



LABORATORIES

Hair Toxic Element Exposure Profile

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Hair Toxic Element Exposure Profile

1. **Measurement of toxic and essential elements**
2. **Inexpensive, noninvasive**
3. **Analysis by ICP-MS**
4. **Result specific commentary provided**
5. **Requires only 0.25 g hair**

Extensive research established that scalp hair element levels are related to human systemic levels. The strength of this relationship varies for specific elements, and many researchers consider hair as the tissue of choice for toxic and several nutrient elements. Unlike blood, hair element levels are not regulated by homeostatic mechanisms. Thus, deviations in hair element levels often appear prior to overt symptoms and can thereby be a valuable preliminary tool for predicting the development of physiological abnormalities.

Since 1972, Doctor's Data, Inc. has performed over four million hair elements tests for physicians and other health care providers, accumulating what is probably the largest database regarding this procedure.

Why hair?

With respect to its contained elements, hair is essentially an excretory tissue rather than a functional tissue. Hair element analysis provides important information which, in conjunction with symptoms and other laboratory values, can assist the physician with an early diagnosis of physiological disorders associated with aberrations in essential and toxic element metabolism.

As protein is synthesized in the hair follicle, elements are incorporated permanently into the hair with no further exchange or equilibration with other tissues. Scalp hair is easy to sample, and because it grows an average of one to two cm per month, it contains a "temporal record" of element metabolism and exposure to toxic elements.

Nutrient elements including magnesium, chromium, zinc, copper and selenium are obligatory co-factors for hundreds of important enzymes and also are essential for the normal functions of vitamins. The levels of these elements in hair are correlated with levels in organs and other tissues.

Toxic elements may be 200-300 times more highly concentrated in hair than in blood or urine. Therefore, hair is the tissue of choice for detection of recent exposure to elements such as arsenic, aluminum, cadmium, lead, antimony, and mercury. The CDC acknowledges the value of hair mercury levels as a maternal and infant marker for exposure to neurotoxic methyl mercury from fish.

Through recent vast improvements in technology, instrumentation, and application of scientific protocols, hair element analysis has become a valuable tool in providing dependable and useful data for physicians and their patients. The U.S. Environmental Protection agency stated in a recent report that "...if hair samples are properly collected and cleaned, and analyzed by the best analytic methods, using standards and blanks as required, in a clean and reliable laboratory by experienced personnel, the data are reliable." (U.S.E.P.A. 600/4-79-049)

Hair, however, is vulnerable to external elemental contamination by means of certain shampoos, bleaches, dyes, and curing or straightening treatments. Therefore, the first step in the interpretation of a hair element report is to rule out sources of external contamination.

Hair element analysis is a valuable and inexpensive screen for physiological excess, deficiency or maldistribution of elements. It should not be considered a stand-alone diagnostic test for essential element function, and should be used in conjunction with patient symptoms and other laboratory tests.

 **Committed to Research**

- Analyses of special samples
- Diverse range of species studied
- Study of mercury detoxification
- Collaborative research

Doctor's Data, Inc. has a long history of participation in cutting edge research with prominent research institutions. We make a significant financial commitment to research. In fact, greater than five percent of all tests performed at DDI are for the purpose of basic research.

The scope of our research interest is vast and includes special analyses of toxic and essential elements and amino acid metabolites. Specimens vary from foods and supplements to tissues from humans and sick sea lions. Our primary research goal is to bring greater awareness of the function of elements in clinical biochemistry and medicine. To further this cause we are eager to review and assist in any relevant scientific endeavor that is based on sound scientific principals.

DDI has had a strong presence in research focused on intellectual and neurological development and behavior in children. Significant advances have been made in these areas as a result of tests that we have provided for the Carl Pfeiffer Treatment Center, Tennessee Tech, and the Universities of California, Georgia, Massachusetts and Wyoming.

To help unravel the biochemical connection between aberrant behavior and violence in juveniles and adults, we have analyzed numerous samples for Argonne National Labs, The Oklahoma Department of Health and Human Services, The California Criminal Justice System, and the Universities of California, Florida, and Texas.

To advance biochemical knowledge pertaining to the adverse effects of toxic waste and heavy industrialization, we have performed tests for the United States Navy, Division of Nuclear Submarines, the Toxic Waste and Automobile Industries, Brookhaven National Labs, and the University of Illinois. These studies addressed toxic exposure and detoxification, hypertension, cardiovascular disease, lead exposure and nutrition programs to minimize lead absorption, and alcoholism and stress in industry. We have also provided analyses of mercury and essential elements in packed red blood cells, urine and hair for a study of the efficacy of a mercury detoxification protocol.

Jefferson University and the University of California have relied on our tests for analyses of human organs, and John's Hopkins Hospital called upon our expertise to facilitate a fascinating study of zinc deficiency and suppression of growth in humans. To further exemplify our versatility and utility, the Hobbs-Sea World Research Institute has relied on us on several occasions upon encountering life threatening problems with aviary nutrition.

Doctor's Data, Inc. is a well-established diagnostic reference laboratory. We are also committed to providing a strong scientific approach to help answer important biomedical questions. To that end, we welcome research proposals and seek collaboration with strong clinical practitioners who are equally committed to improving health and advancing basic knowledge of element function and metabolism.



