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**Anna**

Date: 4/28/2009  
(accession: A0904290213)

Next Test Due: 10/29/2009

***LabAssist™ Urine Organic Acid Report***  
***Practitioner***

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## Basic Status High/Low

**Anna**

**Urine Organic Acid Date: 4/28/2009**

Female / Age: 57

Client ID:555986644 (8322)

The % Status is the weighted deviation of the laboratory result.

### Low Results

-80	-60	-40	-20	0		% Status	Result	Low	High
		-48.88			Indican	-48.88 L	0.90	0.00	80.00
		-40.72			CA Cycle Return	-40.72 L	237.71	125.00	1340.00
		-35.00			Tricarballylate	-35.00 L	0.24	0.00	1.60
		-32.26			Homovanillate	-32.26 L	2.60	1.50	7.70
		-32.05			a-Ketoisocaproate	-32.05 L	0.07	0.00	0.39
		-31.50			a-Ketoglutarate	-31.50 L	9.28	2.60	38.70
		-29.82			Citrate	-29.82 L	373.20	175.00	1157.00
		-27.83			cis-Aconitate	-27.83 L	43.08	30.00	89.00
		-25.00			a-Hydroxybutyrate	-25.00 L	0.30	0.00	1.20
		-25.00			a-Ketoisovalerate	-25.00 L	0.15	0.00	0.60

-25%

### High Results

-50	0	50	100	150		% Status	Result	Low	High
		1033.33			Phenylacetate	1033.33 H	0.65	0.00	0.06
		713.39			Sulfate	713.39 H	1876.00	166.00	390.00
		395.45			D-Lactate	395.45 H	24.50	0.00	5.50
		148.40			Benzoate	148.40 H	4.96	0.00	2.50
		98.00			2-Methylhippurate	98.00 H	0.07	0.00	0.05
		91.67			Kynurenate	91.67 H	2.55	0.00	1.80
		89.44			Fumarate	89.44 H	0.99	0.00	0.71
		86.43			Glucarate	86.43 H	9.55	0.00	7.00
		70.00			p-Hydroxyphenyllactate	70.00 H	0.84	0.00	0.70
		58.05			Pyruvate	58.05 H	4.43	0.00	4.10
		46.55			Formiminoglutamic Acid	46.55 H	1.40	0.00	1.45
		46.52			Isocitrate	46.52 H	90.05	36.00	92.00
		42.86			Xanthurenate	42.86 H	0.65	0.00	0.70
		33.00			Orotate	33.00 H	0.83	0.00	1.00
		30.00			Phenylpropionate	30.00 H	0.40	0.00	0.50
		30.00			Pyroglutamate	30.00 H	48.00	0.00	60.00
		25.56			Vanilmandelate	25.56 H	3.14	1.10	3.80

-25%

25%

### Basic Status Alphanumeric

**Anna**

**Urine Organic Acid Date: 4/28/2009**

Female / Age: 57

The % Status is the weighted deviation of the laboratory result relative to the range.

-100	-50	0	50	100	% Status	Result	Low	High
		█			<b>2-Methylhippurate</b>	<b>98.00 H</b>	<b>0.07</b>	0.00 0.05
		█			5-Hydroxyindoleacetate	20.73	4.40	1.50 5.60
		█			8-Hydroxy-2-deoxyguan	8.49	3.10	0.00 5.30
		█			Adipate	-4.39	2.60	0.00 5.70
		█			<b>a-Hydroxybutyrate</b>	<b>-25.00 L</b>	<b>0.30</b>	0.00 1.20
		█			<b>a-Ketoglutarate</b>	<b>-31.50 L</b>	<b>9.28</b>	2.60 38.70
		█			<b>a-Ketoisocaproate</b>	<b>-32.05 L</b>	<b>0.07</b>	0.00 0.39
		█			<b>a-Ketoisovalerate</b>	<b>-25.00 L</b>	<b>0.15</b>	0.00 0.60
		█			<b>Benzoate</b>	<b>148.40 H</b>	<b>4.96</b>	0.00 2.50
		█			CA Cycle Entry	20.20	84.24	0.00 120.00
		█			<b>CA Cycle Return</b>	<b>-40.72 L</b>	<b>237.71</b>	125.00 1340.00
		█			<b>cis-Aconitate</b>	<b>-27.83 L</b>	<b>43.08</b>	30.00 89.00
		█			<b>Citrate</b>	<b>-29.82 L</b>	<b>373.20</b>	175.00 1157.00
		█			D-Arabinitol	0.00	16.00	0.00 32.00
		█			<b>D-Lactate</b>	<b>395.45 H</b>	<b>24.50</b>	0.00 5.50
		█			Ethylmalonate	-0.91	2.70	0.00 5.50
		█			<b>Formiminoglutamic Acid</b>	<b>46.55 H</b>	<b>1.40</b>	0.00 1.45
		█			<b>Fumarate</b>	<b>89.44 H</b>	<b>0.99</b>	0.00 0.71
		█			<b>Glucarate</b>	<b>86.43 H</b>	<b>9.55</b>	0.00 7.00
		█			Hippurate	10.70	329.01	0.00 542.00
		█			<b>Homovanillate</b>	<b>-32.26 L</b>	<b>2.60</b>	1.50 7.70
		█			Hydroxymethylglutarate	-12.50	2.55	0.00 6.80
		█			<b>Indican</b>	<b>-48.88 L</b>	<b>0.90</b>	0.00 80.00
		█			<b>Isocitrate</b>	<b>46.52 H</b>	<b>90.05</b>	36.00 92.00
		█			<b>Kynurenate</b>	<b>91.67 H</b>	<b>2.55</b>	0.00 1.80
		█			Malate	18.26	1.57	0.00 2.30
		█			Methylmalonate	-14.35	0.82	0.00 2.30
		█			<b>Orotate</b>	<b>33.00 H</b>	<b>0.83</b>	0.00 1.00
		█			<b>Phenylacetate</b>	<b>1033.33 H</b>	<b>0.65</b>	0.00 0.06
		█			<b>Phenylpropionate</b>	<b>30.00 H</b>	<b>0.40</b>	0.00 0.50
		█			p-Hydroxybenzoate	20.00	0.84	0.00 1.20
		█			P-Hydroxyphenylacetate	17.20	13.44	0.00 20.00
		█			<b>p-Hydroxyphenyllactate</b>	<b>70.00 H</b>	<b>0.84</b>	0.00 0.70
		█			<b>Pyroglutamate</b>	<b>30.00 H</b>	<b>48.00</b>	0.00 60.00
		█			<b>Pyruvate</b>	<b>58.05 H</b>	<b>4.43</b>	0.00 4.10
		█			Quinolinat	-1.47	4.95	0.00 10.20
		█			Suberate	10.56	1.09	0.00 1.80
		█			Succinate	5.87	10.71	1.10 18.30
		█			<b>Sulfate</b>	<b>713.39 H</b>	<b>1876.00</b>	166.00 390.00
		█			<b>Tricarballylate</b>	<b>-35.00 L</b>	<b>0.24</b>	0.00 1.60
		█			<b>Vanilmandelate</b>	<b>25.56 H</b>	<b>3.14</b>	1.10 3.80
		█			<b>Xanthurenate</b>	<b>42.86 H</b>	<b>0.65</b>	0.00 0.70
	-25%	25%			<b>Total Status Deviation</b>	<b>79.10</b>		
					<b>Total Status Skew</b>	<b>60.08</b>		

## Client Summary Review

**Anna**

**Urine Organic Acid Date: 4/28/2009**

Female / Age: 57

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### Nutritional Support

The following supplements may help to balance your biochemistry. Consult your practitioner.

**1-Antioxidant Complex**  
See Nutrition Detail

**1-Detoxification Protocol**  
See Nutrition Detail

**1-Tyrosine**  
2x daily 500 mg

**1-Whey Protein**  
See Nutrition Detail

**2-Glycine**  
2x daily 500 mg

### Foods to AVOID

The following foods may aggravate already out-of-balance biochemistry.

Green Tea

**Results Missing From Test**

A more comprehensive report would have been generated if the following results were provided.

Lactate                                      b-Hydroxybutyrate                                      b-Hydroxyisovalerate                                      a-Keto-b-methylvalerate

**Out-Of-Balance Panel Values**

The following panels have a PSD of greater than 25% indicating need for further review. PSD is the Panel Status Deviation, or the average imbalance of that subset of results. The PSS is the Panel Status Skew, or the direction, negative (deficiency) or positive (excess), of that subset of results.

Panel Name	PSD	PSS
Intestinal Dysbiosis	204.08%	183.11%
Liver Detox Indicators	164.30%	155.97%
Carbohydrate Metabolism	41.52%	16.52%
CAC Cycle Ratios	34.54%	11.98%
Neurotransmitters	34.34%	20.85%
Energy Production	32.72%	7.31%
B-Complex Markers	32.16%	3.60%
BCAA Catabolism	28.53%	-28.53%

**Lab Reported out-of-range Values**

The following results are out-of-range (as reported by the lab), and should be carefully reviewed.

**Phenylacetate (1033.33%)**

A high reading of this organic acid may be indicative of an overgrowth of intestinal microbiota or protozoa. The presence of this acid may be due to the action of bacteria on phenylalanine and should not appear in anything more than background amounts.

**Sulfate (713.39%)**

High levels of sulfate in the urine may be indicative of a number of problems related to glutathione use and depletion. If urinary pyroglutamate and a-hydroxybutyrate are also elevated, this indicates an early stage of glutathione depletion as it suggests that the system is increasing the flow of sulfur compounds into the liver to meet a growing need for the antioxidant tri-peptide. If those two markers are not elevated, suspect a high intake of sulfur bearing foods or amino acids such as NAC (N-Acetyl-Cysteine), methionine or taurine.

**D-Lactate (395.45%)**

A high reading of D-lactate may indicate that there may be an overgrowth of *Lactobacillus acidophilus*, *plantarum* or *salivarius*. High dietary carbohydrate intake or antibiotic use are other possibilities.

**Oxidative Damage (212.67%)**

A high reading of this ratio is indicative of excessive oxidative damage and the use of anti-oxidants is highly recommended.

**Benzoate (148.40%)**

An elevated reading of this organic acid may mean an overgrowth of certain intestinal microbiota, ingestions of excessive benzoic acid in the diet (preserved foods, pickles, lunch meats, cranberries), or poor Phase II detoxification capabilities as the conjugation of benzoate with glycine is very efficient. The presence of this compound may be due to the action of the bacteria on phenylalanine. Assessment of amino acid competency may be helpful especially plasma glycine.

**2-Methylhippurate (98.00%)**

This organic acid is an indication of exposure to or xylene or toluene. A comprehensive detoxification program should be undertaken to help the body excrete these petrochemicals. The use of antioxidants and glycine are recommended. Also, the ingestion of alcohol is contraindicated as it will inhibit the persons ability to detoxify these solvents.

**Kynurenate (91.67%)**

A high reading of this by-product of the breakdown of the amino acid tryptophan is consistent with a vitamin B6 deficiency, possible inflammatory processes, interferon-gamma stimulated macrophages or excessive tryptophan supplementation (not 5-HTP). Abnormally high levels can cause and increase in pain sensations and may, in multiple sclerosis patients, be a marker for an exacerbation period.

**Fumarate ( 89.44%)**

Elevated fumarate may be indicative of a Coenzyme Q10 deficiency or if citrate, malate, and a-ketoglutarate are also elevated then suspect a cytochrome C oxidase deficiency.

**Drugs which may have an adverse affect:**

Lithium Carbonate

**Glucarate ( 86.43%)**

Glucarate is a by-product of oxidation in the Phase 1 detoxification process involving cytochrome p450. Elevations may be indicative of toxic exposures, especially pesticides. Glycine and N-acetyl-cysteine are helpful supplements in reducing this reading. Elevations may also be seen in alcoholism, solvent exposure, excessive estrogen and/or testosterone and drugs such as aspirin, lorazepam, digoxin and morphine.

**CA Cycle Phase 3 ( 71.30%)**

A high result may be indicative of the lack B-complex nutrients and/or an array of amino acids especially aspartic acid. Supplementing a balanced amino acid blend with a B-complex may help bring a surge of energy. This phase of the citric acid cycle is the movement from Isocitrate to a-ketoglutarate.

**p-Hydroxyphenyllactate ( 70.00%)**

High levels of this organic acid are indicative of an ongoing pro-oxidative response. Increased tissue growth, oxidative challenges due to toxicity, inborn errors of metabolism and low levels of vitamin C may be reasons for high results.

**Pyruvate ( 58.05%)**

Pyruvate is the end product of glucose metabolism. An elevated level may be indicative of a fundamental deficiency of B-complex vitamins and lipoic acid. High results are also seen in anorexia and other undereating disorders.

**CA Cycle Phase 6 ( 55.72%)**

The last phase of the citric acid cycle, this stage marks the conversion of Fumarate into Malate. When the ratio is low, this may signify that the body is not refilling its losses along the entire cycle. Supplementing with a broad spectrum amino acid along with niacin may help restore balance.

Anna

Female / Age: 57

Nutritional and herbal information contained in this report is based upon research related to imbalances in your chemistry. The recommendations are based upon the information provided, without interpretation. This must be done with the help of a qualified health care professional.

**1-Antioxidant Complex** See Nutrition Detail

**ANTIOXIDANT PROTOCOL**

When certain oxidative test markers appear, the following protocol can be followed: a Broad Spectrum Antioxidant which should include CoEnzyme Q10 (2 times daily, Vitamins A and E as well as Selenium (2 times daily) and Vitamin C (1000 mg 2 times daily).

Vitamin E should only be consumed with the advice of a physician if currently taking Coumadin or other blood thinning medications.

**COENZYME Q10**

An important antioxidant and essential component of mitochondria, CoQ10 can be depleted if on cholesterol lowering drugs.

**VITAMIN A/MIXED-CAROTENES**

Vitamin A is involved in the growth and repair of tissue and helps maintain healthy skin. It is essential in the maintenance of eyesight, building of bones, teeth and blood. It also enhances production of RNA.

**VITAMIN E**

Vitamin E is a major antioxidant, enhances lymphocyte production, maintains cellular integrity, and aids in the biosynthesis of heme proteins

**SELENIUM (Se)**

Cofactor in glutathione peroxidase, in detoxification of peroxides, free radicals and thyroid hormone deionases.

**VITAMIN C**

Water-soluble vitamin essential for the synthesis and maintenance of collagen as well as body tissue cells, cartilage, bones, teeth, skin and tendons. Helps protect the immune system. Also improves iron and calcium absorption as well as trace mineral utilization.

<u>Decreased</u>	<u>Rationale</u> <u>Normal</u>	<u>Increased</u> Oxidative Damage
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**1-Detoxification Protocol** See Nutrition Detail

**DETOXIFICATION PROTOCOL**

Due to the elevated level of 2-Methylhippurate, it is important that you avoid xylene, a compound found in fossil fuels and as a solvent as well as toluene and styrene. A comprehensive detoxification protocol should include at least 250 mg of glycine daily along with a balanced amino acid complex and a broad spectrum antioxidant formula with Vitamin C and CoEnzyme Q10.

Adults:

Glycine - 500 mg 2x daily

Amino Acid Complex - 5 grams 2x daily

Broad Spectrum Antioxidant - 2x daily

Children:

Glycine - 250 mg 2x daily

Amino Acid Complex 2.5 grams 2x daily

Broad Spectrum Antioxidant - 1x daily

<u>Decreased</u>	<u>Normal</u> Hippurate	<u>Increased</u> 2-Methylhippurate
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**1-Tyrosine** 2x daily 500 mg

**TYROSINE**

An amino acid which is essential to the synthesis of protein, catecholamines, melanin, and thyroid hormones. Vitamin C and folic acid are essential to its metabolism. The formation of thyroid hormone is dependent upon the absorption and sequestering of iodine which then attaches to tyrosine to form thyroxine.

<u>Decreased</u> Homovanillate	<u>Normal</u>	<u>Increased</u> Vanilmandelate
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**1-Whey Protein** See Nutrition Detail

**WHEY PROTEIN**

High quality whey protein is one of the most effective means of boosting glutathione levels which seem to be deficient in this case. The whey should also contain an array of vitamins (especially vitamin C) and minerals along with immunoglobulins, glycine and N-acetyl cysteine. For adults, at least one serving full serving and for children one-half a serving per day is recommended.

<u>Decreased</u> a-Hydroxybutyrate	<u>Normal</u>	<u>Increased</u> Pyroglutamate
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## Nutrition - Detail

Urine Organic Acid Date: 4/28/2009

**Anna**

Female / Age: 57

Nutritional and herbal information contained in this report is based upon research related to imbalances in your chemistry. The recommendations are based upon the information provided, without interpretation. This must be done with the help of a qualified health care professional.

**2-Glycine** 2x daily 500 mg

GLYCINE

Glycine is an important amino acid and it is helpful in lowering the levels of Benzoate and Hippurate.

Decreased

***Rationale***

Normal

Hippurate

Increased

Benzoate



## Drug Interactions

**Anna**

**Urine Organic Acid Date: 4/28/2009**

Female / Age: 57

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Drugs listed below tend to further aggravate elements of blood chemistry that are out of range (H or L). The (#) after each drug denotes the number of times that drug is flagged as being potentially harmful.

Acetaminophen  
Haloperidol  
Reserpine

Ampicillin  
Insulin

Aspirin  
Lithium Carbonate(2)

Colchicine  
Methotrexate

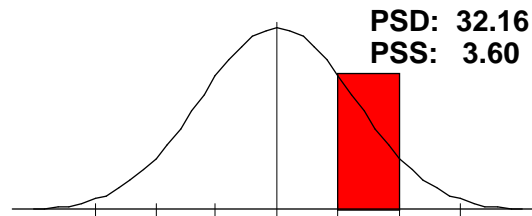
Anna

Female / Age: 57

**B-Complex Markers**

a-Ketoisovalerate[L], a-Ketoisocaproate[L], Methylmalonate, Formiminoglutamic Acid[H], Xanthurenate[H].

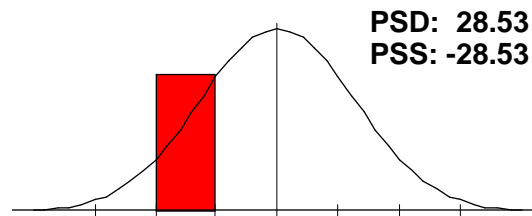
This panel profile may reflect a low level of certain B-complex vitamins. Review the Nutritional Support section to ascertain which nutrient are necessary.



**BCAA Catabolism**

a-Ketoisovalerate[L], a-Ketoisocaproate[L].

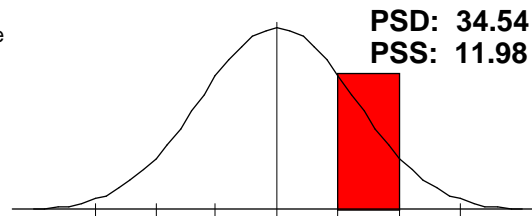
This panel abnormality may be due to poor amino acid metabolism or a lack of quality protein in the diet. Supplementation of high grade amino acids may be necessary.



**CAC Cycle Ratios**

CA Cycle Entry, CA Cycle Phase 1[H], CA Cycle Phase 2, CA Cycle Phase 3[H], CA Cycle Phase 4, CA Cycle Phase 5[L], CA Cycle Phase 6[H], CA C.

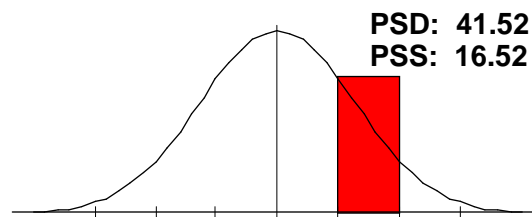
This panel reflects steps of the citric acid cycle. A high reading may be indicative of poor energy production and/or vitamin, mineral and amino acid deficiencies.



**Carbohydrate Metabolism**

Pyruvate[H], a-Hydroxybutyrate[L].

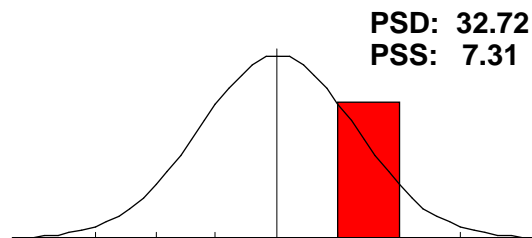
The panel profile seen here may be due to impaired carbohydrate metabolism, inefficient utilization or poor mobilization of carbohydrates. Often, B-complex vitamins are helpful in balancing these results. See Nutritional Support for further details.



**Energy Production**

Citrate[L], cis-Aconitate[L], Isocitrate[H], a-Ketoglutarate[L], Succinate, Fumarate[H], Malate, Hydroxymethylglutarate.

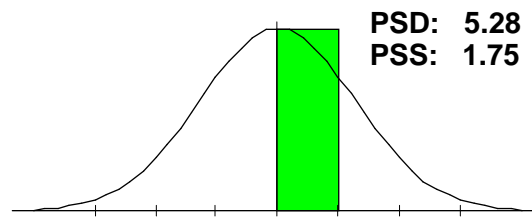
This panel profile result may be due to a breakdown in the Citric Acid Cycle. Supplementation with specific amino acid combinations and precursor vitamins and minerals may help to reverse this imbalance. Review the Nutritional Support section for further details.



**Fatty Acid Metabolism**

Adipate, Suberate, Ethylmalonate.

These urinary markers give us a picture into the metabolism of fatty acids.

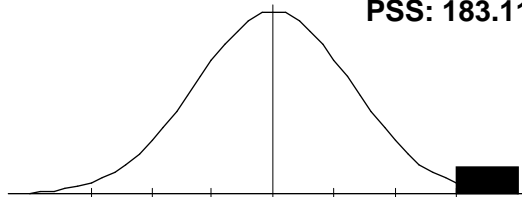


**Intestinal Dysbiosis**

p-Hydroxyphenyllactate[H], Phenylacetate[H], Phenylpropionate[H],  
Tricarballicylate[L], Indican[L], p-Hydroxybenzoate, D-Lactate[H],  
D-Arabini.

This panel profile may be indicative of intestinal dysbiosis. Poor absorption and metabolism of proteins, fats and carbohydrates may occur. A review of potential bacteria, protozoa, Clostridial spp., yeast or fungus may be necessary.

**PSD: 204.08**  
**PSS: 183.11**

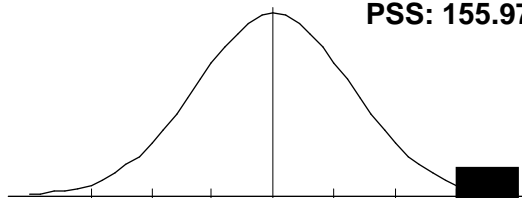


**Liver Detox Indicators**

2-Methylhippurate[H], Glucarate[H], Orotate[H], Pyroglutamate[H],  
Sulfate[H], a-Hydroxybutyrate[L].

This panel profile may be due in part to environmental toxins, improper regulation of cell growth, hereditary deficiencies, and a depressed ability of the liver to detoxify itself. A program of detoxification may be helpful in this case. Review Nutritional Status for additional recommendations.

**PSD: 164.30**  
**PSS: 155.97**

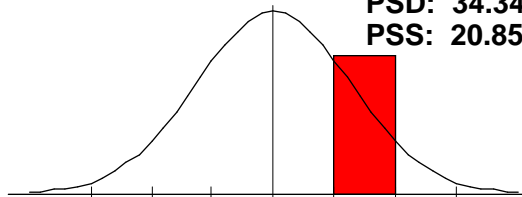


**Neurotransmitters**

Vanilmandelate[H], Homovanillate[L], 5-Hydroxyindoleacetate,  
Kynurenate[H], Quinolate.

The panel profile seen here may be due to the use of serotonin re-uptake inhibitors such as Prozac or poor catecholamine catabolism.

**PSD: 34.34**  
**PSS: 20.85**



## Clinical Correlation

**Anna**

**Urine Organic Acid Date: 4/28/2009**

Female / Age: 57

This report "MATCHES" clinical observations with the lab test. Elements shown, normal and abnormal, tend to characterize the observation. Highlighted elements are those reported to "MATCH" the characteristics of the clinical observation. Others are NOT matches but are elements in the observation.

### Detoxification Impairment ()

**83.33% (5 of 6)**

**Decreased**

713.39 Sulfate

**Normal**

**Increased**

**70.00 p-Hydroxyphenyllactate**

**33.00 Orotate**

**98.00 2-Methylhippurate**

**86.43 Glucarate**

**30.00 Pyroglutamate**

The body's ability to detoxify itself may be impaired.