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# Hair Mineral Analysis

**Practitioner**
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**Project# 20434**

Client# 1428

**Patient:** *Naveed Aslam, (SID: 54951)*

**Report Date:** December 20, 2022 **Login Date:** December 19, 2022

## TOXIC AND NON-NUTRITIONAL

| | Result (ug/g) | High Limit | --- Acceptable--- ---------- Above Acceptable Limits ---------- | |
|---|---|---|---|---|
| Mercury (Hg) | 1.16 | 1.00 | | Hg |
| Lead (Pb) | 0.16 | 1.00 | | Pb |
| Cadmium (Cd) | <DL | 0.10 | | Cd |
| Arsenic (As) | 0.07 | 1.00 | | As |
| Aluminium (Al) | 6.14 | 10.00 | | Al |
| Antimony (Sb) | 0.13 | 1.00 | | Sb |
| Barium (Ba) | 0.57 | 1.50 | | Ba |
| Beryllium (Be) | <DL | 0.050 | | Be |

Weighted Total Toxicity Assessment (27)

## NUTRITIONAL ELEMENTS

| | Result (ug/g) | Expected (ug/g) | Below Normal / Normal / Above Normal | |
|---|---|---|---|---|
| ***Mainly Structural*** | | | | |
| Sulphur (S) | 43517 | 35000-55000 | | S |
| Silicon (Si) | 49 | 15-300 | | Si |
| Boron (B) | 1.69 | 0.5-3.5 | | B |
| Phosphorus (P ) | 242.9 | 125-350 | | P |
| Strontium (Sr) | 4.8 | 0.8-6.0 | | Sr |
| Calcium (Ca) | 1716 | 200-630 | | Ca |
| Magnesium (Mg) | 73 | 18-78 | | Mg |
| ***Mainly Electrolyte*** | | | | |
| Sodium (Na) | 442.4 | 25-180 | | Na |
| Potassium (K) | 166.3 | 10-80 | | K |
| ***Mainly CoFactor*** | | | | |
| Zinc (Zn) | 188.3 | 140-250 | | Zn |
| Copper (Cu) | 13.5 | 12-35 | | Cu |
| Iron (Fe) | 9.0 | 6-28 | | Fe |
| Selenium (Se) | 0.78 | 0.8-2.0 | | Se |
| Chromium (Cr) | 0.58 | 0.1-1.4 | | Cr |
| Manganese (Mn | 0.150 | 0.2-0.8 | | Mn |
| Nickel (Ni) | 0.227 | 0.15-1.0 | | Ni |
| Vanadium (V) | 0.011 | 0.00-0.15 | | V |
| Molybdenum (Mo) | 0.052 | 0.03-0.15 | | Mo |
| Cobalt (Co) | 0.008 | 0.02-0.20 | | Co |

Results and the bar that is displayed in yellow indicate a high or low borderline result to the normal range

## SIGNIFICANT RATIOS

| | Result | Expected |
|---|---|---|
| Ca:Mg | 23.7 | 4-20 |
| Ca:P | 7.1 | 1.5-7.0 |
| Ca:K | 10.3 | 9.4-135 |
| Ca:Na | 3.9 | 3.8-44 |
| Ca:Fe | 191.0 | 21-109 |
| Na:K | 2.7 | 2.0-4 |
| Na:Mg | 6.1 | 0.2-2.2 |
| Zn:Cu | 14.0 | 4-17 |
| Fe:Cu | 0.7 | 0.20-1.5 |

| | Result | Expected |
|---|---|---|
| Ca:Pb | 10466 | >84 |
| Fe:Pb | 54.7 | >4.4 |
| Fe:Hg | 7.7 | >22 |
| Se:Hg | 0.67 | >1.0 |
| Zn:Hg | 162 | >200 |
| Zn:Cd | >1000 | >800 |

## OTHER ELEMENTS

The significance of these elements in hair has not been established. Higher than normal values may indicate exogenous sources.

### Potentially Toxic

| | Result | Expected |
|---|---|---|
| Bismuth (Bi) | 0.035 | <1.0 |
| Silver (Ag) | 0.011 | <1.0 |
| Thallium (Tl) | <DL | <1.0 |
| Uranium (U) | 0.007 | <1.5 |
| Tungsten (W) | <DL | <2.0 |

### Generally Non-Toxic

| | Result | Expected |
|---|---|---|
| Lithium (Li) | 0.023 | <DL - 0.1 |
| Tin (Sn) | 0.725 | <DL - 2.0 |
| Zirconium (Zr) | 0.012 | <DL - 0.4 |
| Cerium (Ce) | 0.003 | <DL - 0.05 |
| Lanthanum (La) | 0.001 | <DL - 0.05 |

*Normal Type: (7) PubicMale*

Analysis Date: December 20, 2022

<dl: Below Method Detection Limit NA: No Analytical Data (Suspected Contamination) For use by practitioners only. Not for diagnosis.

## INTRODUCTION TO HMA INTERPRETATION

The interpretation of the results in this report is to be used as a guide. Hair mineral analysis is a valuable adjunct to other diagnostic techniques but should not be used in the absence of other information. Each person is biochemically unique and experiences a different environment, thus it is important to employ a range of information ; eg patient history, metabolic type, occupation, symptoms, diet analysis, digestion and absorption status, current supplementation regimen, drug use, etc. It is important to consider each individual element that is outside the normal range, establish the possibility of exogenous sources (eg workplace, hobby), and assess the result in relation to other test results and information. Finally, the patterns and ratios can be used to confirm your conclusions.

This report does not (and could not) provide patient-specific recommendations for nutritional or detoxification protocols because such recommendations require information from numerous sources, as outlined above. As with the interpretation of complex and sometimes conflicting nutritional symptoms, it is sometimes necessary to concentrate on correction of the most significant issues rather than attempt to correct everything at once. Diet and supplementation is a complex issue and must be carried out with consideration of input from and assimilation of dietary nutrients. Many vitamins and minerals interact and an excess of one can cause a deficiency of another. Indeed, this is one of the values of hair analysis: it indicates these balances. Nutrients must work together to be absorbed and utilized effectively.

Hair analysis is widely recognized as a valuable tool for the detection of toxic heavy metals (mercury, cadmium, lead, arsenic, etc.). Research has shown that minerals in hair are reflective of the total nutritional environment, including the input of protein, carbohydrate, fat, vitamins and minerals, as well as the psychological state of the individual; Gershoff [Am. J. Clin. Nutr., 30, 868 (1977)]. Some elements are more reliable than others as indices of body burden and nutritional status.

Exogenous sources can contaminate the hair and cleaning is important during sampling as well as in the lab. Industrial and tobacco smoke, aerosol and other air particulate are particularly problematic. We recommend the use of Johnsons Baby or similar mild Shampoo prior to taking the hair sample. The strength of washing procedures and analytical methods may vary from one laboratory to another especially for water soluble elements like sodium and potassium, thus concentration data and 'normal ranges' should not be compared directly [Assarian & Oberleas, Clin.Chem., 23, 1771(1977)]. Despite this difference, the interpretation of the concentration data (relative to 'normal') can be relied upon. The treatment of hair a shampoo like Selsun has a significant influence on trace element values and can render them unreliable. Some hair colouring and shampoo additives are rich in lead, selenium, silicon, and other elements which could contaminate the sample, [McKenzie, Am.j.Clin.Nutr., 31, 470 (1978)].

## DETAILED NUTRITIONAL INFORMATION REPORT

The following information is a summary of the known information relating to each individual element found to be outside normal ranges for this person. Extreme care must be taken when assessing this information with respect to a specific person because, in general, a relatively small subset of the information will be relevant. The assessment MUST be carried out in conjunction with other information.

## SUMMARY RESULTS PAGE (Patient Copy)

This page provides a brief summary of mineral / nutritional information that is relevant for this patient based on the observed concentrations of elements in this hair sample. It is necessary to integrate this information with other data before deciding on a course of action.
In all cases elevated hair concentrations can be caused by exogenous sources, dietary excess or supplementation. A low hair concentration can be caused by dietary deficiency or malabsorption eg exocrine problems like low stomach acid, bile or pancreatic enzyme deficiencies. In addition intestinal problems like inflamation, illeosecal difficulties, irritable bowel, leaky gut may play a role. NB! RDA's serve as a reference point and should not be interpreted as optimal intake levels, particularly when individual regimens are being designed. Please consult with your health care professional and refer to the 'DETAIL REPORT' for more comprehensive information.

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### TOXIC ELEMENTS

**Hg Pb Cd and/or As High**: These elements are particularly toxic. Hair concentrations are good indicators of body burden. Exogenous sources should be ruled out. If exogenous sources have been eliminated, appropriate action should be taken to eliminate the ingestion and accelerate the displacement and de-toxification of these elements. Supplementation with selenium, calcium and zinc may help.

Toxic Group 2 Elements (Aluminium, Antimony, Barium, Berillium) are within normal limit

### Mainly Structural

*These elements participate in thousands of biochemical / metabolic reactions.*

### CALCIUM (Ca)

**High Ca:** Hair is a good index. Rule out bleach or perm. High levels of supplementation, over intake of Phosphorus and/or protein, unusually low or high vitamin D. Try to lower the intake of soft drinks and food additives. Inadequate Magnesium intake. Mobilization from bone, parathyroid. Levels within a factor of 2 of the upper normal are usually not cause for concern. Adult RDA 1200. - 1500. mg.

### MAGNESIUM (Mg)

Magnesium is in normal range.

Sulphur is in normal range.

### SILICON (Si)

Silicon is in normal range.

### BORON (B)

Boron is in normal range.

### PHOSPHORUS (P)

Phosphorus is in normal range.

### STRONTIUM (Sr)

Strontium is in normal range.

### Mainly Electrolyte

*These elements participate in many hormone actions and assist in maintaining equilibrium and homeostatis.*

### POTASSIUM (K)

**High K:** Hair is an approximate index. Use dietary assessment and symptomatology to establish over intake. Check use of diuretics. RDA 3500. mg. When seen with low sodium it may indicate long term stress and adrenal issues.
RDA's Foods and Other Info: RDA is between 2. and 3. grams. Squash, beans, spinach, soybeans, raisins, chard, potato, and milk contain high levels. Fish and most fresh uncooked vegetables provide some Potassium.

### SODIUM (Na)

**High Na** : Hair is an approximate index. Use dietary assessment and symptomatology to establish over intake. Check use of softened water, diuretics. RDA 2400. mg Balancing nutrients are: Vitamins B1, B3, B5, B6, B12, D, E, Potassium, Selenium, Calcium, Copper, Phosphorus, Iron. Elevated levels (ratio to K > 4) is a sign of stress. RDA's Foods and Other Info: RDA is between 2. and 3. grams.

## ENDOCRINE EVALUATION

Electrolyte levels suggest normal adrenal - thyroid function.

Sodium / Potassium Ratio is within normal range.

## Mainly CoFactor

*These elements participate in thousands of biochemical / metabolic reactions.*

### ZINC (Zn)

Zinc is in normal range.

### COPPER (Cu)

Copper is in normal range.

### IRON (Fe)

Iron is in normal range.

### SELENIUM (Se)

**Low Se:** Hair is a good index. Usually caused by low dietary intake. RDA 50. - 200. ug . Soil in Eastern and Western America is low in selenium causing a deficiency in many. Linked to the immune system. Higher levels may aid in reducing cancer rates. The window of safe levels of selenium is narrow, and therefore supplementation should be approached cautiously. The daily intake should not exceed 150 micrograms and high levels of supplementation should not be sustained for long periods: 50 ug (micrograms) per day is generally accepted as safe. NB! supplementing at higher levels than 200. ugs may be TOXIC. Supplementation should be balanced with the following nutrients: Vitamins A, B1, B3, B6, B12, D, E, C, Copper, Iron, Manganese, Calcium, Sodium and Potassium. Vitamin E levels should be correlated with Selenium levels. Vitamin C increases uptake.
RDA is 40. - 70. ug (microgram) but suggested optimal levels are in the 60. - 200. ug . range: requirements increase with age. Dietary sources include marine fish, whole grains, meat, brazil nuts (Highest levels- 1 nut per day supplies RDA), garlic, and sunflower seeds. Most fruits and vegetables are low in Selenium. Inorganic sources are poorly absorbed, especially when combined with vitamin C. L-selenomethionine is the major form in food.

### CHROMIUM (Cr)

Chromium is in normal range.

### MANGANESE (Mn)

**Low Mn:** Hair is a good index. Supplementation should be balanced with the following nutrients: Vitamins A, B1, B3, B6, E, Magnesium, Zinc, Iron, Phosphorus and Potassium. RDA's Foods and Other Info: RDA is 3 - 10 mg. Food sources include black tea, and nuts. Most fruits and vegetables (except pineapple and raspberries) are poor sources.
Excess Iron and/or Calcium can exacerbate a low Manganese condition.

### NICKEL (Ni)

Nickel is in normal range.

### VANADIUM (V)

Vanadium is in normal range.

### MOLYBDENUM (Mo)

Molybdenum is in normal range.

### COBALT (Co)

**Low Co**: Hair level correlation with nutritional status is not well documented. Hair levels do not reflect Vitamin B12 levels. The conversion of inorganic Cobalt to vitamin B12 does not occur and supplementation of Cobalt intake with other than this vitamin is not recommended as many forms of soluble Cobalt are toxic.RDA's Foods and Other Info: RDA is 1 ug (microgram) as B12. The main source of vitamin B12 is red meats, and vitamin B12 supplementation (which is difficult to absorb and requires healthy levels of stomach acid).