

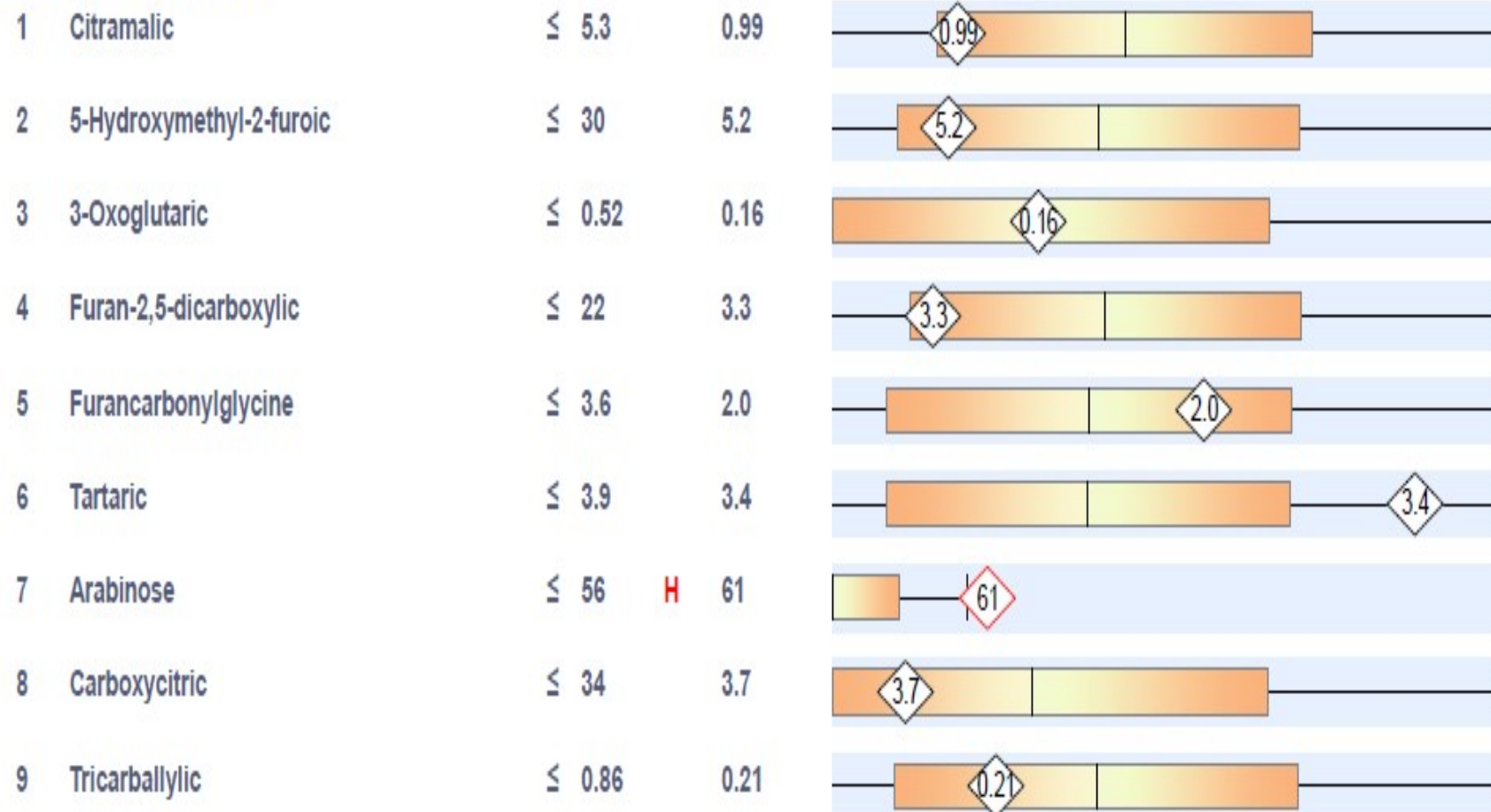
Część 2

Zrozumienie i stosowanie badania kwasów organicznych w leczeniu chorób przewlekłych

4 year old girl with severe urticaria and itching over whole body

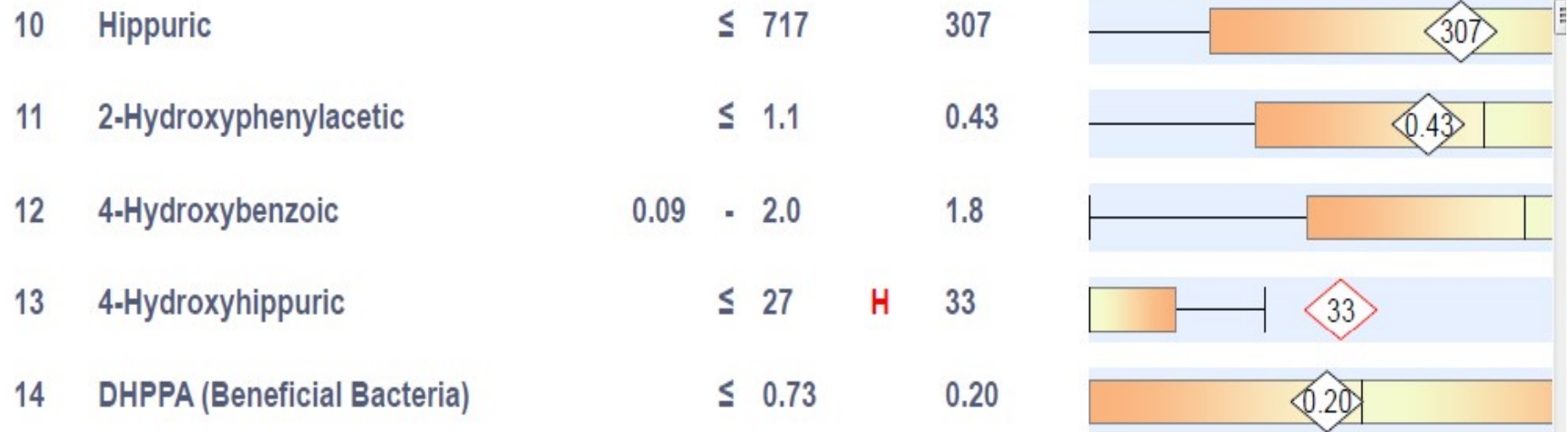
Intestinal Microbial Overgrowth

Yeast and Fungal Markers

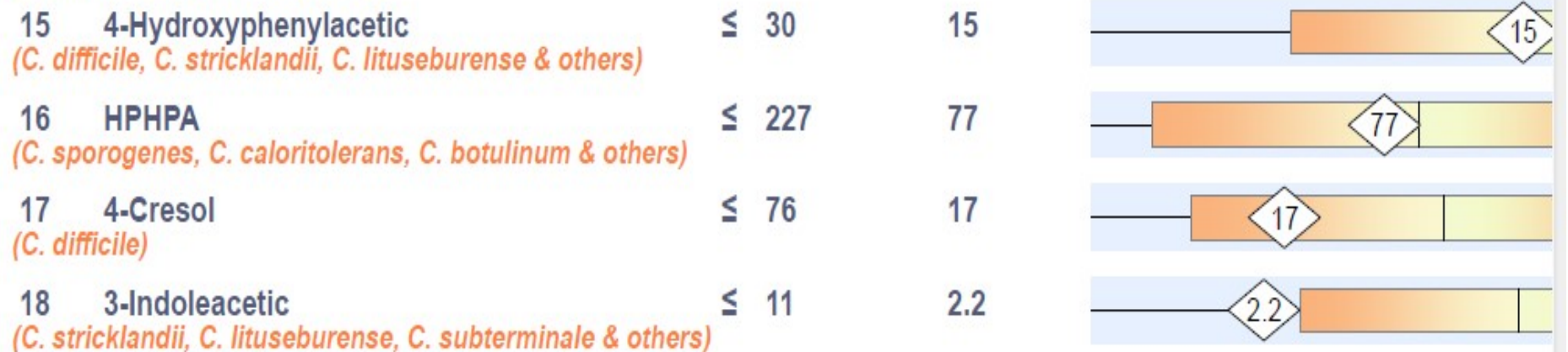


4 year old girl with severe urticaria and itching over whole body

Bacterial Markers

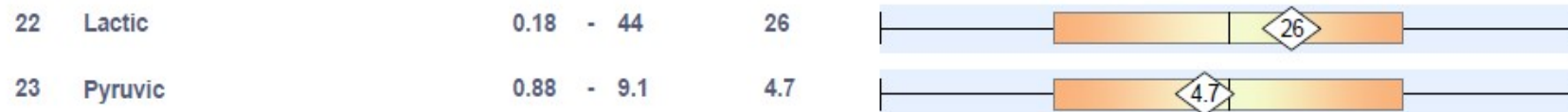


Clostridia Bacterial Markers

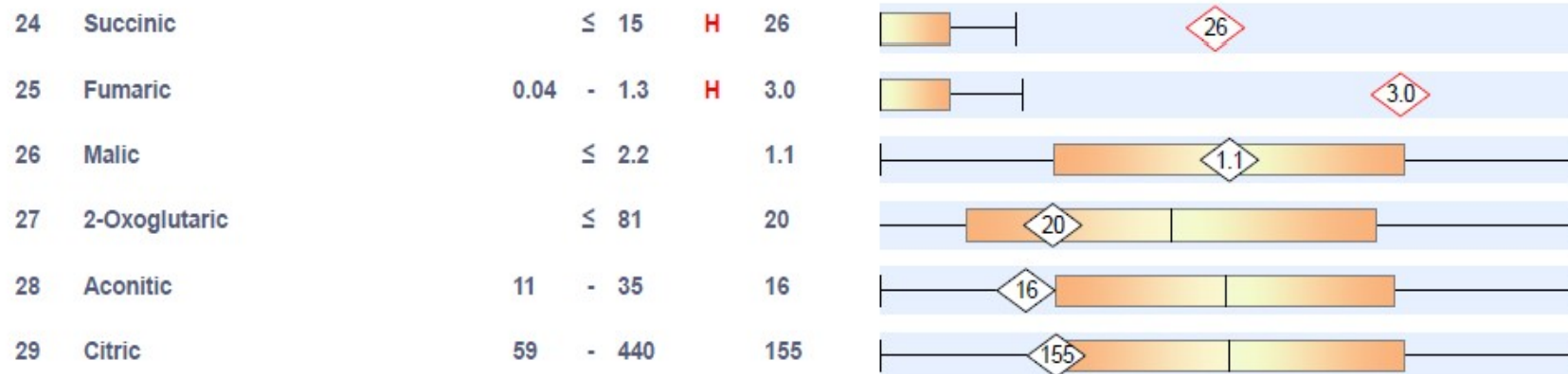


4 year old girl with severe urticaria and itching over whole body

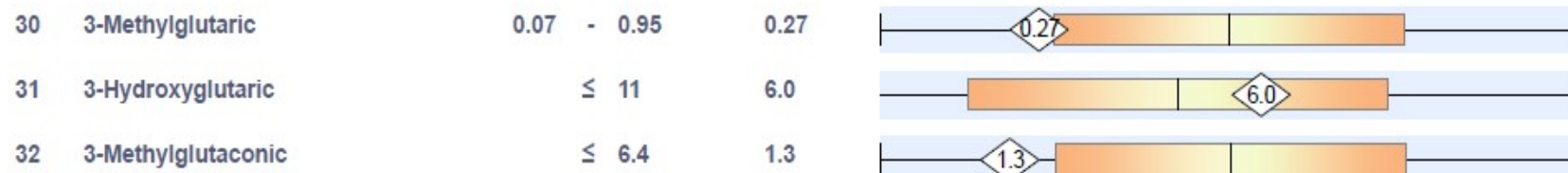
Glycolytic Cycle Metabolites



Mitochondrial Markers - Krebs Cycle Metabolites



Mitochondrial Markers - Amino Acid Metabolites



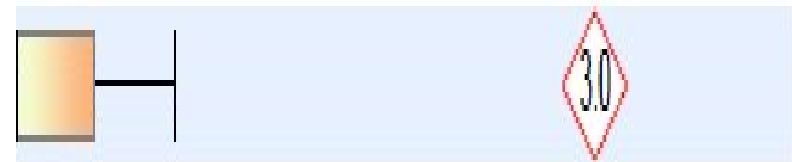
4 year old girl with severe urticaria and itching over whole body

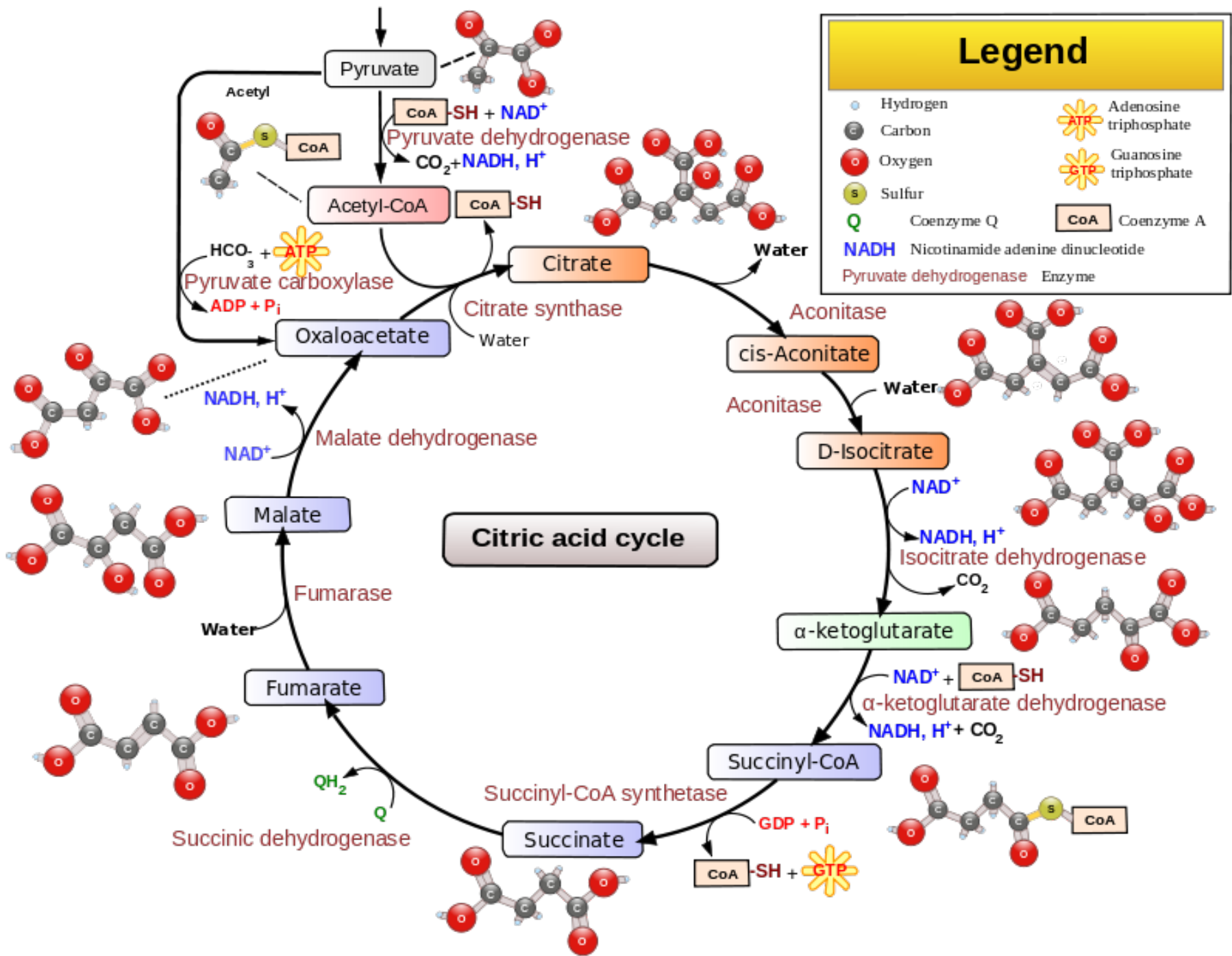
Mitochondrial Markers - Krebs Cycle Metabolites

24 Succinic ≤ 15 H 26

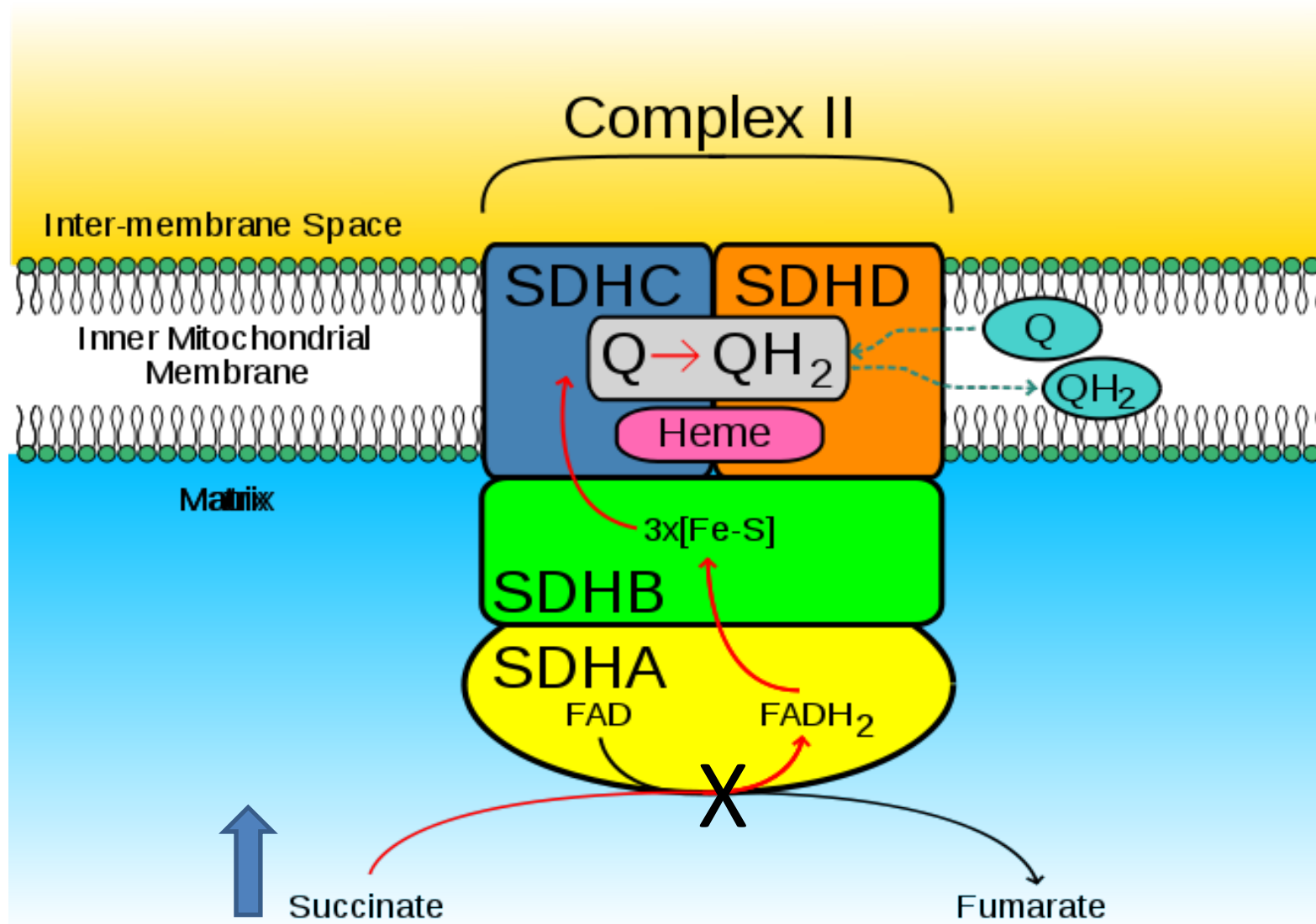


25 Fumaric 0.04 - 1.3 H 3.0



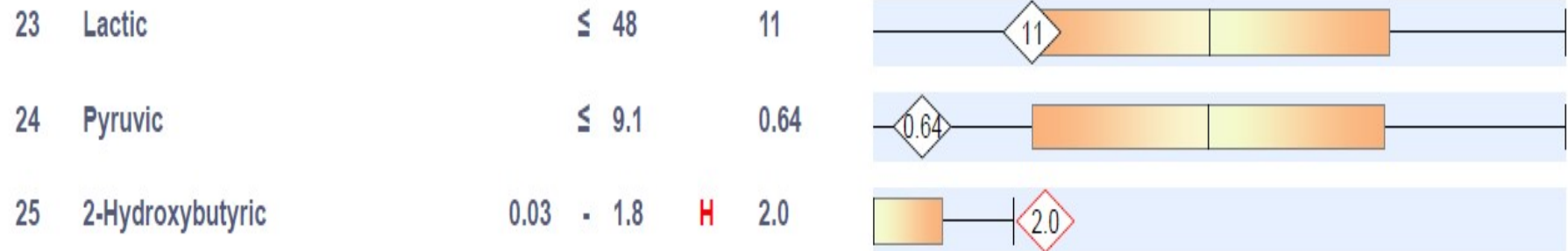


Succinic dehydrogenase-only enzyme that is part of Krebs cycle and electron transport chain

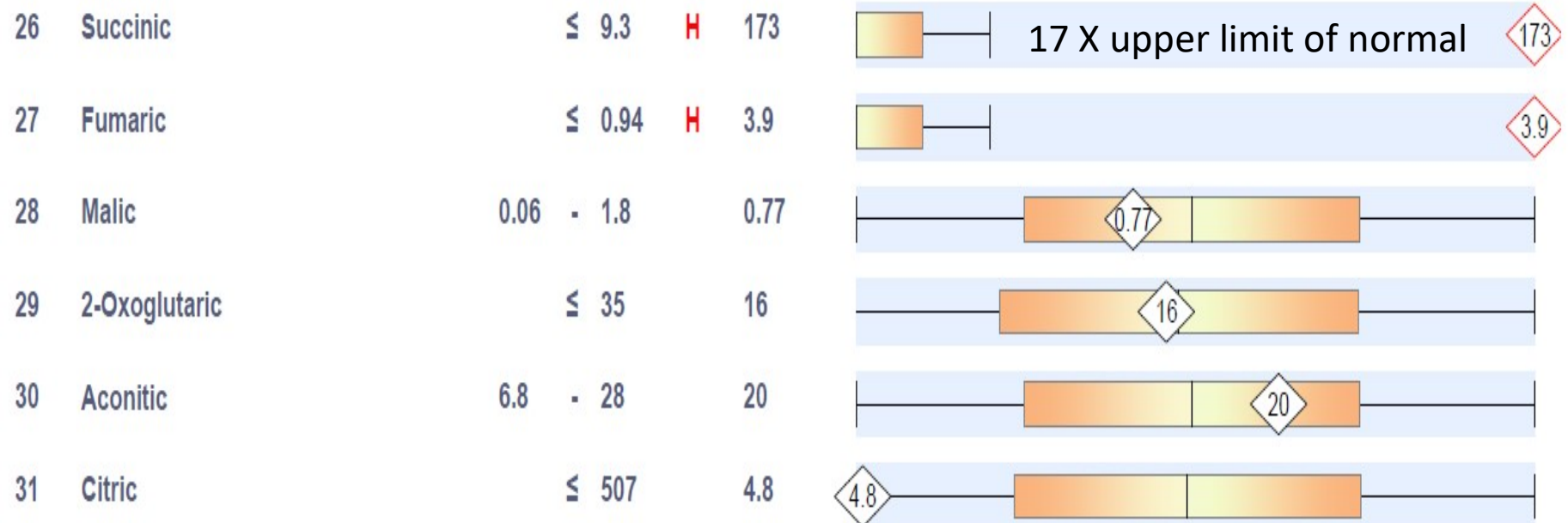


Adult patient with Kearns Sayres syndrome-a confirmed mitochondrial disorder

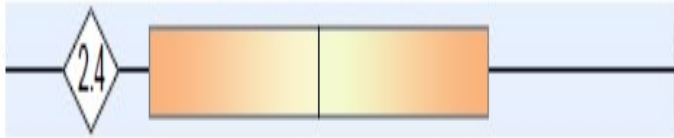

Glycolytic Cycle Metabolites



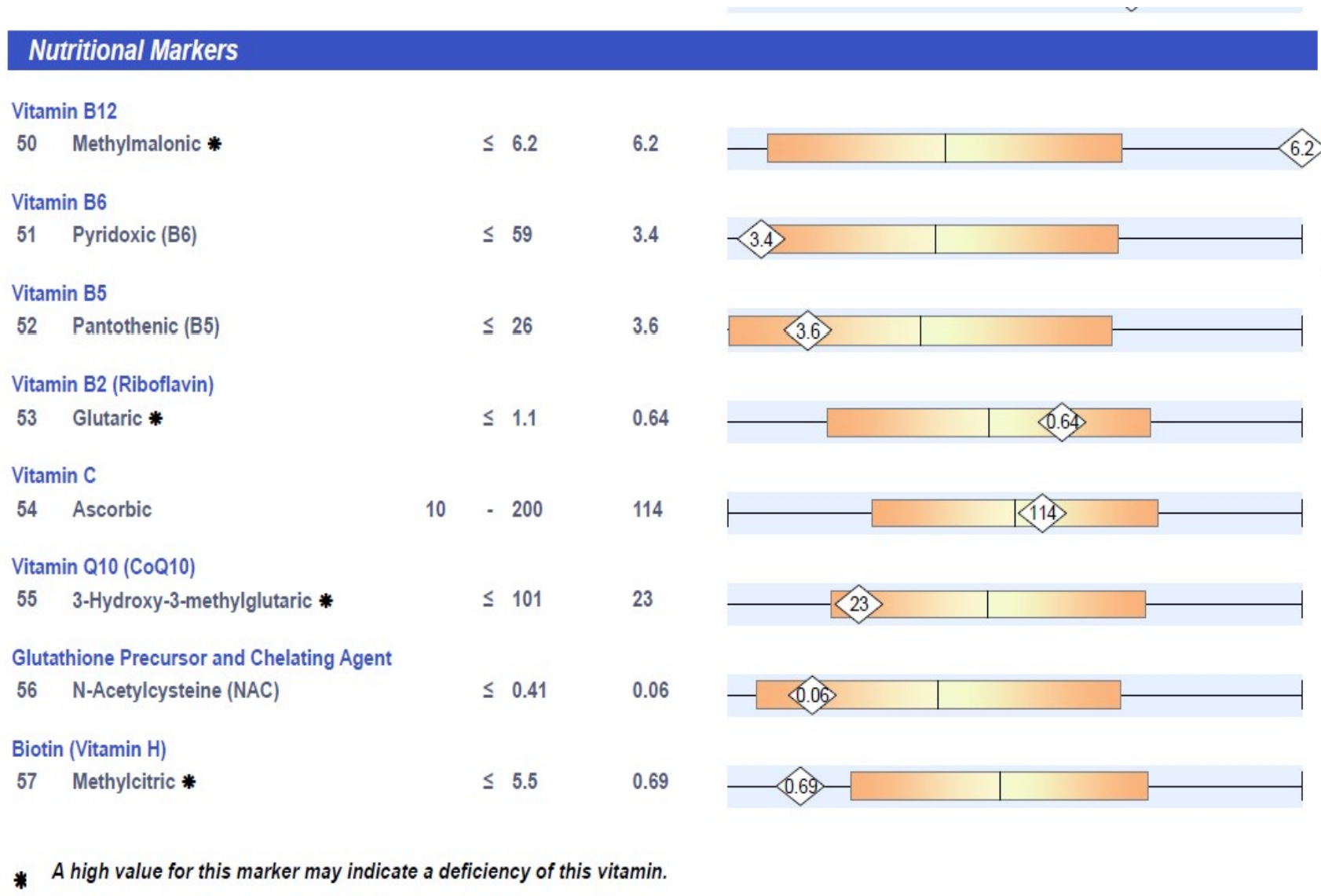
Krebs Cycle Metabolites



4 year old girl with severe urticaria and itching over whole body

	(mmol/mol creatinine)	Value		
Pyrimidine Metabolites - Folate Metabolism				
40	Uracil	≤ 19	2.4	
41	Thymine	0.01 - 0.89	H 1.3	

4 year old girl with severe urticaria and itching over whole body



4 year old girl with severe urticaria and itching over whole body

Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Females Under Age 13
----------------------------	--	---------------	---

Indicators of Detoxification

Glutathione



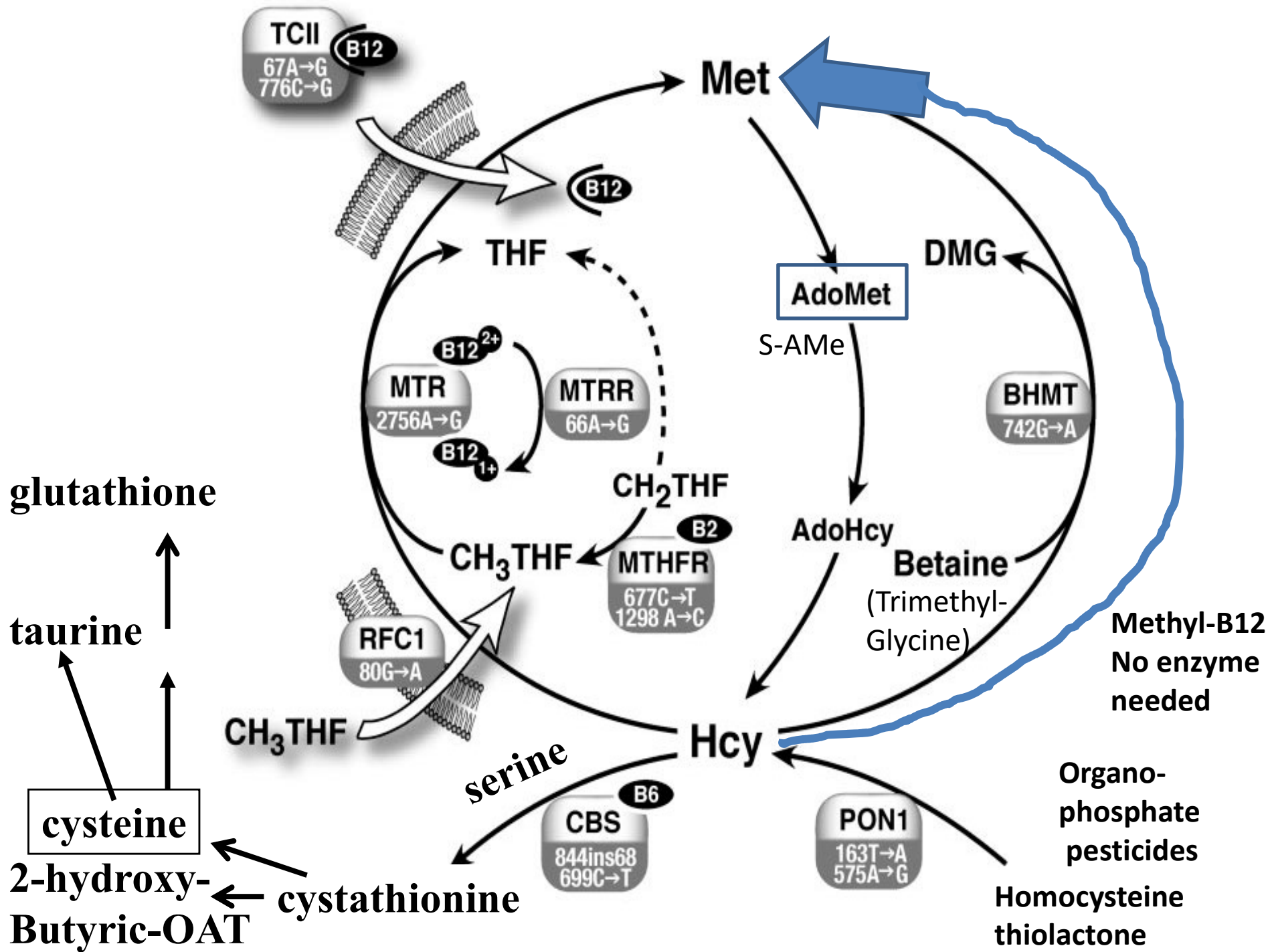
Ammonia Excess



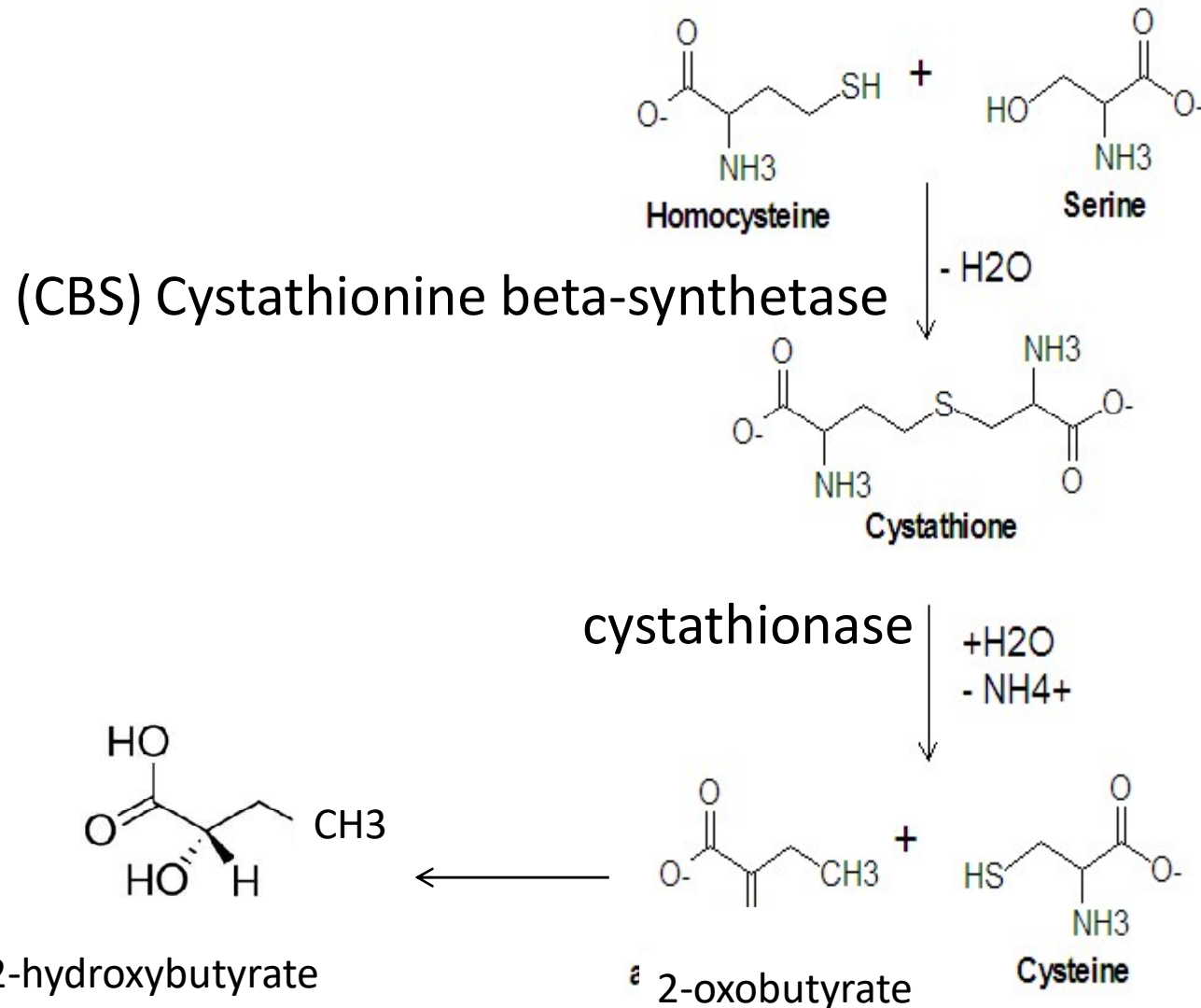
Aspartame, salicylates, or GI bacteria



* A high value for this marker may indicate a Glutathione deficiency.



Production of 2-hydroxybutyric acid from cystathionine via cystathionase



Causes of excess 2-hydroxybutyric

1. There is increased need for glutathione to detoxify a host of toxic chemicals, resulting in increased shunting of homocysteine into the production of cysteine for glutathione. This is the most common reason.
Pyroglutamic high.
2. There are genetic variants of the DNA such that methylation of homocysteine by betaine homocysteine methyl transferase or methionine synthase is impaired.
3. There are nutritional deficiencies of betaine, methylcobalamin, or methyltetrahydrofolate that reduce the enzyme activities of the enzymes in #2 above.
4. There is a genetic variant in cystathionine beta synthase (CBS) enzyme such that there is excessive shunting of homocysteine into cysteine production that results in excessive 2-hydroxybutyric acid formation.

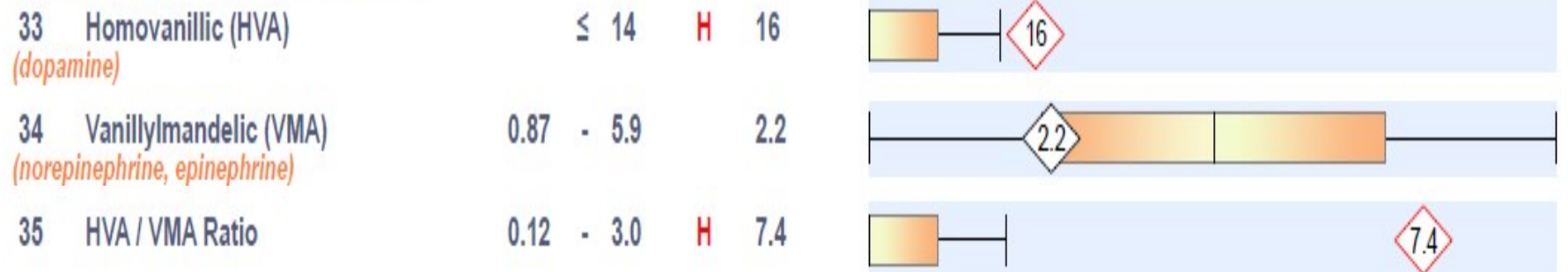
Summary of abnormalities in girl with itching

- Elevated Candida metabolites-antifungal treatment
- Elevated succinic acid-mitochondrial damage due to genetic damage or environmental exposure-hair metals test and GPLTOX test in urine
- B-vitamin deficiencies
- Elevated dopamine metabolite- elevated Clostridia, copper deficiency, or vitamin C deficiency. Clostridia not elevated, vitamin C not deficient so copper deficiency is possible
- Folate and B12 needed to improve methylation cycle
- High quinolinic acid and thymine indicate inflammation

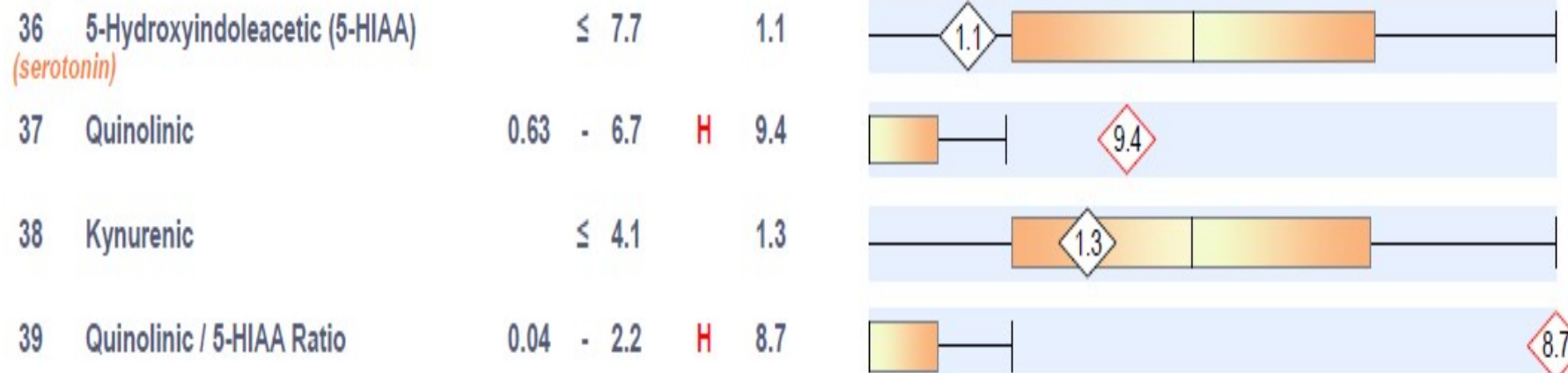
4 year old girl with severe urticaria and itching over whole body

Neurotransmitter Metabolites

Phenylalanine and Tyrosine Metabolites



Tryptophan Metabolites

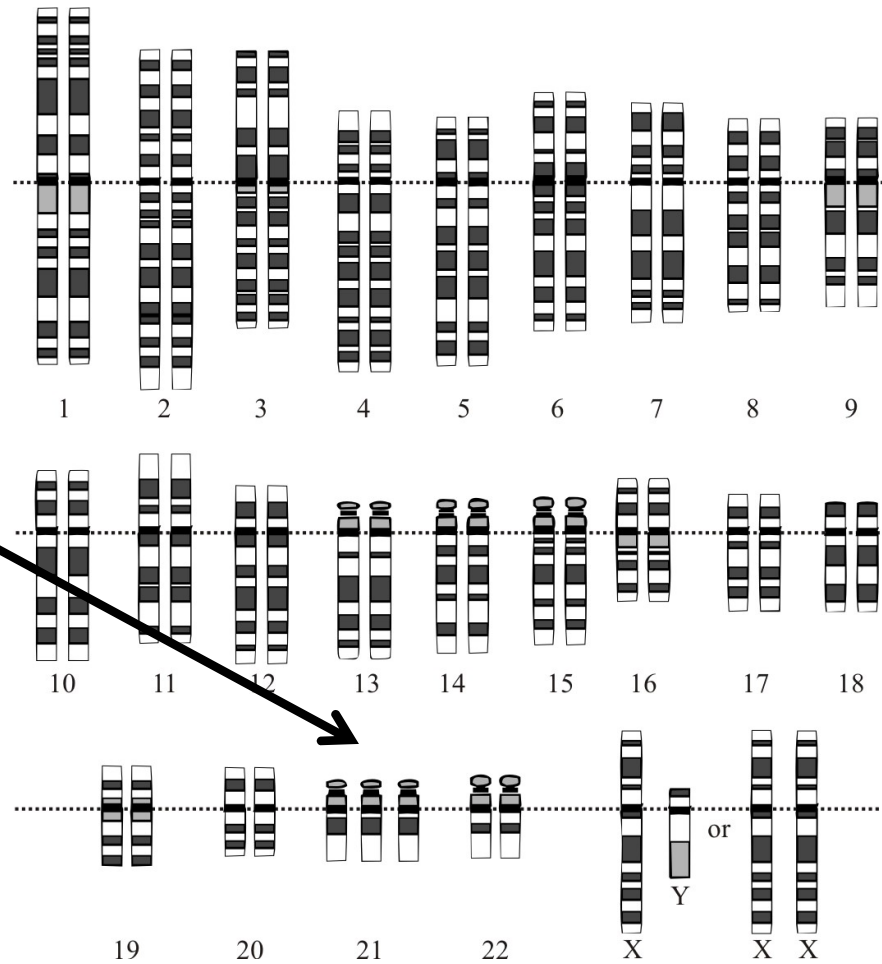
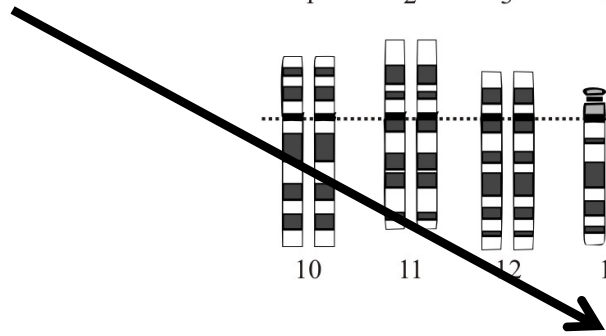


Down syndrome



Down syndrome chromosomes (47)

3 copies of
chromosome 21



3 yr old with Down syndrome-3 copies of chromosome 21

Nutritional Markers

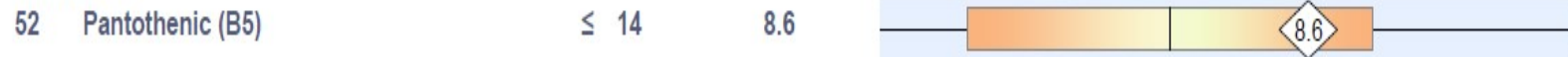
Vitamin B12



Vitamin B6



Vitamin B5



Vitamin B2 (Riboflavin)



Vitamin C



Vitamin Q10 (CoQ10)



Glutathione Precursor and Chelating Agent



Biotin (Vitamin H)

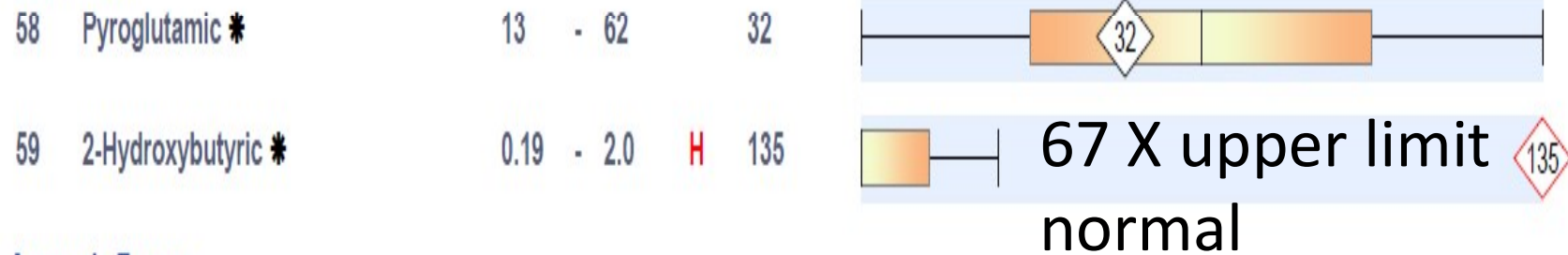


3 yr old Down syndrome

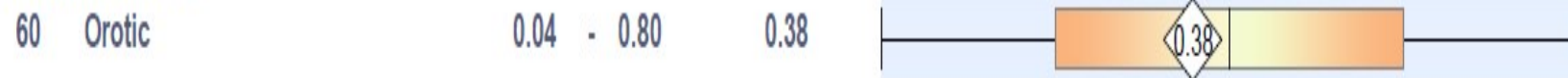
Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Males Under Age 13
----------------------------	--	------------------	---

Indicators of Detoxification

Glutathione



Ammonia Excess



Aspartame, salicylates, or GI bacteria

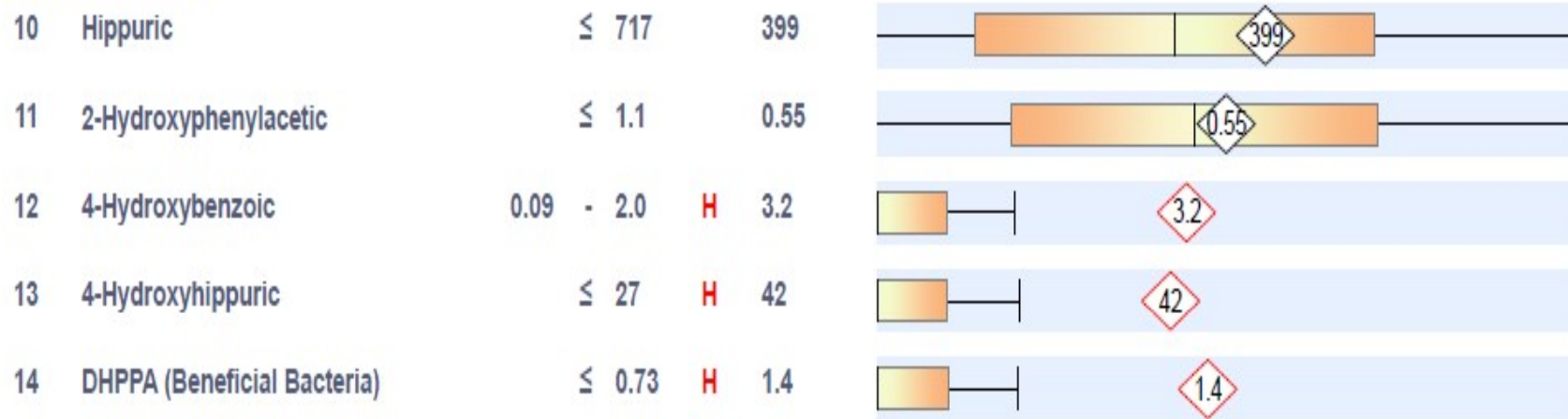


Consequences of CBS overdosage

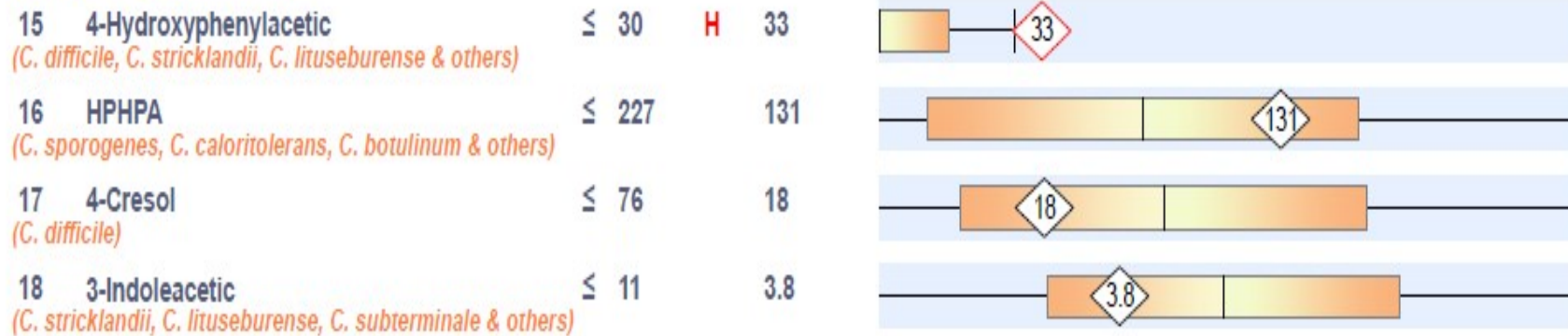
- Inadequate conversion of homocysteine back to methionine leading to overconversion of homocysteine to cysteine but inadequate production of methionine and s-adenosyl methionine (S-ame).
- Consequences: Inadequate methylation of neurotransmitters, DNA, many others
- Treatment : Supplementation with vitamin B12, methylcobalamin, methyl-tetrahydrofolate, and betaine
- Use homocysteine and 2-hydroxybutyric as indicators of need for methylation factors

6 yr old girl with attention deficit, poor growth, peculiar rocking motion, unable to suck

Bacterial Markers



Clostridia Bacterial Markers



6 yr old girl with attention deficit, poor growth, peculiar rocking motion

Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Females Under Age 13
Oxalate Metabolites			
19 Glyceric	0.71 - 9.5	2.3	
20 Glycolic	20 - 202	75	
21 Oxalic	15 - 174	H 261	
Glycolytic Cycle Metabolites			
22 Lactic	0.18 - 44	H 164	
23 Pyruvic	0.88 - 9.1	0.98	
Mitochondrial Markers - Krebs Cycle Metabolites			
24 Succinic	≤ 15	H 29	
25 Fumaric	0.04 - 1.3	H 23	
26 Malic	≤ 2.2	H 68	
27 2-Oxoglutaric	≤ 81	3.6	
28 Aconitic	11 - 35	18	
29 Citric	59 - 440	L 4.0	

6 yr old girl with attention deficit, poor growth, peculiar rocking motion

Mitochondrial Metabolites

30	3-Methylglutaric	0.07 - 0.95		0.42	
31	3-Hydroxyglutaric	≤ 11	H	58	
32	3-Methylglutaconic	≤ 6.4		2.5	

Neurotransmitter Metabolites

Phenylalanine and Tyrosine Metabolites

33	Homovanillic (HVA) <i>(dopamine)</i>	≤ 14		7.9	
34	Vanillylmandelic (VMA) <i>(norepinephrine, epinephrine)</i>	0.87 - 5.9		2.0	
35	HVA / VMA Ratio	0.12 - 3.0	H	4.0	

Tryptophan Metabolites

36	5-Hydroxyindoleacetic (5-HIAA) <i>(serotonin)</i>	≤ 7.7		0.84	
37	Quinolinic	0.63 - 6.7		6.6	
38	Kynurenic	≤ 4.1		2.1	
39	Quinolinic / 5-HIAA Ratio	0.04 - 2.2	H	7.9	

6 yr old girl with attention deficit, poor growth, peculiar rocking motion

Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Females Under Age 13
Pyrimidine Metabolites - Folate Metabolism			
40 Uracil	≤ 19	H 43	
41 Thymine	0.01 - 0.89	0.05	
Ketone and Fatty Acid Oxidation			
42 3-Hydroxybutyric	≤ 4.1	3.3	
43 Acetoacetic	≤ 10	0	
44 4-Hydroxybutyric	≤ 3.4	1.7	
45 Ethylmalonic	≤ 4.6	1.3	
46 Methylsuccinic	≤ 4.3	2.3	
47 Adipic	≤ 9.7	1.6	
48 Suberic	≤ 9.5	2.8	
49 Sebacic	≤ 0.37	0	

6 yr old girl with attention deficit, poor growth, peculiar rocking motion

Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Females Under Age 13
----------------------------	--	---------------	---

Indicators of Detoxification

Glutathione

58	Pyroglutamic *	7.0 - 63	42	
59	2-Hydroxybutyric *	≤ 2.2	H 2.4	

Ammonia Excess

60	Orotic	≤ 0.88	0.41	
----	--------	--------	------	--

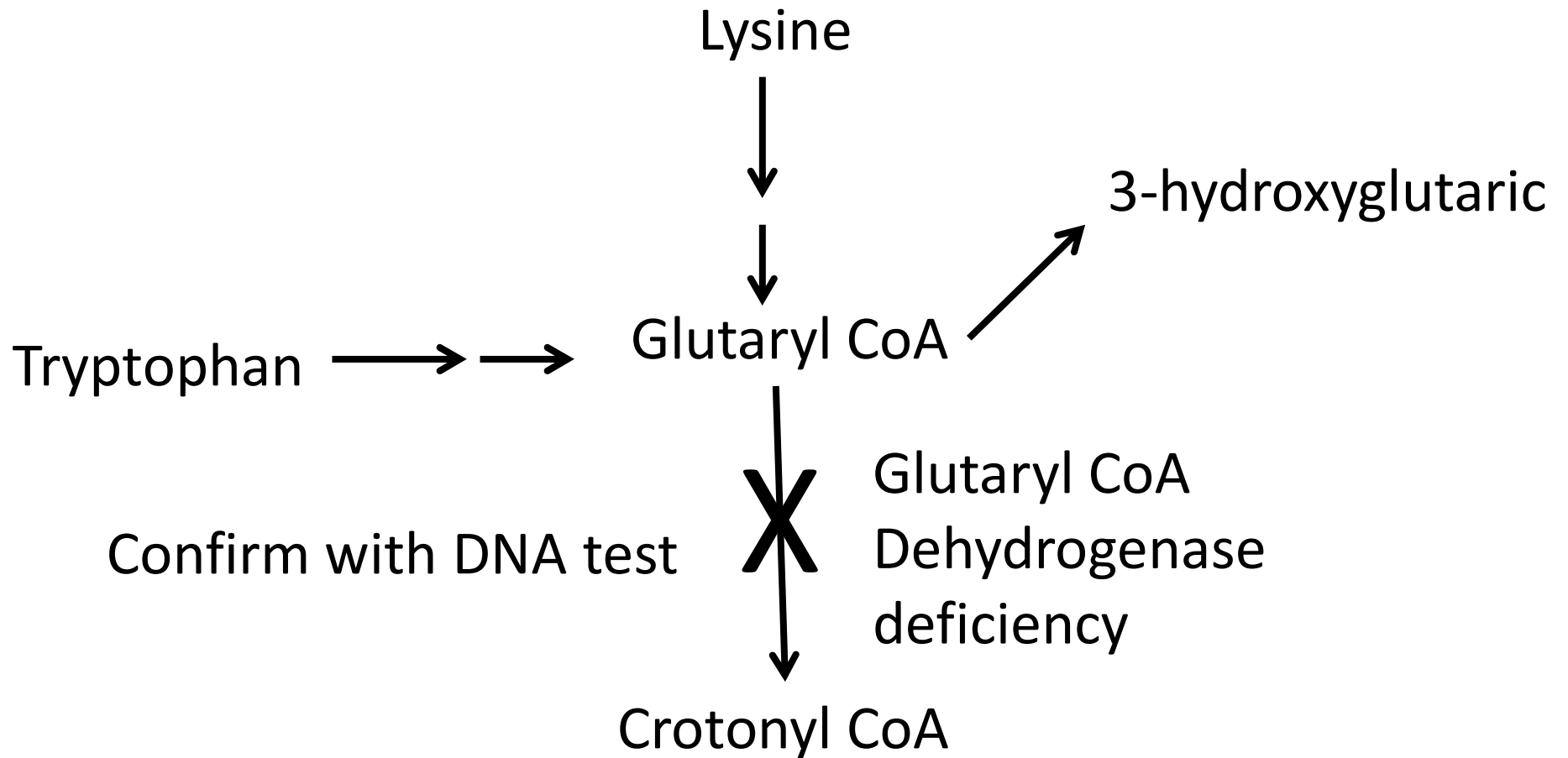
Aspartame, salicylates, or GI bacteria

61	2-Hydroxyhippuric	≤ 1.2	0.81	
----	-------------------	-------	------	--

* A high value for this marker may indicate a Glutathione deficiency.

Symptoms of glutaryl CoA deficiency

- High 3-hydroxyglutaric acid in urine
- Macroencephaly (large head)
- Spasms, low muscle tone, jerking, poor sucking
- Peculiar movements
- Decreased mental attention
- Many times diagnosed as cerebral palsy
- Very common in groups that are more inbred such as Mennonites
- May cause bleeding into eyes or brain-parents may be wrongly convicted of child abuse



Treatment: Diet low in tryptophan and lysine,
Intravenous carnitine, choline supplements

Research article

Increased urinary excretion of a 3-(3-hydroxyphenyl)-3-hydroxypropionic acid (HPHPA), an abnormal phenylalanine metabolite of *Clostridia* spp. in the gastrointestinal tract, in urine samples from patients with autism

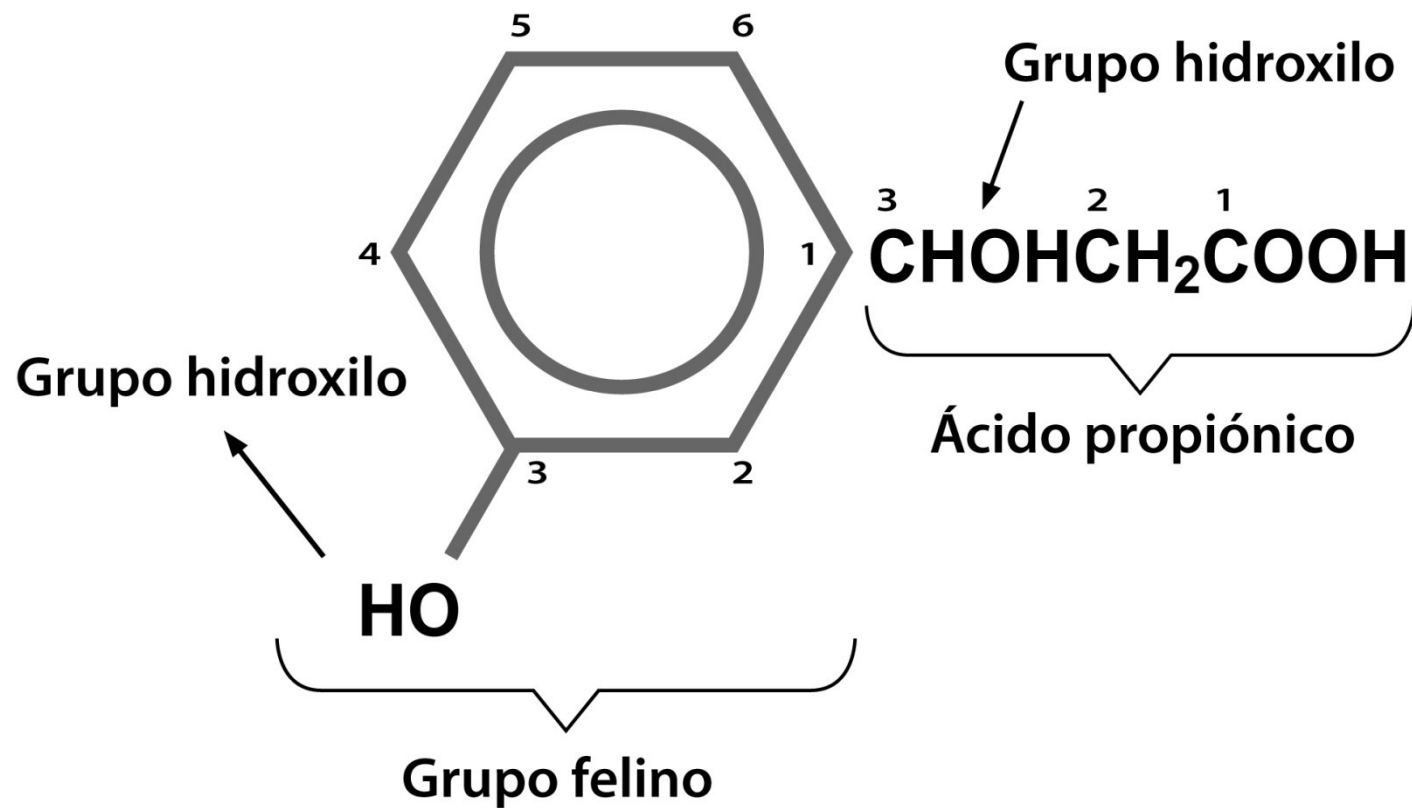
William Shaw ¹ *zophrenia* Nutritional Neuroscience 2010 Vol 13 No 3: 1-10

William Shaw

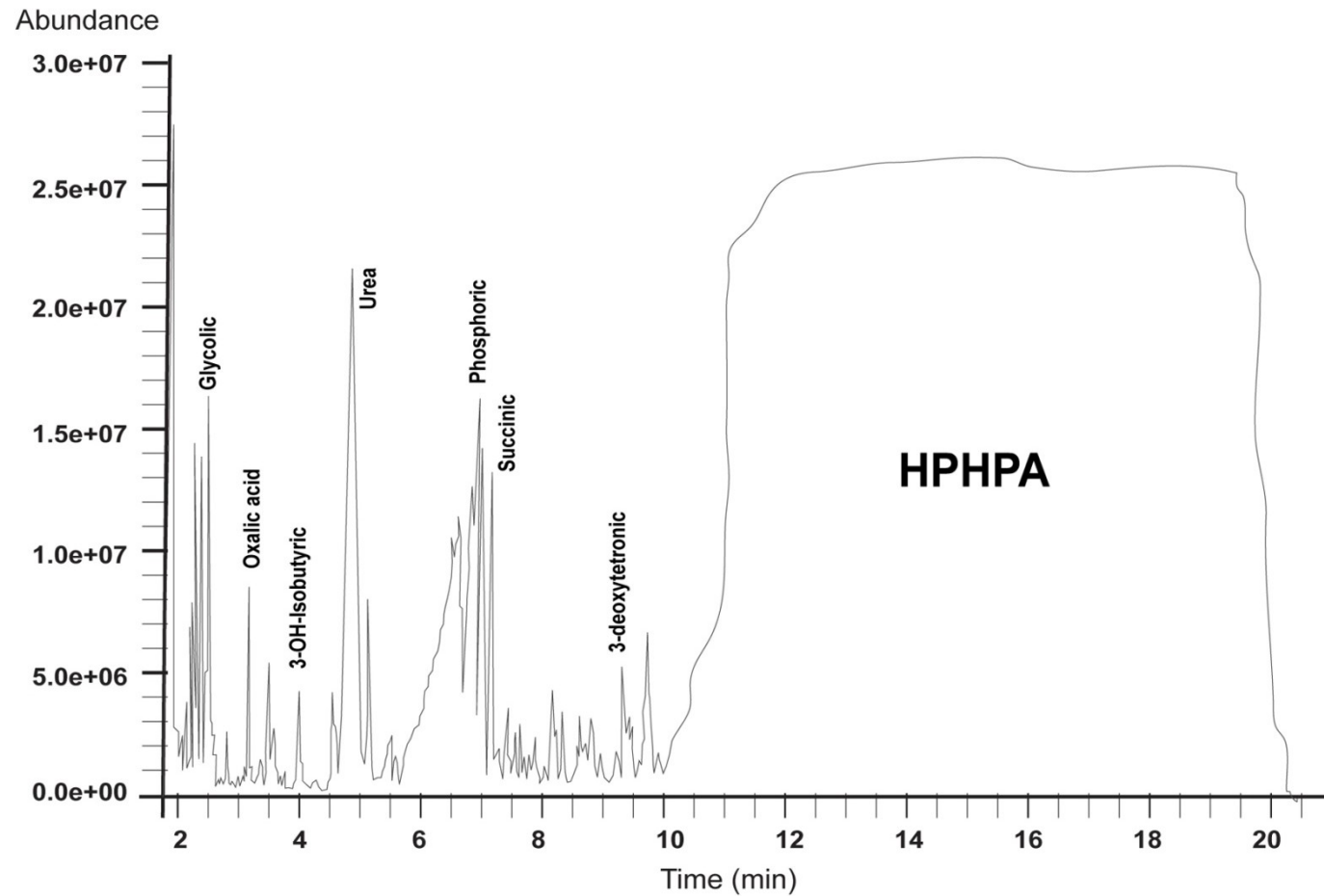
The Great Plains Laboratory, Inc., Lenexa, Kansas, USA

A compound identified as 3-(3-hydroxyphenyl)-3-hydroxypropionic acid (HPHPA) was found in higher concentrations in urine samples of children with autism compared to age and sex appropriate controls and in an adult with recurrent diarrhea due to *Clostridium difficile* infections. The highest value measured in urine samples was 7500 mmol/mol creatinine, a value 300 times the median normal adult value, in a patient with acute schizophrenia during an acute psychotic episode. The psychosis remitted after treatment with oral vancomycin with a concomitant marked decrease in HPHPA. The source of this compound appears to be multiple species of anaerobic bacteria of the *Clostridium* genus. The significance of this compound is that it is a probable metabolite of *m*-tyrosine (3-hydroxyphenylalanine), a tyrosine analog which depletes brain catecholamines and causes symptoms of autism (stereotypical behavior, hyperactivity, and hyper-reactivity) in experimental animals.

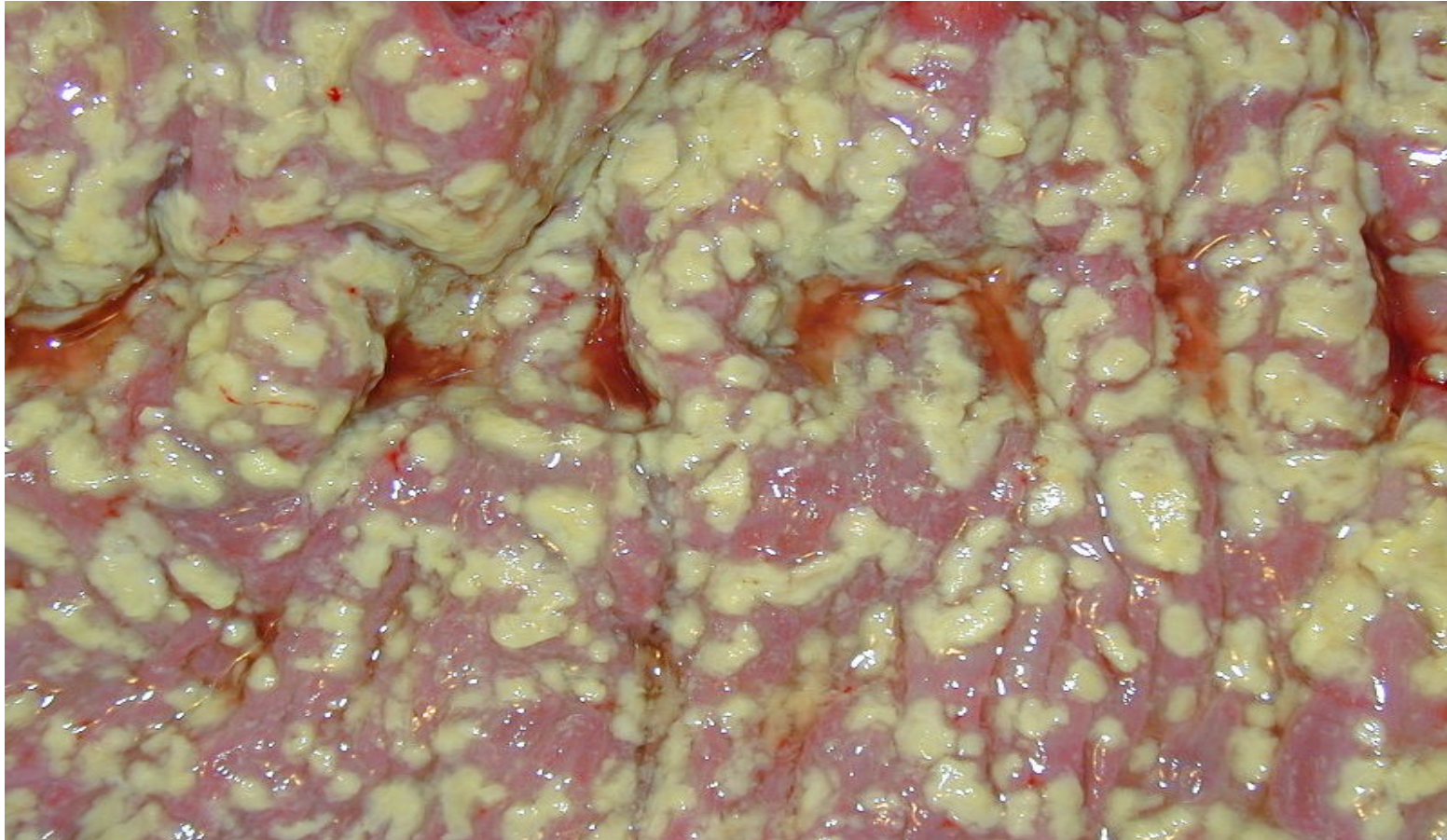
Estructura del ácido 3-(3-hidroxifenilo)-3-hidroxi propiónico



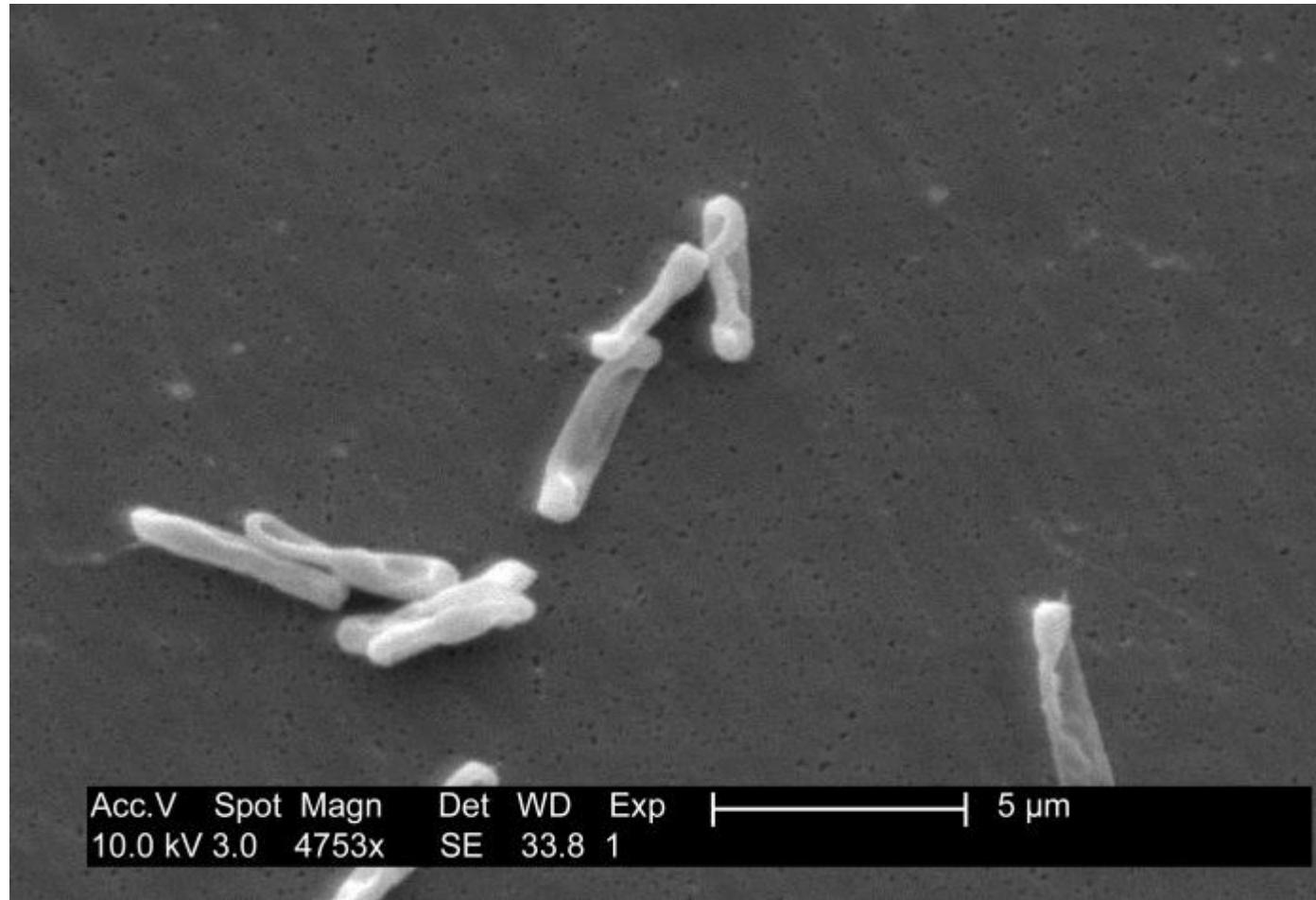
Psicosis del niño durante hospitalización (simulado desde la memoria)



Colitis pseudomembranosa

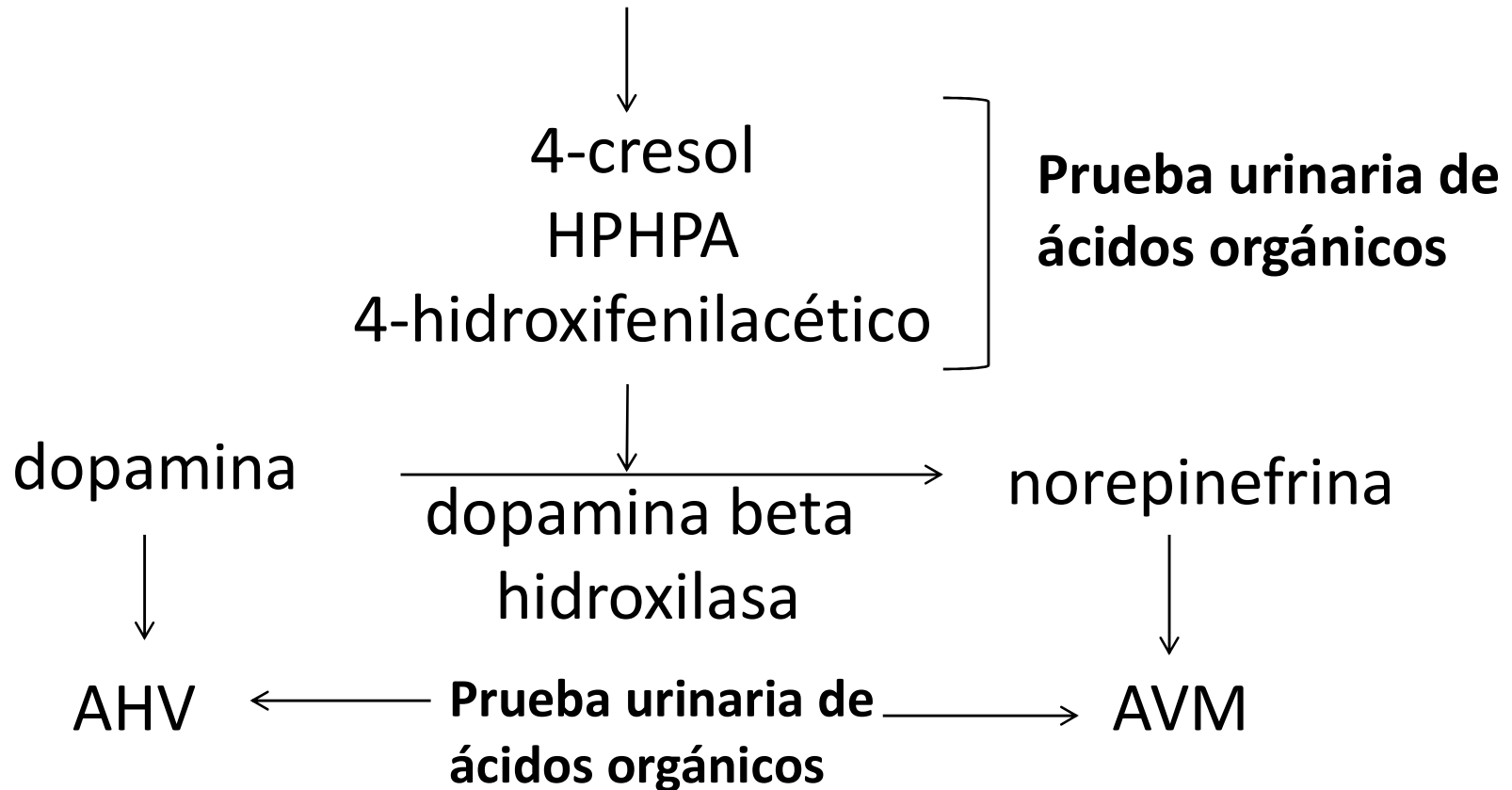


Clostridia por microscopía de electrones

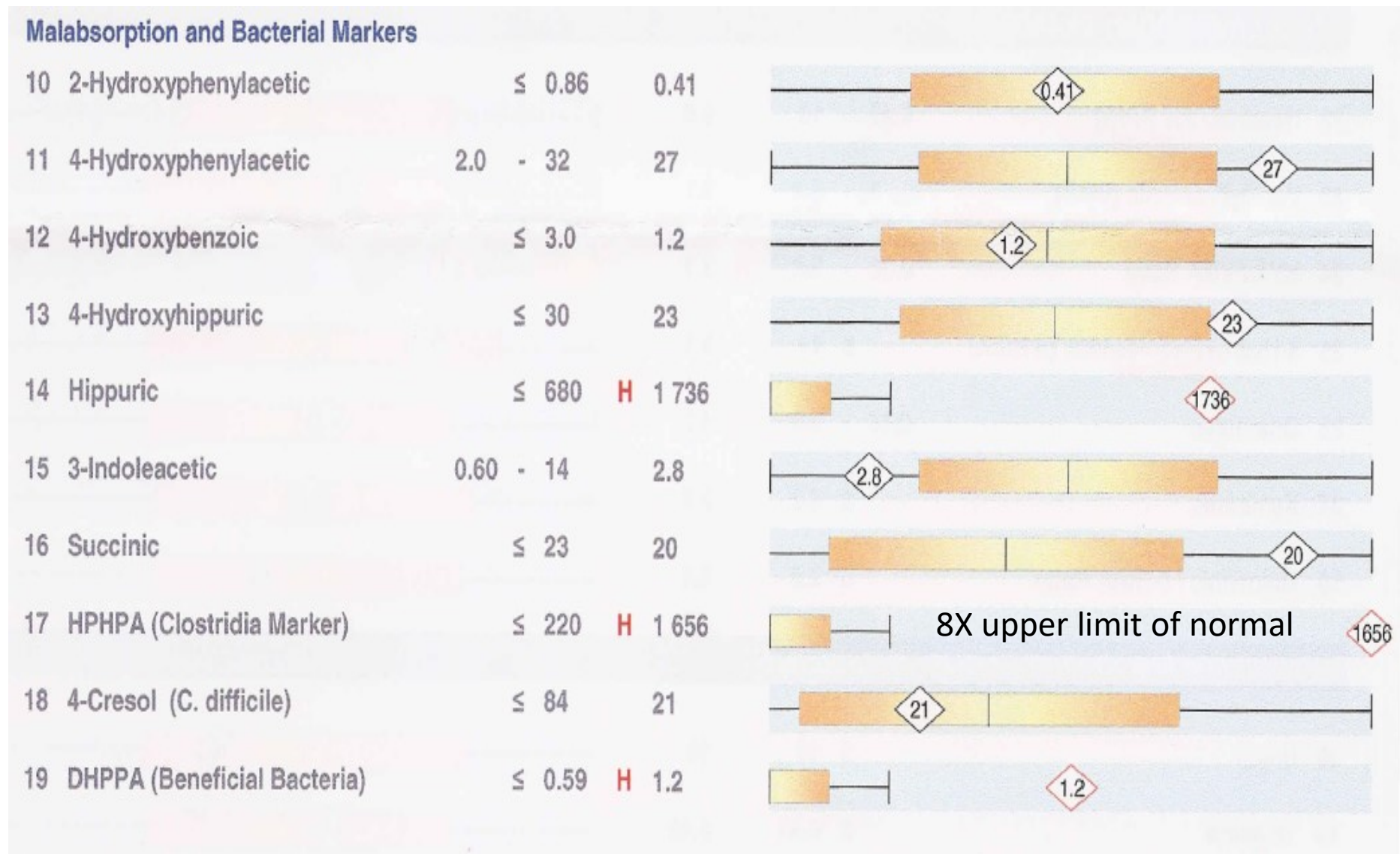


Efecto crítico de la bacteria intestinal en los neurotransmisores cerebrales

Bacteria *Clostridium*-tracto gastrointestinal



8 yr old autism severe clostridia baseline

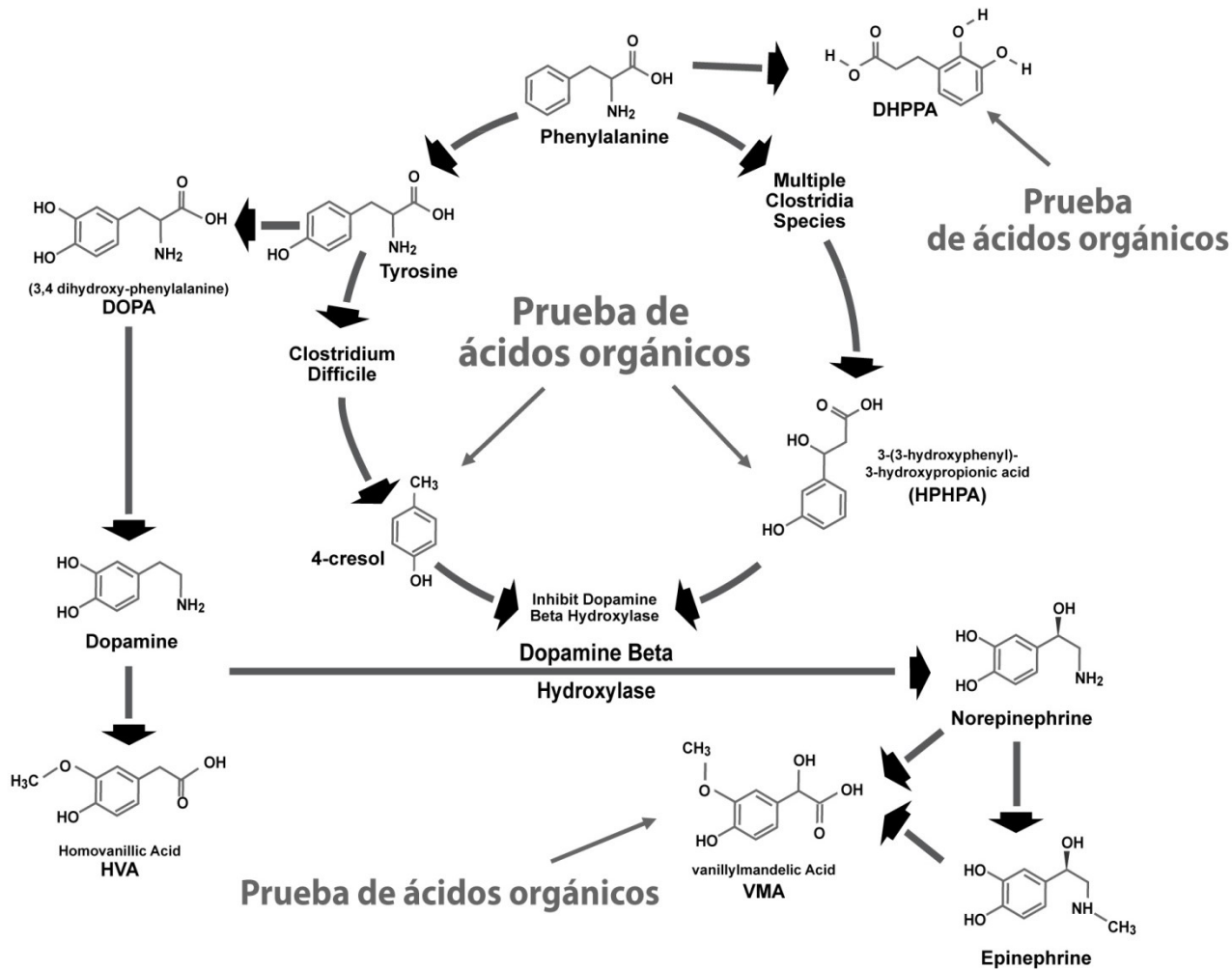


Linan Chen, et al(2008) La dopamina citosólica no regulada causa neurodegeneración relacionada al estrés oxidativo en ratones.

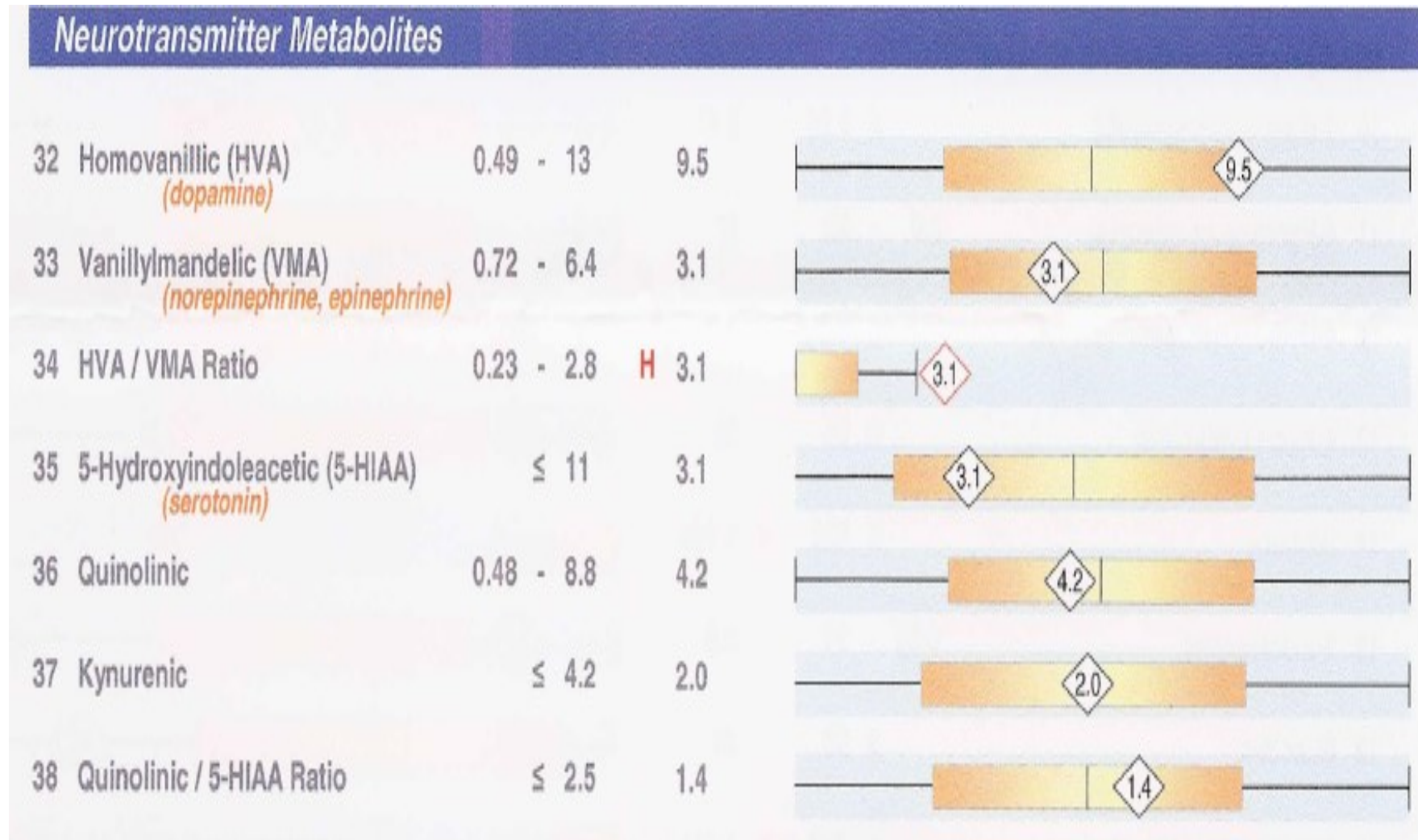
J. Neurosci. 28, 425–433

- La dopamina es una molécula muy reactiva comparada con otros neurotransmisores. Su degradación naturalmente produce especies oxidativas.
- Más del 90% de la dopamina en las neuronas de dopamina se almacena en abundantes vesículas terminales, protegidas de la degradación.
- Sin embargo, una pequeña fracción es citosólica, siendo la principal fuente del metabolismo de dopamina y supuesta toxicidad.
- La dopamina citosólica se degrada para formar el ácido 3,4-dihidroxifenilacético (DOPAC) y AHV así como peróxido de hidrógeno por la vía de la monoaminooxidasa.

Efecto crítico de las bacterias intestinales en los neurotransmisores cerebrales

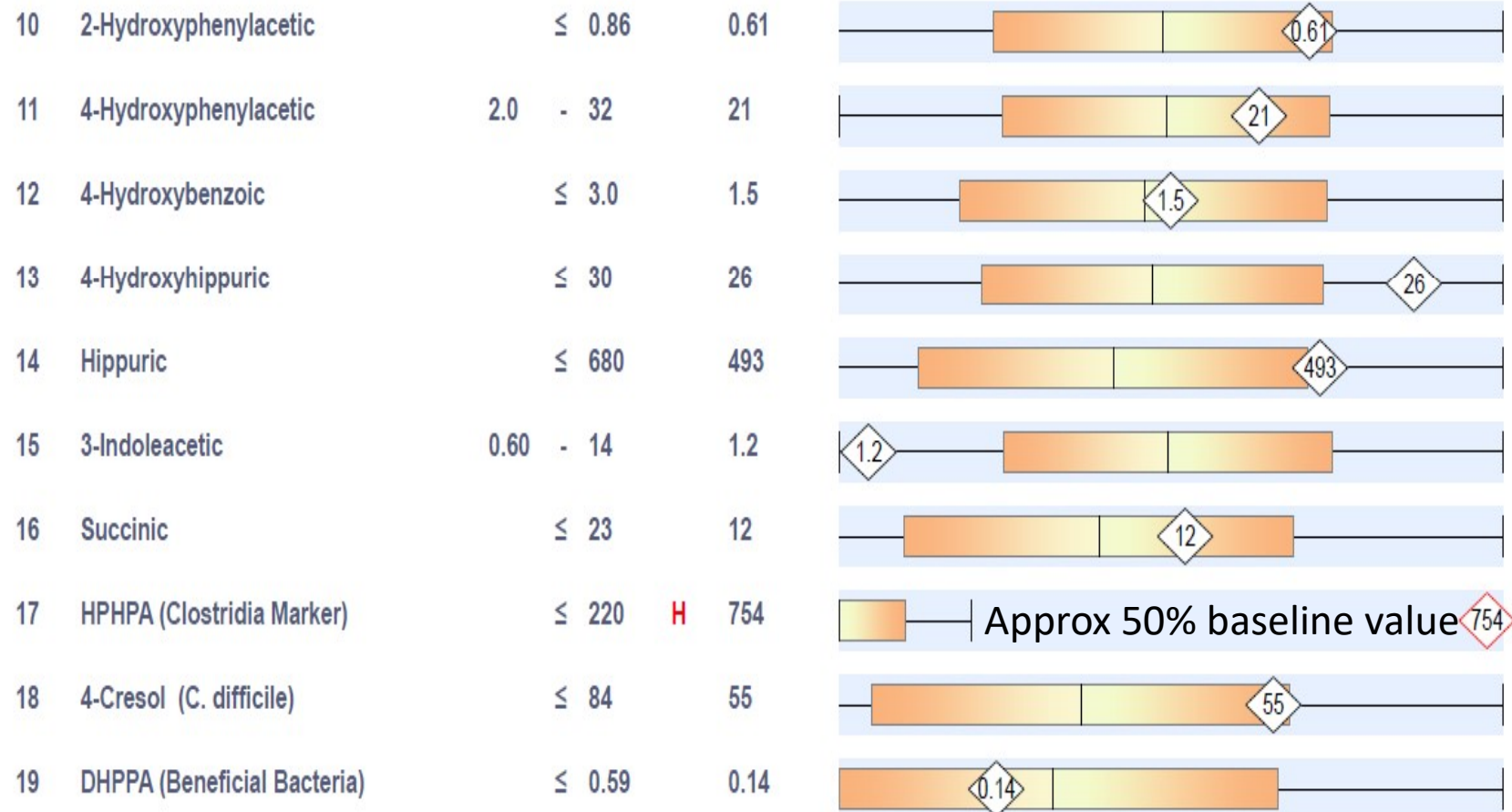


8 yr old autism severe clostridia baseline



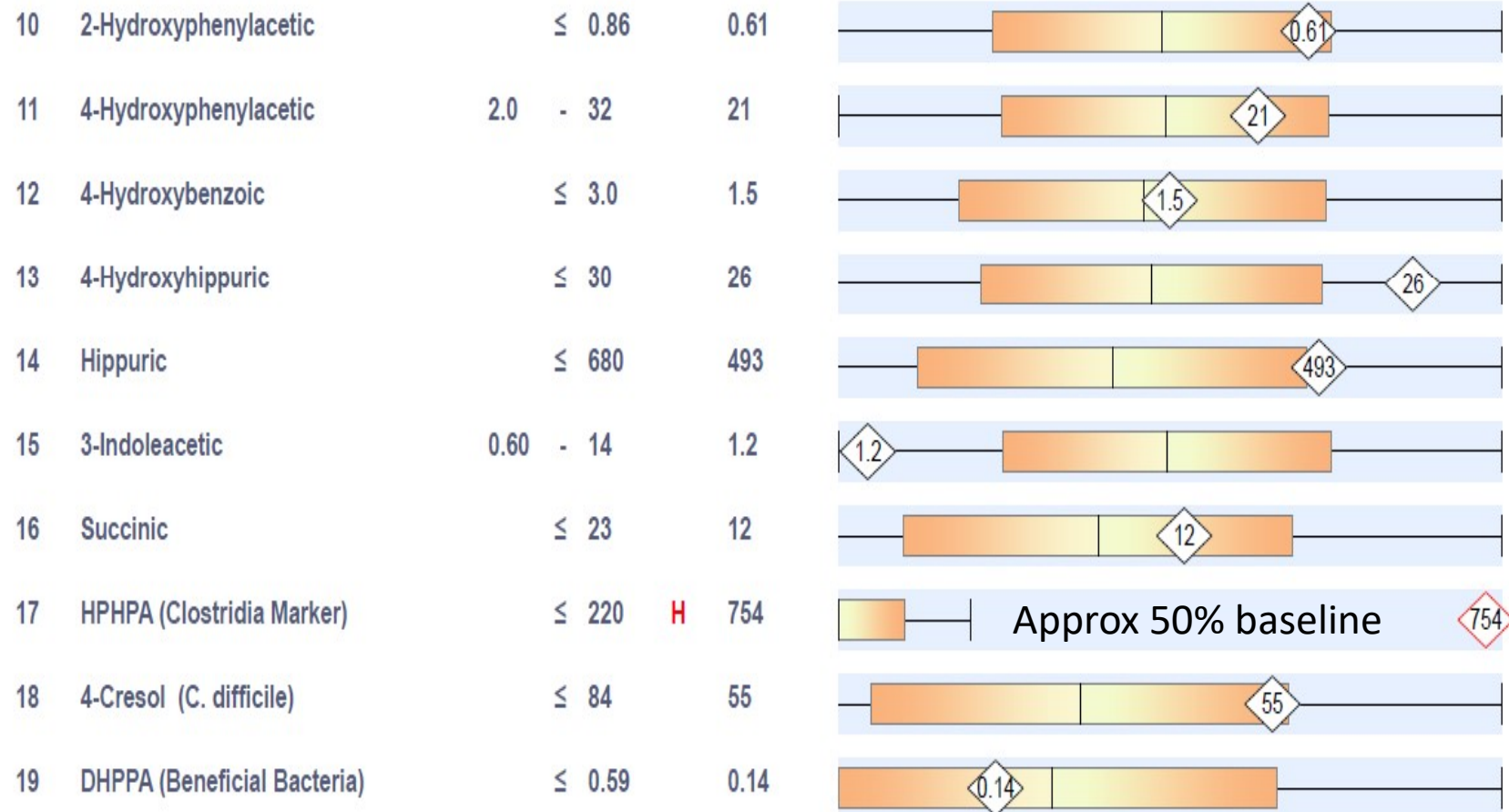
8 yr old autism severe clostridia after two consecutive rounds of oral vancomycin

Malabsorption and Bacterial Markers



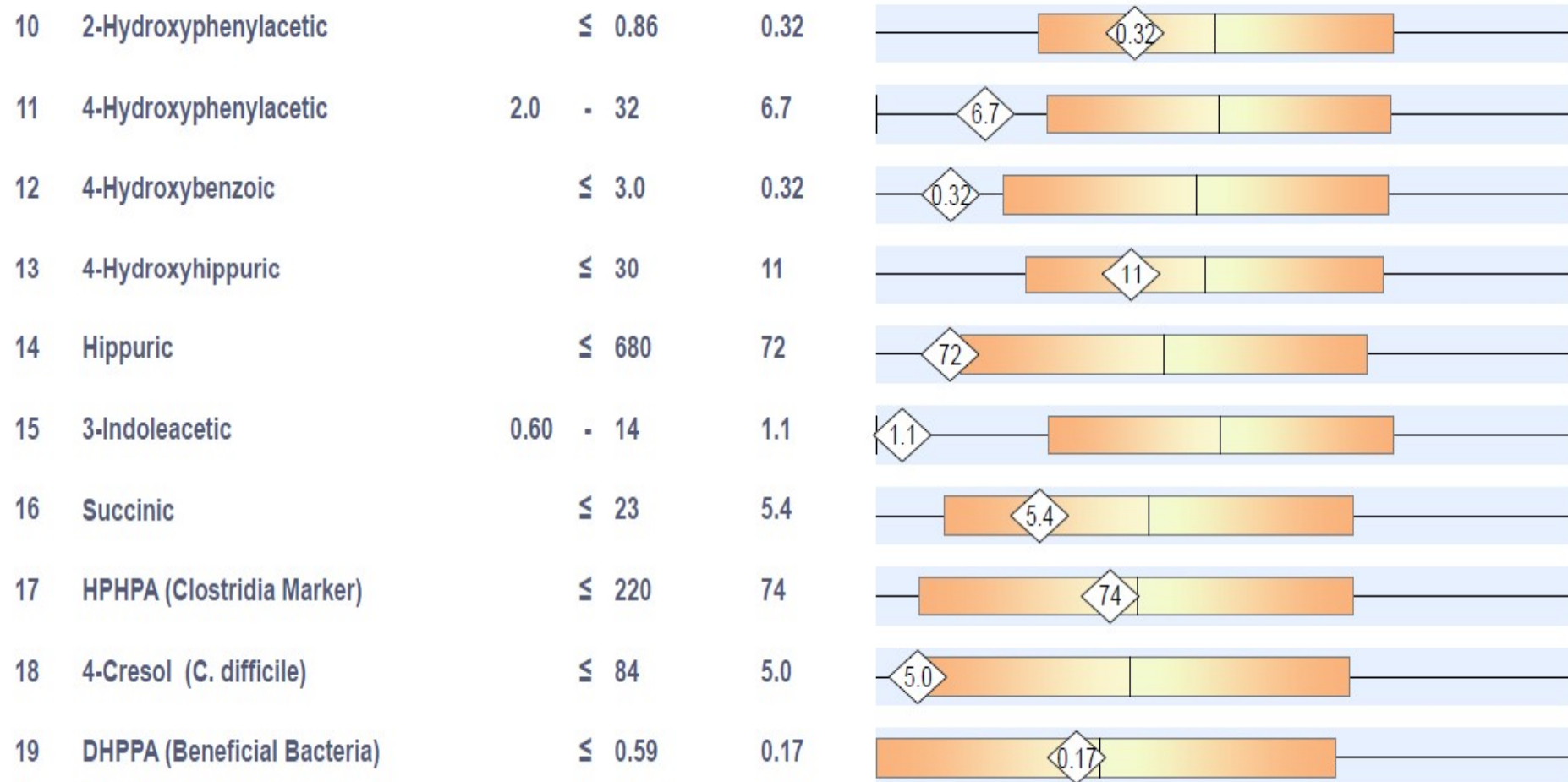
8 yr old autism severe clostridia after two rounds of oral vancomycin

Malabsorption and Bacterial Markers



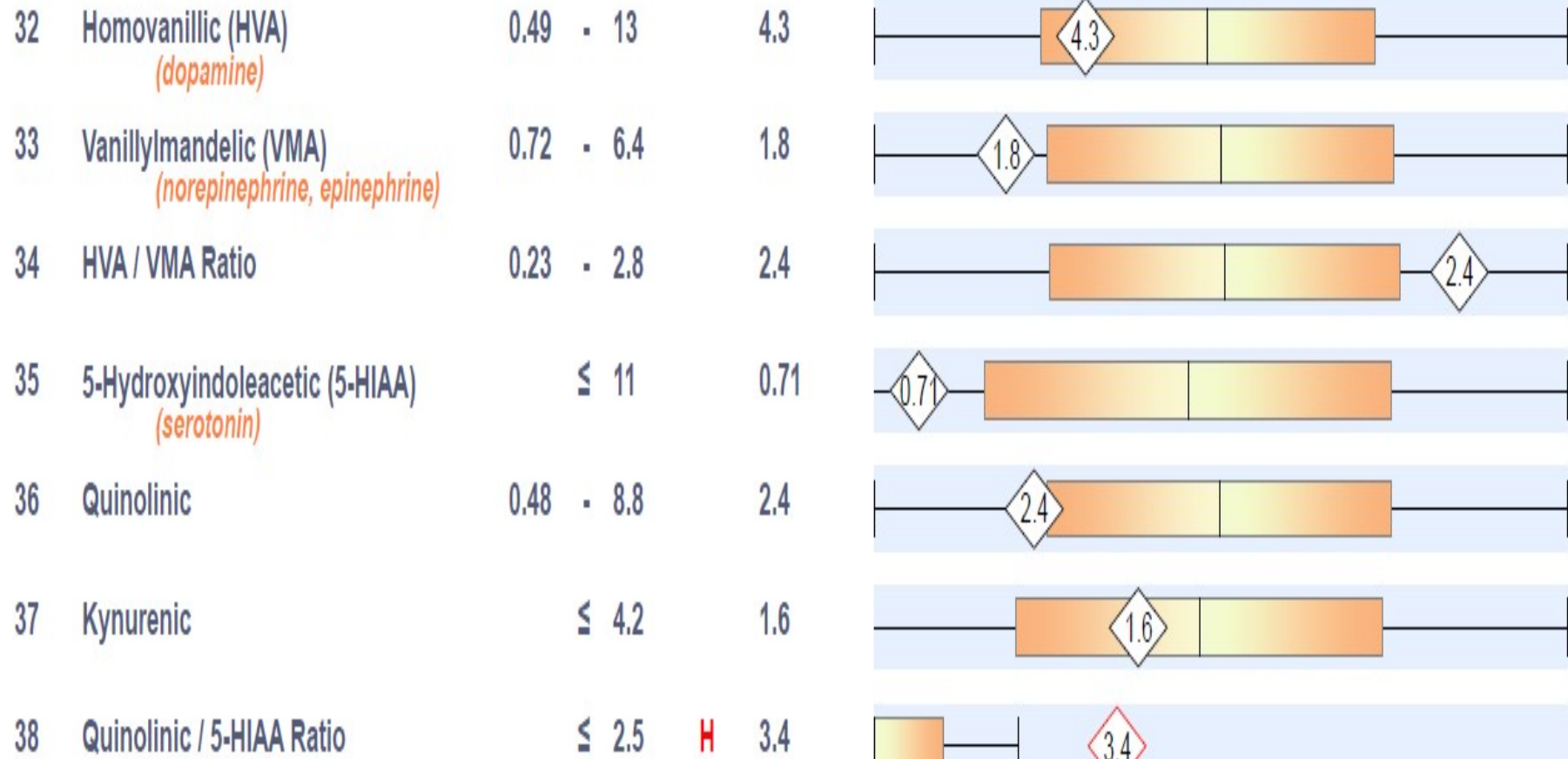
8 yr old autism severe clostridia after use of Body Biotics Probiotics

Malabsorption and Bacterial Markers



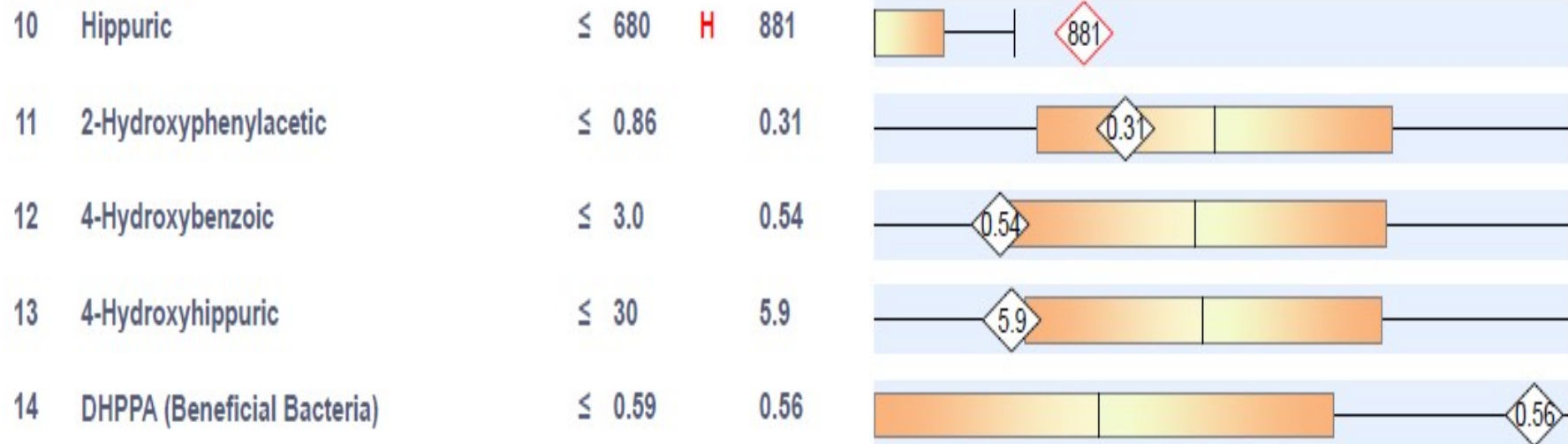
8 yr old autism severe clostridia after use of Body Biotics Probiotics

Neurotransmitter Metabolites

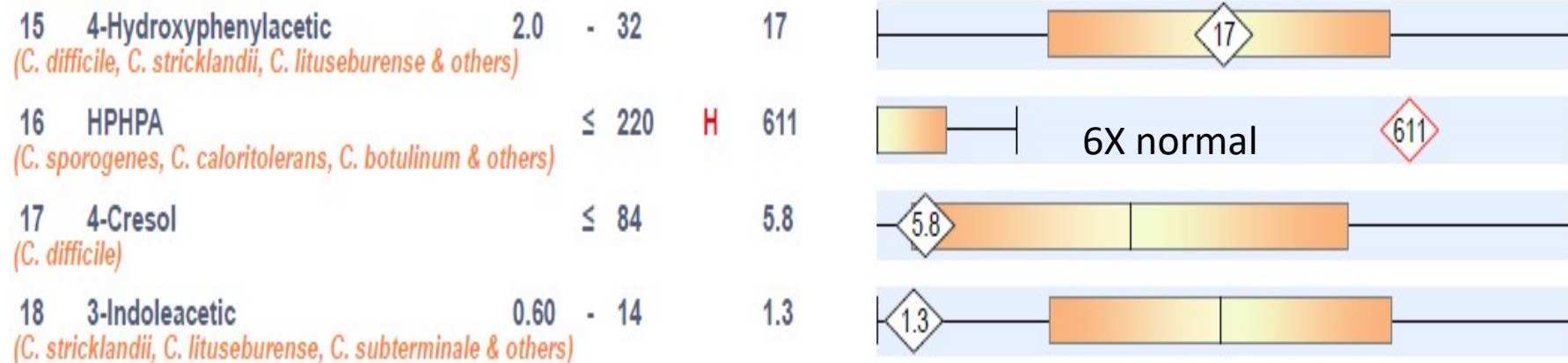


Same child- 4 years later-nearly recovered from autism

Bacterial Markers

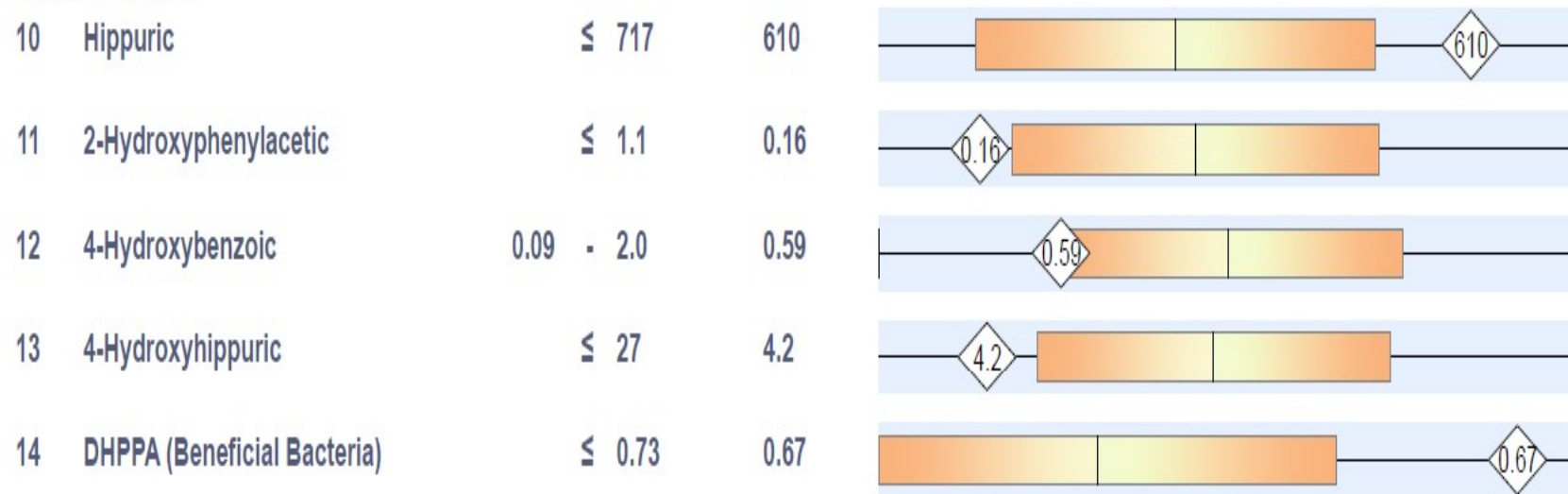


Clostridia Bacterial Markers



Normal sister of child with Clostridia

Bacterial Markers



Clostridia Bacterial Markers



The flush toilet-the most dangerous object in the house?



Flushing Lidless Toilet Sends Spray Of Diarrhea-Causing Bacteria Into The Air: Study

🕒 01/06/2012 01:09 pm ET



Amanda L. Chan
Managing Editor, Healthy Living



It may be common sense, but we all need the reminder -- flush the toilet with the lid down, lest you send a [spray of diarrhea-causing bacteria](#) up into the air, according to a new study.

The study, published in the *Journal of Hospital Infection*, shows that the bacteria *Clostridium difficile*, which is known to cause diarrhea, is sprayed 25 centimeters, or nearly 10 inches, [above the toilet seat](#) when you flush without putting the lid down, ABC News reported. The most bacteria was found right after the toilet was flushed, with the number of bacteria declining as time passed on.

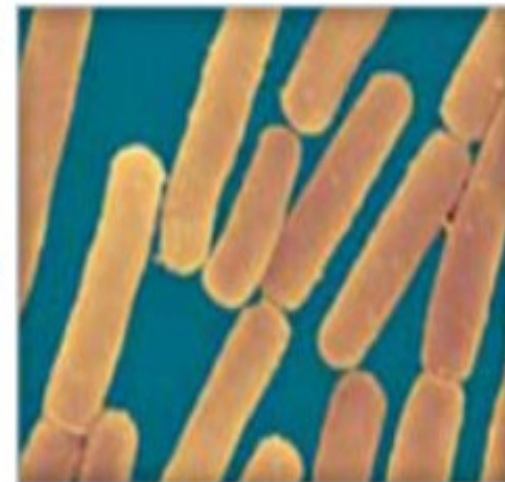


C. difficile Prevention

Infection Rates Are Higher than Previously Thought

The CDC's most recent figure for *C. difficile*-associated deaths in the U.S. is considerably higher than that of any previous survey. According to the CDC:*

- ✓ Nearly 500,000 *C. diff* infections estimated per year in the U.S., with more than 29,000 deaths
- ✓ Up to \$4.8 billion in excess health care costs for acute care facilities
- ✓ Prevention steps include antibiotic stewardship and improved infection control in hospitals, doctor's offices, nursing homes and other healthcare facilities

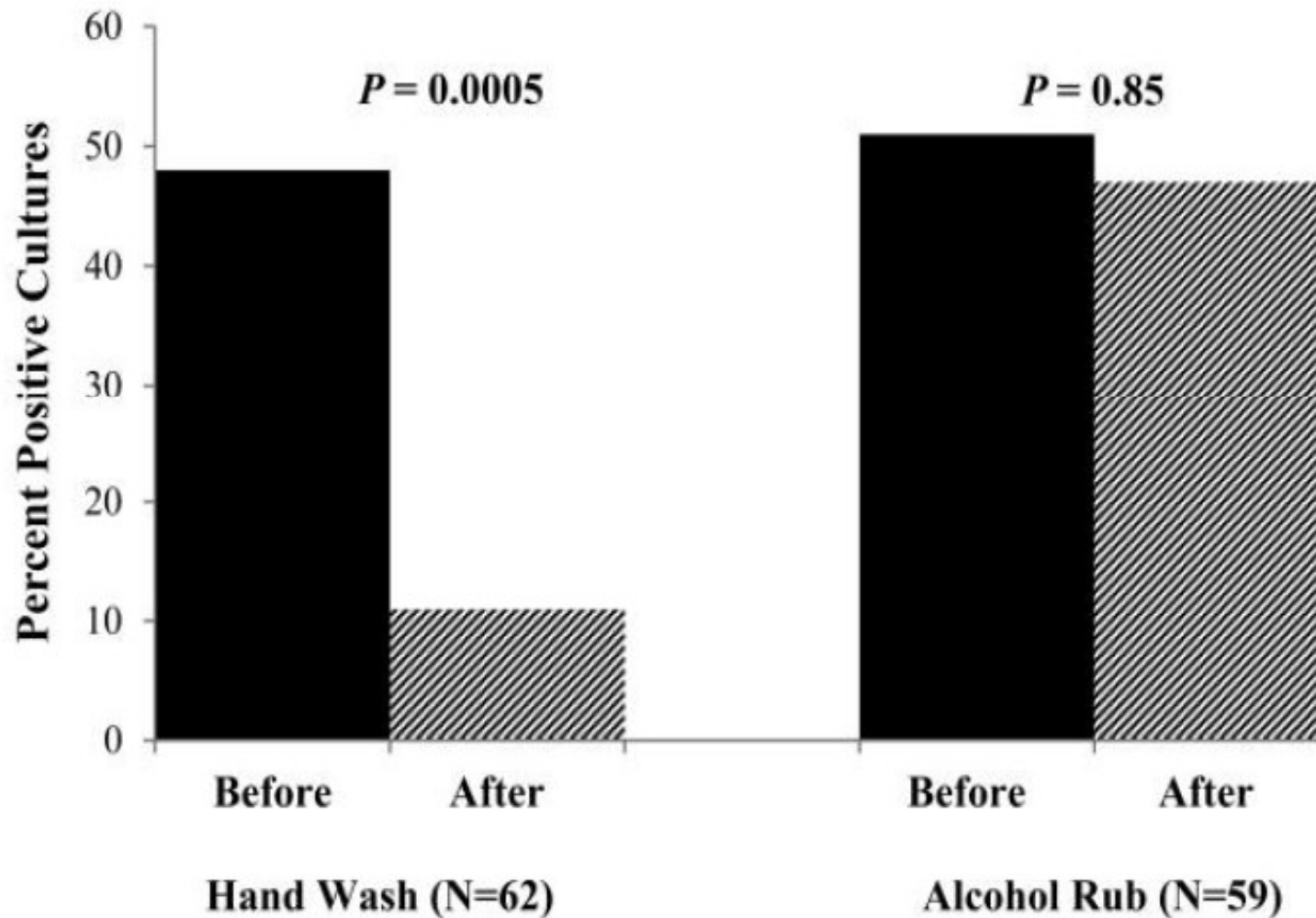


Learn More About CDC Study →

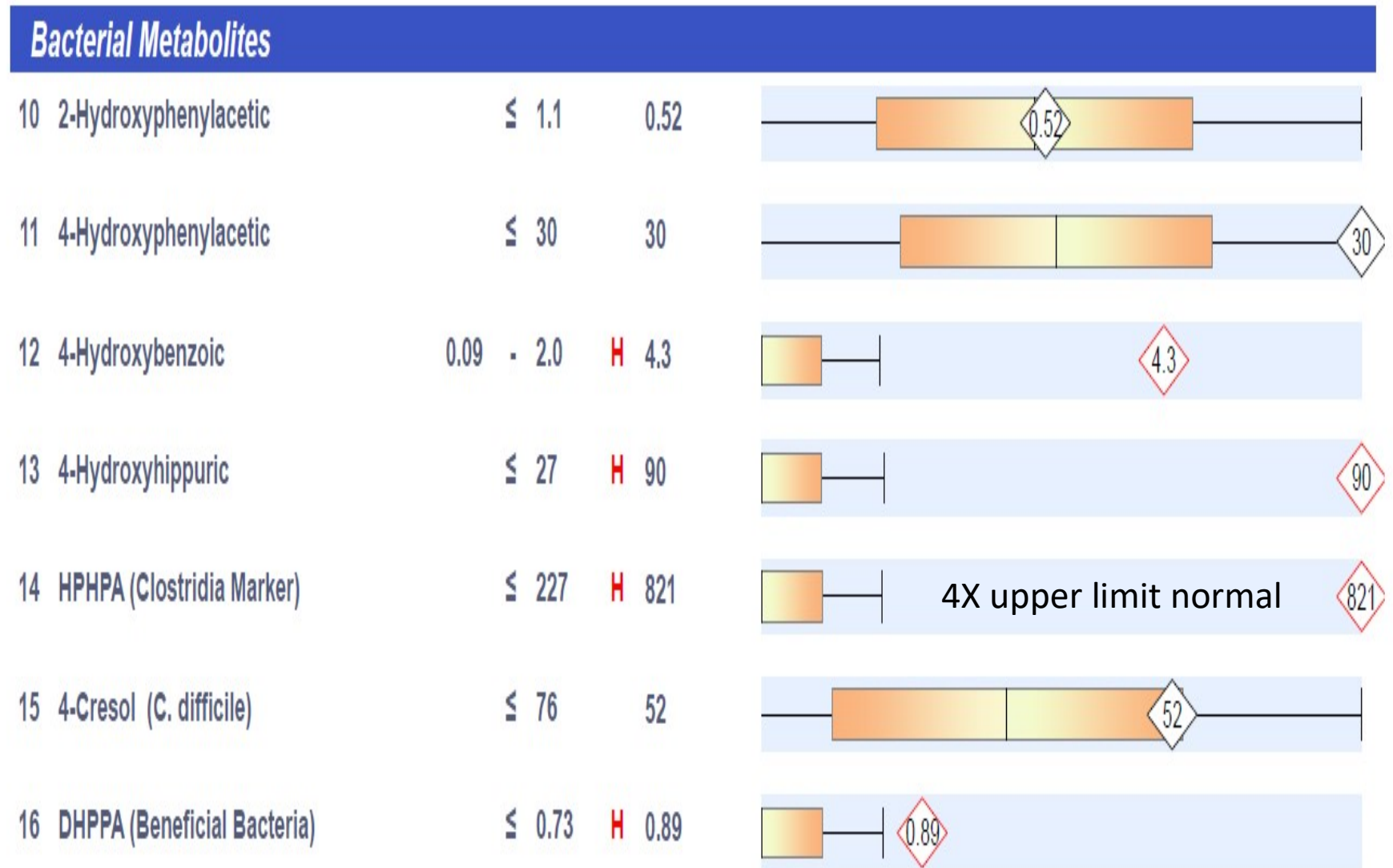
*"Nearly Half a Million Americans Suffered from Clostridium difficile Infections in a Single Year" (press release), Feb. 25, 2015.
<http://www.cdc.gov/media/releases/2015/p0225-clostridium-difficile.html>.

A Randomized Trial of Soap and Water Hand Wash Versus Alcohol Hand Rub for Removal of *Clostridium difficile* Spores from Hands of Patients

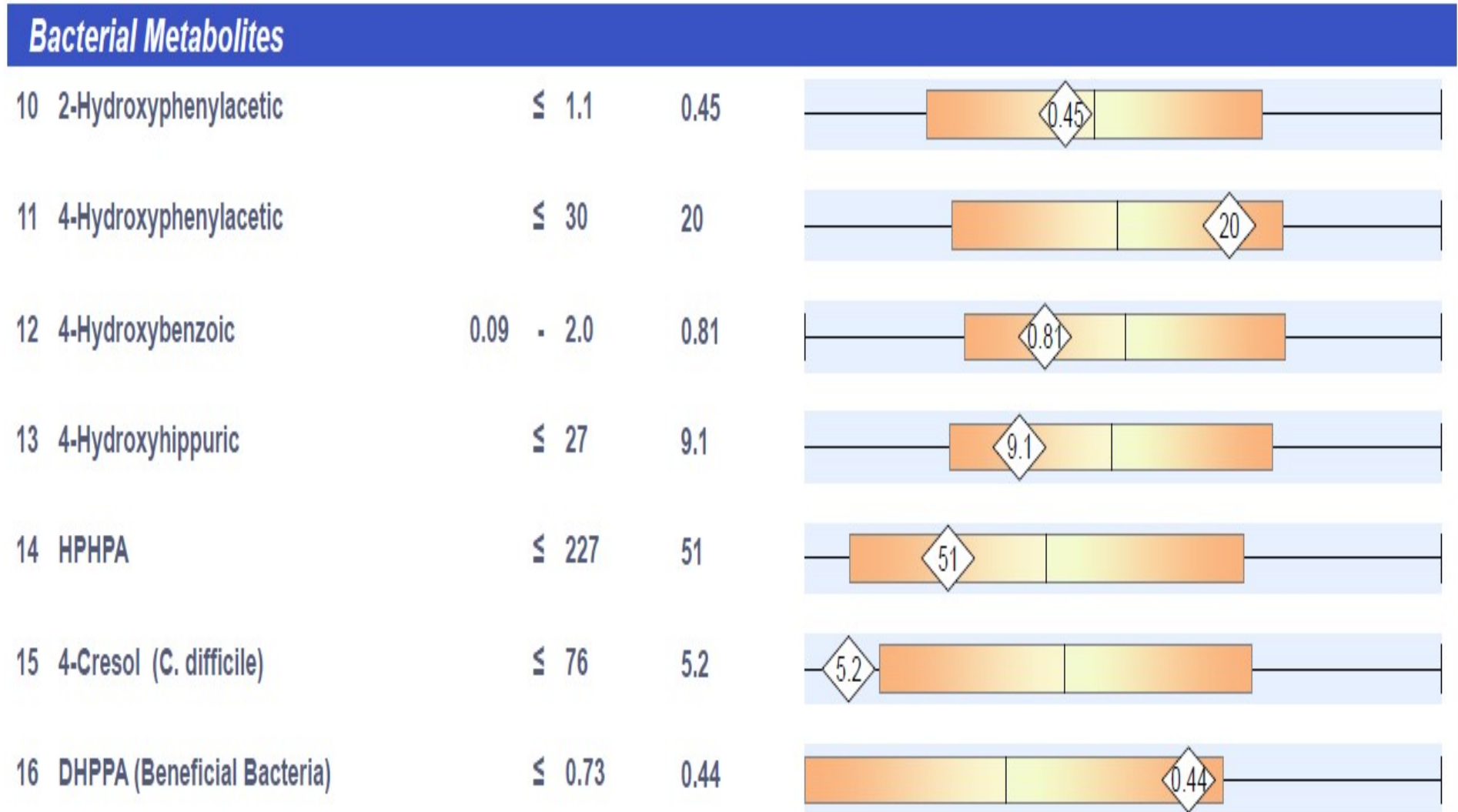
Sirisha Kundrapu, MD et al *Infection Control and Hospital Epidemiology* Vol. 35, No. 2 (February 2014), pp. 204-206



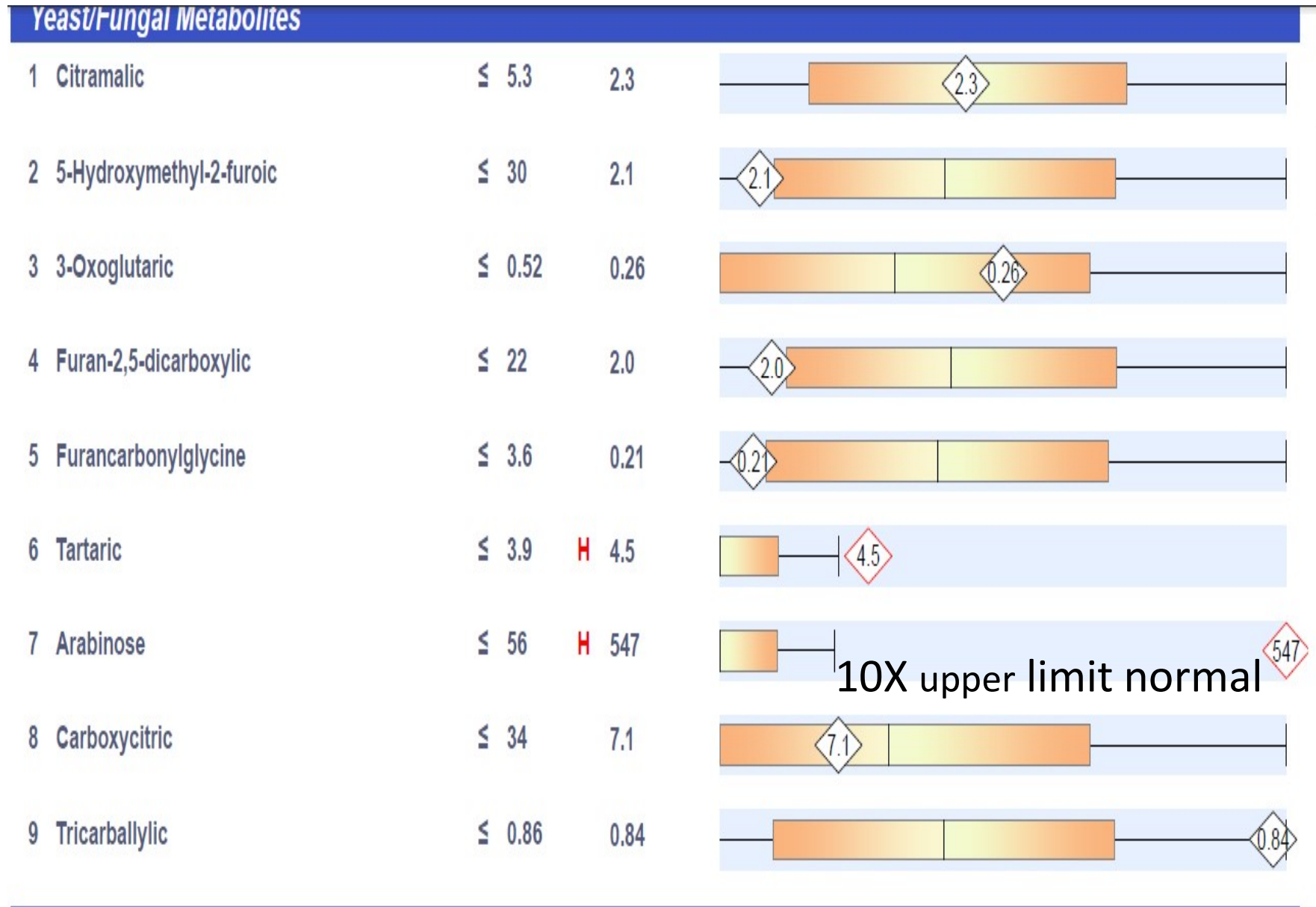
7 yr old boy with autism baseline



7 yr old boy with autism after Body Biotics probiotics



7 yr old boy with autism baseline



7 year old autism after Body Biotics probiotics

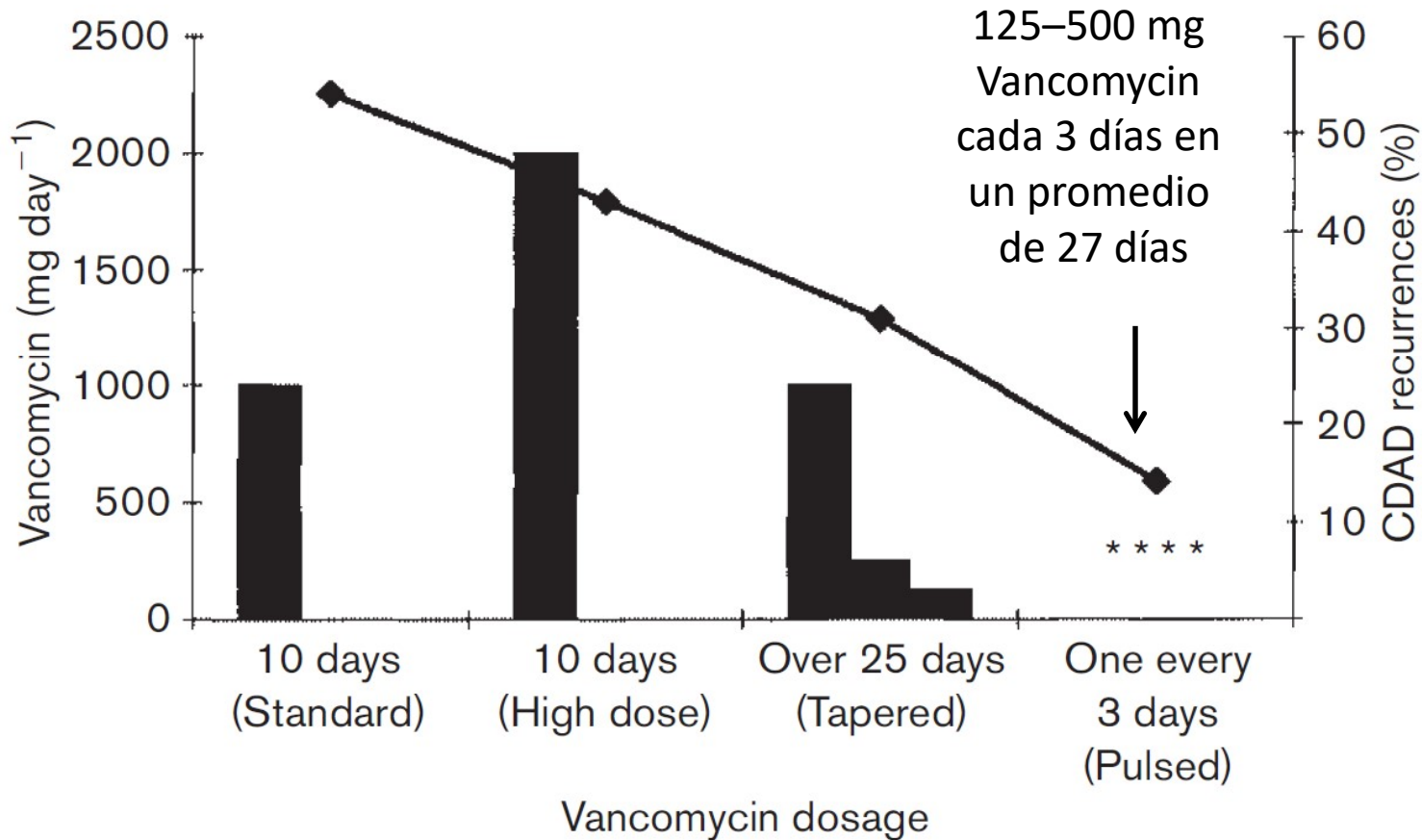


Microbial Organic Acids Test

Show Full Report

Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)	Patient	Reference Population - Females Under Age 13
Yeast/Fungal Metabolites			
1 Citramalic	≤ 5.3	2.4	
2 5-Hydroxymethyl-2-furoic	≤ 30	11	
3 3-Oxoglutaric	≤ 0.52	0.45	
4 Furan-2,5-dicarboxylic	≤ 22	11	
5 Furancarboxylglycine	≤ 3.6	2.2	
6 Tartaric	≤ 3.9	H 5.6	
7 Arabinose	≤ 56	H 69	Slightly higher than upper limit of normal
8 Carboxycitric	≤ 34	1.8	
9 Tricarballic	≤ 0.86	H 0.94	

Los tratamientos alternativos para la enfermedad por *Clostridium difficile*: ¿qué funciona realmente? Lynne V. McFarland Journal of Medical Microbiology (2005), 54, 101–111



SHARE:

[Sign Up](#)[Member Login](#)

BODY BIOTICS™

Bio-Identical SBO Probiotic & Prebiotic

Pure &
Natural
FREE of:



GMO, Dairy, Yeast, Gluten, Dyes,
Fillers, Animal-by-Products,
Artificial Sugars or Flavors,
Salt, Harmful Preservatives,
and DOES NOT
Require Refrigeration!

BODY BIOTICS™

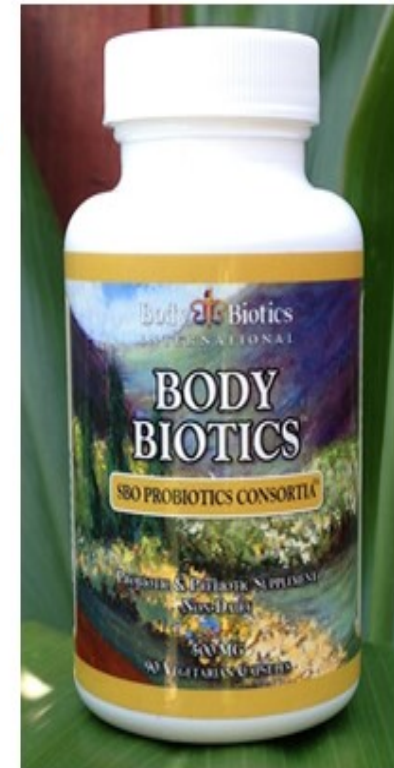
“Bio-Identical” SBO Probiotics Consortia™

*A uniquely different Prebiotic & Probiotic, custom cultured to rebalance friendly gut flora, strengthen the immune system, provide messenger chemicals & restore optimal health. **

For eons, humans naturally ingested friendly **soil born organisms** (SBOs) from chemical free organic foods they consumed each day. Little was known about these beneficial, life-supporting microbes before the mid to late 1900s, and in truth, not until the last ten years. Today, Probiotic researchers around the world work endlessly in their labs offering up more and more evidence to support the critical importance of these friendly bacteria that have all but **“gone missing”** from our daily diets. It has now become obvious to many, in the medical and alternative world, that replacing these missing organisms is paramount to digestive health and our long-term wellbeing.

BODY BIOTICS INTERNATIONAL, with a 37 year old Prebiotics & Probiotics formula, has long known the vital role that SBOs play in gut health for both humans and pets. From the moment we secured exclusive worldwide marketing rights to this formula (April/1995), we have remained steadfast in our commitment to provide the safest, most effective natural Probiotic to our customers.

With contradictory information and general confusion in today’s Probiotics marketplace, we have reviewed the dynamics of our formulation, culturing process and ingredients; all, to offer our customers a better way of understanding the exceptional qualities of **BODY**



BODY BIOTICS™ Bio-Identical
SBO Probiotics Consortia™
with Prebiotics

Body Biotics Probiotics

- <http://bodybiotics.com>
- Using standard Lactobacillus species
- Also contains SBO-Soil Based Organisms-
Bacillus subtilis and licheniformis species that produce spores that kill other microorganisms
- Company claims species are on FDA
“Generally recognized as safe” (GRAS) list
- May be unsafe for people with immune deficiency

The safety of *Bacillus subtilis* and *Bacillus indicus* as food probiotics

H.A. Hong, J.-M. Huang, R. Khaneja, L.V. Hiep, M.C. Urdaci, S.M. Cutting

First published: 29 February 2008 [Full publication history](#)

DOI: 10.1111/j.1365-2672.2008.03773.x [View/save citation](#)

Cited by: 43 articles [Refresh](#) [Citing literature](#)



✉ Simon M. Cutting, School of Biological Sciences, Royal Holloway, University of London, Egham, Surrey, TW20 0EX, UK. E-mail: s.cutting@rhul.ac.uk



[View issue TOC](#)
Volume 105, Issue 2
August 2008
Pages 510–520

Significance and Impact of the Study: The results support the use of *B. subtilis* and *B. indicus* strains as food supplements.

Disq Dis Sci. 2008 Apr;53(4):954-63. Epub 2007 Oct 13.

The safety of two *Bacillus* probiotic strains for human use.

Sorokulova IB¹, Pinchuk IV, Denayrolles M, Osipova IG, Huang JM, Cutting SM, Urdaci MC.

⊕ Author information

Abstract

Open/close author information list

Probiotics based on *Bacillus* strains have been increasingly proposed for prophylactic and therapeutic use against several gastro-intestinal diseases. We studied safety for two *Bacillus* strains included in a popular East European probiotic. *Bacillus subtilis* strain that was sensitive to all antibiotics listed by the European Food Safety Authority. *Bacillus licheniformis* strain was resistant to chloramphenicol and clindamycin. Both were non-hemolytic and did not produce Hbl or Nhe enterotoxins. No *bceT* and *cytK* toxin genes were found. Study of acute toxicity in BALB/c mice demonstrated no treatment-related deaths. The oral LD(50) for both strains was more than 2×10^{11} CFU. Chronic toxicity studies were performed on mice, rabbits, and pigs and showed no signs of toxicity or histological changes in either organs or tissues. We demonstrated that while certain risks may exist for the *B. licheniformis* strain considering antibiotic resistance, *B. subtilis* strain may be considered as non-pathogenic and safe for human consumption.

Conclusion: *B. subtilis* strain may be considered as non-pathogenic and safe for human consumption.

Caution

J Med Microbiol. 2012 Dec;61(Pt 12):1766-9. doi: 10.1099/jmm.0.042275-0. Epub 2012 Aug 23.

Combined *Bacillus licheniformis* and *Bacillus subtilis* infection in a patient with oesophageal perforation.

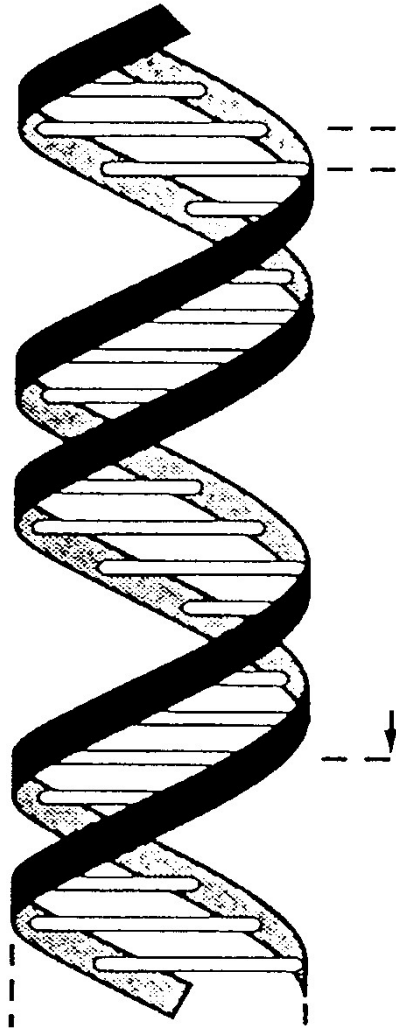
Jeon YL¹, Yang JJ, Kim MJ, Lim G, Cho SY, Park TS, Suh JT, Park YH, Lee MS, Kim SC, Lee HJ.

⊕ Author information

Abstract

Species of the genus *Bacillus* are a common laboratory contaminant, therefore, isolation of these organisms from blood cultures does not always indicate infection. In fact, except for *Bacillus anthracis* and *Bacillus cereus*, most species of the genus *Bacillus* are not considered human pathogens, especially in immunocompetent individuals. Here, we report an unusual presentation of bacteraemia and mediastinitis due to co-infection with *Bacillus subtilis* and *Bacillus licheniformis*, which were identified by 16S RNA gene sequencing, in a patient with an oesophageal perforation.

DNA-deoxyribonucleic acid

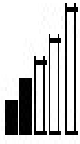
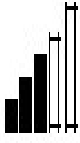
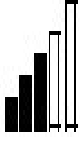


- Encoded repository of heredity
- Watson and Crick-1954
- DNA on chromosomes in higher organisms, corn, mice, humans
- DNA –naked in bacteria, viruses, mitochondria
- Same code in all living things on earth

GPL-SNP 1000

- Test that includes more than 1000 genetic variations (single nucleotide polymorphisms-SNPs) that are important in autism and other mental illnesses
- Test can be done on blood or saliva
- Results include interpretations-50 pages average
- Consultations with experts are additional charges
- If abnormalities are genetic, supplements or other treatments may need to be lifelong

Case study of 3 yr old with autism-oxalate genes

GRHPR	glyoxylate reductase	rs309458		++	No disease associated with this snp
HAO1	glycolate oxidase	rs941426		+ -	Primary hyperoxaluria
HAO1	glycolate oxidase	rs2423334		+ -	Primary hyperoxaluria


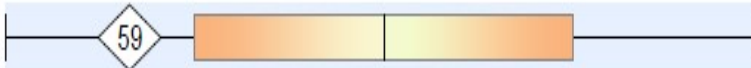

+ unfavorable SNP

- favorable SNP

Case study of 3 yr old with autism-oxalate genes

Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Males Under Age 13
----------------------------	--	---------------	---

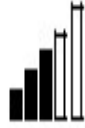
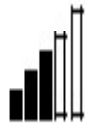
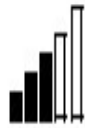
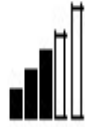
Oxalate Metabolites

19	Glyceric	0.74 - 13	6.0	
20	Glycolic	27 - 221	59	
21	Oxalic	35 - 185	H 357	

Glycolytic Cycle Metabolites

22	Lactic	2.6 - 48	18	
23	Pyruvic	0.32 - 8.8	3.4	

Case study of autism-genes that breakdown opiate peptides

DPP4	dipeptidyl peptidase IV	rs4664443		++	Increased risk of obesity
DPP4	dipeptidyl peptidase IV	rs1558957		++	Increased risk of cardiovascular disease
DPP4	dipeptidyl peptidase IV	rs10490422		++	Increased risk of cardiovascular disease
DPP4	dipeptidyl peptidase IV	rs13015258		++	Altered lipid profile

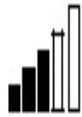
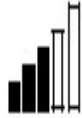
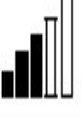
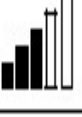
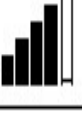
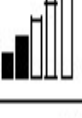

Case study of 3 yr old with autism- DPP IV genes

Gluten / Casein Peptides Test

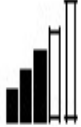
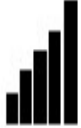
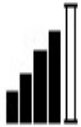
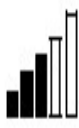
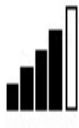
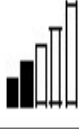

Peptides	Peptide (P) ng/ml	Creatinine (C) mg/dl	Patient Relative Ratio (P/C)	Reference Range Relative Ratio
Casomorphin (Milk)	>500.0	173	> 2.89	<0.56 H
Gliadorphin (Wheat)	59.5	173	0.34	<0.58

5X limit of normal

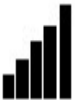
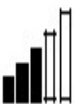
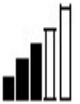
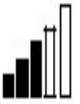
Case study of autism-oxytocin related genes

OXT	oxytocin/neurophysin I prepropeptid	rs2770378		+ -	Increased risk of autism
OXT	oxytocin/neurophysin I prepropeptid	rs2740208		+ +	Increased risk of autism
OXTR	oxytocin receptor	rs237885		+ -	Increased risk of autism and schizophrenia
OXTR	oxytocin receptor	rs2268493		+ -	Increased risk of autism and schizophrenia
OXTR	oxytocin receptor	rs53576		+ +	Increased risk of autism and schizophrenia
OXTR	oxytocin receptor	rs2268496		+ -	No disease associated with this snp
OXTR	oxytocin receptor	rs237898		+ -	Increased risk of autism and schizophrenia

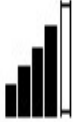
Case study of autism-neurotransmitter function

COMT	catechol-o-methyltransferase	rs4633		+ -	Schizophrenia
COMT	catechol-o-methyltransferase	rs4680		+ -	Schizophrenia
MAOA	monoamine oxidase A	rs6323		+ +	Brunner syndrome
AHCY	S-Adenosyl homocysteine hydrolase	rs819171		+ -	Alteration in biologic methylations
AHCY	S-Adenosyl homocysteine hydrolase	rs819133		+ -	Alteration in biologic methylations
AHCY	S-Adenosyl homocysteine hydrolase	rs819147		+ -	Alteration in biological methylations
AHCY	S-Adenosyl homocysteine hydrolase	rs819146		+ -	Increased risk of aneurysm

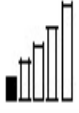
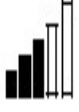
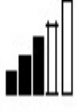
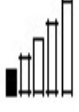
Case study autism-methylation

Gene	Description	RS Number	Pathogenicity	Phenotype	Disease Associated
MTHFR	Methylenetetrahydrofolate reductase	rs1801131		++	Disrupted folate metabolism
MTRR	5-methyltetrahydrofolate-homocysteine methyltransferase reductase	rs1801394		+ -	"neural tube defects, folate-sensitive, susceptibility to down syndrome"
MTRR	5-methyltetrahydrofolate-homocysteine methyltransferase reductase	rs2287780		+ -	No disease associated with this snp
MTRR	5-methyltetrahydrofolate-homocysteine methyltransferase reductase	rs1802059		+ -	No disease associated with this snp

Case study autism-methylation

BHMT	betaine-homocystein methltransferase	rs651852		++	Increased risk of neural tube defects and adhd
BHMT	betaine-homocystein methltransferase	rs506500		++	No disease associated with this snp
BHMT	betaine-homocystein methltransferase	rs567754		++	Increased risk of spina bifida
BHMT	betaine-homocystein methltransferase	rs694290		++	No disease associated with this snp
BHMT	betaine-homocystein methltransferase	rs558133		++	Increased risk of neural tube defects
BHMT	betaine-homocystein methltransferase	rs585800		++	Increased risk of adhd

Case study autism-homocysteine detoxification

CBS	cystathionine beta-synthase	rs2124459		++	No disease associated with this snp
CBS	cystathionine beta-synthase	rs9325622		++	No disease associated with this snp
CBS	cystathionine beta-synthase	rs1801181		++	Increased risk of neural tube defects
CBS	cystathionine beta-synthase	rs2851391		++	Homocysteine levels are altered
CBS	cystathionine beta-synthase	rs234714		++	Change in plasma homocysteine levels
CBS	cystathionine beta-synthase	rs2850144		++	No disease associated with this snp

Case study of 3 yr old with autism-

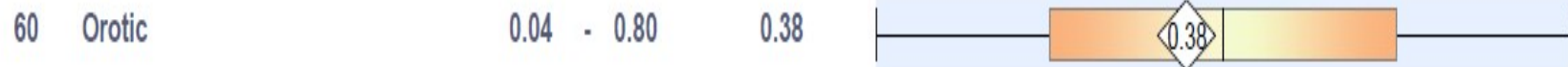
Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Males Under Age 13
----------------------------	--	------------------	---

Indicators of Detoxification

Glutathione



Ammonia Excess



Aspartame, salicylates, or GI bacteria



* A high value for this marker may indicate a Glutathione deficiency.

Case study of 3 yr old with autism-



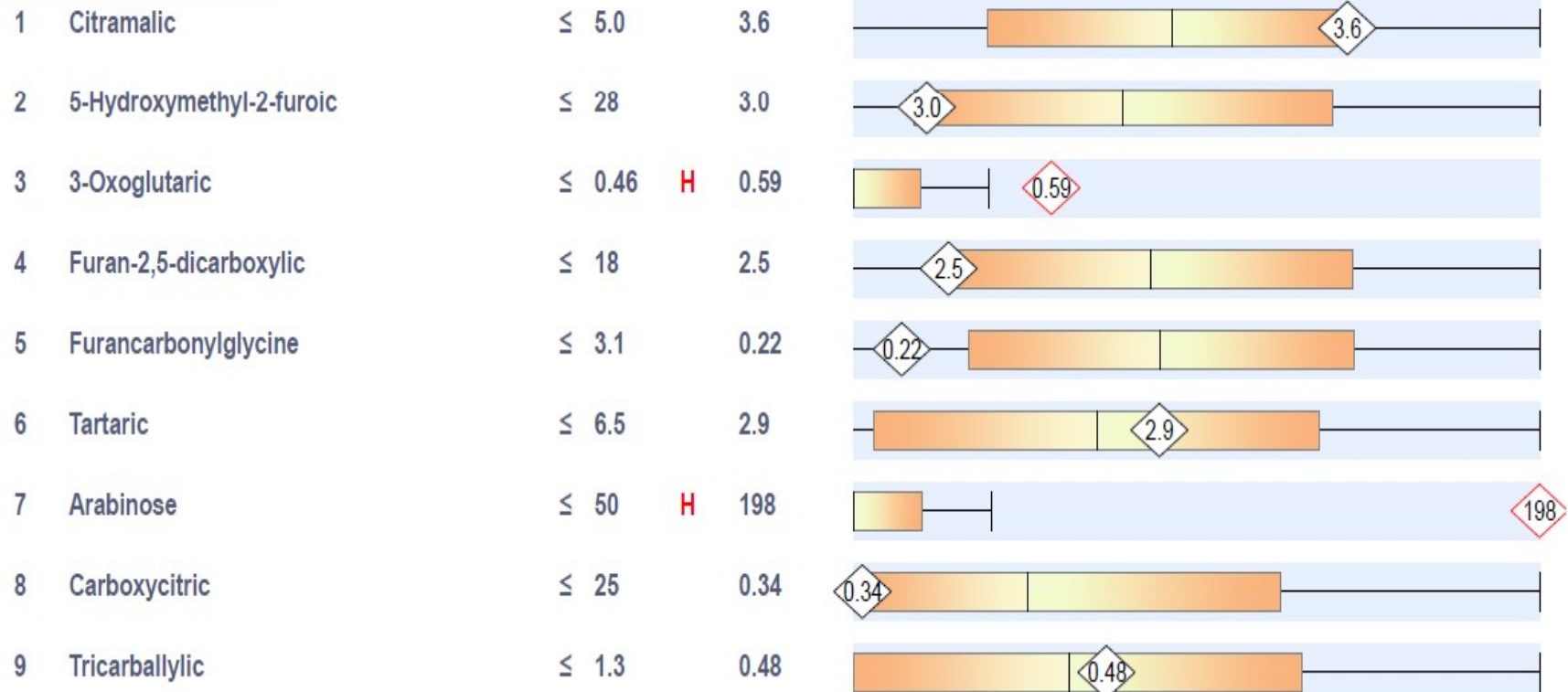
Organic Acids Test - Nutritional and Metabolic Profile

Click on Sign to add text and signatures on a PDF file.

Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Males Under Age 13
----------------------------	--	---------------	---

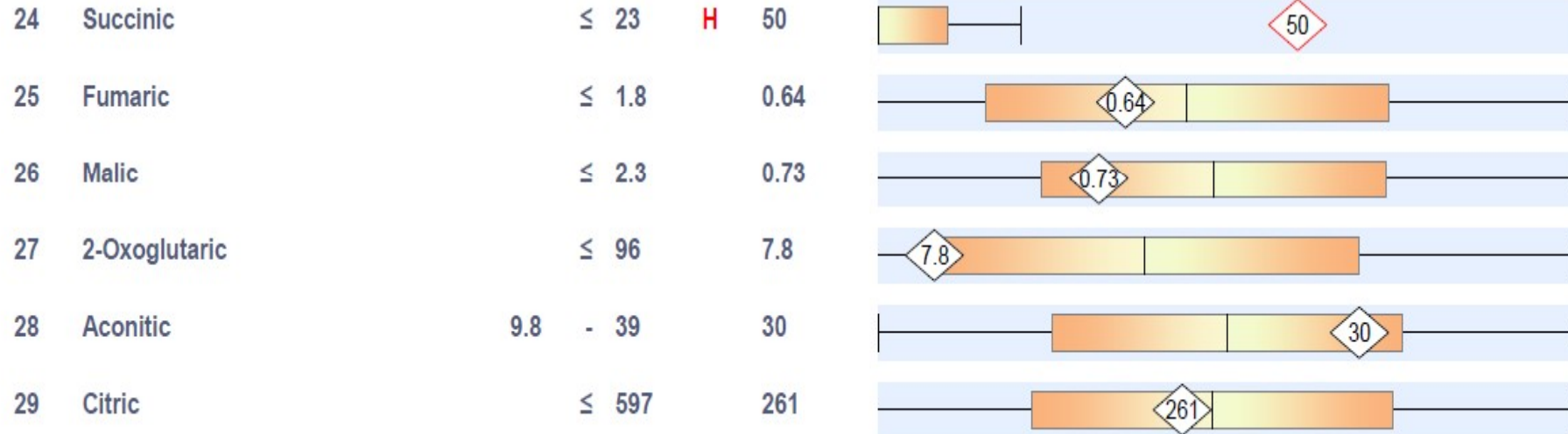
Intestinal Microbial Overgrowth

Yeast and Fungal Markers

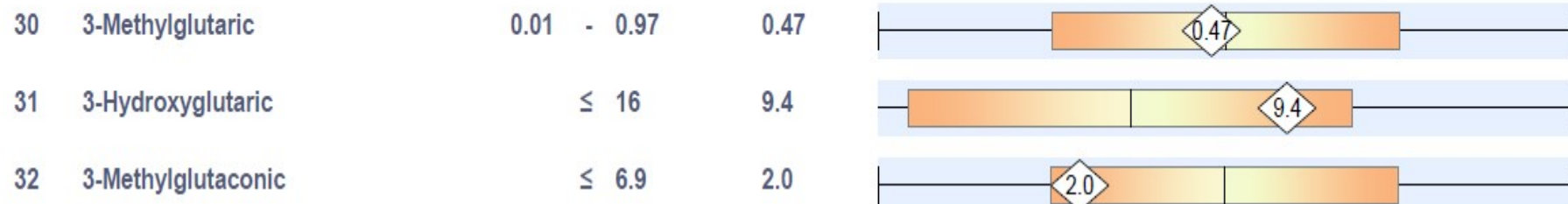


Case study of 3 yr old with autism-

Mitochondrial Markers - Krebs Cycle Metabolites



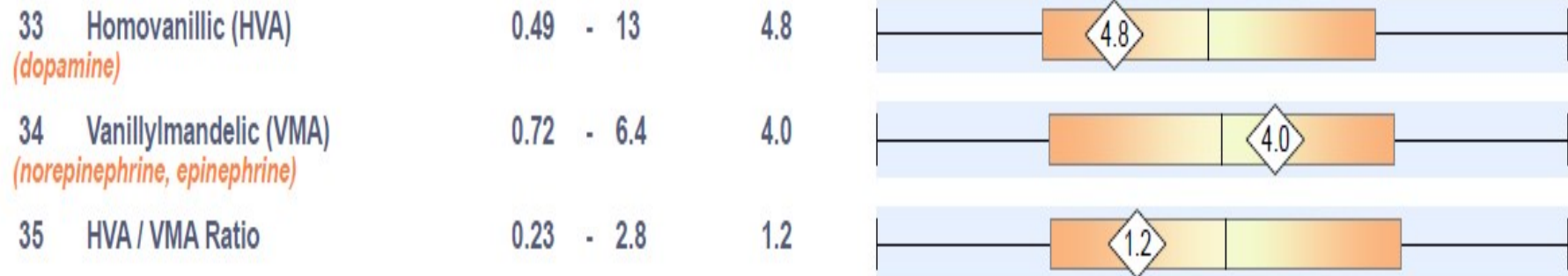
Mitochondrial Markers - Amino Acid Metabolites



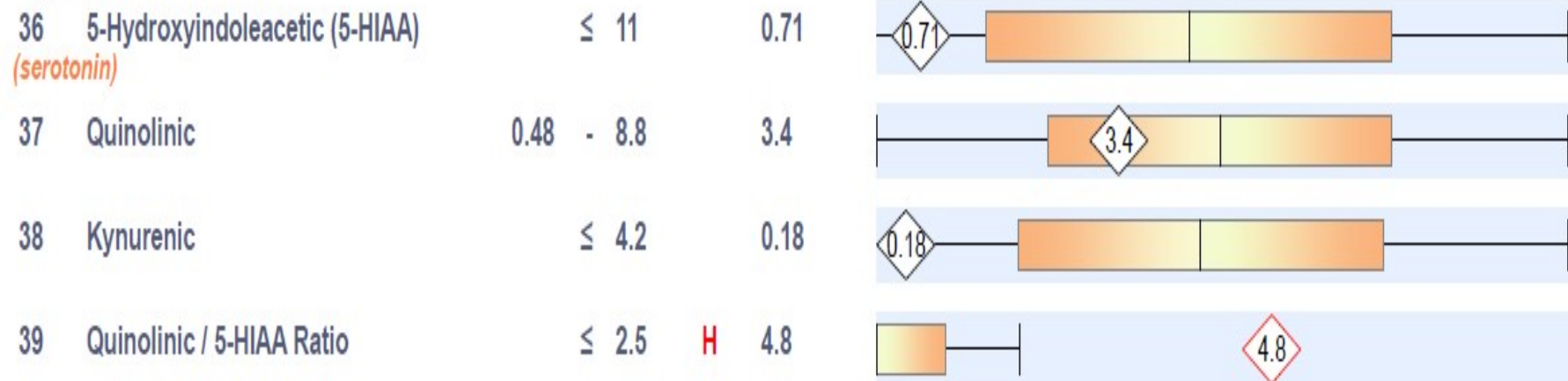
Case study of 3 yr old with autism-

Neurotransmitter Metabolites

Phenylalanine and Tyrosine Metabolites



Tryptophan Metabolites



Case study of 3 yr old with autism-

Nutritional Markers

Vitamin B12



Vitamin B6



Vitamin B5



Vitamin B2 (Riboflavin)



Vitamin C



Vitamin Q10 (CoQ10)



Glutathione Precursor and Chelating Agent



Biotin (Vitamin H)





**Dzięki
tak dużo!**