

## Quantitative Fluid Analysis

This particular test is, in my experience the quintessential test to measure pH, rates of oxidation on the cell membrane, and the conductivity of minerals across the cell membrane. This test requires a fasting period and collection of urine, saliva and a blood sample. It is the only slightly invasive test I perform, and the information gained is invaluable. To obtain similar information would require several hundred dollars in lab tests that could never be as accurate since rates of oxidation increase the longer fluids are exposed to environmental factors.

The information gained from this test provides a comprehensive "snapshot" of a variety body fluids and can be used by your physician to assess the rate of biological aging in the body. Biological age is an accurate assessment of the rate at which your internal organs are aging as a result of oxidation.

**Below are excerpts from the results of a sample test:**

### **Test result: Blood pH Slightly Increased**

Evaluation:

An increase in the venous blood pH is known as an "alkalemia". Physiological causes of an alkalemia are numerous, but they all depend on a greater concentration of HCO<sub>3</sub><sup>-</sup> (bicarbonate ion) to CO<sub>2</sub> (carbon dioxide) ratio. The most common cause is the over-consumption and production of endogenous and exogenous acids. These acids are compensated for in the blood resulting in an elevated concentration of the very alkaline bicarbonate ion. Correcting this alkalemia can be both lengthy and involved and usually requires alterations in diet, lifestyle and increasing kidney, liver and respiratory functioning.

When the blood becomes more alkaline, its ability to optimally unload oxygen and nutrients to the tissue is diminished. This can often times lead to tissue hypoxia and nutritional deficiencies. These imbalances can create reactive oxygen species, free radical pathologies and mitochondrial stress with ox-phos derailment. . .

### **Test result: Blood Redox Slightly Increased**

Evaluation:

In this case the rH<sub>2</sub> value of the blood has increased from the optimal range. This indicates that the relative concentration of electron donors to electron acceptors has decreased. This scenario translates into a lowered ability to produce high-energy cellular fuel (ATP, GTP). Corrective therapies aligned at improving mitochondrial function and production should be considered. Additionally it must be understood that increased levels of stress will also often times create elevated rH<sub>2</sub> readings. Removal of the primary invading xenobiotic should be considered, along with the stimulation of the liver and lymphatic system to increase the body's production of naturally occurring anti-oxidants. A number of pilot studies have demonstrated that the frequent utilization of alkaline-reduced electrolyzed water has decreased the blood rH<sub>2</sub> value. . .

## **Test result: Blood r Extremely Depressed**

### **Evaluation:**

The r value of the blood is depressed. When the r value of the blood is depressed it may indicate an elevation of minerals found in the serum. This is most frequently caused by either an inability of the kidney to adequately filter the blood content or from an increase in consumption of supplemental minerals above and beyond what the body is capable of utilizing.

Out of these two scenarios, the former, or kidney filtration inefficiency, is more probably the causation. Therapy aimed at draining the kidney and supporting its normal elimination process is therefore essential. Additional attention should also be placed on cleaning the blood.

## **Test result: Saliva redox Slightly Increased**

### **Evaluation:**

This condition is frequently associated with increased oxidative stress to the organ of the liver. The presence of a highly toxic poison like a heavy metal or pesticide will frequently create this scenario. Lowering the body's overall oxidative stress is essential, with special considerations being focused on the liver.

The lymphatic system plays such a vital role in maintaining optimum levels of oxidants/anti-oxidants that support to this often over burdened system should also be considered. Additionally it must be understood that increased levels of emotional/mental stress will also often times create elevated rH2 readings.

Special care should therefore also be considered to educate the client on meditation, deep breathing techniques and other effective means for lowering stress levels. . .

### **Remedy Suggestions:**

- 1) Digestive organ stress (Digestive enzyme therapy, probiotics)
- 2) Improve liver anti-oxidant production (N-Acetyl Cysteine, Taraxacum officianlis, Silybum marianum,)
- 3) Improve TCA production of electron rich intermediates (Alpha-Ketoglutaric acid, L-carnitine, Lipoic acid, Vitamin B2 and B5)
- 4) Support Lymphatic activity (Lymphatic Drainage, Scophularia nodosa, Thuja)
- 5) Rule out active oxidizing metal in the oral cavity

## **Test result: Saliva r Slightly Increased**

### **Evaluation:**

When the r value of the saliva is elevated it may indicate a diminished concentration of available minerals. This condition can often times be caused by malabsorption, which restricts the minerals from being properly brought into the body through the digestive system. Therapy aimed at the normalization of the digestive system and re-introduction of minerals is therefore essential.

Leaky-gut syndrome or even lack of proper enzyme function can cause malabsorption. Nutritional considerations might include acidophilus/bifidus, primary stomach and pancreatic digestive enzymes, glutamine and intestinal anti-inflammatories.

## **Test result: Urine redox Increased**

### Evaluation:

This condition may indicate that the relative concentration of metabolites that are rich in energy are not being excreted as a waste product. This condition may often times indicate a mitochondrial dysfunction commonly referred to as an "ox-phos uncoupling." This uncoupling creates a diminished production of high-energy electron rich intermediates. When the cells either limit or lose their ability to produce these high-energy metabolic intermediates, energy to run the cell can no longer be produced.

A second possible explanation for the increase in the urine rH2 values is easily explained by oxidative stress. In this case, the body is producing electron-rich intermediates needed to produce energy, but harmful poisons in the body are robbing these products. . .

## **Test result: Urine r Extremely Increased**

### Evaluation:

The r value of the urine is elevated. When the r value of the urine is elevated it indicates that the overall mineral concentration of the urine is diminished. This depletion of minerals may indicate a lack of available minerals in the body which may severely alter enzyme efficiency.

A depletion of minerals may be due to an imbalance in normal dietary factors, or perhaps even intestinal malabsorption. . .

## **Test result: Urine redox high and blood redox high**

### Evaluation:

When both the urine and the blood indicate elevated rH2 values it is imperative to understand that the likely cause of this scenario is that the body has a lack of electron donors. The mitochondria produces electron-rich intermediates in the form of FADH2 and NADH+H. These electron rich intermediates are then converted to ATP energy through the mechanisms of the electron transport/oxidative phosphorylation system. If however, both the blood and the urine do not contain any electron-rich intermediates or electron donors, it indicates that the body is not producing these metabolites.

Careful consideration should be placed on the mitochondria's TCA cycle. This is the area where the electron-rich/electron donor intermediates are first formed. Individuals who demonstrate this scenario are more than likely energy deficient and show signs of considerable fatigue.

## **Test result: Urine R high and blood R low**

### Evaluation:

This scenario indicates that the kidneys are not cleansing the blood adequately and that the remaining detoxification organs of the body are unable to compensate. The resultant finding is an increase in the electrically conductive ions found in the blood.

This increase in blood viscosity is obviously a negative potentially dangerous scenario that can lead to diminished oxygen and nutrient transportation and potentially increased blood clotting. Improving the kidney's ability to remove waste, while supporting the detoxifying organs of the body (lungs, liver, skin and lymphatic system) should be considered.

Monitoring the r-value of the blood and urine should be performed on a regular basis until these factors begin to return to normal levels.

## **Test result: Saliva resistivity high and urine resistivity high**

### **Evaluation:**

At first glance it would appear that the kidney is not concentrating the urine to the degree that is needed. However, when comparing this finding with the finding in the saliva we find that the saliva is not overly congested. A conclusion about the kidneys' ability to remove excess waste and maintain optimum mineral concentration is impossible to determine. This is due to the fact that there appears to be no minerals for the kidney's to concentrate.

The underlying cause of this scenario is usually due to a lack of adequate minerals in the body. The saliva is void of minerals and therefore, the kidneys do not have the ability to concentrate minerals that are not even in the body to begin with. Further examination or referral to determine a pathological state of malabsorption or demineralization should be considered. Gut permeability studies or bone density analysis are a few methods of determining these possible maladies.

## **Test result: Saliva rH2 high and urine rH2 normal or high**

### **Evaluation:**

When both the urine and the saliva indicate elevated rH2 values it is imperative to understand that the likely cause of this scenario is that the body has a lack of electron-rich intermediate products. The mitochondria produces these electron-rich intermediate products. If however, both the saliva and the urine do not contain any electron-rich intermediates or electron donors, it indicates that the body is not producing these metabolites.

Careful consideration should be placed on improving cellular and mitochondrial function. The mitochondria is the cellular organelle that forms these electron rich intermediates and electron donor. Individuals who demonstrate this scenario are more than likely energy deficient and show signs of considerable fatigue and sluggishness. . .

## **Test result: Urine rH2 high and saliva rH2 high**

### **Evaluation:**

When both the urine and the saliva indicate elevated rH2 values it is imperative to understand that the likely cause of this scenario is that the body has a lack of electron-rich intermediate products. The mitochondria produces these electron-rich intermediates products. If however, both the saliva and the urine do not contain any electron-rich intermediates or electron donors, it indicates that the body is not producing these metabolites.

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## **Minerals: Moderately stressed**

### **Evaluation:**

Mineral buffers are essential minerals utilized by the body to bind with excess acid production or accumulation. The body utilizes and depletes these minerals when the quantity of acids is excessive. Minerals serve as essential components of enzymes and coenzymes.

Enzymes are molecules involved in speeding up or catalyzing chemical reactions. Coenzymes are molecules that aid the enzymes in their chemical reaction. Enzymes and coenzymes work to either unite

molecules together or split them apart by making or breaking the chemical bonds between them. One of the key concepts in nutritional medicine is to supply the necessary minerals to allow the enzymes of a particular tissue to function at their optimum level. . .

### **Virus: Moderately stressed**

Evaluation:

Generally, the viruses that cause infections in the human body are smaller than bacteria and can easily pass through the tiniest of cellular and intercellular filtration systems. When viruses enter the body, they live and thrive off the organism's cellular enzyme production. Fever, headaches, muscular aching and chills usually characterize viral infections.

The common cold is an example of a viral infection as are mononucleosis, influenza, polio, tonsillitis, infectious hepatitis, encephalitis, measles and even certain forms of asthma. Allopathic drugs have been shown to have little or no effect upon viruses. Instead, natural therapeutics have proven to be not only the first line of defense against these invading microorganisms, but the best defense as well.

### **Interstitial: Slightly stressed**

Evaluation:

The interstitium is the pathway that all nutrients, toxins and hormones must pass in order to allow for communication between cells. When this area becomes overburdened with waste products, the nutritional needs as well as the waste elimination demands of the cell are greatly compromised. The pH of the first morning urine is an excellent indicator of the interstitium base pH, while the saliva r-value offers valuable information concerning this area's level of congestion.

### **Cellular: Slightly stressed**

Evaluation:

Superceding but often paralleling the importance of the mesenchyme or interstitial fluid (Interstitial fluid is defined as all of the fluid found in-between the cells of the body) is the function of the cell. All life activity occurs on this level.

Therefore, it is essential to be aware of the factors that can have stimulatory as well as inhibitory effects on cellular metabolism. Perhaps two of the greatest factors that determine cellular function are pH and rH2. Scientists have proven that an acid/oxidized cell is primed for degeneration and even cancer. A healthy, vibrant cell must have and maintain a dynamic balance of both pH and rH2.

### **Mitochondrial: Extremely stressed**

Evaluation:

The powerhouse of the cell and therefore the entire human body is the mitochondria. The mitochondria are small organelles found in the cells of all animals. Their primary responsibility is to convert by-products of food into energy to run not only the cell, but the entire organism.

When this cellular component is not functioning optimally, the entire body will greatly suffer, experiencing fatigue, lowered immune response and ultimately death. Mitochondrial function is pH and can therefore be monitored by examining the balance of pH between all of the bodily fluids.

Even though the mitochondria produces reactive oxygen species, which ultimately lead to free radical pathologies, excess production of these entities will create a diminished mitochondrial output. Monitoring the relationship of the rH2 values of both bodily fluids is essential for determining mitochondrial function.

## **Lymphatic: Moderately stressed**

### Evaluation:

The lymphatic system is a primary means of removing toxic waste from the cells and the interstitium or interstitial fluid (interstitial fluid is defined as all of the fluid found in-between the cells of the body). When it becomes overburdened, its ability to adequately detoxify the body becomes greatly depleted. This may lead to deterioration in overall cellular function as well as a greater stress on the circulatory system and kidney.

The saliva can be invaluable for assessing lymphatic stagnation by virtue of the fact that the saliva and lymphatic system both utilize the same interstitial fluid. Specifically, viewing the saliva r-value is the optimal means to rule out lymphatic congestion and toxicity.

## **Circulatory: Extremely stressed**

### Evaluation:

This system is comprised of the heart, blood and blood vessels. According to Guyton Physiology, the blood provides nutrients, removes waste products, and carries hemoglobin which binds with oxygen. It is essential to test and understand whether this system is functioning properly or has become depleted or overburdened.

Viewing and analyzing the saliva r-value is an excellent means for determining the circulatory system's overall capacity and the existence of circulatory congestion. When this vital system becomes congested, numerous problems may arise.

## **Liver: Slightly stressed**

### Evaluation:

The liver carries out a wide range of functions and activities that allow for optimal metabolic behavior. Understanding the liver's capacity and capabilities offers tremendous insight into organ imbalances, accurate application of chosen therapies as well as overall therapeutic efficacy.

Because of the many diverse functions of this organ, regulation of oxidative damage is essential. As the oxidative stress increases on the liver, digestion diminishes, toxin removal becomes compromised and overall health suffers. Therefore, monitoring the rH2 value of the saliva may be an excellent means to determine variances in this organ's ability to carry out and perform its normal work load.

## **Adrenal: Extremely stressed**

### Evaluation:

The adrenal glands are involved in regulating the autonomic nervous system, helping the body cope through extreme episodes of stress and balancing the retention and excretion of minerals. It seems in this high paced world, adrenal stress and exhaustion are becoming more and more prevalent.

A combination of lifestyle, diet and activity levels are compromising this glands function and are resulting in deleterious alterations in mineral concentration, most notably magnesium and potassium. Analyzing the r-value of both the saliva and urine is advantageous for predicting adrenal function.

## **Pancreas: Slightly stressed**

### Evaluation:

The pancreas gland has both an exocrine and an endocrine function. In this way the pancreas not only regulates blood sugar levels, but also tremendously aids in the overall digesting capacity of the body. Any deterioration in this gland's overall function will result in a myriad of imbalances, including hypoglycemia, diabetes, digestive difficulties with malabsorption or even death.

Monitoring the pancreas's overall status is therefore essential for maintaining optimal health. Because of the vast complexity of the pancreas's activities, oxidative stress, which causes free radicals, plays a primary role in its function/dysfunction. Analyzing the rH2 factor of the saliva is an excellent means for monitoring pancreatic activity.

## **Kidney: Extremely stressed**

### Evaluation:

The kidneys are the main filtration system of the blood. They keep the body from being overwhelmed with toxic waste, while placing a tight control on the regulation of essential minerals, e.g., sodium, magnesium, chloride, and potassium. They are perhaps the most overworked, under-nourished system in our bodies. They take abuse from the lack of pure water, consumption of carbonated beverages, coffee, tea and alcohol to mention just a few.

When the kidneys lose their ability to remove the excess acids consumed/produced by the body it can be visualized in the pH relationship between the saliva and the urine. When the kidneys become 'clogged' and their ability to adequately concentrate the urine becomes compromised, the r-value of the urine will become increasingly elevated.

## **Digestive: Moderately stressed**

### Evaluation:

The digestive system is comprised of numerous organs and glands including the liver, stomach, intestines and pancreas. It often times is the first system in the body to become compromised due to stress, inappropriate food combining and over-consumption of food products.

Repairing and rebuilding an intact digestive system is essential to improving the absorption of nutrients, regulating blood sugar levels, increasing immune response and balancing hormonal function. Variances in the performance of the organs and glands that compromise this system can easily be tracked and analyzed by viewing the saliva factors. Research has shown that alterations in the diet will affect pH, depleted detoxification capabilities will appear in the r factor, while overall digestive oxidative stress is well defined by the rH2 factor.

## **Heavy Metals: Slightly stressed**

### Evaluation:

Foreign substances known as heavy metals are very toxic to the human body. They interfere with enzyme utilization by binding themselves into the enzyme's active site thereby eliminating the potential for the enzyme to become functional.

Additionally, heavy metals have a very strong affinity for specific type of tissue including liver, kidneys and brain. When these metals lodge themselves into these tissue regions they may only cause a deterioration of function or they may render the organ almost completely useless.

Because of these far reaching negative effects it is imperative to remove these toxic waste products from the body as quickly and completely as possible. From a clinical perspective case studies have demonstrated that when the urine pH is very acidic, the saliva rH2 very elevated and the urine resistivity is very high, there is a strong correlation with a probability of mercury toxicity.

## **Thyroid: Extremely stressed**

Evaluation:

The thyroid gland is one of the most significant glands in the body to help regulate and balance the body's metabolism. If the thyroid becomes too sluggish the body will experience coldness, lethargy and excess weight gain to focus on just a few key changes. However if the thyroid is over active the body will experience heart palpitations, weight loss and other dangerous symptoms.

Therefore it is essential to help regulate and maintain the proper function of this gland. Finally, it should be remembered that treating and supporting the adrenal gland should almost always accompany treating the thyroid gland.

## **Immune: Slightly stressed**

Evaluation:

The immune system is perhaps the most complex and diverse system of the body. Its' primary function is to protect the body against infections while also deterring the onset of chronic illnesses like cancer. The immune system is composed of the lymphatic vessels and organs of the thymus, spleen and tonsils, white blood cells, macrophages, mast cells and specialized chemical factors.

A comprehensive approach to the immune system will help maintain optimal function of this critical supporting network. Possible considerations for the care and maintenance of a healthy immune system should include: stress management, exercise, balanced diet, nutritional supplementation and plant-based herbal therapy.