections can be used to combat many illnesses.

Therapeutic Benefits and Uses of Vitamin C

- ✓ Vital for brain health
- ✓ Facilitates collagen production
- ✓ Improves mood, combats depression, and lowers anxiety
- ✓ Reduces toxin burden
- ✓ Reduces Fatigue
- ✓ Beneficial during pregnancy
- ✓ Slows age related cognitive decline
- ✓ Lowers Cortisol Levels
- ✓ Beneficial for circulation
- ✓ Improves energy
- ✓ Combats cancer
- ✓ Reduces negative effects of chemotherapy
- ✓ Relieves chronic stress and burnout
- ✓ Amazing antioxidant
- ✓ Boosts Immunity
- ✓ Beneficial for diabetics
- ✓ Reduces inflammation
- ✓ Combats weight gain
- ✓ Lowers Histamine levels
- ✓ Great for skin health

Methods of Administration

Oral supplementation of Vitamin C is often adequate in healthy individuals with healthy digestive systems. Some individuals experience nausea and stomach upset when taking oral supplements. With ill patients IV injection is a much more effective means of administration because having Vitamin C absorbed directly into the bloodstream has the advantage of achieving blood levels of the vitamin 10 times higher compared to taking an oral supplement. Consequently, in healthy individuals, oral supplementation can be effective for correcting a vitamin C deficiency. This being said, for some conditions achieving therapeutic blood concentrations of the vitamin must be done through intravenous administration in order to attain high enough levels.

Intramuscular or subcutaneous injections are not recommended since this form of fast delivery can cause an unpleasant burning sensation at the injection site.

Natural Sources of Vitamin C

Many fruits and vegetables are an excellent source of Vitamin C such as oranges, mangos, peppers, broccoli and Brussel sprouts.



-Foods High in Vitamin C-



Poly MVA

DNA Repair

Poly MVA is a unique arrangement of vitamins, minerals, and amino acids which support cellular energy production, exerts antioxidant effects, and replaces nutrients that may have become exhausted in the body due to chronic illness or particular health therapies. This arrangement is a proprietary blend of the mineral palladium which is bonded to alpha-lipoic acid, Vitamins B1, B2, B12, formal-methionine, N-acetyl cysteine, with trace amounts of molybdenum, rhodium, and ruthenium. Poly MVA is specifically designed to provide increased energy for compromised systems in the body by changing the electrical potential of human cells and helping aerobic metabolism within the cell.

In scientific studies Poly MVA has demonstrated fascinating health promoting benefits. One of Poly MVA most interesting effects is its ability to assist in **DNA repair** in response to injurious agents such as gamma-radiation. Gamma-radiation damage often occurs during radiation treatment for cancer. Being able to take a supplement that mitigates this damage is extremely advantageous.

Furthermore, by providing the essential ingredients needed to fuel mitochondria (the power house of the cell) and produce ATP, Poly MVA has the ability to reverse cellular energy deficits, and thus improve energy stores in the entire body. This is excellent for anyone combatting fatigue related symptoms.

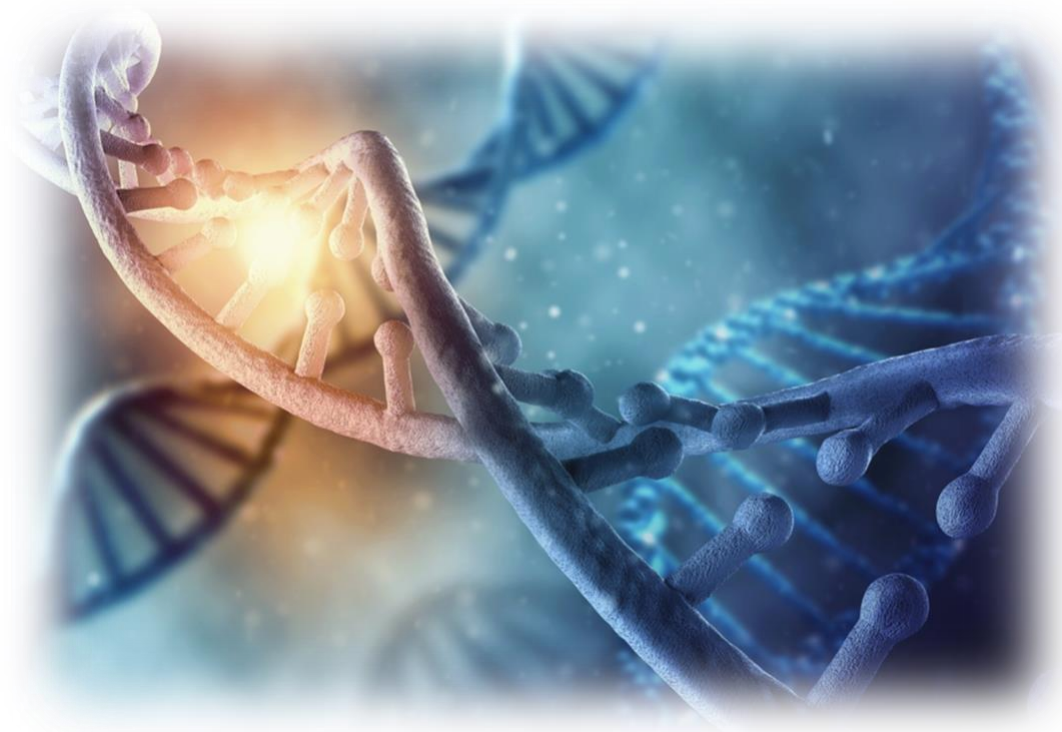
Poly MVA undoubtedly offers a lot of promise in terms of health benefits for people dealing with chronic illness. For people seeking solutions for fatigue, as well as anyone who wants to fortify their bodies and support optimal health, Poly MVA may be a beneficial

Therapeutic Benefits and Uses of Poly MVA

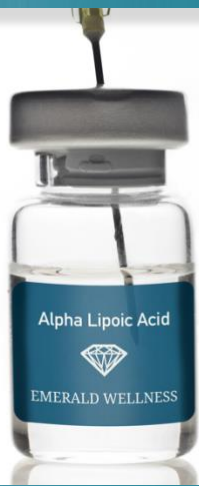
- ✓ Assists in preventing cell damage
- ✓ supports oxygenation of cells and tissues
- ✓ Helps the body to produce energy for proper cell function
- ✓ Works as a powerful antioxidant
- ✓ Supports nerve and neurotransmitter function
- ✓ Supports the liver in removing substances from the body
- ✓ Alleviates hyperglycemia in diabetics
- ✓ Assist in DNA repair
- ✓ Excellent for chronic illnesses
- ✓ Reduces fatigue
- ✓ Effective, safe, and intriguing way of targeting cancer
- ✓ Alternative/complement to chemotherapy
- ✓ Provides protection from Radiotherapy

Methods of Administration

Poly MVA can be administered into the body either through an IV or orally as a liquid supplement. IV administration allows for better absorption, higher dosing, and more immediate results. Many patients benefit from supplementing both orally and intravenously at the same time. It is also beneficial to supplement with CoQ10 to enhance the effects of Poly MVA.



-The Ability to Protect and Repair DNA-

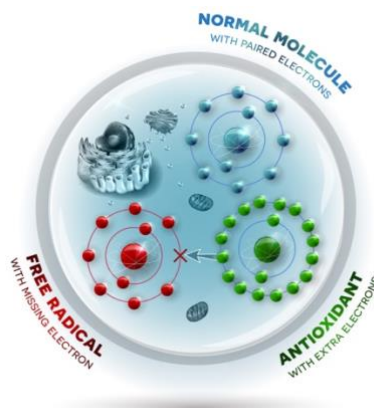


Alpha Lipoic Acid

The “Universal Antioxidant”

Alpha Lipoic Acid (ALA) is a natural antioxidant and anti-inflammatory compound which works to alleviate pain, protect the brain, decrease the risk of cardiovascular disease, help with weight loss, improve diabetes, fight cancer, and assist in the treatment of several other health conditions. ALA has such exceptional therapeutic capabilities due to its unique molecular structure which allows it to act as both a fat-soluble and water-soluble antioxidant. This rare characteristic enables ALA to carry out its powerful antioxidant mechanisms in more areas of the body and allows it to easily cross the blood-brain barrier. A supplemental antioxidant that is able to cross the blood-brain barrier, in order to reduce inflammation and clear toxins in the brain, is extremely valuable in the treatment of many health conditions. Another interesting quality of ALA supplementation is its ability to rapidly regenerate supplies of vitamin C and glutathione in the body. So, ALA is able to increase levels of other important antioxidants while being an antioxidant itself. All of the aforementioned abilities have led many to refer to ALA as **‘The Universal Antioxidant’**.

High dose intravenous supplementation of ALA has been shown to prevent healthy cell damage and at the same time induce cell death in cancerous cells. In Europe, ALA is licensed for the treatment of diabetic neuropathy. It is also extremely beneficial in the treatment of chemotherapy induced neuropathy. The reason for this is its ability to improve the function and condition of neurons. If a patient is suffering from symptoms of brain toxicity, inflammation, or other cognitive issues high dose ALA is recommended due to its remarkable abilities to improve memory, reduce brain damage, reverse cognitive dysfunction, and protect the brain from neurodegeneration.



-ALA is a Powerful Antioxidant-

Therapeutic Benefits and Uses of ALA

- ✓ Helps with weight loss
- ✓ Powerful Antioxidant
- ✓ Decreases inflammation
- ✓ Prevents and improves diabetes
- ✓ Promotes muscle regeneration
- ✓ Combats Metabolic syndrome
- ✓ Helps lowers blood pressure
- ✓ Protects the brain
- ✓ Helps with Multiple Sclerosis
- ✓ Prevents Migraines
- ✓ Alleviates pain
- ✓ removes toxic metals from the body
- ✓ Beneficial for the skin
- ✓ Fights cancer
- ✓ Hypothyroidism
- ✓ Neuropathy
- ✓ Lyme Disease
- ✓ Prevents bone loss
- ✓ May help with high risk pregnancies
- ✓ Improves Sperm Quality
- ✓ Helps with ulcers and IBD

Methods of Administration

Alpha Lipoic Acid can either be taken orally or through intravenous therapy. When supplementing orally the only form that is well absorbed is the 'R' form, "R-ALA". Although this oral supplement is slightly more expensive than the more common, 'S' form, of ALA it has been shown to be 10 times more effective at raising ALA levels in the body. Dosages of between 600-1800 mg may be taken orally per day. Doses at the higher end of this range can cause stomach upset in some patients.

This being said many of the studied benefits of ALA are only associated with high dose intravenous therapy. Depending on the patient's needs, both oral and intravenous administration of ALA is commonly recommended in order to achieve therapeutic levels in the body. When quicker and more dramatic results are desired intravenous supplementation is the gold standard of ALA treatment. ALA is a very important therapeutic supplement due to its unique brain-barrier crossing, antioxidant, and anti-inflammatory effects.



NAD+

Nicotinamide Adenine Dinucleotide

“The Molecule of Youth”

Naturally occurring **Nicotinamide** molecules have recently seen a huge surge in scientific interest. Growing bodies of research have discovered some truly extraordinary effects of the Coenzyme **Nicotinamide Adenine Dinucleotide** (NAD⁺/NADH). The most notable being Harvard Medical School’s discovery that the NAD⁺ molecule appears to be the only molecule known to science that is able to **reverse** and not just delay aging. This may seem like a fantastical claim but more and more evidence is being uncovered regarding NAD⁺’s anti-aging properties. We have known for some time that NAD⁺ levels in the body decrease dramatically as we age, especially after the age of 40. We also know that low levels of NAD⁺ have some quite harmful effects on our bodies, such as:

- Suffocating our bodies cells
- Increasing risk of sunburns and skin cancer
- Associated with fatigue
- Quickens Aging
- Worsens weight gain and metabolic syndrome
- Decreases Cellular Antioxidants
- May worsen Cardiovascular Diseases
- May contribute to Multiple Sclerosis
- Can Impair Brain Function
- Harms Immune Balance/Function
- Increases Inflammation
- Decreases metabolism along with Thyroid Hormones

Many of the harmful symptoms of low NAD⁺ can be likened to the symptoms of aging itself. Other health factors can also cause low levels of NAD⁺ such as chronic illness, chronic inflammation, disrupted circadian rhythm, overeating, high blood sugar and insulin levels, and DNA damage. It is quite evident that one wants to avoid the effects of low NAD⁺ in order to maintain a healthy disposition.

Why is NAD+ so Important?

Nicotinamide Adenine Dinucleotide (NAD+) is an essential molecule found in every cell of the human body. It is a coenzyme of Niacin (Vitamin B3), which acts as a helper molecule that binds to a protein in order to activate an Enzyme reaction. Enzymes are responsible for 1000s of different biochemical reactions throughout the body and NAD+ partakes in more reactions than any other vitamin-derived molecule. A few of the fundamental biological reactions NAD+ facilitates are:

Energy Production: NAD+ assists your cells in converting food to energy by operating as an electron transporter during cell metabolism

Gene Expression: Certain enzymes can turn off genes that promote aging, such as those that are involved in inflammation, fat synthesis and storage, and blood sugar management. The more levels of NAD+ increase in the body the more active these beneficial enzymes become.

Repair DNA: A steady supply of NAD+ is fundamental for the activation of biological processes which detect and repair damaged DNA.

Cell Signaling: NAD+ is able to be released from the intracellular to the extracellular space for communication. One aspect of this cellular communication is to alert the immune response when a cell is under stress or in cases of inflammation.

Therapeutic Benefits and Uses of NAD+

When you increase your levels of NAD+, your cells are able to produce more energy, your DNA is repaired, your “good genes” are turned on, it protects the brain, and many other health functions are improved. The effects of this can be quite astounding, and the fact that NAD+ is such a powerful and prolific molecule its supplementation can be helpful for many different conditions. Some conditions that are especially benefited by increasing NAD+ levels are:

- ✓ Stress
- ✓ Depression
- ✓ Chronic Pain
- ✓ Brain Injury
- ✓ Mitochondrial Disease
- ✓ Chronic Fatigue
- ✓ Anxiety
- ✓ Neurodegeneration
- ✓ Substance Abuse
- ✓ Addiction
- ✓ Sleep Disorders
- ✓ Autism
- ✓ Lyme Disease
- ✓ Improving Physical Performance in Athletics

You will notice that many of the conditions mentioned involve suboptimal functioning of the brain and nervous system. The reason NAD+ is so beneficial for these conditions is due to its neuroprotective properties and ability to promote regenerative healing in the brain. There are several clinics in the United States who solely practice IV NAD therapy as an Addiction and Mental Health treatment with great success.

Methods of Administration

NAD+ therapies should be custom tailored to the patient's specific needs. All individuals, healthy or otherwise, can benefit from oral dosing of NAD+ precursors such as Nicotinamide Riboside. Oral supplements of NAD+ itself are ineffective at raising levels in the body due to malabsorption unless they are liposomal versions. This being said, the most successful and therapeutic way to increase NAD+ levels is through intravenous injection. An individual's type and severity of condition greatly determines the dosage, frequency, and duration of treatment when it comes to NAD Intravenous Therapy. Some patients may benefit from a monthly injection, whereas others will benefit from much more intensive treatment plans. Often for conditions such as addiction or chronic illness intensive slow drip IV sessions over the course of several days is recommended to achieve more dramatic and lasting results. Intravenous NAD Therapy can have some really remarkable effects on energy, cognitive performance, mental health, and overall health. After an NAD Therapy session patients often report feeling increased energy, mental clarity, and focus. As well as an enhanced sense of purpose, improved mood, and lower levels of pain. This special molecule is truly revolutionizing the way we address healing and aging in today's world.



-NAD+ Works to Rejuvenate the Brain-



Alpha GPC

Alpha-Glycerolphosphorylcholine

Give your Brain a Boost

When it comes to memory formation and learning one of the most important brain chemicals involved is called acetylcholine. This critical neurotransmitter is derived from the precursor choline, and one of the best supplemental sources of choline is **Alpha GPC (Alpha-glycerolphosphorylcholine)**. Through providing your brain with more raw choline, and converting this into acetylcholine, a number of therapeutic benefits can be realized which improve one's health. Alpha GPC is an extremely potent tool when it comes to improving memory and learning, as well as fighting cognitive decline and symptoms of Alzheimer's disease. When a patient presents with symptoms of impaired cognitive functioning, sometimes experienced as "Brain Fog", supplementation with Alpha GPC can provide clearer and sharper thinking. Healthy individuals can also use this amazing source of choline to improve cognitive performance. The most choline rich foods include liver and other organ meats which are no longer a common staple in the North American diet. Due to this we have noticed that many people are deficient and can accrue great advantages from supplementing with Alpha GPC. It is an excellent source of fuel for cognitive functioning in the brain.

Therapeutic Benefits and Uses of Alpha GPC

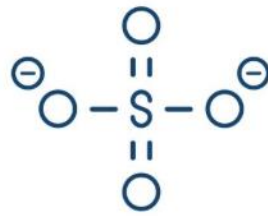
- ✓ Improves memory
- ✓ Improves liver health
- ✓ Decreases Inflammation
- ✓ increases myelin in the brain
- ✓ Improves cognitive performance
- ✓ Improves symptoms in Alzheimer's and Parkinson's Disease
- ✓ Helps with Schizophrenia, Bipolar and Autism
- ✓ Improves recovery after brain injury
- ✓ Can increase athletic performance
- ✓ Can be useful in treating drug addiction
- ✓ Choline is essential for fetal development
- ✓ Helps with 'Brain Fog'

Methods of Administration

Supplementing with Alpha GPC orally is actually quite effective at increasing choline levels in the body if the patient has a healthy digestive system. Oral doses of 300-600mg a day are tolerated quite well and can be very beneficial for one's health. Depending on a patient's condition one may recommend to supplement with Alpha GPC primarily through the oral route. However, if a patient presents with symptoms of imperfect digestive health, more serious health conditions, or is not benefitting enough from oral administration and requires much higher doses, intravenous administration is the best option for raising levels. This allows for 100% absorption directly into the bloodstream and can replenish choline levels in the body much more efficiently. Patients often report clearer thinking and improved cognitive function during their first IV session. Sometimes a few sessions are required to achieve and maintain optimal results.



-Alpha GPC Improves Cognitive Functioning-



Magnesium

A Very Important Mineral

Magnesium is the fourth most abundant mineral found in our bodies and is critical for numerous physiological functions. In fact, over 300 important enzymatic processes require adequate levels of magnesium to take place. This multi-purpose mineral is required for the production of ATP (the main source of energy in our cells), bone health, muscle relaxation, the immune system, healthy stress response, stabilizing blood sugar, and much more. Unfortunately, low consumption of magnesium is quite common throughout the world. Studies estimate that the average North American's intake of dietary magnesium is well below the Recommended Daily Amount. To make things worse acute and chronic stress further depletes our bodies magnesium levels which can be a double-edged sword. Inadequate levels of magnesium make us less equipped to deal with stressors in our modern lives, which ends up causing our bodies to use up even more of this vital mineral when our reserves are already low. Due to the fact that this mineral is so crucial for optimal health, and since many Canadians are deficient, this is one of the rare instances where we recommend nearly all individuals to supplement (or increase dietary sources of magnesium). A high-quality magnesium supplement can do wonders for maintaining your health. One of the reasons taking an Epsom Salt bath makes your body feel so great is because your skin is absorbing a large amount of Magnesium and delivering it to other areas in the body.

Methods of Administration

It is generally advisable for many individuals to supplement daily with a high-quality magnesium supplement orally. This being said, some individuals may benefit much more from IV administration if they have compromised absorption or require higher doses. Oral supplementation is generally well tolerated but can cause stomach upset and diarrhea at higher doses. Adding Magnesium to an IV mix is quite common practice since so many individuals can benefit from raising their levels in today's society. One can also take Epsom baths to increase magnesium levels through skin absorption as well.

Therapeutic Benefits and Uses of Magnesium

Strengthens Bones: Magnesium is essential for bone formation since it aids in calcium absorption, and plays a fundamental role in activating Vitamin D in the Kidneys.

Relieves Anxiety: Low levels of Magnesium, or fluctuations in the way the mineral is processed by the body, have been directly associated with High Anxiety levels. Correcting this imbalance is able to reduce patient anxiety levels.

Increases Energy Levels: Magnesium is able to increase the production of energy in the body since it directly facilitates ATP production.

Relieves Headaches and Migraines: Magnesium deficiency has been associated with factors that cause headaches. People who suffer from migraines often have lower levels of tissue magnesium and serum. Research suggests that supplementation may reduce or prevent symptoms of migraine headaches.

Magnesium may Prevent Cancer: Magnesium deficiency, through exacerbating chronic inflammatory stress, could play a role in the onset of cancer. A study found that middle-aged men with higher magnesium concentrations had a 50% lower risk of cancer death than those with low magnesium.

- ✓ Soothes aching muscles
- ✓ Maintains bone integrity
- ✓ Reduces blood pressure
- ✓ Improves Heart Health
- ✓ Lowers risk of Diabetes
- ✓ Beneficial for Brain function
- ✓ Relieves Chronic Fatigue Syndrome
- ✓ Reduces Depression, Anxiety and OCD
- ✓ May be beneficial in ADHD
- ✓ Decreases inflammation
- ✓ May slow Aging
- ✓ Protects from Kidney function decline
- ✓ Relieves constipation
- ✓ Improves Sleep Quality
- ✓ Relieves Premenstrual Syndrome
- ✓ Helps Produce Collagen
- ✓ Stimulates the Absorption of other minerals



-Some Dietary Sources of Magnesium-



Find your
Healthiest Self



EMERALD WELLNESS

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