



The Patients' Voice

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ACIDITY, ALKALINITY, AND pH

Sorting Out the Confusion

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There seems to be a lot of misunderstanding in the natural supplement world about the subject of what makes our bodies "acid" and "alkaline" and how we measure them. Do we measure urine, saliva or blood to determine pH? What is this term pH anyway? I will do my best in this article to sort out this tangle of misinformation.

First of all, pH is the term used to describe the concentration of hydrogen ions in solution and is actual the $\log \frac{1}{H^+ \text{conc.}}$ or $-\log H^+$ concentration. It is used this

way because hydrogen ion concentration is a very cumbersome process. Very strong acids like stomach acid has a pH of 1-3 (strong hydrochloric acid). As the pH rises, the hydrogen ion concentration decreases, becoming less acidic. As the pH approaches 7, a solution becomes more neutral (water is a good example). As the pH rises higher, the hydrogen concentration is very low and the solution becomes basic or alkaline (lye is a good example).

Just because a solution is not acidic, does not mean it cannot be caustic (caus burns). Very alkaline solutions also can burn, and quite a few cases of "heartburn" or stomach burning are caused by a production of sodium hydroxide (a strong caustic base.) This condition is then typically treated with antacids, making the problem worse.

In a subsequent article I will go more into detail about the value of salivary and urine pH. What I wish to discuss in this article is the value of blood pH and how diet and other factors affect it. Arterial blood has a pH of 7.4, while venous blood and interstitial fluids (between the cells) is about 7.35 (a bit more acidic because of the extra carbon dioxide forming carbonic acid).

In the past when I have talked about blood acidity or alkalinity, I *have referred* to a test called the Anion-Gap. This test measures Gap. This test measures the

"gap" of electrical potential between positively charged ions called cations (*pronounced* cat-I-ons) and negatively charged ions (an-I-ons). It is calculated by taking the sodium and potassium scores and adding them together and then subtracting out the chloride and carbon dioxide values. This is a very helpful indicator of the relative pH of the blood. The more alkaline the imbalance, the more symptoms the body will manifest. Here are a few signs and symptoms that I watch for:

Muscle pain, joint pain (fibromyalgia-type symptoms), osteoarthritis, osteoporosis (poor mineral solubility and availability), high blood pressure, migraine headaches, tension headaches (constriction, inability of smooth muscle to relax), frequent infection or prolonged chronic infection (typically coupled with other nutrient deficiency states), i.e. chronic sinusitis, cystitis, inability to "hold" an adjustment, mineral insolubility leading to zinc deficiency (prostate, skin, immune system problems), chromium deficiency (*blood-sugar* regulation problems), maganese deficiency (inability to

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