



2014

**Typing And Subtyping... One Size Does Not Fit All.**

I took this title from a viewpoint article that appeared in JAMA. The article titled *The Merits of Subtyping Obesity One Size Does Not Fit All*, discusses the fact that most individuals who are overweight or obese are grouped together without consideration of individual causation. Therapy or recommendations are essentially the same for everyone therefore, leading to poor treatment outcomes. The discussion uses some examples of subtypes such as those individuals with high insulin secretion, those with low response to satiety signals, food addiction etc. *The Merits of Subtyping one size does not fit all. Field, AE, et al. JAMA 310, 20, 2013*

Comment: The fact that one size does not fit all is also true of many health conditions, including obesity. All individuals can be typed and subtyped based simply on their HTMA mineral patterns. TEI recognizes two major metabolic categories, each having three subtypes to include eight metabolic types in all. Each type could be correctly categorized further, but that could add to difficulty in comprehension. Obesity, heart disease, cancer, diabetes or any other disease can exist in both metabolic categories and subtypes. For example, we have recognized over eleven contributors to the development and progression of diabetes in a previous TEI Newsletter; <http://traceelements.com/docs/DiabetesMarch-April2013Newsletter.pdf>. The HTMA is a biomarker for insulin resistance, provides information about the metabolic condition of the individual as well as an individualized, targeted approach to therapy, rather than a easy "one size fits all" policy that has done little to impact the rise in obesity and type 2 diabetes conditions on an individual basis.

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**Nutritional Therapy Reduces Disease Progression in Adults Infected With HIV**

It is known that nutritional deficiencies exist in the early stages of human immunodeficiency virus (HIV) infection. Botswana, has one of the highest rates of HIV infection in the world and early treatment in the population with antiretroviral therapy (ART) can be slow and difficult. A trial using multivitamins was conducted involving over eight hundred HIV patients in the early stages of HIV and who were not on ART. The vitamins included B complex along with vitamins C and E and selenium. The study was conducted over a two year period and found that nutritional supplementation was safe and significantly reduced the risk of a decline in immunity as well as morbidity among those treated compared to a placebo group. *Effect of Micronutrient Supplementation on Disease Progression in Asymptomatic, Antiretroviral-Naïve, HIV-Infected Adults in Botswana. A Randomized Clinical Trial. Baum, MK, et al. JAMA 310,20, 2013.*

Comment: The impact of nutrition on immunity has long been recognized. However, it is not often recognized just how powerful the effect of nutrition can actually be. The study above shows the importance of nutritional supplementation in delaying the progression of HIV in its early form. However, the immune system is also compromised in many disease states other than HIV, as well as in those who develop auto-immune disorders that can also be impacted with targeted nutritional support. HTMA provides the ability to recognize a disruption in the balance of the immune system (Cellular/Humoral Bal-



ance) that can contribute to thyroid disorders, allergic disorders, as well as patients suffering from diabetes, rheumatoid arthritis, multiple sclerosis CFS, ALS and others. <http://traceelements.com/Docs/News%20March-April%20094.pdf>

### **NSAIDS and Vitamin B6 Status**

Cyclooxygenase inhibitors (COX-2 inhibitors) are a group of selective non-steroidal inflammatory drugs (NSAIDS) that are prescribed for pain control. Some trade names include; Celebrex, Vioxx and Bextra. These drugs are associated with low vitamin B6 status and low vitamin B6 is also associated with inflammation. It is suspected that long-term use of these drugs may reduce the synthesis of pyridoxal-5-phosphate and can lead to increased cardiovascular risks. In fact, some of the prescription COX-2 inhibitors have been removed from the market due to these increased risks and the FDA has required box warnings for the increased risk on others. Over-the-counter NSAIDS are also known to increase cardiovascular disease risks and trade names include; Motrin, Advil, Indocin, Aleve, Naprosyn, Anaprox Clinoril, Tolectin and others. A complete list can be found at; <http://www.fda.gov/default.htm> *Clinical Use of Cyclooxygenase Inhibitors Impairs Vitamin B-6 Metabolism. Chang, HY, et al. Am.J.Clin.Nutr. 98,6, 2013.*

Comment: Vitamin B-6 deficiency has been found to be common in the U.S. population and include women of child bearing age, those taking oral contraceptives, those over sixty-five years of age and alcoholics. The intake of the above drugs further contribute to widespread B-6 deficiency or increased requirements. B-6 is involved in over one-hundred biochemical functions in the body, including hormone balance, neurotransmitter production and glucose metabolism, as well as the production of niacin from tryptophan. Since it is also involved with the normal functioning of minerals such as zinc, copper, calcium and magnesium a person's vitamin B6 status can be reflected in HTMA mineral patterns related to its' association to these elements.

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### **High Insulin Levels and Heart Disease**

The role of insulin in chronic disease states is becoming more appreciated today. Since most type 2 diabetics have high levels of circulating insulin (hyperinsulinism), it is now being assessed more often by many clinicians. However, since insulin resistance is also known to be a precursor to many chronic diseases, in particular coronary heart disease (CHD) and cardiovascular disease (CVD), it has taken on renewed interest. A recent study found that high fasting insulin levels were significantly associated with increased risk for high blood pressure, and CHD. It is also speculated that a rise in insulin precedes the development of type 2 diabetes and raises the risk for the development of macro-vascular disorders, then CVD, and then hypertension. *Fasting Insulin Concentrations and Incidence of Hypertension, Stroke, and Coronary Heart Disease: A Meta-Analysis Prospective Cohort Studies. Ying, PX, et al. Am.J.Clin.Nutr. 98,6, 2013.*

Comment: This is interesting due to the fact that I recall the late Dr. Robert Atkins had written in one of his earliest books about the connection between heart disease and insulin. He apparently routinely evaluated his cardiac patients' insulin levels. I have recommended this due to his influence since the late 1970's. Dr. Atkins was certainly ahead of his time and perhaps his approach will be adopted by more physicians in light of this research. Also, as we have stated at TEI, the HTMA can be invaluable in assessing the potential for hyperinsulinism in evaluating the minerals involved in insulin production, insulin sensitivity, and insulin antagonism and resistance as well as those involved in free radical production and inflammation.

<http://traceelements.com/Docs/News%20Jan-Feb%202007.pdf>

<http://traceelements.com/Docs/News%20May-June%2099.pdf>

<http://traceelements.com/Docs/DiabetesMarch-April2013Newsletter.pdf>

<http://www.ncbi.nlm.nih.gov/pubmed/22777676#>

<http://www.ncbi.nlm.nih.gov/pubmed/20195917#>

<http://www.ncbi.nlm.nih.gov/pubmed/19221698#>



## Magnesium and Epstein-Barr Viral Protection

Latent Epstein-Barr Virus (EBV) is present in approximately ninety percent of humans worldwide and is frequently established following a viral episode such as mononucleosis. EBV is a member of the herpes virus family. Usually dormant, chronic EBV activation can lead to lymphoma, and other health conditions. Recent investigations have found that in individuals who have a genetic defect in the magnesium transporter 1 have high levels of EBV. Conversely, individuals with chronic EBV infections had low amounts of basal free magnesium levels in their cells, even though bound levels of magnesium were found to be normal. Ninety-five percent of the magnesium present in the cell is bound and the rest is in a free form. A reduction in free cellular magnesium concentration is associated with a defect in the expression of the natural killer activating receptor in natural killer cells, CD8 T cells and reduces the cytotoxic response against EBV. With magnesium supplementation, a restoration of the concentration of free cellular magnesium results in reduced EBV infected cells. Therefore, magnesium homeostasis is important for antiviral and antitumor immunity. *MG Regulates Cytotoxic Functions of NK and CD8 T Cells in Chronic EBV Infection Through NKG2D. Chaigne-Delalande, B, et al. Science, 341, 6142, 2013.*

Comment: The connection between magnesium and EBV is significant in that the condition is so common. Interestingly, low magnesium intake is also common in the U.S. as well as many other countries. Also, even if a person has adequate magnesium intake and status, if they are symptomatic of EBV, they may still warrant magnesium supplementation to reestablish adequate levels of free cellular magnesium, as it is the free magnesium that exerts the antiviral activity. We have discussed extensively HTMA findings related to viral susceptibility as well as the antiviral properties of magnesium and other minerals. This study supports our findings very well.

<http://traceelements.com/Docs/News%20Nov-Dec%2089.pdf>

<http://traceelements.com/Docs/Newsletteraugust2011.pdf>

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## Stomach Acid Inhibitors Contribute To Nutritional Deficiencies (B12)

Proton pump inhibitors (PPIs) are the most common drugs used in the United States. It was estimated that almost fifteen million patients were prescribed PPIs in 2012 and this does not include over-the-counter use of antacids. A study conducted by Lam, et al. found that the use of stomach acid inhibitors was significantly associated with vitamin B12 deficiency. This is an important study in that as they stated, "Left untreated, vitamin B12 deficiency can lead to dementia, neurological damage, anemia and other complications, which may be reversible." *Proton Pump Inhibitors and Histamine 2 Receptors Antagonists Use and Vitamin B12 Deficiency. Lam, JR, et al. JAMA 310, 22, 2013.*

Comment: Past research has shown that the use of PPI's can also contribute to magnesium deficiency leading to complications such as fractures, cardiac arrhythmias, seizures, and tetany. Now a deficiency of vitamin B12 can be added to the use of PPIs and there are undoubtedly others. Nutritional assessment should be a requirement for any patient receiving a prescription PPIs, or those taking over the counter antacid products. It should be noted that these drugs were never meant to be taken continuously over long periods of time.

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## Hair Mineral Patterns and Stunted Growth

Minerals are important for normal growth and development. Mineral deficiencies as well as imbalances can interfere with development. This study measured the zinc, copper, iron, calcium and magnesium content in whole blood and hair of children with growth retardation compared to that of controls. The levels of iron and zinc were significantly lower in the whole blood of children with growth retardation compared to the control group. The affected group showed significantly lower



levels of hair iron, zinc, calcium and magnesium. *Ozmen, H, et al. The Levels of Calcium and Magnesium, and Of Selected Trace Elements, in Whole Blood and Scalp Hair of Children with Growth Retardation. Iran, J.Ped. 23,2, 2013.*



















