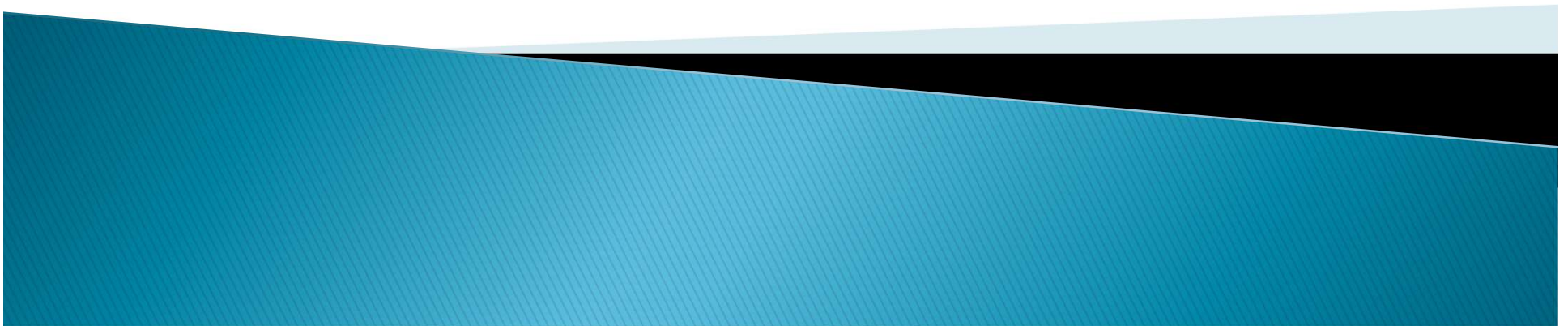


# Organic Acid & Environmental Pollutants Testing

Lab Interpretation LLC



# Lesson Goals

- ▶ Why Test for Organic Acids?
- ▶ Why Test for Environmental Pollutants ?
- ▶ The Lab Assist™ Commentary – How to Read it, How to Use it.
- ▶ Clinical Attributes of interpreting lab data through Multi-Variant Analyses.
- ▶ Clinical Pearls through Case Studies.



# The Lab Assist <sup>TM</sup> Difference

- ▶ The Concept and Use of % Status
- ▶ What the equation does is the following
  - If the range for sodium is 135–145 mEq/L
  - Then the mid–point would be 140 and the Status Deviation would be 0%
  - If the result was 135, the SD would be –50%
  - If the result was 145, the SD would be +50%
  - So each standard deviation away from the mid–point would be 50% either negative or positive.
- ▶ This concept allows us to compare and contrast results which have different reference ranges easily.



# The Lab Assist™ Difference

## Basic Status High/Low

### Specific Nutrient Deficiencies

Female / Age: 25

Client ID: (38100)

### Urine Organic Acids Date: 5/11/2012

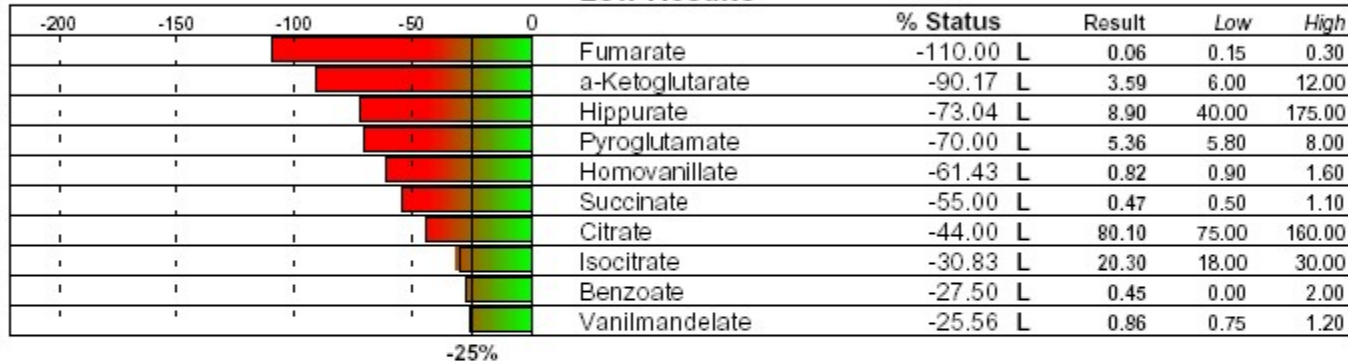
Case Studies (7126)

Lab Interpretation LLC

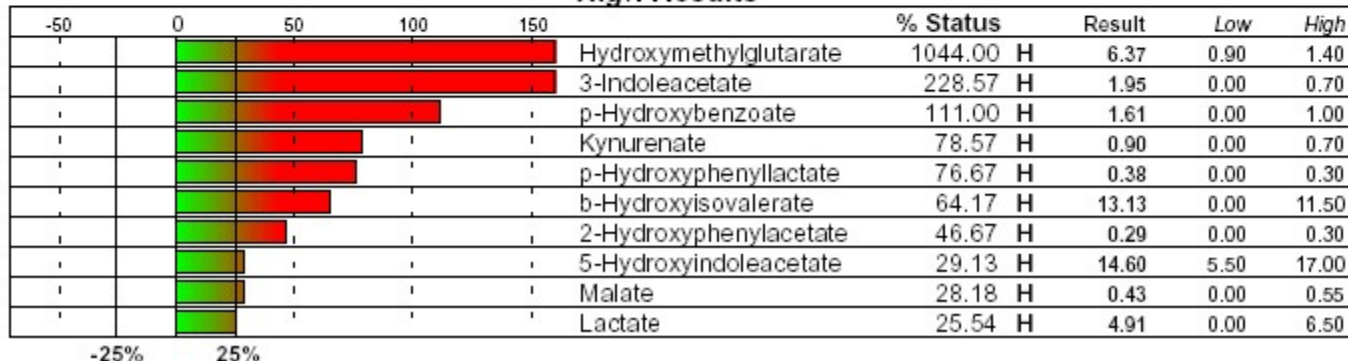
1-775-851-3337

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

### Low Results



### High Results



# Why Test for Organic Acids?

- ▶ It is a reflection of the current state of the individual's biochemistry.
- ▶ It is a reflection of functional nutrient deficiencies.
- ▶ In many instances, especially vitamin B12, the functional marker, Methylmalonate when elevated, is a superior marker to serum B12 levels.
- ▶ Methylmalonate will appear elevated before MCV levels rise in a blood chemistry.



# Why Test for Organic Acids

- ▶ There are some powerful clues within the results that can guide the practitioner to root causes of imbalances and health disorders.
- ▶ Case in Point: Elevations in Homovanillate and Vanilmandelate, neurotransmitter metabolites may be indicative of heavy metal or petrochemical toxicity.



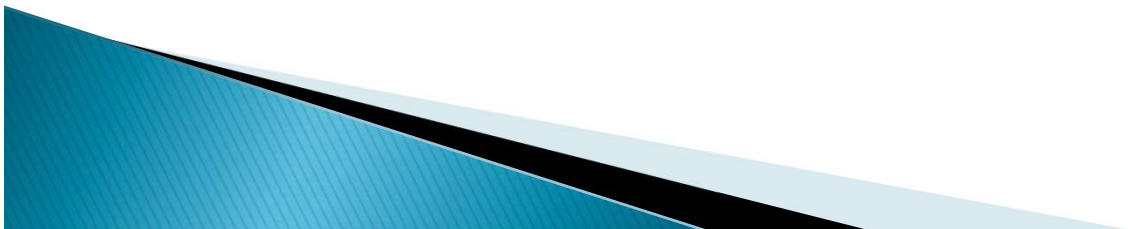
# Why Test for Organic Acids

- ▶ Case in Point: Elevations in 5-Hydroxyindolacetate, a marker for serotonin spillage, when elevated, may indicate inflammatory and/or immune response to foods.
- ▶ Chromaфин cells in the gut produce serotonin and when inflammed, can increase the production to extremely elevated levels.
- ▶ One must first rule out the use of SSRI's and/or tryptophan supplementation.



# Why Test for Organic Acids

- ▶ IgG testing would be helpful in cases when 5-Hydroxyindolacetate is elevated.
- ▶ Note that we are talking about elevations primarily when discussing organic acids.
- ▶ When elevated in the urine, organic acids represent a blocked step in enzyme reactions that are blocked due to nutrient or co-factor deficiencies.
- ▶ Think about a river that has a series of dams. Each dam is a metabolic blockade.





# Why Test for Organic Acids

- ▶ There are a few of the organic acids that have significance when low such as the ones involved in Citric Acid Cycle (Citrate, Cis-aconitate, Isocitrate,  $\alpha$ -Ketoglutarate, Succinate, Fumarate and Malate) and those involved in Neurotransmitter Metabolism (Vanilmandelate, Homovanillate and 5-Hydroxyindolacetate).
- ▶ These may indicate general protein and amino acid deficiencies.



# Why Test for Environmental Pollutants?

- ▶ While much focus has been on heavy metals for a number of years, the research on petrochemical pollutants and their effect on human health has been gathering momentum.
- ▶ Hormonal disruption, the effect on the rise of cancer rates, cardiovascular disease, diabetes and other inflammatory diseases has reached epidemic proportions.
- ▶ It is more than poor diet and pharmaceutical deficiencies.



# Why Test for Environmental Pollutants?

- ▶ Everyone is exposed and carries petrochemical pollutants within their bodies.
- ▶ If this is the case, why test for them?
- ▶ It is important to assess the *excretion* capabilities of the individual.
- ▶ Let's look at this real case of an elderly couple, both with recurring cancers.

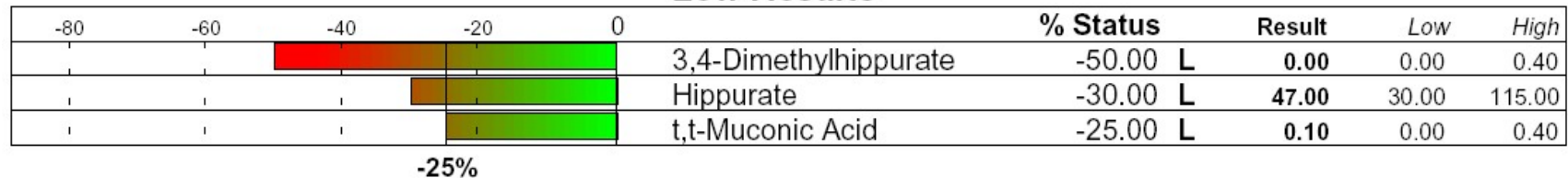


3D bar chart showing the distribution of the number of children per woman. The x-axis represents the number of children (0 to 10), and the y-axis represents the percentage of women. The distribution is skewed to the right, with a peak at 2 children. A vertical line is drawn at 2 children, and a horizontal line is drawn at 25%.

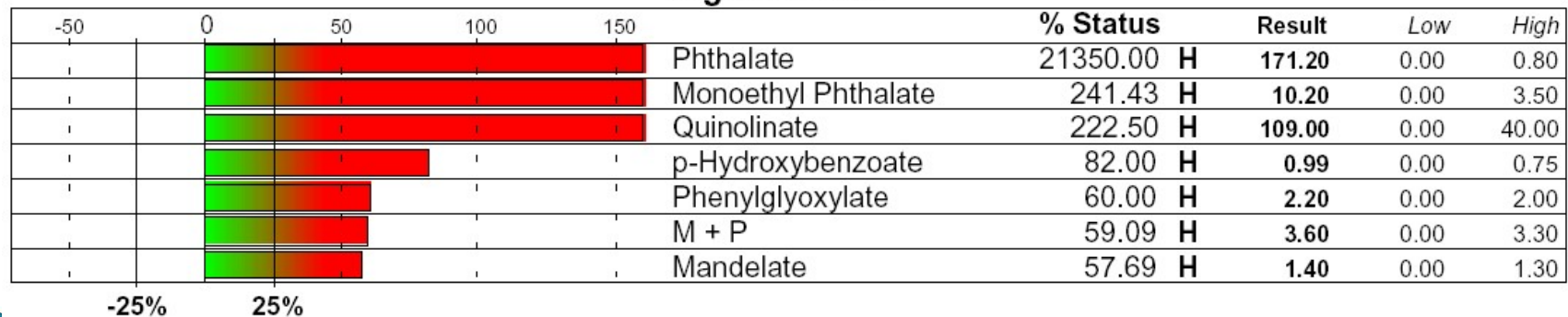
Case Studies (7126)  
Lab Interpretation LLC  
1-775-851-3337

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

### Low Results



## High Results



# Recurring Cancer 2

## Basic Status High/Low

### Recurring Cancer 2

Female / Age: 61

Client ID: (36118)

### Environmental Pollutants Exposure Date: 10/19/2010

Case Studies (7126)

Lab Interpretation LLC

1-775-851-3337

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

### Low Results

-80	-60	-40	-20	0		% Status	Result	Low	High
					3,4-Dimethylhippurate	-50.00 L	0.00	0.00	0.40
					Benzoate	-50.00 L	0.00	0.00	2.00
					t,t-Muconic Acid	-50.00 L	0.00	0.00	0.40

-25%

### High Results

-50	0	50	100	150		% Status	Result	Low	High
					Phthalate	16150.00 H	162.00	0.00	1.00
					Quinolate	172.00 H	111.00	0.00	50.00
					p-Hydroxybenzoate	140.00 H	1.90	0.00	1.00
					Mandelate	92.86 H	2.00	0.00	1.40
					Monoethyl Phthalate	90.00 H	5.60	0.00	4.00
					M + P	64.71 H	3.90	0.00	3.40
					Phenylglyoxylate	45.00 H	1.90	0.00	2.00

-25%

25%

# The Lab Assist Report™

- ▶ Easy to pinpoint the most significant imbalances that need addressing.
- ▶ Scientifically based, research backed, nutritional recommendations to help balance the individual's chemistry using the notion of biochemical individuality.
- ▶ Nutritional recommendations to aid the individual to improve detoxification pathways safely and efficiently.
- ▶ Let's go back to the first case.



# The Lab Assist™ Report

## Basic Status High/Low

### Specific Nutrient Deficiencies

Female / Age: 25

Client ID: (38100)

### Urine Organic Acids Date: 5/11/2012

Case Studies (7126)

Lab Interpretation LLC

1-775-851-3337

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

### Low Results

	-200	-150	-100	-50	0		% Status	Result	Low	High
						Fumarate	-110.00 L	0.06	0.15	0.30
						α-Ketoglutarate	-90.17 L	3.59	6.00	12.00
						Hippurate	-73.04 L	8.90	40.00	175.00
						Pyroglutamate	-70.00 L	5.36	5.80	8.00
						Homovanillate	-61.43 L	0.82	0.90	1.60
						Succinate	-55.00 L	0.47	0.50	1.10
						Citrate	-44.00 L	80.10	75.00	160.00
						Isocitrate	-30.83 L	20.30	18.00	30.00
						Benzoate	-27.50 L	0.45	0.00	2.00
						Vanilmandelate	-25.56 L	0.86	0.75	1.20

-25%

### High Results

	-50	0	50	100	150		% Status	Result	Low	High
						Hydroxymethylglutarate	1044.00 H	6.37	0.90	1.40
						3-Indoleacetate	228.57 H	1.95	0.00	0.70
						p-Hydroxybenzoate	111.00 H	1.61	0.00	1.00
						Kynurenate	78.57 H	0.90	0.00	0.70
						p-Hydroxyphenyllactate	76.67 H	0.38	0.00	0.30
						β-Hydroxyisovalerate	64.17 H	13.13	0.00	11.50
						2-Hydroxyphenylacetate	46.67 H	0.29	0.00	0.30
						5-Hydroxyindoleacetate	29.13 H	14.60	5.50	17.00
						Malate	28.18 H	0.43	0.00	0.55
						Lactate	25.54 H	4.91	0.00	6.50

-25%

25%



# Clinical Pearls

- ▶ Every man, woman and child in the past 40 years has had detectable levels of Styrene in their blood.
- ▶ It is important that some moderate levels of the metabolites of Styrene, Mandelate and Phenylglyoxalate (plus M + P) be found in the sample.
- ▶ If not, then the person is a non-excretor and needs detoxification support.





# Clinical Pearls

- ▶ If the Citric Acid Cycle metabolites Citrate, Cis-aconitate, Isocitrate,  $\alpha$ -Ketoglutarate, Succinate, Fumarate, and Malate are all or most are elevated, suspect hyperammonemia.
- ▶ Symptoms of hyperammonemia include: fatigue, brain fog, headaches, seizures and...
- ▶ Bedwetting
- ▶ A case I'd like to share has to do with this problem.



# Multi-Variant Analysis

- ▶ One of the greatest problems in today's health care model is the reliance on single variable analysis.
- ▶ The focus on Cholesterol is a case in point.
- ▶ Looking at just Cholesterol or even adding HDL, LDL and even particle size misses so much.
- ▶ By looking at multiple results simultaneously is how we uncover why the problems exist and more importantly, what to do about them.



# Lab Assist™ – Panels

## Practitioner Summary Review

### Specific Nutrient Deficiencies

Female / Age: 25

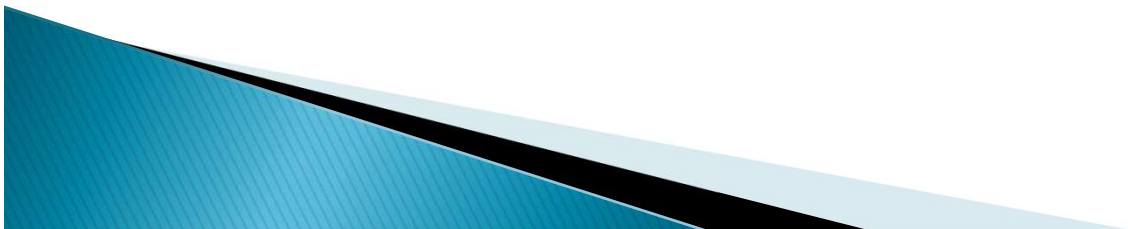
### Urine Organic Acids Date: 5/11/2012

Case Studies (7126)

### 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
Energy Production	177.20%	94.70%
Intestinal Dysbiosis	63.67%	61.44%
Neurotransmitters	41.02%	6.22%
Liver Detox Indicators	32.14%	-17.86%
CAC Cycle Ratios	31.39%	-19.15%

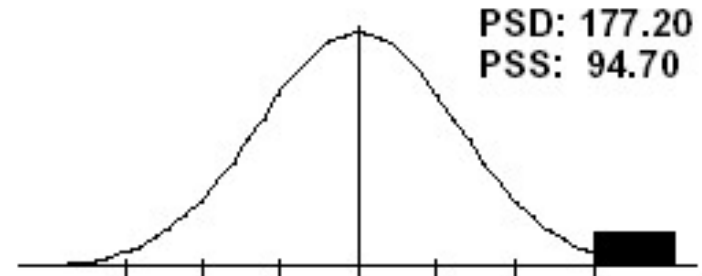


# Lab Assist™ – Panels

## Energy Production

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

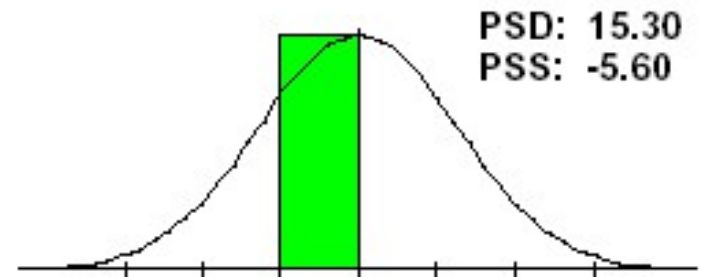
This panel reviews cellular energy producing cycles to maintain health and weight. This profile may indicate a breakdown in the Citric Acid Cycle. Review your Supplement List Explanation.



## Fatty Acid Metabolism

Adipate, Suberate, Ethylmalonate.

This panel assesses how fats are being broken down and utilized by the body. This profile shows a percent imbalance below 25%, so no abnormalities were found.



# Clinical Pearl

- ▶ Three markers of fatty acid oxidation Adipate, Suberate and Ethylmalonate are excellent markers, when elevated, of a functional carnitine deficiency.
- ▶ When these markers are elevated, it may cause problems with excessive omega 3 fatty acid oxidation which can be harmful.
- ▶ When using omega 3 supplements, add 250 mg of carnitine per gram of fish oils to avoid the problem.



# Nutritional Recommendations

- ▶ The nutritional recommendations based on the results of both the organic acid and environmental pollutants are conservative and reflect an average person.
- ▶ It is up to the practitioner to assess the needs of the individual, including how many supplements the person can afford and/or tolerate.
- ▶ These recommendations are strictly to be viewed as guidelines.



# Nutritional Recommendations

- ▶ Remember to focus on the biggest imbalances first.

## Client Summary Review

### Specific Nutrient Deficiencies

Female / Age: 25

Urine Organic Acids Date: 5/11/2012

Case Studies (7126)

### Nutritional Support

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

- ☐ 1-5-HTP  
3x daily 100 mg
- ☐ 1-BCAA's  
2x daily 500 mg
- ☐ 1-Tyrosine  
2x daily 500 mg

- ☐ 1-Amino Acid Complex  
5-10 grams daily
- ☐ 1-CoEnzyme Q10  
2 x daily 100 mg



# Clinical Correlations

## Clinical Correlation

### Specific Nutrient Deficiencies

Female / Age: 25

Urine Organic Acids Date: 5/11/2012

Case Studies (7126)

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.

### Catecholamine Dysfunction ()

100.00% (3 of 3)

#### Decreased

#### Normal

#### Increased

-61.43 Homovanillate  
-25.56 Vanilmandelate  
-110.00 Fumarate





# Summary

- ▶ Organic acid testing is a functional test that determines what nutritional deficiencies may be causing imbalances in the individual's chemistry that does not allow full metabolic processes to occur.
- ▶ In many cases, deficiencies would be missed with direct measurements of nutrient levels.
- ▶ Direct measurement does not take into account environmental and emotional stress, genetics or environmental toxicity.



# Summary

- ▶ Everyone is exposed to environmental toxins, especially petrochemical pollutants.
- ▶ It is important to assess the levels of exposure to determine sources.
- ▶ It is equally important to assess levels of exposure to determine whether the detoxification pathways are operating efficiently.
- ▶ People with very low results in the EPP test are poor secretors and generally most symptomatic.

