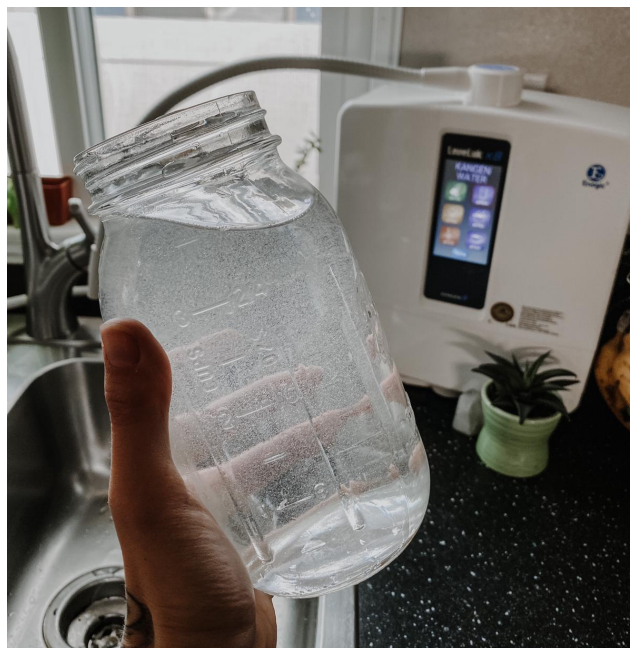


All Kangen Made Easy II

HEALTH BENEFITS OF ERW MEDICAL RESEARCH

Medical research is proving the true benefits of this powerful living water, we can certainly not ignore the evidence!



By Anick MARTINEZ

WELCOME!

Welcome to your Health Benefits of ERW - Medical Research e-book!

In this e-book we will look at the main different health studies driven on Electrolyzed Reduced Water and Molecular Hydrogen. What you will find in here will blow your mind!

My purpose is to inform you about the incredible findings of many different researches on Electrolyzed Reduced Water (ERW). Even though we cannot claim that ERW is a cure or can prevent anything, I believe it's important to know the true power that this water holds.

Stay safe and inside the lines. We cannot claim that Kangen Water is a cure or can prevent any disease. But what we can do is present the evidence on ERW and let people make up their minds on their own.

Remember that the human body is the hero, when fueled correctly!



Take your time while reading this e-book, some concepts may be new to you.

Enjoy your reading!

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VOCABULARY

Apoptosis: programmed cell death.

Arteriosclerosis: the thickening, hardening, and loss of elasticity of the walls of arteries.

Cell water turnover: the replacement of body water that is lost in a given period of time.

Dissolved oxygen: amount of oxygen present in a body of water.

ERW: Electrolyzed Reduced Water

Et al: "and others" - when citing a study.

Etiological: causing or contributing to the development of a disease.

Free Radical Scavenger: substance that neutralizes free radicals.

Glucagon: a hormone that is produced by alpha cells (a-cells) in the pancreas, its purpose is to raise blood levels.

Gut microflora: bacteria and other organisms that live inside the intestines.

Hepatoprotective: ability of a chemical substance to prevent damage to the liver.

Hydrophilic: water loving substance.

Hyperglycemia: high blood sugar.

Insulin: a hormone that is produced by beta cells (b-cells) in the pancreas, its purpose is to lower blood levels.

Melanoma: a type of skin cancer.

Mineral ion: electrically charged forms of minerals.

Mutated cell: a mutation is a change in a DNA sequence. Mutations can result from DNA copying mistakes made during cell division, exposure to ionizing radiation, exposure to chemicals called mutagens, or infection by viruses.

Osteoporosis: a bone disease that develops when bone mineral density and bone mass decreases, or when the quality or structure of bone changes.

Pathogen: a microorganism that causes, or can cause, disease.

Protein glycation: modification of the structure of a protein caused by glucose.

Redox: oxidation and reduction considered together as complementary processes.

ROS: reactive oxygen species - mostly free radicals.

Telomere: a compound structure at the end of a chromosome.

Tumor angiogenesis: the formation of new blood vessels in a tumor, facilitating tumor growth

INTRODUCTION

"In the past decade, the **decrease in the quality of tap water** because of pollution of the global environment over time has become a **major social problem**. Air pollution affects water in soils, rivers, and farm products by acid rain. **Chemicals in polluted water are considered to generate oxidative stress** in the placenta of pregnant women, and this can cause various types of diseases in newborns"



"Potable ERW* (pH 8–10) is popular as a health-beneficial water in Japan. **ERW exhibits an alkaline pH, is hydrogen molecule-rich, and has a negative oxidation–reduction potential (ORP) and reactive oxygen species (ROS)-scavenging activity"**

(Shirahata et al., 2012)

ERW characteristics are recognized in medical fields for their effectiveness in assisting the body to rebuild itself from **oxidative stress and inflammation**, which lead to many types of illnesses, including...

- Arthritis
- Chronic fatigue
- Leg cramps
- Migraines
- Diabetes
- Heartburn
- Poor circulation
- Gout
- High blood pressure
- High cholesterol
- Hypertension
- Asthma
- Skin rashes
- Dermatitis
- Psoriasis
- Obesity
- Weight issues
- Diarrhea
- Indigestion
- Heart disease
- Allergies
- Constipation
- Stomach ulcers
- Hepatitis
- Cancer
- And many more

Although, the only health benefits of ERW we are allowed to talk about as it relates to illness are:

- **Gastrointestinal Fermentation**
- **Chronic Diarrhea**
- **Indigestion**

Even if **these are the bases of more significant illnesses**, speaking of them is not permitted. However, there are numerous cases in clinical studies conducted by doctors and scholars that found drinking ERW **helps the body heal itself from various diseases.**

It is also known that **neutralizing reactive oxygen species (ROS)** from the body with ERW inevitably **boosts the natural healing** power of the body.

*"Clinical data suggested that **ERW improved oxygen stress-related diseases.**"*

(Hayashi & Kawamura, 2002)

ERW is also termed:

Alkaline electrolyzed water, alkali-ionic water, alkaline cathodic water and alkaline ionized water, based on its physicochemical and physiological aspects.

Now, let's dive into some of the research!



WATER AS A HEALING METHOD

Water has tremendous healing potential for the human mind, body and spirit. For thousands of years it has been known to help cure illness, refresh the body and relax the mind. As the cheapest and most abundant resource on this planet, water should still be used for its ability to cure and help people in these times.

Comprising over 70% of our brain, heart, skin, muscles, kidneys, lungs, and liver, even 31% of our dry bones are water. The more water we lose, the more we deteriorate and when we are only 50% water, we die.

Water shapes us, our DNA, our whole body. It is the carrier of nutrients, the medium for life.

Water can also store information and take different shapes according to what it is exposed to.

We are water in human form, it is logical that water would be a key factor in restoring the health of people.

Water is an abundant resource that should be studied and advanced for the sake of modern medicine and healing. For the future health of humanity water is a wonderful weapon against ailments of the body mind and spirit.



ACID/ALKALINE BALANCE

Minich, D. M., Bland, J. S., (2007). [Acid-alkaline balance: role in chronic disease and detoxification.](#)

This study looked at the impact of acidic foods (mainly cheese, meat, fish, grains and processed foods) vs the impact of alkaline foods (fruits, veggies). Although **they didn't study the impact of any type of water.**

They discovered that **in order to maintain a healthy acid/alkaline balance** when there is an overly acidic dietary load, the body's **alkaline reserves (such as calcium and magnesium in the bone matrix) had to be used.** A chronic acidic load can cause serious health conditions such as osteoporosis*, kidney disease and muscle wasting.

Scientists say that a **modification in diet can positively impact bone metabolism.** A diet that can **provide the alkaline mineral ions (calcium and magnesium)** can neutralize the production of acid, thus increasing calcium and phosphate retention (two main minerals of bone structure) and maintaining a healthy bone mineral density.

We can **ASSUME** that by providing these essential mineral ions* (calcium, magnesium, potassium), **ERW may help restore the healthy acid/alkaline balance in the body,** thus helping us maintain a healthy bone structure, muscles and kidneys.

"In conclusion, the increasing dietary acid load in the contemporary diet can lead to a disruption in acid-alkaline homeostasis in various body compartments and eventually result in chronic disease through repeated borrowing of the body's alkaline reserves. Adjustment of tissue alkalinity, particularly within the kidney proximal tubules, can lead to the more effective excretion of toxins from the body. Metabolic detoxification using a high vegetable diet in conjunction with supplementation of an effective alkalizing compound, such as potassium citrate, may shift the body's reserves to become more alkaline."

MOLECULAR HYDROGEN

Ever since molecular hydrogen was first reported as a hydroxyl radical scavenger in 2007, **the beneficial effect of hydrogen was documented in more than 170 disease models and human diseases (2019)** including ischemia/reperfusion injury, metabolic syndrome, inflammation, and cancer. All these pathological damages share the overproduction of reactive oxygen species (ROS) where molecular hydrogen has been widely demonstrated as a **selective antioxidant**.

To date, H₂ preventive and therapeutic effects have been observed in various organs, including the brain, heart, pancreas, lung, and liver.

H₂ has primarily selective anti-oxidative, anti-inflammatory, anti-apoptotic properties and stimulates energy metabolism.

The exact molecular mechanisms of the effects of low-dose H₂ remain unclear, further research is needed.

Possible model of explanation

- Exogenous damage due to such factors as radiation induces excess cellular ROS production, thus oxidative stress in the body.
- H₂ penetrates biomembranes and effectively reaches cell nuclei.
- H₂ selectively scavenges ·OH and ONOO⁻ and thus prevents DNA damage.
- H₂ also down-regulates the expression of pro-inflammatory and inflammatory cytokines and of pro-apoptotic factors.
- H₂ up-regulates the expression of anti-apoptotic factors, modulates signal transduction within and between many pathways. The exact targets and molecular mechanisms of H₂ are unknown.

(Li Ge, et al., 2017)

Selective antioxidant

H₂ is a specific scavenger of hydroxyl radical ·OH and peroxynitrite ONOO⁻, which are very strong oxidants that react indiscriminately with nucleic acids, lipids, and proteins, resulting in DNA fragmentation, lipid peroxidation, and protein inactivation. Fortunately, H₂ does not appear to react with other ROS that have normal physiological functions in vivo.

It has been shown the **antioxidant and cytoprotective properties of hydrogen gas or dissolved in aqueous solutions** in several experimental models (e.g. Alzheimer, Parkinson, hypersensitivity reactions, transplant rejection, and damage to liver, intestine, lung, heart, and neurons) and in patients with diabetes and metabolic syndrome.

Can penetrate biomembranes

H₂ rapidly diffuses into tissues and cells to exhibit efficient effects. It can easily reach your organelles like your mitochondria and cell nuclei.

Anti-inflammation

H₂ inhibits oxidative stress-induced inflammatory tissue injury via down-regulation of pro-inflammatory and inflammatory cytokines.

Anti-apoptosis

H₂ exerts anti-apoptotic effects by up- or down-regulating apoptosis-related factors.

Gene expression alterations

Molecules may be secondarily regulated by H₂, and some may be direct H₂ targets. The anti-inflammatory and anti-apoptotic properties of H₂ could be realized by **modulating expression of pro-inflammatory and inflammatory cytokines, and apoptosis-related factors**. Other studies state that in addition to the direct neutralization of highly reactive oxidants, H₂ reduces oxidative stress by regulating the expression of various genes.

These published papers cover many biological effects against oxidative stress in almost all organs (Ohta, 2011, Ohta, 2012).

ANTI-CANCER EFFECT

Persistent oxidative stress is one of the major causes of most lifestyle-related diseases, cancer and the aging process. The effects of molecular hydrogen in cancerous disease states have been documented and it is reported that hydrogen may have therapeutic potential.

It has been shown that **hydrogen rich water had an effect on inhibiting tumor growth** as a result of its ability to reduce oxidation products. **H2 can also alleviate adverse effects induced by cancer radiotherapy or anti-tumor drugs.**

Kang, et al. suggested that daily consumption of **Hydrogen Water could mitigate radiotherapy-induced oxidative stress and improve quality of life after radiation exposure without compromising anti-tumor effects** in patients with liver tumors. H2 has potential as an anti-cancer therapeutic, and could be used to reduce radio/chemotherapeutic side effects in patients. (Li Ge, et al., 2017)

- **ERW causes telomere* shortening in cancer cells** (Shirahata et al., 1999). Telomere shortening can act as a **tumor suppressor**.
- **ERW suppresses tumor angiogenesis*** by scavenging intracellular ROS and suppressing the gene expression and secretion of vascular endothelial growth factor (Ye et al., 2008).
- **ERW suppresses the growth of cancer cells and microorganisms** (Hamasaki et al., 2005, Komatsu et al., 2001) and induces apoptosis* together with glutathione in human leukemia HL60 cells (Tsai, Hsu, Chen, Ho, & Lu, 2009).
- Reduced water impaired the tumor phenotypes such as rapid growth, anchorage independent growth in a soft agar, morphology, telomere maintenance, and abilities of invasion, metastasis, and angiogenesis. **It activated the cancer immune systems, suppressing the tumor growth in vivo.** (Shirahata S., 2002)

ANTI-DIABETIC EFFECT

The chronic presence of high glucose blood levels enhances the production of ROS. Diabetes also disturbs natural antioxidant defense systems. **Both an increase in ROS and a decrease in the antioxidant defense mechanism lead to the increase in oxidative stress in diabetes.**

Hyperglycemia* and type 2 diabetes cause insulin resistance and the deterioration and dysfunction of pancreatic a-cells (glucagon* producing) and b-cells (insulin producing), this alters their function to regulate blood sugar levels.

Studies show that ERW with ROS scavenging ability **reduced the blood glucose concentration, increased blood insulin level, improved glucose tolerance and preserved b-cell mass** in mice. The present data suggest that ERW may protect b-cell damage and would be useful for antidiabetic agent. ([Kim, M, et al., 2007](#))

Long-term drinking H2-water significantly controlled fat and body weights, despite no increase in consumption of diet and water.

Moreover, drinking H2-water **decreased levels of plasma glucose, insulin, and triglyceride**, the effect of which on hyperglycemia was similar to diet restriction.

To examine how drinking H2-water improves obesity and metabolic parameters at the molecular level, gene-expression profiles of participants were examined, and found enhanced expression of a hepatic hormone (FGF21) which functions to enhance fatty acid and glucose expenditure. Indeed, **H2 stimulated energy metabolism** as measured by oxygen consumption.

The present results suggest the potential benefit of H2 in improving obesity, diabetes, and metabolic syndrome. ([Kamimura, N, et al., 2012](#))

DIGESTIVE HEALTH

Gut microbiota

Gut microbiota are deeply associated with our health through a symbiotic relationship. Recent reports have described that most gastrointestinal microbial species encode the genetic capacity to metabolize molecular hydrogen, meaning that **molecular hydrogen might affect the gut microbial composition.**

Nevertheless, the exact effects of ERW on gut microbiota remain unknown.

- **“Drinking such water favors the growth of residential microflora in the gut.** A sufficient array of data confirms this idea. However, most researchers explain the mechanism of its action by an antioxidant properties destined to detox the oxidants in the gut and other host tissues. Evidence is presented in favor of the hypothesis that the primary target for electrolyzed reducing water is the residential microflora in the gut.” (N V Vorobjeva, 2005)
- “Although the definitive role of gut microbes of ERW-administered mice remains unknown, our data demonstrate the possibility that ERW administration affects the gut microbial composition and that it has **beneficial health effects in terms of cholesterol metabolism and liver protection.**” (Higashimura, Y, et al., 2018)

Gastrointestinal symptoms

- Tashiro et al. examined the effect of ingesting ERW or purified tap water (as a placebo) for 4 weeks in patients who had abdominal pain such as heartburn, stomach discomfort, abdominal bloating, diarrhea, constipation, etc., and reported that the results of the ERW group were superior to those of the placebo group.
- Shin et al., concluded that drinking ERW for eight weeks improves the quality of life in patients with diarrhea-predominant IBS.

- Hayakawa et al. reported the inhibitory effect of ERW ingestion on abnormal intestinal fermentation.
- Naito et al. reported the inhibitory effect of ERW ingestion on gastric mucosal disorder caused by aspirin.

From these results, apparatus that produce AEW have been approved as medical devices by the Japanese Ministry of Health, Labour and Welfare. ERW is thought to be effective for functional gastrointestinal disorders.

Stomach acidity

Our stomach pH is around 1-2, which is highly acidic. This is needed in order to break down foods, facilitate digestion, nutrient absorption and to kill pathogens that may be present in our food. Due to its high alkalinity, ERW can slightly change our stomach's pH.

It is recommended to stop drinking ERW 30 minutes before any meal and start drinking again 1 or 2 hours after eating, to have a smooth and efficient digestion.

EFFECT ON DNA

The generation of ROS is thought to cause extensive oxidative damage to various biomolecules. **DNA is one of the main targets of this damage** and its origin could be either somatic or mitochondrial. Mitochondrial DNA repair is less complete than chromosomal DNA repair. Damage to mitochondrial DNA is important for producing energy in the form of ATP, therefore, it can limit energy production leading to apoptosis and necrosis.

As a selective antioxidant, H₂ has the power to scavenge HO· and ONOO⁻, two of the most damaging oxidants. They both damage DNA, RNA and proteins.

H₂ may be the ideal DNA protective molecule.

- "Reduced water suppresses single-strand breakage of DNA by active oxygen species produced". ([Shirahata, S, et al., 1997](#))
- "A number of reports have shown an effect of molecular hydrogen on the regulation of gene expression, acting directly on cellular signaling pathways that are stimulated by excess ROS" . ([Nishikawa, R, et al., 2005](#))

WOUND HEALING

ERW accelerated the healing of full-thickness cutaneous wounds in rats, but only anode chamber water (acidic pH) was effective.

According to this study, it is not the Hypochlorous Acid which is responsible for the accelerated wound healing effect of the Acidic Water, but it's clear that it has a **positive effect on accelerating wound healing.**

- "Hypochlorous acid (HOCl), also produced by electrolysis, was ineffective, suggesting that these types of electrolyzed water enhance wound healing by a mechanism unrelated to the well-known antibacterial action of HOCl. One possibility is that the small production of reactive oxygen species in the acidic water, shown to be electron spin resonance spectra present in anode chamber water, might trigger early wound healing through fibroblast migration and proliferation." ([Yahagi, N., 2000](#))

ARTHRITIS

Rheumatoid arthritis (RA) is a chronic inflammatory disease characterized by the destruction of bone and cartilage. While the mechanisms responsible for the onset of RA remain unclear, **reactive oxygen species (ROS) play a significant role in the development of this condition.**

ROS play a central role both upstream and downstream of NF- κ B (Nuclear Factor) and TNF α (Tumor Necrosis Factor) pathways, which are located at the center of the inflammatory response. Among the ROS, **the hydroxyl radical is the most harmful, and recently, molecular hydrogen (H₂) was demonstrated to be a selective scavenger for the hydroxyl radical.**

It has been shown that H₂ is useful when administered along with the conventional therapy in RA as it acts to reduce oxidative stress in the patients. Especially in the early stage, H₂ showed significant therapeutic potential, which also seemed to assist diagnosis and treatment decisions of RA.

The results suggest that the hydroxyl radical scavenger H₂ effectively reduces oxidative stress in patients with this condition. The symptoms of RA were significantly improved with high H₂ water. (Ishibashi, T., 2012)

NEUROPROTECTIVE

The Human brain is the biggest energy consuming tissue in the body. For that reason, **the brain is considered to be the most vulnerable part of human body against the reactive oxygen species (ROS).**

Because of its low molecular weight, **hydrogen can easily diffuse across the blood-brain barrier**, which allows it protects cells against degeneration and improves brain function.

ERW was demonstrated to scavenge ROS in several cell types. Molecular hydrogen could scavenge ROS and protected brain from oxidative stress.

Although the protective effects of molecular hydrogen have been reported in many kinds of brain disorders, the mechanism to explain the neuroprotective effects of hydrogen is limited to its antioxidant property.

A possible cause for the neuroprotective effect of hydrogen may be related to its high diffusibility. Hydrogen molecules can readily cross the blood-brain barrier and penetrate biomembranes smoothly to diffuse into the cytosol, nucleus and mitochondria. This is particularly important, as mitochondria is the major source of ROS and notoriously difficult to target.

Molecular hydrogen has also been shown to **prevent cognitive decline**. In addition, **molecular hydrogen likely retards the development and progression of Parkinson's disease.**

- "The results suggest that ERW is beneficial for the prevention and alleviation of oxidative stress-induced human neurodegenerative diseases." ([Yan, H., et al., 2011](#))
- "ERW has proven to scavenge intracellular ROS and exhibited a protective effect against neuronal network damage caused by H₂O₂ (hydrogen peroxide) in N1E-115 cells. ERW significantly suppressed NO-induced cytotoxicity in PC12 cells despite the fact that it did not have the ability to scavenge intracellular NO. ERW significantly suppressed both glutamate induced Ca²⁺ influx and the resulting cytotoxicity in primary cells. These results collectively demonstrated for the first time that ERW protects several types of neuronal cells by scavenging ROS because of the presence of hydrogen and platinum nanoparticles dissolved in ERW". ([T. Kashiwagi, et al., 2014](#))

OTHER PHYSIOLOGICAL FUNCTIONS

ANTI-ARTERIOSCLEROSIS EFFECTS:

Hydrogen-supplemented water also suppresses arteriosclerosis. ERW suppresses the Cu²⁺-catalyzed oxidation of human LDL and suppresses triglyceride levels in mice fed high fat foods (Abe et al., 2010).

SUPPRESSIVE EFFECT OF THE SIDE EFFECTS OF ANTI-CANCER DRUGS:

Hydrogen-supplemented water suppresses the side effects of anti-cancer drugs. (Shirahata, S. et al., 2012)

LIVER PROTECTIVE EFFECT:

ERW exhibits hepatoprotective* effects against CCl₄-induced liver damage in mice (Tsai et al., 2009).

PROTECTS FROM HANGOVERS:

ERW also exhibits an anti-hangover effect (Park et al., 2009).

PROTECTS FROM ENVIRONMENTAL STRESSORS:

ERW could increase thermotolerance and resistance to UV-irradiation. (Park, SK., Kim, JJ., Yu, A.R. et al. 2012)

KIDNEY PROTECTIVE EFFECT:

ERW exhibits potent nephroprotective effects on cisplatin-induced kidney damage in mice, likely due to both the increase in antioxidant-defense system activity and the inhibition of lipid peroxidation. (Tse-ChouCheng, et al., 2018)

CONCLUSION

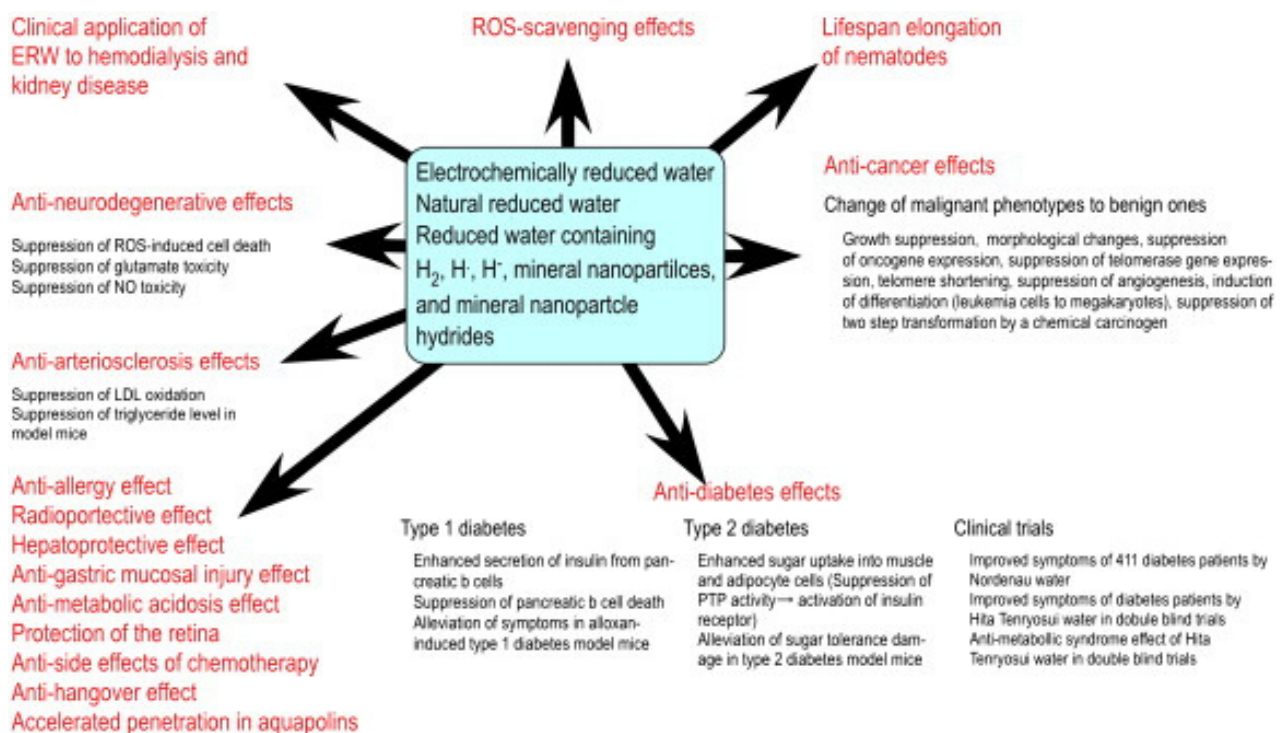
Electrolyzed Reduced Water, high in Molecular Hydrogen and alkaline minerals has shown to **have very positive therapeutic effects regarding oxidative stress-related diseases** such as diabetes, cancer, arteriosclerosis and neurodegenerative diseases.

It has shown to have a **DNA, kidney, liver and brain protector effect (for a specific damage) and a wound healing effect.**

In Japan, this water has been **approved for the treatment of gastrointestinal illnesses** such as gastro-intestinal fermentation, indigestion and chronic diarrhea/constipation.

ERW with Molecular Hydrogen and alkaline minerals brings our body back to homeostasis!

Although, it's important to keep in mind that it is still unclear whether the Molecular Hydrogen is an actual active antioxidant or a powerful helper in our body's natural antioxidant system.



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