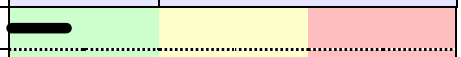
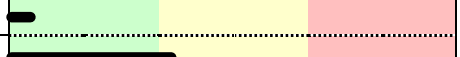
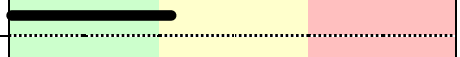
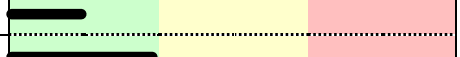
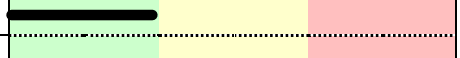
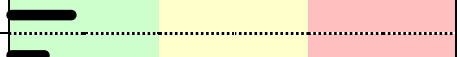
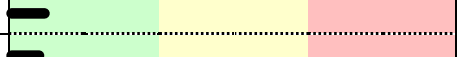
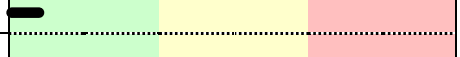
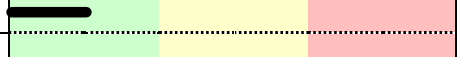
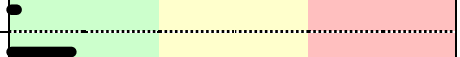
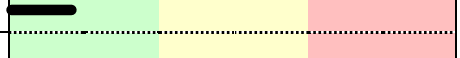
DOCTOR'S DATA INC

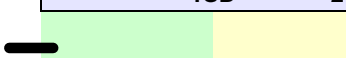
LAB #: U191223-2295-1
PATIENT: Ian W Cumming
ID: CUMMING-I-00050
SEX: Male
DOB: 02/08/1973 AGE: 46

CLIENT #: 47376
DOCTOR: Ronald Partain, PHARMD
Rons Nutrition
308 E 12th Street
Beaumont, CA 92223 U.S.A.

Toxic Metals; Urine 24 hour

TOXIC METALS PER CREATININE		RESULT µg/g creat	REFERENCE INTERVAL
Aluminum	(Al)	5.2	< 25
Antimony	(Sb)	< dl	< 0.2
Arsenic	(As)	8.8	< 75
Barium	(Ba)	6.4	< 7
Beryllium	(Be)	< dl	< 1
Bismuth	(Bi)	< dl	< 2
Cadmium	(Cd)	0.3	< 0.8
Cesium	(Cs)	4.5	< 9
Gadolinium	(Gd)	< dl	< 0.5
Lead	(Pb)	0.5	< 2
Mercury	(Hg)	0.5	< 3
Nickel	(Ni)	1.1	< 8
Palladium	(Pd)	< dl	< 0.3
Platinum	(Pt)	< dl	< 0.1
Tellurium	(Te)	< dl	< 0.5
Thallium	(Tl)	0.1	< 0.5
Thorium	(Th)	< dl	< 0.03
Tin	(Sn)	0.1	< 4
Tungsten	(W)	0.1	< 0.4
Uranium	(U)	< dl	< 0.03

TOXIC METALS PER 24 HOURS	RESULT µg/24 HOUR	REFERENCE INTERVAL	WITHIN REFERENCE / OUTSIDE REFERENCE
Aluminum (Al)	11	< 30	
Antimony (Sb)	< dl	< 0.3	
Arsenic (As)	19	< 150	
Barium (Ba)	13	< 8	
Beryllium (Be)	< dl	< 1	
Bismuth (Bi)	< dl	< 5	
Cadmium (Cd)	0.7	< 1.5	
Cesium (Cs)	9.4	< 10	
Gadolinium (Gd)	< dl	< 1	
Lead (Pb)	1	< 2.5	
Mercury (Hg)	1.1	< 5	
Nickel (Ni)	2.4	< 13	
Palladium (Pd)	< dl	< 0.3	
Platinum (Pt)	< dl	< 0.2	
Tellurium (Te)	< dl	< 0.5	
Thallium (Tl)	0.3	< 0.6	
Thorium (Th)	< dl	< 0.03	
Tin (Sn)	0.2	< 6	
Tungsten (W)	0.2	< 0.5	
Uranium (U)	< dl	< 0.03	

URINE CREATININE	RESULT mg/24 hr	REFERENCE INTERVAL	- 2SD	-1SD	MEAN	+1SD	+2SD
Creatinine	2090	900- 3000					

SPECIMEN DATA

Comments: **Requisition is marked pre.**

Date Collected: **12/20/2019**
Date Received: **12/23/2019**
Date Reported: **12/30/2019**
Method: **ICP-MS**

pH Upon Receipt: **Acceptable**
<dl: **less than detection limit**
Provoking Agent: **EDTA SUPP 1250 MG**
Creatinine by Jaffe Method

Collection Period: **24 hr**
Volume: **3000 ml**
Provocation: **PRE PROVOCATIVE**

Results are creatinine corrected to account for urine dilution variations. **Reference intervals and corresponding graphs are representative of a healthy population under non-provoked conditions.** Chelation (provocation) agents can increase urinary excretion of metals/elements.

V13

INTRODUCTION

This analysis of urinary elements was performed by ICP-Mass Spectroscopy following acid digestion of the specimen. Urine element analysis is intended primarily for: diagnostic assessment of toxic element status, monitoring detoxification therapy, and identifying or quantifying renal wasting conditions. It is difficult and problematic to use urinary elements analysis to assess nutritional status or adequacy for essential elements. Blood, cell, and other elemental assimilation and retention parameters are better indicators of nutritional status.

1) 24 Hour Collections
"Essential and other" elements are reported as mg/24 h; mg element/urine volume (L) is equivalent to ppm. "Potentially Toxic Elements" are reported as µg/24 h; µg element/urine volume (L) is equivalent to ppb.

2) Timed Samples (< 24 hour collections)
All "Potentially Toxic Elements" are reported as µg/g creatinine; all other elements are reported as µg/mg creatinine. Normalization per creatinine reduces the potentially great margin of error which can be introduced by variation in the sample volume. It should be noted, however, that creatinine excretion can vary significantly within an individual over the course of a day.

If one intends to utilize urinary elements analysis to assess nutritional status or renal wasting of essential elements, it is recommended that unprovoked urine samples be collected for a complete 24 hour period. For provocation (challenge) tests for potentially toxic elements, shorter timed collections can be utilized, based upon the pharmacokinetics of the specific chelating agent. When using EDTA, DMPS or DMSA, urine collections up to 12 hours are sufficient to recover greater than 90% of the mobilized metals. Specifically, we recommend collection times of: 9 - 12 hours post intravenous EDTA, 6 hours post intravenous or oral DMPS and, 6 hours post oral bolus administration of DMSA. What ever collection time is selected by the physician, it is important to maintain consistency for subsequent testing for a given patient.

If an essential element is sufficiently abnormal per urine measurement, a descriptive text is included with the report. Because renal excretion is a minor route of excretion for some elements, (Cu, Fe, Mn Zn), urinary excretion may not influence or reflect body stores. Also, renal excretion for many elements reflects homeostasis and the loss of quantities that may be at higher dietary levels than is needed temporarily. For these reasons, descriptive texts are provided for specific elements when deviations are clinically significant. For potentially toxic elements, a descriptive text is provided whenever levels are measured to be higher than expected. If no descriptive texts follow this introduction, then all essential element levels are within acceptable range and all potentially toxic elements are within expected limits.

Reference intervals and corresponding graphs shown in this report are representative of a healthy population under non-provoked conditions. Descriptive texts appear in this report on the basis of measured results and correspond to non-challenge, non-provoked conditions.

Chelation (provocation) agents can increase urinary excretion of metals/elements. Provoked

reference intervals have not been established therefore non-provoked reference intervals shown are not recommended for comparison purposes with provoked test results. Provoked results can be compared with non-provoked results (not reference intervals) to assess body burden of metals and to distinguish between transient exposure and net retention of metals. Provoked results can also be compared to previous provoked results to monitor therapies implemented by the treating physician. Additionally, Ca-EDTA provoked results can be used to calculate the EDTA/Lead Excretion Ratio (LER) in patients with elevated blood levels.

CAUTION: Even the most sensitive instruments have some detection limit below which a measurement cannot be made reliably. Any value below the method detection limit is simply reported as "< dl." If an individual excretes an abnormally high volume of urine, urinary components are likely to be extremely dilute. It is possible for an individual to excrete a relatively large amount of an element per day that is so diluted by the large urine volume that the value measured is near the dl. This cannot automatically be assumed to be within the reference range.

Barium High

Barium (Ba) has not been established to be an essential element. Elevated levels of Ba often are observed after exposure to Ba (a contrast agent) during diagnostic medical tests (e.g. "barium swallow", "upper GI series", "barium enema", etc.). Elevated levels of Ba may interfere with calcium metabolism and potassium retention. Acutely high intake of soluble Ba-salts (nitrates, sulfides, chlorides) can be toxic. Chronic exposure to Ba may be manifested by muscular and myocardial stimulation, tingling in the extremities, and loss of tendon reflexes.

Brazil nuts and peanuts/peanut butter are very high in Ba so urine Ba may be elevated shortly after consumption of these foods; toxic effects would not be anticipated under such conditions. Although Ba is poorly absorbed orally (<5%) it can be very high in peanuts and peanut butter (about 3,000 nanograms/gram), frozen and fast foods such as burgers, fries, and hot dogs (400-500 nanograms/gram). It is noteworthy that Ba intake is much higher in children than adults (Health Canada 2005, www.atsdr.cdc.gov/toxprofiles/tp24-c6.pdf).

Ba is surprisingly abundant in the Earth's crust, being the 14th most abundant element. High amounts of Ba may be found in soils and in food, such as nuts (e.g. brazil nuts), seaweed, fish and certain plants. Because of the extensive use of barium in industry, human activitiesadd greatly to the release of barium in the environment. As a result barium concentrations in air, water and soil may be higher than naturally occurring concentrations in many locations. It can also enter the air during coal and oil combustion. Barium compounds are used by the oil and gas industries to make drilling mud. Drilling mud simplifies drilling through rocks by lubricating the drill. Barium compounds are also used to make paint, brics, tiles, glass, and rubber. Soluble Ba compounds are highly toxic and may be used as insecticides. Ba-aluminates are utilized for water purification, acceleration of concrete solidification, production of synthetic zeolites, and in the paper and enamel industries.

Ba levels (and the levels of 16 other elements) in water can be assessed with water testing as provided by DDI. A possible confirmatory test for excessive Ba is measurement of blood electrolytes as hypokalemia may be associated with excessive Ba in the body. Hair elements

analysis may provide further evidence of exosure to Ba.