

## Hair Analysis – Science or Scam?

Hair testing for animals has arrived. Simply snip some hair from a patient, send it to a laboratory, and in two short weeks, receive a printout listing the levels of over thirty toxins and minerals. Use it to screen for thyroid disease, allergies, cancer, diabetes, and heart problems. Best of all, put your patients' health "back on track" by selling clients nutritional supplements suggested by the hair-testing company that will boost deficiencies and eliminate toxins. Does this sound too good to be true? It probably is, and here's why.

Hair analysis, like applied kinesiology or muscle strength testing, cytotoxic testing, herbal crystallization analysis, and live cell analysis, are considered by some to be forms of "nutritional quackery". Unlike these other unproven diagnostic methods, though, hair analysis *can* offer useful information in certain circumstances, such as assessment of mercury poisoning. However, for most other substances, there is little experimental evidence proving that hair is a true biological marker. Furthermore, the relationship between the uptake of minerals or other chemicals into the body and the concentrations delivered to hair follicles is hazy at best. Factors such as geographical location, gender, and age create added variability in hair mineral concentrations.

Nonetheless, hair testing is "booming" in the United States and Europe: in 2001, consumers spent almost \$10 million on hair analyses by nine laboratories. Especially popular among chiropractors, naturopaths, and nutritional consultants, hair analysis purportedly indicates a patient's disease status or health vulnerability. Hair analysis laboratories often claim that their tests are accurate and reliable and that their evaluators are experts. The laboratories provide printouts comparing the mineral values from the submitted hair sample to reference ranges. Some minerals are coupled to provide ratios that allegedly add insight into a patient's health status. Practitioners may then base prescriptions for nutritional supplements on the hair mineral profile. Most companies suggest that patients undergo successive monitoring during dietary supplementation and, if necessary, detoxification.

Reliance on hair analysis for supplement prescribing is fraught with uncertainty and unreliability. The main concern involves the absence of established and accepted reference ranges. In 1985, Barrett published a study in the *Journal of the American Medical Association (JAMA)* entitled "Commercial hair analysis, science or scam?" in which he revealed poor inter-laboratory reliability of reported mineral levels among eighteen laboratories. Seidel et al. re-evaluated the reliability of hair mineral analysis in another *JAMA* study in 2001, sending samples from a single donor to six laboratories performing 90% of analyses in the United States. The authors again found significant interlaboratory differences in reference ranges, hair test values, and interpretations. Although the donor (one of the study's authors) was a healthy 40 year-old woman with no clinical evidence of disease, the laboratories informed her that she was at increased risk

for adrenal insufficiency, anemia, cardiovascular disease, “dysinsulinism”, passive-aggressive behavior patterns, etc. Based on the unreliability of hair mineral analysis due to the lack of verifiable reference ranges for human hair, Seidel et al recommended that “health care practitioners refrain from using hair analysis to assess individual nutritional status or suspected environmental exposures. Problems with the regulation and certification of these laboratories should also be addressed.”

Although supporters and providers of hair testing have attempted to discount the findings by Seidel et al, a similar evaluation of seven commercial hair mineral analysis laboratories in Germany arrived at the same conclusion. In this 2002 report by Drasch and Roider in the *Journal of Trace Elements in Medicine and Biology*, the authors stated that they “agree totally” with the findings of Seidel et al. that hair mineral testing data is unreliable, and that “incorrect and not reproducible analytical results do more harm than good, because they must result in misinterpretations.” The American Medical Association’s current policy on hair analysis is as follows: “The AMA opposes chemical analysis of the hair as a determinant of the need for medical therapy and supports informing the American public and appropriate governmental agencies of this unproven practice and its potential for health care fraud” [AMA Policy No. H-175.995]. In 2001, the Agency for Toxic Substances and Disease Registry (ATSDR) convened a seven-member panel of scientific experts in hair analysis, toxicology, and medicine to review the current state of the science related to hair analysis. They determined that, “For most substances, insufficient data currently exist that would allow the prediction of a health effect from the concentration of the substance in hair. The presence of a substance in hair may indicate exposure (both internal and external), but does not necessarily indicate the source of exposure.” According to a report in the April 2003 issue of *Environmental Health Perspectives* on the ATSDR conclusions, “Universally, the panelists expressed concern about the misuse of hair analysis to justify and support unnecessary and unethical medical therapy.”

It is almost twenty years since Barrett’s first critique of hair testing reliability for humans was published, and recent studies continue to demonstrate worrisome unreliability in hair mineral analyses. It is sixteen years after passage of the Clinical Laboratory Improvement Act (CLIA) in 1988 which was designed to regulate clinical testing and improve laboratory methods, and there is still no CLIA specialty area for hair analysis, because no standards for proficiency testing yet exist. So far, only one laboratory offers hair analysis for animals. Will more follow? How reliable can hair testing for animals be, when hair analysis for humans is still “in its infancy”, after two decades? How can animal healthcare providers ethically and medically justify selling dietary supplements based on hair testing, in the face of this uncertainty?