HAIR ELEMENTS

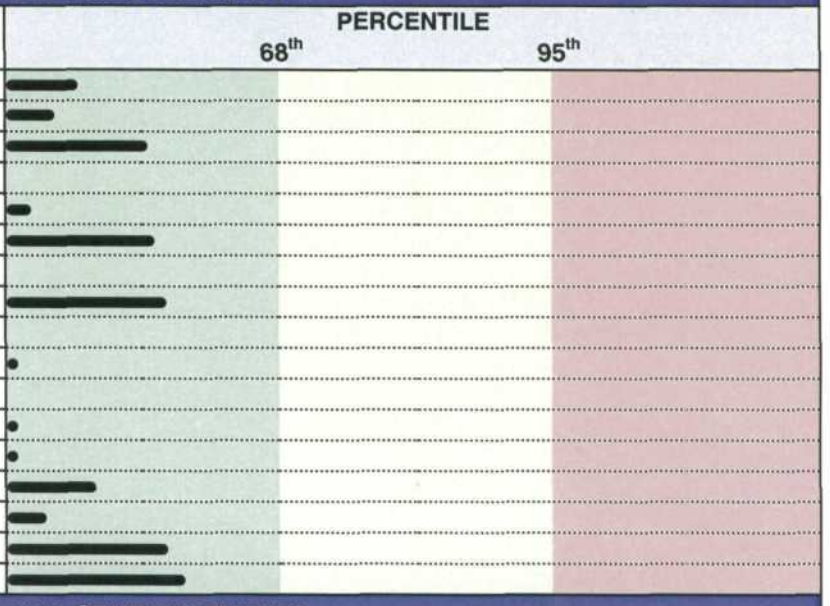
DOCTOR'S DATA INC

LAB#: H050826-0230-1
PATIENT: Frank
SEX: Male
AGE: 61

CLIENT#: 27210
DOCTOR: Joel Grimwood
Carbon Based Corporation
3545 Airway Dr Ste 114
Reno, NV 89511

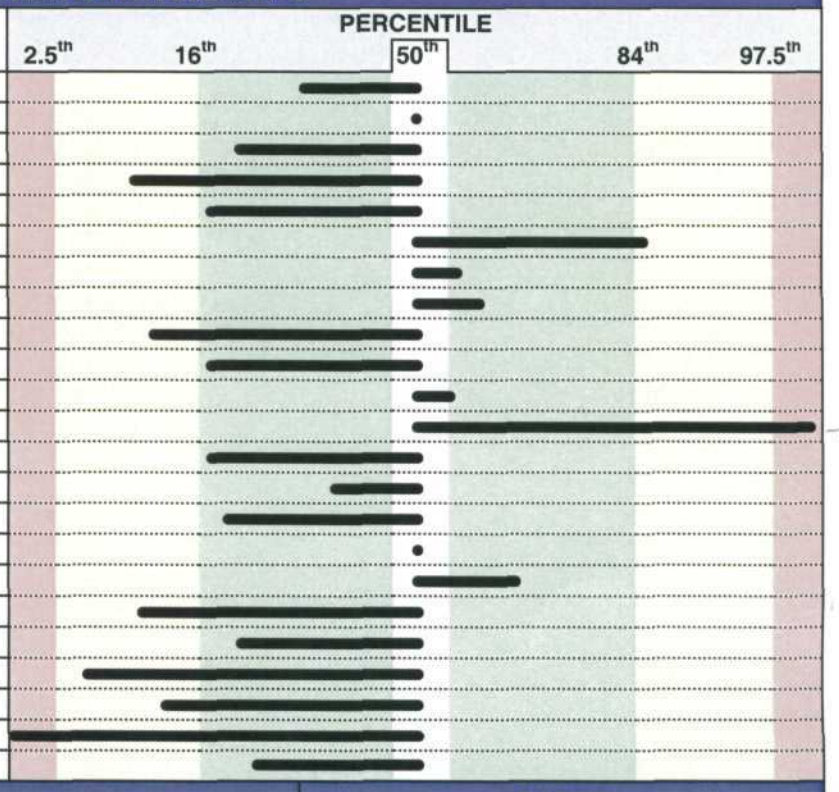
POTENTIALLY TOXIC ELEMENTS

TOXIC ELEMENTS	RESULT µg/g	REFERENCE RANGE
Aluminum	1.7	< 7.0
Antimony	0.018	< 0.066
Arsenic	0.045	< 0.080
Beryllium	< 0.01	< 0.020
Bismuth	0.005	< 0.060
Cadmium	0.083	< 0.15
Lead	< 0.01	< 2.0
Mercury	0.64	0.4 < 1.1
Platinum	< 0.003	< 0.005
Thallium	0.001	< 0.010
Thorium	< 0.001	< 0.005
Uranium	0.001	< 0.060
Nickel	0.01	< 0.40
Silver	0.04	< 0.12
Tin	0.05	< 0.30
Titanium	0.59	< 1.0
Total Toxic Representation		



ESSENTIAL AND OTHER ELEMENTS

ELEMENTS	RESULT µg/g	REFERENCE RANGE
Calcium	282	200- 750
Magnesium	45	25- 75
Sodium	16	12- 90
Potassium	6	9- 40
Copper	10	10- 28
Zinc	210	130- 200
Manganese	0.36	0.15- 0.65
Chromium	0.33	0.20- 0.40
Vanadium	0.015	0.018- 0.065
Molybdenum	0.025	0.025- 0.064
Boron	1.4	0.40- 3.0
Iodine	6.3	0.25- 1.3
Lithium	0.007	0.007- 0.023
Phosphorus	184	160- 250
Selenium	0.97	0.95- 1.7
Strontium	1.0	0.30- 3.5
Sulfur	49900	44500- 52000
Barium	0.11	0.16- 1.6
Cobalt	0.014	0.013- 0.035
Iron	4.1	5.4- 13
Germanium	0.039	0.045- 0.065
Rubidium	< 0.003	0.011- 0.12
Zirconium	0.033	0.020- 0.44



SPECIMEN DATA

COMMENTS:

Date Collected: 8/21/2005
Date Received: 8/26/2005
Date Completed: 8/27/2005

Methodology: ICP-MS

Sample Size: 0.201 g
Sample Type: Head
Hair Color: Brown
Treatment:
Shampoo: Sappohill Bar Soa

V06.99

RATIOS

ELEMENTS	RATIOS	EXPECTED RANGE
Ca/Mg	6.27	4- 30
Ca/P	1.53	0.8- 8
Na/K	2.67	0.5- 10
Zn/Cu	21	4- 20
Zn/Cd	> 999	> 800

HAIR ELEMENTS REPORT
INTRODUCTION

Hair is an excretory tissue for essential, nonessential and potentially toxic elements. In general, the amount of an element that is irreversibly incorporated into growing hair is proportional to the level of the element in other body tissues. Therefore, hair elements analysis provides an indirect screening test for physiological excess, deficiency or maldistribution of elements in the body. Clinical research indicates that hair levels of specific elements, particularly potentially toxic elements such as cadmium, mercury, lead and arsenic, are highly correlated with pathological disorders. For such elements, levels in hair may be more indicative of body stores than the levels in blood and urine.

All screening tests have limitations that must be taken into consideration. The correlation between hair element levels and physiological disorders is determined by numerous factors. Individual variability and compensatory mechanisms are major factors that affect the relationship between the distribution of elements in hair and symptoms and pathological conditions. It is also very important to keep in mind that scalp hair is vulnerable to external contamination of elements by exposure to hair treatments and products. Likewise, some hair treatments (e.g. permanent solutions, dyes, and bleach) can strip hair of endogenously acquired elements and result in false low values. Careful consideration of the limitations must be made in the interpretation of results of hair analysis. The data provided should be considered in conjunction with symptomology, diet analysis, occupation and lifestyle, physical examination and the results of other analytical laboratory tests.

Caution: The contents of this report are not intended to be diagnostic and the physician using this information is cautioned against treatment based solely on the results of this screening test. For example, copper supplementation based upon a result of low hair copper is contraindicated in patients afflicted with Wilson's Disease.

Potassium Low

The level of Potassium (K) in hair does not reflect nutritional status or dietary intake. However, hair K levels may provide clinically relevant information pertaining to adrenal function and/or electrolyte balance.

K is an electrolyte and a potentiator of enzyme functions in cells, but neither of theses functions takes place in hair. K can be low in the body as the result of gastrointestinal or renal dysfunction, or as a side effect of some diuretics. In adrenocortical hyperactivity, blood levels of K are depressed, while urinary K is increased. Low hair K should be viewed as a screening test. Observations at DDI indicate that hair levels of sodium and K are commonly low in association with emotional stress. The low levels of sodium and K are frequently concomitant with high levels of calcium and magnesium in hair. This apparent "emotional stress pattern" requires further investigation.

Symptoms of true K deficiency include: muscle weakness, fatigue, and tachycardia. Diabetic acidosis can result in severe K loss.

Confirmatory tests for K deficiency include measurements of packed red blood cell K; whole blood K and the sodium/K ratio; urine K and the sodium/K ratio. An electrocardiogram may show

abnormalities when K is low in serum/plasma or whole blood.

Copper Normal

Hair Copper (Cu) levels are usually indicative of body status, except that exogenous contamination may occur giving a false normal (or false high). Common sources of contamination include: permanent solutions, dyes, bleaches, and swimming pools/hot tubs in which Cu compounds have been used as algaecides.

Cu is an essential element that activates specific enzymes. Erythrocyte superoxide dismutase (SOD) is a Cu (and zinc) dependent enzyme; lysyl oxidase which catalyzes crosslinking of collagen is another Cu dependent enzyme. Adrenal catecholamine synthesis is Cu dependent, because the enzyme dopamine beta-hydroxylase, which catalyzes formation of norepinephrine from dopamine, requires Cu.

If hair Cu is in the normal range, this usually means tissue levels are in the normal range. However, under circumstances of contamination, a real Cu deficit could appear as a (false) normal. If symptoms of Cu deficiency are present, a whole blood or red blood cell elements analysis can be performed for confirmation of Cu status.

Zinc High

A result of high hair Zinc (Zn) may be indicative of low Zn in cells, and functional Zn deficiency. Zn can be displaced from proteins such as intracellular metallothionein by other metals, particularly cadmium, lead, copper, and mercury (Toxicology of Metals, 1994), resulting in paradoxically elevated hair Zn. Zn may also be high in hair as a result of the use of Zn-containing anti-dandruff shampoo. Rough or dry, flaky skin is a symptom of Zn deficiency, so it is not uncommon for Zn deficient patients to use an anti-dandruff shampoo. A result of high hair Zn warrants further testing to assess Zn status.

Zn is an essential element that is required in many very important biological processes. However, Zn can be toxic if exposure is excessive. Although very uncommon, high hair Zn might be indicative of Zn overload which could result from Zn contaminated water (galvanized pipes), welding or gross, chronic over-supplementation (100 mg/day). Other sources of Zn include: manufacture of brass, bronze, white paint, and pesticide production. Symptoms of Zn excess include: gastrointestinal disorders, decreased heme synthesis (copper deficiency), tachycardia, blurred vision, and hypothermia.

Confirmatory tests for Zn status are whole blood or packed red blood cell elements analysis, urine amino acid analysis, and serum ceruloplasmin (low with Zn induced copper deficiency).

Vanadium Low

Vanadium (V) is typically found at low levels in hair and the clinical significance of the measured result of lower than average hair V is not known. V is measured in hair for research purposes because it has been postulated to be an essential microtrace element. Indirect data to support this postulate have been derived from experimental models. Suggested functions for V include: regulation of sodium-potassium-ATPase, intracellular glutathione metabolism, thyroid metabolism, and insulin mimetic effects at pharmacological doses.

Average dietary V intake varies considerably between 20 mcg to 2 mg. Food sources of V include: liver, fish, radishes, grains, nuts, and vegetable oils.

Iodine High

Hair Iodine (I) levels have been noted to vary according to I status levels and dietary intake. I is nutritionally essential for humans and is used in the formation of thyroid hormones. I is bound to the tyrosine residue in thyroglobulin to form triiodothyronine (T-3) and thyroxine (T-4). However, there is no scientific support indicating that high hair I levels, per se, are diagnostic of thyroid function.

External contamination of hair with I from hair treatments is possible. Contamination is often accompanied by elevated aluminum, silver, nickel, and titanium if there is exogenous I contamination from hair preparations.

Conditions that may be associated with excessive I include: hypersensitivity reactions, hypothyroidism, thyroiditis, and iodide goiter. Hypersensitivity reactions can be immunologic or nonimmunologic, but usually include dermatological irritation or contact dermatoses. Other possible hypersensitivity reactions include: angio-edema, burning or soreness of mouth and throat, and nausea/diarrhea. Autonomous thyrotoxicosis (Plummer's disease) and autoimmune thyrotoxicosis (Graves' disease) may occur in I excess if thyroid function is poorly controlled by hypothalamic-pituitary action. If questionable, thyroid function should be assessed by measurement of TSH, T-4, and T-3.

Total Toxic Element Indication

The potentially toxic elements vary considerably with respect to their relative toxicities. The accumulation of more than one of the most toxic elements may have synergistic adverse effects, even if the level of each individual element is not strikingly high. Therefore, we present a total toxic element "score" which is estimated using a weighted average based upon relative toxicity. For example, the combined presence of lead and mercury will give a higher total score than that of the combination of silver and beryllium.