Toxic Metals; stool

Order: SAMPLE REPORT
Client #: 12345
Doctor: Sample Doctor
Doctor's Data, Inc.
3755 Illinois Ave.
St. Charles, IL 60174

Patient: Sample Patient
Age: 35
Sex: Female
Dental Amalgams: Yes

Sample Collection	Date/Time
Date Collected	04/21/2020
Date Received	04/22/2020
Date Reported	04/23/2020

Toxic Metals	Result	Unit	Percentile (68th, 95th)	Reference Interval
Antimony	0.056	mg/kg Dry Wt		< 0.050
Arsenic	0.08	mg/kg Dry Wt		< 0.20
Beryllium	0.005	mg/kg Dry Wt		< 0.011
Bismuth	0.053	mg/kg Dry Wt		< 0.100
Cadmium	0.50	mg/kg Dry Wt		< 0.50
Cesium	0.25	mg/kg Dry Wt		< 0.1
Copper	52	mg/kg Dry Wt		< 60
Gadolinium	0.14	mg/kg Dry Wt		< 0.03
Lead	0.29	mg/kg Dry Wt		< 0.30
Manganese	121	mg/kg Dry Wt		< 200
Mercury	0.41	mg/kg Dry Wt		< 0.050
Nickel	9.1	mg/kg Dry Wt		< 8.0
Platinum	<dl	mg/kg Dry Wt		< 0.003
Thallium	0.60	mg/kg Dry Wt		< 0.020
Tungsten	0.015	mg/kg Dry Wt		< 0.130
Uranium	0.19	mg/kg Dry Wt		< 0.100

Water Content	Result	Unit	-2SD -1SD Mean +1SD +2SD	Reference Interval
Water Content	74.1	%		66.3 – 78.8

Information

- Analysis of elements in feces provides a means to assess oral exposure, and to a lesser extent endogenous detoxification of potentially toxic metals. For several toxic elements such as mercury, cadmium, lead, antimony and uranium, biliary excretion of metals into feces is a primary natural route of elimination from the body. Studies performed at Doctor's Data demonstrate that the fecal mercury content and number of amalgam surfaces are highly correlated. Therefore people with several amalgams in place will typically have higher concentrations of fecal mercury than people without amalgams.

  Results are reported as mg/kg dry weight of feces to eliminate the influence of variability in water content of fecal specimens.

  To provide guidance in interpretation of results, patient values are plotted graphically with respect to percentile distribution of the population base. Since this test reflects both oral exposure and biliary excretion of metals, overt clinical associations are not directly implied.
- **Cesium High**
  Fecal cesium (CS) provides an indication of recent oral exposure to the element, and to a much lesser extent Cs that has been excreted from the body in bile.

Notes:
Methodology: ICP-MS

Analyzed by DOCTOR'S DATA, INC. • 3755 Illinois Avenue, St. Charles, IL 60174-2420 USA • LAB DIR: Erlo Roth, MD • CLIA ID: 14D0646470

Naturally occurring Cs, the isotope measured at Doctor's Data, is not radioactive and is referred to as stable Cs (Cs133). Cesium is a naturally occurring element found combined with other elements in rocks, soil, and dust in low amounts. Humans may be exposed to Cs at relatively low levels from air and diet. Cesium-chloride is used as a lubricant to facilitate drilling for oil and natural gas. As such Cs may contaminate surface and ground water, and certain crops in close proximity to drilling sites.

Very high levels of fecal Cs have been observed at Doctor's Data for patients self-supplementing with oral Cs-chloride. Cesium chloride has been proclaimed to be a therapeutic treatment for cancer but documentation to that effect is not available. Indiscriminant use Cs-chloride solutions have been reported to have very serious consequences when chronically ingested or injected at high levels. Like thallium, Cs is antagonistic to the essential element potassium, and Cs toxicity has been associated with hypokalemia, ventricular tachycardia and death.

Confirmatory tests for excessive exposure to Cs include serum electrolytes and blood or red blood cell elements analysis.

- **Gadolinium High**

Fecal gadolinium (Gd) provides an indication of Gd that has been excreted from the body in bile, and to a lesser extent oral exposure.

Gadolinium can be found in the environment in geographically variable amounts, and usually at very low levels. Gadolinium is widely used in industrial and household applications such as radar technologies, compact discs, and microwaves; direct exposure from such sources is not a concern. However disposal of Gd-containing devices contributes to greater potential for human exposure. The single greatest direct source of exposure to Gd is Gd-based contrast agents (GBCAs) that are widely used with magnetic resonance imaging (MRI). Concern has been raised regarding the use of unstable linear GBCAs, especially for patients with mild to severe kidney dysfunction. Fecal Gd levels vary with the time after administration, and the dose of the specific GBCA. There is much controversy regarding the safety of certain unstable GBCAs; Gd doesn't have physiological functions in the body.

Urinary levels of Gd typically decrease very rapidly after administration for patients who have good kidney function (glomerular filtration rate; GFR). However, the rate of Gd clearance may be markedly slowed with compromised GFR. Fecal Gd levels have not been well studied, but preliminary observations indicate that fecal levels of Gd also normally decrease sharply with time after administration of GBCAs (unpublished, Doctor's Data). While the Gd levels normally decrease rather rapidly in urine and feces, it is clear that some Gd is retained in the body for a long time. Of greatest potential concern is Gd deposition in the brain, which is correlated with the number of GBCA-enhanced MRIs.

Gadolinium deposition disease (GDD) has recently been described and may be associated with central and peripheral pain, headache, bone pain, skin thickening, muscle weakness, arthralgia, and persistent clouded mentation and headache. If such new symptoms appear 2-8 weeks after Gd-enhanced MRI, it is recommended to assess the level of Gd in urine (1st AM void or 24 hour collection).

- **Mercury High**

Fecal mercury (Hg) provides a good indication of recent or ongoing exposure to elemental Hg, and to a much lesser extent Hg that has been excreted from the body in bile. Data collected at Doctor's Data indicates a linear association between fecal Hg concentration and the number of amalgams currently in the mouth. Fecal Hg for subjects with 9 to 11 dental amalgams in place was 20-times greater than that of subjects without any dental amalgams in place (0.60 and 0.03 ųg/gram dry weight, respectively). Dental amalgams typically contain about 50% elemental Hg, and constant abrasion associated with chewing and bruxism releases very small particles of Hg which are poorly absorbed (about 5%) in the gastrointestinal tract. A direct association between fecal Hg levels and health has not been established, but a land mark study of amalgam placement in monkeys indicated there was an associated induction of co-resistance to both Hg and antibiotics by pathogenic bacteria in the gastrointestinal tract, particularly for species in the Enterobacteriaceae family. Such was also reported for miners exposed to elemental Hg while working in gold mines.

Methylmercury, which is abundant in predatory fish, is almost entirely absorbed and thereby does not show up nearly as prevalent in feces as does amalgam-derived inorganic Hg. In fact the presence of just a few dental amalgams precludes definitive contribution of fish consumption to total fecal Hg. The study conducted at Doctor's Data indicates that consumption of greater than 36 ounces of fish per month in subjects without dental amalgams was associated with a level of fecal Hg equivalent to that of subjects with only 1-2 amalgams (0.16 mg/kg dry weight).

The use of Hg in fungicides and pesticides (including that in marine paints) has declined due to environmental concerns, but residual Hg persists from past use. Except for fish, the human dietary intake of mercury is negligible unless food is contaminated with one of the previously mentioned forms/sources.

Analysis of Hg in red blood cells and hair provides a good estimate of sustained exposure to methymercury from fish; methylmercury partitions into those two matrices to a far greater extent than does inorganic Hg.

- **Thallium High**

Fecal thallium (Tl) provides an indication of Tl that has been excreted from the body in bile, and to a lesser extent recent oral exposure to the element. The biliary fecal route is the primary route of Tl excretion from the body, although about 35% is excreted in urine. Tl is rapidly and near completely absorbed when ingested, inhaled or brought into contact with skin. Thallium is a highly toxic heavy metal which is generally tasteless and odorless, and doesn't have physiological functions in the body.

Currently the most common sources of dietary Tl are contaminated vegetables, fish and shellfish; particularly those obtained in close proximity to drilling sites for natural gas and oil. Kale, spinach, cabbage and other Brassicaceae family vegetables appear to be most highly contaminated. The highest levels of urine Tl observed at Doctor's Data have been associated with daily consumption of "green drinks" that were prepared at home from raw Brassicaceae vegetables. It should be noted that a statement of "organic" generally does not provide any assurance that the produce is not contaminated with Tl. Contaminated water has apparently been used to irrigate crops in certain agricultural areas in California. Other possible sources of Tl include tobacco, fly ash (coal), cement dust, some fertilizers, some artists' paints, semiconductors, and hazardous waste sites and landfills (nearby drinking water/soil). Thallium is also a by-product from the smelting of copper, zinc and lead ores.

Symptoms associated with significant exposure to Tl may include: fatigue, headaches, sleep disturbance, neuropathy, ataxia, depression, psychoses, and extreme loss of hair. Thallium follows potassium in the body and accumulates in tissues with high potassium content including skeletal/cardiac muscle, and central/peripheral nerves.

Hair elemental analysis may be utilized to assess exposure to Tl over the past 2-4 months.